

° Catalogue and Price List

OF

THE WATERBURY FARREL FOUNDRY AND MACHINE COMPANY,

WATERBURY, CONN., U. S. A.

BUILDERS OF

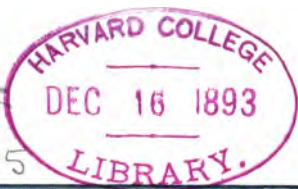
ROLLING MILL MACHINERY FOR BRASS, COPPER, SILVER, ETC. MACHINERY
FOR DRAWING BRASS WIRE AND TUBING. POWER, HYDRAULIC, DROP,
SCREW, AND FOOT PRESSES. RIVET MACHINES. CARTRIDGE
AND SPECIAL MACHINERY.

1893

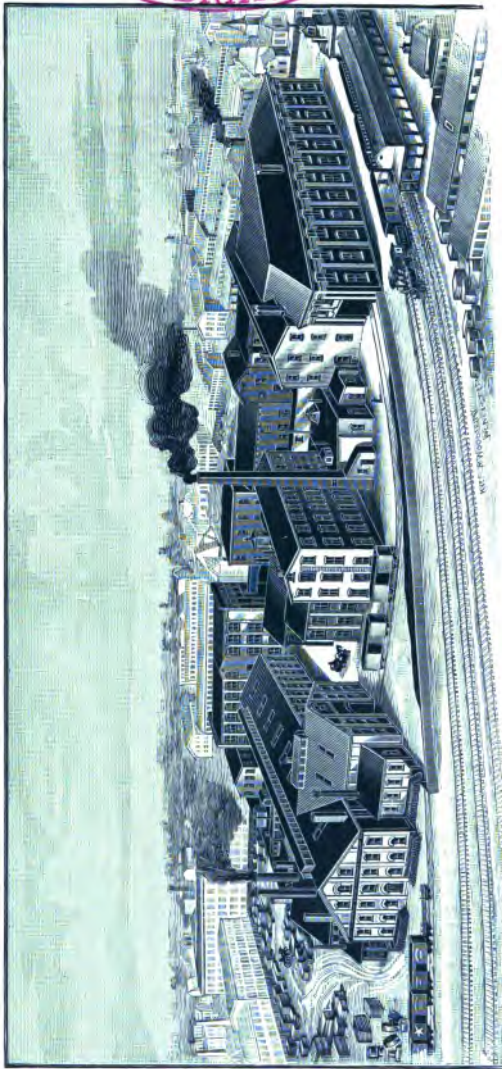
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The Company.



THE WATERBURY FARREL FOUNDRY AND MACHINE COMPANY,

OPPOSITE N. Y., N. H. & H. R. R. STATION, WATERBURY, CONN., U. S. A.

INTRODUCTION.

THE Waterbury Foundry and Machine business was started in the year 1851; was consolidated in 1857 with the Ansonia Foundry, under the name of The Farrel Foundry and Machine Company, and was so continued until 1880, when the present company was organized under the name of The Waterbury Farrel Foundry and Machine Company. New buildings and new machinery have been added yearly, and the capacity of the plant has quadrupled since the formation of the present company.

Inspection of the various machines illustrated in this edition of our catalogue will be of interest to all manufacturers of general hardware, and will be of particular value to those who manufacture specialties from sheet brass, copper, steel, silver, etc.

We call special attention to the portion of this Catalogue which shows the improved construction of heavy mill machinery for producing sheet brass and copper, brass tubing, and brass and copper wire.

We carry a large stock of finished machinery—power presses, drop presses, foot presses, trimming lathes, polishing lathes, slitters, and rivet machines, in our store-house.

The Waterbury Farrel Foundry and Machine Co.

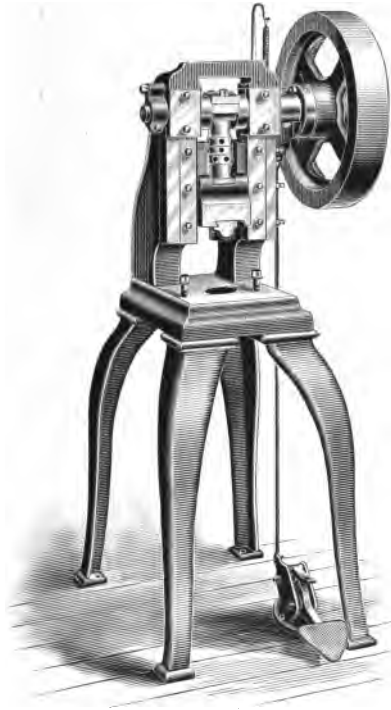
Open Back Single-Acting Presses.

The advantages of the open back press over those with a solid back, and the crank on the end of the shaft are as follows: The crank is supported by journals on each side, preventing the shaft from springing and chafing; the opening in back admits light, a very necessary condition for the nice adjustment of dies; the wheel is on the side, and within easy reach of the operator; the metal can be fed from front to back, as well as from right to left.

Our patterns for these presses are so constructed as to enable us to make them with the distance from bed to bottom of slide, the width between uprights, the manner of holding punches, size of opening in bed, etc., to suit requirements in all cases; also, enabling us to build presses adapted to any existing tools or fixtures. The table on page 10 gives such sizes as we make for standard presses, when no special instructions are given, but *we are prepared to make any modification to suit the purchaser.*

When a press of special dimensions is required we will furnish a blank specification with outline drawing, to be filled out in accordance with the requirements of the purchaser, and can in most cases conform to the sizes given.

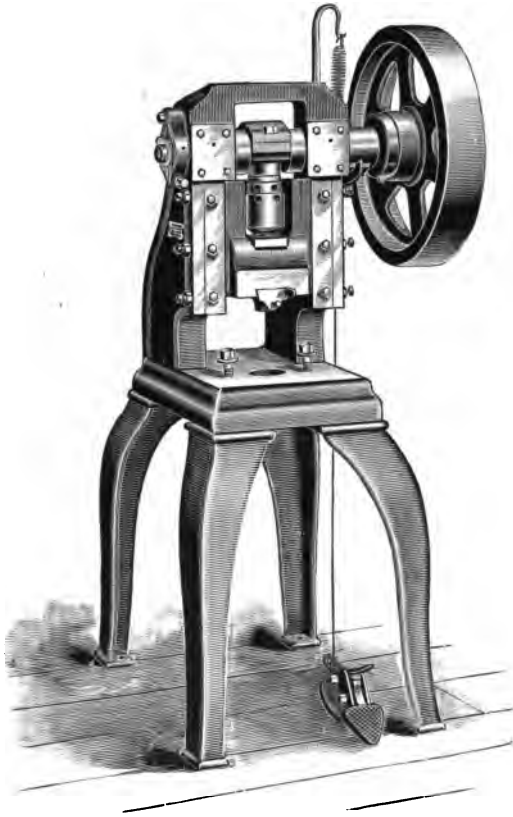
We have adopted for general use the style of connections and adjustments as shown in the different cuts, but will furnish any of the forms described on page 11, if requested.



No. 2 Open Back Single-Acting Press.

The illustration represents the No. 2 size of our Standard Open Back Press, of which dimensions and prices are given on page 10. Our patterns are so constructed that we can build special presses of the above number, with almost any width or stroke, or with unusual distance from the bed to bottom of slides, and arrange the manner of holding dies and punches to suit the purchaser. We furnish wrenches as well as the improved adjustable treadle (patented July 5th, 1892), with all sizes.

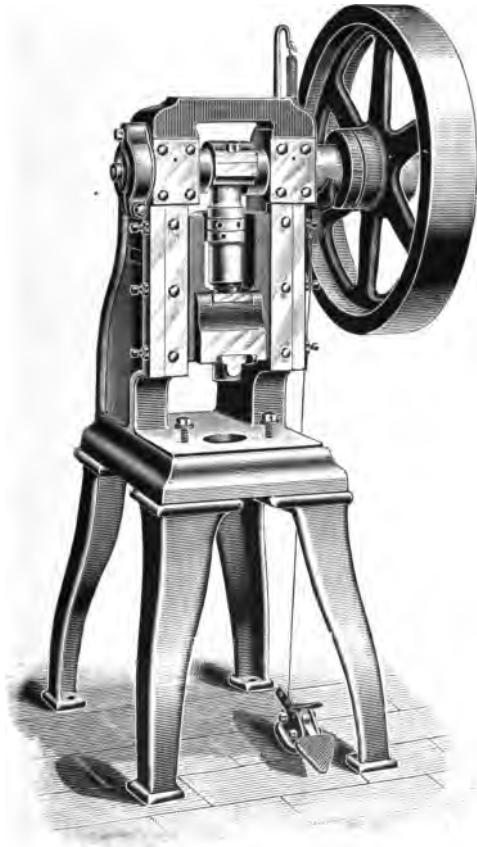
The No. 2 Press, at 130 revolutions per minute, will punch a blank 1 inch in diameter and $\frac{5}{8}$ of an inch thick.



No. 3 Open Back Single-Acting Press.

For price and general dimensions of the No. 3 Standard Open Back Press, see page 10. If special dimensions are desired we will furnish a blank specification and outline drawing, as described on page 4.

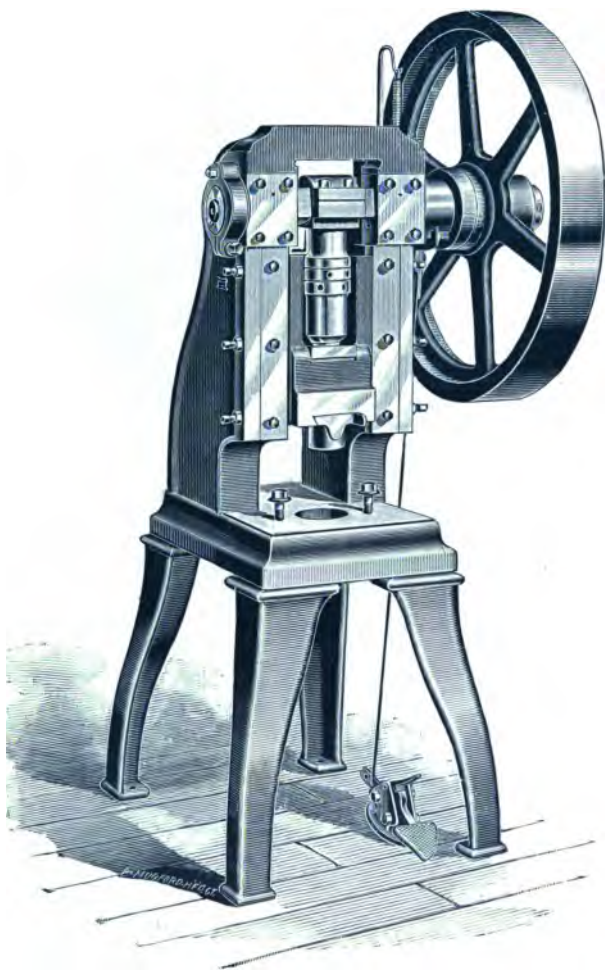
The No. 3 Press, at 125 revolutions per minute, will cut a blank 1 inch in diameter and $\frac{1}{8}$ inch thick.



No. 4 Open Back Single-Acting Press.

Price and dimensions of the No. 4 Standard Open Back Press are given on page 10. We make special presses of this number, with strokes ranging from 1 to 8 inches, and with any changes in the dimensions that may be required.

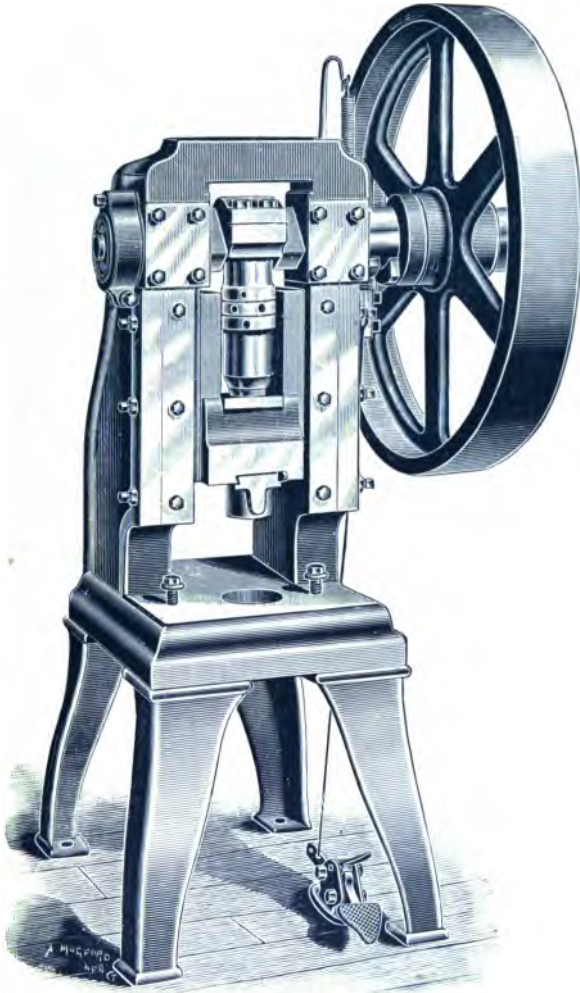
The No. 4 Press, at 120 revolutions per minute, will cut a blank 2 inches in diameter and $\frac{5}{8}$ inch thick.



No. 5 Open Back Single-Acting Press.

The illustration represents our No. 5 Standard Open Back Press, of which dimensions and prices are given on page 10. Special presses of same strength are made to conform to any specifications.

The No. 5 Press, at 100 revolutions per minute, will cut a blank 3 inches in diameter and $\frac{1}{8}$ inch thick.



No. 6 Open Back Single-Acting Press.

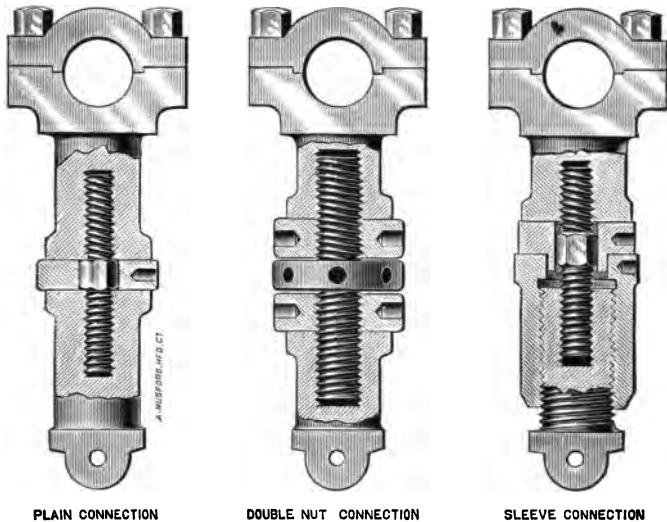
This illustration represents our No. 6 Press, as well as the general appearance of the larger sizes, No. 7 and No. 8. The prices and dimensions are given on page 10. Special presses of either size are made all widths and strokes. Blank specifications, as described on page 4, will be furnished upon application.

The No. 6 Press, at 100 revolutions per minute, will cut a blank 3 inches in diameter and $\frac{1}{8}$ inch thick.

Price List of Standard Single-Acting Open Back Presses.

	NUMBER OF PRESSES,							
	1	2	3	4	5	6	7	8
Distance from bed to center of shaft, inches,	14 $\frac{7}{8}$	16	18 $\frac{1}{2}$	24	27 $\frac{3}{4}$	31	35 $\frac{7}{8}$	44 $\frac{1}{2}$
Stroke as desired, from one inch to	1 $\frac{1}{2}$	2	2	3	3	3	3	3
Distance from bed to slide, when down,	4 $\frac{1}{2}$	4 $\frac{1}{2}$	5 $\frac{1}{2}$	6	7	7	8	8
Distance from center of slide, back to uprights,	2 $\frac{3}{4}$	3 $\frac{1}{4}$	3 $\frac{3}{4}$	4	4 $\frac{1}{4}$	4 $\frac{1}{4}$	5	5 $\frac{3}{4}$
Distance between uprights,	4 $\frac{3}{4}$	4 $\frac{3}{4}$	8	8 $\frac{1}{4}$	9 $\frac{1}{2}$	11 $\frac{1}{2}$	13	14 $\frac{1}{2}$
Distance between die-bed bolts,	5 $\frac{1}{2}$	7	7 $\frac{1}{2}$	8	9	10 & 13	12 & 15	13 & 16
Size of bed in width,	9	9 $\frac{3}{4}$	12 $\frac{1}{2}$	14	15 $\frac{3}{4}$	18 $\frac{7}{8}$	22	30
Size of bed, front to back,	6	8 $\frac{1}{4}$	9 $\frac{3}{8}$	9 $\frac{1}{2}$	10 $\frac{3}{4}$	11 $\frac{3}{4}$	14	14
Diameter of opening in bed,	3	3	4	4	5	6	8	8
Diameter of fly wheel,	14	18	20	30	36	42	48	50
Face of fly wheel,	2 $\frac{3}{4}$	3	3 $\frac{1}{2}$	4 $\frac{1}{4}$	4 $\frac{1}{2}$	5 $\frac{1}{2}$	6	7
Weight of fly wheel, lbs.,	75	100	150	320	400	620	850	1,400
Weight, plain,	450	550	800	1,450	2,000	3,000	4,500	6,500
Price, plain,	\$110	\$125	\$150	\$225	\$275	\$360	\$500	\$650
Price, back-gearcd,			\$225	\$325	\$375	\$475	\$625	\$800

Prices include improved adjustable treadle and wrenches.



Connections and Adjustments.

We will fit any size of press with either of the three styles of adjustments shown and described as follows :

PLAIN CONNECTION.

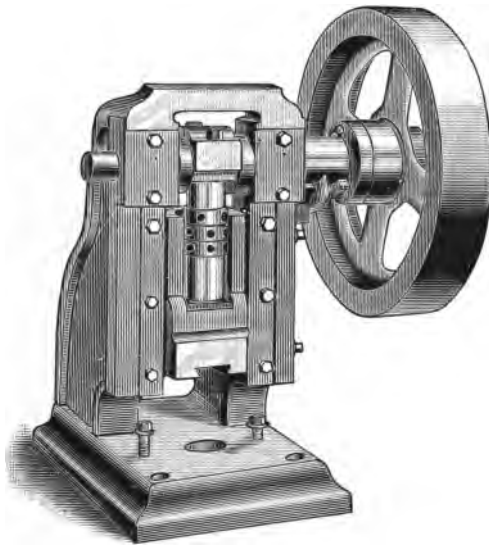
The plain connection is one that has been much used, and is still preferred by many users of our presses. It is made by joining the upper and lower members with a right-and-left-hand screw, having its central portion of hexagon shape, and fitted with a collar and nut for turning; the adjustment is made by separating the two parts of the connection and inserting U shaped packing of sheet metal, and then bringing the two parts solidly together by means of the screw. This makes, when adjusted, a practically solid connection, and one that is reliable for the hardest work.

DOUBLE-NUT CONNECTION.

This connection is constructed by joining the upper and lower members by a large right-and-left-hand screw, fitted with jam-nuts; makes an excellent and easy adjustment for drawing presses, or for any work not subjected to extreme shock.

SLEEVE CONNECTION.

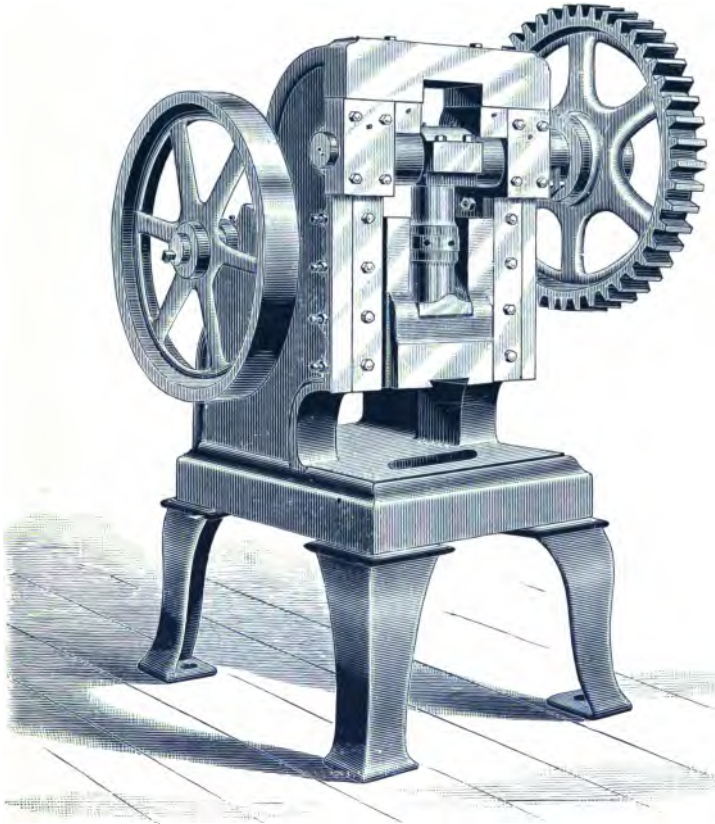
The Sleeve Connection is made by fitting a large steel nut or internally threaded sleeve to the lower part of the connection, and connecting the upper and lower parts by a right-and-left-hand screw. This screw is turned by a collar having a hexagonal hole in center, through which the screw is fitted, making an exceedingly strong adjustment, and one that will not loosen by the shock or jar of the press.



Bench Press.

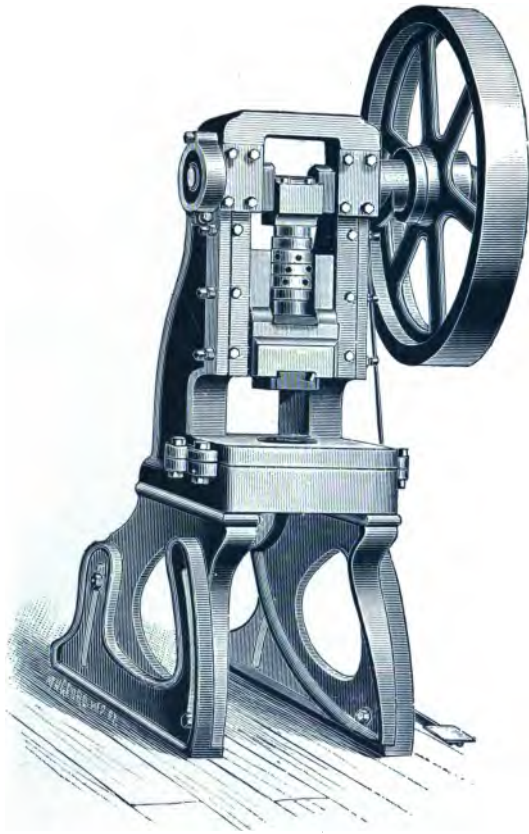
This illustration represents one of our small presses made without legs, and designed to be placed upon an ordinary bench. These presses are made of the dimensions given on pages 10 and 15. A blank specification will be furnished where special sizes of these presses are needed.

No. 0,	Weight	175 lbs.	Price, \$	90.00.
No. 1,	“	415 “	“	105.00.
No. 2,	“	500 “	“	120.00.
No. 3,	“	650 “	“	140.00.
No. 4,	“	1200 “	“	215.00.



Open Back Single-Acting Press with Back Gears.

The illustration shows the manner of applying back gears to our open back presses. They are made with cut gearing and steel pinions, and fitted with tight and loose pulleys when desired. Blank specifications will be furnished for presses requiring special dimensions. For prices see page 10.



Patent Adjustable Incline Presses.

These presses are similar to those illustrated on the preceding pages, but have larger die accommodations. To change from upright to inclined position it is only necessary to loosen the bolts upon sides of the legs, and push the press to the desired point, an operation easily performed, as the point of contact on bottom of legs always remains under the center of gravity. The punch holders are made as shown in the cut, or for round or square shanks, as desired.

Dimensions and prices are given on the following page.

Patent Adjustable Single-Acting Incline Presses.

	NUMBER OF PRESS.							
	2	3	4	5	6	7	8	
Stroke as desired, from one inch to inches,	2¼	2½	3½	3½	4	4	4	
Distance from bed to slide, when down,	4½	5¼	7	8	8½	9	9	
Distance from center of slide, back to uprights,	3¼	3¾	5	5½	5¾	6	6	
Distance between uprights,	6	8	8¼	9½	10¾	15	15	
Size of bed, front to back,	8	10½	12	13½	14	15	15	
Size of bed in width,	12	14½	17	18½	21	24	24	
Diameter of opening in bed,	3	6	8	10	11	11	11	
Thickness of bolster plate,	1½	1½	2	2	2	2	2	
Diameter of fly wheel,	18	20	34	36	42	48	48	
Face of fly wheel,	3	3½	4½	4½	5½	6	6	
Weight of fly wheel, lbs.	120	150	350	400	550	850	850	
Weight, plain, lbs.	650	1,100	1,800	2,500	3,500	5,000	5,000	
Price, plain,	\$135	\$175	\$250	\$300	\$400	\$525	\$525	
Price, back-gear'd,		\$250	\$350	\$400	\$525	\$650	\$650	

Prices include bolster plate, treadle and wrenches.

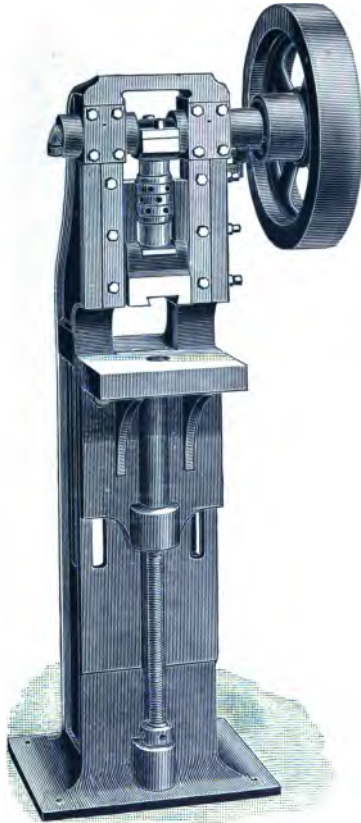


No. 0 Open Back Press with Table.

This press, while classed with our regular open back presses, is of slightly different construction. The slide is square, the joint between it and the connection being spherical. Dimensions are about as follows: Distance between bed and bottom of guide, $4\frac{1}{2}$ inches; from center back to uprights, $3\frac{3}{8}$ inches; size of bed, front to back, $5\frac{1}{4}$ inches; side to side, 6 inches; wheel, 12 inches in diameter and 2 inches face; stroke as desired up to $1\frac{1}{2}$ inches. For prices see page 12.

We illustrate this press on an iron table with legs, which is a suitable mounting for the No. 0, 1, 2, or 3 size, mentioned on page 12.

Price of Table with legs, \$10.00.

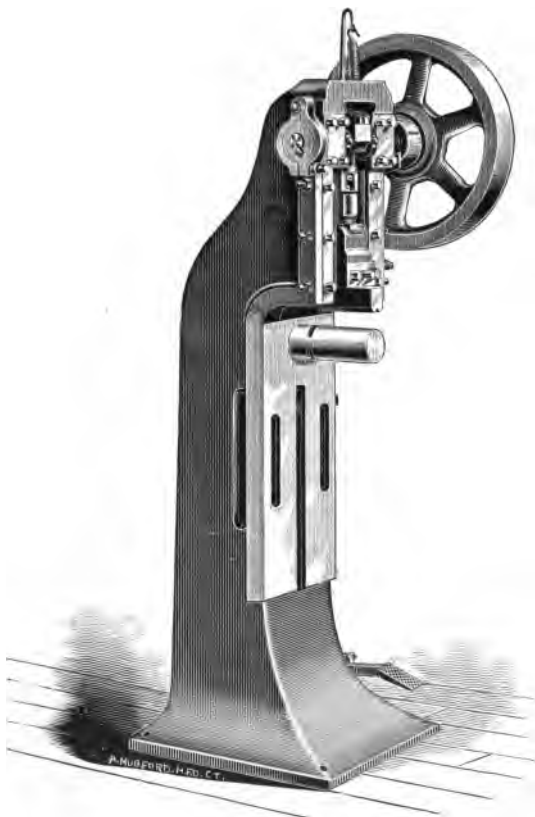


No. 2 Adjustable Bed Press.

Our No. 2 Standard Open Back Press, when arranged as above, finds much favor, and when provided with perforating attachment described on page 99, is specially suited for piercing ends of shells, perforating chandelier rings, etc. The distance between bed and bottom of slide may be varied from four to seventeen inches. Other dimensions are as given on page 10.

Weight, 750 lbs. Price, as shown, \$175.00.

Price, with Perforating Attachment, - 300.00.

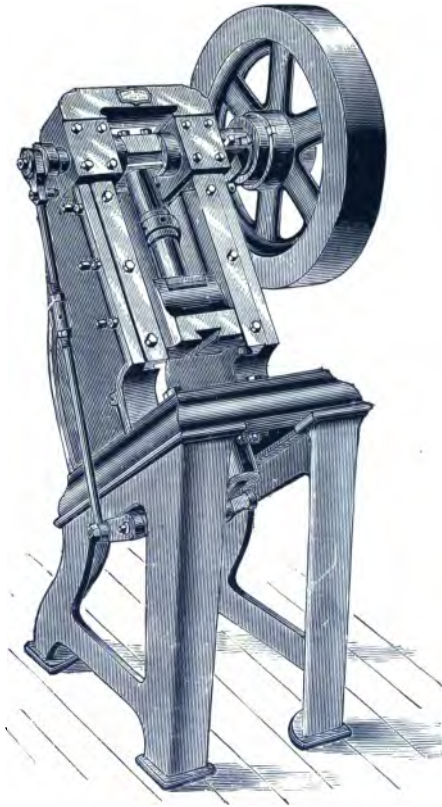


No. 3 Adjustable Bed Press.

The above illustration shows our No. 3 Standard Press as designed for an adjustable bed, and as a closing press for can seams. The distance from center of slide back to upright is 5 inches; from center of horn to bottom of slide, 4 inches; size of hole for shank of horn, $2\frac{1}{2}$ inches in diameter and 4 inches deep; distance from bottom of slide to bed may be varied from 8 inches to 15 inches. Other dimensions are as given on page 10.

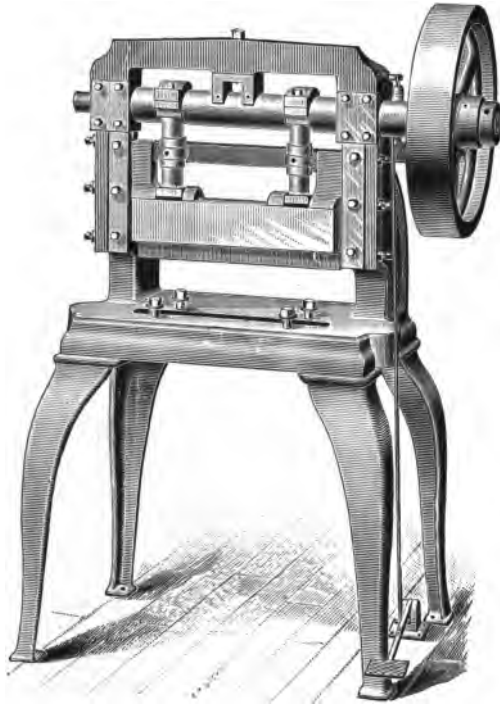
Price as shown, - - - \$175.00.

Price, with Adjustable Bed, 200.00.



Inclined Press.

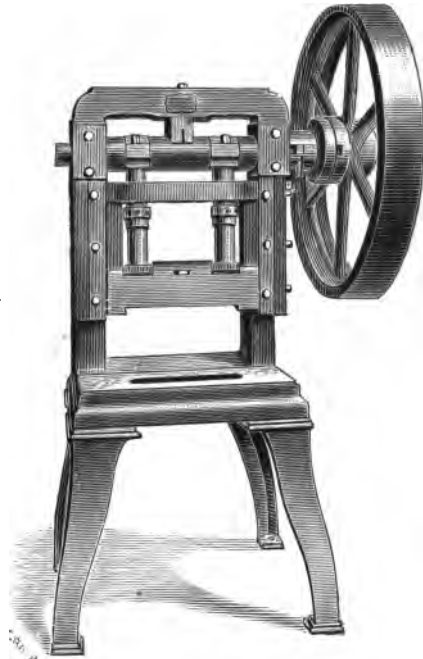
This illustration shows the manner of mounting open back presses upon fixed inclined legs, for which all sizes are adapted. For prices see page 10.



No. 3 Double Connection Press.

The illustration represents our No. 3 Press with double connections, suitable for trimming and piercing work like corset steels, etc., or to receive gang punches or shear blades. The distance between the uprights is 20 inches, and other dimensions same as those given for No. 3 Press, on page 10. We will make special presses of this pattern to order, with dimensions to conform to specifications.

Weight, 1,100 lbs. Price, including Treadle and Wrenches, \$225.00.

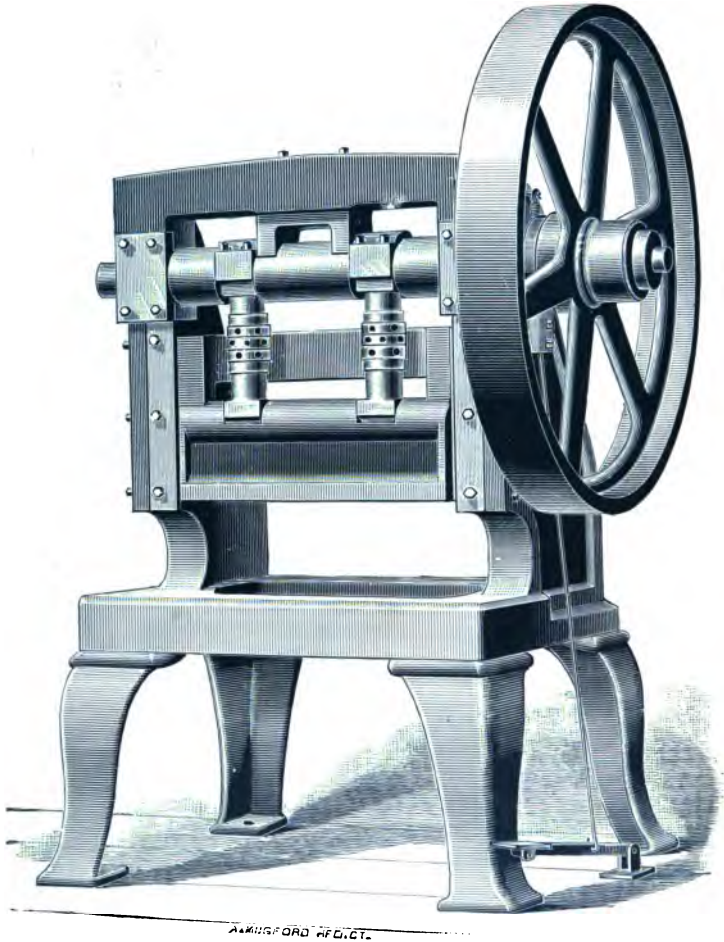


No. 4 Double Connection Press.

This Press as illustrated is 20 inches wide between the uprights, but we will make it to order of any desired width, with or without back gears, and will be made adapted to shear blades or other special tools, to suit purchaser.

Weight of No. 4 Press, as shown, 1,850 lbs.	Price, \$325.00
Back-Geared,	“ 425.00

No. 5 Double Connection Press, Price, \$375.00.	
No. 5, Back-Geared,	“ 475.00.



No. 7 Double Connection Press.

The above illustration represents our No. 7 Double Connection Press, made 33 inches wide between uprights. We make to order presses of all widths and fitted with shear blades or tools as required.

Weight, 5,500 lbs.	Price, \$550.00.
Back-Geared,	" 675.00.

No. 6, Double Connection Press, Price, \$450.00.

No. 6, Back-Geared, " 575.00.

Special Open Back Presses.

We make from our regular patterns a variety of special Open Back Presses not illustrated in this catalogue, among which the following forms will be found desirable for many purposes:

Double Slide Press.

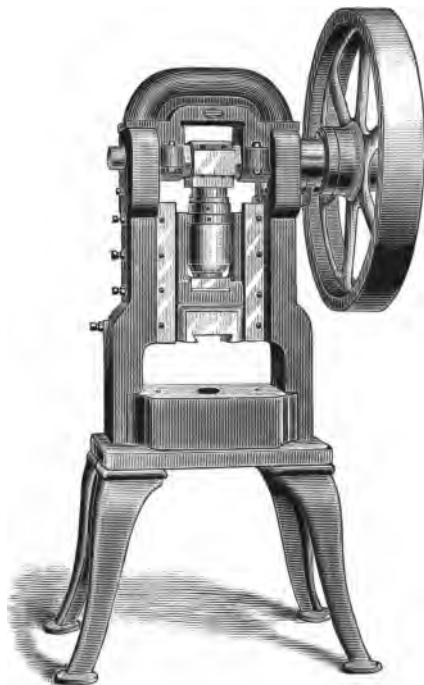
The Double Slide Open Back Press is made by casting the frame with a central upright of same form as the main or side uprights, and fitting the frame with two slides and guides, the sides being operated from the shaft by eccentrics, with the stroke as desired. Such presses are useful for cutting and bending, or for forging and trimming, and can be made with feeds for automatic work, and are also fitted with one single and one double-acting slide for special work.

Multiple Plunger Press.

Open Back Presses with any number of plungers are made from our regular patterns by casting the frame of the desired width between the uprights, and fitting the front of the uprights with a slide-bearing frame with caps, for any number of slides, which may be operated by cams or eccentrics. These presses can also be made with a double-acting slide for cupping sheet metal, and are usually provided with automatic feed and carrying devices for special work.

Double Presses.

Double Open Back Presses are made by mounting two complete presses upon one table, each press having separate wheel and clutch, one at the right and the other at the left hand side. These presses are useful for various kinds of hot work, such as forging and trimming, and when arranged with dial feeds will enable one operator to feed both machines with ease.

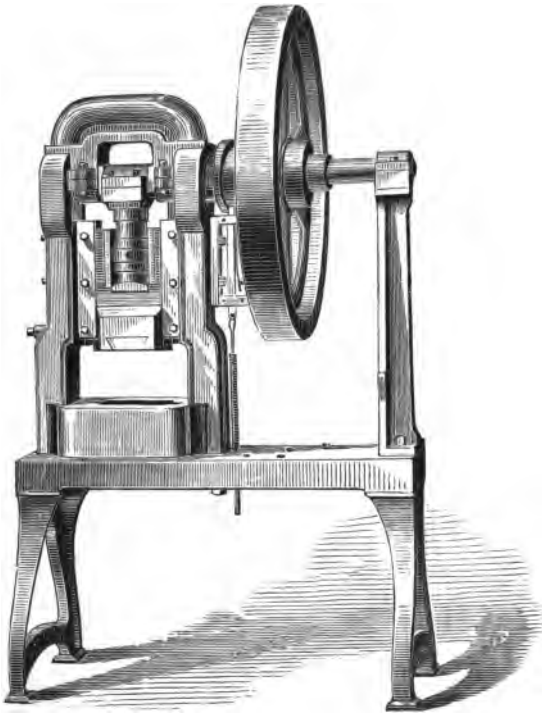


No. 1 Arch Press.

Arch Presses are designed for the heavier kinds of work, and are unequalled for strength, the strain being in a direct line through the center of the uprights.

The illustration represents our No. 1 size as mounted upon legs, without the outside support for wheel as shown on the following pages. We will arrange the manner of holding punches to suit the purchaser, but recommend the dove-tailed punch block, keyed in for all kinds of heavy work, as it holds the punches beyond possibility of moving under heavy strain, and enables the operator to remove and replace the punch with ease and accuracy.

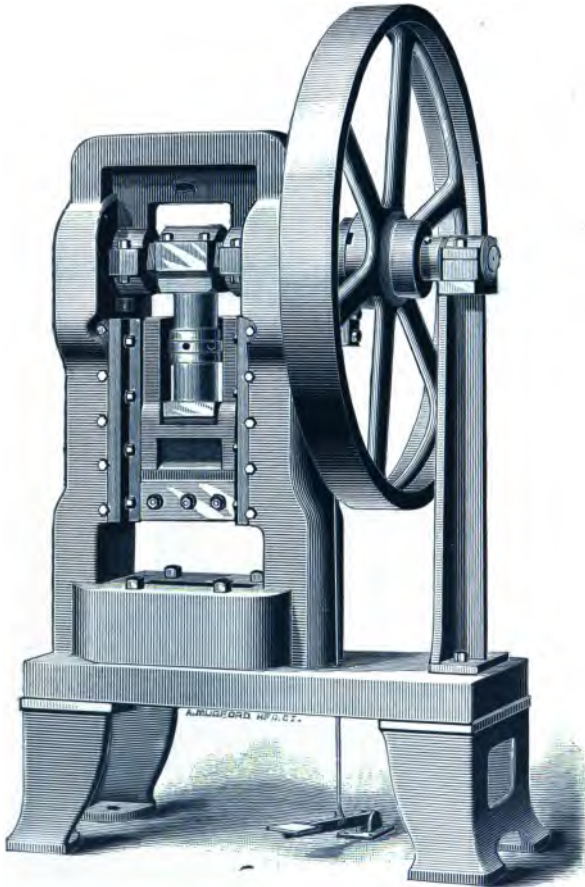
Prices and dimensions are given on page 27.



No. 2 Arch Press.

The illustration represents our No. 2 Arch Press mounted upon a table, and having support and bearing outside of the fly wheel. The details can be changed so as to adapt them to special requirements.

Prices and dimensions are given on page 27.



No. 3 Arch Press.

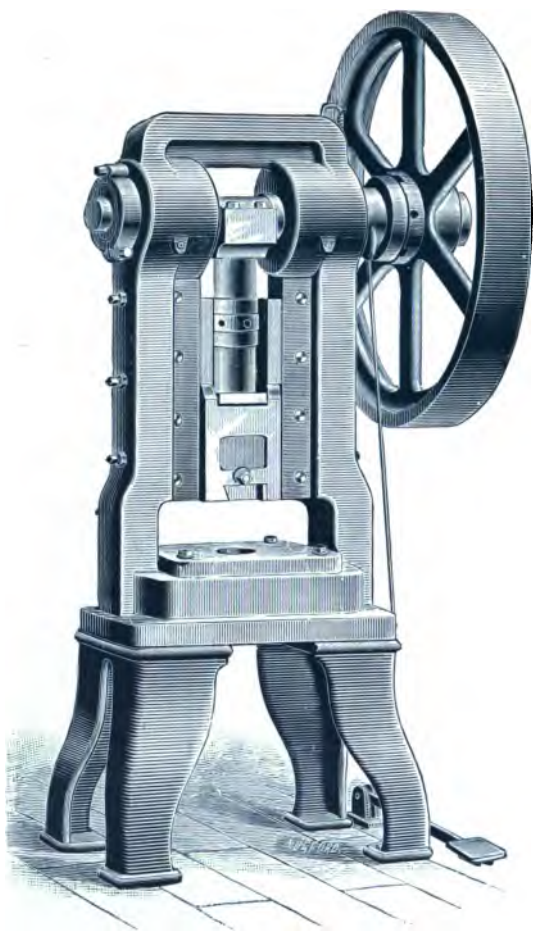
This illustration represents our No. 3 Arch Press on a table, and with bearing outside of the fly wheel. We will make special sizes of this press to conform to specifications:

Prices and dimensions are given on page 27.

Price List and Dimensions of Arch Presses.

NUMBER OF PRESS,	1	2	3
Stroke as desired, from one inch to inches,	2	2½	3
Distance from bed to slide, when down, .	6½	7¾	8
Distance between uprights,	16	18	23
Width of bed, front to back,	16	18	21
Size of uprights,	3½ x 7	4½ x 11	6 x 12
Diameter of wheel,	42	50	61
Weight of wheel, lbs.	600	900	1,200
Weight,	3,100	5,500	8,000
Price,	\$425.00	\$675.00	\$900.00

Prices include treadle and wrenches.

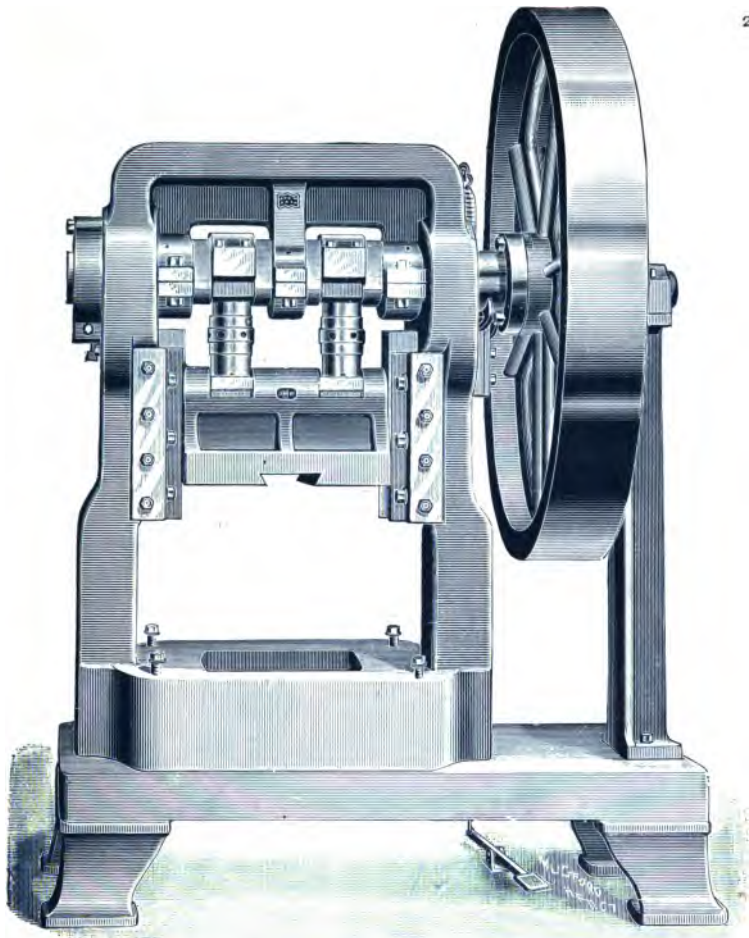


Special Arch Press.

The illustration represents one of our Special Arch Presses designed for heavy punching. The slide is extra long and rigidly guided, making an excellent press in which to use gang tools. The stroke is $1\frac{1}{4}$ or $1\frac{1}{2}$ inches. The distance from bottom of slide to bed, when down, is 7 inches; width between uprights, 19 inches; diameter of wheel, 48 inches.

Weight, 4,000 lbs.

Price, \$500.00.



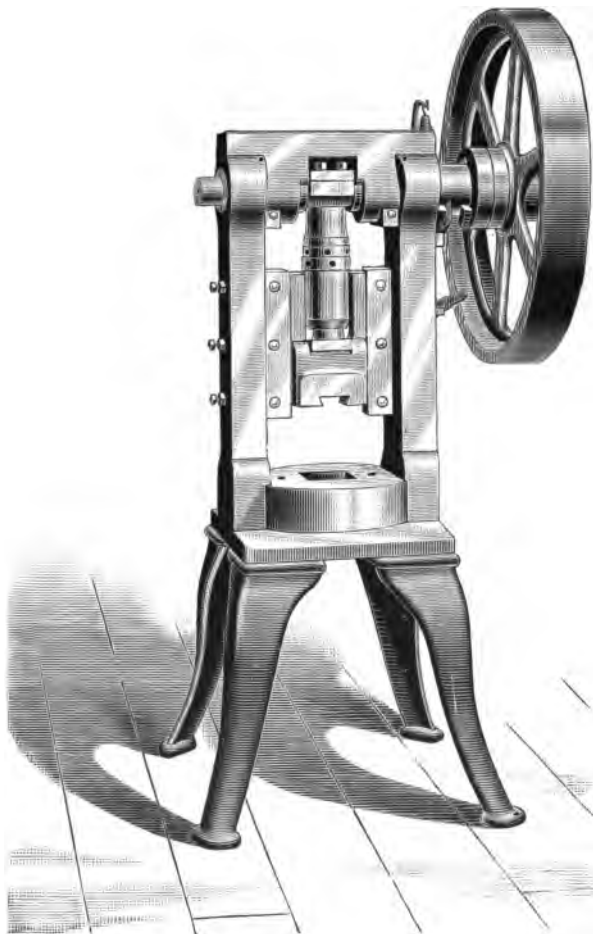
Double Connection Arch Press.

This press is suitable for trimming drop forgings (either hot or cold), for punching or forming, and a variety of work requiring large dies. The principal dimensions are as follows, but may be varied to conform to any specifications: Size of uprights, $12\frac{1}{2}$ x $6\frac{1}{2}$ inches; distance between uprights, $34\frac{3}{4}$ inches; distance from bed to bottom of slide, when down, $16\frac{1}{2}$ inches; opening in bed, 18 x 18 inches. The wheel is 34 inches in diameter and 9 inches face, and weighs $2,400$ pounds. Stroke can be made as desired up to $3\frac{1}{2}$ inches.

Total Weight, 12,500 lbs.

Price, \$1,250.00.

We have various patterns for presses of this class, and are prepared to design and build them with dimensions to suit any requirements. Prices for any special size will be given after receipt of sample of work or specifications.



Pillar Press.

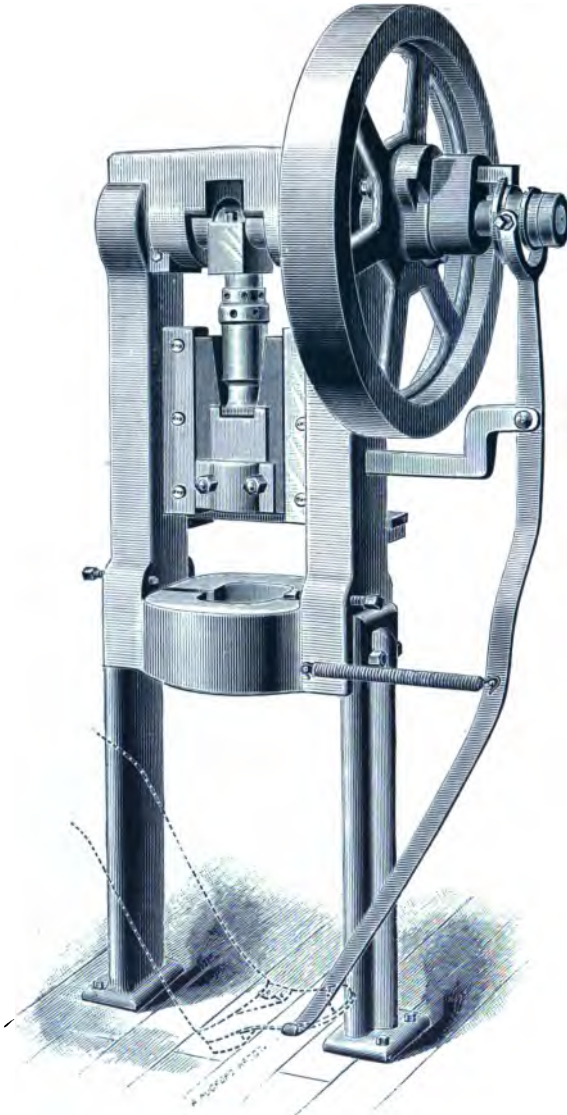
The illustration represents our straight side or Pillar Press, of which we have a variety of sizes besides the regular line. The opening in bed and manner of holding punches can be changed to suit the requirements of the work for which they are intended, and we will at any time design presses of this class to suit specifications. Prices and dimensions of regular sizes are given in the table on the following page.

These presses are mounted as shown on pages 32 and 33, when desired.

Price List and Dimensions of Pillar Presses.

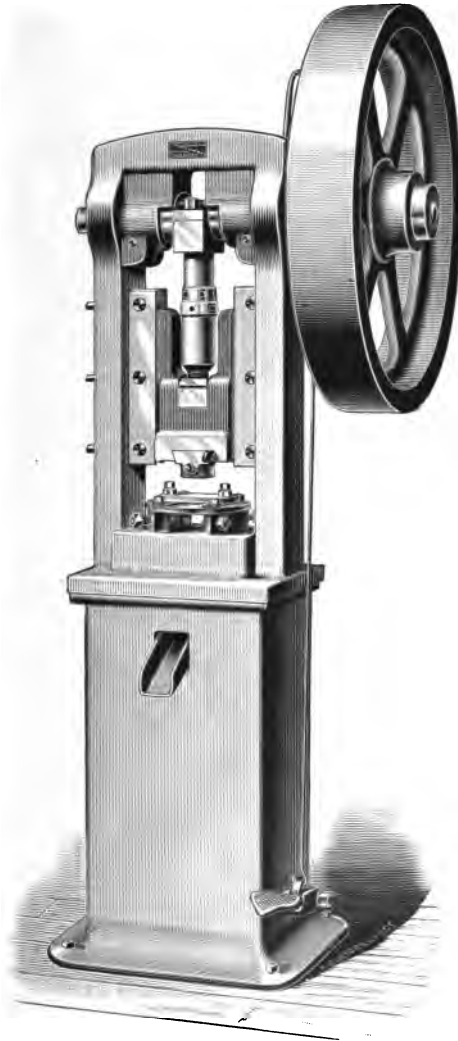
	Number of Press,		2		2½		3		3½	
	0	1	2	SPECIAL	2½	3	3½	SPECIAL		
Stroke, inches,	1	1½	1½	1½	4	1½	1½	1½	5	
Distance from bed to slide, when down,	4	5½	6	6½	7	6	7	7	6¼	
Distance between uprights,	9½	11½	16	12½	16	18	15	20	14¾	
Width of bed, front to back,	10¾	13¾	18	19½	21	18	18	20	18	
Opening in bed,	2 x 3	4 x 4	6 x 6	5 x 5	5 x 8	7 x 10	8 x 8	7 x 7	4 x 4	
Diameter of fly wheel,	20	22	30	30	38	38	42	42	38	
Face of fly wheel,	3½	4	4¼	5¼	4½	5	5	5	5	
Weight of fly wheel, lbs.	125	225	350	400	450	500	550	550	500	
Weight,	900	1,200	1,600	1,800	2,000	2,400	3,250	3,300	3,500	
Price,	\$200	\$240	\$280	\$300	\$325	\$350	\$425	\$450	\$475	

Prices include treadle and wrenches.



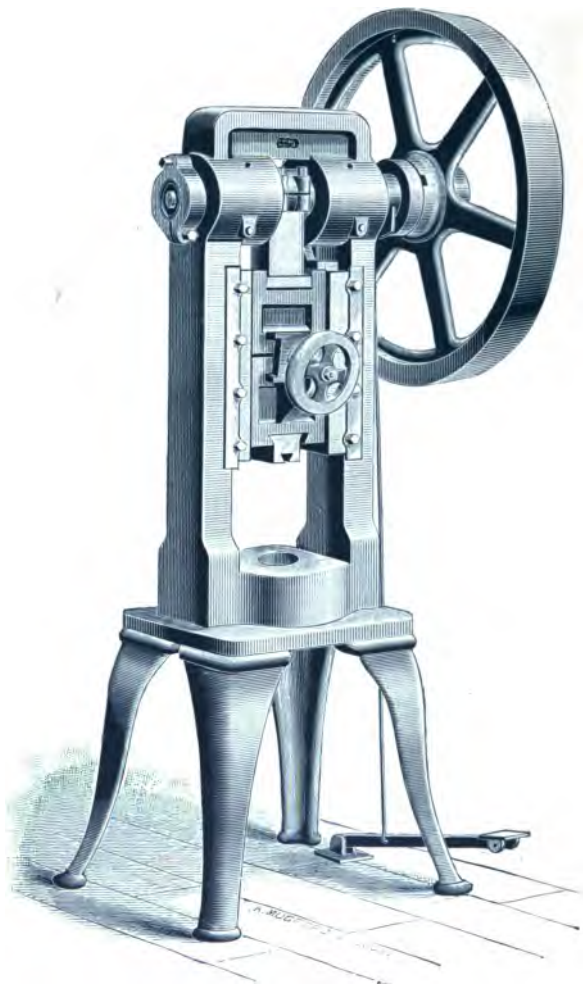
No. 2 Pillar Press.

The illustration shows style of mounting Pillar Presses as preferred by some manufacturers. The operator sits at one side and can control both ends of the stock. The stop motion is arranged to stop and start at any part of the stroke, and can be applied to all styles of presses when desired.



Pillar Press on Pedestal.

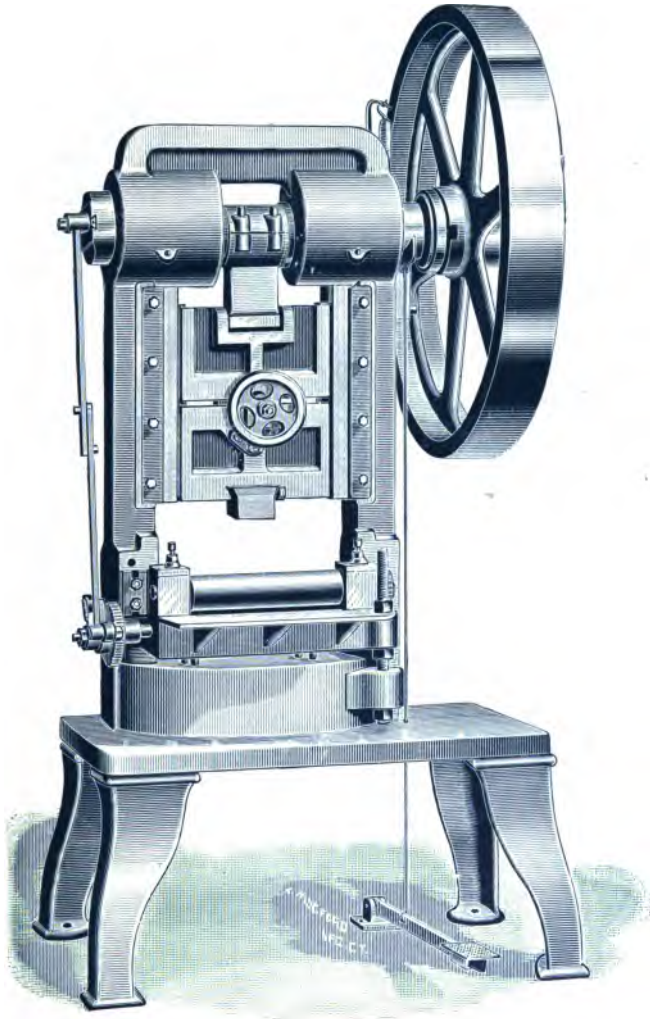
We illustrate here our No. 1 Plain Pillar Press neatly mounted, and designed for cutting coin blanks, proving weights, etc. Dimensions are about as in table on page 30. Height from floor to face of die-bed, 34 inches. Wheel, 30 inches in diameter and $4\frac{1}{4}$ inches face. Stroke, 1 inch.



Pillar Press for Sub-Press Work.

We illustrate above the No. 1 size of Pillar Press, especially designed for this class of work. Three regular sizes of this form are made of dimensions given in the adjoined table, but we will make to order any special size with dimensions as may be required. Automatic feeds are readily applied to these presses.

	NUMBER OF PRESS,	1	2	3
Distance from bed to slide, when down,	inches,	10	16	20
Distance between uprights,		13½	16	20
Diameter of fly wheel,		36	48	72
Face of fly wheel,		4½	5¾	9
Weight of fly wheel,	lbs.	430	900	2,000
Weight, complete,		2,350	5,500	15,150
Price,		\$375.00	\$750.00	\$1,500.00



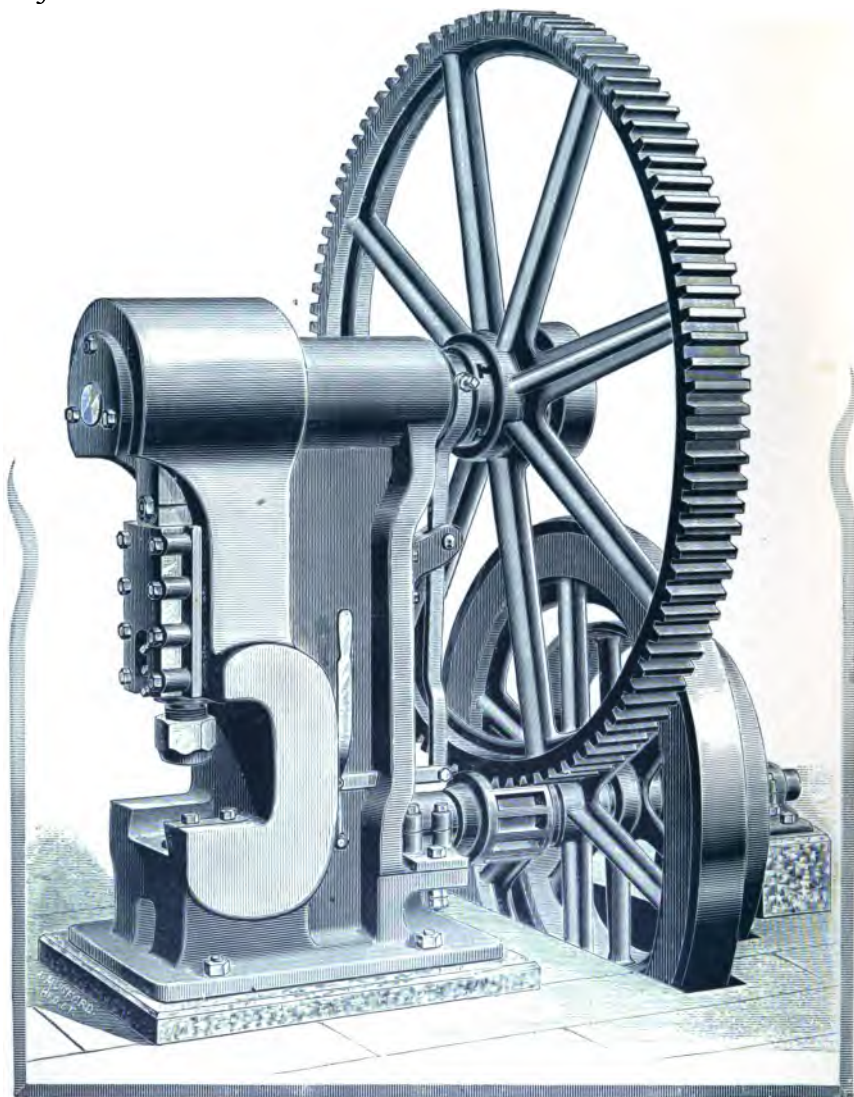
Special Pillar Press for Sub-Press Work.

As an example of the changes we make in these presses to fit them for extra long work, the above illustration shows the No. 2 size made extra wide, the distance between the uprights being 22 inches, and having a special ratchet-driven roll feed so arranged that it may be easily adjusted as to height, or swing out of the way to facilitate the adjustment of tools.

The adjustment of gate on all of these presses is made by means of the well-known double wedge, firmly fitted, and operated by a convenient hand wheel on front.

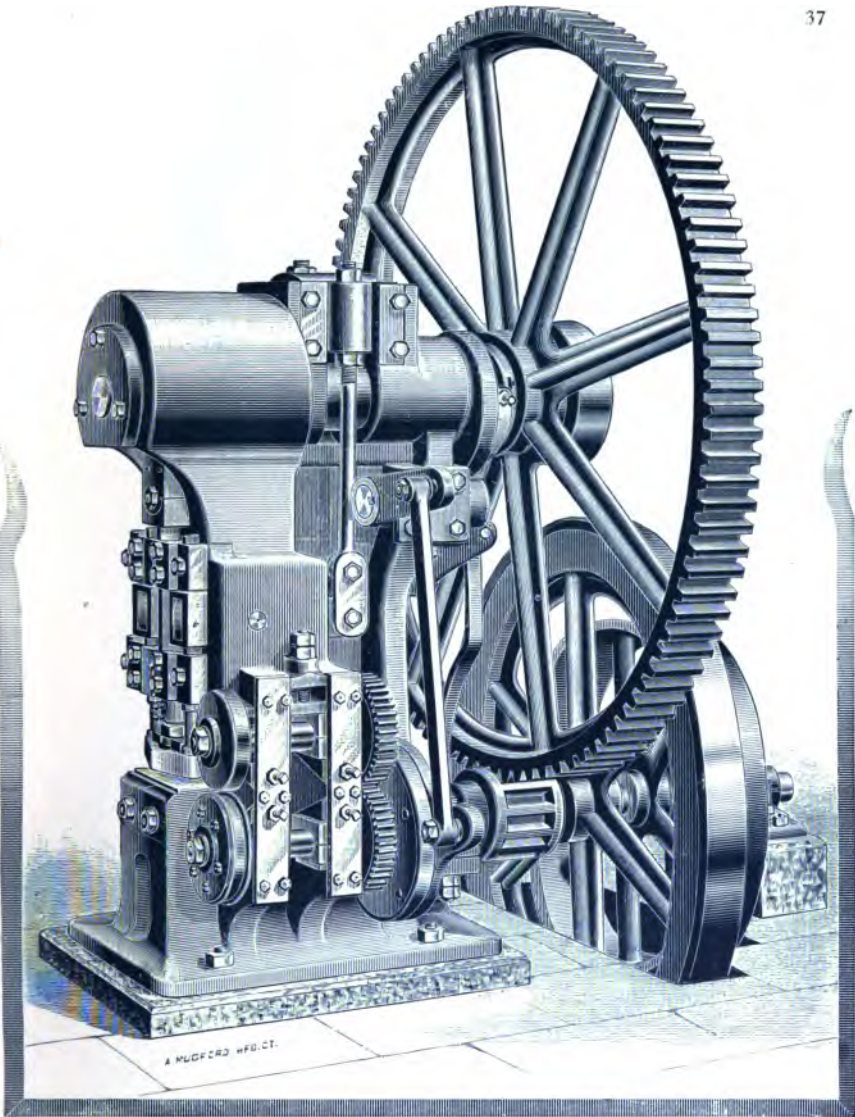
Weight, complete, 6,000 lbs.

Price, \$850.00.



Large Punching Press.

We are prepared to build to order various sizes of special presses for heavy punching, with dimensions suited for the intended work, and fitted with feeding devices of all kinds. The illustration represents a press capable of punching $1\frac{1}{2}$ inch holes in $1\frac{1}{2}$ inch iron. We build several sizes of this form and fitted with double or single back gearing. Stroke, $2\frac{1}{4}$ inches. Geared $9\frac{1}{4}$ to 1. Balance Wheel, 80 inches in diameter and 7 inches face. Pulley, 42 inches in diameter and 12 inches face.

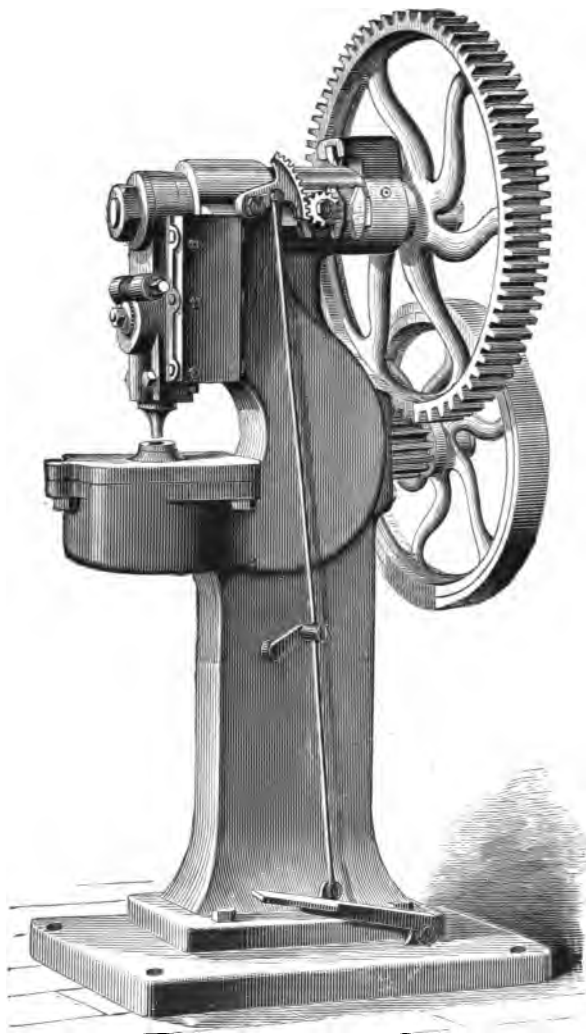


Large Punching Press.

The illustration represents a large punching press fitted with roll feed for feeding heavy iron, and an automatic pressure plate for holding same while being cut or pierced. Various sizes and modifications are made to order. Stroke of punch, $1\frac{1}{4}$ inches. Geared $\frac{9}{16}$ to 1. Balance wheel, 80 inches in diameter and 7 inches face. Driving pulley, 48 inches in diameter and 12 inches face.

Prices will be quoted upon application.

Weight, 25,000 lbs.



Wilder Punching Press.

In addition to Open Back and Pillar Presses already described, we have a full line of patterns for solid back punching presses, of which the above cut is a good representation of sizes from No. 1 to No. 5, inclusive. All sizes are made either plain or back-gearred, as desired.

For dimensions and prices see page 39.

Price List of Wilder's Patent Punching Presses.

Size of Press.	Stroke In Inches.	Diameter and Face of Fly Wheel In Inches.	Opening in Bed, Oval, In Inches.	(Gears.)	Greatest Distance of Slide From Bed, Inches.	Distance From Center of Slide to Back, Inches.	Price.
No. 1 Plain,	1	20 x 3	3 x 4½	.....	5	3½	⌘
" 1 Geared,	1	15 x 3	3 x 4½	5 to 1	5	3½	
" 2 Plain,	1½	25 x 3½	4 x 7	.....	5½	6	
" 2 Geared,	1½	20 x 3	4 x 7	5 to 1	5½	6	
" 3 Plain,	1½	30 x 4	5 x 8	.....	6	6½	
" 3 Geared,	1½	25 x 3½	5 x 8	5 to 1	6	6½	
" 4 Plain,	1½	35 x 4½	6 x 8	.....	6½	7	
" 4 Geared,	1½	30 x 4	6 x 8	5 to 1	6½	7	
" 5 Plain,	1½	50 x 5½	8 x 10	.....	7½	7½	
" 5 Geared,	1½	35 x 4½	8 x 10	6 to 1	7½	7½	

Wilder's Punch and Shear.

The illustrations on the following page show the Wilder Punch and Shear for punching and shearing boiler or tank iron, etc. They are made either plain or with back gears, or as punches, shears, or combined punch and shear, as desired.

No. 5 Plain will punch $\frac{3}{8}$ inch hole in iron $\frac{3}{8}$ inch thick, 15 inches from edge of sheet, or will shear $\frac{3}{8}$ inch iron 13 inches from edge of sheet. The fly wheel is 40 inches in diameter and 4 inches face.

Price of punch or shear, \$425.00.

Price of combined punch and shear, \$475.00.

No. 5 Geared will punch $\frac{3}{4}$ inch hole in iron $\frac{3}{8}$ inch thick, or will shear plates $\frac{1}{2}$ inch thick. The press is geared 5 to 1, and has a fly wheel 30 inches in diameter and 4 inches face.

Price of punch or shear, \$525.00.

Price of combined punch and shear, \$575.00.

No. 6 Plain will punch $\frac{3}{4}$ inch hole in iron $\frac{1}{2}$ inch thick, 18 inches from edge of sheet, or will shear $\frac{1}{2}$ inch plate 16 inches from edge of sheet. The fly wheel is 60 inches in diameter and 6 inches face.

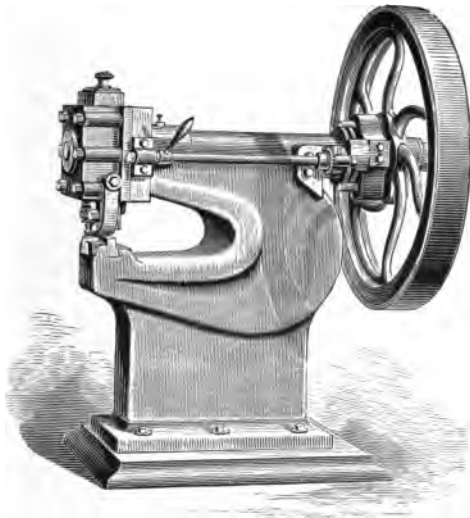
Price of punch or shear, \$600.00.

Price of combined punch and shear, \$650.00.

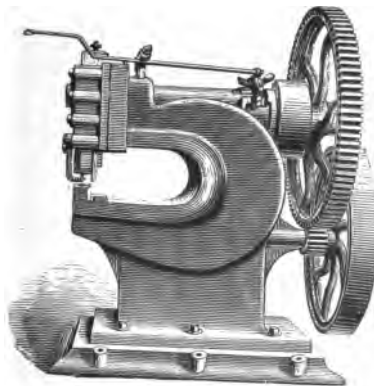
No. 6 Geared will punch $\frac{3}{4}$ inch hole in $\frac{3}{4}$ inch iron, or will shear $\frac{3}{4}$ inch plates. The fly wheel is 35 inches in diameter and 4 inches face. The press is geared 6 to 1.

Price of punch or shear, \$700.00.

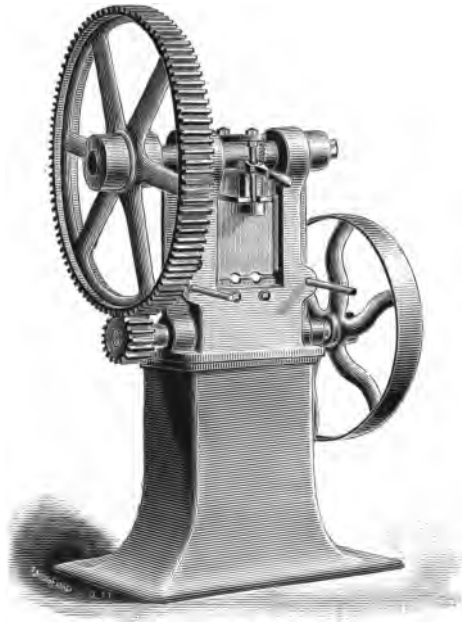
Price of combined punch and shear, \$750.00.



No. 5 Wilder Punch and Shear.



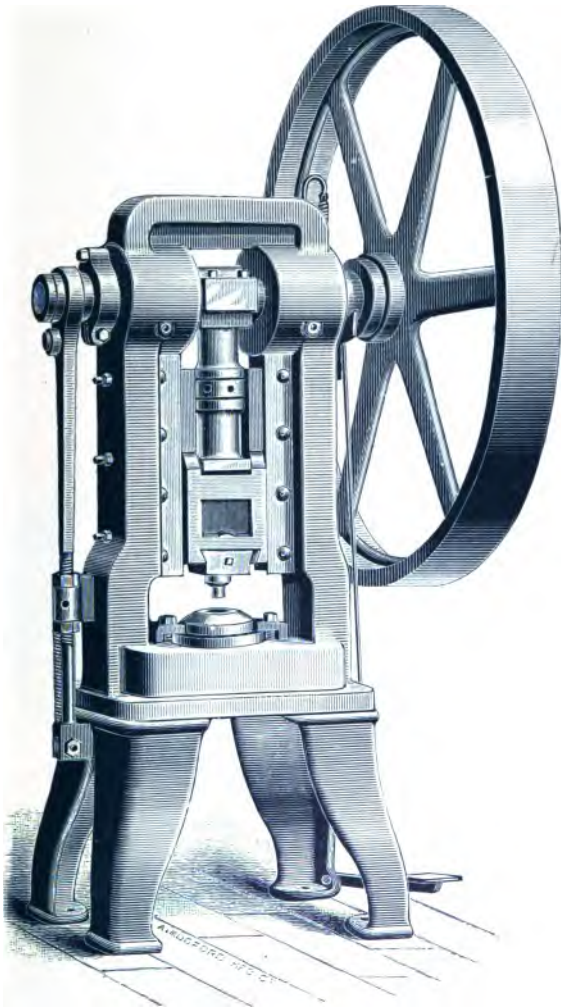
No. 6 Wilder Punch and Shear.



No. 1 Bar Iron Cutter.

The following sizes of machines are designed for cutting off round, square or flat, bar iron.

No.	cuts	in.	round or square,	or	5 in. wide,	Price,	\$
1	$\frac{3}{4}$					125.00.	
2	1				7	175.00.	
3	$1\frac{1}{2}$				10	375.00.	
4	2				12	575.00.	
5	$2\frac{1}{2}$				15	800.00.	

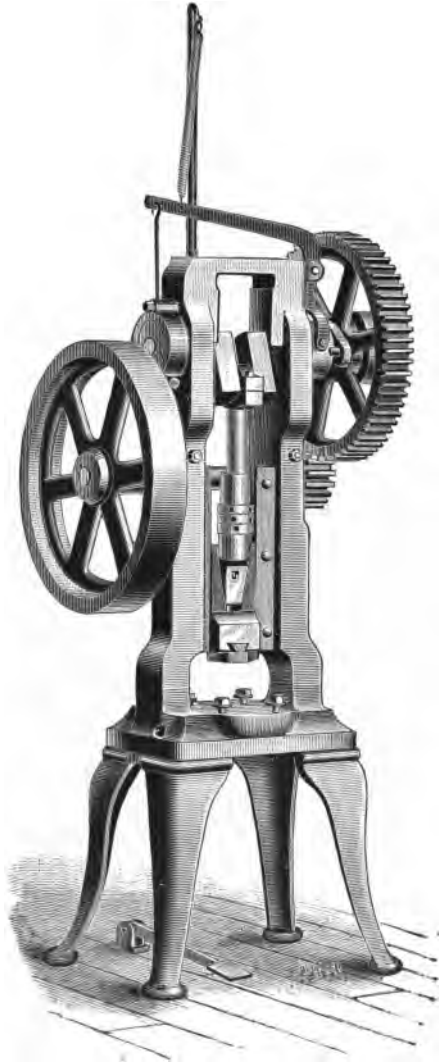


Washer Press.

The illustration shows special arch press with knock-out attachment and large fly wheel. The attachment is used in connection with combination dies for cutting and piercing at one operation washers of standard size for $1\frac{1}{2}$ inch bolts. Dies and punches made to order.

The Horizontal form of washer press is described on page 102.

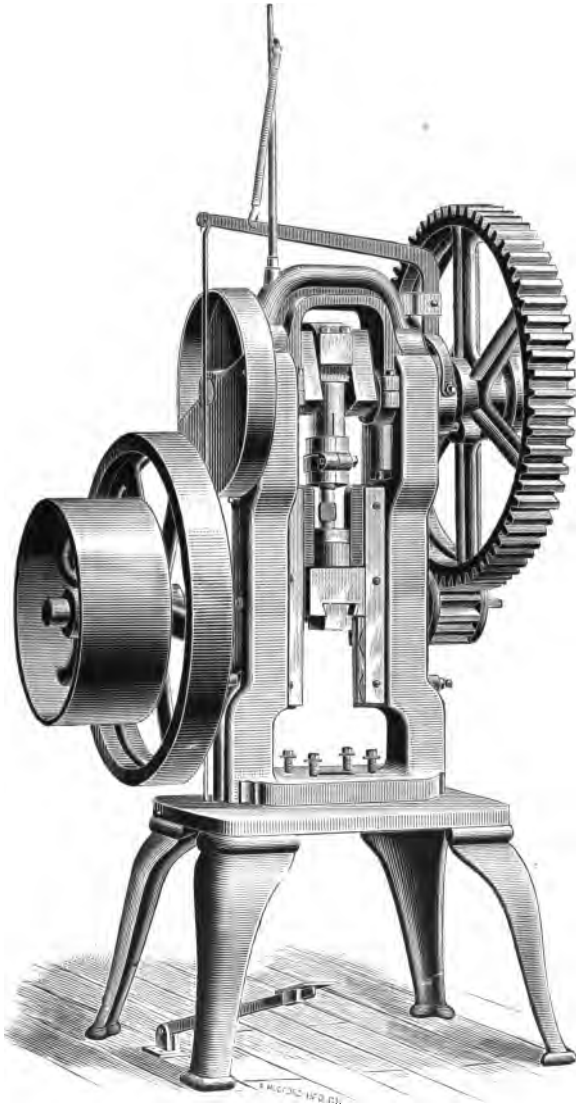
Weight, 4,100 lbs. Price, with attachment (without dies), \$600.00.



No. 1 Arch Geared Drawing Press.

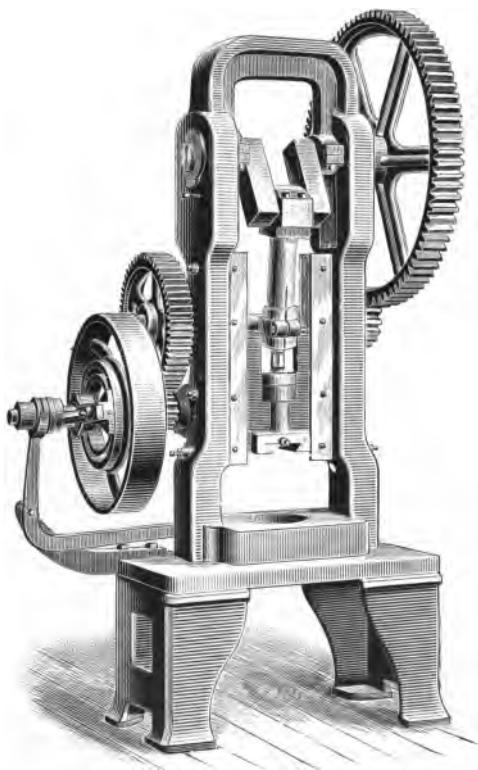
Designed for redrawing long shells or tubes. It has cut gearing, with steel pinion and crank shaft.

Prices and dimensions are given on page 47.



No. 2 Geared Drawing Press.

The illustration represents the No. 2 size of Geared Drawing Press. Prices and dimensions are given on page 47.



No. 3 Geared Drawing Press.

These presses are made with double gearing, having all cut teeth, with steel pinions and shafts. They are driven by friction clutch pulley, provided with brake, which enables the operator to stop and start the press at any point of the stroke, by the treadle.

Price List and Dimensions, Arch Geared Drawing Presses.

	NUMBER OF PRESS.	1	2	3
Stroke, as desired from Inches,		6 to 12	6 to 13	10 to 16
Distance from bed to slide, when down,		6½	8	10
Distance between uprights,		13½	18	21½
Width of bed, front to back,		16	17	19
Opening through bed,		4	8	8
Diameter of fly wheel,		30	36	....
Face of fly wheel,		4	4½	....
Weight of fly wheel,		300	400	....
Driving Pulley, Inches,		24 x 4½	30 x 5
Geared,		4 to 1	6 to 1	24 to 1
Weight,		2,200	4,350	7,000
Price,		\$400	\$650	\$900

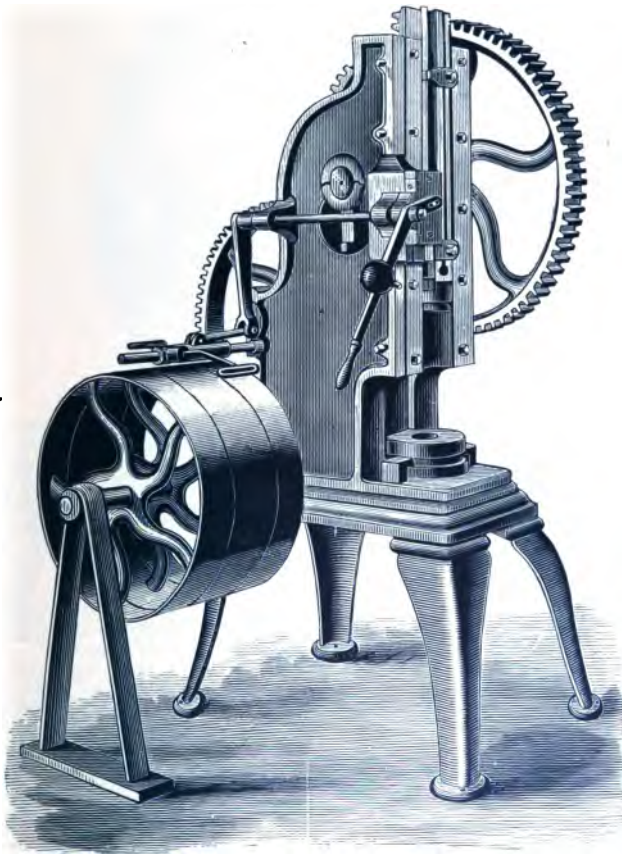


No. 8 Eccentric-Geared Drawing Press.

Designed for drawing long tubes, heavy metallic cartridge cases, etc. The eccentric gears give a uniform speed to the punch during the entire downward stroke, and a quick upward or return motion. The clutch motion is connected with a brake which works automatically when the foot treadle is released, and stops the machine quickly at any time. The gearing is all cut from solid metal. The stroke of crank is 12 inches; distance from bottom of slide to bed of press, when slide is down, 10 inches; width between uprights, $14\frac{1}{2}$ inches; width of bed over all, $25\frac{1}{2}$ inches. The gearing is $5\frac{1}{2}$ to 1, without the eccentric gears. The fly wheel is 42 inches in diameter and $5\frac{1}{2}$ inches face.

Total weight, 9,500 lbs.

Price, \$1,200.00.

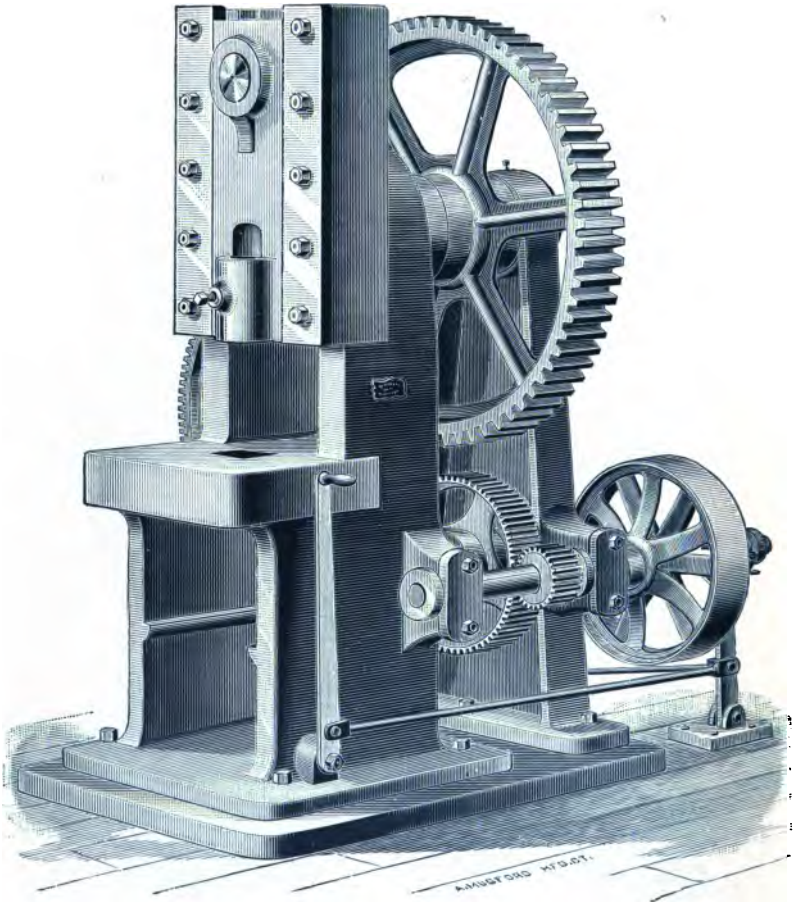


Upright Rack-and-Pinion Press.

This machine is designed for drawing very long shells or tubes. It has an adjustable stroke from 4 to 30 inches, with a quick return motion. The distance between uprights is $7\frac{3}{4}$ inches. The bed surface is 13 x 17 inches. The driving pulleys are 22 inches in diameter, and the ratio of belt speed to speed of slide is 202 to 1.

Weight, 4,900 lbs.

Price, with countershaft, \$850.00.

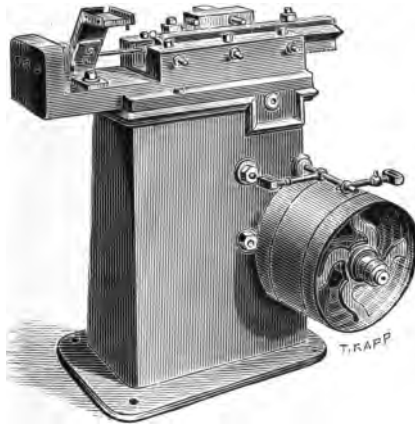


Broaching Press.

Designed for broaching holes in forgings or castings. It is made with cut gearing and steel pinions and shafts. The stroke of slide is 7 inches. The distance from bottom of slide, when down, to bed of press, is 9 inches. The distance from center of slide back to uprights is $3\frac{3}{4}$ inches. Distance between uprights, 15 inches. The friction clutch driving pulley is 18 inches in diameter and $4\frac{1}{2}$ inches faces, and should run 300 revolutions per minute. The press is geared 75 to 1.

Weight, 5,500 lbs.

Price, \$850.00.



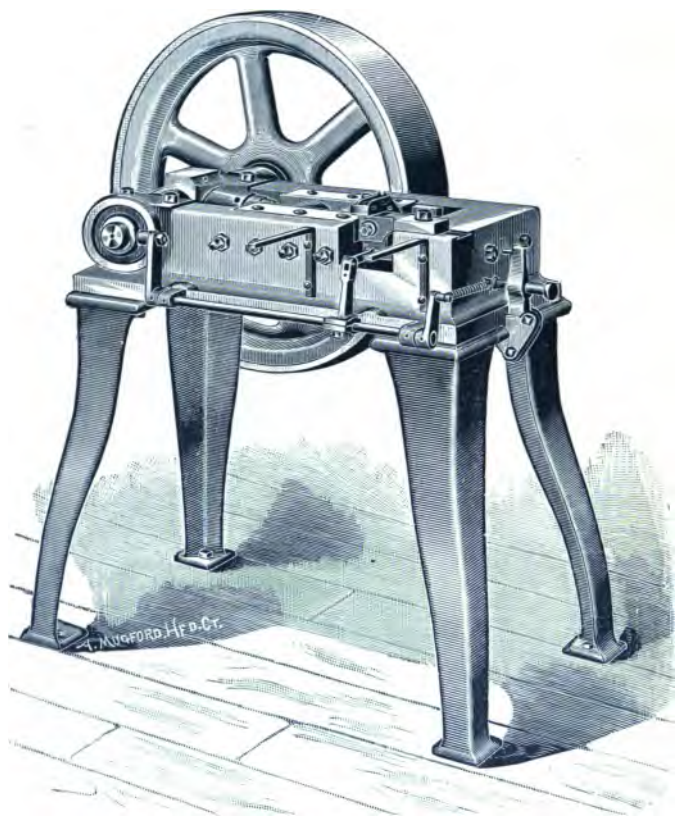
Horizontal Rack-and-Pinion Press.

This machine has an adjustable stroke with quick return motion. It is strongly geared and especially designed for drawing long, slender tubes of gold, silver or brass, such as pen and pencil cases. The greatest stroke is $1\frac{3}{4}$ inches. The driving pulleys are 14 inches in diameter. Ratio of belt speed to speed of slide is 49 to 1. The countershaft has tight and loose pulleys 8 inches in diameter and 4 inches face, and should run 350 revolutions per minute.

This price does not include feeding attachment.

Weight, 1,175 lbs.

Price, with countershaft, \$500.00.

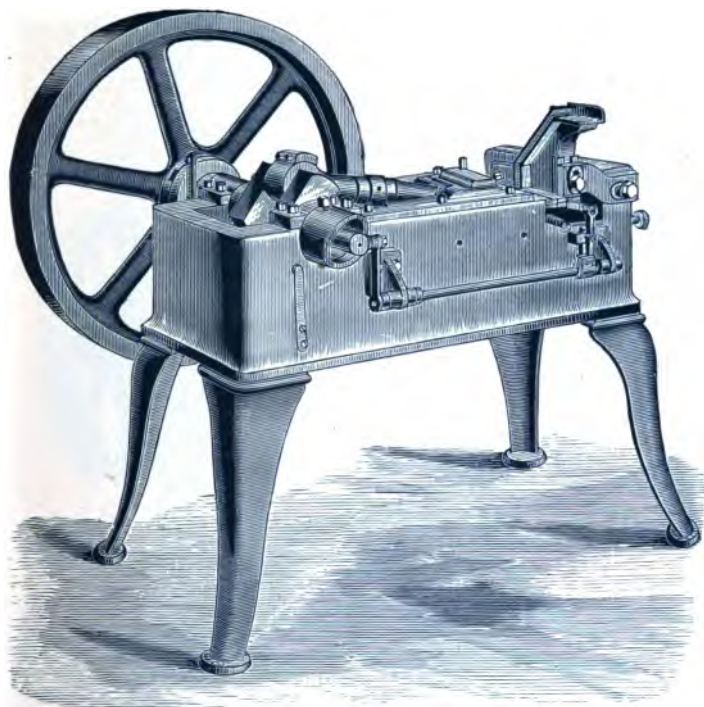


No. 3 Horizontal Press.

The illustration represents our No. 3 Horizontal Press with automatic feed. The stroke is $1\frac{3}{4}$ inches; distance from slide to bed, when forward, $3\frac{1}{2}$ inches. Wheel, 24 inches in diameter and $4\frac{1}{4}$ inches face.

Weight, 700 lbs.

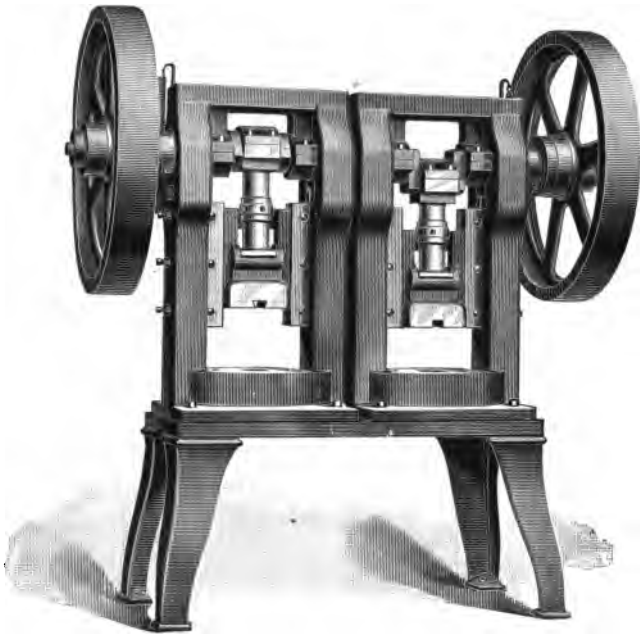
Price, \$300.00.



Horizontal Drawing Presses.

Designed for drawing all kinds of shells, and for tapering or reducing work which cannot be passed through the dies. They are provided with an automatic knock-out, and an adjustable hopper for feeding. We make various sizes and modifications to order.

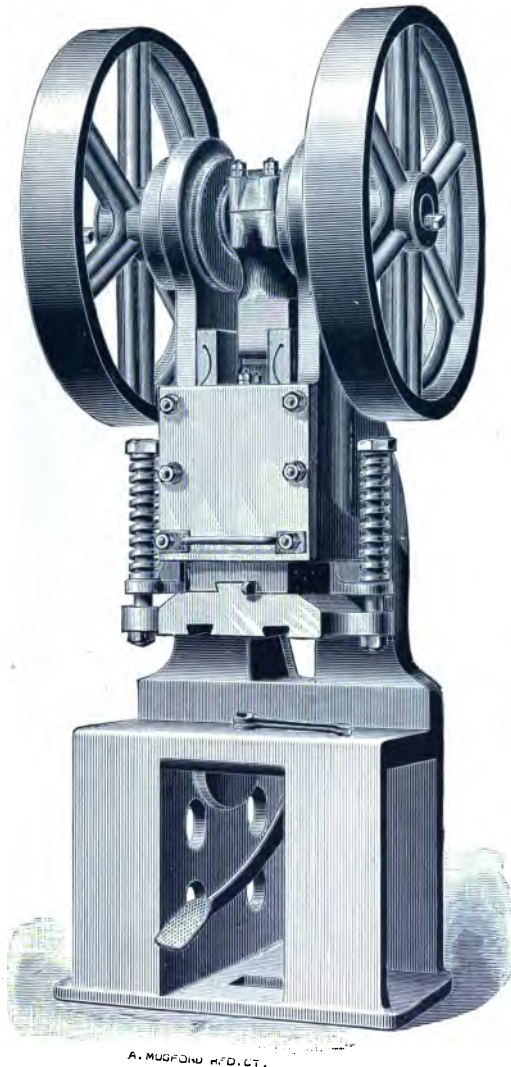
	NUMBER OF PRESS,	4	5
Stroke as desired to	inches,	5	7
Distance from end of slide to bed, when forward,		6	6
Diameter of wheel,		30	38
Weight,	lbs.,	1,700	2,750
Price with feed and knock-out,		\$400	\$500



Double Forging Press.

The cut represents two of our No. $3\frac{1}{2}$ Special Pillar Presses mounted upon a table. They are built for forging or for forging and trimming, with stroke and dimensions as desired.

Prices will be given upon receipt of specifications.



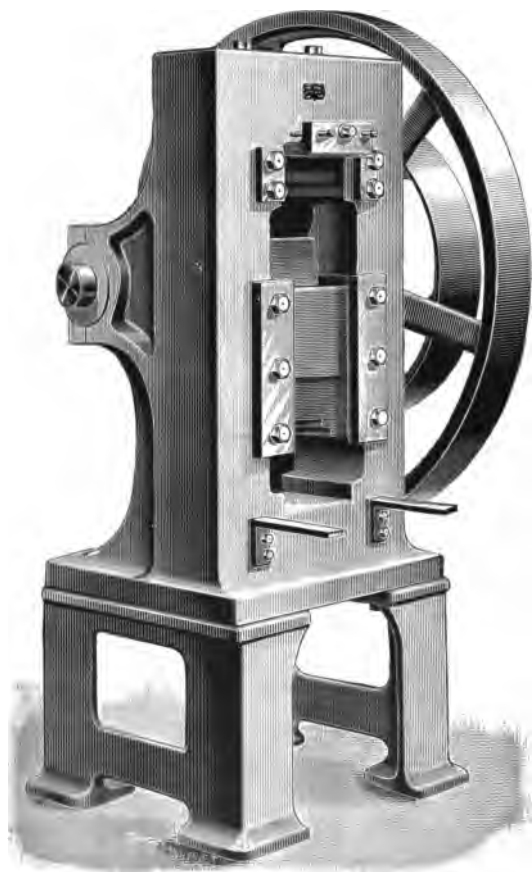
A. MUGFORD RFD. CT.

Hot Trimming Press.

Designed for trimming drop forgings. The fly wheels are 42 inches in diameter and $5\frac{1}{4}$ inches face. The distance from bottom of slide, when up, to bed of press is 14 inches; motion of slide, $2\frac{1}{2}$ inches; size of end of slide, 10 x 12 inches; size of top surface of bed, $16\frac{1}{2}$ x 32 inches.

Weight, 7,550 lbs.

Price, \$900.00.

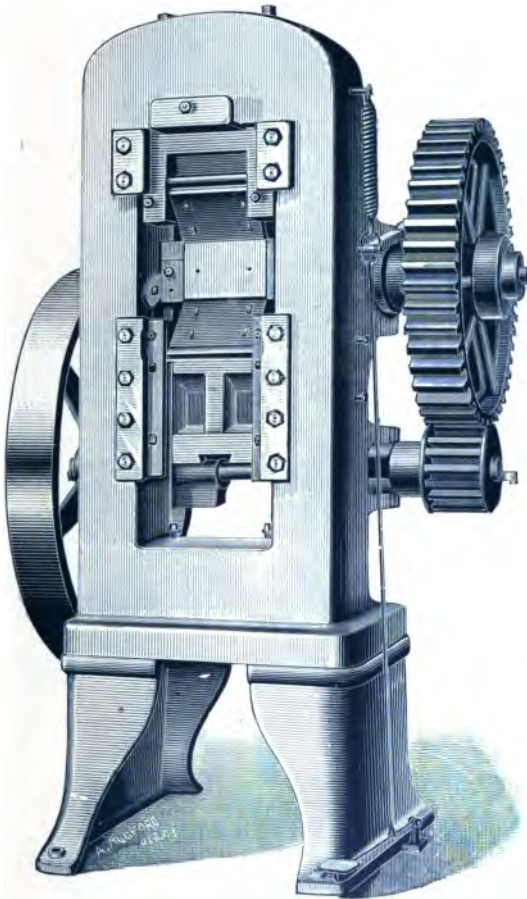


Knuckle-Joint Press.

This press has a wheel 60 inches in diameter and 6 inches face, weighing 1,100 lbs.; the pulley is 36 inches in diameter, for $5\frac{1}{2}$ inch belt. The stroke of slide is $1\frac{1}{4}$ inches; distance from bed to gate, when down, $6\frac{1}{4}$ inches; distance between up-rights, $13\frac{1}{2}$ inches; distance from the front to back of bed, 10 inches; distance from the floor to bed of press, 31 inches.

Weight, 7,500 lbs.

Price, \$850.00.

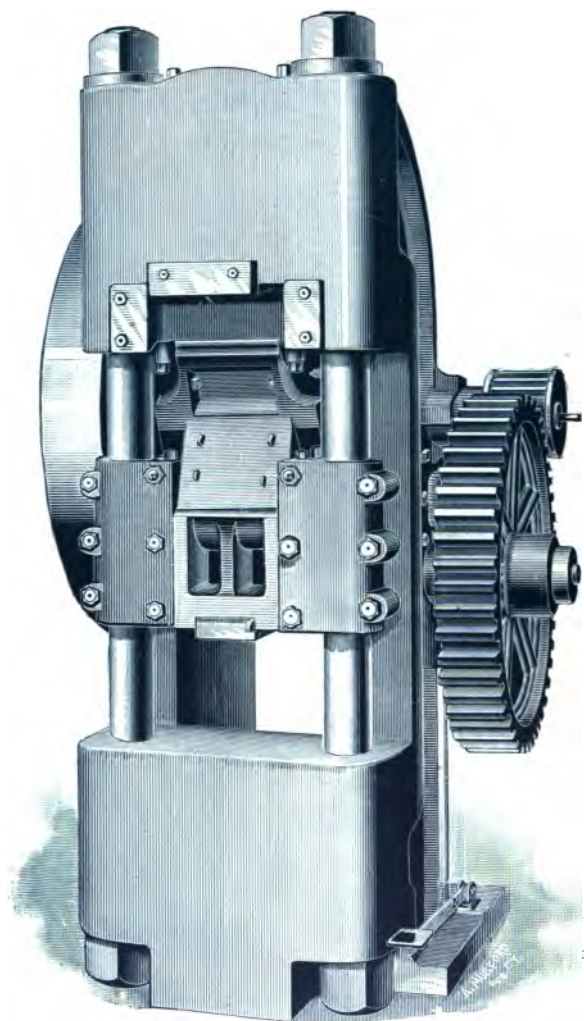


Knuckle-Joint Embossing Press.

This press has a wheel 48 inches in diameter and 6 inches face, weighing 1,050 lbs. The stroke of slide is $1\frac{1}{2}$ inches; distance from bed to bottom of slide, when down, 7 inches; between uprights, $16\frac{1}{4}$ inches; from the front to back of bed, 12 inches; from floor to bed of press, 34 inches. Press is geared 4 to 1.

Weight, 10,000 lbs.

Price, \$1,250.00.

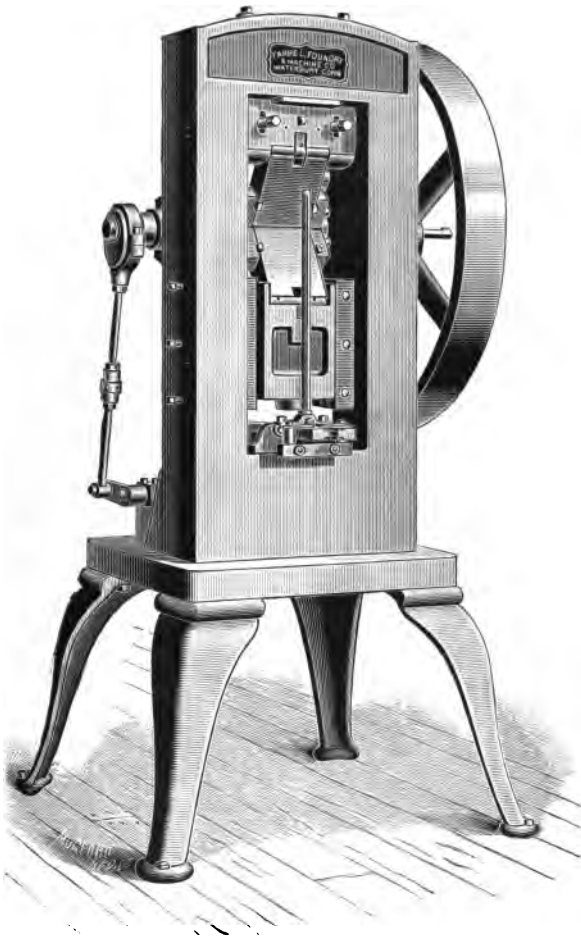


Knuckle-Joint Embossing Press.

This press has a wheel 50 inches in diameter and 6 inches face, weighing 1,500 lbs., and will give a pressure of 450 tons. The stroke of slide is $19\frac{1}{8}$ inches; distance from bed to bottom of slide, when down, 20 inches; from center to center of guide rods, $22\frac{1}{2}$ inches, and the rods are of steel, 5 inches in diameter; distance between uprights, $17\frac{1}{4}$ inches. Press is geared 4 to 1.

Weight, 14,000 lbs.

Price, \$1,600.00.

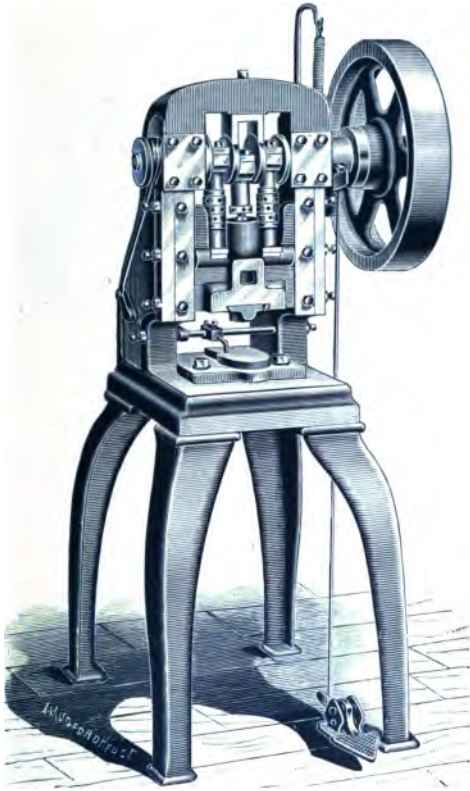


Coining Press.

This illustration shows knuckle-joint press with coin blank feeding attachment, suitable for coining as large as two-cent pieces. We make several sizes to order and prices will be given upon application.

Double-Acting Presses.

We illustrate on the following pages the different forms of our Double-Acting and Cupping Presses, and have a very complete assortment of patterns from which we can build to order almost any size for either single or gang tools. The crank presses are preferable to other forms for all small work, or for cupping from thick metal. All motions are obtained from eccentrics, making a press that will run smoothly at a high speed, and the eccentrics operating the cutting punch will hold blank sufficiently to give the best result in drawing small shells, or cupping metal of ordinary thickness. They are suitable for such work as cartridge cups, button blanks, and a great variety of brass work ranging in size from the smallest, to shells made from metal $\frac{3}{8}$ inches in thickness, and can be adapted to the use of gang tools to excellent advantage when a large quantity of shells of uniform size are wanted. The Cam Presses are especially suited for cupping or forming large sizes of shells made from extremely thin metal, as in such cases it is necessary to hold the blank rigidly during the entire process of drawing. We make these presses of the best material, and with cams and rolls hardened and ground, calculated for the fast speed required in the modern practices of manufacturing. We make to order a variety of special double-acting presses, such as presses arranged for holding the centers of blank and drawing the outside, or for holding blank and stamping or upsetting, etc., and having a variety of patterns can make presses of any of the various forms or sizes best suited for the intended work.

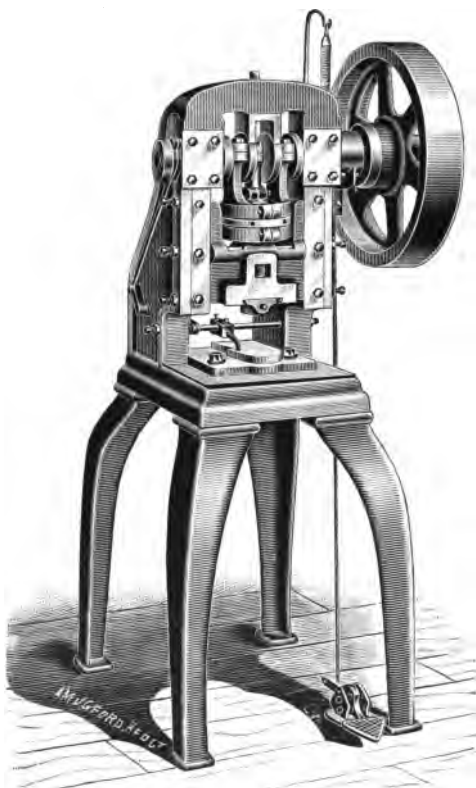


No. 3 Double-Acting Press.

The illustration represents our No. 3 Double-Acting Press, and shows the general appearance of the No. 2 and smaller sizes. The No. 3 press will cut a disc $1\frac{5}{8}$ inches in diameter from No. 20 metal, and draw a cup $\frac{3}{4}$ inch in diameter and $\frac{1}{2}$ inch deep, or from No. 24 metal will cut a blank $1\frac{9}{8}$ inches in diameter and $\frac{1}{2}$ inch deep.

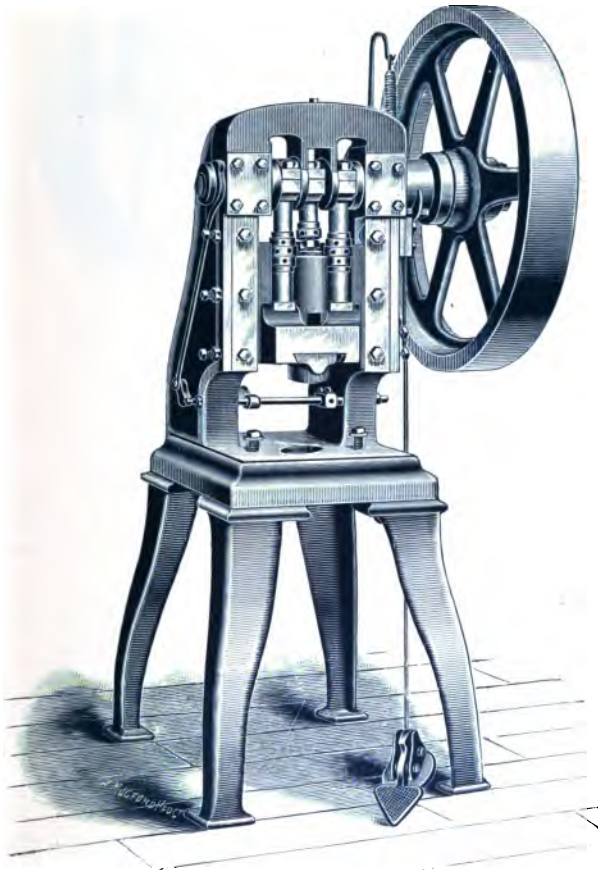
The No. 2 Press will cut a disc $\frac{3}{4}$ inch in diameter from No. 22 metal, and form a cup $\frac{7}{8}$ inch in diameter and $\frac{8}{32}$ inch deep.

Prices and general dimensions are given on page 65.



Double-Acting Press with Ellis Connection.

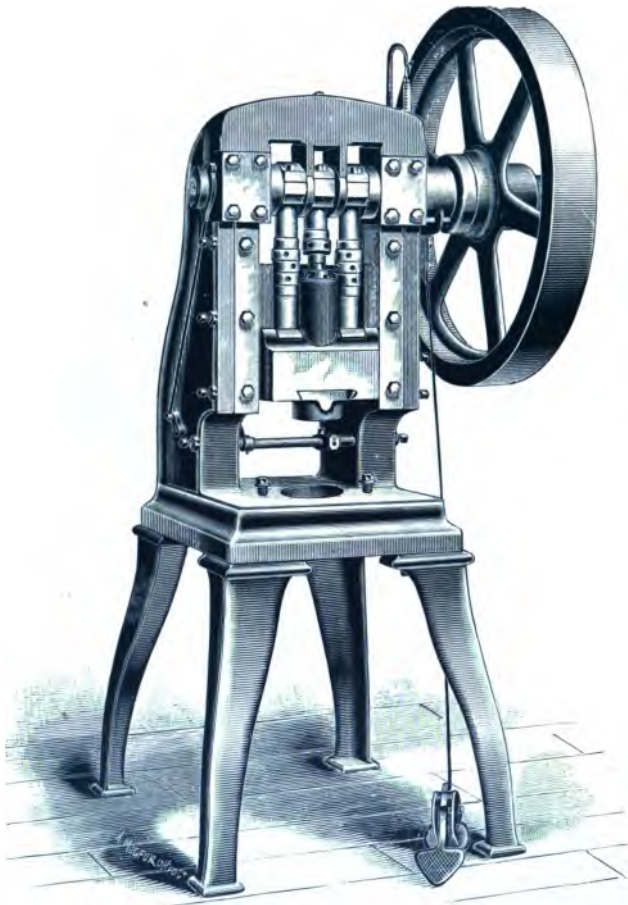
The illustration shows our No. 3 Double-Acting Press with the Ellis Patent Connection, by which the adjustment of the cutting punch is made with a single screw. We apply this connection to all sizes of presses, and fit slides for single or gang tools. The general dimensions are the same as given on page 65, or strokes can be varied if desired.



No. 4 Double-Acting Press.

The illustration represents our No. 4 Double-Acting or Cupping Press. This press will cut blanks from No. 16 metal 1 inch in diameter, and draw a cup $\frac{9}{8}$ inch in diameter and $\frac{3}{8}$ inch deep, or from No. 24 metal will cut a disc $2\frac{1}{4}$ inches in diameter, and draw a cup $1\frac{1}{2}$ inches in diameter and $\frac{3}{8}$ inch deep.

Prices and general dimensions are given on page 65.



No. 5 Double-Acting Press.

This illustration represents our No. 5 Cupping Press, which will cut a blank $1\frac{3}{4}$ inches in diameter from No. 13 metal, and draw a cup 1 inch in diameter and $\frac{1}{8}$ inch deep, or from No. 20 metal will cut a disc 3 inches in diameter, and form a cup 2 inches in diameter and $\frac{7}{8}$ inch deep.

The No. 6 size has capacity for drawing blanks of No. 10 metal $2\frac{1}{4}$ inches in diameter into cups $1\frac{1}{4}$ inches in diameter and $\frac{3}{8}$ inch deep, or for drawing cups $2\frac{1}{8}$ inches in diameter and 1 inch deep from blanks of No. 16 metal $3\frac{1}{4}$ inches in diameter.

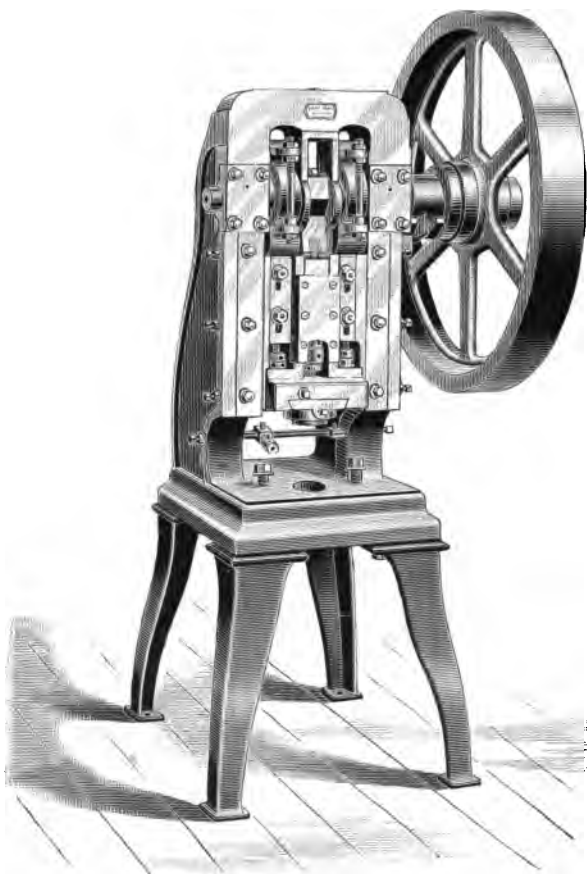
The No. 7 size has capacity for cutting blanks $2\frac{5}{8}$ inches in diameter from No. 8 metal, and drawing cups $1\frac{1}{2}$ inches in diameter and 1 inch deep, or from No. 14 metal will cut blank $3\frac{3}{8}$ inches in diameter, and draw a cup $2\frac{1}{2}$ inches in diameter 1 inch deep.

Prices and dimensions are given on the opposite page.

Price List and Dimensions of Double-Acting Crank Presses.

No. of Press.	Weight In Lbs.	Cutting Stroke. Inches.	Drawing Stroke. Inches.	Diameter of Wheel. Inches.	Distance from Bed to Bottom of Slide, when down. Inches.	Width between Uprights. Inches.	Price.
0	150	$\frac{1}{2}$	1	10	$2\frac{1}{2}$	$4\frac{1}{2}$	\$180
1	350	$\frac{3}{4}$	$1\frac{1}{2}$	12	3	6	200
2	600	$\frac{7}{8}$	$1\frac{1}{2}$	18	$4\frac{1}{2}$	$7\frac{1}{2}$	225
3	900	1	$2\frac{1}{2}$	20	5	$9\frac{1}{2}$	275
4	1500	1	$2\frac{1}{2}$	34	7	$10\frac{1}{2}$	350
5	2100	1	$2\frac{1}{2}$	36	$7\frac{3}{4}$	12	450
6	3600	$1\frac{1}{2}$	3	42	7	14	550
7	4500	$1\frac{1}{2}$	3 to 4	48	8	$14\frac{1}{2}$	650

The stroke and dimensions can be made to suit the purchaser. The price includes Finger Motion, Treadle and Wrenches.



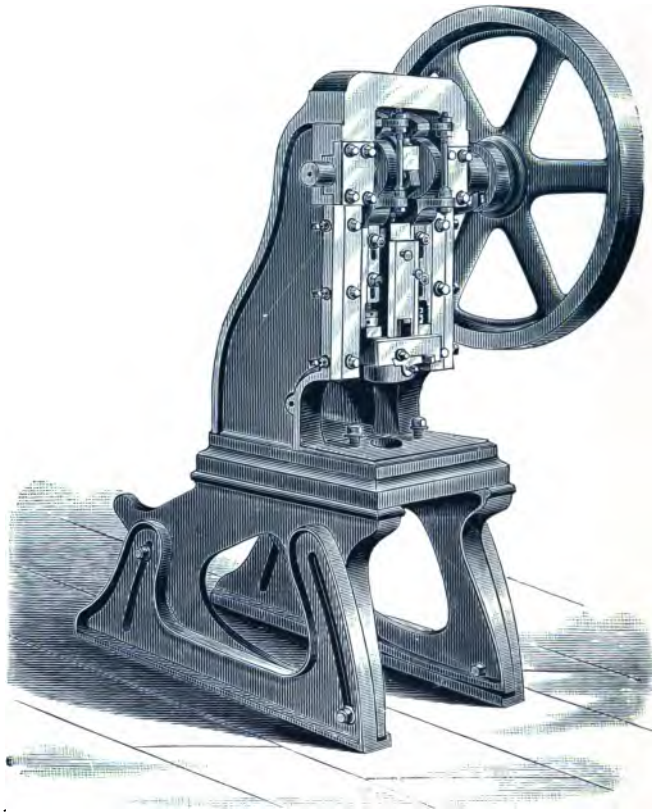
Double-Acting Cam Press.

The illustration represents our Cam Cupping Press, designed to run at a quick speed, and especially adapted for brass work. The cam shaft and connections are of forged steel, and the cams and rolls are of the best tool steel hardened and ground, making a strong machine that will run rapidly.

Prices and general dimensions are given on page 67. The prices include finger motion, treadle and wrenches. The dimensions may be changed to suit the requirements of special work.

Double-Acting Cam Presses for Cupping.

	NUMBER OF PRESS,	4	5	6	7
Cutting Stroke,	Inches,	$7\frac{1}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$
Drawing Stroke,		$2\frac{3}{4}$	3	$3\frac{1}{2}$	4
Distance of cutting slide from bed when slide is down,	}	6	$7\frac{1}{8}$	$8\frac{1}{2}$	9
Distance between uprights,		$11\frac{1}{2}$	$11\frac{1}{2}$	15	$15\frac{1}{2}$
Distance from center of slide back to uprights,		4	$4\frac{1}{2}$	6	$6\frac{1}{2}$
Diameter of fly wheel,		34	38	42	48
Weight,	lbs.,	1600	2500	3500	5000
Price,		\$475	\$575	\$700	\$800

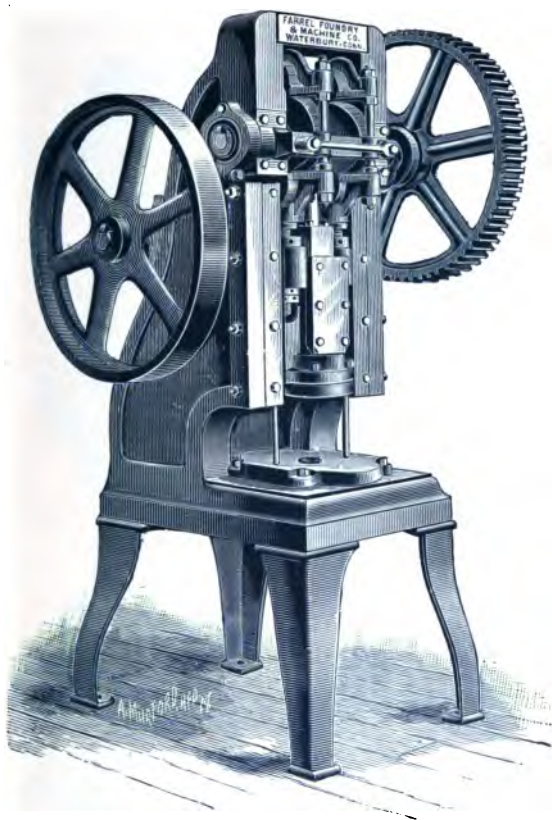


Patent Adjustable Double-Acting Cam Press.

This illustration represents our Double-Acting Cam Press, designed for cutting and forming work at one operation. It differs from the preceding press by having cams of long stroke, so that the work can be thrown off from top of the die instead of passing through. They are made with steel connections, and the details will be arranged so as to adapt them to special work.

Prices include treadle and wrenches.

No. 4,	Weight,	1,650 lbs.	Price,	\$500.00.
" 5,	"	2,600 "	"	600.00.
" 6,	"	3,600 "	"	700.00.
" 7,	"	5,200 "	"	800.00.



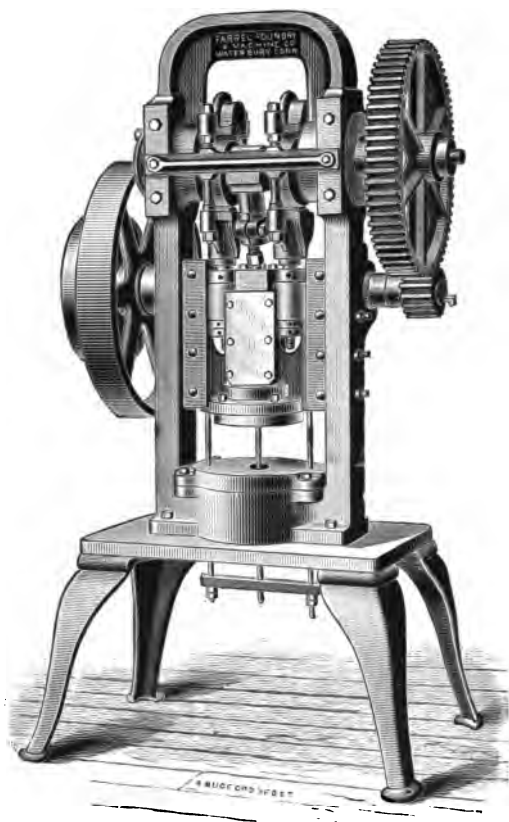
No. 7 Double-Acting Cam Press, Geared.

Designed for cutting and forming, or cutting and drawing. It has cut gearing with steel pinions and crank. The cams and rolls are of tool steel hardened and ground. The stroke of cutting slide or blank holder is 3 inches; stroke of drawing slide, 6 inches; distance from bed to bottom of cutting slide, when down, 9 inches; from bottom of drawing slide, 11 inches; between uprights, 15½ inches; size of bed, 24 x 16 inches. Wheel is 34 inches in diameter and 4½ inches face. The press is geared 5½ to 1.

Price includes Bolster Plate, Treadle and Wrenches.

Weight, 5,300 lbs.

Price, \$850.00.



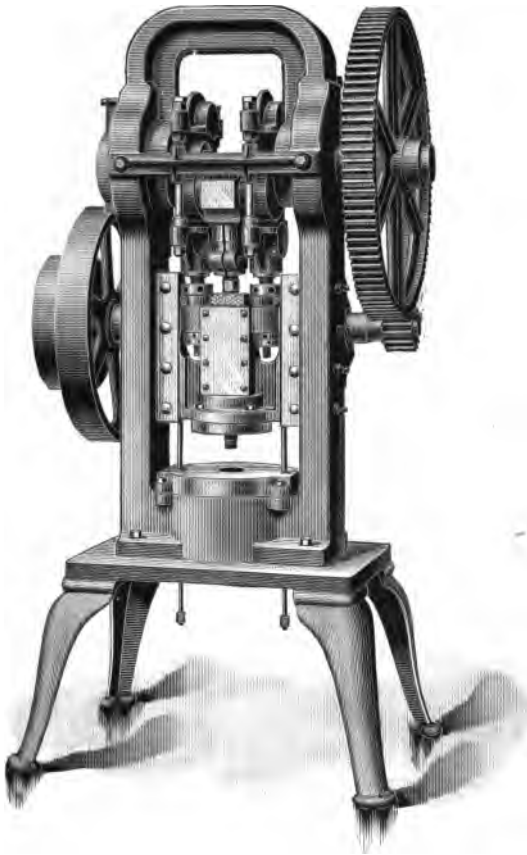
No. 1 Arch Double-Acting Cam Press.

This press has three-inch cutting stroke, and six-inch drawing stroke. Distance between uprights, 20 inches; diameter of top of bed, 18 inches; distance from top of bed to bottom of slide, when down, $9\frac{1}{2}$ inches; distance from bed to bottom of drawing slide, when down, $11\frac{1}{2}$ inches. The press is geared $4\frac{1}{2}$ to 1, and has fly wheel 34 inches in diameter, and drawing pulley 20 inches in diameter and $5\frac{1}{2}$ inches face.

Price includes Bolster Plate, Treadle and Wrenches.

Weight, 5,000 lbs.

Price, \$850.00.



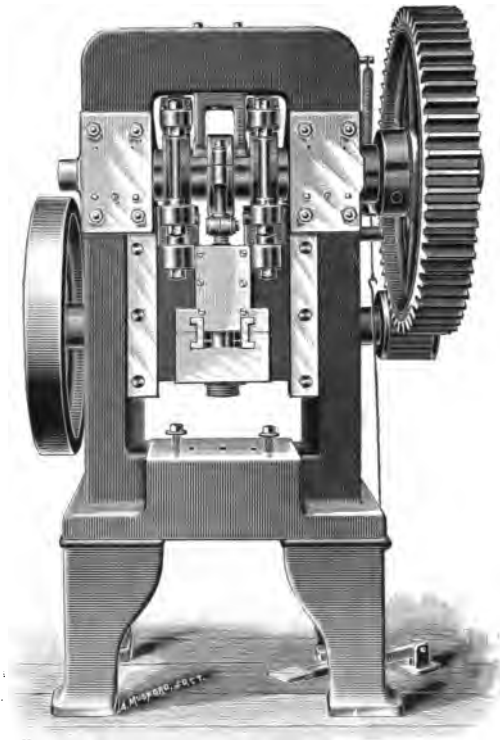
No. 2 Arch Double-Acting Cam Press.

This press is back-gearred 7 to 1. It has a fly wheel 34 inches in diameter, and driving pulley 20 inches in diameter and $5\frac{1}{2}$ inches face. The stroke of cutting slide is $4\frac{1}{2}$ inches, and of drawing slide, 9 inches. The distance from bed to bottom of slide, when down, is $9\frac{1}{4}$ inches. The distance between uprights is 20 inches.

Price includes Bolster Plate, Treadle and Wrenches.

Weight, 7,000 lbs.

Price, \$1,100.00.

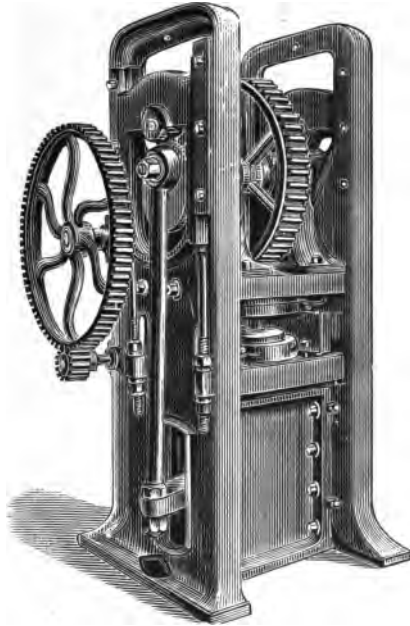


Special Double-Acting Cam Press.

The illustration represents one of the special forms of Double-Acting Presses designed for holding a blank and stamping or upsetting for special work. We build such machines with cam motion attached to the center slide for holding cup and upsetting the outside, or as shown in the cut. The distance between uprights is $20\frac{1}{2}$ inches. The distance from bed to slide, when down, is 7 inches. The press is geared 5 to 1, and has a fly wheel 36 inches in diameter and 5 inches face.

Total weight, 7,000 lbs.

Price, \$1,100.00.



Forming Press.

This press is designed for forming or drawing large blanks of copper, brass or tin. It has convenient adjustments and is very easy to operate, one man being able to press twenty large boiler bottoms per minute. The stroke of blank holder is $4\frac{1}{4}$ inches; stroke of drawing slides, 9 inches; distance between uprights, $25\frac{1}{2}$ inches. The blank holder is 24 x 35 inches, with opening 11 x 22 inches. The machine is geared 33 to 1, and is driven by a pulley 42 inches in diameter and 9 inches face.

Special Trimmer for rounds and ovals is illustrated on page 247.

Weight, 15,000 lbs.

Price, \$2,000.00.

Feed Motions for Power Presses.

The following description of feed motions applied to our power presses comprise the forms in general use, but the great variety of material to be operated upon, and the innumerable forms of tools used, necessitate many modifications which require special designs.

Finger Feed.

One of the most useful appliances of this class is the ordinary Finger Motion. It consists of a rocking bar extending from one upright to the other, having an adjustable arm fitted to receive a pointed stop or "finger." The bar is operated upon by each stroke of the press, so as to raise the finger from the face of the die, while the material in use slides under the finger, which at the proper time drops into the hole last pierced, forming an accurate stop for the next operation. We attach the Finger Feed to either single or double-acting presses. It is shown in cuts on pages 61, 62, 63, 66, 86.

Reel Feed and Finger Motion.

This feed consists of a reel for taking up the metal or other material after it has passed under the press. It is driven by belt or by friction, at a sufficient speed to draw the stock at the proper time against a finger operated as before described. This feed can be applied to both single and double-acting presses of all sizes, and so as to feed from front to back or from right to left, as desired.

Ratchet Roll Feed.

This feed consists of geared rolls mounted in suitable frames attached to press and operated with an intermittent motion through a ratchet wheel. It can be applied to all forms of presses, and can be made to feed in either direction; it is illustrated on pages 76 to 84.

Friction Roll Feed.

This feed is the same as the last described, except the intermittent motion of rolls is obtained from a smooth disc instead of from a ratchet wheel, the operation of the feeding arm being such as to impinge upon the surface of the disc, so as to give an accurate movement which will admit of minute adjustment by means of a radial screw in the crank pin plate. This feed is shown in the cuts on pages 85 and 86.

Automatic Slide Feed.

The Slide Feed consists of an adjustable reciprocating bar, with gripping fingers, which grip the metal and carry it forward a definite distance, then release it and return; we make them in various forms for special work.

Friction Dial Feed.

This feed is designed for feeding round blanks, shells, or cups, under the punch to receive a secondary operation. It consists of a smooth, circular disc or dial, driven continuously by belt or gearing. The pieces to be fed are placed upon this disc which carries them (between stationary guides) in front of a plunger or finger which places them accurately under the punch. This is the best feed in use for re-drawing short shells. It is illustrated on pages 91 and 95.

Ratchet Dial Feed.

We make many modifications of this feed, adapted to a great variety of work. It consists of a circular disc or plate having an intermittent rotary motion. This disc or dial is made in different forms, either with a series of dies or punches inserted, or perforated with holes to receive the work. In either form they can be used for work requiring two or three consecutive operations. This feed is shown in illustrations on pages 90, 92, 93, 94 and 98.

Automatic Shell Feed.

Designed for taking shells or cups automatically from a box or hopper and presenting them properly under the punch. It is best adapted for work of one uniform size, or where a press can be used continuously upon one size of work. It is shown on page 96.

Hopper Feed.

The Hopper Feed is designed for horizontal presses. Shells, tubes and other articles are fed into the top of suitable inclined guides, from the bottom of which they are taken automatically by fingers and carried into exact position in front of the dies. This feed is suitable for redrawing shells, trimming, piercing erlds, tapering, etc. It is illustrated on pages 52 and 53.

Tube Feed.

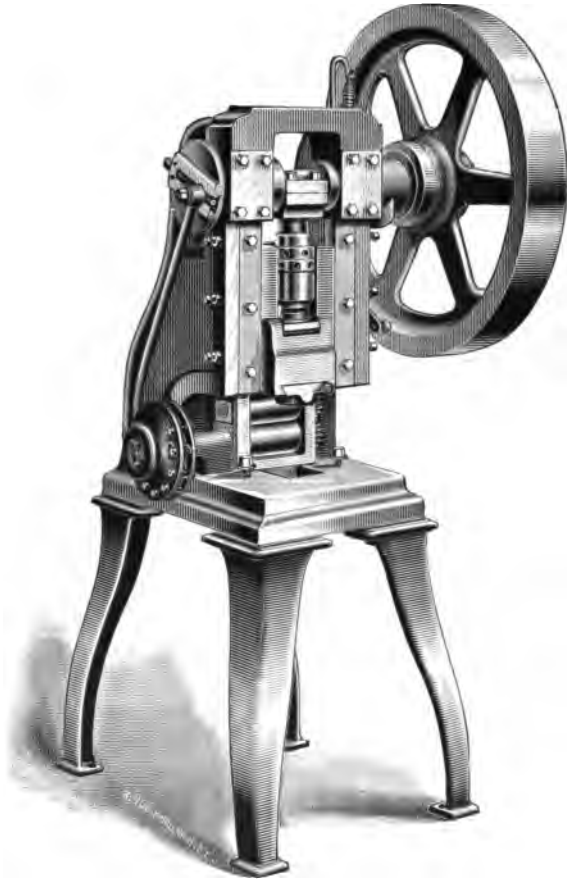
This feed is designed for feeding pieces for a secondary operation. It consists of a tube of suitable shape to receive the work and into which the articles are fed. Automatically-working fingers take out the bottom piece and deliver it to the dies at the proper time. It is a suitable feed for many forming, stamping, and coining operations. It is illustrated on page 59.

Combination Feeds.

Combinations of different feeds are made for special work, so as to complete the article of manufacture automatically. Such articles as pen-holders, lamp-wick tubes, etc., can be made complete from the sheet metal.

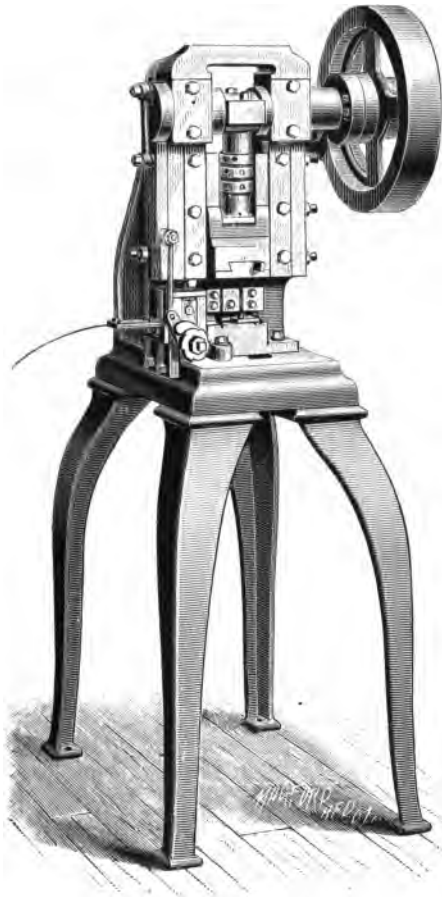
Knock-Out Motion.

Many kinds of tools require the work to be lifted or forced out of the dies after the pressing is performed. For this purpose knock-out attachments are used in several forms, some of which are illustrated on pages 19, 43 and 52.



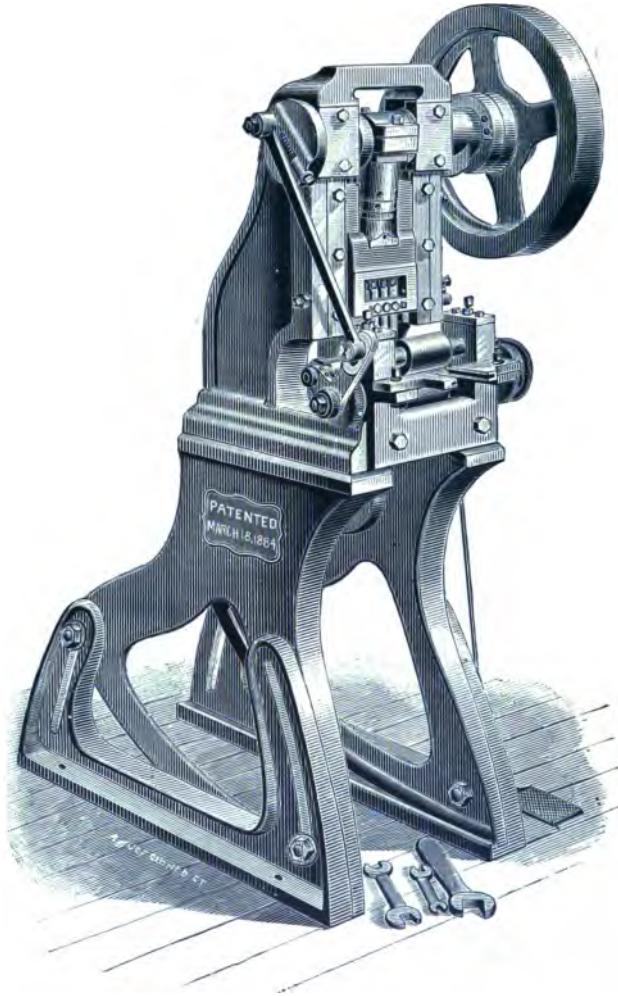
Open Back Single-Acting Press with Ratchet Roll Feeding Attachment.

The illustration shows the manner of applying the Ratchet Roll Feed to open back presses for feeding sheet metal from front to back or from back to front. The ratchet is made of steel and of large diameter, and is operated by a series of six pawls which are pivoted between two side plates which support the pawl pins perfectly. The pawls are connected together so that all can be disengaged at once by means of a small handle on the side of the plate. The crank pin for operating the connecting rod is adjustable by a screw.



Open Back Press with Ratchet Roll Feed.

The illustration shows the Ratchet Roll Feed applied for feeding from left to right, or from right to left. These feeds are made of various sizes and adapted to different kinds of metal and work.

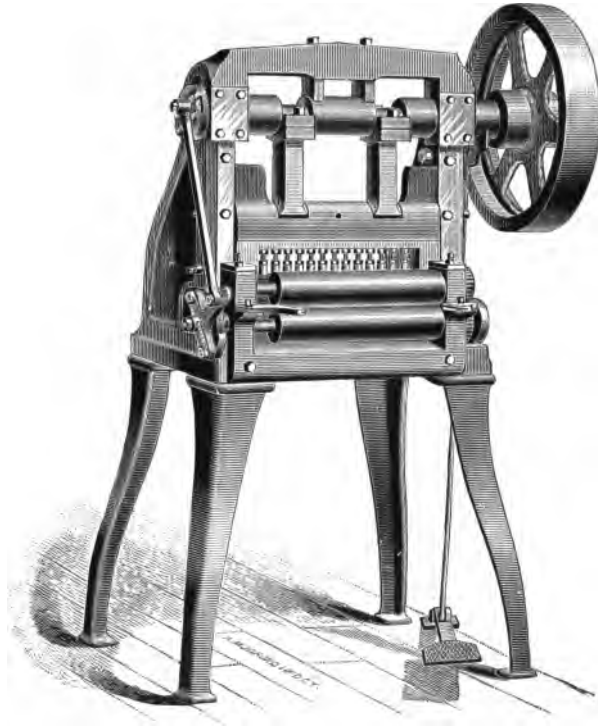


Adjustable Incline Press with Ratchet Roll Feed.

The illustration shows the Ratchet Roll Feed applied to an Adjustable Incline Press for feeding metal from front to back of press. It is suitable for cutting and stamping blanks from thin metal, or for such work as required to be thrown off the top of the die. The cut shows a No. 2 press fitted with gang tools for such work.

Weight, 700 lbs.

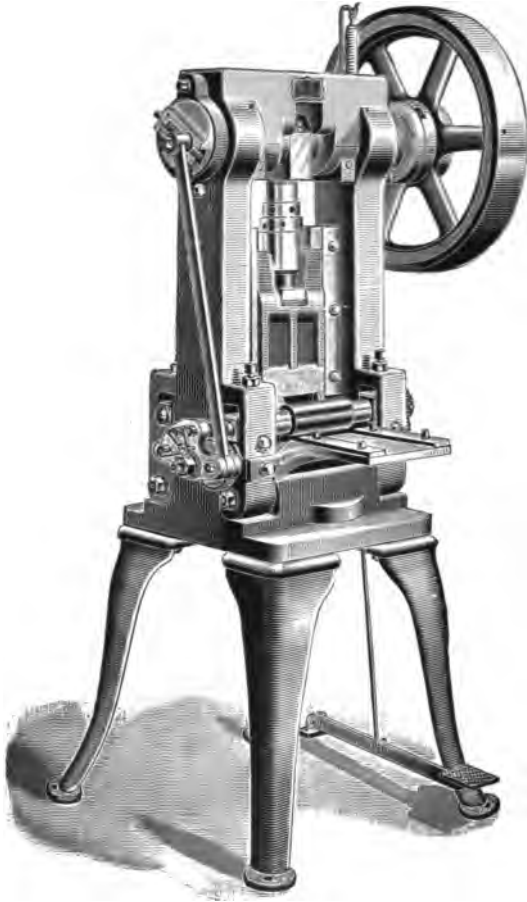
Price, without tools, \$250.00.



Double Connection Press with Ratchet Roll Feed.

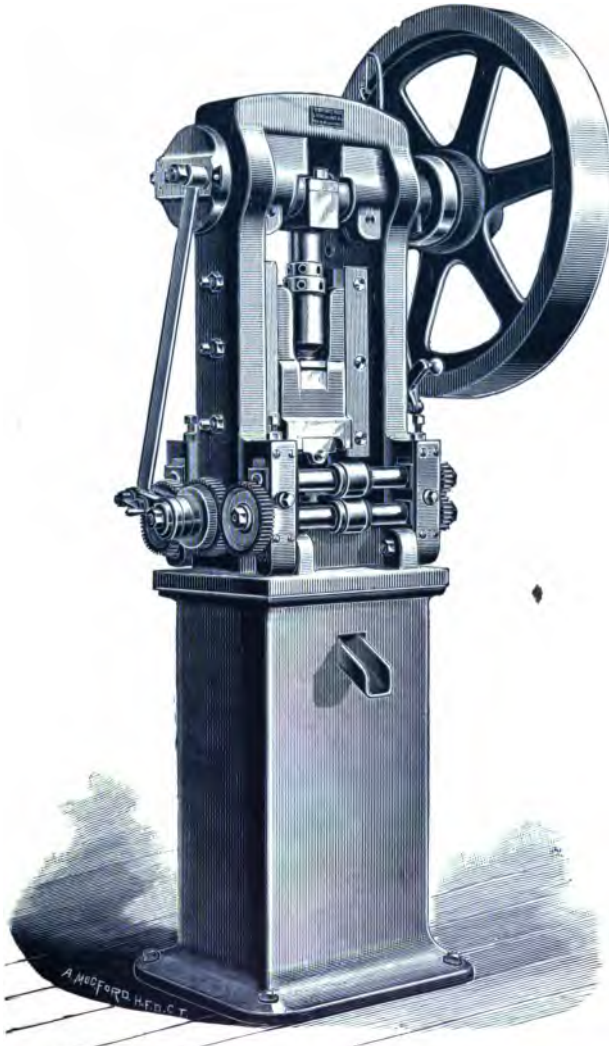
Designed for feeding wide material such as paper, card-board, sheet tin, etc.
The illustration shows press fitted with gang tools for cutting a large number of blanks from sheet tin.

Prices upon application.



No. 2 Pillar Press with Double Roll Feed.

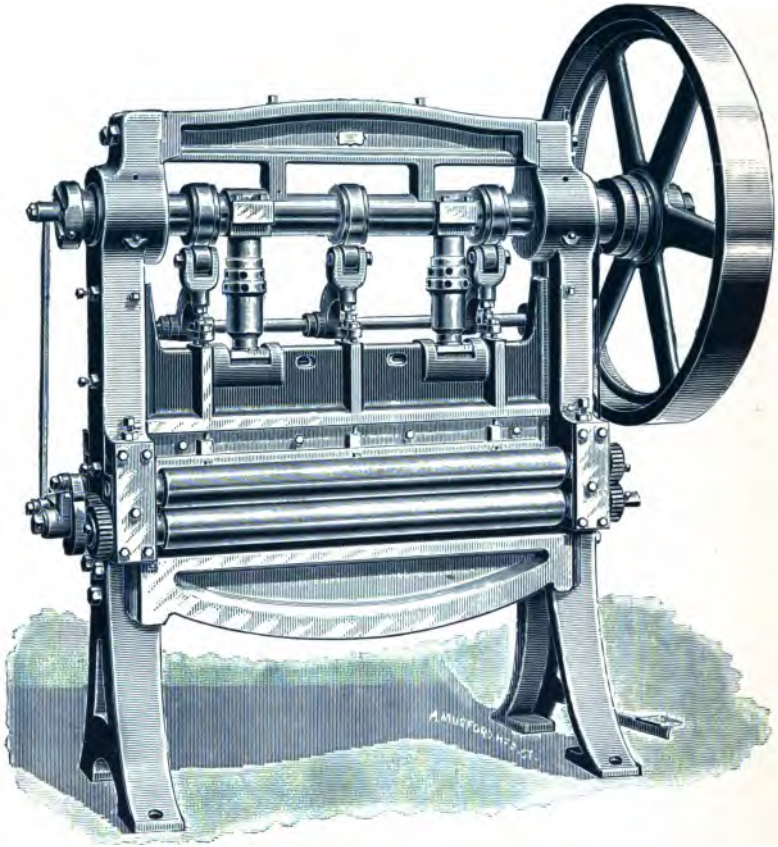
This press is designed for feeding sheet metal, etc., in connection with gang tools. The feed roll brackets are pivoted to press frame so that they may be swung downward, out of the way, when setting or changing tools. The principal dimensions are: Width between uprights, $12\frac{1}{2}$ inches; from bed to bottom of slide, when down, 5 inches; stroke of gate, $1\frac{1}{4}$ inches, or as desired. The feed rolls are $2\frac{1}{2}$ inches in diameter, and the centers of two upper rolls are $9\frac{3}{8}$ inches apart. The bed has an opening $1\frac{1}{2} \times 6\frac{1}{4}$ inches. Wheel, 24 inches in diameter and $4\frac{1}{4}$ inches face.



No. 1 Pillar Press with Double Roll Feed.

Our No. 1 Pillar Press is here shown mounted upon a pedestal. It has Double Roll Feed similar to that shown on preceding page, and is suitable for blanking coins and similar work, with gang tools. The width between the uprights is $11\frac{1}{8}$ inches; distance from bed to gate, when down, 5 inches; stroke, 1 inch. Wheel, 30 inches in diameter and $4\frac{1}{2}$ inches face.

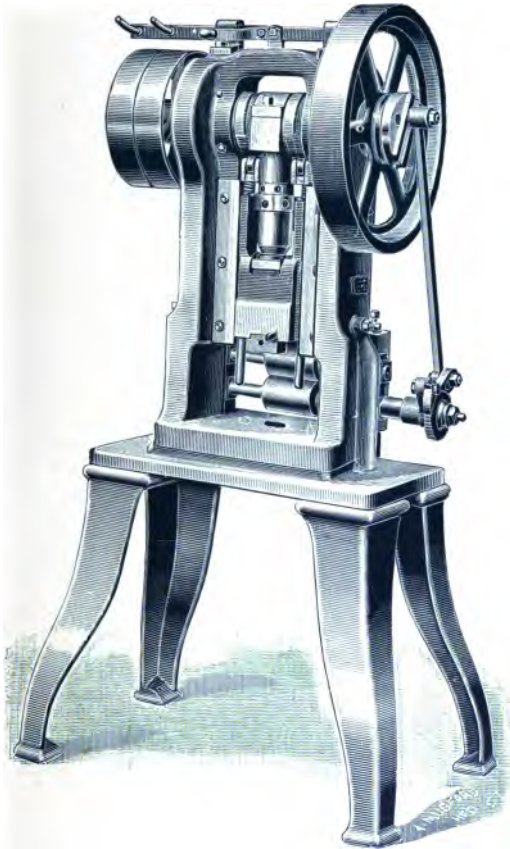
Price of Special Double Feed Fixtures adds to cost of press \$300.00.



Special Double Connection Press.

The illustration represents one of our Double Connection Pillar Presses with Roll Feed and Pressure Plate, designed for perforating wide sheet metal. We build such machines to order of any width, and with or without feeding attachments and tools.

Prices upon application.



Perforating Press.

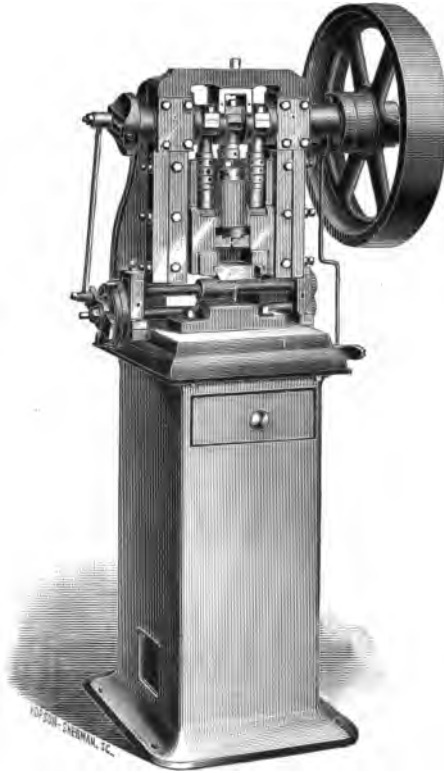
The illustration shows one of our Pillar Press fitted with Roll Feeding Attachments and Pressure Plate rods, designed for perforating sheet metal, or for punching small work with gang tools. We build all sizes with these attachments, and fitted for any size of work.

Prices upon application.



No. 1 Press on Pedestal.

This illustration shows style of mounting small presses upon an iron pedestal, with drawer for the reception of work as it drops from the dies. For small work, especially where an automatic feed is used, it makes a neat and convenient arrangement. We also make a short base with drawer, designed for the bench.

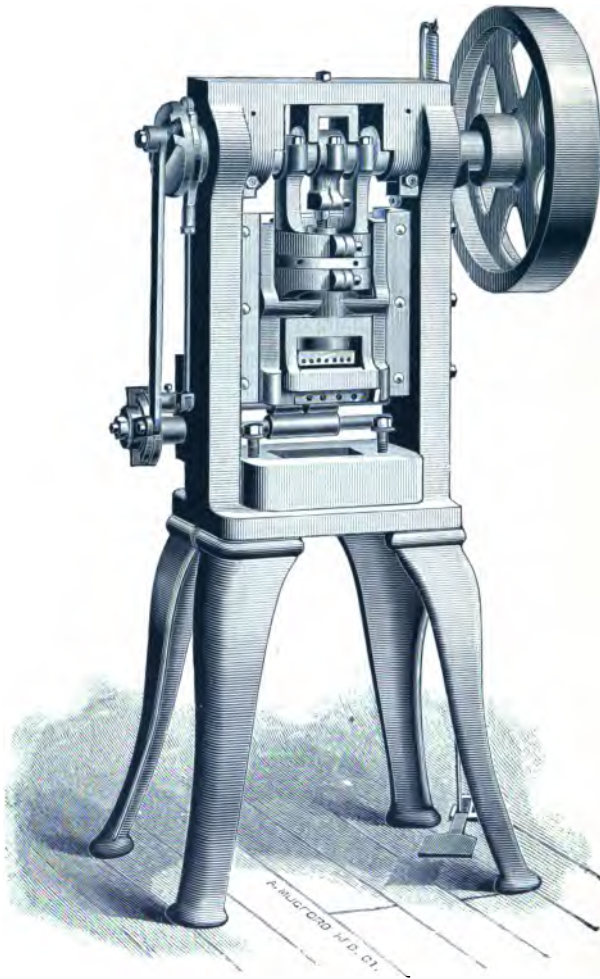


Open Back Double-Acting Presses for Gang Tools.

We build all sizes of Open Back Double-Acting Presses arranged for gang tools, and fitted with automatic roll feed operated by either friction or ratchets. The illustration represents the No. 2 size mounted upon pedestal with drawer, and fitted for gang punches, with friction roll feed.

Weight, 750 lbs.

Price, complete, as above, \$325.00.



Double-Acting Gang Tool Press.

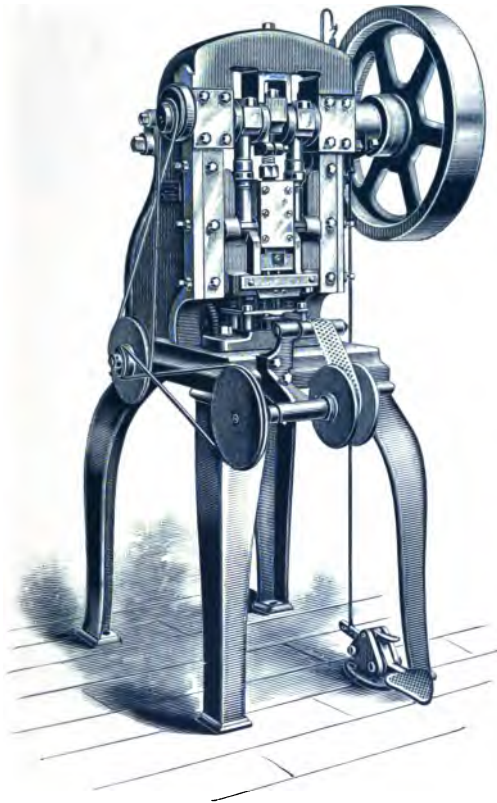
The illustration represents our Double-Acting Pillar Press with the Ellis Patent Connection, by means of which the adjustment of cutting punch is made with a single screw. It also illustrates the construction of slide adapted for gang tools. The press has friction roll feed and finger motion, and is designed for cutting and drawing button shells or similar work. A press of this style will cut from 500 to 600 shells per minute without waste of stock.

Weight, 1,150 lbs.

Price, \$300.00.

Roll Feed, \$85.00.

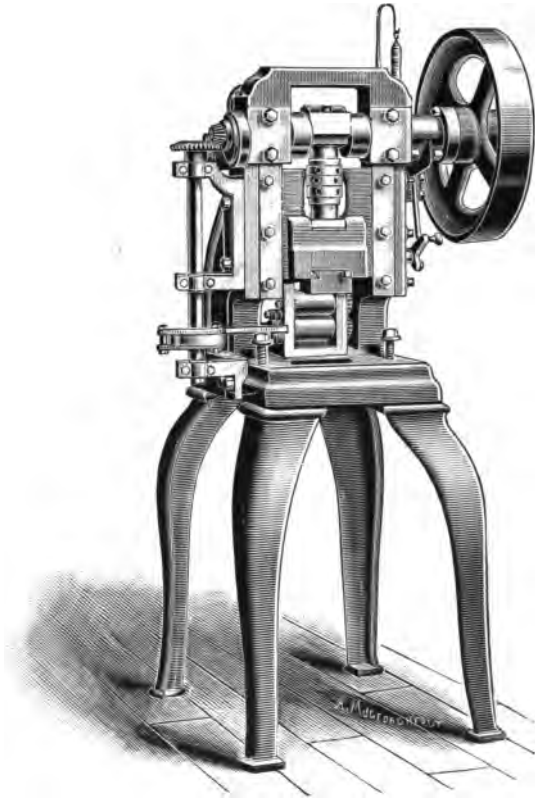
Finger Motion, \$15.00.



Double-Acting Press with Automatic Feed.

The illustration represents a No. 3 Open Back Press fitted for gang punches, with automatic feed and winding attachment for the scrap. These presses are adapted for making small cups or shells in large quantities, and will cut the metal to the best advantage with the least possible waste of material.

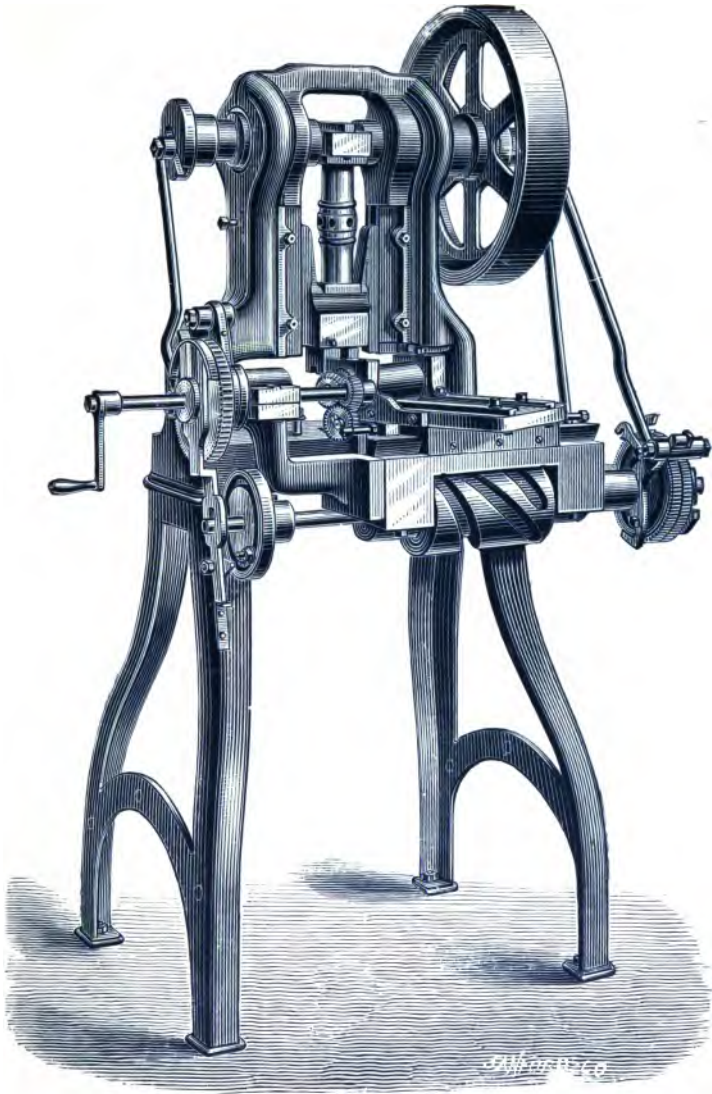
Price of No. 3 Press, complete, as shown, \$450.00.



Cut-and-Carry Press with Roll Feed.

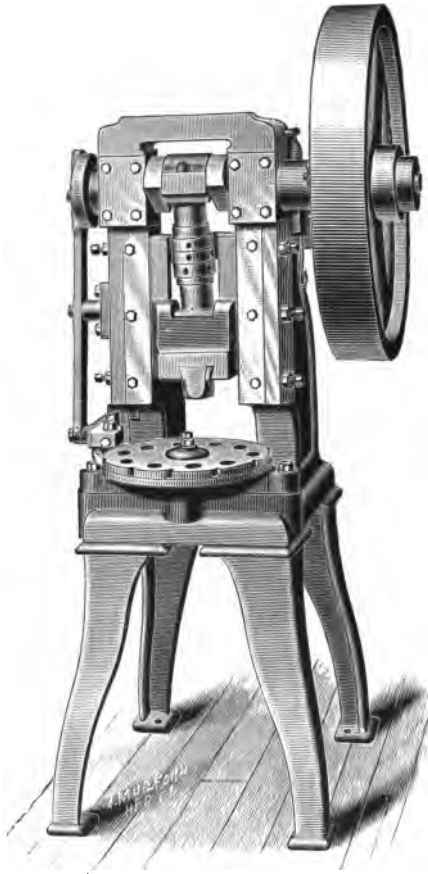
This very serviceable labor-saving attachment, which we illustrate above in connection with our No. 3 press, is much used where two operations are required, as, for instance, forming or piercing after blanking. By means of cams on the vertical side shaft, which revolve once to two strokes of the gate, the carrying slide is made to rest first under the blanking punch, then under the forming die, and will be found a very convenient arrangement for producing small work of various shapes from sheet metal.

Price, complete, with Attachment, \$450.00.



Patent Compound Automatic Roll Feed.

This is a very excellent device for both labor and metal-saving when applied to either single or double-acting power presses, for either blanking, or blanking and cupping at one operation. Sheets of metal are fed automatically from end to end, and cut up with the least possible waste of material.



No. 4 Press with Ratchet Dial Feed.

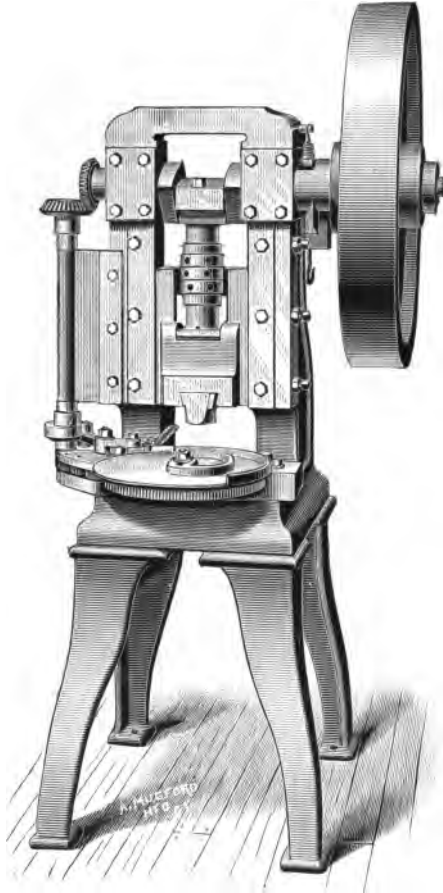
These presses are suitable for piercing, drawing and forming work of various kinds. The attachments can be made for any of the sizes described on page 10. We build these presses with or without back gears, and with required stroke, to suit the special work for which they may be intended.

For prices see table on page 10.

For Dial and Fixtures add as follows:

For No. 2, 3 and 4 sizes, \$100.00.

For No. 5, 6, 7 and 8 sizes, \$125.00.



Open Back Press with Friction Dial Feed.

The Friction Dial Feed is designed for feeding shells or cups for redrawing or stamping, as described on page 75, and can be applied to all sizes of presses. The Dial Plate as shown in the cut, is driven by gearing from a side shaft, and the entire attachment can be removed in one piece and the press used in the ordinary way when desired.

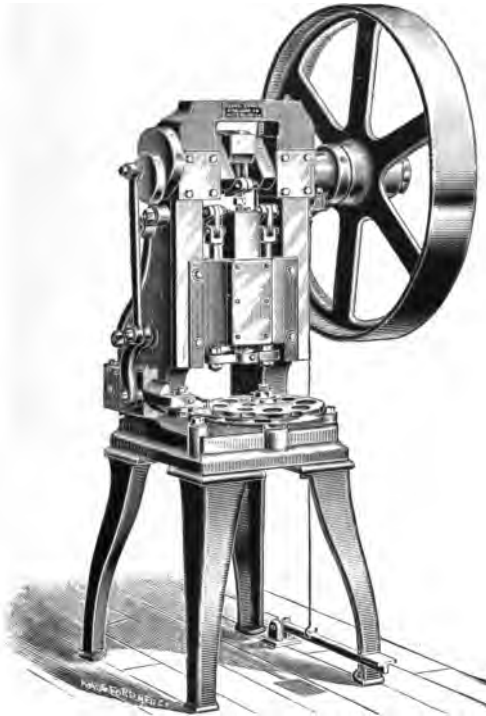
Prices given on page 90.



No. 3 Press with Ratchet Dial Feed.

This illustration shows the manner of applying automatic stop motion to disengage the clutch of press. Whenever the dial is misplaced, a plunger operated by the slide of press passes by the locking lever, at the back of dial, but if the locking lever is not in its true position, or the dial misplaced, the plunger will strike upon the lever and disengage the clutch of press before the punch strikes the dial plate or tools. This arrangement will effect a considerable saving in tools and is very desirable for many operations.

Price of Attachment, extra, \$25.00.



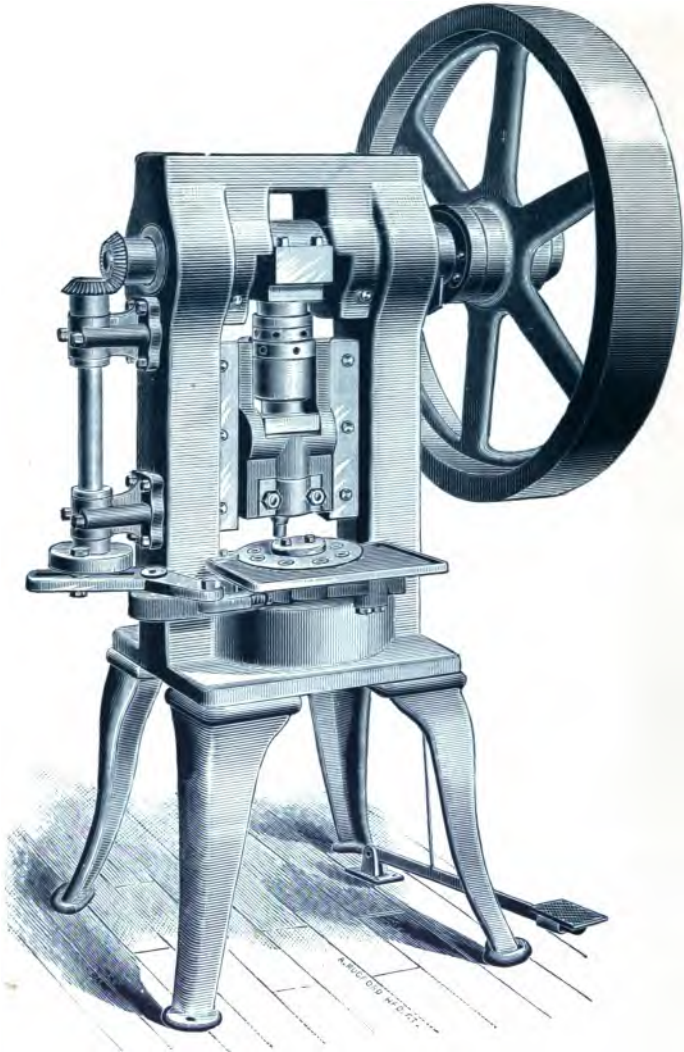
Special Double-Acting Press with Dial Feed.

Presses of the above form are designed for redrawing thin cups with the assistance of a pressure plate or holder to prevent puckering. The pressure plate is operated by a single cam on the side of press, and has sufficient throw to permit the outside punch or holder to enter the cup and hold it before the drawing action begins, and a considerable gain in the amount of reduction is effected by its use. The illustration is taken from a No. 4 press, which is designed for redrawing cups of tin-foil or other light metal. The blank holder has a stroke of $2\frac{1}{4}$ inches, and the drawing slide, 7 inches stroke. Distance from bed to shaft, $28\frac{3}{4}$ inches. Wheel, 42 inches in diameter and $5\frac{1}{2}$ inches face, with light rim.

Price, as shown above, \$750.00.

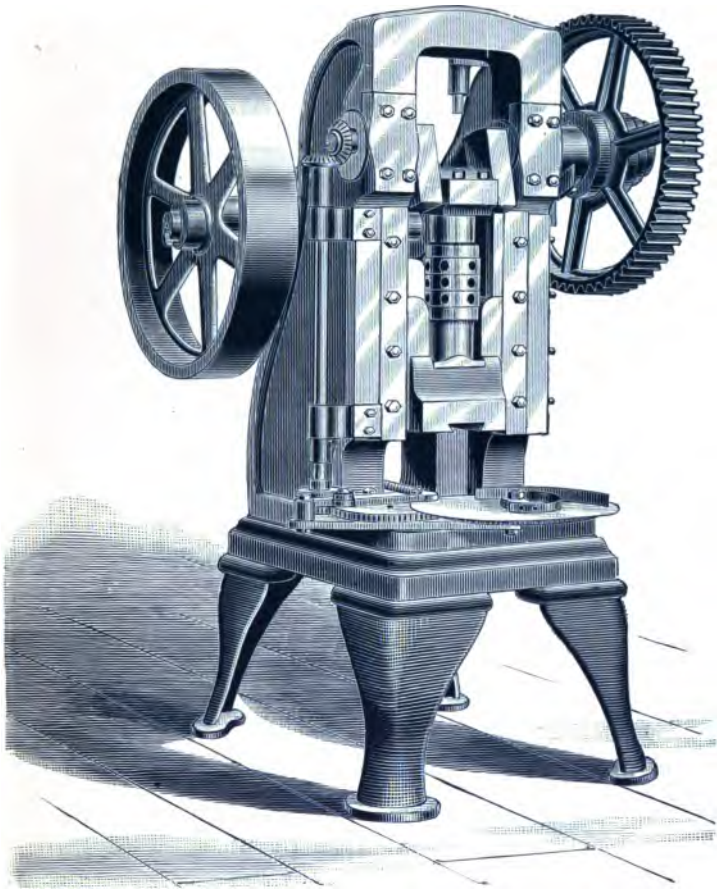
For larger work of the same character, we make a press of the same form from our No. 5 pattern, having height from bed to shaft of 43 inches; stroke of drawing punch, 10 inches; stroke of holding slide, 5 inches. Cups $2\frac{1}{4}$ inches deep can be fed and redrawn to $3\frac{1}{2}$ inches deep. The special feature of this construction is the delicacy with which the blanks may be held without tearing, which is of particular value when redrawing packs of tin-foil in producing bottle caps.

Price of No. 5, as described, \$900.00.



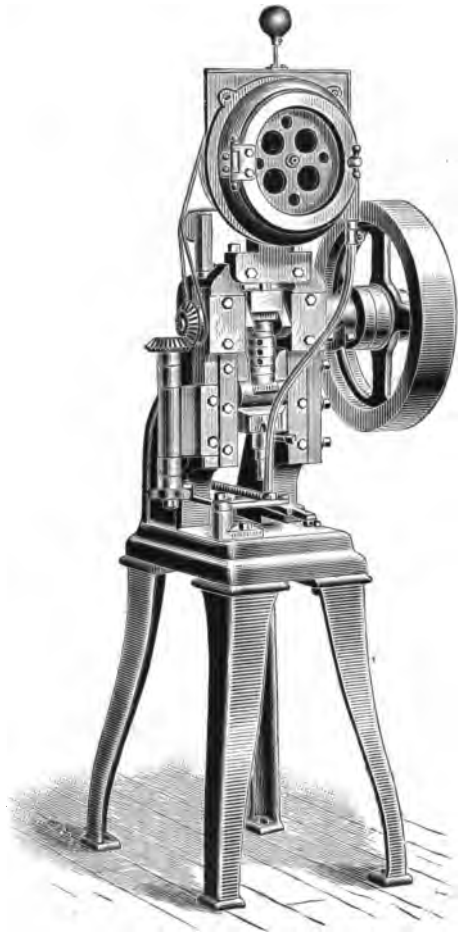
Pillar Press with Ratchet Dial Feed.

The illustration shows one manner of applying the Ratchet Dial Feed to Pillar and Arch Presses. Such combinations are useful for stamping and forming many articles requiring heavy pressure, and avoids the necessity of the operator putting his fingers under the punch. The attachment can be applied to all sizes of pillar presses, and fitted for various kinds of tools.



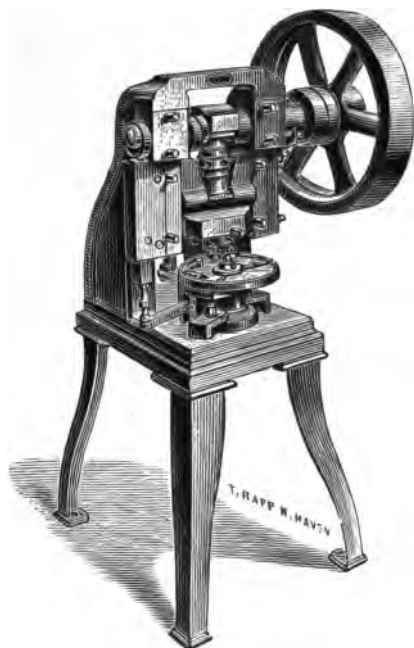
Geared Drawing Press with Friction Dial Feed.

The illustration shows a No. 8 Geared Drawing Press with friction dial feed. We build this press with single or double gearing as may be required. The feed can be removed and the press used as an ordinary drawing press with hand feed.



Automatic Shell Feed.

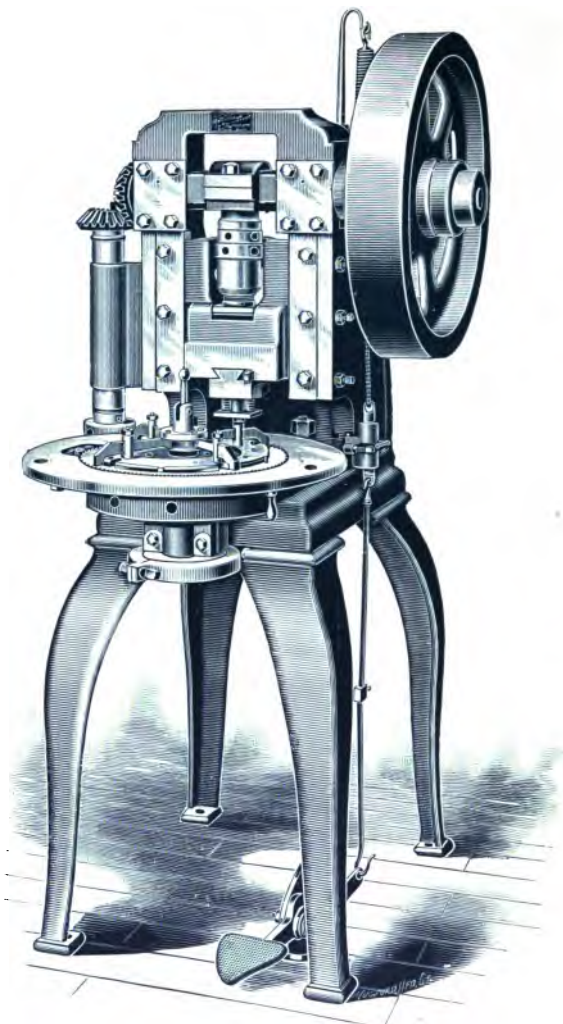
Designed for feeding shells or cups automatically from a hopper. It is most useful when it can be run continuously upon one size of work. For miscellaneous work the friction dial feed is preferable.



Jewelers' Chain Link Press.

The cut represents a single-acting press with watch chain link swaging attachment. The links are fed into a dial plate and carried automatically to dies which swage them into the required shape. The machine does good work at a great saving in cost over other methods.

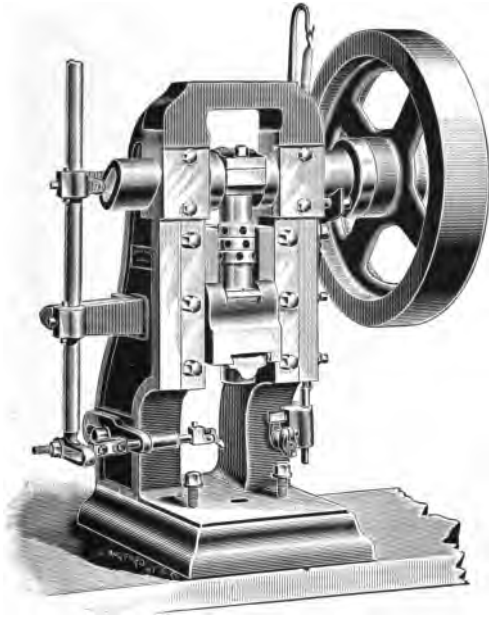
No. 2,	Weight,	650 lbs.	Price, \$300.
" 3,	"	900 "	" 350.
" 4,	"	1,660 "	" 400.



Perforating Press.

The illustration represents the No. 3 size of Open Back Press fitted with attachment for perforating armature plates. Plates as large as 20 inches in diameter are clamped upon the ratchet plate and perforated with any number of holes or dots, the press stopping automatically when the circle is completed.

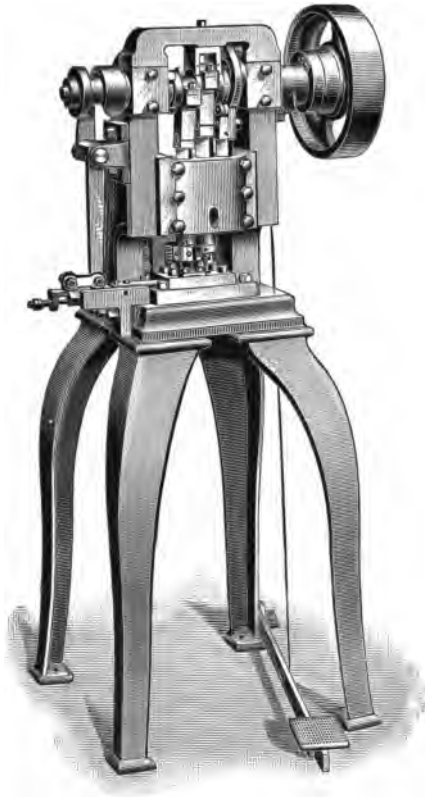
Price of press, complete, as shown in cut, \$500.



Perforating Press.

The attachment illustrated on this page is designed for perforating shells or rings of sheet metal, such as lamp burner parts, chandelier rings, etc. The pieces to be operated upon are placed upon a form or hub not shown in the cut, which has a ratchet of the desired number of teeth attached, and is so connected with the clutch mechanism of the press as to give one complete revolution to the shell, and then stop the press ready to receive the next piece. The ratchet and pawl can be adjusted to any position or angle, so as to pierce ends or sides of shells or rings. This attachment is also applied to the adjustable bed press shown on page 17, for perforating large rings.

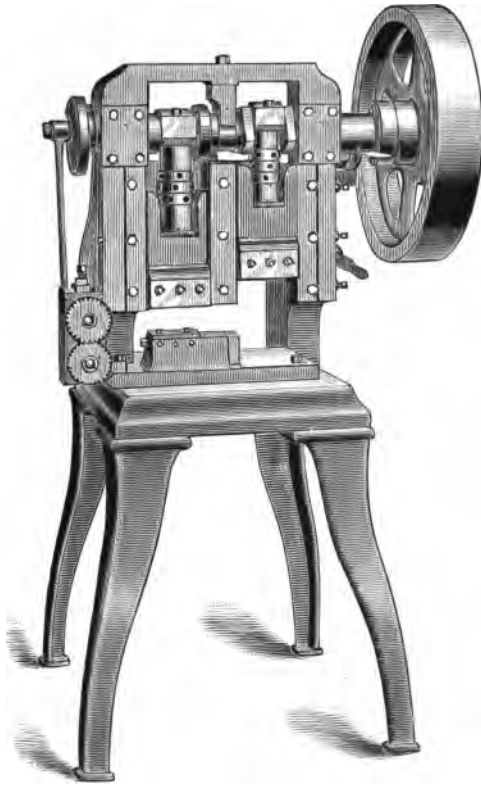
Price of press, complete, as shown in cut, \$250.



Triple-Acting Press.

This illustration represents small press designed for making paper fasteners automatically, and is suitable, with slight changes in construction, for making many small articles requiring three operations, such as cutting, drawing, and stamping or forming. It will cut out, draw, and stamp small pieces as fast as 200 per minute.

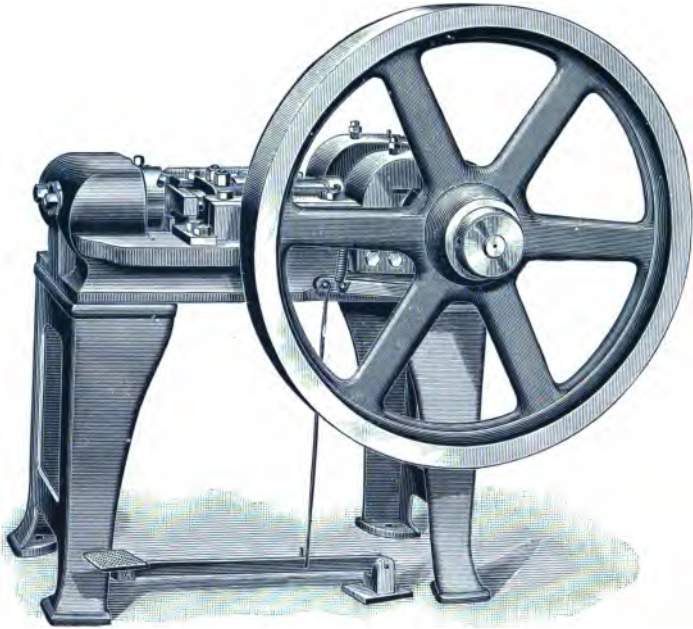
Prices will be given on application, accompanied with samples of work.



Double Plunger Press.

We build to order presses of all sizes, with two or more slides or plungers with separate guides, and of strokes as desired; or make them with one part double-acting and the other single-acting. We have found such presses well adapted for many kinds of special work requiring several operations, such as cutting and bending. These presses will be designed for special work, and can be made in all sizes from patterns which we have.

Prices will be given upon receipt of specification.



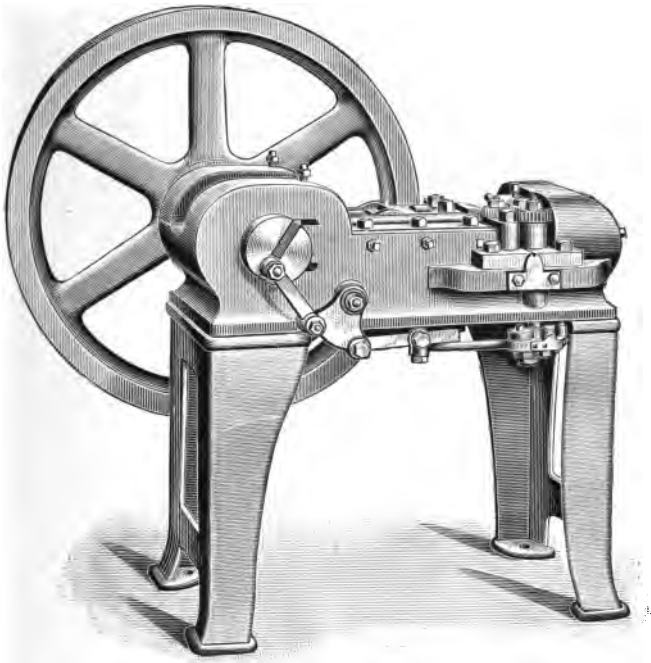
No. 1 Horizontal Washer Press.

HAND FEED.

We are prepared to furnish machines of the type illustrated, for producing finished washers of all sizes, from strip metal. As shown, these machines are arranged conveniently for feeding short stock by hand, the action being controlled by the treadle. The No. 1 press will cut washers $1\frac{3}{8}$ inches in diameter with $\frac{3}{8}$ inch hole, from stock $\frac{1}{8}$ inch thick. The stroke is $1\frac{1}{4}$ inches. The balance-wheel is 38 inches in diameter and 5 inches face.

Weight, 2,000 lbs.

Price, \$350.

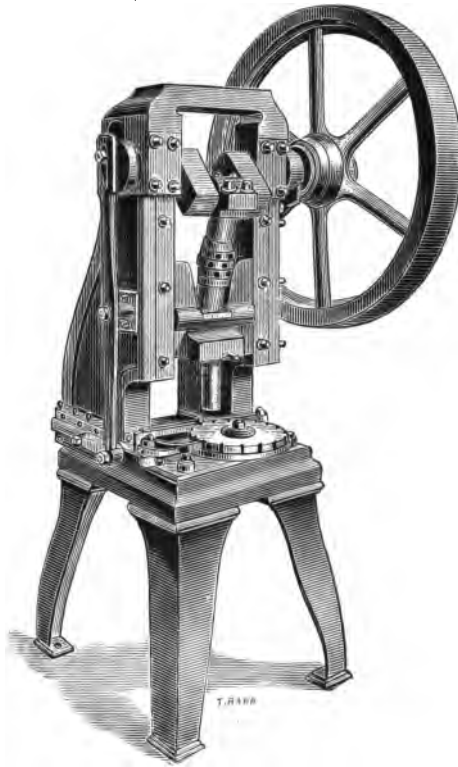


No. 1 Horizontal Washer Press.

WITH AUTOMATIC ROLL FEED.

We here illustrate the No. 1 Press, designed with automatic roll feed convenient for feeding long strips of band-iron, etc. Except in this particular the machine is identical with that described on opposite page. The upright form of washer press is shown in cut on page 43.

Price, with roll feed, \$450.



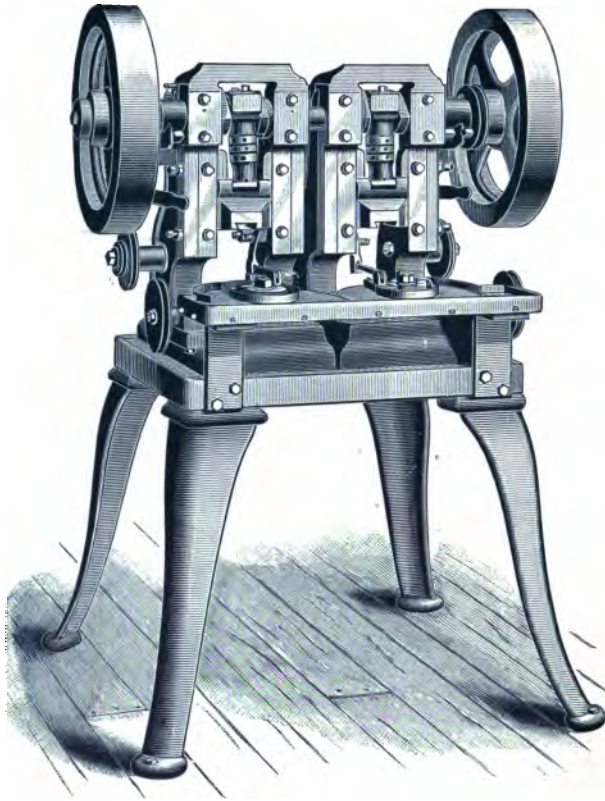
Open Back Drawing Press with Ratchet Dial Feed.

The above cut shows the general arrangement of our Ratchet Dial Drawing Presses, which are specially suited for re-drawing shells for metallic cartridges and other purposes. Dimensions of the various sizes are given in the table on opposite page.

Drawing Presses with Ratchet Dial or Friction Dial Feed.

	SIZE OF PRESS,									
	2	2½	3	3½	4	4½	5	6	7	8
Stroke as desired up to inches,	3	4	3	4	5	8	6	8	10	10
Distance from bed to center of shaft,	16	19	19	21	26	28½	26	31½	40	44¾
Distance from bed to slide, when down,	5	4½	4½	5	6¼	7	7	9	9	9½
Distance from center of slide, back to uprights,	3¼	3¼	3¾	3¾	4	4	4	4	4	4
Distance between uprights,	4¾	4¾	8	8	8¼	8¾	11¾	11¾	12½	15
Diameter of wheel,	18	18	20	20	28	30	36	38	48	50
Face of wheel,	3	3	3½	3½	4¼	4¼	4½	5	6	7
Weight, lbs.,	550	700	850	1000	1700	2000	2300	2500	4800	7500
Price without feed,	\$140	\$160	\$175	\$225	\$275	\$300	\$325	\$375	\$550	\$725
Price with feed,	\$240	\$260	\$275	\$325	\$375	\$400	\$450	\$500	\$675	\$850
Price when back-gearred,										

Prices include treadle and wrenches.



Double Drawing Press with Friction Dial Feed.

This illustration shows the manner of mounting two friction dial presses upon one table. In many cases one operator can supply shells to the friction dial plates sufficiently fast to feed the two machines.

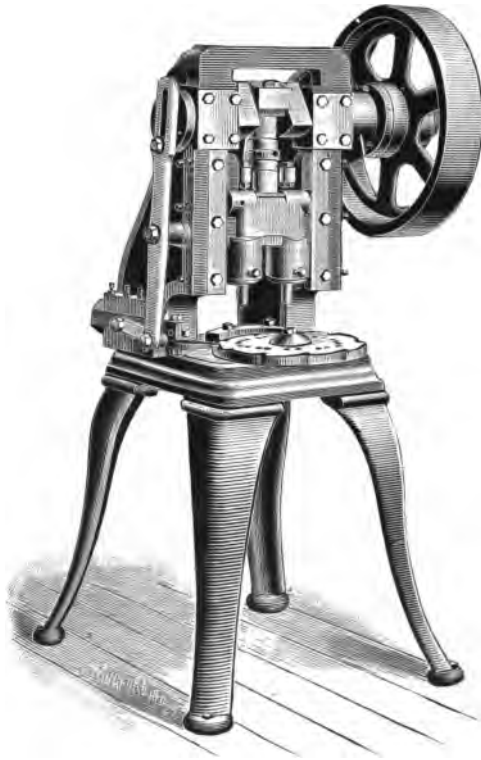


Shot-Shell Heading Press.

Above we show our No. 6 Press with ratchet dial attachment, lifting motion and pick-off, as designed for heading paper shot-shells.

Weight, 3,500 lbs.

Price, \$675.

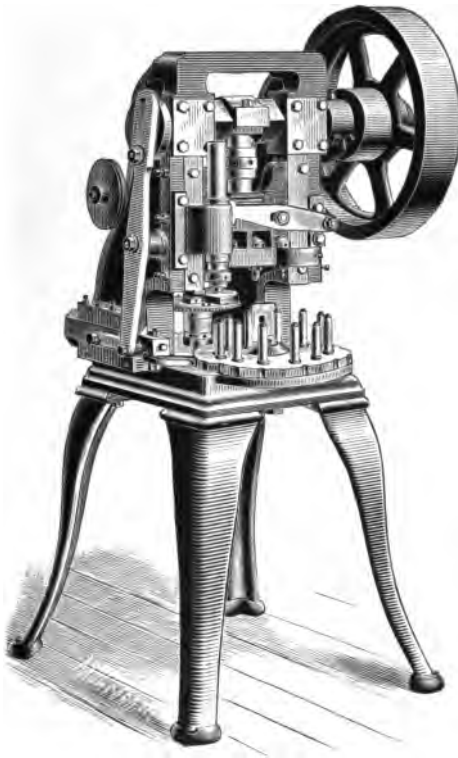


Reducing Press.

Designed for reducing or tapering metallic cartridge shells.

Weight, 1,200 lbs.

Price, \$400.

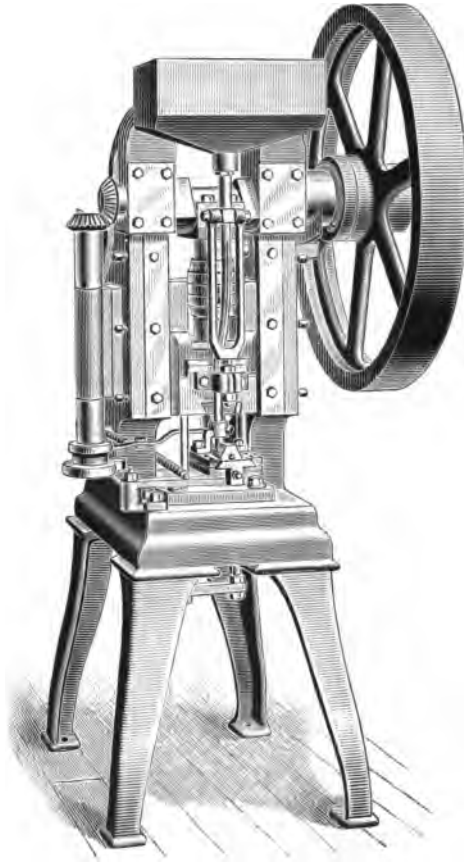


Priming Press.

Designed for piercing holes and inserting primers in metallic or shot-shells. The press is the same pattern as shown on the preceding page, but has both ratchet and friction dial attachments and pick-off motion. The shells are fed upon the punches and carried automatically to the several operations, the primers being fed from the friction dial in back of the press.

Weight, 1,200 lbs.

Price, \$450.



Bullet Press.

The illustration shows one of our No. 5 Presses fitted with automatic tube feed and knock-out motion, as designed for swaging bullets. The lead slugs or castings are taken automatically from the hopper and carried to the dies, where they are pressed into the required shape.

No. 3, with attachments, weight,	900 lbs.	Price, \$325.
No. 4, " " " "	1,800 lbs.	" 450.
No. 5, " " " "	2,250 lbs.	" 525.

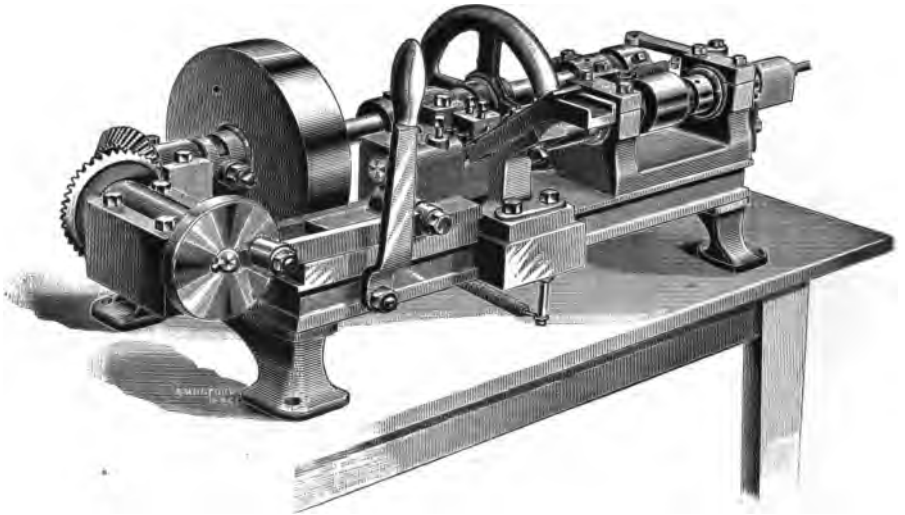


Canneluring Machine.

This machine is designed for forming the channels or creases in bullets, by rolling them between a fixed and a revolving die. The bullets are placed by hand on a revolving friction plate which carries them to the dies. The table, which we make of either wood or iron, is 33 inches from the floor. The driving pulleys are 15 inches in diameter and 3 inches face.

Weight, 560 lbs.

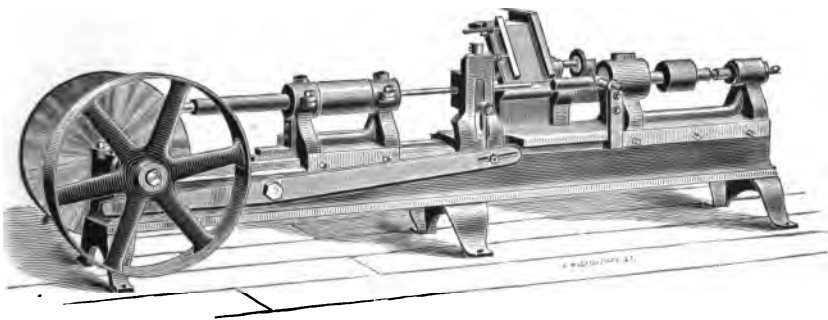
Price, \$375.



Automatic Shell-Trimmer.

This machine is designed for trimming cartridge shells, from 22 to 38 calibre. The shells are fed into the inclined guides at front of machine, and carried automatically to chuck, where the ends are cut off to make the shells true and of exact length.

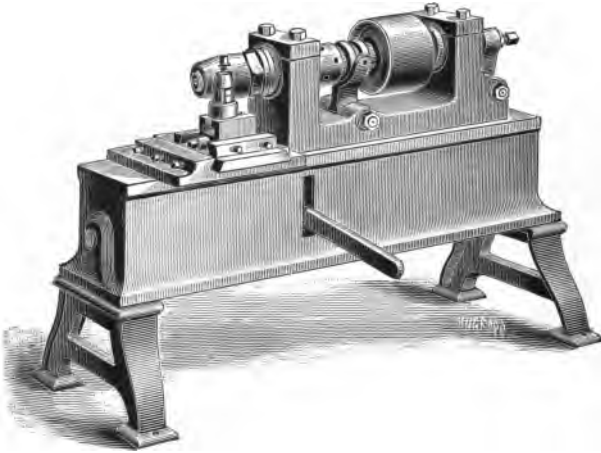
Price, \$350.



Automatic Cutting-off Lathe.

For cutting large brass shells to uniform length prior to heading, we make the machine here illustrated. In this the shells are automatically taken from feeding box, forced on to revolving arbor and trimmed by circular knife, after which both the shell and scrap are removed from the arbor.

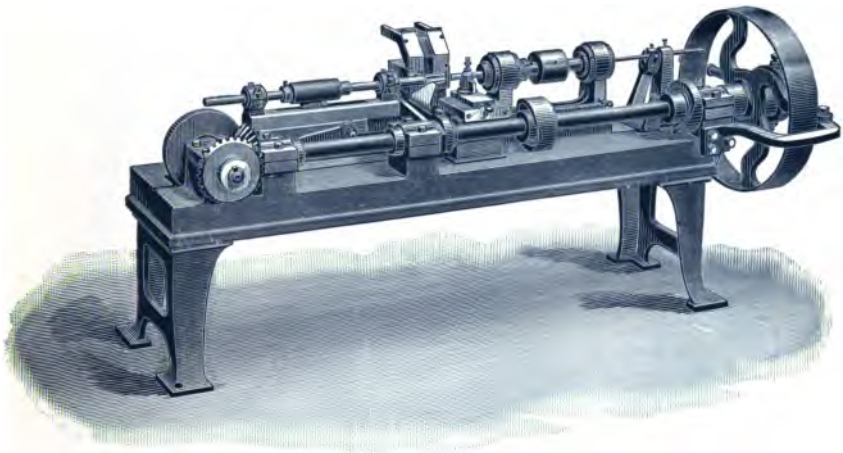
Price, \$350.



Head-Shaping Lathe.

We make the small machine illustrated above, for shaping and trimming the heads of brass shot-shells. In this machine the chuck and ejector are actuated by the single hand-lever which operates the tool-carrying slide. The base of machine is 6 x 24 inches. The pulley is 4 inches in diameter and $2\frac{1}{2}$ inches face.

Price, \$200.



Automatic Head-Trimming Lathe.

In the manufacture of small solid head brass shells the operation of heading leaves the rim a little larger in diameter than when finished. For the purpose of reducing this irregularity to a standard we furnish this special automatic lathe, to which the headed shells are fed through a hopper, placed, trimmed, and ejected. It will handle shells up to $\frac{1}{2}$ inch in diameter and $2\frac{1}{2}$ inches long, and occupies a space on bench of 12 x 54 inches.

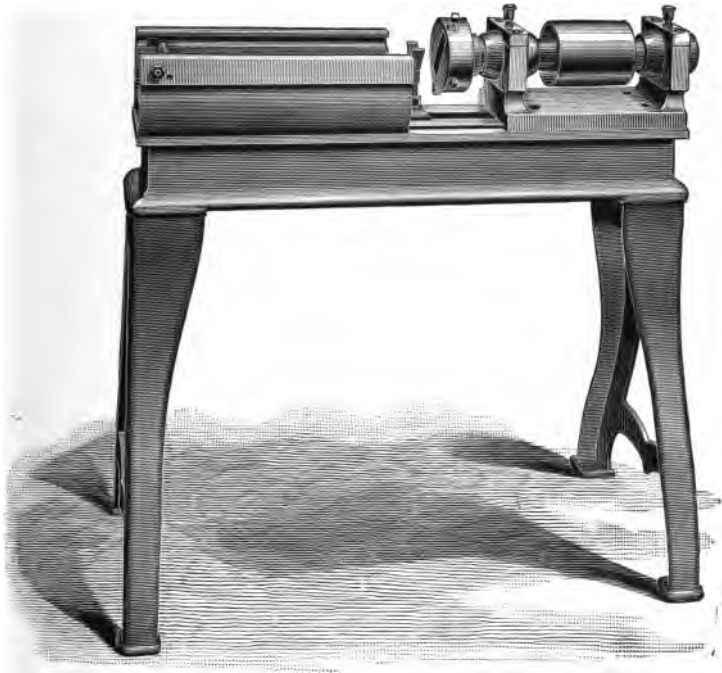
Price, \$350.



Mouth-Annealing Machine.

This machine consists of a large friction dial as a carrying plate, upon which the shells are fed so that they pass between gas flames at a proper speed for annealing the ends. The table is three feet square; dial is 30 inches diameter.

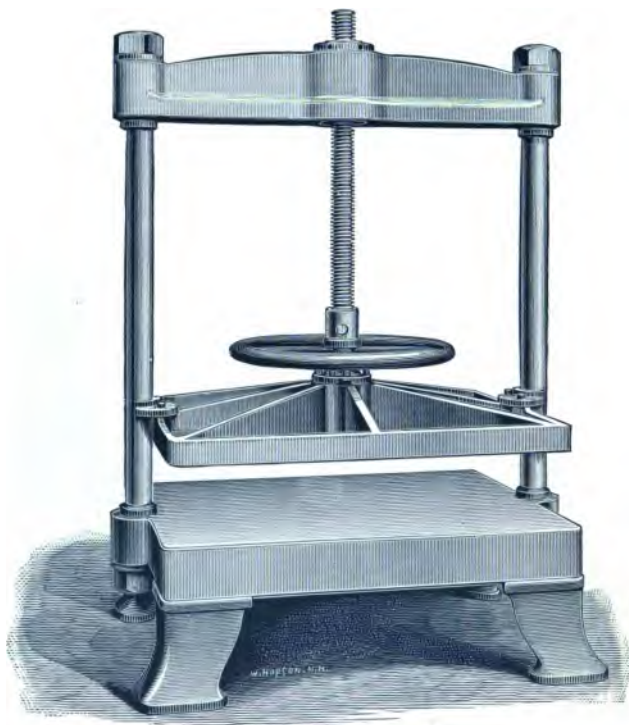
Weight, 600 lbs. Price (without pipes), \$120.



Hand Sizing Lathe.

This machine is designed for sizing and burnishing paper tubes for shot-shell cases. It has very large, hollow spindle, with chuck, and driving pulley $5\frac{1}{2}$ inches diameter and $6\frac{1}{2}$ inches face. Length of bed, 4 feet; swing, 10 inches.

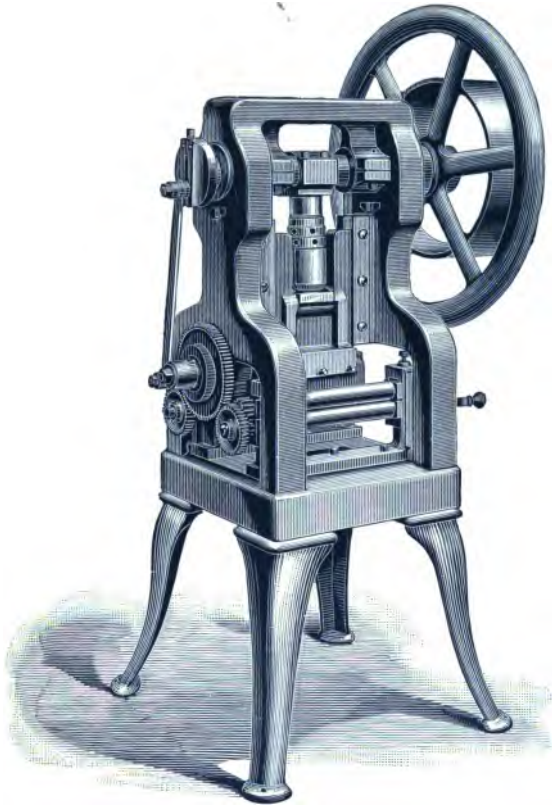
Weight, 250 lbs. Price, \$125.



Hand Screw Press.

This machine is designed for pressing felt for gun wads. The plates are 38 x 50 inches, and they separate to 34 inches between.

Weight, 4,000 lbs. Price, \$320.

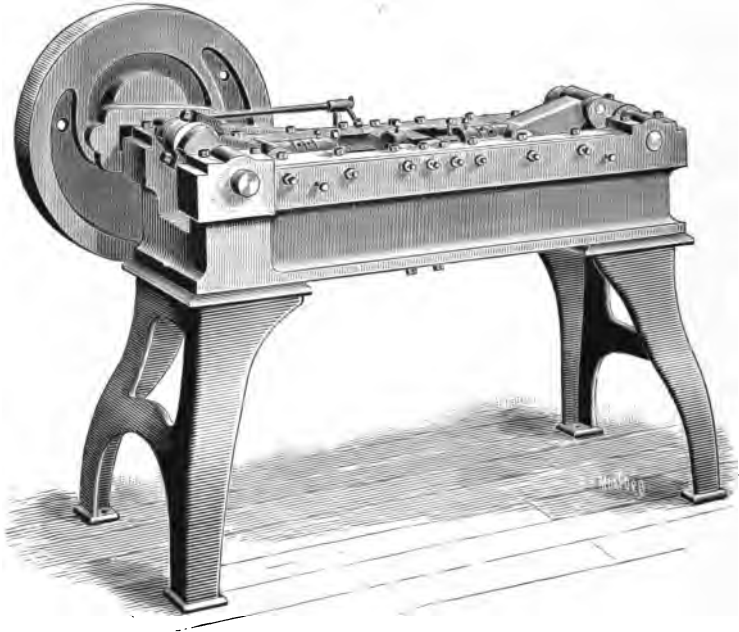


Wad-Cutting Press.

One of our Open Side Pillar Presses is here shown arranged with double roll feed, designed for feeding felt for cutting into gun wads. The open sides allow removing the tools without disturbing the feed rolls. Some of the dimensions of this special size are as follows: Stroke, 2 inches; fly-wheel, 36 inches diameter, with 3-inch round rim, and driving pulley 20 x 6 inches; distance from bed of press to gate, when down, is $8\frac{1}{2}$ inches; distance between uprights, 16 inches; opening in uprights at sides, 16 inches; feed rolls, 2 inches in diameter with 14-inch faces.

Weight, 2,200 lbs.

Price, \$600.



Cartridge Header.

We make a line of horizontal machines specially designed for heading cartridge cases, forming either folded or solid heads. The smallest size, No. 0, is suitable for making $\frac{3}{10}$ shells with folded heads.

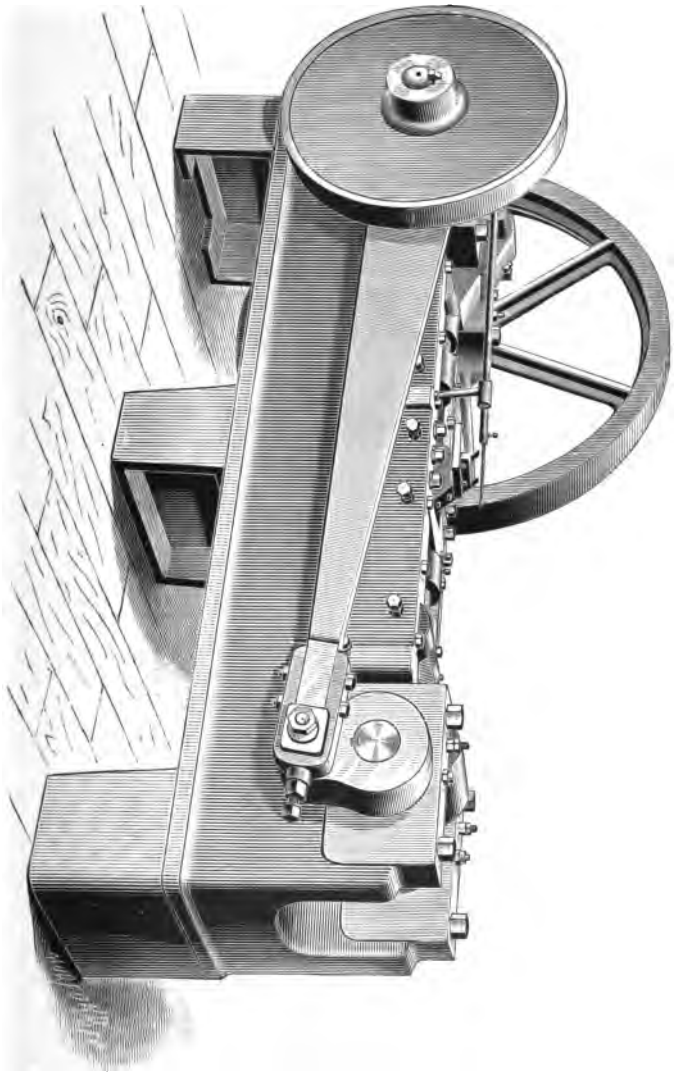
The No. 1 is well adapted for making folded heads on $\frac{4}{10}$ shells and is illustrated above.

The No. 2 is a heavy machine and is recommended for solid heads, up to $\frac{3}{10}$.

The No. 3 is used to form the solid heads on $\frac{4}{10}$ shells. It has a wheel 45 inches diameter and $4\frac{3}{4}$ inches face.

On the opposite page we illustrate the No. 4, which is a very heavy and powerful machine, suitable for heading No. 10 brass shot-shells.

No. 0,	Weight,	850 lbs.	Price, \$	550.
No. 1,	"	1,250 lbs.	"	650.
No. 2,	"	3,500 lbs.	"	950.
No. 3,	"	5,500 lbs.	"	1,250.
No. 4,	"	13,600 lbs.	"	2,000.



No. 4 Cartridge Header.

SPECIAL CARTRIDGE MACHINERY.

In addition to the Cartridge Presses, etc., illustrated on the preceding pages, we make to order a large variety of miscellaneous machinery used in the manufacture of both paper and brass shells, and as we are frequently called upon to build special forms from plans furnished us, we wish to assure our patrons, at the outset, that all such orders are treated in the strictest confidence, and the original suggestions contained therein are never appropriated nor given to others.

Assembling Press.

This machine resembles the Priming Press shown on page 109. It has both ratchet and friction dial, and by its use the brass heads are properly placed and forced on to the paper shells.

Weight, 1,250 lbs. Price, \$450.

Brass Operation Press.

This is a Ratchet Dial Machine in which by several operations the brass cups are reduced, shaped and stamped to form cartridge heads.

Weight, 1,250 lbs. Price, \$450.

Double Cutting-up Machine for Paper Shot-Shells.

This machine, of the character of a small lathe, carries an arbor having cutters and collars arranged to suit the length of shells to be cut. Two paper tube arbors are provided, one on each side of the main arbor, so that two operators can work at the machine. The bed is 36 inches long, and is mounted on short legs suitable for the bench.

Price, \$200.

Hand-Lever Loading Presses.

We make two sizes of this machine to be used for loading small cartridges. They are toggle presses operated by long hand-levers. The principal dimensions of the No. 1 size are: Height from bed to gate, when down, $5\frac{1}{2}$ inches; stroke, $2\frac{1}{2}$ inches; from center of gate backward to uprights, 4 inches; hand-lever, 7 feet long.

No. 2 machine. Height from bed to gate, when down, $5\frac{1}{2}$ inches; stroke, $3\frac{1}{4}$ inches; distance from center of gate backward to upright, $4\frac{1}{2}$ inches; hand-lever, 8 feet long.

Price of No. 1 (including ejecting treadle), \$225.

Price of No. 2 " " " 300.

Revolving Annealing Furnace, Double.

This furnace is built of brick-work, having a casing and front of iron. It consists of two conveniently arranged ovens heated from below, in which are revolved by power the two perforated iron annealing drums, each 20 inches in diameter and 23 inches long. The drums are rolled out through suitable doors in front, on to brackets, for charging or emptying. Space occupied is 10 feet in width, 4 feet in depth, and 6 feet in height.

Weight, 5,300 lbs.

Price of Iron Work, ~~\$225~~ ^{425.}

Automatic Shell Feeds.

Our machinery for operating on small brass shells can be supplied with tube-feeds by which the shells are automatically sorted from a hopper and properly presented to the tools for the required operation. Illustrated on page 96.

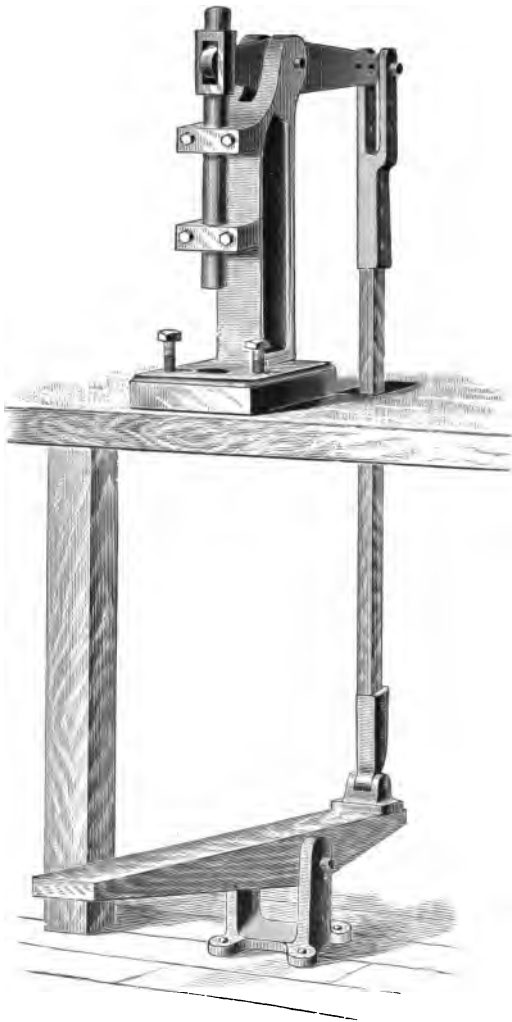


No. 0 Round Slide Foot Press.

The motion of slide is one inch ; distance from bed to bottom of guide, $3\frac{1}{2}$ inches ; distance from bed to bottom of slide, when down, $2\frac{1}{4}$ inches ; size of bed, $5\frac{1}{4}$ x $3\frac{1}{4}$ inches ; opening in bed, $1\frac{1}{2}$ inches ; distance between die-bed bolts, 4 inches.

Weight, 50 lbs.

Price, \$12.50.



No. 1 Round Slide Foot Press.

Stroke, 3 inches ; distance from bed to bottom of guide, 6 inches ; from bed to bottom of slide, when down, 3 inches ; size of bed, $6\frac{1}{2} \times 5\frac{1}{2}$ inches ; from center of slide to upright, $2\frac{1}{2}$ inches ; distance between die-bed bolts, 5 inches. Opening in bed, 2 inches diameter.

Weight, 110 lbs.

Price, \$18.00.



No. 1 Square Slide Foot Press.

Stroke, $1\frac{1}{2}$ inches ; distance from bed to bottom of guide, $4\frac{1}{2}$ inches ; from bed to bottom of slide, when down, $2\frac{1}{2}$ inches ; from center of slide to upright, $2\frac{1}{2}$ inches ; size of bed, 7 x 5 inches ; opening through bed, $2\frac{1}{2}$ inches diameter ; distance between die-bed bolts, 5 inches.

Weight without table, 92 lbs.

Price, \$17.00.

Weight with table, 180 lbs.

Price, 26.00.

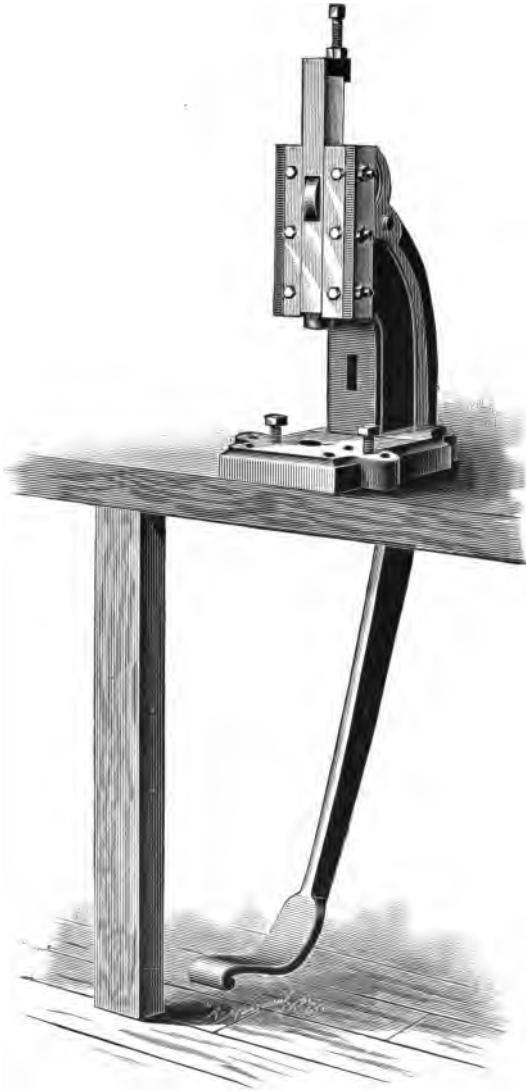


No. 2 Square Slide Foot Press.

Stroke, $2\frac{1}{2}$ inches ; distance from bed to bottom of guide, 6 inches ; from bed to bottom of slide, when down, $3\frac{1}{4}$ inches ; from center of slide to upright, $3\frac{1}{2}$ inches ; distance between die-bed bolts, $5\frac{1}{2}$ or $7\frac{1}{2}$ inches.

Weight, 225 lbs.

Price with treadle, \$25.00.



No. 2 Foot Press with Iron Kick-Treadle.

This cut shows the size and kind of foot press in most general use among the manufacturers of brass goods. Specifications are as follows: Stroke, $1\frac{3}{4}$ inches; distance from bed to bottom of guides, 6 inches; distance from bed to bottom of slide, when down, $2\frac{3}{4}$ inches; from center of slide to upright, 3 inches; distance between die-bed bolts, $5\frac{1}{2}$ inches or $7\frac{1}{2}$ inches; opening in bed, 2 inches diameter.

Weight, 130 lbs.

Net Price, \$18.00.

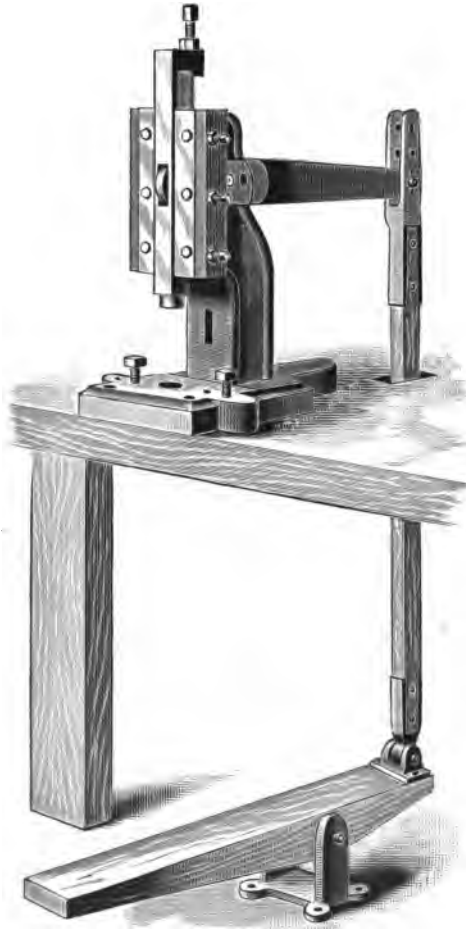


No. 2 Foot Press with Gibbed Slide, on Table.

Stroke, 1 $\frac{3}{4}$ inches. Other dimensions same as on previous page. The table is 24 x 30 inches, and 36 inches high; iron drawer fitted when desired.

Weight, 300 lbs.

Price, \$28.00.

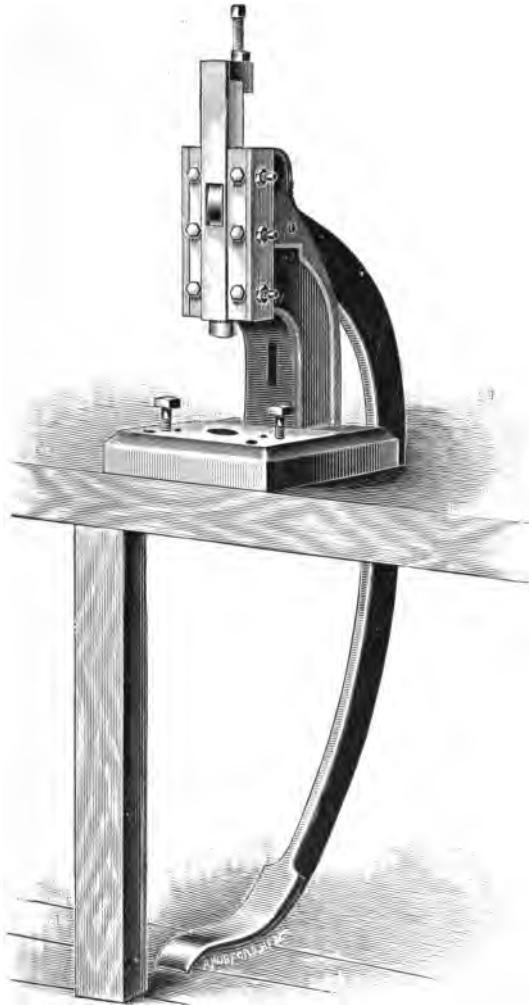


No. 2 Foot Press with Gibbed Slides and Wood Treadle.

Stroke, $2\frac{1}{2}$ inches ; distance from bed to bottom of guides, 6 inches ; from bed to bottom of slide, when down, $2\frac{3}{4}$ inches ; from center of slide to upright, 3 inches ; distance between die-bed bolts, $5\frac{1}{2}$ or $7\frac{1}{2}$ inches ; size of bed, $7 \times 5\frac{3}{4}$ inches without the lugs.

Weight, 130 lbs.

Price, \$18.00.



No. 2 Foot Press with Extra Wide Bed. •

Stroke, $2\frac{1}{2}$ inches ; distance from bed to bottom of guides, 6 inches ; distance from bed to bottom of slide, when down, 3 inches ; distance from center of slide back to uprights, 4 inches ; distance between die-bed bolts, $7\frac{1}{2}$ or $5\frac{1}{2}$ inches ; size of bed, 10 x 7 inches ; hole in bed, $1\frac{3}{4}$ inches diameter.

Weight, 170 lbs.

Price, \$20.00.

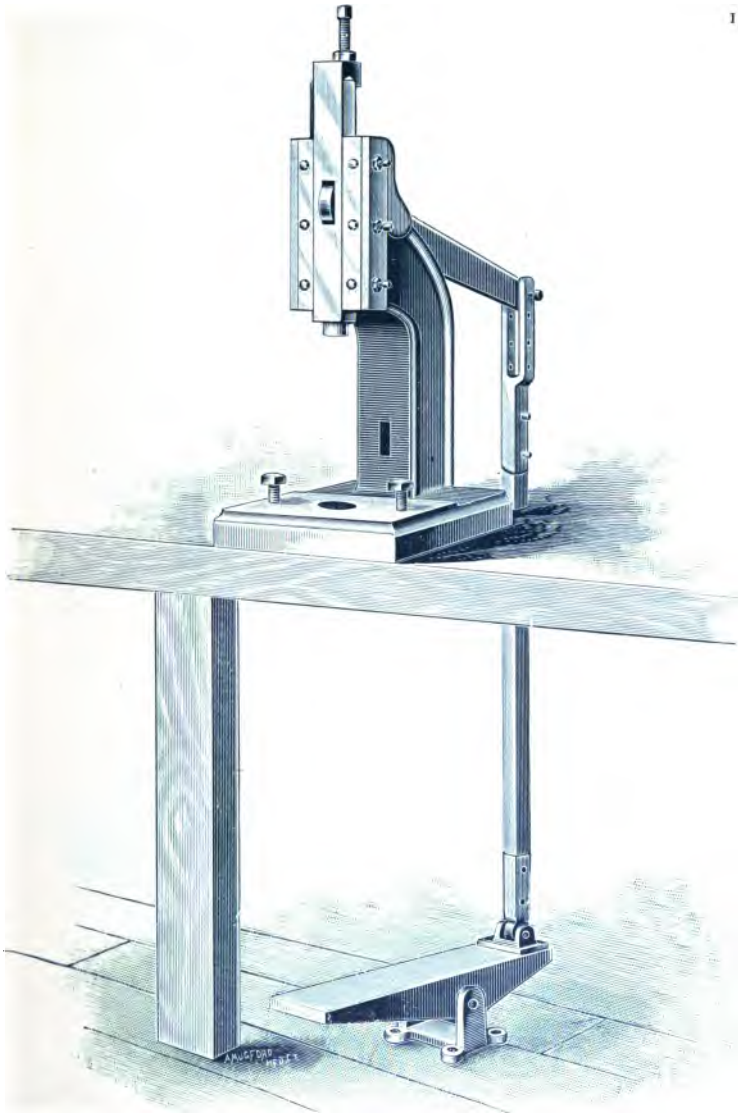


No. 2 Foot Press, Extra High.

Distance from bed to bottom of guides, 9 inches. Other dimensions same as regular No. 2 Gibbed Slide Foot Press.

Weight, 155 lbs.

Price with Treadle, \$20.00.

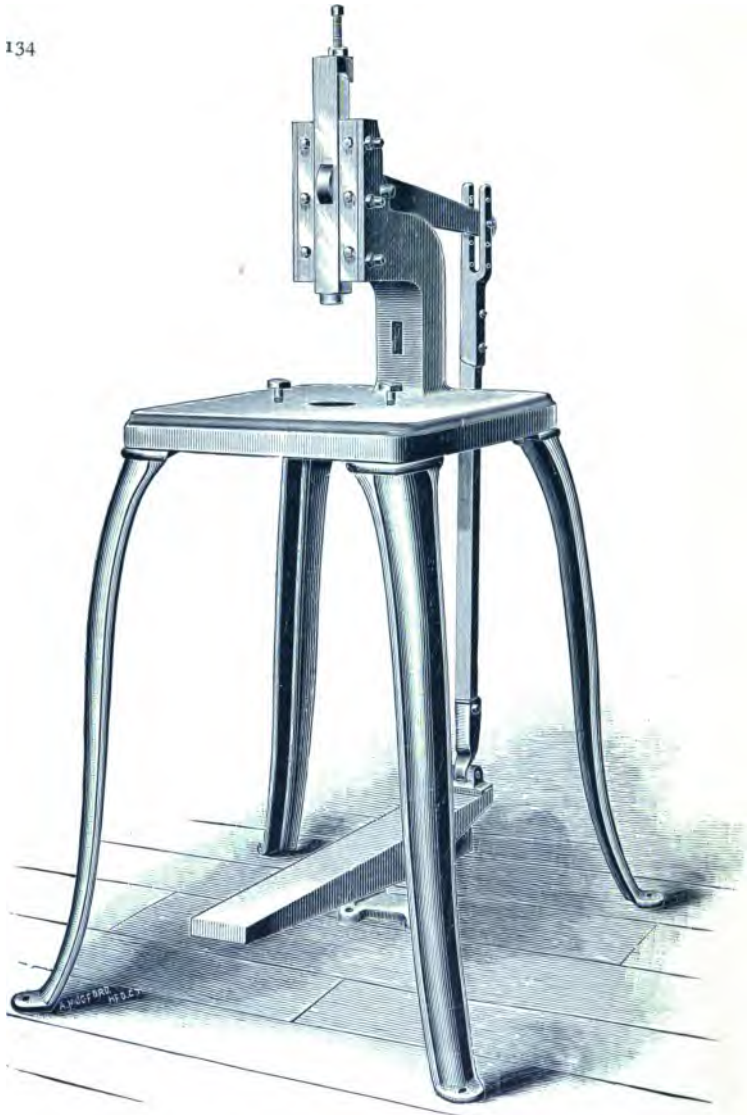


No. 2 Foot Press, Extra High.

Stroke, 2 inches; distance from bed to bottom of guides, 10 inches; distance from bed to bottom of slide, when down, $7\frac{1}{2}$ inches; distance from center of slide back to uprights, $5\frac{1}{2}$ inches; distance between die-bed bolts, $5\frac{1}{2}$ or $7\frac{1}{2}$ inches; size of bed, $8\frac{1}{2}$ x 10 inches; hole in bed, 2 inches diameter.

Weight, 185 lbs.

Price, \$24.00.

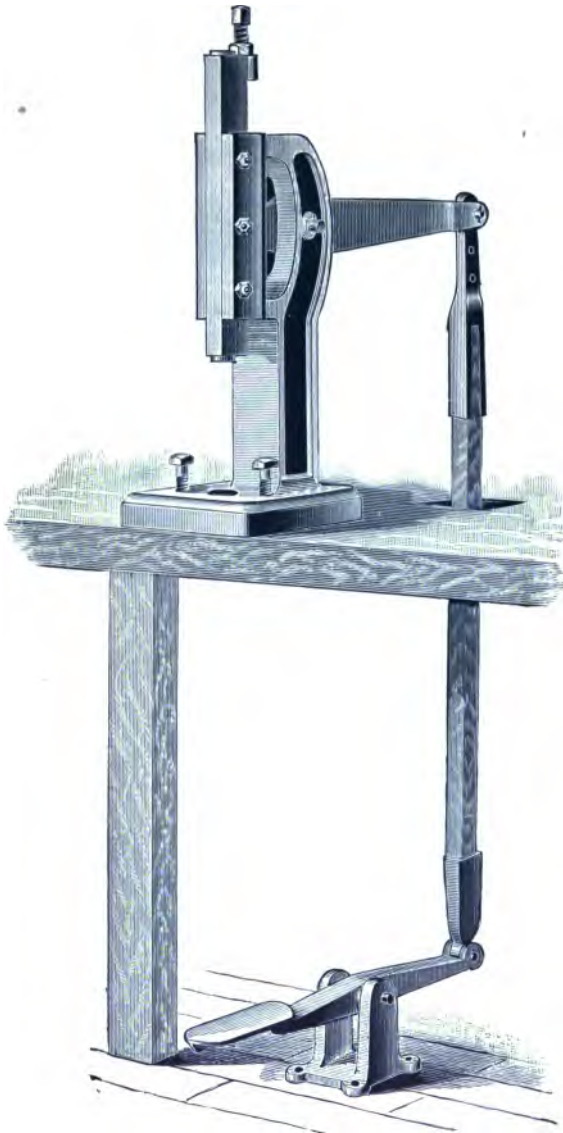


Special No. 2 Foot Press on Legs.

Stroke, 2 inches; distance from bed to bottom of guides, 7 inches; distance from bed to bottom of slide, when down, $4\frac{1}{2}$ inches; from center of slide back to uprights, 9 inches; distance between die-bed bolts, $5\frac{1}{2}$ or $7\frac{1}{2}$ inches; size of bed, 18 x 18 inches; hole in bed, 3 inches diameter.

Weight, 390 lbs.

Price, \$38.00.



Cloth Button Covering Press.

Stroke, $2\frac{3}{8}$ inches ; distance from bed to bottom of guides, $8\frac{1}{2}$ inches ; from bed to bottom of slide, when down, 5 inches ; from center of slide to upright, $2\frac{3}{4}$ inches ; distance between die-bed bolts, $5\frac{1}{2}$ inches. We also furnish this press with wood or swing-lever treadle if preferred.

Weight, 120 lbs.

Price, with Treadle, \$18.00.

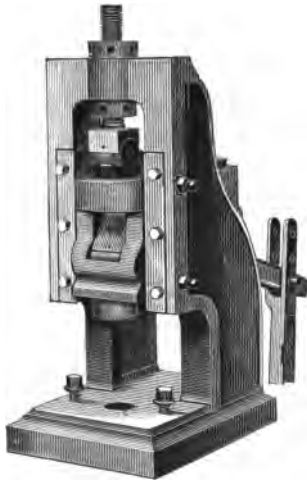


Weighted Compound Lever Foot Press.

Stroke, 1 inch ; distance from bed to bottom of guides, $6\frac{1}{8}$ inches ; from bed to bottom of slide, when down, 5 inches ; from center of slide to uprights, 3 inches ; distance between die-bed bolts, $5\frac{1}{2}$ or $7\frac{1}{2}$ inches ; size of bed, 13 x 6 inches ; opening in bed, $2\frac{1}{4}$ inches diameter.

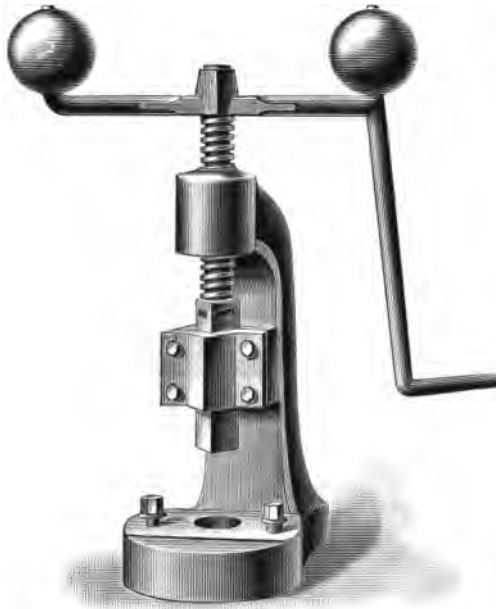
Weight, 290 lbs.

Price, \$45.00.



Knuckle-Joint Foot Press.

	NUMBER OF PRESS,	
	1	2
Stroke,	2 $\frac{1}{8}$ inches.	4 inches.
Distance from bed to bottom of guides,	6 $\frac{1}{4}$ "	6 $\frac{1}{4}$ "
Distance from bed to bottom of slide, when down,	4 $\frac{1}{4}$ "	6 $\frac{1}{4}$ "
Distance from center of slides to uprights,	3 "	3 $\frac{1}{2}$ "
Distance between die-bed bolts,	4 $\frac{1}{2}$ or 6 $\frac{1}{2}$ in.	6 $\frac{1}{2}$ or 8 in.
Weight,	275 lbs.	375 lbs.
Price with treadle,	\$55.00	\$70.00

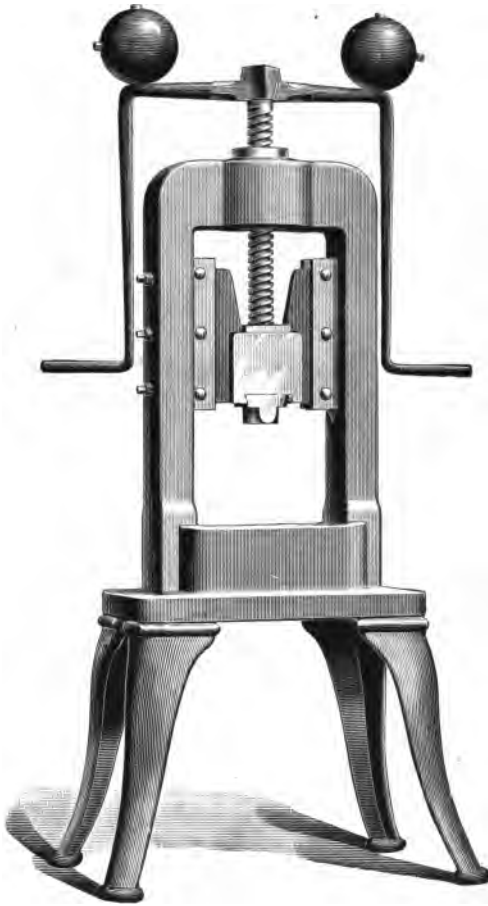


Hand Screw Press.

We make to order a variety of hand screw presses in addition to those described below. We put in gun-metal bushing and steel screws with double or triple thread, as may be desirable.

	NUMBER OF PRESS,	1	2	3	4
Weight, about		420 lbs.	800 lbs.	1,100 lbs.	1,400 lbs.
Price,		\$80.00	\$120.00	\$150.00	\$180.00
Bed to bottom of slide when up,		6½ in.	8½ in.	9 inches.	10 inches.
Distance back from center of slide,		3 "	6 "	7 "	8 "
Diameter of steel screws,		2 "	2½ "	2¾ "	3 "

Double or triple thread, with pitch as desired.



Arch Screw Press.

This press has been especially designed to supply a first-class screw press for tool room use in testing new dies. The stroke of slide is $4\frac{1}{2}$ inches; the distance from bottom of guides to bed, 11 inches; distance between uprights, 15 inches; the bed is 10 inches wide, with opening 3 inches in diameter, or as desired; diameter of steel screw, $2\frac{1}{2}$ inches; double thread with $1\frac{1}{2}$ inches pitch.

Weight, 1,750 lbs.

Price, \$200.00.



Portable Bench Drop Press.

Distance between poppets, 5 inches.

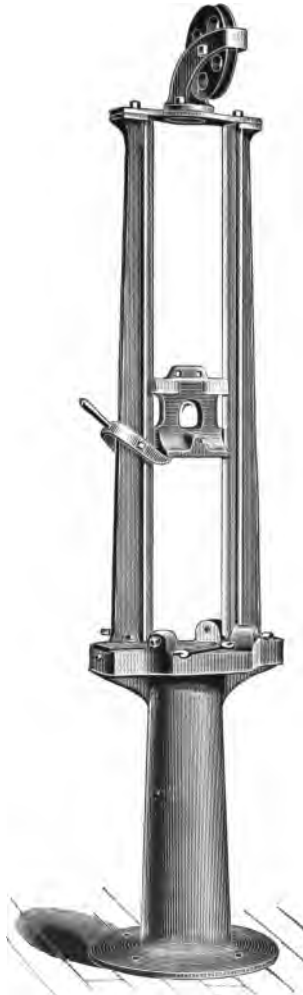
Height from floor to top of base, 15 inches.

Weight of hammer, 25 lbs. to 50 lbs., as wanted.

Weight, 450 lbs. Price, \$65.00.

We make a Heavy Bench Drop as follows :

Weight of Hammer.	Total Weight.	Size of Base.	Height of Base.	Length of Uprights.	Distance between Uprights.	Price.
320 lbs.	3400 lbs.	38 in. x 18 in.	12 in.	60 in.	26 in.	\$275



Portable Drop Press.

The above illustration shows portable drop press, with round base 22 inches in diameter at the bottom and 36 inches high. The rails are 5 feet long. The distance between poppets and between points of rails is $5\frac{1}{2}$ inches. The hammer can be made from 15 to 60 pounds in weight, with any desired holder for punches.

Weight complete, 700 lbs. Price, \$90.00.

Another pattern is just like the above, except the distance between poppets is $5\frac{1}{2}$ inches x $8\frac{1}{2}$ inches, and the distance between rails is 9 inches.

Weight, 850 lbs. Price, \$100.00.



Four-Poppet Drop Presses.

Made with heavy cast iron poppets and steel screws.

No	Weight of Hammer.	Total Weight.	Diam of bottom of Base.	Height from floor to top of Base.	Length of Uprights.	Distance between Uprights.	Distance between Poppets.	Price with Counter-shaft.
1	80 lbs.	1000 lbs.	14 in.	27 in.	60 in.	7 $\frac{3}{4}$ in.	6 $\frac{3}{4}$ in.	\$130
1 $\frac{1}{2}$	120 "	1600 "	16 "	29 "	68 "	9 "	8 "	150

These presses are popular for all kinds of light stamping. Price includes dove-tail in hammer.

Four-Poppet Drop Presses.

Made with heavy wrought iron poppets and steel screws.

No.	Weight of Hammer.	Total Weight.	Diam. of bottom of Base.	Height from floor to top of Base.	Length of Uprights.	Distance between Uprights.	Distance between Poppets.	Price, with Counter-shaft.
1	90 lbs.	1000 lbs.	14 in.	27 in.	60 in.	7¾ in.	6¾ in.	\$140
2	150 "	2000 "	16 "	29½ "	68 "	9½ "	10 "	190
2½	175 "	2500 "	20 "	29½ "	72 "	9½ "	12 "	225
3.	250 "	3500 "	24 "	30½ "	72 "	12 "	12 "	275
4	350 "	5000 "	26 "	33 "	72 "	14 "	14 "	350
5	500 "	8500 "				20 "		510

Sizes No. 1 and No. 2 we carry in stock, and other sizes built on short notice. We will fit hammers to receive any tools, and make the form and weight as desired. The hammer is raised by aid of flanged pulley on an overhead shaft, by which the operator has the hammer under perfect control, and can deliver a light or heavy blow at will.

If countershaft is not wanted, deduct \$20 from above prices.

The above Drops are the same in general outline as cut on the previous page.

Six-Poppet Drop Presses.

These Drops are designed for stamping spoons, forks and silverware, and are made with heavy wrought iron poppets and large steel screws. The distance between the poppets is made suitable for the required work. We will fit the hammers to receive any tools or fixtures, without extra charge.

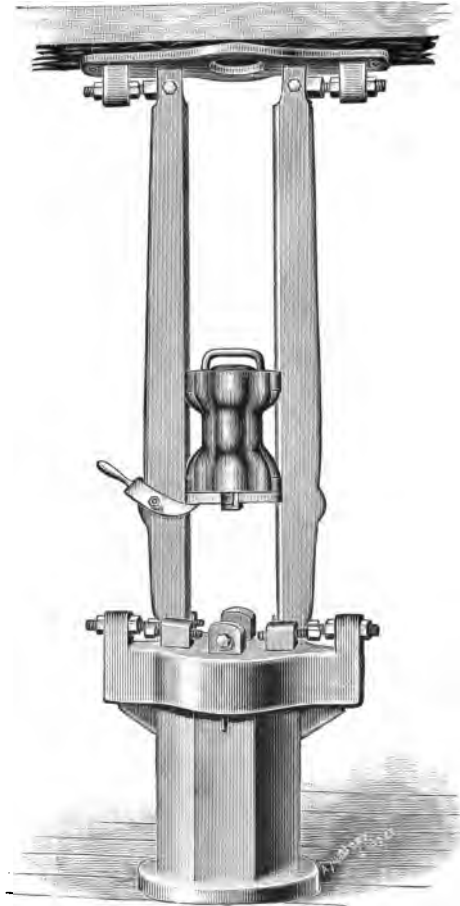
No.	Weight of Hammer.	Total Weight.	Diam. of bottom of Base.	Height from floor to top of Base.	Length of Uprights	Distance between Uprights.	Distance between Poppets.	Price, including Counter-shaft.
1	200 lbs.	3100 lbs.	20 in.	30½ in.	72 in.	8½ in.	9x10 in	\$275
2	350 "	4500 "	26 "	32 "	72 "	12½ "	12x14½ "	400
3	550 "	7250 "	56 "	32 "	78 "	12½ "	14x14½ "	525
4	800 "	9500 "						650

When Automatic Lifter is wanted, please note description of our new lifter.

These Drops are made from recent designs; the accompanying cut being an old one, gives a rather poor conception of the modern press. The rails are held by large bolts extending through the projecting end of the bed, with deep nuts on top, which rest upon bosses built up high on the sides of the rails, in order to strengthen the arch and the bottom of the rail.



Six-Poppet Drop Presses.



Special Six-Poppet Drop Presses.

With shackled uprights.

This form of drop is much used for work requiring special adjustment of the upright to bring the dies in proper surface relation to each other, as for spoons, forks, etc. The pivotal connection of the uprights to both base and yoke makes this universal adjustment an easy one. Dimensions of drop shown are as follows: Weight of hammer, 350 pounds; height of base, 34 inches; length of uprights, 84 inches; distance between uprights, $12\frac{3}{4}$ inches; distance between poppets, 11 x 12 inches.

Total Weight, 5,000 lbs.

Price, \$450.00.

We construct (when so ordered) any of our six-poppet drops with uprights arranged as above.



Drop Presses without Poppets.

FOR CUTLERY AND HARDWARE WORK.

We make all sizes Drops (previously described) without any poppets, and arranged to hold dies of all sizes. The dimensions of special pattern Drop, shown in the above cut, are as follows: Diameter of bottom of base, 16 inches; height from floor to top of base, 29 inches; length of uprights, 6 feet; distance between uprights, 12½ inches.

Weight, 2,900 lbs.

Price, including Countershaft, \$200.00.

DROP HAMMERS.

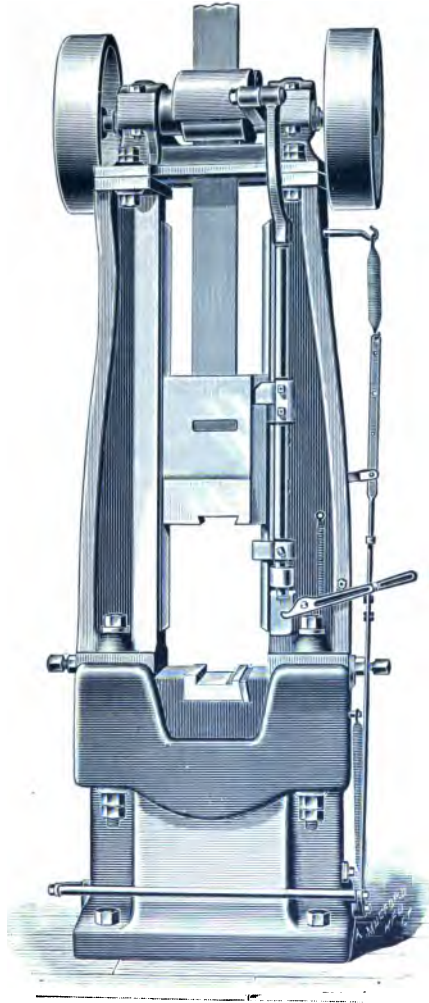
WITH AUTOMATIC LIFTER.

With many years' experience in the manufacture of Drop Presses for various purposes, and after a very careful investigation of the Power Drop, we have taken advantage of the opening in the market for a first-class Drop for forging and for stamping, and have designed a machine which fully meets the demand for a first-class, substantial Power Drop Hammer. Reference to the accompanying illustration, together with the following explanation, giving some details of the improved construction of this press, will show it to be very simple and thoroughly efficient. The base and rails are of extra heavy weight and are made of charcoal iron, the long, heavy bolts used to secure these rails being specially adapted to their particular work.

As the constant jar to which this class of machine is subjected crystallizes its members, especially bolts under strain, we have so arranged that no tapping is done in the cast iron. Every bolt and screw is used in connection with a removable wrought iron nut dropped into a pocket, so that when a bolt is ruptured it can be readily removed and replaced.

The principle of action in this hammer is old and well tried. The hammer-head, which is of forged steel, is raised by friction rolls acting on the board attached to the head. Both of these friction rolls are belt-driven, one by crossed and one by open belt, thus doing away with objectionable gearing. One of these rolls is carried in stationary adjustable boxes, while the other is supported in an eccentrically-hung frame, in such a manner that the raising and lowering of the rod shown on the front of the right-hand rail will force the friction roll to or from the back roll. When the rod is allowed to drop, its weight is sufficient to clasp the board firmly, and the rotation of the rolls will cause the hammer to rise until the rolls are separated by the rod being lifted, through the action of lugs on the hammer, in the well-known manner. The eccentric-yoke or frame carrying the moving roller is a steel casting, bushed with removable bronze sleeves where the roll-shaft runs. These bearings being in one single casting cannot get out of perfect alignment, and can be easily repaired when worn. The roller-frame is in one casting, with caps to hold the rolls in place. Either roll may be removed without disturbing the other. The several positions from which the hammer may fall are fixed, and the catch-lever may be set in any position desired, as this has been found superior to any kind of frictional device for suspending the hammer.

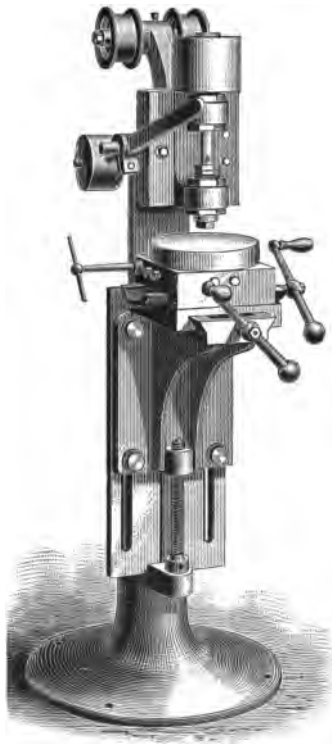
The character of blows and extent of control which the operator has may be summed up as follows: Depressing the treadle releases the catch from the hammer and permits it to fall. If the foot is removed from the treadle as soon as the blow is struck the hammer will return to its set position, and rest. If, however, the treadle is held down, repeated blows are struck from the predetermined height.



Drop Hammers with Automatic Lifters.

Weight of Hammer.	Total Weight.	Length of Uprights.	Height from floor to top of Pulleys.	Diameter between Uprights at Base.	Size of Bottom of Base.	Diam. and Face of Pulleys	Revolu. per Minute.	Price.
450 lbs.	8500lbs	5ft. 6in.	10ft. 6in.	15 in.	24x36in.	24x 6in.	125	\$ 850.00
850 "	16500 "	7ft. 4in.	11ft. 6in.	19 "	32x45 "	36x 8½"	100	1400.00
1500 "	27000 "	7ft. 8in.	12ft.	21 "	48x54 "	36x10½"	80	2000.00

Several sizes of Automatic Lifters are now in course of preparation.



Die Sinking Machine.

This machine is useful for all kinds of light drilling and milling operations, and is especially designed for use in tool rooms where light tools and dies are made. The spindle has a vertical movement of $3\frac{1}{2}$ inches. The table has both transverse and longitudinal movement of $4\frac{1}{4}$ inches. It also has a rotary movement, and a vertical adjustment of 6 inches. The driving pulley is 5 inches in diameter and calculated for belt $1\frac{1}{2}$ inches wide.

Weight, 650 lbs.

Price, with Countershaft, \$300.00.



Die Grinder.

This machine will recommend itself to manufacturers using dies for presses, stamps, rivet machines, etc. The spindle is of steel, running in long bearings, and fitted to receive an emery wheel at each end. The work is placed upon the adjustable table and moved back and forth under the wheel. The table is 7 x 10 inches. The greatest distance from table to center of wheel is 15 inches. The driving pulley is 4 inches in diameter and 4 inches face. The countershaft has tight and loose pulleys 6 inches in diameter and $3\frac{1}{2}$ inches face, and driving pulley 14 inches diameter.

Weight, 350 lbs. Price, with Countershaft, \$75.00.



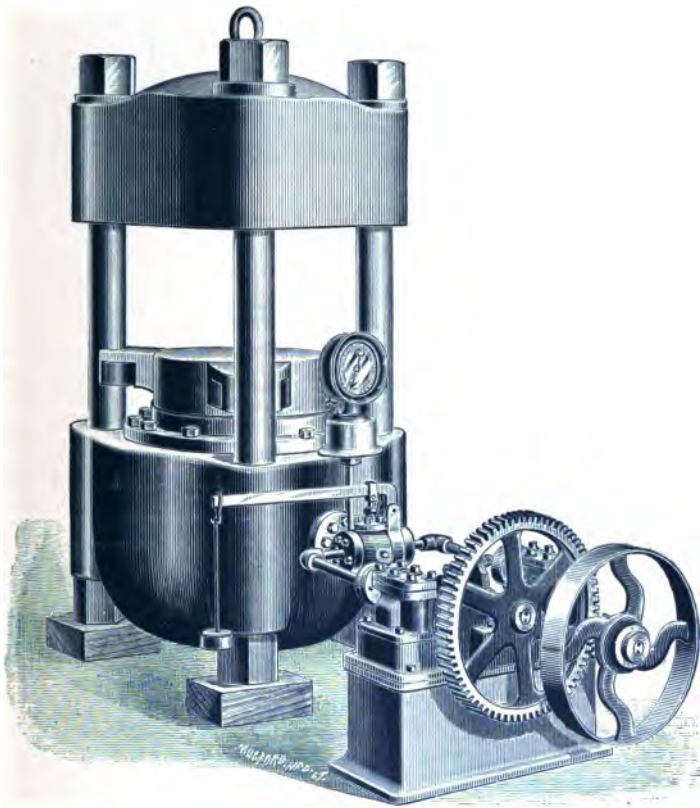
Universal Grinding Machine.

For grinding rolls, punches and dies, reamers, cutters, slitter blades, etc. The machine will swing on its centers $9\frac{1}{4}$ inches in diameter and 24 inches long, and over the bed, or with face-grinding attachment, will swing 11 inches in diameter. The length of table is 56 inches and the length of bed 60 inches. The emery wheel spindle has pulley 3 inches in diameter and $2\frac{1}{2}$ inches face. It will receive emery wheels 9 inches in diameter by $\frac{1}{2}$ inch face. The machine has countershaft for driving the emery wheel and feeding mechanism, and an overhead drum from which the work is driven. The first countershaft has tight and loose pulleys 4 inches in diameter and $3\frac{1}{4}$ inches face, and a pulley to drive the emery wheel 14 inches in diameter by 3 inches face, and should run 430 revolutions per minute. The drum for driving the work is 6 inches in diameter and 32 inches long.

Price includes centers, face-grinding attachments and countershafts.

Weight, 1,800 lbs.

Price, \$500.00.



Hydraulic Press.

The illustration represents one of our Hydraulic Presses, designed for embossing, hubbing dies, or any work requiring great pressure to be applied at a slow speed. The machine has a cylinder 20 inches in diameter, and of sufficient strength to stand a pressure of 4,000 pounds to the square inch. The upright rods are of steel, and calculated to stand a strain of 600 tons with safety.

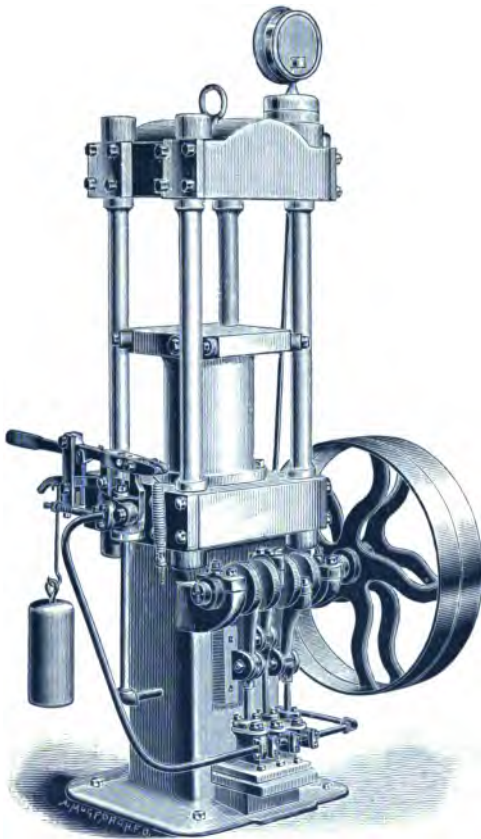
Weight, 10,000 lbs.

Price, with Pump and Fittings as above, \$1,000.



Seventy-Ton Hydraulic Press. (FRONT.)

The illustration shows front view of seventy-ton hydraulic press, with pump, valve and water tank complete. The plunger is 6 inches in diameter and has a stroke of 8 inches. The size of lower platen is 11 x 13 inches, and the distance between platens, 12 inches. The press has a steel cylinder, and is mounted upon a base which has a closet for small tools, and a water tank at the bottom. The pump, which is attached to base of machine, has three plungers $\frac{3}{8}$ inch in diameter, with stroke of $2\frac{1}{2}$ inches, driven by pulley 24 inches diameter and 3 inches face.

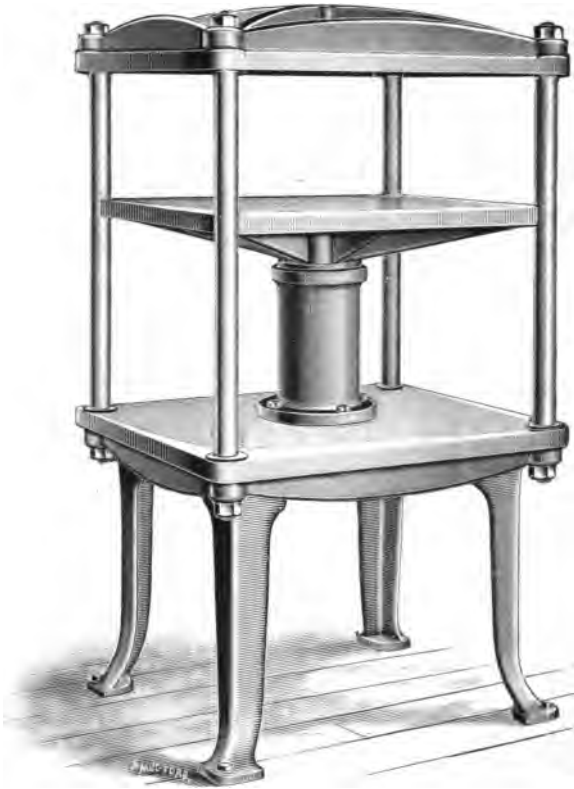


Seventy-Ton Hydraulic Press. (BACK.)

The amount of pressure upon the work can be regulated by adjusting the valve which is arranged to trip when the desired pressure is reached, allowing the ram to fall ready for the next stroke; the motions are all under control of the operator by means of the hand lever shown, and the press is furnished with safety valve and pressure gauge ready for use.

Weight, 2,000 lbs.

Price, \$650.00.



Small Hydraulic Press.

Designed for pressing paper, felt, or fabric of any kind requiring a light pressure quickly applied. The ram is 6 inches diameter, with a stroke of 12 inches. The cylinder is copper lined. The platens are 26 x 32 inches, and the distance between platens when separated is 12 inches. The press is calculated to work under any pressure up to 500 pounds per square inch, and may be connected with city mains or an accumulator, as desired.

Weight, complete, as shown, 2,000 lbs.

Price, without pump or valves, \$200.00.



Hydraulic Accumulator.

The illustration shows a small hydraulic accumulator having ram 9 inches in diameter, with a stroke of 4 feet, and weighted to a pressure of 100 pounds per square inch. We are prepared to make all sizes, up to 20 inches diameter of plunger or stroke of 24 feet, and weighted to any desired pressure. Plans, specifications and prices furnished upon application.



Four-Hundred-and-Fifty-Ton Hydraulic Press.

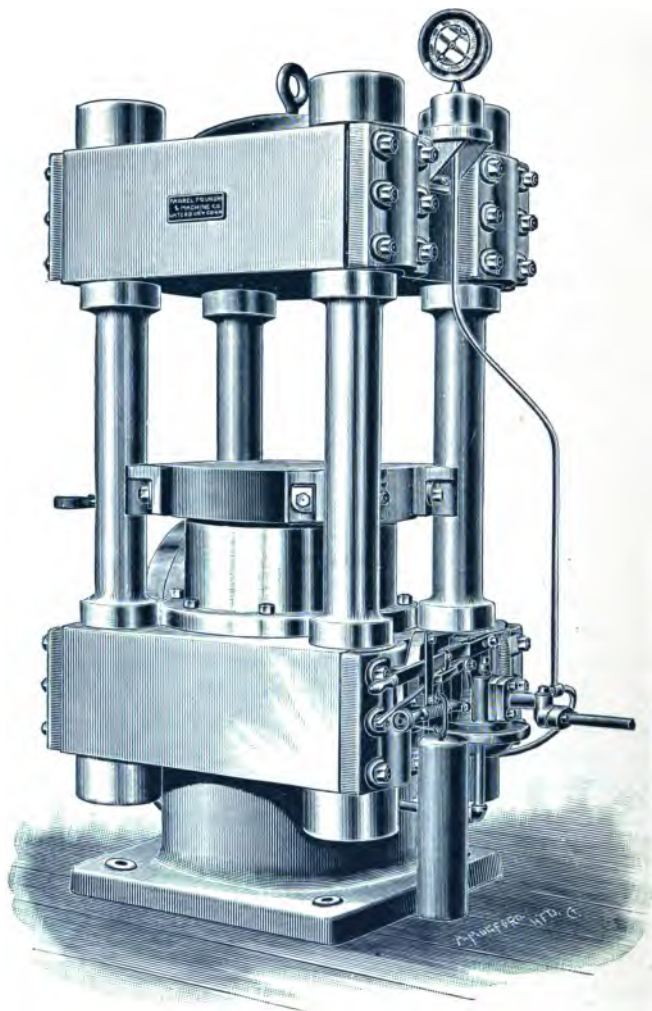
Description on opposite page.

Four-Hundred-and-Fifty-Ton Hydraulic Press.

The Hydraulic Press illustrated on the preceding page is suitable for embossing watch-cases or silverware, coining large medals, hubbing dies, etc. The press is made of the best material and accurately fitted. The main cylinder is 13 inches in diameter, made of steel and copper lined. The upright rods are of steel with solid ends, and are $4\frac{1}{4}$ inches in diameter at the smallest part. The distance between rods is $18\frac{1}{4}$ inches, and the distance between platens, when separated, $17\frac{1}{2}$ inches. The valve motion is arranged to trip automatically as soon as the desired pressure is reached, and can be instantly regulated to any pressure within the limits of the capacity of the machine. For embossing we advise in connection with this press the use of the high-duty three-plunger pump illustrated on page 164, which is capable of working continuously under a pressure of 8,000 pounds per square inch, giving a quick movement to the ram. For hubbing dies or work requiring only a slow motion we attach a small pump directly to the press, as shown on page 161.

Weight complete, 9,500 lbs.

Price, including pressure gauge and automatic valve, \$1,000.00.

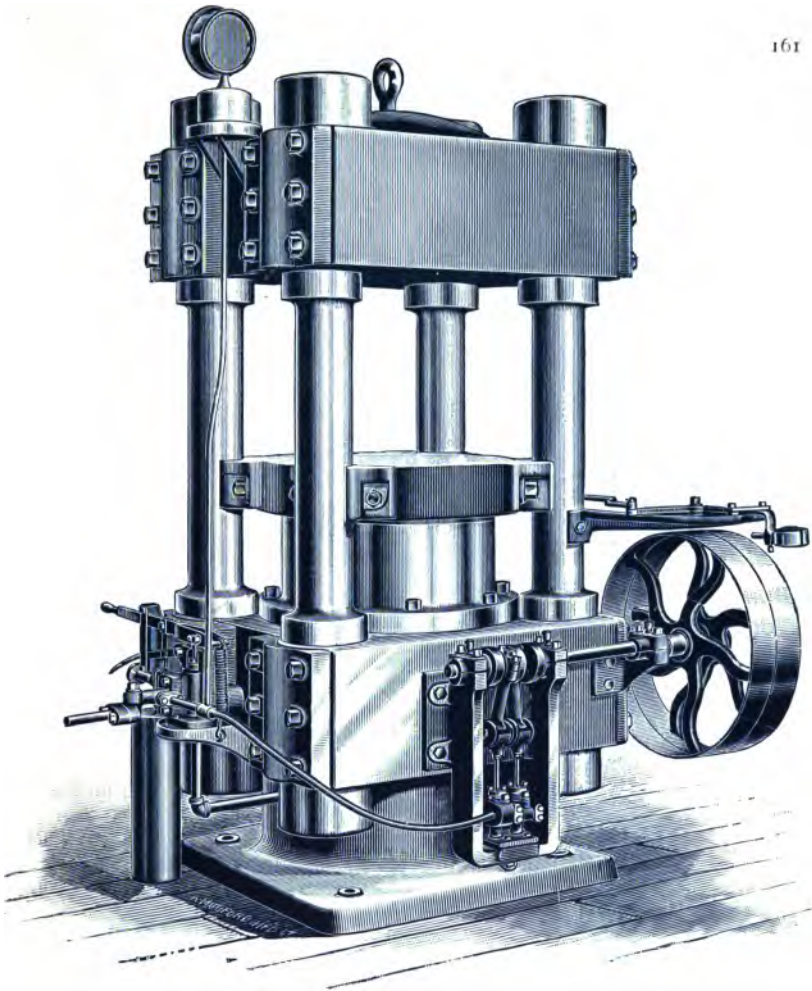


Seven-Hundred-and-Fifty-Ton Hydraulic Press.

The illustration represents our Seven-Hundred-and-Fifty-Ton Hydraulic Press, arranged with automatic valve same as described on page 159. These presses have copper lined steel cylinders 18 inches in diameter. Rods of steel, $5\frac{1}{2}$ inches in diameter at the smallest part. The space between rods is 24 inches, and distance between platens, when separated, 19 inches. Distance from face of ram to floor, 45 inches. Total height, 7 feet. The lower part of base forms the tank for water.

Weight, complete, 16,500 lbs.

Price, with automatic valve and pressure gauge, \$1,750.00.



Seven-Hundred-and-Fifty-Ton Hydraulic Press.

The illustration shows the manner of applying a small pump to the seven-hundred-and-fifty-ton large press for hubbing dies or any work requiring a slow speed. This pump can be used in connection with the automatic valve and the large pump if desired.

Total Weight, 20,000 lbs. — Price, \$1,800.00.

One-thousand-ton press is made the same style as the seven-hundred-and-fifty-ton, having cylinder 18 inches in diameter, and with upright rods 6 inches in diameter.

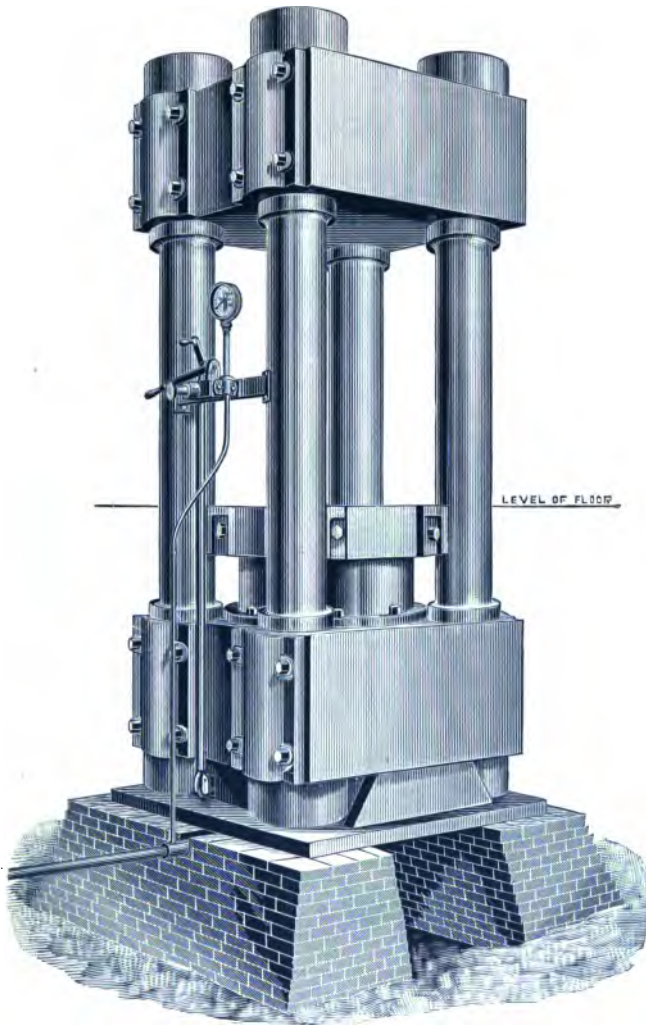


Seven-Hundred-and-Fifty-Ton Hydraulic Press.

The illustration shows a hydraulic press having three upright rods, instead of four, as shown on the preceding pages. This press is fitted with the same valve motions, and driven by pumps similar to those used in connection with the four-rod machines. The rods are $6\frac{1}{2}$ inches in diameter; space between rods, $27\frac{1}{2}$ inches; stroke, 3 inches; distance between platens when separated, 42 inches; total height, 8 feet.

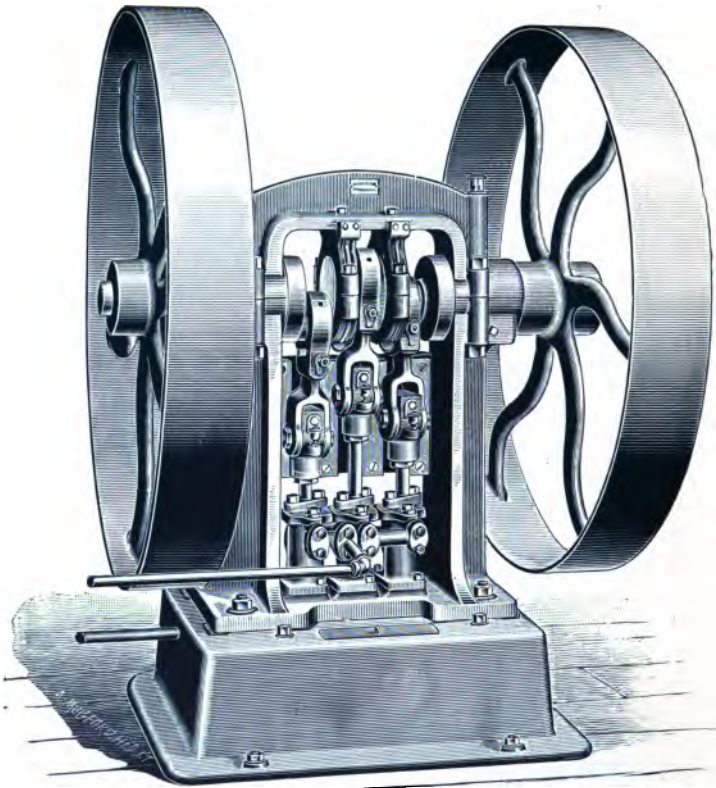
Total Weight, 16,000 lbs.

Price, including automatic valve, \$1,600.00.



Three-Thousand-Ton Hydraulic Press.

This machine is fitted with the automatic valve, same as used in smaller sizes, and should be connected with a pump similar to the high-duty pump shown on page 164. The upright rods are $11\frac{3}{4}$ inches in diameter at the smallest part. The space between rods is 35 inches. The distance from top of ram, when down, to upper platen, is 60 inches. The press has copper-lined steel cylinder 32 inches in diameter, and calculated to withstand a pressure of 8,000 lbs. per square inch, with safety. The total weight of machine without pump is 75,000 lbs.

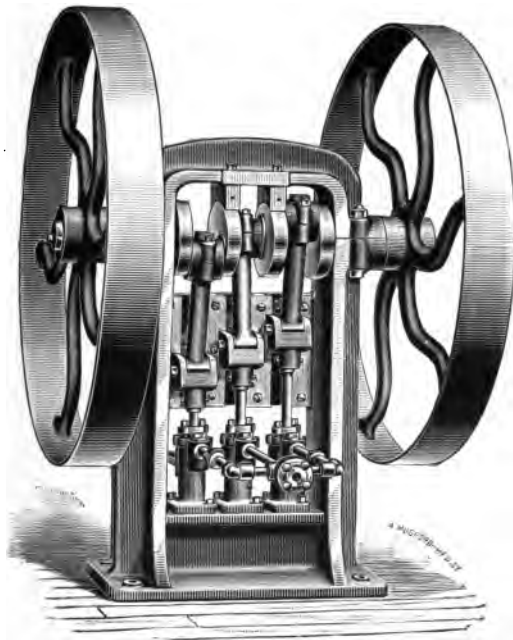


Three-Plunger Power Pump.

The illustration represents a high-duty power pump designed for operating hydraulic presses, etc., under extremely heavy pressure. The main shaft is $3\frac{1}{2}$ inches in diameter at its journals, and is provided with adjustments for taking up wear in all directions. The connecting rods are made of steel, with bronze boxes provided with all adjustments, and hardened steel pins connecting with the cross-heads. The plungers are of steel, hardened and ground, and pump barrels and valves of the best phosphor bronze are carefully fitted and provided with lubricating devices and adjustments. The stroke of plungers is 5 inches. Diameter of plungers, 1 inch. Driving pulleys, 54 inches diameter and $7\frac{1}{2}$ inches face. Distance from center to center of pulleys, 39 inches. Floor space required, 4 x 5 feet. Height from bottom of base to center of main shaft, $42\frac{3}{4}$ inches. The pump is capable of working under a pressure of 8,000 pounds per square inch, and should run 60 revolutions per minute.

Total Weight, 2,800 lbs.

Price, \$800.00.

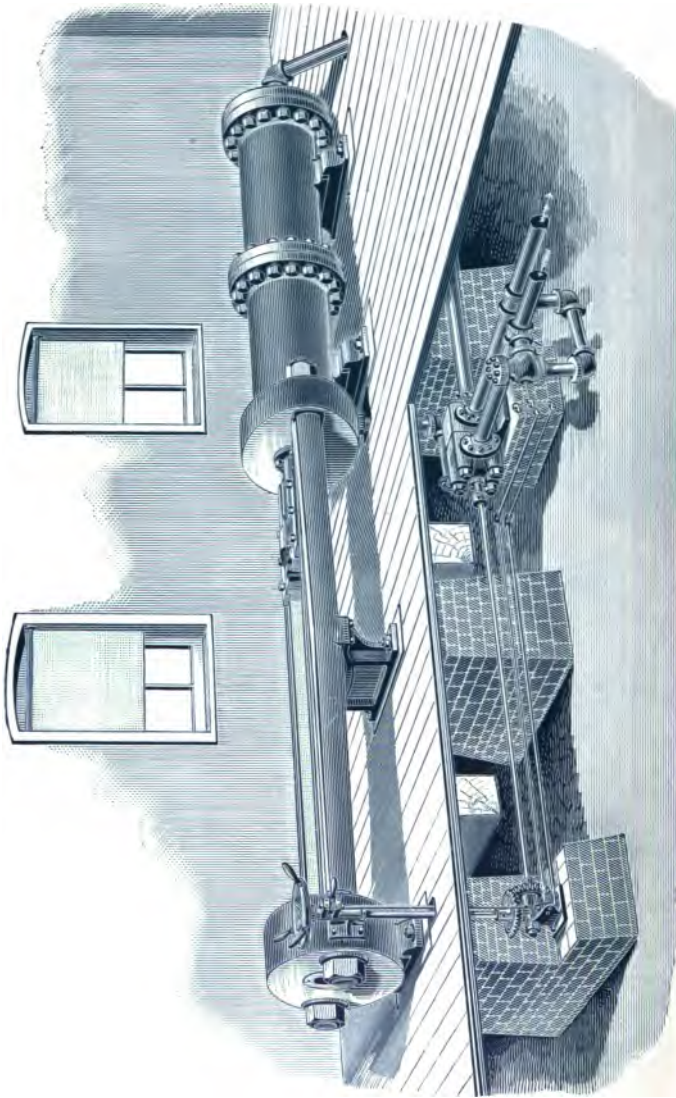


Three-Plunger Pump.

We build the above pump for lighter service than that requiring our high-duty pump; it is made on similar lines, but is of simpler construction; it is a superior machine of the very best material, and well fitted, equal to the best machine of its class in the market. It is constructed to withstand a steady resistance of 4,000 lbs. per square inch. The pulleys are 48 inches in diameter and $6\frac{1}{2}$ inches face, and should run 60 to 80 revolutions per minute.

Price, \$550.00.

The following specifications will be required in making estimate of cost of hydraulic presses, viz.: Size of platens and distance between platens when separated; stroke or movement of ram; speed at which the ram should travel and total pressure.



Hydraulic Drawing Press.

Hydraulic Drawing Presses.

We have made many improvements in machinery of this class, of late, and our recent patterns cover a great variety of presses specially adapted to drawing seamless tubing of steel or brass, and large shells of all kinds.

Hydraulic drawing presses have many advantages over chain draw benches of equal capacity. The speed is entirely under the control of the operator, and the start may be made without shock. Work can be either pushed or pulled through the dies. For breaking down by pushing, the piston rod is made extra large for stiffness, and is thoroughly supported in all positions. If the press is intended for pulling only, the piston is returned without material waste of power, the only water used being that displaced by the piston rod.

In addition to the form illustrated we make a line having the bed of same design as used on chain draw benches (for pulling only), having tongs or grip attached to cross-head, and arranged with extension to support triplet rod.

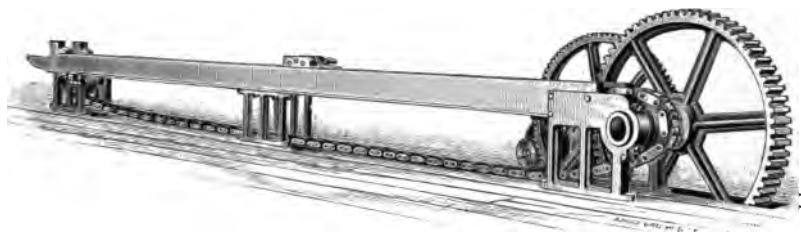
In size these presses vary from 6 to 24 inches in diameter of cylinders, and from 3 to 25 feet in stroke. All sizes are furnished with valves and couplings, and arranged to be directly connected to the supply pump, or with an accumulator, as desired.

The illustration represents a press having a cylinder 22 inches in diameter and a stroke of 10 feet, with steel piston rod and cross-head, and arranged to be driven directly by a power pump.

The motions of the press are controlled by the hand wheel shown in front, which reverses the movement of the ram.

The press is instantly stopped at any time by a slight movement of the small handle which is located under the hand wheel, and controls a powerful hydraulic by-pass valve, allowing the pump to run continuously and the press to be started and stopped at will.

Specifications and estimates for all sizes furnished upon application.



Chain Draw Benches.

IRON FRAMES.

These machines are made for drawing, through stationary dies, all kinds of copper and brass tubing, and rods. The bed or frame is planed both top and bottom and fitted with suitable gearing, bed plates, etc. We furnish working drawings from which to build foundations, and supply the necessary anchor-bolts, plates, etc. The draw-plate is made with either tongs, grip, or double-wedge grip. Patterns are of such character that machines may be driven from either side, or the belt driving attachment may be omitted, in which case the large gear is driven directly from main line, below the floor; the No. 4 size has a double-link chain and is built specially to be so driven, and has a gear 8 feet in diameter and 3 inches pitch.

We can furnish friction clutch driving pulleys in place of the tight and loose pulleys described below, and arrange with cones for varying the speed, when it is desirable.

Prices include suitable countershaft.

	NUMBER OF BENCH,	1	2	3	4
Size of chain links, inches,		2 x $\frac{5}{8}$	2 $\frac{1}{2}$ x 1	3 x 1	3 x 1
Diameter of pins in chain,		1 $\frac{1}{8}$	1 $\frac{1}{2}$	1 $\frac{5}{8}$	1 $\frac{3}{4}$
Pitch of chain-wheel,		4	4 $\frac{1}{2}$	4 $\frac{3}{4}$	5 $\frac{1}{2}$
Number of teeth in chain-wheel,		12	12	12	14
Chain-wheel back-geared 1 to		24	40 $\frac{1}{2}$	44 $\frac{3}{4}$	3 $\frac{1}{2}$
Length of bed, feet,		24	25	24	24
Diameter of driving pulleys, inches,		26	30	36	
Face of driving pulleys,		6	6	11	
Weight complete, lbs.,		7,500	12,000	18,000	28,000
Price,		\$750	\$1,100	\$1,600	\$2,250

Draw Benches with Wood Beds,

FOR DRAWING ALL KINDS OF TUBING.

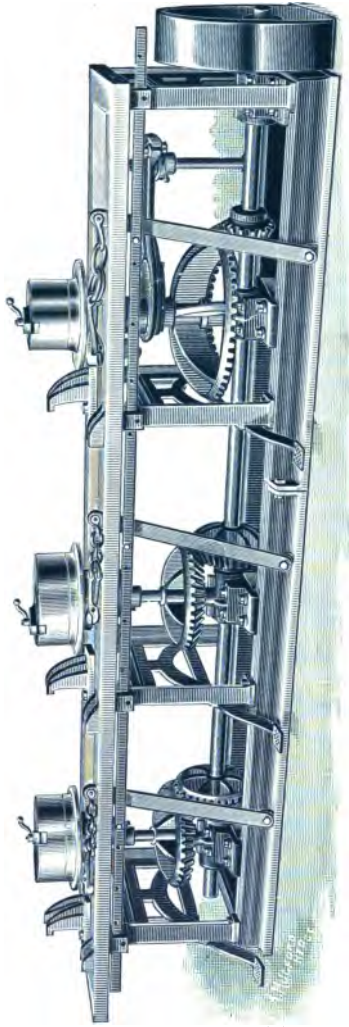
We build a variety of sizes of draw benches with wood beds, and will make to order any length of bench and arrange the gearing, etc., as desired. The following are regular sizes, but may be changed to suit the requirements of their work and location:

NUMBER OF BENCH,	1	2	3
Size of chain links, inches,	$1\frac{1}{2} \times \frac{5}{8}$	$3 \times \frac{1}{2}$	3×1
Diameter of pins in chain,	1	$1\frac{1}{8}$	$1\frac{5}{8}$
Number of teeth in chain-wheel,	10	12	12
Pitch of teeth in chain-wheel,	$3\frac{1}{2}$	$4\frac{5}{8}$	$4\frac{5}{8}$
Chain-wheel back geared 1 to	8	34	40
Diameter of driving pulleys,	26	30	30
Face of driving pulleys,	5	6	8
Section of each side of wood bed,	$4 \times 12\frac{1}{2}$	$13\frac{1}{2} \times 6\frac{1}{2}$	$13\frac{1}{2} \times 6\frac{1}{2}$
Price,			

Pointing Machine for Seamless Tubes.

For the pointing of seamless tube castings we build a powerful toggle-joint press, having a wide cross-head, fitted with a series of dies suitable for all sizes. The press has fly wheel on each side and can be run rapidly, and is always adjusted for any size of point.

We furnish muffles and furnaces for casting, for brazing, and for annealing; also tube moulds, pointing shears, slitting machines, etc.



Wire-Drawing Machine.

We build to order a variety of sizes of Wire-Drawing Benches suitable for drawing both heavy and fine wire. These benches are made with either long or short spindles, and with all iron, or partly iron and partly wood frames, as desired. The more recent patterns for iron-frame benches with short spindles are constructed so that the main shaft can be taken out at the front of the bench without disconnecting the framework. They are made with all sizes of blocks, from 10 inches to 26 inches in diameter. The long-spindle benches are made so that the main shaft can be removed below the mill floor, placing the care and repair of the running gear in the basement or cellar. This arrangement we advise for brass work where sizes are large, and the saving of floor space desirable. They are made with all iron frames, or with iron bottom and wood frame tops and with blocks and spindles for all sizes of wire.

Prices, plans and specifications furnished upon application.

Miscellaneous Wire Mill Machinery.

We have patterns for the following special machinery, and will furnish our customers with more detailed specifications when requested.

Wire-Thrashing Barrel.

These barrels are about 22 inches in diameter and about 52 inches long, inside, and are mounted upon iron framework with driving gear, complete; or we furnish barrel and core only, for mounting upon wood frames.

Price of barrel and framework complete, \$325.00.

“ “ “ with iron core only, 200.00.

Wire Rod-Pointing Shear.

We build for this purpose a small alligator shear mounted upon solid base, with gearing, complete, making a neat tool that can be located and driven in any convenient place. They are designed for pointing ends of brass and German silver rods after slitting.

Wire Bar-Slitting Machines.

We build wire bar-slitting machines capable of slitting brass or German silver sheets up to $\frac{3}{4}$ inch in thickness, and furnish cutters and collars for same of all thicknesses. These machines are often driven from end of rolling mill train but can be fitted with back-gearing and friction clutch pulley.

Rod-Straightening Machine.

We make special machines for straightening wire rods as large as $\frac{3}{4}$ inch in diameter, which are provided with automatic feeding devices.

Rod-Drawing Machines.

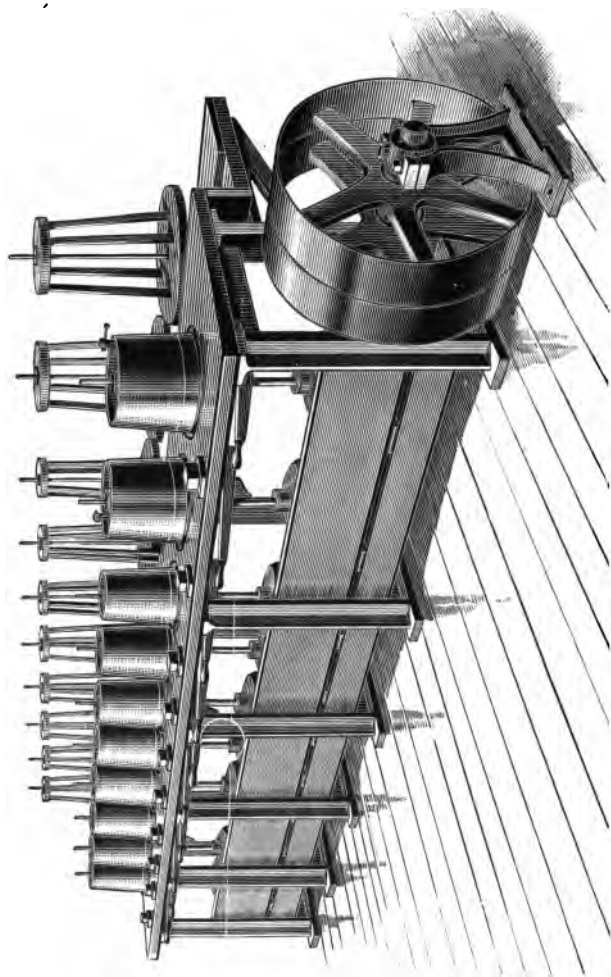
For drawing upon blocks similar to wire, large sizes of wire and rods.

Wire-Pointing and Reducing Machine.

This machine is built exclusively by us for Mr. S. W. Goodyear, whose experience of twenty-five years in building and operating pointing machines for reducing by cold compression insures to purchasers the best there is in this line.

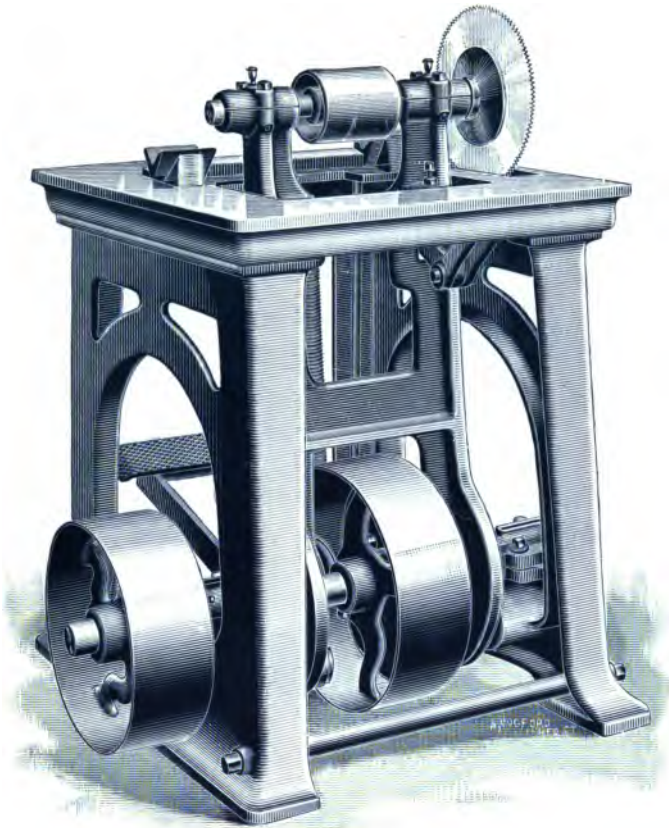
There are three regular sizes of the machine, adapted to pointing wire rods and wire for drawing, as also to a great variety of pointing and reducing in manufacturing processes. These three machines cover a range of sizes from $\frac{3}{8}$ inch in diameter, down to the smallest sizes, and in addition to these, two larger machines are furnished which reduce successfully the softer metals and alloys, copper, brass, gold, silver, etc., from $1\frac{1}{4}$ inches in diameter, and 2 inches in diameter, respectively. The shafts are steel and all working parts of machines are of best tool steel, hardened, and workmanship guaranteed to be the best possible.

Weight of machines from about 1,000 lbs. in the smallest to 3,800 lbs. in the largest.



Fine Wire Drawing Bench.

Benches of this class, without drawing *z*-in motion, are made with either wood or iron frames, and with any desired number of blocks. The illustration shows a ten-block bench with iron framework and wood top. The blocks are 8 inches in diameter, 10 inches high, and 18 inches apart between centers. The spindles are of steel, 1 inch in diameter, and the driving shaft 2 inches in diameter. Similar benches with 6-inch or 10-inch blocks are made to order.



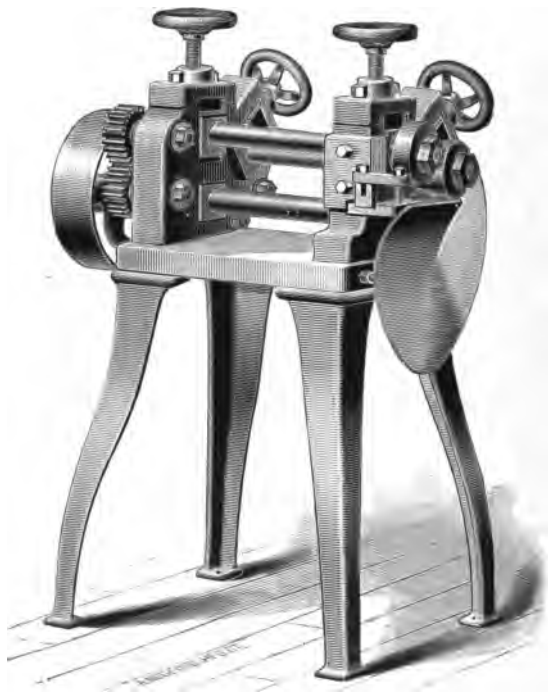
Cut-Off Saw for Brass Rods, Etc.

This machine will cut solid rods up to 2 inches in diameter, or will cut brass tubing up to 3 inches in diameter. The holder is V shaped so as to accommodate different sizes.

The framework is stationary, and supports a swinging saw-carrier, pivoted near the floor, which is controlled by the treadle through powerful toggles, forcing the saw against the work. The saw is 12 inches in diameter, and should run about 1,200 revolutions per minute.

Floor space required is $2\frac{1}{2}$ x 3 feet, and it is intended to have a wooden table either side of the saw, suited to the kind of work to be operated upon.

Price, \$200.00.

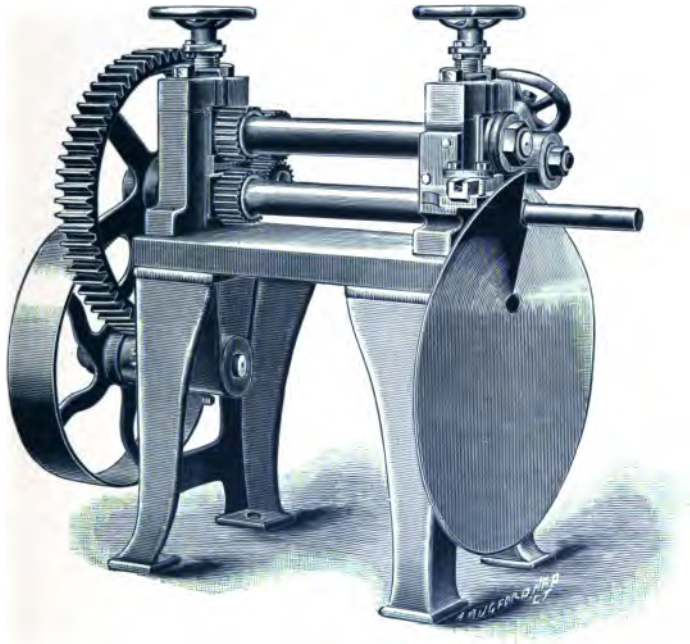


Small Wire Rod-Coiling Machine.

Designed for coiling slit wire rods, for brass wire, etc. The machine is fitted with steel shafts, hardened steel rolls and guides, cut steel pinions, and will coil rods $\frac{1}{2}$ inch square. The rolls are $4\frac{1}{2}$ inches in diameter; drawing pulley, 20 inches in diameter and $4\frac{1}{2}$ inches face, and should run 120 revolutions per minute.

Weight complete, 800 lbs.

Price, \$250.00.



Wire Rod-Coiling and Cornering Machine.

This machine is similar to the one illustrated on preceding page, but made with much heavier parts, and designed for rolling down the corners of slit rods, as well as for coiling. It is made with heavy steel shafts, cut steel pinions, and has grooved steel rolls $5\frac{1}{8}$ inches in diameter, and is capable of cornering and coiling slit rods as large as $\frac{5}{8} \times \frac{1}{8}$ inch, suitable for entering wire-drawing dies. The machine is back-gearred five to one, and driven by pulley 24 inches in diameter and $5\frac{1}{2}$ inches face.

Weight complete, 1,500 lbs.

Price, \$400.00.

Rolling Mills.

We furnish plans and specifications for the entire outfits of machinery used in rolling and finishing sheet brass, copper, silver, etc., and with the advantage of being located in the midst of the Brass Industry, where we can see the needs and can practically demonstrate all improvements, we can guarantee the very best construction in this class of machinery.

Our patterns for this work are of recent design, and the mills fully equal to the demands of latest practice, both in point of strength and wearing qualities. The housings are extra heavy, and so arranged on slotted bed plates that they can be readily adjusted to take rolls of different lengths. The adjusting screws and brasses are extra large, and well calculated to sustain the pressure to which they are subjected when reducing metal rapidly. The pinions we furnish with our mills are all of the very best material and have teeth of the double-spiral form, which are made very perfect by the use of specially designed machinery for producing the patterns.

We furnish working drawings for all foundations.

In the illustration of the 18-inch Mill is shown one arrangement of gearing, bed plates, etc., suitable for driving, but this is, of course, subject to many modifications to meet varying conditions.

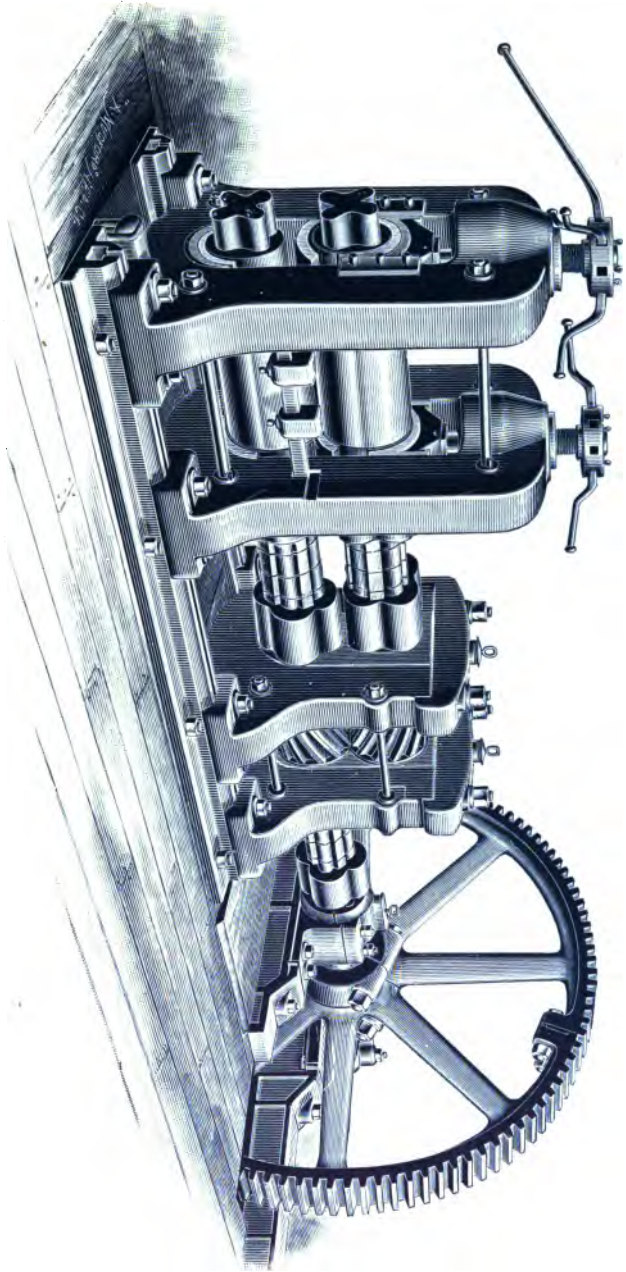
We will be pleased to furnish estimates for single mills or entire plants, and will give customers the benefit of our experience in suitably arranging a mill, according to requirements. We are well prepared to furnish all kinds of heavy power transmitting machinery, gearing, shafting, etc., required in mill practices.

On page 180 we show a 12-inch mill arranged to be driven by belt; they are frequently driven by gearing direct from shaft below the floor.

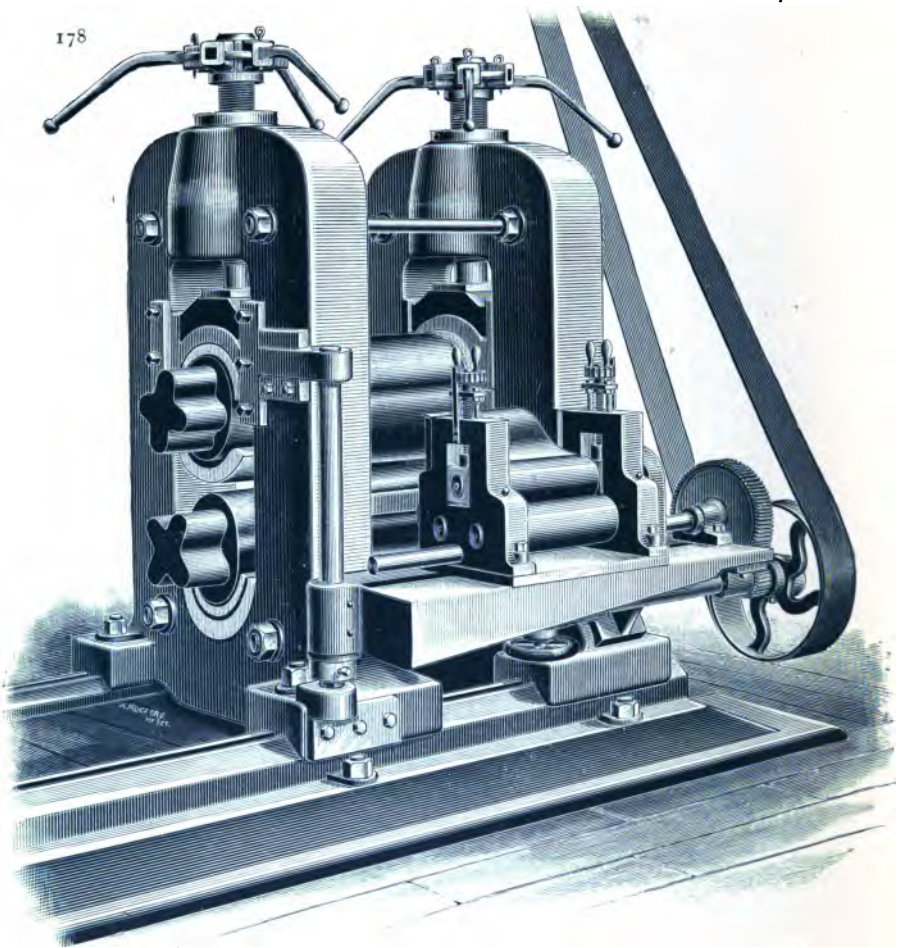
Mills suitable for copper rolling are arranged with top gearing connecting the screws on top of housings, and a single large hand wheel on horizontal shaft regulates the space between rolls. Special feeding and delivery tables must also be used for conveniently handling the heated slabs or packs of copper.

In the list of weights each mill is supposed to comprise all the iron work except rolls, viz.: Roll frames, pinion frames and pinions, bed plates, anchor plates and bolts, counter-weights and levers, spindles, couplings, wrenches, and suitable guides.

Weight of 12-inch mill, 16,500 lbs.	Weight of 18-inch mill, 50,000 lbs.
“ “ 14 “ “ 25,000 “	“ “ 20 “ “ 55,000 “
“ “ 16 “ “ 33,000 “	“ “ 24 “ “ 65,000 “

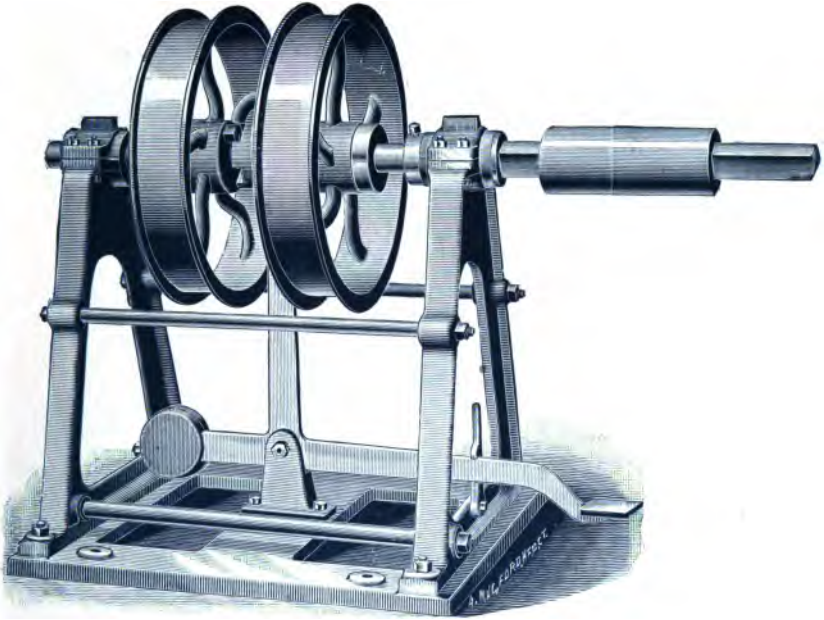


18 x 36 Inches Rolling Mill.



Patent Coiling Attachment for Rolls or Slitters.

The object of this attachment is to put the metal in shape to handle with more economy, and with better results than is possible in the customary manner. The special benefits obtained are as follows: A more uniform temper of the metal as it comes from the muffle; four times the quantity can be annealed in hoop than in long lengths; twenty times as much can be moved from the rolls to the muffles, and *vice versa*; also, this device acts as a guide and holds the metal firmly as it comes from the rolls, which bring the metal out straighter than is possible by the ordinary method, where it is taken out straight by hand. The economy in floor space is one of the important features of this method, all metal being coiled after leaving the breaking-down rolls. The machine is adapted to coil all metal one-quarter inch thick to No. 18 B. & S. gauge, and as wide as the rolls will admit.



Winders.

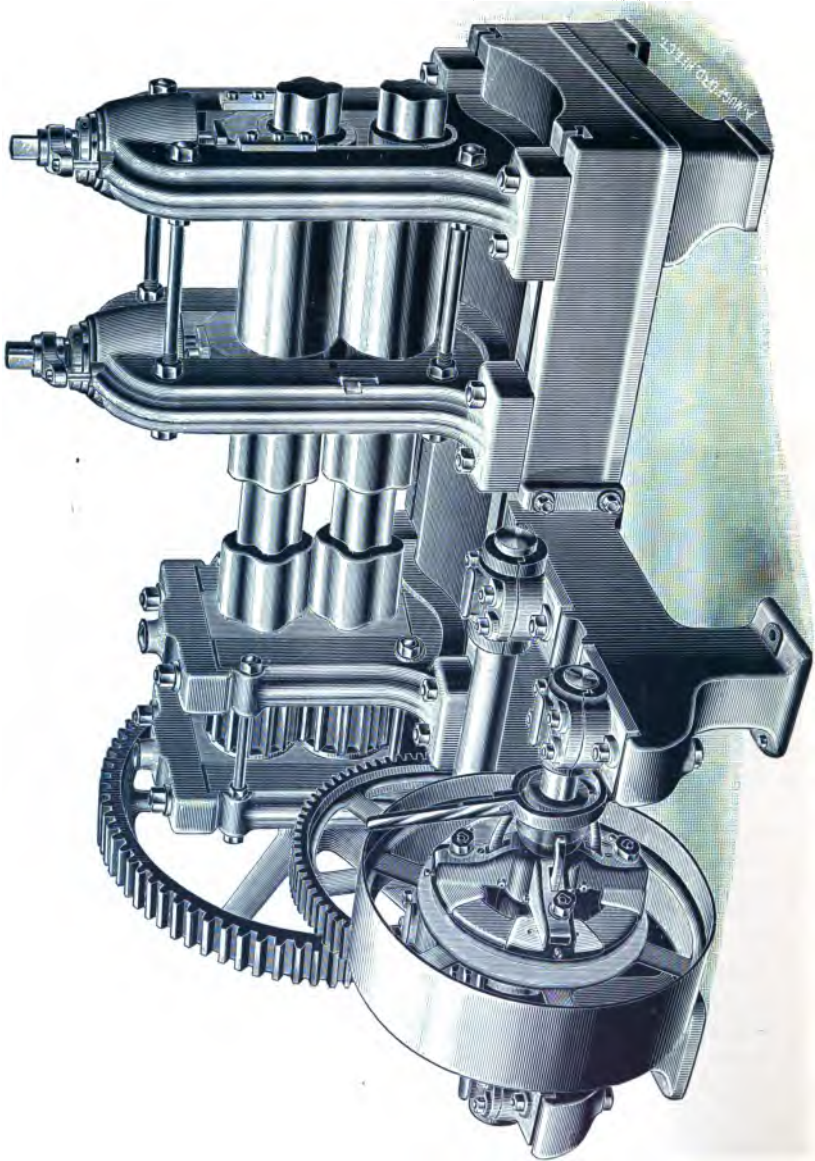
For the purpose of winding thin sheet metal as it is delivered from the rolls of 16 or 18-inch mills, we recommend the winder shown above. The revolving arbor carries two flanged pulleys, each $24 \times 4\frac{1}{2}$ inches, which are driven in opposite directions by a belt from overhead countershaft. By the use of clutch treadle the arbor may be revolved in either direction or stopped at will. Variations of speed are met by "slip" of belt, and reversing the direction of spool tends to loosen the coil and permit its easy removal. Spool shown is of iron, $5\frac{1}{2}$ inches in diameter and 14 inches long. The center of arbor is situated 34 inches above base.

Price includes necessary flanged pulleys not shown in illustration.

Price, \$175.00.

We make a smaller size of the above, suitable for 12-inch mills, and smaller. The pulleys are $14 \times 4\frac{1}{4}$ inches. Distance from floor to center of arbor, 28 inches.

Price, \$125.00.



12 X 20 Inches Rolling Mill.

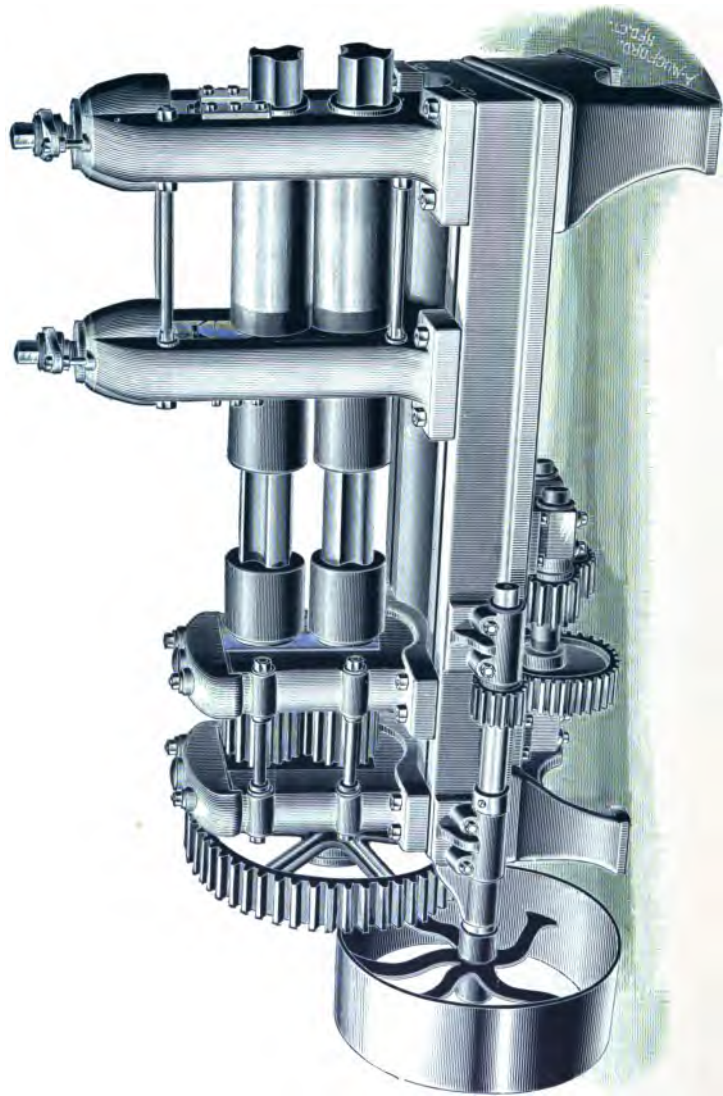
12 X 20-Inch Rolling Mill.

The illustration represents a portable rolling mill, with rolls 12 inches in diameter and 20 inches face, designed for rolling sheets of brass, silver, Britannia metal, etc. It has an extra heavy bed plate with all gearing attached, and can be placed upon floor without special foundation. The mill is geared 30 to 1, and driven by a friction clutch pulley 38 inches in diameter and 12 inches face, and is provided with the necessary guides, wrenches, etc.

Floor space required, 10 feet square.

Weight complete, 22,000 lbs.

Price, including one pair of chilled rolls, \$1,800.00.



10 x 16 Inches Rolling Mill.

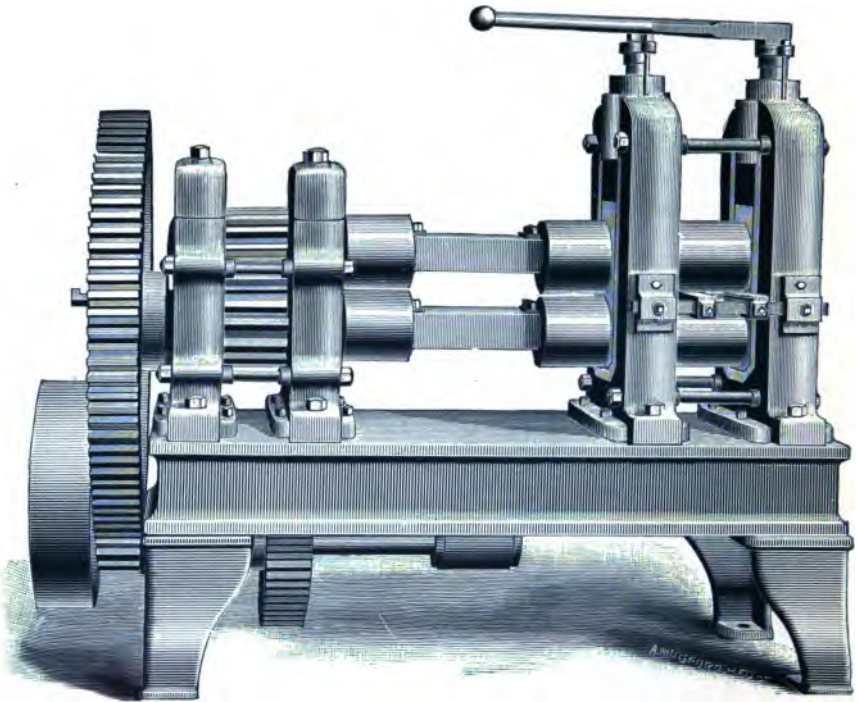
Ten-Inch Rolling Mill.

The illustration on the opposite page represents an extra heavy mill, designed to receive rolls 10 inches in diameter and from 12 to 16 inches face. The pinions are made of steel, and all the gearing is cut, and attached directly to the main bed plate, rendering special foundation unnecessary. The mill is strongly back-gearred, requiring 30 revolutions of the driving pulley to one of the rolls. The driving pulley is 34 inches in diameter and 10 inches face. Floor space required, 5 x 9 feet. We usually arrange the driving shaft for a friction clutch pulley, readily operated by the roller.

Weight of mill complete, 15,000 lbs.

(With chilled iron rolls, and friction clutch pulley.)

Price, complete as above with Guides and Wrenches, \$1,500.00.



Eight-Inch Double-Geared Rolling Mill.

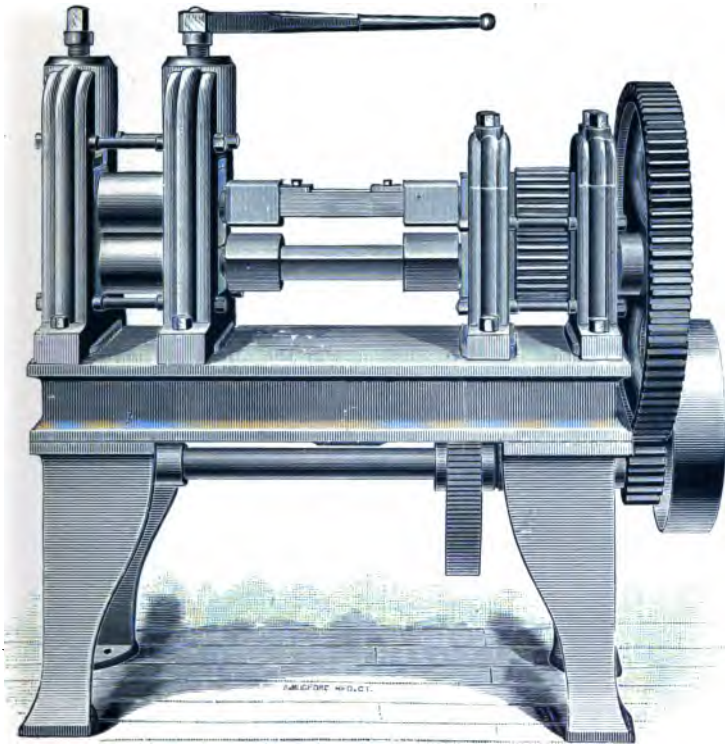
This mill is designed for rolls 8 inches in diameter and 10 inches face. It is built with cut gearing, steel pinions and steel shafts. The extreme length is 7 feet and 4 inches, and the length of bed 6 feet and 2 inches. It is back-gearred 30 to 1, and driven by pulley 28 inches in diameter and 6½ inches face.

Weight, 8,500 lbs.

Price without rolls, \$1,050.00.

Price with chilled iron rolls, \$1,200.00.

Mills for cross-rolling are made of various sizes, one roll-housing having an enlarged opening so the operator may work on end of roll by passing the work through the opening in the housing.



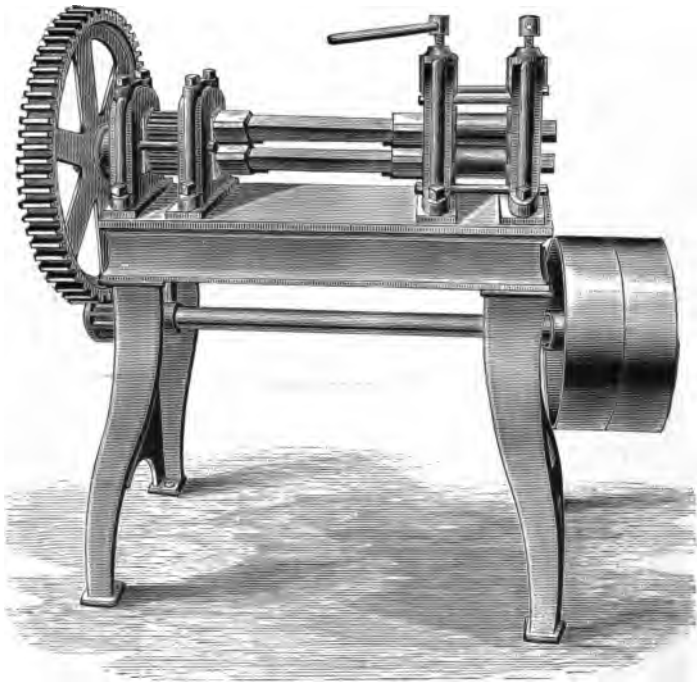
Five-Inch Double-Gear Rolling Mill.

For rolls 5 inches in diameter and 8 inches face. It is strongly built, and has cut gearing, steel pinions and steel shafts. The extreme length is 58 inches; length of bed, 48 inches; geared 25 to 1, and driven by pulley 20 inches in diameter and $4\frac{1}{2}$ inches face.

Weight, 3,500 lbs.

Price with one set steel rolls, \$750.00.

Price without rolls, \$550.00.



Jewelers' Rolls.

The illustration represents a small rolling mill with steel rolls $2\frac{1}{2}$ inches in diameter and 4 inches face. It has cut gearing with steel pinions and shafts. The length of bed is 34 inches. The gearing is 5 to 1. Driving pulley 20 inches in diameter and $3\frac{1}{2}$ inches face.

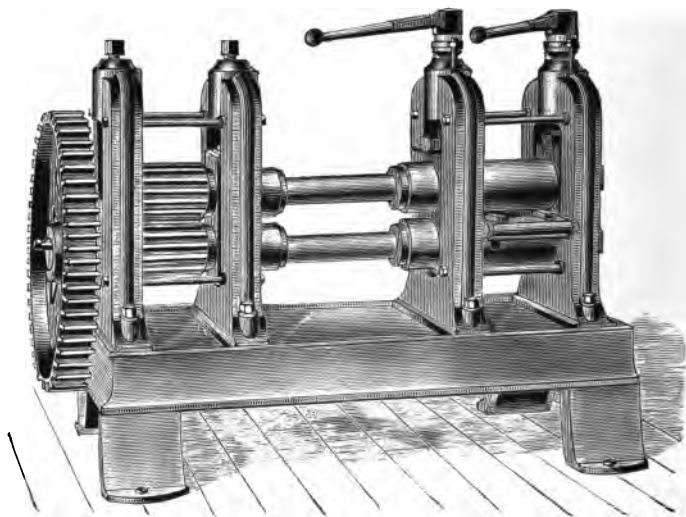
Weight, 950 lbs. Price with rolls, \$275.00. Price without rolls, \$200.00.



Small Jewelers' Rolls.

This machine has steel rolls $2\frac{1}{2}$ inches in diameter and $3\frac{1}{2}$ inches face. It is back-gear'd 4 to 1 and driven by pulley 16 inches in diameter and $3\frac{1}{4}$ inches face.

Weight, 300 lbs. Price, with steel rolls, \$120.00.

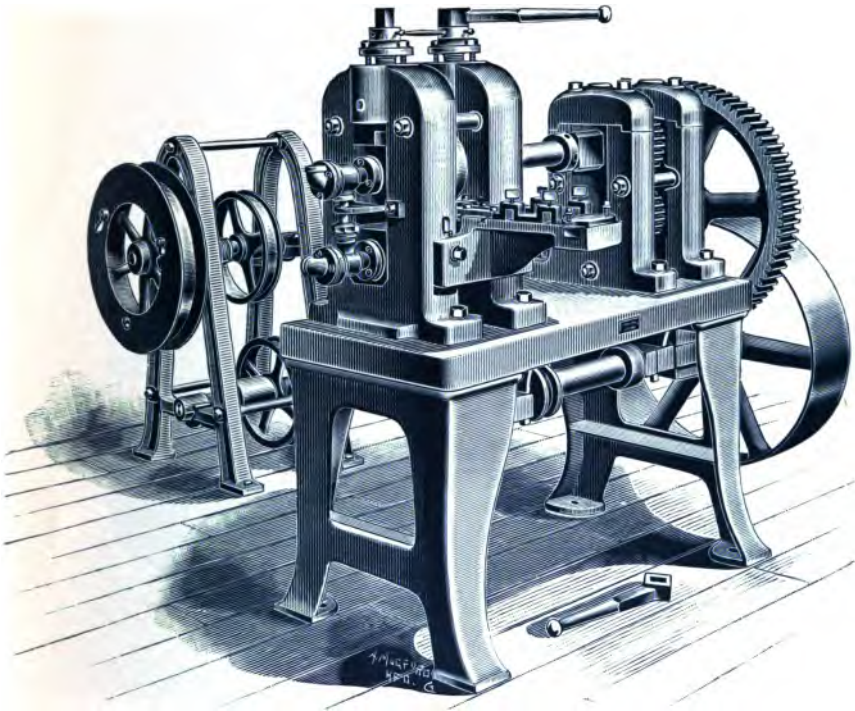


Tin-Foil Rolling Mill.

Designed for rolling tin-foil, Britannia metal, etc., where a number of mills may be driven from a continuous shaft with pinions and clutches. It is calculated for chilled iron rolls 7 inches in diameter and 12 inches face.

Weight, 7,500 lbs.

Price without rolls, \$875.00.

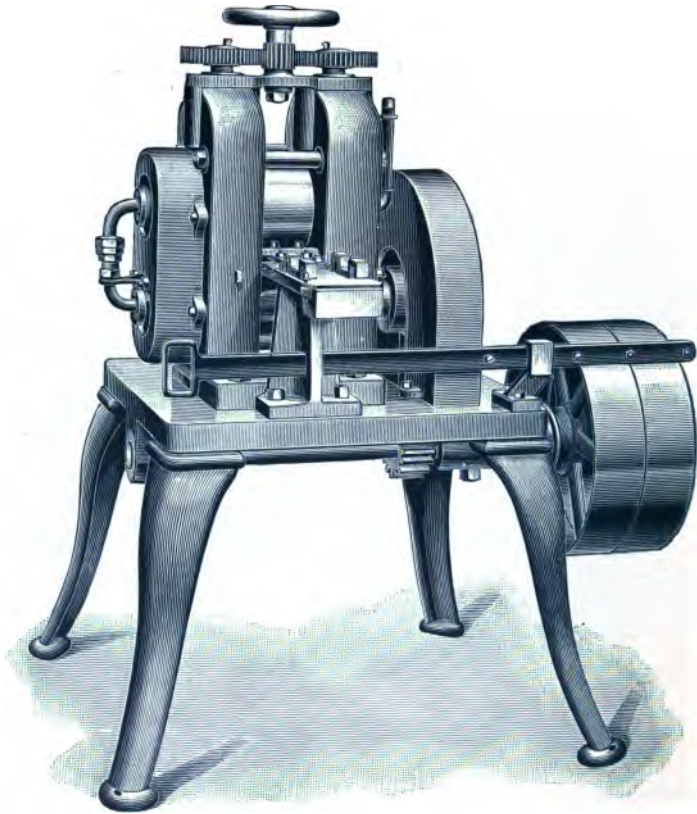


Wire-Flattening Water Rolls.

To supply the demand for more powerful machines for wire-flattening than those usually made, we make the small rolling mill shown above, retaining by special construction the feature of circulating water through both rolls. The water enters and leaves at the same end instead of passing in one end and out at the other as is usual, but not applicable to this form of mill. We furnish with the machine all necessary guides, and either single or double reels as shown, in connection with the smaller rolls. As illustrated the pressure screws are operated independently, but we join them by gearing, and operate both at once by hand wheel if so desired. The rolls are formed by forcing a steel shell 8 inches in diameter and $4\frac{1}{2}$ inches face, on to a 5-inch steel shaft, which construction admits of easy renewal. The driving pulley is 30 inches in diameter and $8\frac{1}{2}$ inches face, and should run 250 revolutions per minute. Floor space, $2\frac{1}{2} \times 5$ feet.

Weight complete, 3,720 lbs.

Price with hardened steel rolls, \$850.00.



Wire-Flattening Rolls.

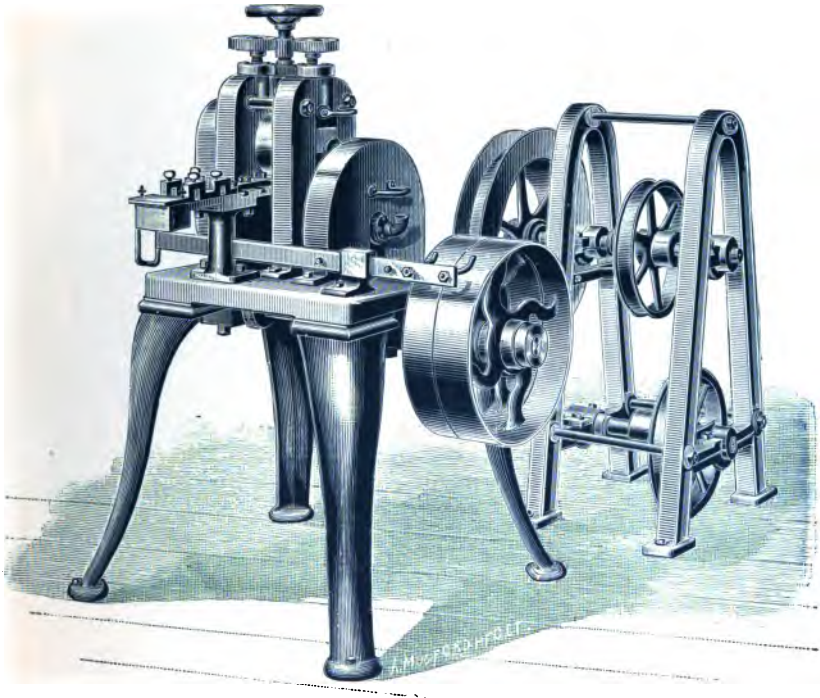
This machine has rolls 8 inches in diameter and $4\frac{1}{2}$ inches face, with necks or journals $3\frac{1}{2}$ inches in diameter and $4\frac{1}{2}$ inches long; it is back-gearred 4 to 1, and has driving pulleys 20 inches in diameter and $4\frac{1}{2}$ inches face. It has water circulation and automatic winding attachment, with one or two reels, as desired. Price includes one set of hardened steel rolls.

Weight complete, 2,600 lbs.

Price, \$725.00.

Weight without winder, 2,000 lbs.

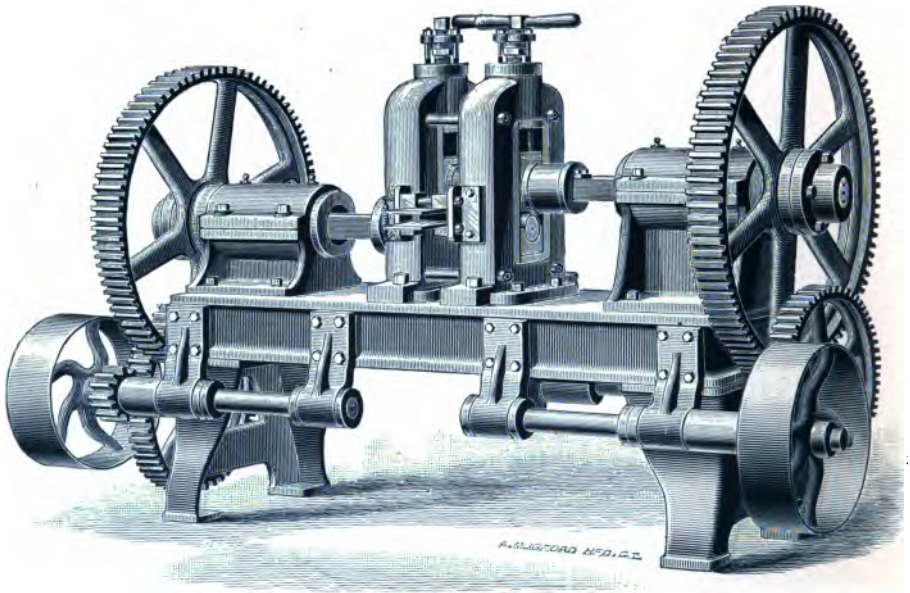
“ 650.00.



Wire-Flattening Rolls.

For rolling steel springs or flat wire of any kind. It has water circulation and automatic winding attachment. The rolls are steel, 6 inches in diameter and $2\frac{1}{4}$ inches face. It is geared 3 to 1, and driven by pulley 16 inches in diameter and $3\frac{1}{2}$ inches face. We also make winding attachments for double reels.

Weight, 1,400 lbs. Price with winder and one set of rolls, \$425.00.
Price without winder, \$375.00.

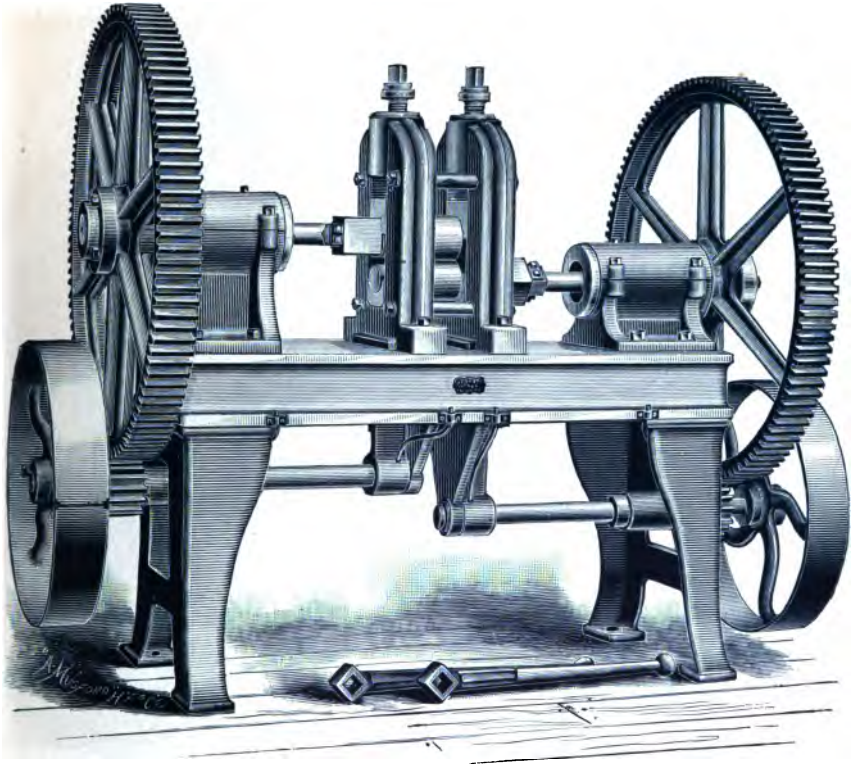


Double-Geared Grading Mill.

Designed for rolling or grading spoon, fork or ladle blanks. It is made with cut gearing, steel pinions and shafts, and is the strongest mill built for this class of work. It is calculated to receive rolls 5 inches in diameter and 5 inches face. The length over all is 9 feet. It is geared $27\frac{1}{2}$ to 1, and driven by pulleys 20 inches in diameter and 6 inches face.

Weight, 7,500 lbs.

Price without rolls, \$900.00.



Spoon-Blank Grading Mill.

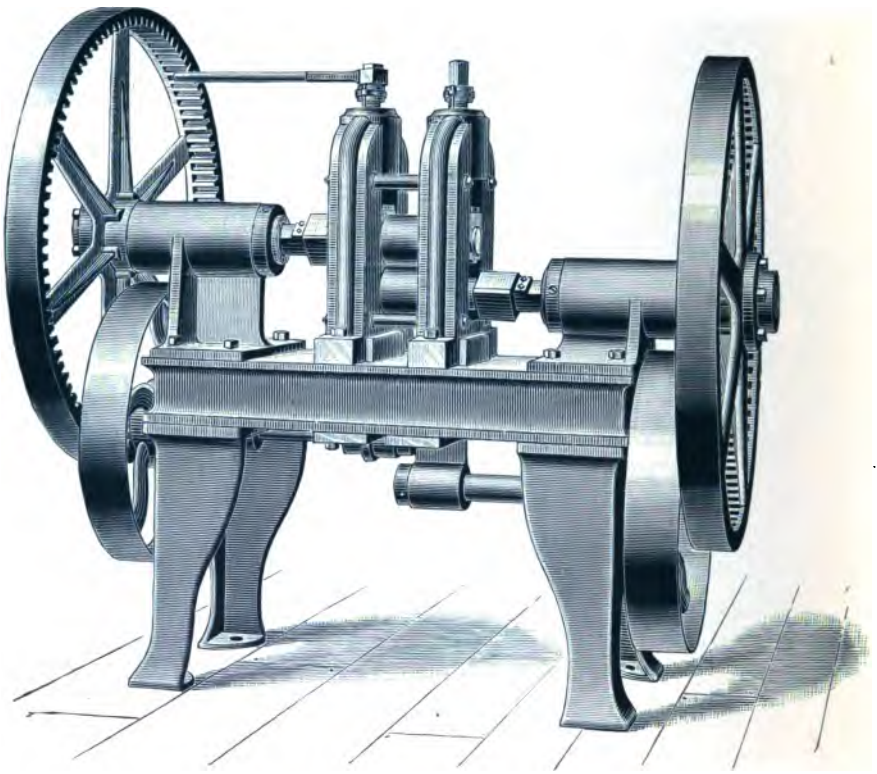
This Mill is designed for grading spoon and fork blanks of the smaller sizes, and is especially adapted for work in sterling silver. The housings are extra heavy, being made to receive rolls $4\frac{1}{2}$ inches in diameter and 5 inches face. The gearing is in ratio of eight to one, with cut gears and steel pinions. The driving pulleys are 28 inches in diameter and $5\frac{1}{4}$ inches face.

Weight, 4,200 lbs. Price without rolls, \$600.00.

Price with hardened steel rolls, \$800.00.

We also make the above mill double-gearred, to be driven by pulleys 24 inches in diameter and $6\frac{1}{4}$ inches face. The ratio of gearing is then about $13\frac{3}{4}$ to 1.

Price without rolls, \$750.00.

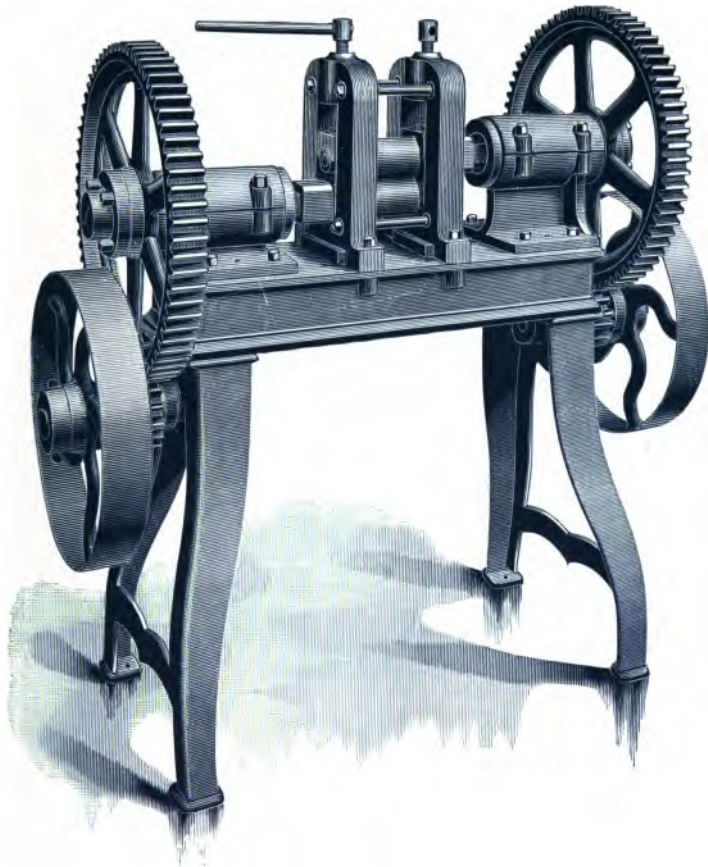


Spoon-Blank Mill.

Designed for rolling or grading spoon or fork blanks. Each roll is driven by independent gearing to allow for the necessary variation of speed on the faces of the rolls. The mill is calculated for rolls 5 inches in diameter and 5 inches face. The length over all is 74 inches. It is geared $7\frac{3}{4}$ to 1, and driven by pulleys 28 inches in diameter and 5 inches face.

Weight, \$3,800 lbs.

Price without rolls, \$575.00.



Small Rolling Mill.

Each roll is driven by gearing and belt independently. It is useful for rolling borders or ornamental designs upon Britannia metal, or for any work where one smooth and one irregular roll is used. The rolls can be $2\frac{1}{8}$ inches in diameter and 5 inches face. The length over all is 48 inches. It is geared 6 to 1, and driven by pulleys 20 inches in diameter and 5 inches face.

Weight, 1,000 lbs.

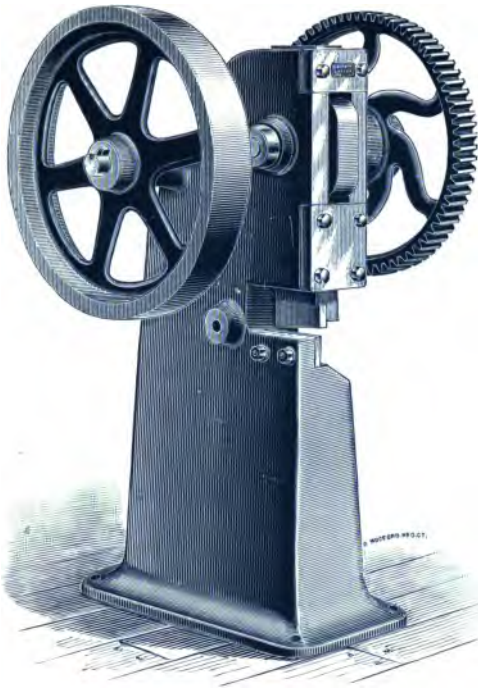
Price without rolls, \$200.00.



Hand Shears.

The illustration shows Hand Shears mounted upon a base with truck wheels so as to be easily moved about the floor. These shears are made in two sizes, with or without the base, as follows:

No.	Length Of Knives.	Length Of Lever.	Weight With Base.	Price With Base.	Price Without Base.
1	13 inches.	48 inches.	600 lbs.	\$90.00	\$80.00
2	16 "	56 "	650 "	100.00	90.00



Geared Shearing Press.

Designed for cutting up brass and German silver scrap, cutting off pieces from narrow sheets of silver, etc. The blades are six inches long; stroke $1\frac{1}{2}$ inches. The press is geared 5 to 1, and has fly wheel 30 inches in diameter and $4\frac{1}{4}$ inches face. Distance from cutter to floor, $28\frac{1}{2}$ inches. Total height, 5 feet.

Weight, complete, 1,600 lbs.

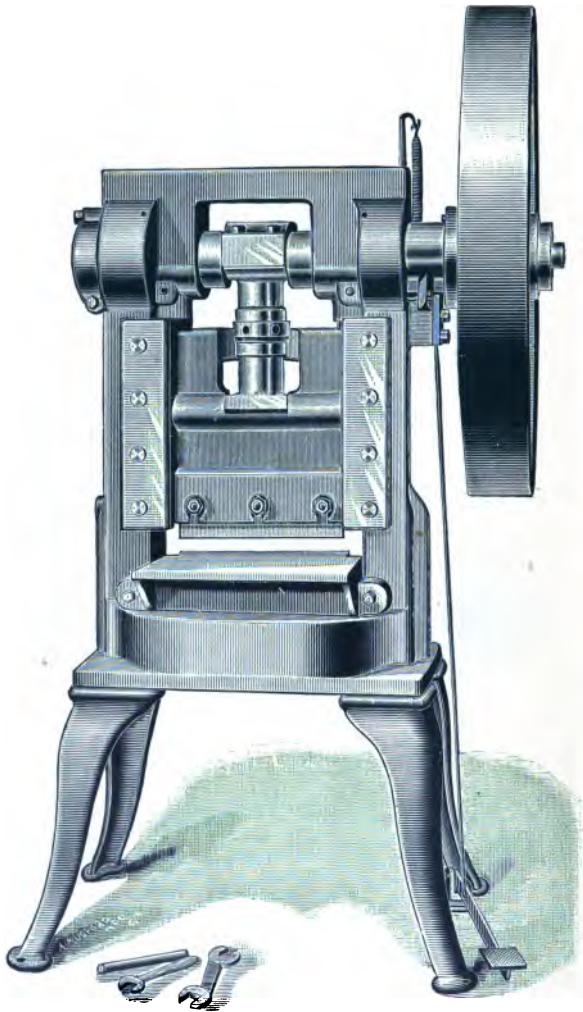
Price, \$275.00.

Small Alligator Shears.

For pointing wire bars, or scrap-cutting, we make a small, powerful shear on the lever principle. It is of columnar design, like the above, the gap or throat being 34 inches from the floor. Blades are $6\frac{1}{4}$ inches long. Crank shaft is placed at back near the floor, and the pitman is vertical. It is geared 4 to 1, and has 24-inch balance wheel. Size of base, 24 x 28 inches. Total height, 44 inches.

Weight, 2,500 lbs.

Price, \$400.00.

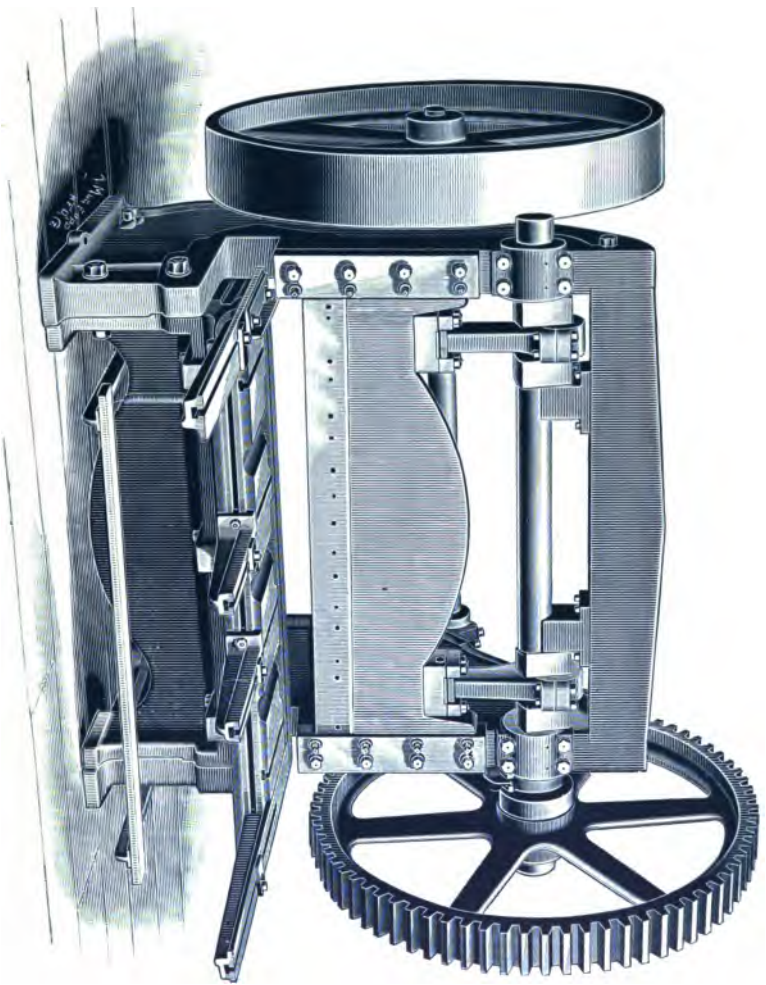


Shearing Press.

The cut represents a No. 3½ Pillar Press, fitted with square guides and shear blades, designed for cutting off sheet metal, etc. The spread between uprights is 20 inches; length of shear blades, 16 inches; fly wheel, 42 inches in diameter and 5¼ inches face, and weighs 550 lbs.; stroke of crank, 1½ inches.

Weight complete, 3,400 lbs.

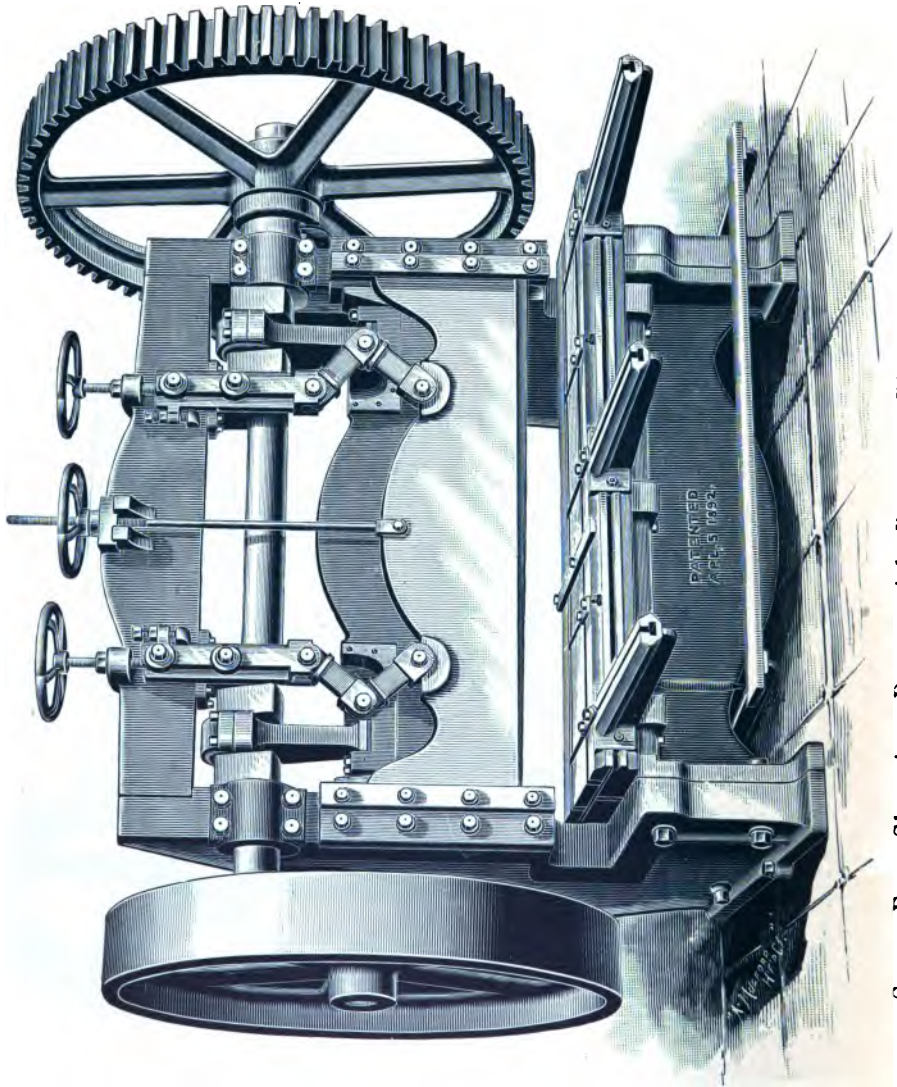
Price, \$475.00.



Extra Heavy Shearing Press.

Weight, 18,500 lbs.

Price, with one pair of 6-foot steel blades, \$1,750.00.



Seven-Foot Shearing Press, with Pressure Plate, Geared 12 to 75.

Seven-Foot Shearing Press.

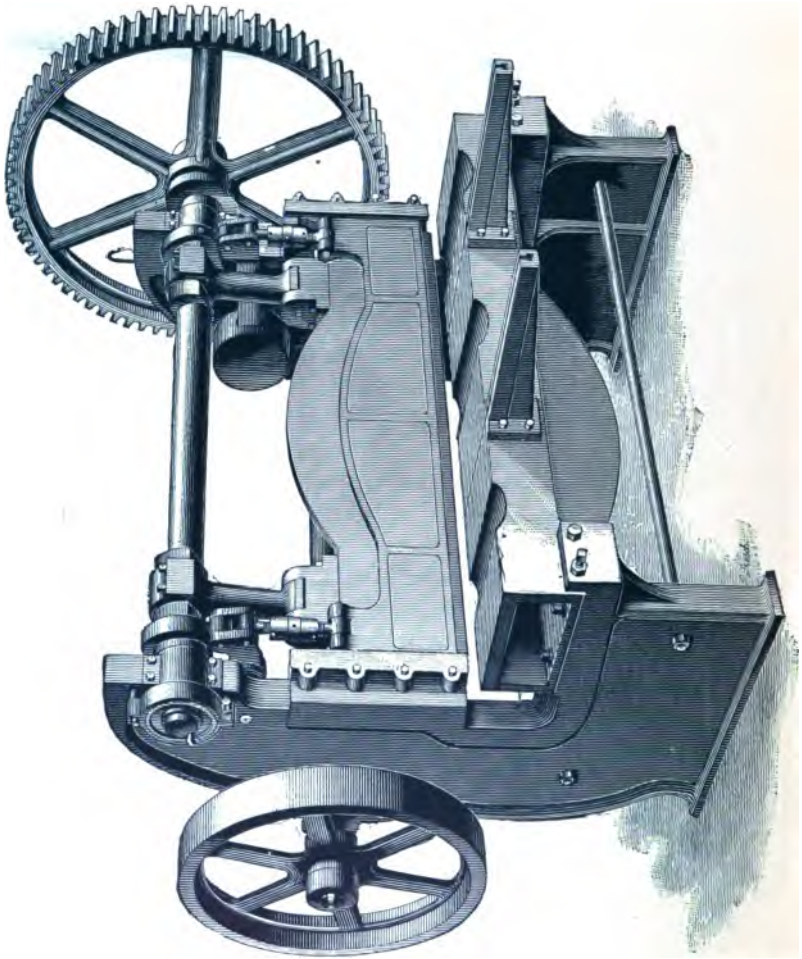
For shearing brass and copper up to $\frac{1}{2}$ inch in thickness we make the heavy shear illustrated on the two preceding pages, for either 6 or 7-foot blades. The crank shaft is of forged steel $5\frac{1}{2}$ inches in diameter, and the stroke of gate is 6 inches. Depth of throat, 12 inches. All necessary adjustments are provided to keep the blades in exact relation. A powerful clutch actuated by treadle is used to couple the crank shaft with main gear. All necessary gauges and gauge extensions are furnished, and the bed has T slots in both directions to facilitate adjustments.

An improved pressure plate is shown in the illustration opposite, which is actuated directly from the gate by cams attached to its face. These cams control the central joint of the toggle connections, by which the pressure plate is suspended from the arch above, so that when the main gate descends the toggle is compelled to straighten and force the pressure plate down in advance of the blade, and automatically clamp the metal to be sheared. The outer hand wheels shown on top of the arch are for adjusting pressure plate to suit thickness of metal. The central hand wheel is used to disengage the toggles from the cams, when pressure plate is not needed.

Total Weight, 22,000 lbs.

Price, including one pair of seven-foot blades, \$2,000.00.

Price without pressure plate, \$1,900.00.



Six-Foot Shearing Press.

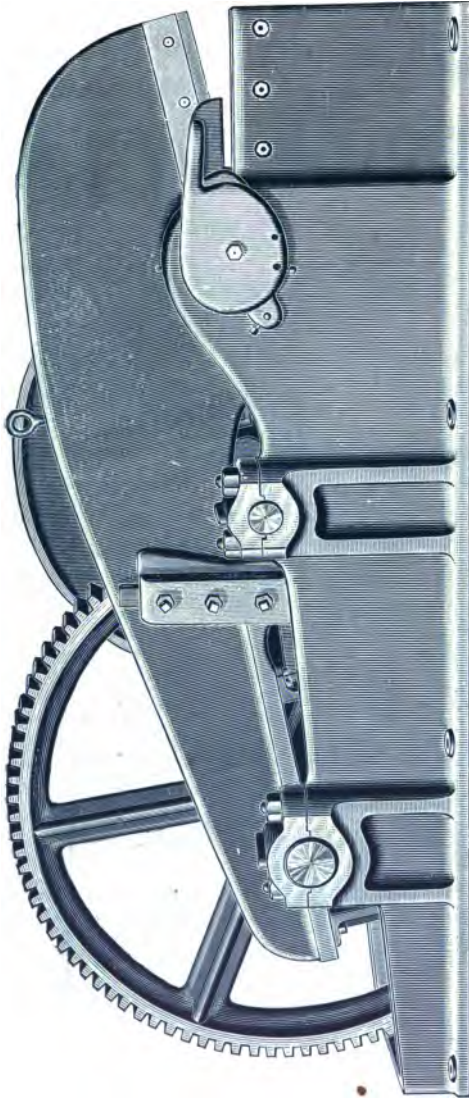
Six-Foot Shearing Press.

The illustration represents shearing press with blades 6 feet long, designed for shearing sheets of iron, copper or brass. The pattern is made overhanging, so that sheets longer than the blades may be cut by moving them along. The distance from the shear blade to the uprights is $4\frac{1}{2}$ inches. The frame and cutter-bed are made extra heavy, and ribbed to prevent springing, and arranged so that the blades can be easily adjusted in either direction. A pressure foot operated directly from the shaft holds the metal firmly while it is being cut. Stroke of shear blade is 3 inches. Stroke of pressure foot, $1\frac{1}{2}$ inches. The press is geared 5 to 1, and driven by a fly wheel 38 inches in diameter and 6 inches face.

Total Weight, 9,500 lbs.

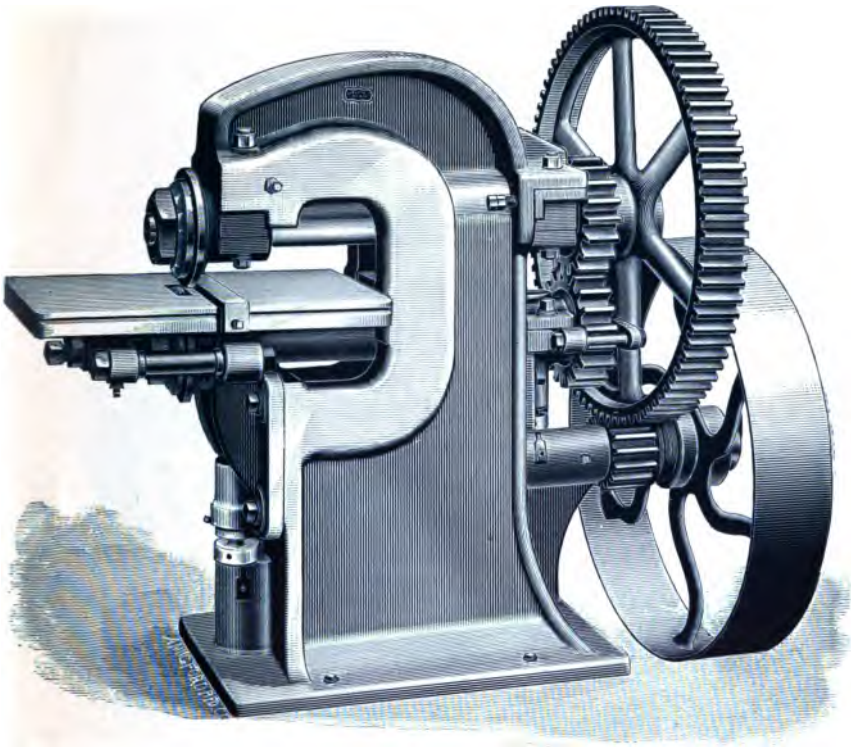
Price, including pressure plate and one set of shear blades, \$1,200.

Price without pressure plate, \$1,000.00.



Alligator Shears.

	NUMBER,	1	2
Length of blade,		12	18
Driving pulley,	Inches,	42 x 8½	42 x 8½
Diameter of fly wheel,		60	64
Weight of fly wheel,	lbs.,	1,900	2,400
Weight complete,		15,000	20,500
Gearing,		5½ to 1	7 to 1
Floor space,		4 feet x 10½ feet.	5 feet x 12 feet.
Price,		\$900.00	\$1,200

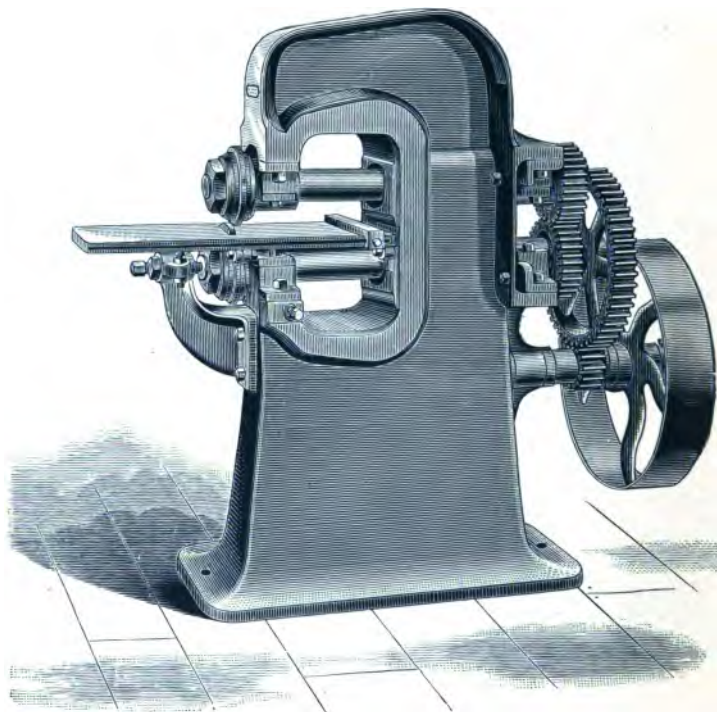


No. 3 Slitting Machine.

This machine has been designed with special reference to the requirements of heavy work, and will slit through the center of a 36-inch plate $\frac{3}{8}$ inch thick. The cutters are 11 inches in diameter. All necessary adjustments are provided to overcome the difficulties attendant upon the wearing and the reduced diameter of the cutters. This machine is back-gearred 6 to 1, and is driven by pulley 42 inches in diameter and 8 inches face. The base of the machine measures 24 x 40 inches. The extreme space required from front to back is about $6\frac{1}{2}$ feet, and extreme height is 5 feet.

Weight, 4,500 lbs.

Price, \$550.00.



No. 2 Slitting Machine.

This machine has cutters $7\frac{1}{4}$ inches in diameter. It will slit in middle of sheets 24 inches wide, No. 10 gauge. It is back-gear'd 4 to 1, and driven by pulley 30 inches in diameter and 5 inches face.

Weight, \$1,800 lbs.

Price, \$250.00.

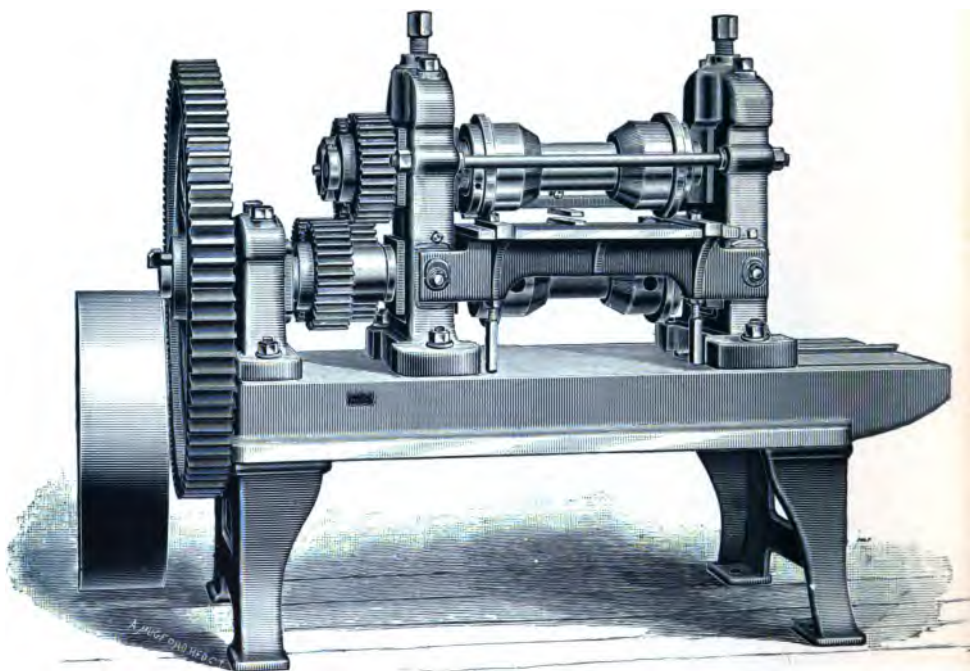


No. 1 Slitting Machine.

Will slit sheet metal, either iron or brass, No. 16 gauge, into strips from $\frac{1}{2}$ inch to 12 inches wide. The cutters are 5 inches in diameter; the driving pulley 30 inches in diameter and 5 inches face.

Weight, 475 lbs. Price, with pulley as in above cut, \$100.00.

Price with tight and loose pulleys, \$110.00.

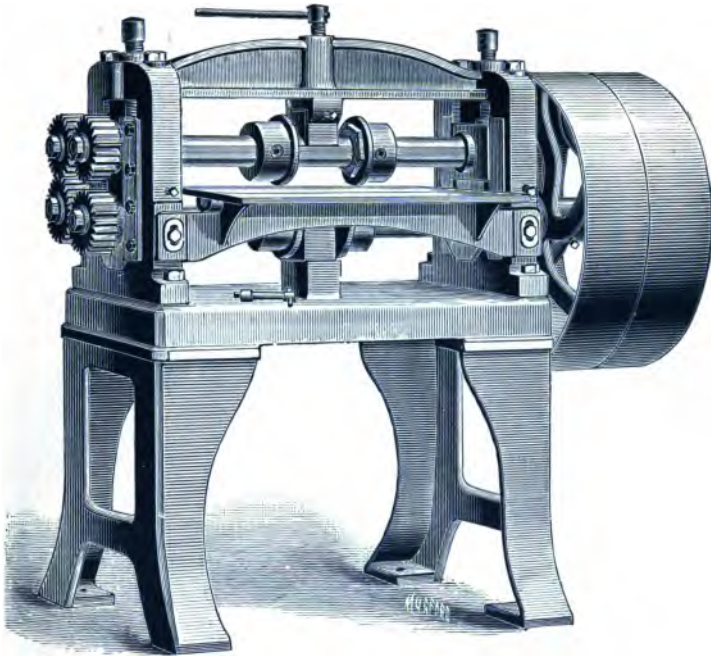


Large Trimming and Slitting Machine.

This machine is designed for trimming heavy sheet metal to exact width; also for slitting into strips with gang cutters. The distance between the housings may be made to take metal of any required width, and the spindles are fitted with easily adjustable cutter-heads, or for cutters and collars, as desired. The cut represents the machine fitted with adjustable cutter-head for trimming metal 18 inches wide. The cutters are 10 inches in diameter, and will cut metal $\frac{3}{8}$ inch thick. This machine is back-gearred $7\frac{1}{2}$ to 1 and is driven with a pulley 30 inches in diameter and $8\frac{1}{2}$ inches face, which may run 200 revolutions per minute. The machine occupies a floor space of $6\frac{1}{2}$ x 3 feet.

Weight, 4,900 lbs.

Price, \$800.00.

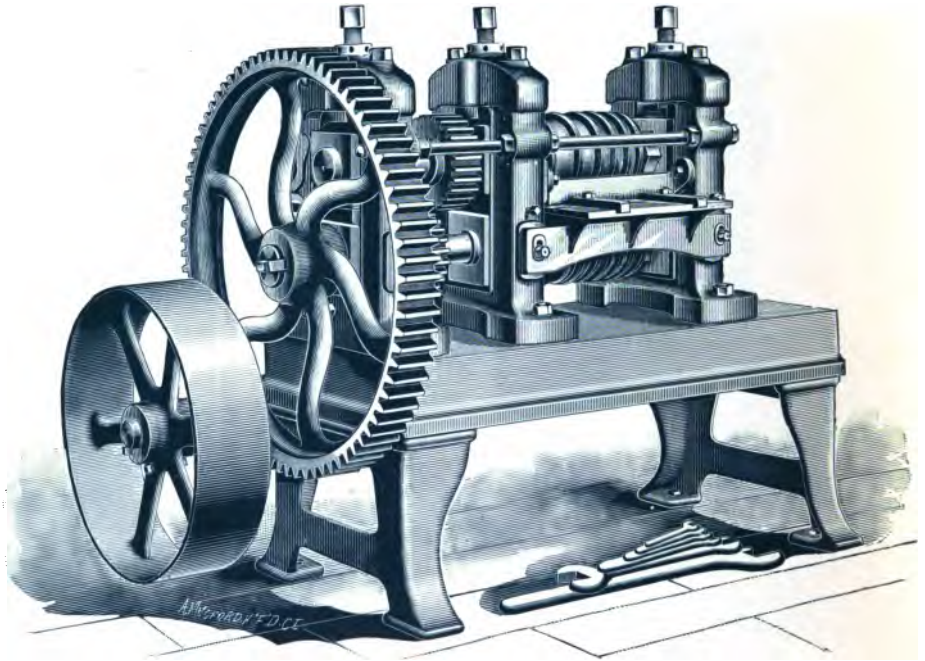


Trimming Machine.

Designed for trimming both edges of sheet metal at one operation. The cutters can be adjusted to any width. The supports at the middle of shafts can be removed, allowing the cutters to be brought together for narrow work. The opening through the housings is large enough to allow the cutters to be taken out without removing the shafts. We make two sizes of this design with dimensions as follows:

	SMALL.	MEDIUM.
Diameter of cutters, inches,	5	6½
Will trim in width,	14	28
Distance between frames,	20½	34
Diameter of shafts,	2¾	3
Pulleys,	24 x 4½	28 x 6
Weight, lbs.	1,500	2,400
Price, with four cutters and winder,	\$450.00	\$600.00

Winders are generally supplied with these machines and are driven by belt directly from lower shaft.



Large Gang Slitter.

This powerful machine is conveniently arranged for slitting heavy stock. The cutters, which are 9 inches in diameter, can be quickly changed, as the frame is adapted to be slipped along on the bed as shown. Machine is geared $7\frac{2}{3}$ to 1, and has pulley $30 \times 8\frac{1}{4}$ inches, and will slit sheets which are 14 inches wide.

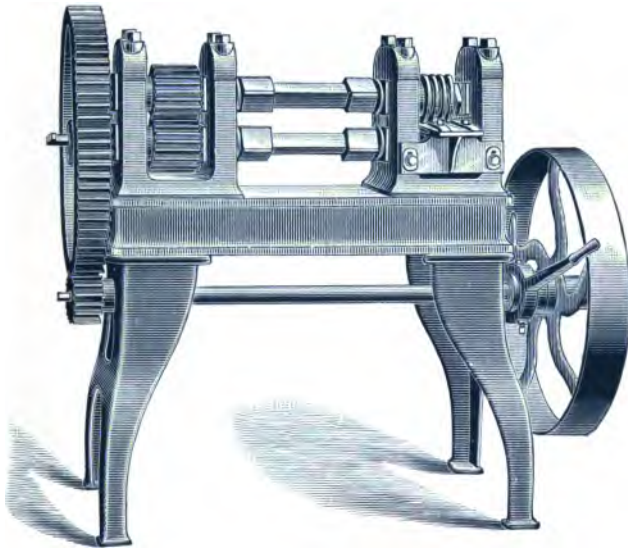
Extra thick cutters or collars at special prices.

Weight, 5,000 lbs.

Price without cutters, \$850.00.

Price of Cutters, \$12.00 each.

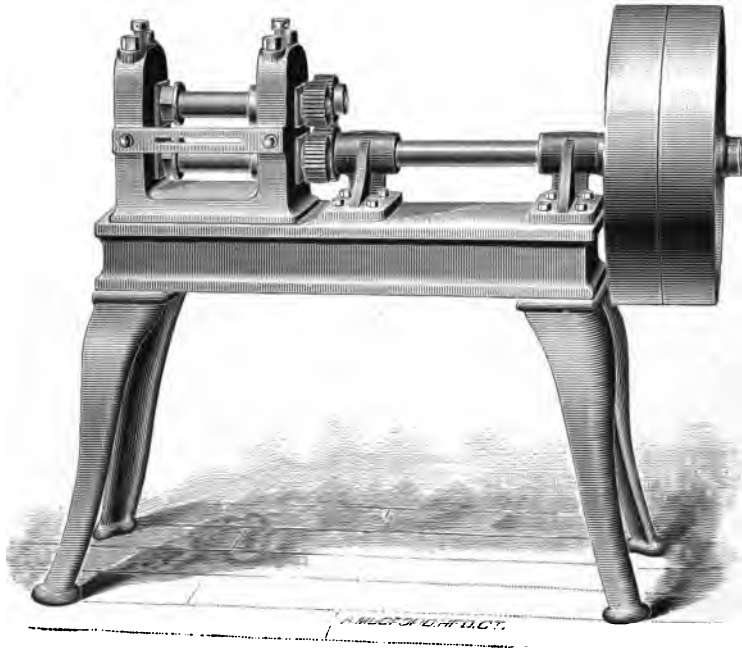
Collars, \$5.00 each.



No. 3 Gang Slitting Machine.

Distance between heads, 12 inches; diameter of cutters, $7\frac{1}{2}$ inches; diameter of hole in cutters, $3\frac{1}{2}$ inches; diameter of driving pulley, 36 inches; face of driving pulley, $6\frac{1}{4}$ inches; back-geared 5 to 1. Winders may be attached.

Weight, 3,250 lbs. Price without cutters, \$650.00.
Price of cutters, \$10.00 each. Collars, \$4.00 each.



No. 2 Gang Slitting Machine.

Will slit metal 6 inches wide; diameter of cutters, $4\frac{3}{8}$ inches; diameter of hole in cutters, $2\frac{3}{8}$ inches; diameter of driving pulley, 24 inches; face of driving pulley, $4\frac{1}{2}$ inches.

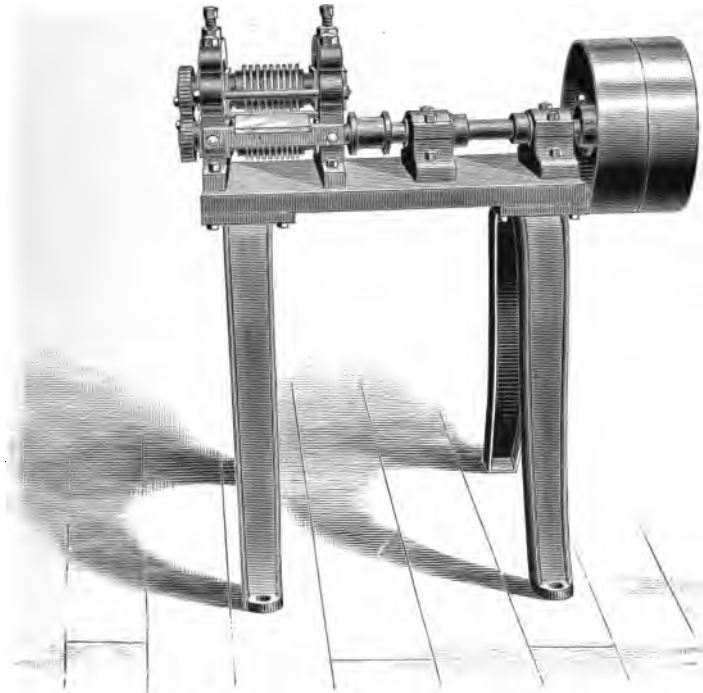
Weight, 1,000 lbs.

Price without cutters, \$300.00.

Price of cutters, \$4.00 each.

Collars, \$1.50 each.

Price of strippers, \$1.00 each. Winder, extra, \$25.00.



No. 1 Gang Slitting Machine.

Designed for slitting thin sheet metal into any number of strips at one operation. Will slit metal 5 inches wide; diameter of cutters, $3\frac{5}{8}$ inches; diameter of hole in cutters, $1\frac{1}{8}$ inches; diameter of driving pulley, 14 inches; face of driving pulley, 4 inches.

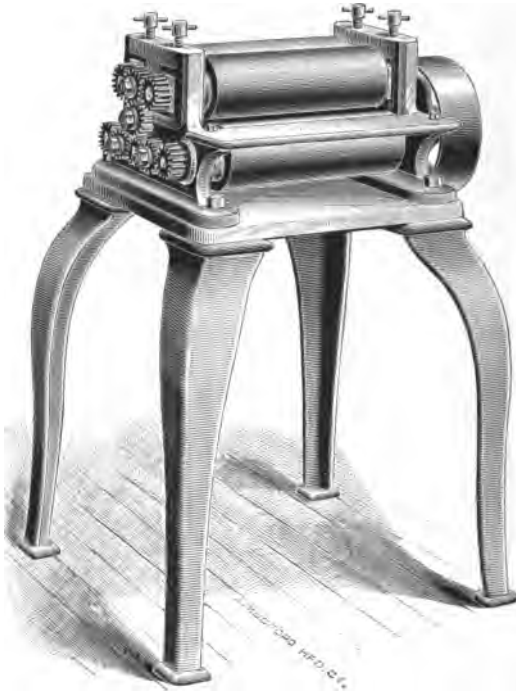
Weight, 550 lbs.

Price without cutters, \$200.00.

Price of cutters, each \$3.50.

Collars, each \$1.50.

Strippers, each \$1.00.

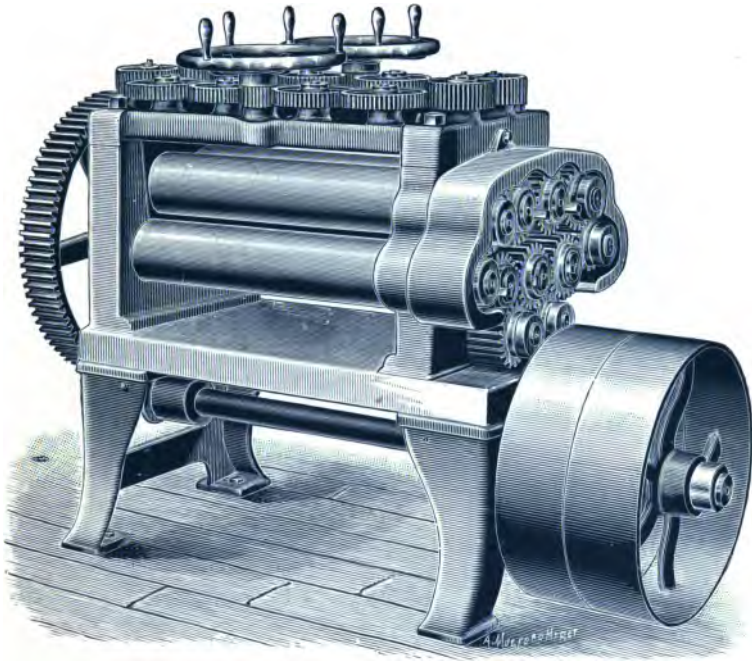


Small Five-Roll Straightener.

Designed for straightening thin sheet metal. The rolls are $4\frac{1}{2}$ inches in diameter and $12\frac{1}{2}$ inches face. The driving pulley is 10 inches in diameter by $3\frac{1}{2}$ inches face.

Weight, 550 lbs.

Price, \$200.00.



Sheet Metal Straightener. Five-Roll Machine.

We illustrate our large size Five-Roll Straightener of recent design. The rolls are of hammered steel, 6 inches in diameter, and either 24 or 30 inches face. The upper rolls are operated independently by the hand wheels on top. These machines are provided with tight and loose pulleys 24 inches in diameter and $6\frac{1}{4}$ inches face, and are geared 6 to 1, with cut gearing.

Weight, about 4,300 lbs.

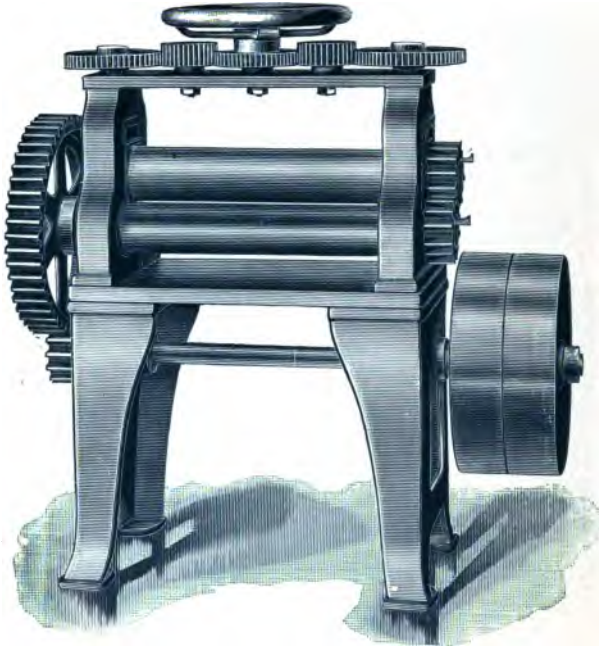
Price for 24 in. rolls, \$850.00.

Price for 30 in. Rolls, \$875.00.

For lighter work we make a machine similar to the above in which the rolls are $4\frac{7}{8}$ inches in diameter, and 22 inches face. The pulleys are 24 inches in diameter and $5\frac{1}{2}$ inches face, and are geared 4 to 1, with cut gearing.

Weight, 2,200 lbs.

Price, \$550.00.



Three-Roll Sheet Metal Straightener.

These machines are especially useful for straightening sheet brass and German silver preparatory to scraping on the Stever Scraping Machine. They are made with steel rolls, cut gearing and steel pinions.

No. 1 size has rolls 5 inches in diameter and 24 inches face, which are back-gearred $3\frac{1}{2}$ to 1, and driven by a pulley 20 inches in diameter and $4\frac{1}{2}$ inches face.

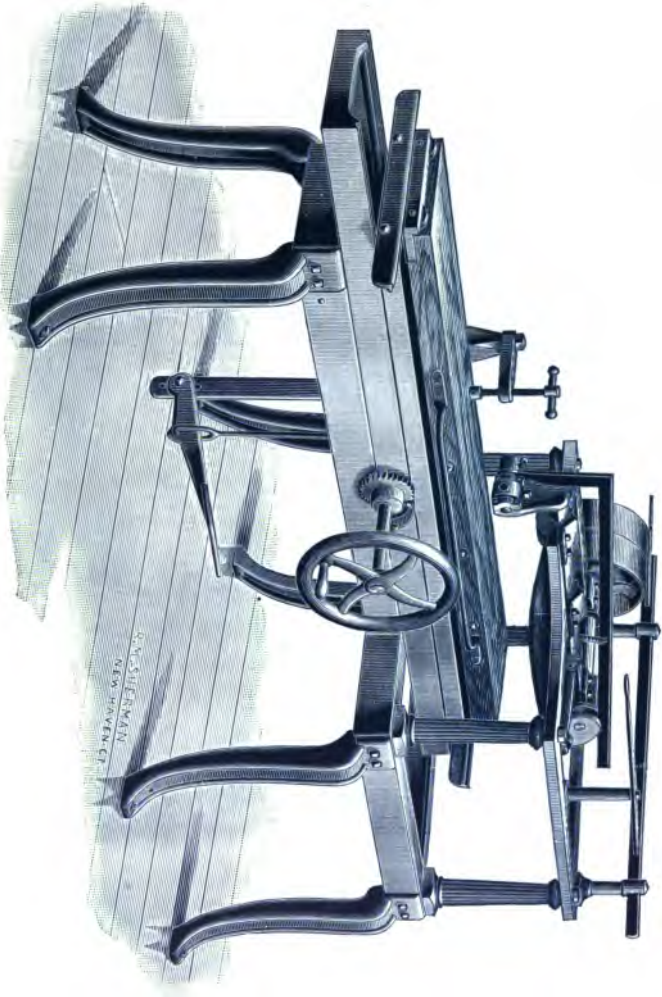
No. 2 size has rolls $6\frac{3}{4}$ inches in diameter and 17 inches face, back-gearred $4\frac{3}{4}$ to 1, and driven by pulley 24 inches in diameter and 5 inches face.

No. 1, Weight complete, 2,500 lbs.

Price, \$400.00.

“ 2, “ “ 4,000 “

“ 575.00.



The Stever Scraping Machine.

This machine is used by all makers of sheet brass and German silver. The pulleys are 13 inches in diameter and $4\frac{1}{2}$ inches face, and calculated to run 100 revolutions per minute.

Weight, 1,800 lbs.

Price, \$250.00.



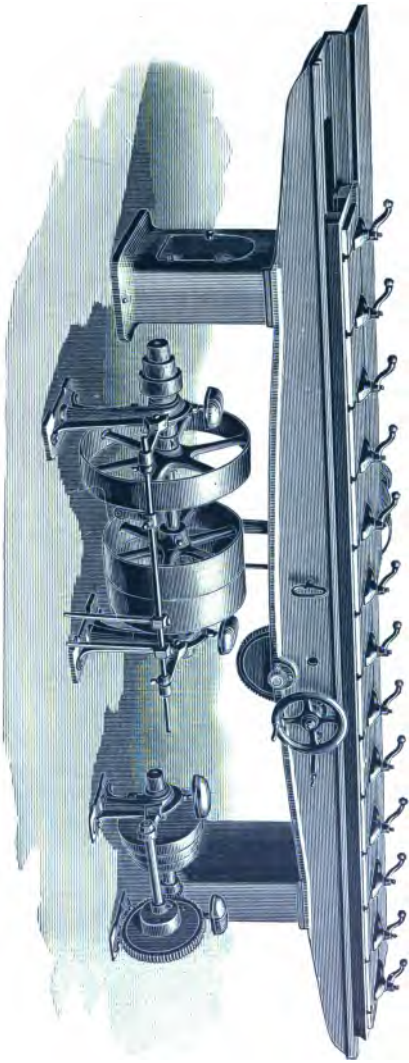
Drying-Out Machine.

This well known machine so long used by sheet brass manufacturers, has been improved in several points for convenience and durability. The framework is all of iron, carrying steel shafts and cut gearing.

While in use the trough of the machine is filled with dry sawdust, through which the damp metal is drawn by the winding arbor or spool, shown at the right hand end. In passing from the box to the arbor it lies in contact with a rapidly revolving brush which removes all adhering particles and coils the rolls clean and dry. When the end of the strip reaches the spool on which it is tightly wound, the spool is run backward or reversed by means of the treadle, which loosens the coil and admits of its being removed.

Weight, 2,500 lbs. Price, \$600.00.

With wood frame instead of iron frame, Price, \$450.00.



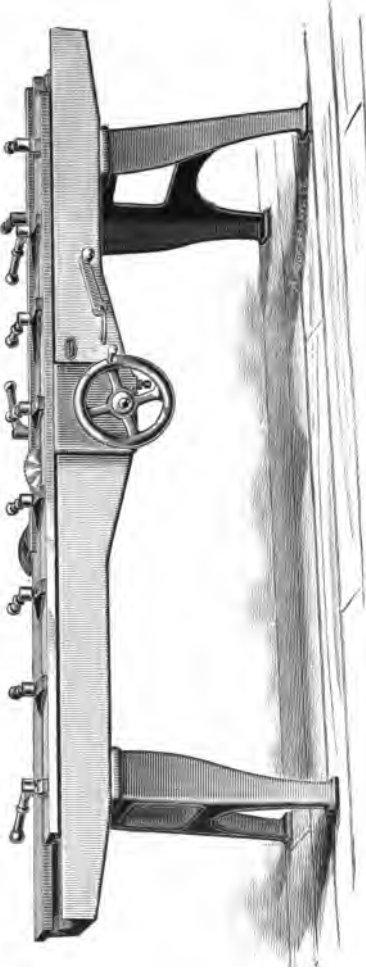
Twelve-Foot Sheet Metal Saw.

This machine has slotted table 13 feet long and 16 inches wide, to which metal is clamped. Saw is 12 inches in diameter, driven by pulley 9 x 4½ inches, which is located 23 inches back of the saw. The table is moved by rack and suitable gearing driven by special countershaft, and engaged by means of the loop handle shown. For returning the table at rapid speed a frictional device is used which is actuated by lever handle shown behind hand wheel.

Cutting speed (regulated by three-step cone) is 8 inches per minute on medium cone. Table returns at rate of 14 feet per minute. Saw to run from 400 to 600 revolutions per minute.

Weight, complete, 5,000 lbs.

Price, \$800.00.

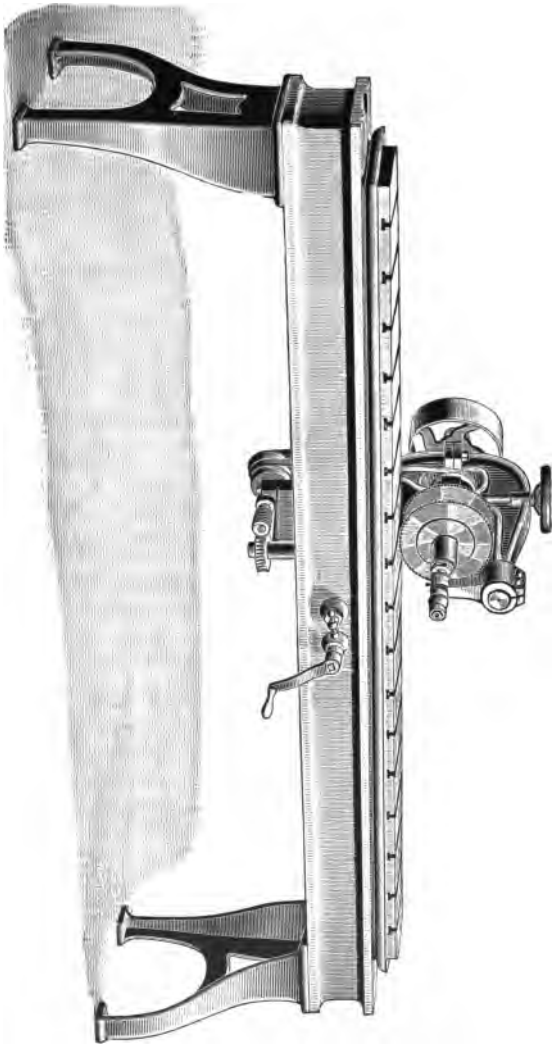


Eight-Foot Sheet Metal Saw.

The above illustration represents a sawing machine designed for sawing sheet metal. The iron table is 9 feet 10½ inches long, with movable table 8 feet and 2 inches long by 12½ inches wide; is provided with automatic feed, with three changes of speed, and a quick return motion which is operated by power through friction gearing, for returning the table to position. The handle in front also moves the table in either direction. The feeding mechanism is below the surface of the table, so that wide metal may be cut. The distance from the saw to the driving belt is 26 inches. The saw is 10 inches in diameter, and pulley on spindle is 8 inches in diameter by 5½ inches face. The machine is furnished with overhead countershafting complete, for driving the saw and for the feed and return motions.

Weight, 2,750 lbs.

Price, \$500.00.



Sheet Metal Sawing Machine.

The above illustration represents a sawing machine designed for sawing sheet metal into strips, with either a single saw or gang of saws. The arbor will carry a saw 10 inches in diameter, or a gang of the same size up to 9 inches in width. The movable table has T slots for clamping the work, and is 9 inches wide on top and 8 feet and 9 inches long. The machine has automatic feed with three changes of speed. The driving pulley is 14 inches in diameter and 5 inches face, and is calculated to run 400 revolutions per minute.

Weight, complete, 2,250 lbs. Price, with countershaft, \$500.00.

Miscellaneous Rolling Mill Machinery.

In addition to the machinery illustrated in this catalogue we make a variety of special tools used in the manufacture of sheet brass and copper, among which the following are in general use.

Cabbaging Machine.

The Cabbaging Machine for compressing scrap is a hydraulic press provided with double "pots" or moulds into which the scrap metal is placed and pressed into suitable shape for remelting in crucibles. A full description with plans will be given to our customers at any time.

Price, including 3-plunger pump, etc., complete, \$1,650.00.

Price, with ordinary pump, \$1,200.00.

Sheet Metal Scouring Machines.

Mill Wagons.

Circle-Cutting Machines.

Moulds and Mould Racks.

Cinder-Pounding Machines.

Casting Shop Cranes.

Cinder-Crushing Machines.

Casting Shop Furnaces.

Send for our List of Gear Patterns.

Send for our Price List of Turned Shafting, Pulleys, Hangers, etc. Discount furnished on receipt of specifications. When desired we make detailed drawings of layout of Shafting, etc., and furnish advice as to the best construction for conveying power.

All kinds of castings furnished for building purposes; also have a large assortment of patterns for iron columns, iron cellar-window frames, iron chimney-caps, iron coal-hole covers, iron hitching posts, etc.

FURNACES.

Muffles for Annealing Brass.

We have patterns for several sizes of muffles arranged for burning either wood, coal or oil. Those for burning wood are fired at the front on both sides of the hearth, and have flue at back. The No. 1 size has hearth 28 inches wide and 7 feet deep, though depth may be varied. Width of front is about 7 feet.

The No. 2 size has breadth of front, 9 feet; width of hearth, 38 inches, and depth of 12 feet.

Of still greater capacity we have the No. 5 size, with patterns so constructed that width of hearth may be made from 5 to 7½ feet, and the depth from 22 to 28 feet. We will supply masons' plans for the erection of brick-work when requested. Price includes necessary bolts and latches forged and fitted, being all iron-work complete. We append a list of standard sizes of the above to illustrate the weight, which of course will vary materially if dimensions are changed. •

No. 1, Hearth 28 inches x 7 feet.	Weight, 3,300 lbs.	Price, \$132.00
No. 2, " 38 " x 12 "	" 10,000 "	" 250.00.
No. 3, " 72 " x 24 "	" 40,000 "	" 800.00.

Rear End Muffles.

In this form of muffles the firing is done from either side at the rear end of the muffle. In this case the structure is reduced in width, and the length may be increased for a given size hearth. A muffle with hearth 5 feet 2 inches x 16 feet covers floor space of 10 x 24 feet.

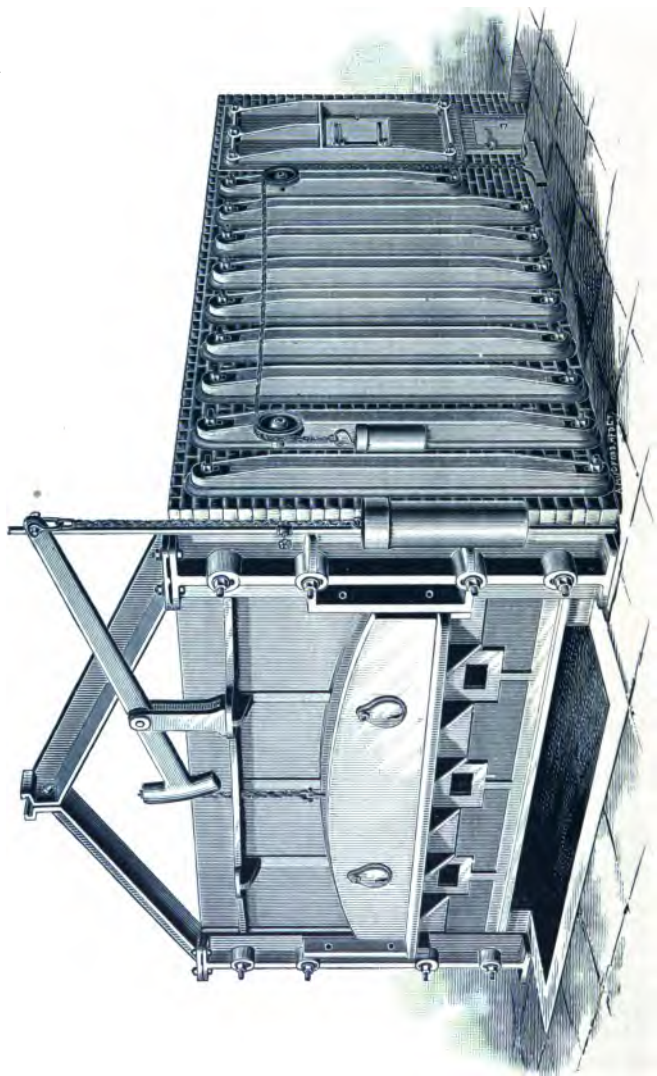
Weight of iron-work, 22,300 lbs. Price, \$500.00.

Rear End Muffle, hearth 42 in. x 7 ft. Weight, 7,500 lbs. Price, \$210.00.

Double End Muffles.

These are same as the single end, except that they are provided with sliding door at rear for convenience in loading and discharging. We make them in special forms also, and arrange them for burning any kind of fuel.

No. 2 Hearth, 38 inches x 17 feet. Weight, 15,000 lbs. Price, \$350.00.



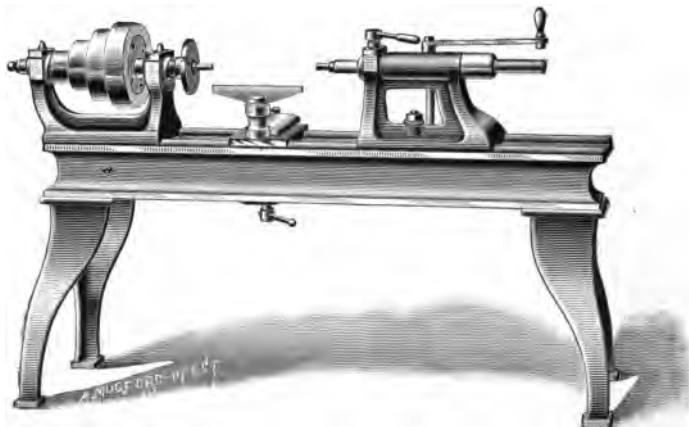
Copper-Heating Furnace.

Heating Furnaces.

The engraving on opposite page represents our latest make of annealing or copper-heating furnace, particularly adapted to the use of oil fuel, as designed by experts, from actual experience in annealing and heating under many and varying conditions. For the even diffusion of heat, economy of fuel, and durability, this furnace has no equal. It can be fired with either coal or oil, and if fired with oil fuel can be run with one burner, on our largest size. We make all sizes to meet any requirements. They are easily constructed and easily operated.

For particulars regarding oil as fuel we can put our customers in communication with Mr. W. S. Rockwell, who will furnish full information, and drawings showing how to erect.

Width of hearth, .	7 ft.	8 ft. 6 in.	2 ft. 6 in.	3 ft. 6 in.		
Width of opening,	7 " 2 in.	8 " 8 "	2 " 6 "	3 " 6 "		
Height of opening,	1 " 7 "	1 " 7 "	1 " 3 "	1 " 6 "		
Length,						
Estimated weight,						
Estimated cost, .						

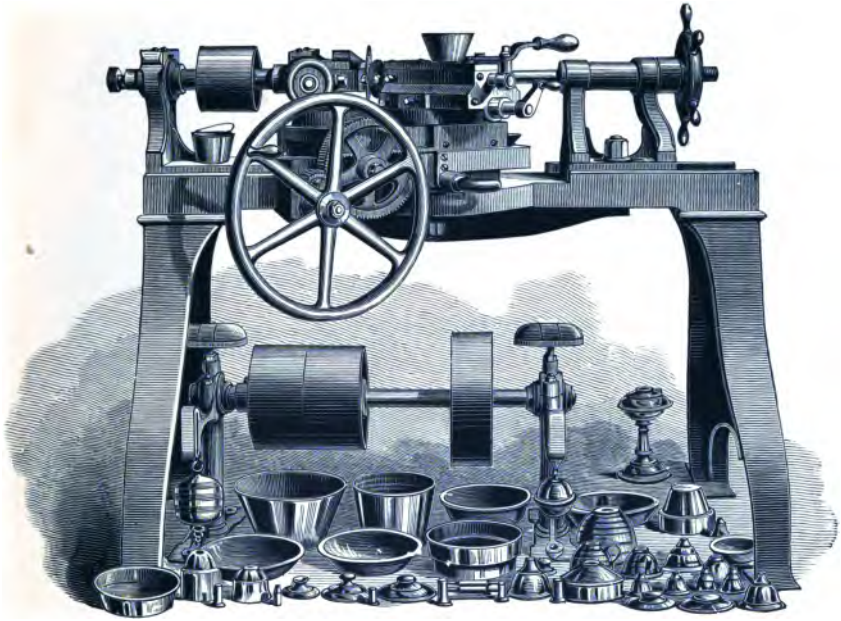


Hand Spinning Lathes.

We make a variety of sizes of Hand Spinning Lathes as follows :

Swing and Length of Bed.		Weight.	Price.
9 inches swing, 28 inches length of bed,	. . .	200 lbs.	\$ 90.00
10 " " 54 " " " "	. . .	600 "	125.00
12 " " 60 " " " "	. . .	750 "	150.00
14 " " 60 " " " "	. . .	800 "	175.00
18 " " 60 " " " "	. . .	900 "	200.00
20 " " 72 " " " "	. . .	1050 "	250.00
24 " " 72 " " " "	. . .	1100 "	300.00

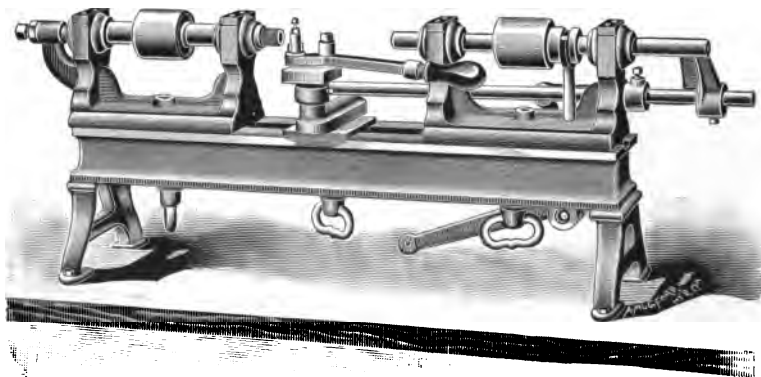
Prices include countershaft.



Seymour's Machine for Spinning Metal.

[PATENTED 1868, 1873, 1873, 1874.]

Adapted for raising articles of sheet metal for lamps and chandelier work; also copper pans of any size or thickness required; locomotive reflectors, domes for engine work, soda founts, air chambers for pumps of any required size; plumbers' copper work of all kinds; articles of any desired form, either in silver, copper, brass, zinc, Britannia metal, German silver, tin or sheet iron. This machine will accomplish with unskilled labor twice the work that can be done by hand spinning. Is specially adapted to spinning articles from sheet zinc, of any form or depth.

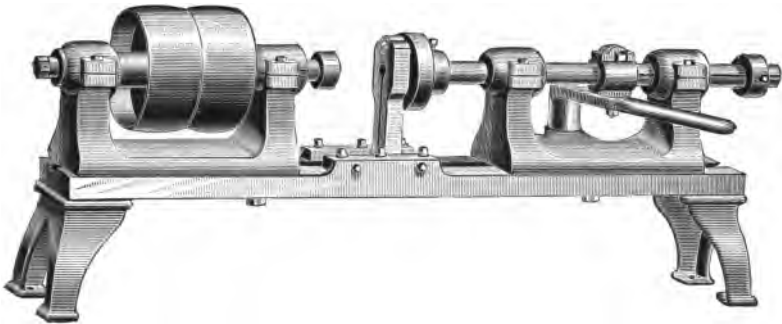


Edging Lathes.

For trimming the rough, irregular edges of metallic shells.

	NUMBER OF LATHE,	1	2	3
Swing, Inches,		8	11	15
Length of bed,		32	36	45
Weight, complete, lbs.		225	350	650
Price with countershaft,		\$125.00	\$150.00	\$250.00

Attachment for Knurling, \$40.00 additional.



Tapping Lathe.

The illustration represents our No. 1 Friction Tapping Lathe, designed for tapping small articles of iron or brass, or for threading with dies small screw blanks, etc.

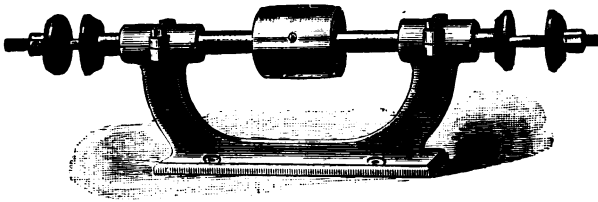
	NUMBER OF LATHE.	1	2	3
Swing, Inches.		9	9	18
Diameter and face of friction pulley,		5 x 2½	6 x 2½	14 and } 10 x 3½ }
Price with countershaft,		\$90.00	\$125.00	\$275.00

Prices include chucks and fixtures fitted for special work.



Buffing Lathe with Overhanging Spindle.

	NUMBER OF LATHE.	
	1	2
Height of spindle from bottom, . . . inches,	8	11½
Distance from center of spindle to front of base,	6	8½
Length of spindle over all,	24	28
Diameter of spindle,	1 7/8	1½
Diameter of driving pulley,	6	5
Face of driving pulley,	4	4½
Weight, complete,	145	160
Price,	\$28.00	\$35.00

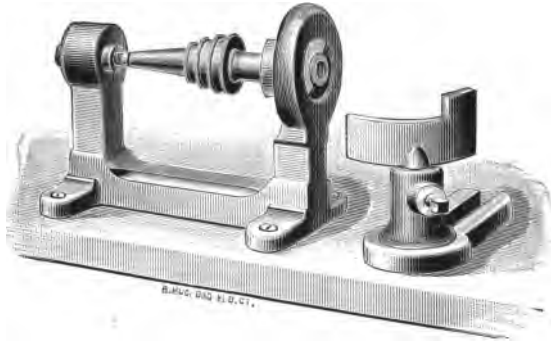


Buffing Lathe.

The illustration represents the style of a Buffing Lathe suitable for all kinds of small brass and nickel plated work.

	NUMBER OF LATHE,	1	2
Length of spindle over all, Inches,		30	34
Diameter of driving pulley,		3 $\frac{1}{4}$	4
Face of driving pulley,		3 $\frac{1}{4}$	4
Price,		\$22.00	\$30.00

We make to order a variety of different styles suitable for larger work, such as spoons and forks, chandeliers, etc., and will make estimates of cost for complete buffing room outfits with shafting and pulleys.



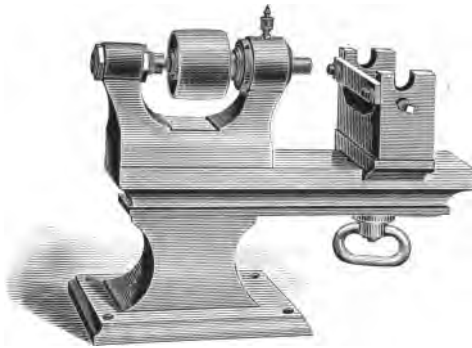
Button-Burnishing Lathe.

For burnishing small work, such as buttons, etc. The height from bench to the center of spindle is $4\frac{1}{2}$ inches. The spindle is of hardened steel and carefully ground to insure smooth running at very rapid speed.

We make to order a variety of sizes of burnishing lathes for large work, up to 24 inches swing.

Price of lathe with rest, as shown, \$20.00.

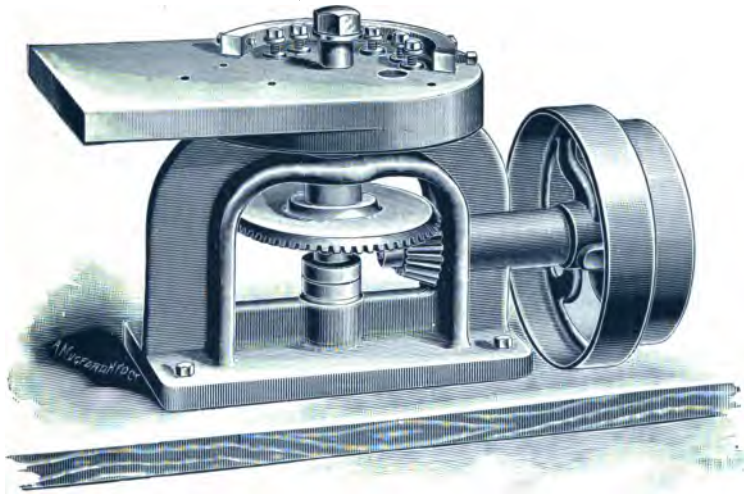
Price of countershaft and driving wheel, \$20.00.



Face-Turning Lathe.

The illustration represents one of our special lathes designed for turning work in a chuck, such as watch cases, etc. The spindle and boxes are of hardened steel carefully ground and fitted.

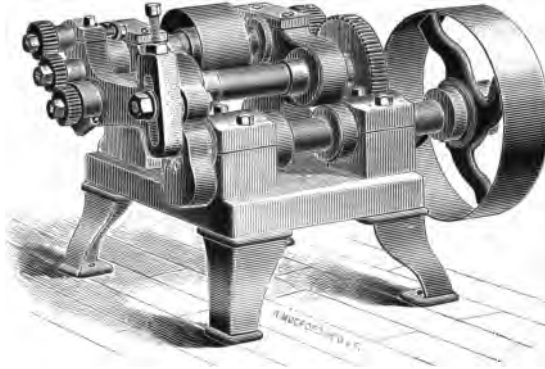
We build a variety of watch-case machinery. Prices given on receipt of full specifications.



Rotary Screw-Threading Machine.

Above machine is intended for the same class of work as the reciprocating machines already described, and has advantage of greater speed and convenience for feeding, but requires dies more expensive in first cost. This machine is used where large quantities of standard work are to be threaded in one set of dies. Will thread screws up to $\frac{5}{16}$ inch in diameter and $1\frac{1}{4}$ inches long.

Price, \$350.00.

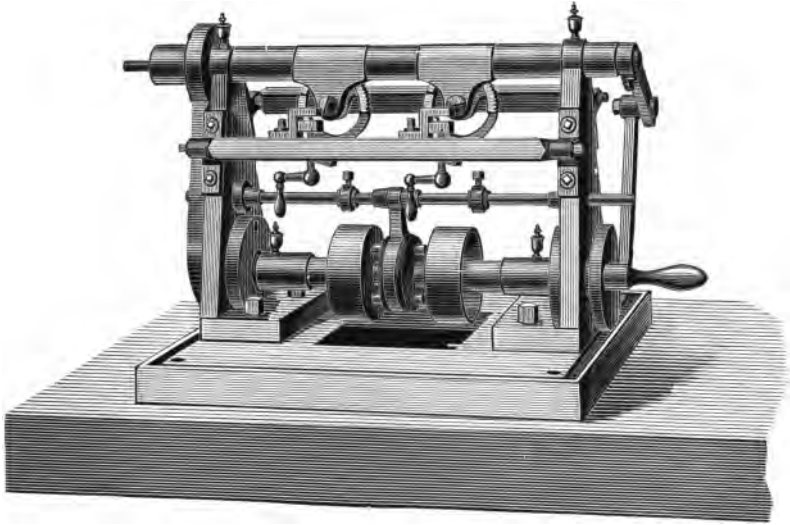


Screw-Cap Threading Machine.

Designed for rolling threads upon all kinds of screw-caps. The machine is automatic in its operations except the feeding, and will thread shells as fast as the operator can supply them to the formers.

The price includes chuck and former fitted to produce sample work.

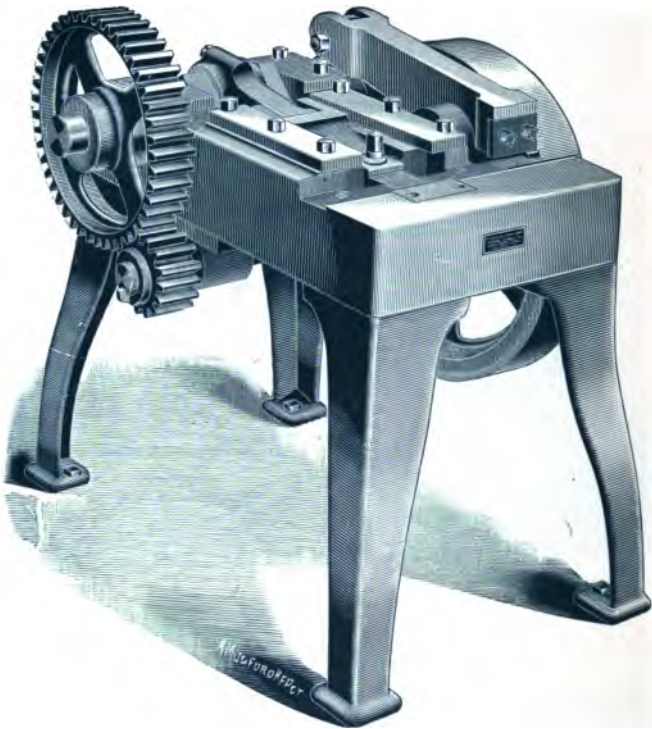
Price, \$200.00.



Spoon-Bowl Burnishing Machine.

This simple and useful automatic machine we furnish in two forms, that is, for either tea spoons or table spoons. The one shown is as arranged for burnishing the bowls of table spoons, two of which may be operated upon at the same time. For tea spoons three sets of clamps and burnishers are arranged. The small pulleys shown are $4 \times 1\frac{1}{2}$ inches, and revolve in opposite directions. They actuate the machine when the central clutch is thrown to the right or left, and are automatically disengaged after a given number of strokes of the burnishing tools. This small machine occupies a space of 12×18 inches.

Price, \$275.00.



Small Hinge-Rolling Machine.

The illustration shows a very handy machine specially designed for rolling the joints on hinges of moderate size. Two operations are required, and as will be seen, are very conveniently performed. The feeder may use both hands and thus complete one hinge at each stroke of machine. It is geared 3 to 1, and has a wheel 24 inches in diameter. No clutch is used, but a slow, steady speed is maintained, which may be suited to the capacity of the feeder.

Weight, 1,300 lbs.

Price, \$450.00.



Hinge-Joint Rolling Machine.

The above illustration shows our No. 3, or larger size machine, for bending or rolling the joints of strap and T hinges up to 18 inches long and 6 inches wide. This size machine has both ends fitted with tools so that two operators can be employed, one at each end of the machine, or one operator can roll straps on one end and T's on the other without changing dies. The slides have a stroke of 5 inches and are 10 inches wide on the top face. The clamping device for holding straps is automatic in its operation. Machine is geared $4\frac{1}{2}$ to 1, and is driven by pulley 30 inches in diameter and $6\frac{1}{2}$ inches face.

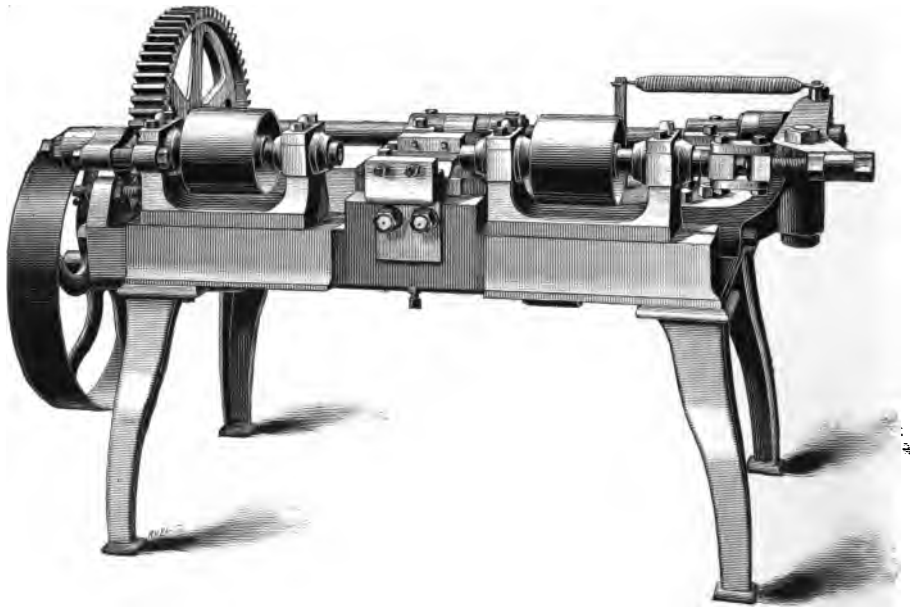
Weight, 4,600 lbs.

Price, \$950.00.

No. 2 size is intended for work up to 14 inches long and 6 inches wide. The slides have a motion of $3\frac{1}{4}$ inches and are $7\frac{1}{8}$ inches wide on top. This size machine is geared $3\frac{1}{4}$ to 1, and is driven by pulley 24 inches in diameter and 4 inches face. We have patterns of smaller sizes.

Weight, 2,750 lbs.

Price, \$800.00.



Hinge-Pin Spinning Machines.

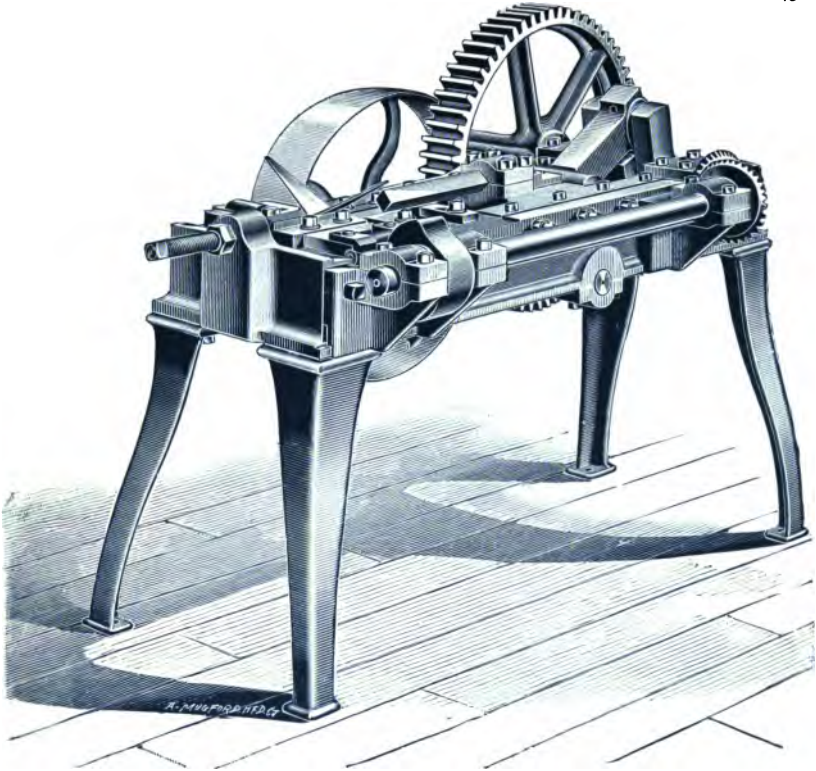
For spinning or riveting heads of pins in straps and **T** hinges, and butts. The hinge, with the pin driven in, is placed by the operator between the gripping jaws, where it is clamped automatically; rapidly revolving ground rolls are then forced against the ends of the pin and spin them into the desired shape, leaving a smooth finish. These machines can be run continuously, being automatic except the feed; the operator having to place the hinge between the gripping jaws and remove it as soon as the jaws open.

The No. 3 or large size will take work up to 8 inches in width. The driving pulleys on the spindles are $8\frac{1}{4}$ inches in diameter and 7 inches face. The machine is geared $4\frac{1}{2}$ to 1, and driven by pulleys 30 inches in diameter and $5\frac{1}{4}$ inches face.

Weight, 3,350 lbs. Price, \$850.00.

The small or No. 2 size will take work up to 5 inches wide. The pulleys on spindles are $6\frac{1}{4}$ inches in diameter and 7 inches face. The machine is geared 4 to 1, and driven by pulleys 20 inches in diameter and $3\frac{1}{2}$ inches face.

Weight, 2,000 lbs. Price, \$650.00.



Hinge-Pin Driving Machine.

We illustrate above one of several sizes of machines for driving pins into butts and hinges. This machine will drive $\frac{1}{4}$ inch pins, 8 inches long, and is arranged with or without automatic feed for the pins. Geared $\frac{4}{3}$ to 1, and driven by wheel 24 inches in diameter and $\frac{5}{4}$ inches face. Floor space required is 30 x 60 inches.

Weight, 1,500 lbs.

Price, \$500.00.

COUNTERSINKING LATHE.

For counter-sinking holes in butts and hinges.

BROACHING MACHINE.

A special machine for broaching the joints of iron strap and T hinges, etc.

BUTT-HINGE MILLING MACHINE.

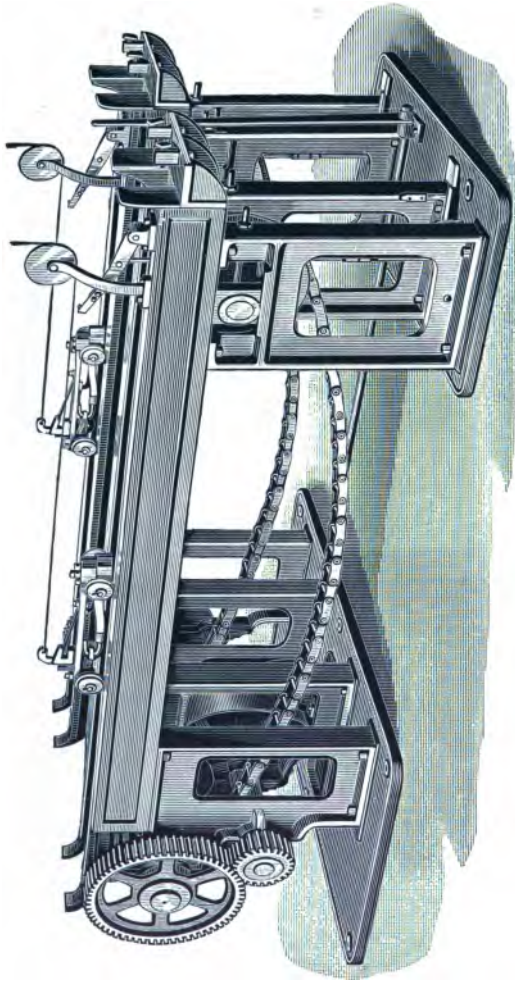
Special machines for milling the joints in brass butts and hinges.

BUTT-GRINDING MACHINE.

Special machines for grinding the ends or edges of brass butts and hinges.

OPENING AND CLOSING MACHINE.

Special machines for opening and closing the joints in brass butts during process of manufacture.



Special Double Drawing Bench.

We illustrate above double chain drawing bench, particularly adapted for drawing gold and silver strips to the exact thickness suitable for coin blanks. The action is semi-automatic; the end of strip is passed through the die (not shown), and the treadle depressed; this action closing the gripping tongs, couples them with the slowly moving chain; the strip is released from the jaws as soon as the end passes out of the die, and the tongs detach themselves from the chain and return to their normal position, ready to secure the next strip. The machine as shown will draw 9 feet in length. Space occupied, 6 feet wide and 12 feet long.

Weight, 9,500 lbs.

Price, \$1,500.00.

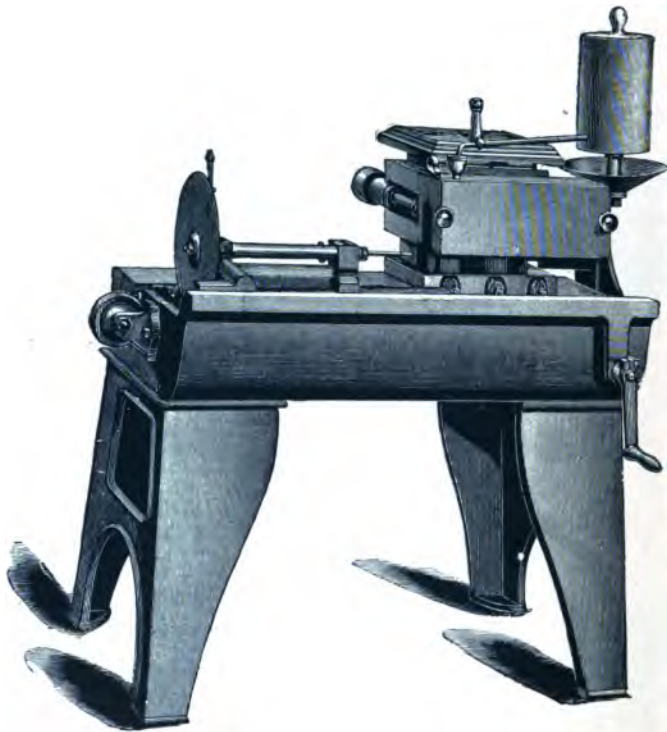


Multiple Shear.

The above form of small alligator shear has four sets of blades, 4 inches long; one or more of the blades may be thrown out of action by a small hand lever at side of frame. Floor space 3 x 4 feet.

Weight, \$3,300 lbs.

Price, \$550.00.

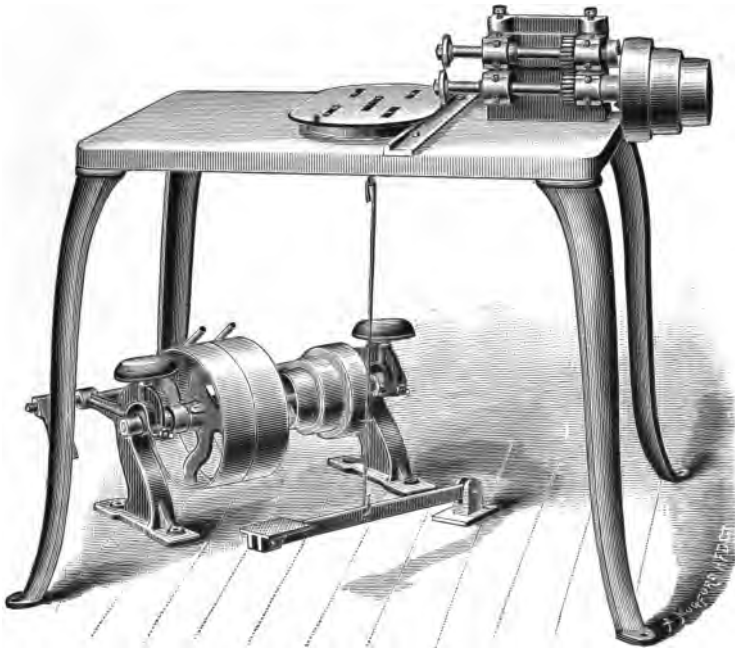


Wheel-Cutting Machine.

The illustration represents Three-Spindle Clock-Wheel-Cutting Machine. Each spindle has independent adjustment in both horizontal and vertical directions, and runs in long bearings which are made adjustable for wear. All adjustments can be made from the front side of the machine. Each machine is provided with two index spindles, one for small and one for larger wheels. The countershaft has flanged friction pulley to assist the forward motion of the carriage. The belt-tightener, floor plates and wrenches are included.

Weight complete, 1,100 lbs.

Price, \$750.00.



Oval Trimmer.

Designed for trimming copper bottoms for boilers or tea kettles, either round or oval in shape.

Price includes countershaft and adjustable formers for round and oval shapes. Boiler-bottom forming press is shown on page 73.

Weight, 750 lbs.

Price, \$225.00.



Miscellaneous Special Machinery.

The following list gives some of the special machinery which we have been called upon to design, and for which we have drawings and patterns.

Fork-Tining Attachment.

This attachment is usually used in connection with our No. 4 open back press, for cutting the tines in table forks. The operation is such that a single slot is cut at each stroke of the press, with simple and durable tools.

Price of attachment and one set of dies, \$150.00.

Spoon-Blank Upsetting Machine.

A special machine for upsetting the shank of spoon blanks before rolling on grading-mill.

Price, \$1,500.00.

Spoon and Fork Blanking Dies.

For cutting the German silver blanks for plated spoons and forks. This work is usually done at the mills where the metal is rolled and the blanks cut without waste of stock.

Spring-Coiling Machine.

For coiling small spiral springs either in long lengths or for coiling and cutting to special length, as desired.

Automatic Pen-Holder Tip Machine.

For making automatically all ordinary forms of metallic pen-holder-tips from sheet metal in rolls.

Price depends on specifications, number of dies, etc.

Lamp-Wick Tube Machine.

An automatic machine for cutting, piercing, forming and seaming wick-tubes of all sizes for lamp and lantern burners.

Price with one set of dies, \$1,500.00.

Clock-Spring Polishing Machines.

Special machine for polishing the sides and edges of clock springs or similar work.

Weight, 3,250 lbs. Price, \$750.00.

Verge-Bending Machines.

For cutting and bending automatically verges for clocks, or cutting and forming wire of similar form.

Veneering Presses, Hand, Power, or Hydraulic.

Coin-Edging Machine.

For rolling and thickening the edges of coin blanks preparatory to the coining operation; also for knurling edges of buttons for lamp burners, etc.

Price, \$400.00.

Peruvian Mill for Grinding Plumbago.

Paper Box Machinery.

Special machines used in the manufacture of paper boxes.

Elevators, Hydraulic and Hand Power.

Tumbling Barrels.

RIVET MACHINES AND HEADERS,

For Making Rivets, Bolts, and Screw Blanks.

The following description of the different styles of machinery we build for the making of rivets by cold heading will give a fair idea of the particular class of work each machine will make. We have the largest line of Headers ever offered to manufacturers, and we claim for these machines that they are so perfect in construction the very best results are obtained in the production of good work.

Open Die, Single Stroke Headers.

These machines are designed for heading wood-screw blanks and tire bolts, or for any kind of iron work intended to be trimmed or shaved after heading. They are also suitable for making rivets upon which the necessary mark or fin left by the dies will not be objectionable. For some kinds of small work—especially brass rivets—the dies can be so nicely adjusted as to make rivets upon which the mark of the dies will be hardly perceptible, and considering the rapidity of the process it will be found preferable to the solid die.

Solid Die, Single Stroke Headers.

Rivets to be made in solid dies should not, as a general rule, exceed in length over seven times the diameter of the wire on account of the difficulty of driving them out of the die after heading, but this limit may be exceeded in some cases, especially with double stroke machines. The single stroke, solid die headers are suitable for making all kinds of rivets and screw blanks of moderate length and size of head, upon which the mark of open dies would be objectionable.

Solid Die, Double Stroke Headers.

This class of machinery is adapted for making all kinds of copper and brass rivets, especially those requiring large heads which cannot be made with a single stroke. These machines are suitable for making many kinds of screw blanks of either iron or brass.

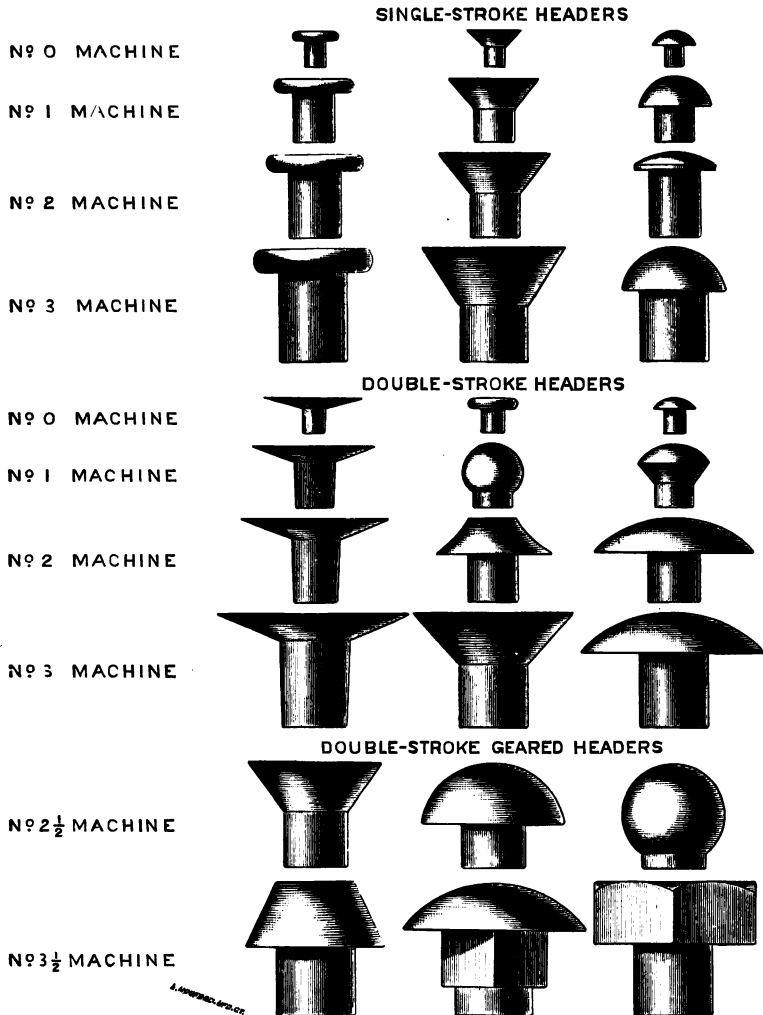
Solid Die, Double Stroke, Geared Headers.

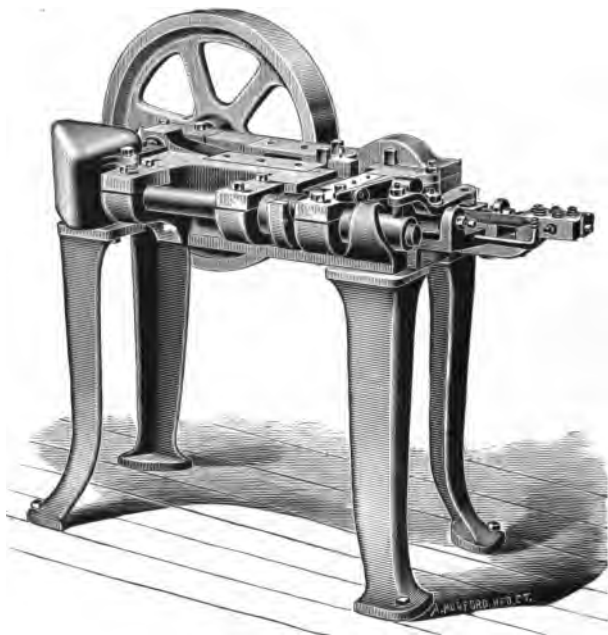
This class of machine is especially designed for heading machine-screw blanks, iron rivets having large, true heads, and for making many kinds of bolt blanks and rivets which have heretofore been made by the hot process. They differ from the plain, double stroke machines in having bearings of increased size, and a crank shaft making two revolutions instead of one for each blank, and by having two fly wheels whereby the strain upon the crank is distributed upon both sides, giving the machine greatly increased heading power. These machines will produce work with true, smooth and solid heads of large size.

Open Die, Double Stroke Headers.

These machines are designed for long work, such as cannot be driven out of solid dies, and requiring heads too large to be made by a single stroke.

These illustrations show the sizes of screw-blanks, rivets, etc., made on our Rivet Machines ; the printed tables in the pages following specify the *lengths* of rivets each machine will make, and also the average speed.

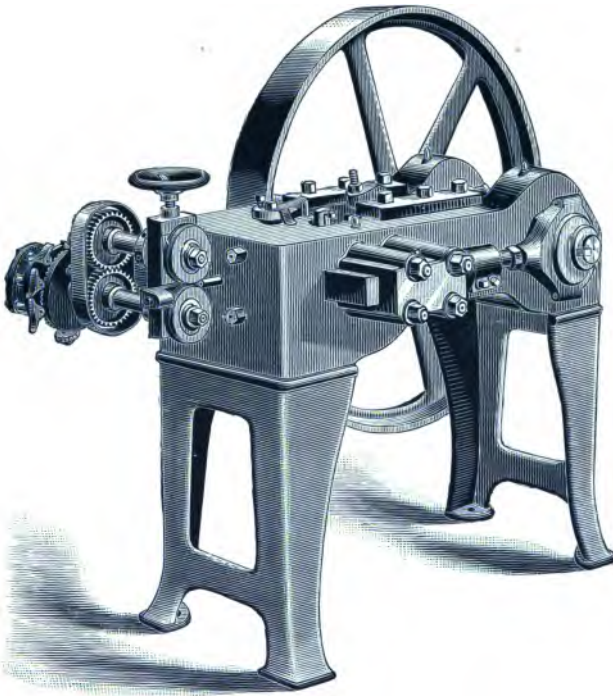




No. 0 Open Die, Single Stroke Rivet Machine.

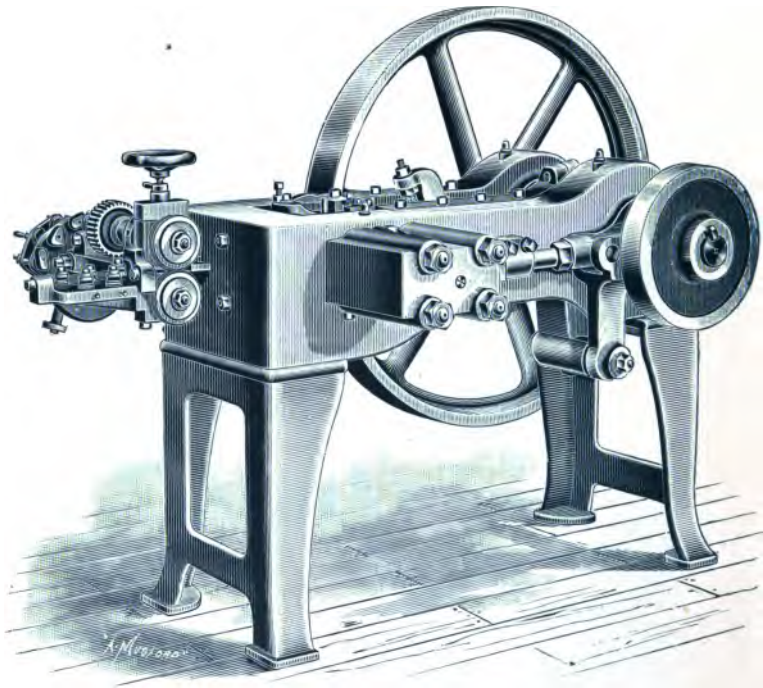
This machine is designed for making all kinds of small rivets of iron or brass, and is extensively used by manufacturers of clocks, lamp burners, locks, corset trimmings, etc. It has steel shafts and tool-holders, with cams and wearing parts hardened.

For price see page 255. The price includes one set of tools fitted and tested; also, all necessary wrenches.



No. 1 Open Die, Single Stroke Header.

The illustration shows the No. 1 size of Open Die, Single Stroke Header. These machines are made of the best material and carefully fitted. All motions are obtained from eccentrics, which insures smooth running at fast speed. In the smallest sizes the dies are clamped by a newly devised toggle mechanism operated by short-stroke steel cam on main shaft. The larger sizes have knuckle-joints as wide as the length of the dies, and the main bed cast solid under the die-block to prevent springing while the wire is clamped.



No. 2 Open Die, Single Stroke Header.

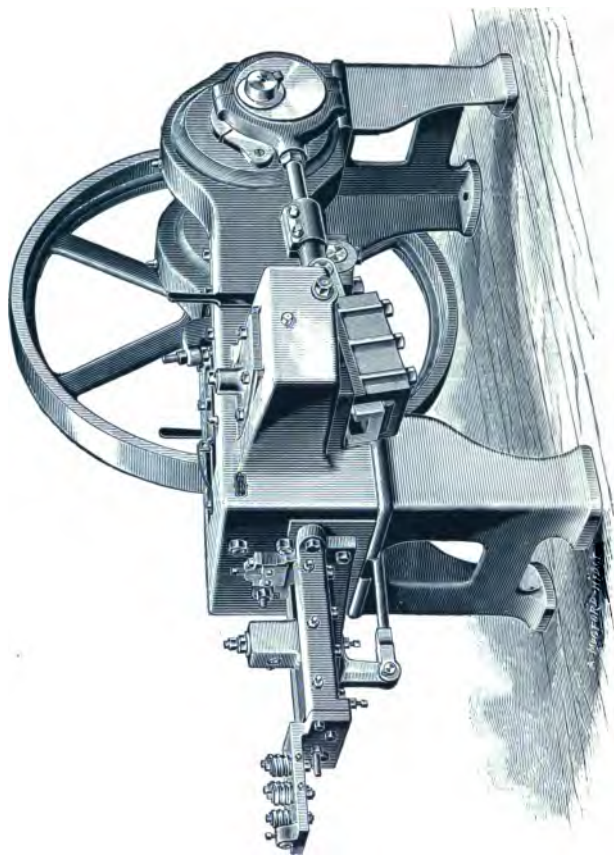
These machines are made throughout of best material; hardened knuckles and plungers, steel punch-holders and steel cams; the die-holders are fitted for each length of rivet, and can be readily removed and replaced by others made for any lengths up to the limit of the machine; the dies are closed and held during the heading by a powerful knuckle-joint actuated by positive cam motion on the main shaft.

Prices of all rivet machines include necessary wrenches and one set of tools fitted and in working order; countershaft, etc., not included.

Open Die, Single Stroke Headers.

	NUMBER OF MACHINE,			
	0	1	2	3
Diameter of wire the machine will work, Inches,	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{3}{8}$
Length of rivet the machine will make,	$1\frac{1}{4}$	$2\frac{1}{4}$	$3\frac{1}{4}$	6
Diameter of fly wheel,	20	$44\frac{1}{2}$	48	62
Face of fly wheel,	$3\frac{1}{2}$	$4\frac{1}{2}$	5	$6\frac{1}{2}$
Number of revolutions per minute,	175	200	150	90
Weight, complete,	900	3,000	4,500	8,000
Price,	\$375	\$650	\$850	\$1,350

The prices include necessary wrenches, and one set of tools fitted and tested to produce sample work.

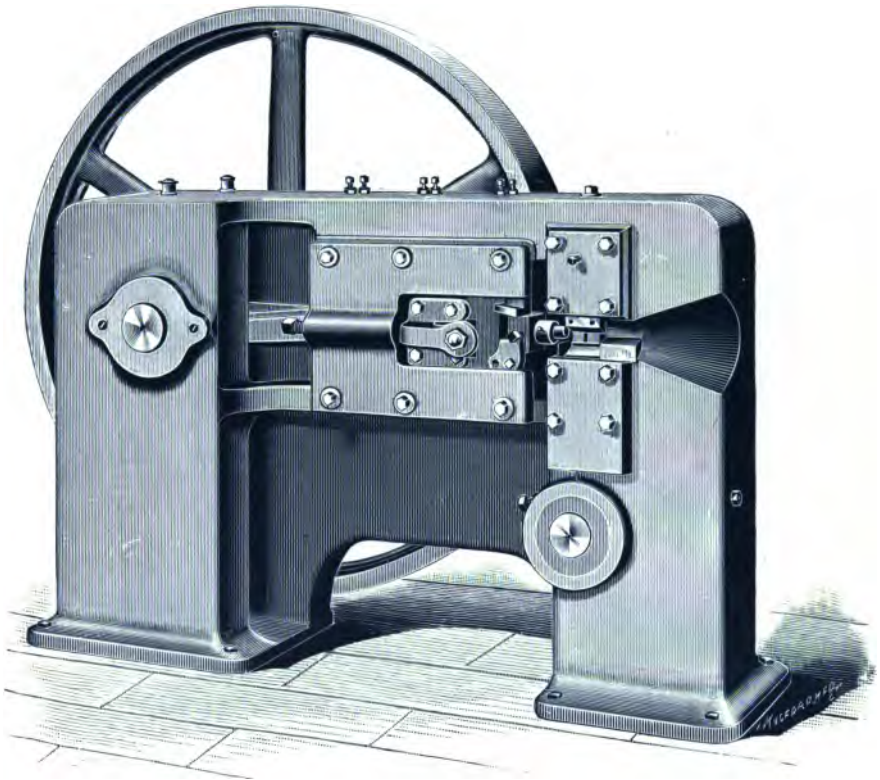


Special, No. 3 Open Die, Single Stroke Upsetter.

The illustration represents our No. 3 Open Die, Single Stroke Header, arranged to give an extra long feed for upsetting the wire preparatory to hot heading. This machine will upset wire $\frac{3}{8}$ inch in diameter and 6 inches long, with a capacity of forty per minute.

Weight, 8,000 lbs. Price, \$1,500.00.

Our Regular No. 3 Open Die, Single Stroke Header, as described in table on previous page is same as above, but with feed like illustration on page 254.



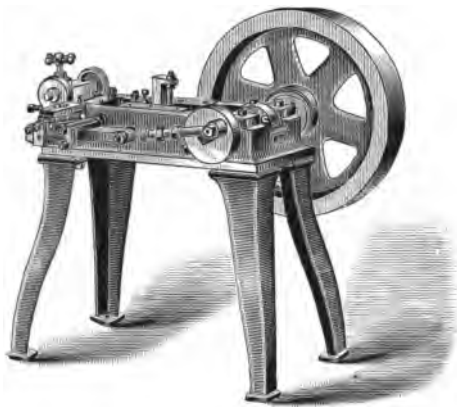
Stove-Rod Heading Machines.

These machines are properly Open Die, Single-Stroke Headers, arranged with special reference to cold-heading bolts or wires that are too long to be fed automatically. We make two sizes of this machine, the larger of which is illustrated on this page. By recent improvements we are enabled to dispense with the secondary shaft and gears formerly used, and operate the gripping toggles at the back of the machine, directly from eccentric on the main shaft. The No. 2 machine will head $\frac{3}{8}$ inch wire of any length, and requires a floor space of $2\frac{1}{2} \times 7$ feet. The stroke is $2\frac{1}{4}$ inches. Wheel 60 inches in diameter and $6\frac{1}{2}$ inches face. All adjustments are conveniently arranged, and the workmanship is first-class.

The No. 1 machine will head wires $\frac{1}{4}$ inch in diameter. Requires floor space of about $2\frac{1}{2} \times 5\frac{1}{2}$ feet. Stroke is $1\frac{1}{2}$ inches. Wheel, 38 inches in diameter and $4\frac{1}{2}$ inches face.

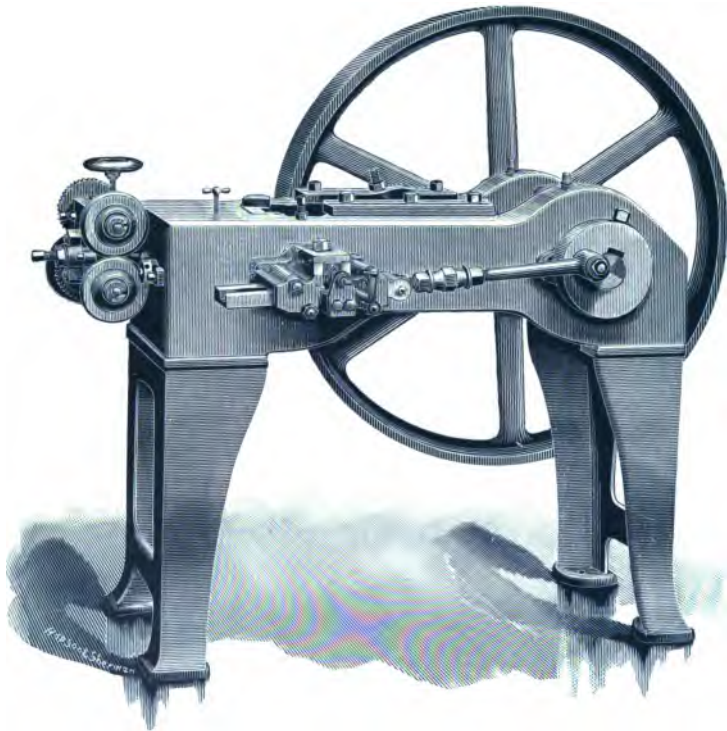
No. 1,	Weight, 2,500 lbs.	Price, \$600.00.
" 2,	" 7,500 "	" 950.00.

For heading small wires see page 266.



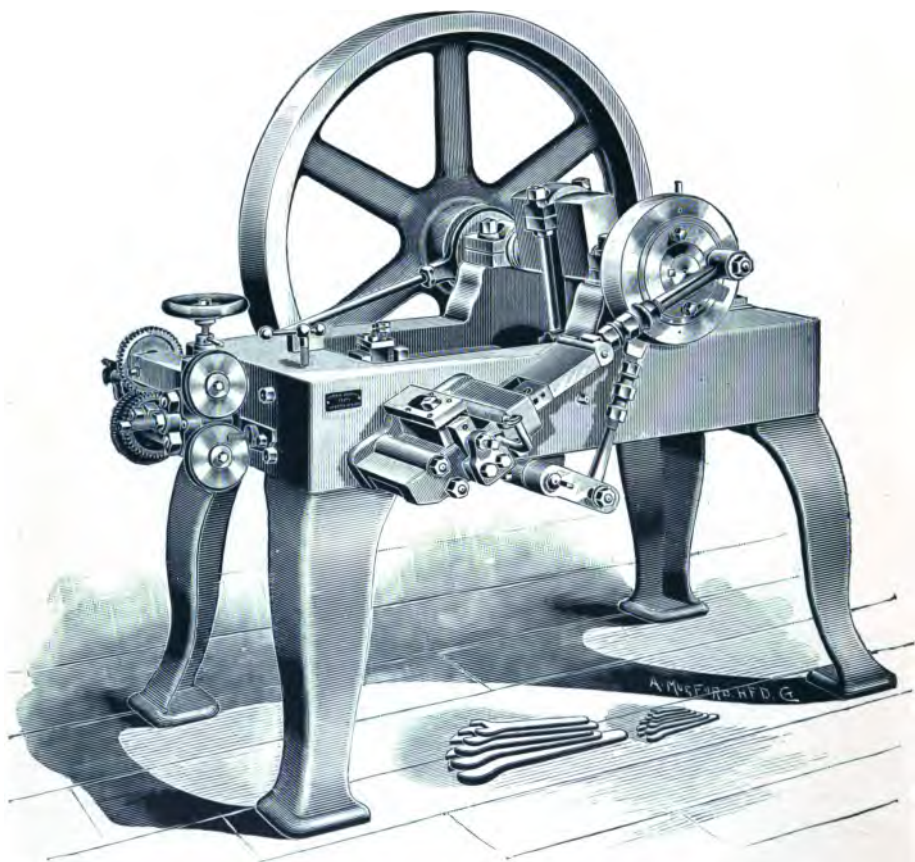
No. 0 Solid Die, Single Stroke Rivet Machine.

NUMBER OF MACHINE,		0	1	2	3
Diameter of wire the machine will work,	inches,	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{5}{16}$	$\frac{3}{8}$
Length of rivet the machine will make,		$1\frac{1}{2}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
Diameter of fly wheel,		20	$44\frac{1}{2}$	48	60
Face of fly wheel,		$3\frac{1}{2}$	$4\frac{1}{2}$	5	$6\frac{1}{2}$
Number of revolutions per minute,		125	90	80	60
Weight, complete,	lbs.,	900	2,900	4,300	6,500
Price,		\$450	\$700	\$950	\$1,350



Solid Die, Single Stroke Rivet Machines.

The illustration shows the No. 1 size of Solid Die, Single Stroke Rivet Machine. They are made with steel shafts and tool-holders. All parts are adjustable for wear and for different sizes of work. They will work up all of the wire, and new pieces of wire can be fed in without stopping the machine. The length of wire feed and the length of rivet can be adjusted while the machine is in motion. The cut-off is arranged to clamp the wire rigidly while being cut off, insuring a square cut blank which can be headed true. Each machine is supplied with necessary wrenches, and fitted with one set of dies tested to produce sample work.



Solid Die, Double Stroke Rivet Machine.

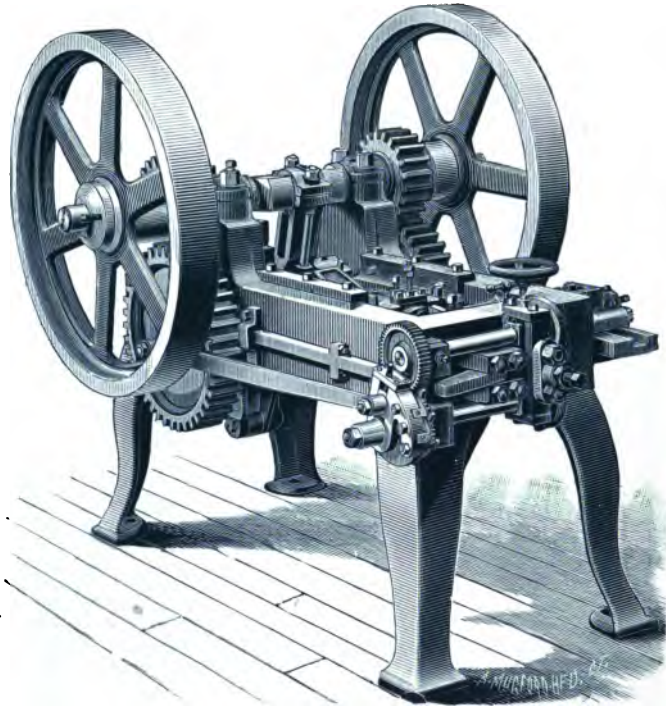
The illustration represents the No. 2 size of this class of machine. They are made of the best material, in the most thorough manner, with all necessary adjustments for wear and for different sizes of work. They will work up the ends of the wire, and new pieces of wire can be fed in without stopping the machine. The adjustments for length of rivet and for the length of wire feed can be regulated while the machine is in motion.

Solid Die, Double Stroke Rivet Machines.

	NUMBER OF MACHINE,			
	0	1	2	3
Diameter of wire the machine will work, Inches,	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$
Length of rivet the machine will make,	$\frac{3}{4}$	$1\frac{1}{8}$	$1\frac{1}{2}$	$2\frac{1}{8}$
Diameter of fly wheel,	20	36	42	62
Face of fly wheel,	$3\frac{1}{2}$	$4\frac{1}{2}$	$5\frac{1}{2}$	7
Number of revolutions per minute,	125	90	75	55
Weight, complete,	800	2,000	3,800	8,000
Price,	\$600	\$750	\$950	\$1,650

The prices include necessary wrenches, and one set of tools fitted and tested to produce sample work.

NOTE.—The sizes of wire that machine will work are calculated for iron; they may be exceeded in many cases, especially for brass and copper work.

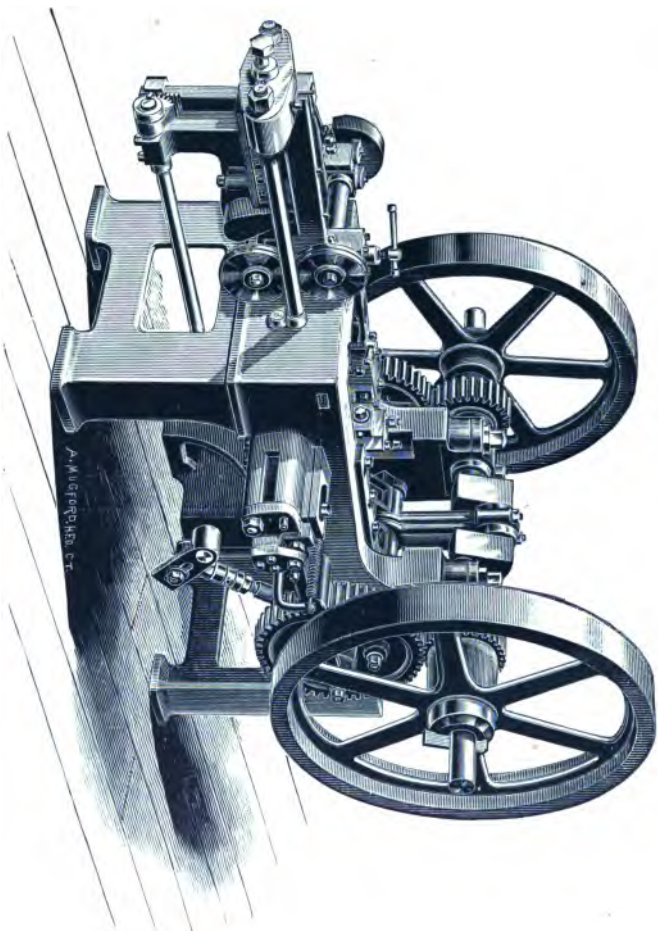


Solid Die, Double Stroke, Geared Rivet Machines.

The illustration represents the No. 2½ size of Solid Die, Double Stroke, Geared Rivet Machines. They have independent knock-out motion, will work up all of the wire, and can be adjusted same as the plain machines.

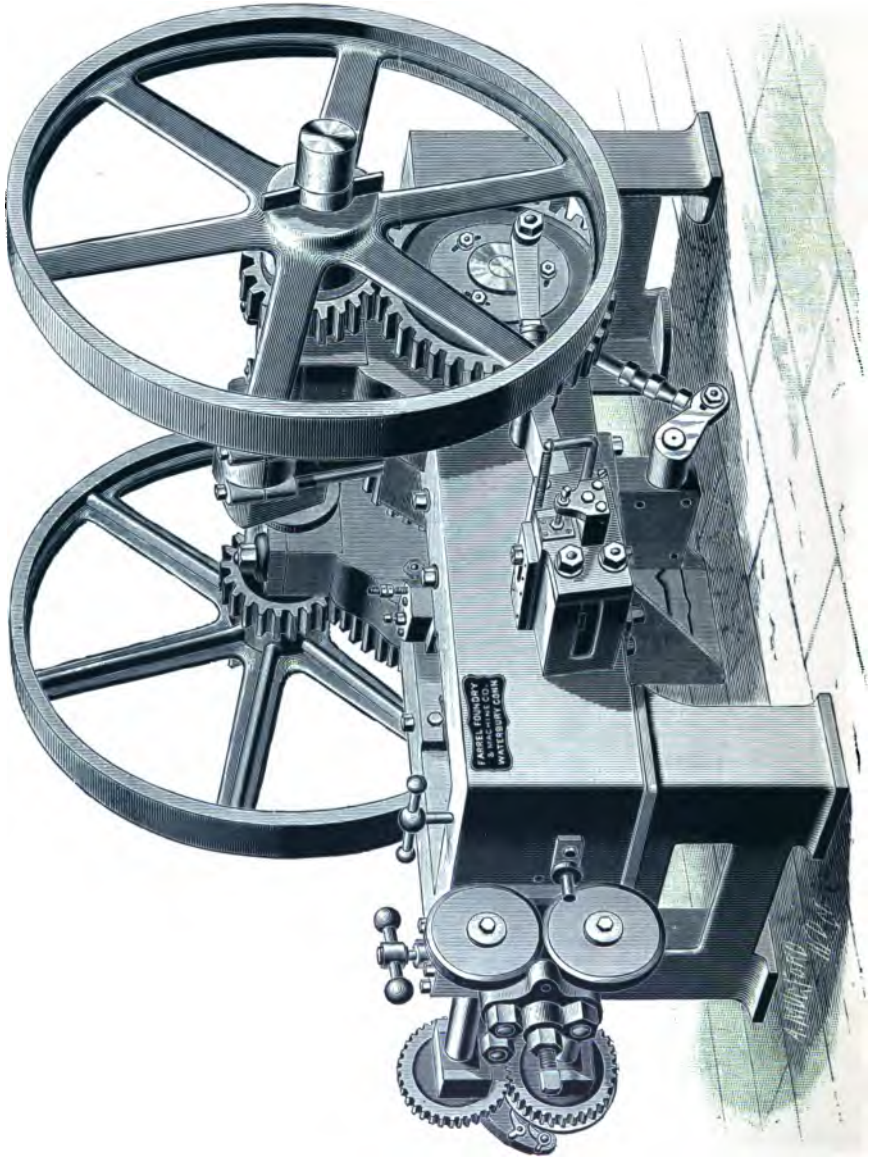
	NUMBER OF MACHINE,	2½	3½	5
Diameter of wire the machine will work, inches,		$\frac{5}{16}$	$\frac{3}{8}$	$\frac{1}{2}$
Length of rivet the machine will make,		1½	3	4½
Number of rivets per minute,		60	50	40
Diameter of fly wheel,		36	50	60
Face of fly wheel,		4½	6	6½
Revolutions of fly wheel per minute,		120	100	80
Weight of machine, complete,		5,500	12,800	21,000
Price,		\$1,350	\$2,500	\$3,800

The prices include all necessary wrenches, and one set of tools fitted and tested.



No. 3 ½ Solid Die, Double Stroke, Geared Rivet Machine.

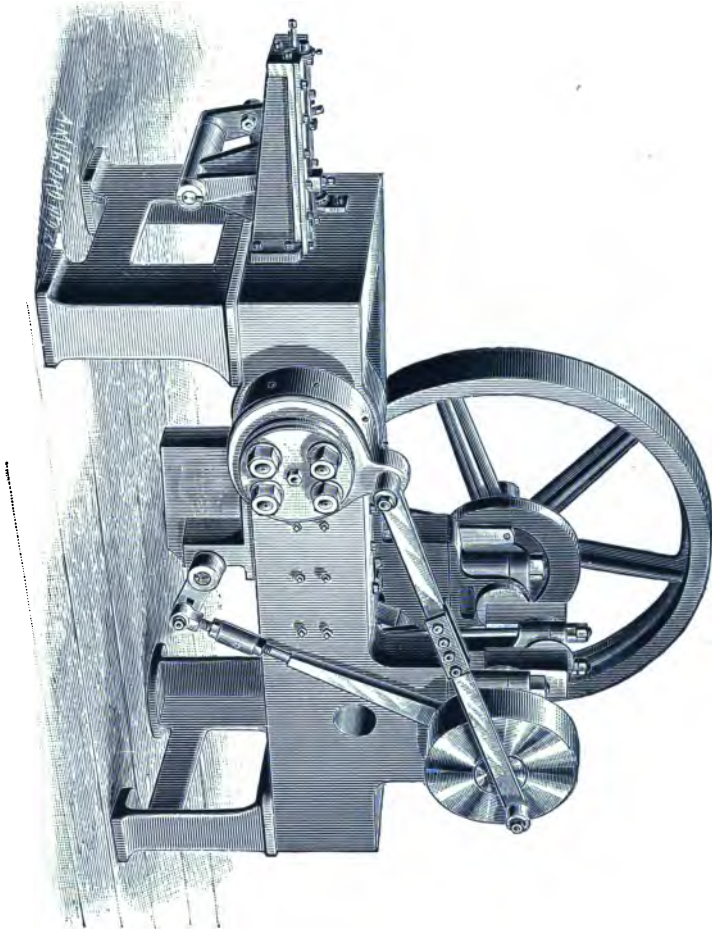
We have recently perfected the No. 3 ½ machine shown in the illustration, and attention is called to the following improvements. The feed and knock-out motions have been revised, and we have added a relief mechanism whereby the end of the knock-out pin, against which the rivet rests when the first blow is struck, is automatically drawn back a short distance—the extent of which can be properly adjusted—and this permits the second blow to drive the rivet further into the die, which in practice enables the machine to easily produce a variety of work that has not heretofore been made by cold heading. All of the gears are cut, and the pinions are of steel.



No. 5 Solid Die, Double Stroke, Geared Rivet Machine.

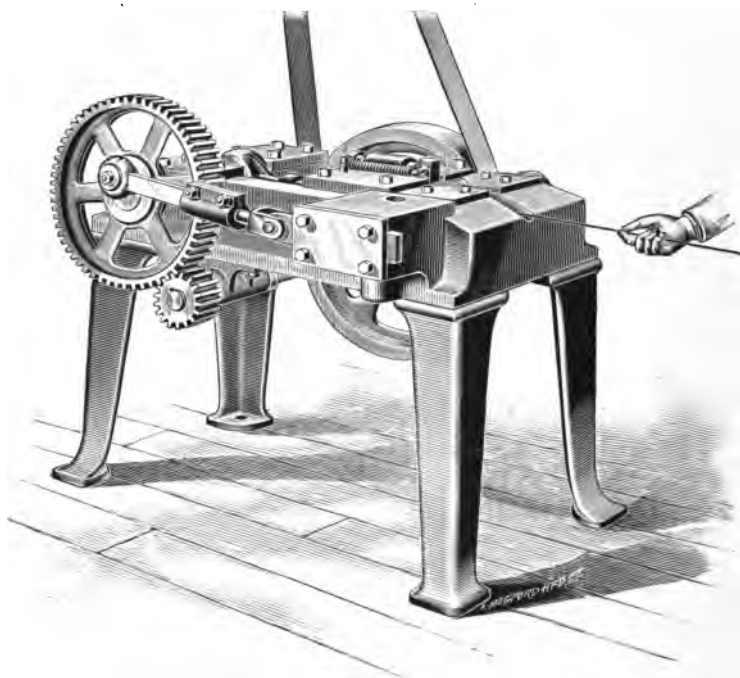
This machine is also built with knock-out and relief mechanism same as illustrated on the No. 3 ½ size.

No. 4 Open Die, Double Stroke Header.



Open Die, Double Stroke Headers.

	NUMBER OF MACHINE,		
	2	3	4
Diameter of wire the machine will work, inches,	$\frac{1}{2}$	$\frac{5}{16}$	$\frac{3}{8}$
Length of rivet the machine will make, .	4	6	8
Diameter of fly wheel,	48	62	72
Face of fly wheel,	5	7	7
Weight, complete,	4,500	8,800	14,000
Price,	\$1,500	\$2,250	\$3,000

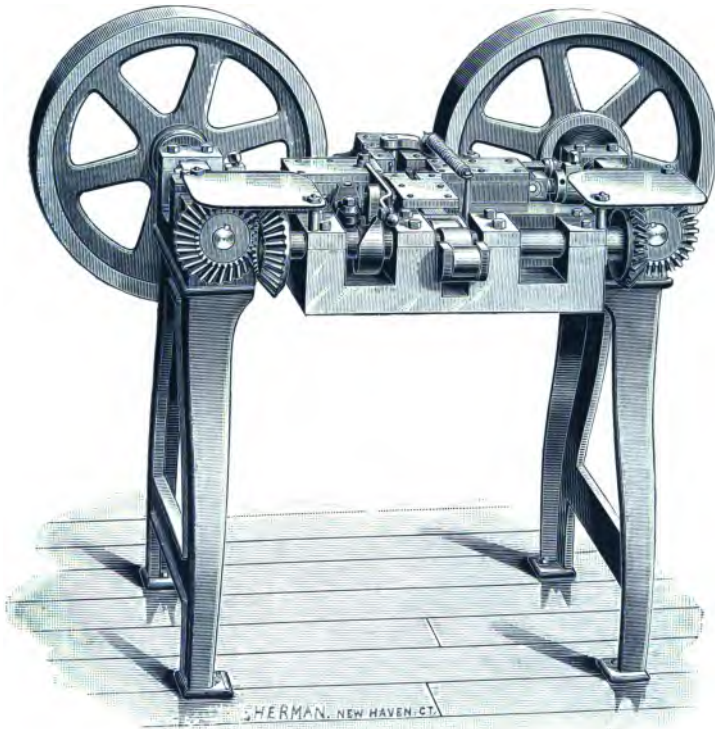


Bicycle-Spoke Heading Machine.

The illustration represents our Special, Single Stroke, Open Die Header, for heading wire to $\frac{3}{16}$ inch in diameter when the wires are too long to be fed automatically. This form of machine is designed especially for upsetting or heading bicycle spokes. The dies are readily accessible, and are so exposed as to enable the wires to be easily and rapidly placed; the machine is without clutch, is geared 4 to 1, and the speed depends upon the operator's ability to feed the wires; say about 40 or 45 per minute. The fly wheel is 20 inches in diameter and $4\frac{1}{2}$ inches face.

Weight, 1,100 lbs.

Price, \$400.00.



Double End Header.

The illustration represents a small Double End Header designed for making corset studs.



Weight, 1,200 lbs. Price with dies and wrenches, \$500.00.

Prices for larger sizes and for any kind of special heading machines will be given upon application.

INDEX.

	PAGE
CHAIN DRAW BENCHES,	168, 244
CLOCK-WHEEL CUTTER,	246
DIE GRINDER,	151
DIE SINKING MACHINE,	150
DROP PRESSES,	140, 149
Drop presses with automatic lifters,	148, 149
Four-poppet drop presses,	142, 143
Six-poppet drop presses,	144, 146
Drop press without poppets,	147
Portable drop presses,	140, 141
FOOT PRESSES,	124, 137
HYDRAULIC DRAW BENCHES,	166, 167
HYDRAULIC PRESSES,	153, 168
HYDRAULIC PUMPS,	164, 165
LATHES,	226, 233
Buffing lathe,	230, 231
Burnishing lathe,	232
Edging lathe,	223
Face-turning lathe,	233
Hand spinning lathe,	226
Seymour spinning lathe,	227
Tapping lathe,	229
POWER PRESSES,	4, 105
Adjustable bed presses,	17, 18
Adjustable leg presses,	14, 15
Arch presses,	24, 28
Automatic feed attachments,	74, 105
Boiler-bottom press,	73
Broaching press,	50
Coining press,	59
Double-acting crank presses,	60, 65
Double-acting cam presses,	66, 68
Double-acting cam geared press,	69
Double-acting cam geared presses (arch),	70, 72
Double-acting gang tool press (patent),	86
Double connection presses,	20, 22
Double connection arch press,	29
Double forging press,	54
Double plunger press,	101
Drawing press,	105
Eccentric-geared drawing press,	48
Geared single-acting presses,	10, 13
Geared drawing presses (arch),	44, 47
Geared drawing press (overhanging),	95
Horizontal drawing presses,	52, 53

POWER PRESSES [Continued].	
Horizontal rack-and-pinion drawing press,	51
Hot trimming press,	55
Knuckle-joint stamping presses,	56, 58
Nut-punching press,	36, 37
Pillar presses,	30, 35
Punching presses and shears (Wilder's),	38, 41
Single acting open back presses,	4, 22
Special presses,	23
Triple-acting press,	100
Upright rack-and-pinion drawing press,	49
Washer press [arch],	43
Washer press [horizontal],	102, 103
RIVET MACHINES,	252, 267
Bicycle-spoke header,	266
Double end header,	267
Open die, single stroke headers,	252, 255
Open die, double stroke headers,	265
Solid die, single stroke headers,	258, 259
Solid die, double stroke headers,	260, 264
Stove-rod header,	257
Upsetting machine,	256
ROLLING MILL MACHINERY,	176
ROLLING MILLS,	177, 195
SCREW PRESSES,	138, 139
SHEARS AND SLITTERS,	
Alligator shears,	204
Arch shear press,	198
Bar iron cutter,	42
Gang slitters,	210, 213
Hand shears,	196
Multiple shears,	245
Oval trimmer,	247
Scrap cutter,	197
Shear Presses,	199, 203
Slitters,	205, 207
Trimming slitters,	208, 209
SPECIAL MACHINERY FOR BRASS AND COPPER MILLS.	
Drying-out machine,	218
Miscellaneous,	222
Muffles and furnaces,	223, 225
Sawing machines,	219, 221
Scraping machine,	217
Straightening machines,	214, 216
SPECIAL MACHINERY FOR MAKING CARTRIDGES,	
.	106, 123
SPECIAL MACHINERY FOR MAKING STRAP AND T HINGES,	
.	240, 243
SPECIAL MACHINERY, MISCELLANEOUS,	
.	248, 249
SPOON-BURNISHING MACHINE,	
.	239
STEAM TABLES,	
.	248
THREADING MACHINES.	
Reciprocating screw-threader,	234, 236
Rotary screw-threader,	237
Screw-cap threading machine,	238
UNIVERSAL GRINDER,	
.	152
WIRE MILL MACHINERY,	
.	170, 175

Memorandum.

DROP PRESSES, ETC.

Barrel Foundry

WATERBURY
• Conn. •
U. S. A.

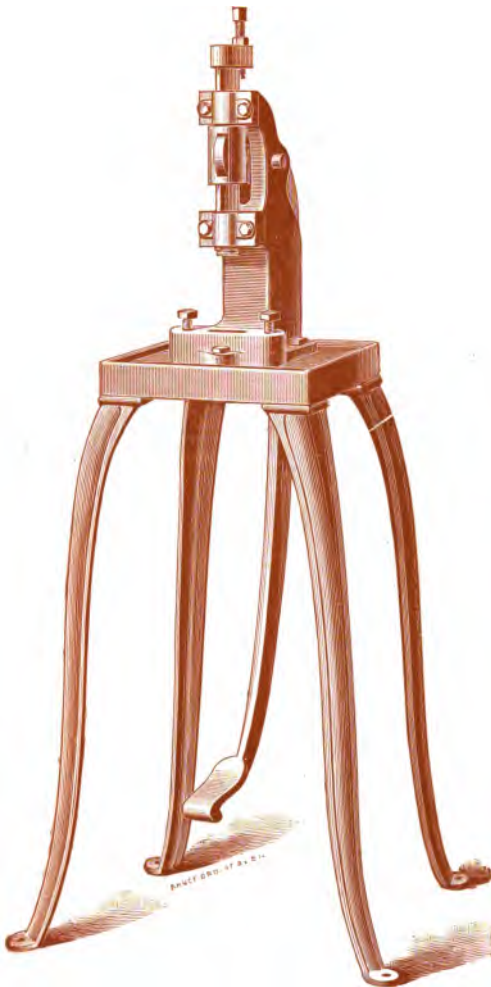
PAGE NUMBERS IN THIS PAMPHLET CORRESPOND WITH 1893 CATALOGUE.



No. 0 Round Slide Foot Press.

The motion of slide is one inch; distance from bed to bottom of guide, $3\frac{1}{2}$ inches; distance from bed to bottom of slide when down, $2\frac{1}{4}$ inches; size of bed, $5\frac{1}{4} \times 3\frac{1}{4}$ inches; opening in bed, $1\frac{1}{2}$ inches; distance between die-bed bolts, 4 inches.

Weight, 50 lbs. Price, \$12.50.

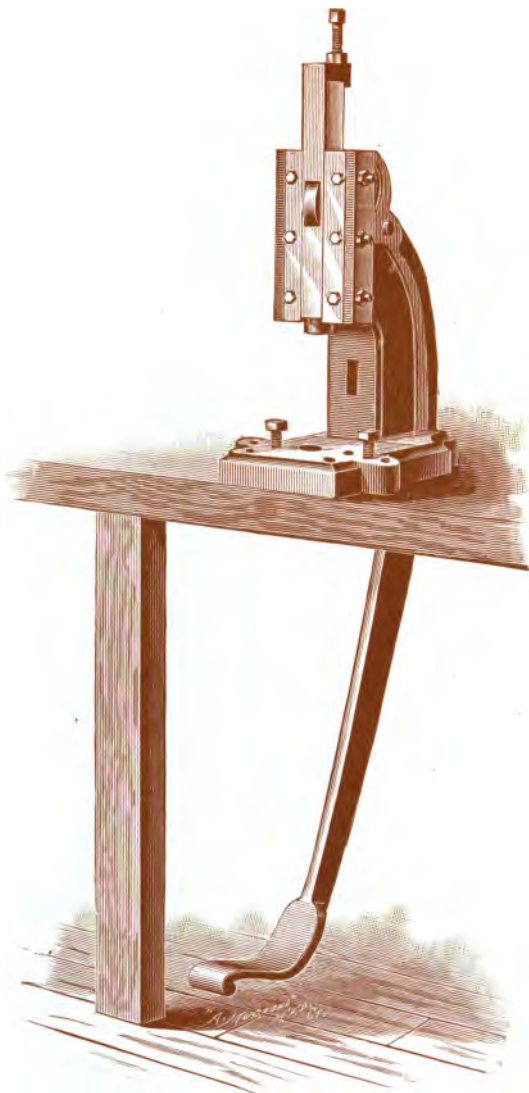


No. 1 Square Slide Foot Press.

Stroke, $1\frac{1}{2}$ inches; distance from bed to bottom of guide, $4\frac{1}{2}$ inches; from bed to bottom of slide when down, $2\frac{1}{2}$ inches; from center of slide to upright, $2\frac{1}{2}$ inches; size of bed, 7 x 5 inches; opening through bed, $2\frac{1}{2}$ inches diameter; distance between die-bed bolts, 5 inches.

Weight without Table, 92 lbs. Price, \$17.00.

Weight with Table, 180 lbs. Price, 26.00.



No. 2 Foot Press with Iron Kick-Treadle.

This cut shows the size and kind of foot press in most general use among the manufacturers of brass goods; specifications are as follows: Stroke, $1\frac{3}{4}$ inches; distance from bed to bottom of guides, 6 inches; distance from bed to bottom of slide when down, $2\frac{3}{4}$ inches; from center of slide to upright, 3 inches; distance between die-bed bolts, $5\frac{1}{2}$ inches or $7\frac{1}{2}$ inches; opening in bed, 2 inches diameter.

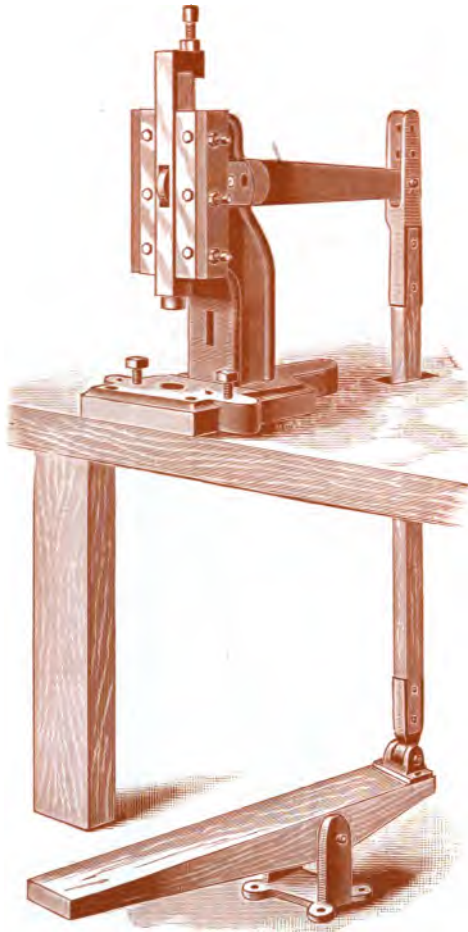
Weight, 130 lbs. Net Price, \$18.00.



No. 2 Foot Press with Gibbed Slide, on Table.

Stroke, $1\frac{3}{4}$ inches. Other dimensions same as on previous page. The table is 24 x 30 inches, and 36 inches high; iron drawer fitted when desired.

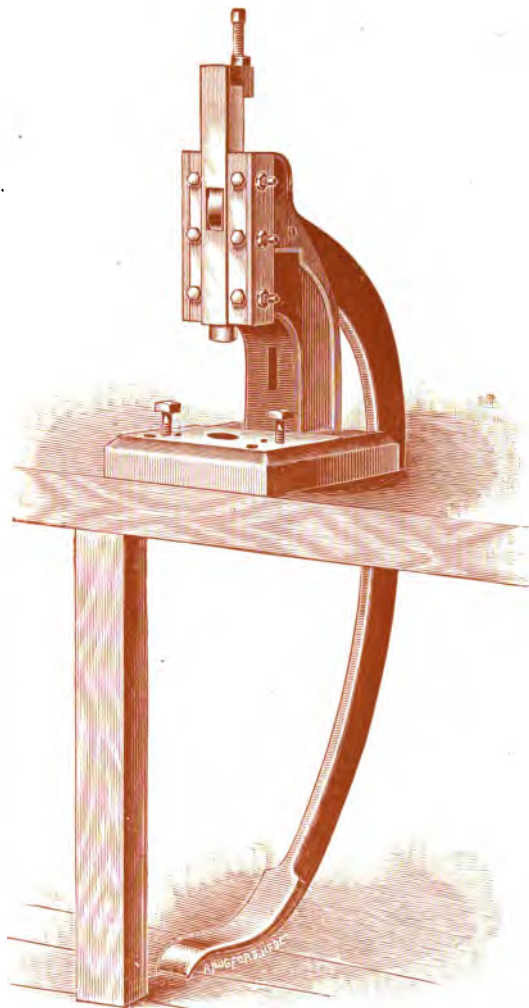
Weight, 300 lbs. Price, \$28.00.



No. 2 Foot Press with Gibbed Slide and Wood Treadle.

Stroke, $2\frac{1}{2}$ inches; distance from bed to bottom of guides, 6 inches; from bed to bottom of slide when down, $2\frac{3}{4}$ inches; from center of slide to upright, 3 inches; distance between die-bed bolts, $5\frac{1}{2}$ or $7\frac{1}{2}$ inches; size of bed, 7 x $5\frac{3}{4}$ inches without the legs.

Weight, 130 lbs. Price, \$18.00.



No. 2 Foot Press, with Extra Wide Bed.

Stroke, $2\frac{1}{2}$ inches; distance from bed to bottom of guides, 6 inches; distance from bed to bottom of slide when down, 3 inches; distance from center of slide back to uprights, 4 inches; distance between die-bed bolts, $7\frac{1}{2}$ or $5\frac{1}{2}$ inches; size of bed, 10 x 7 inches; hole in bed, $1\frac{3}{4}$ inches diameter.

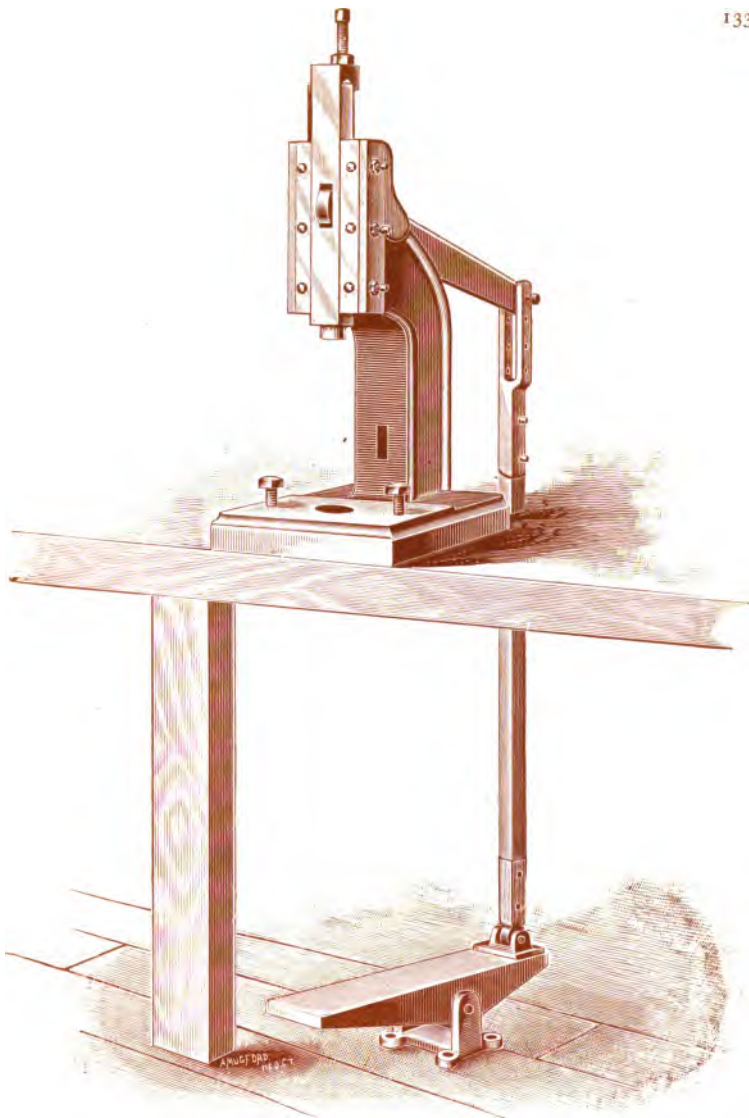
Weight, 170 lbs. Price, \$20.00.



No. 2 Foot Press, Extra High.

Distance from bed to bottom of guides, 9 inches. Other d'mensions same as regular No. 2 Gibbed Slide Foot Press.

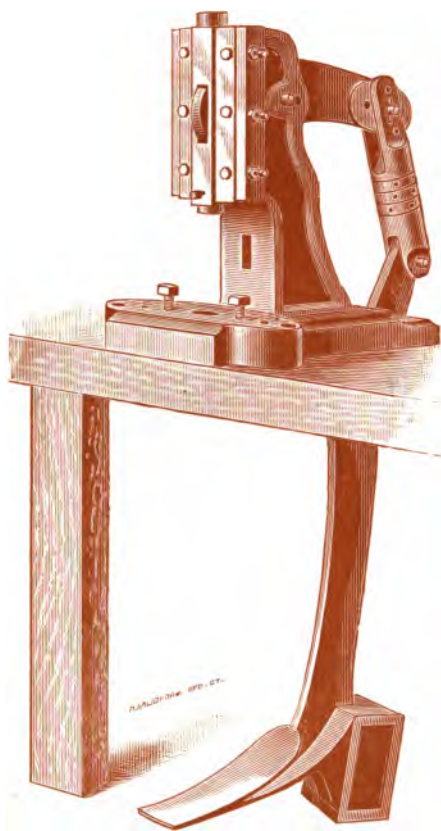
Weight, 155 lbs. Price with Treadle, \$20.00.



No. 2 Foot Press, Extra High.

Stroke, 2 inches; distance from bed to bottom of guides, 10 inches; distance from bed to bottom of slide when down, $7\frac{1}{2}$ inches; distance from center of slide back to uprights, $5\frac{1}{2}$ inches; distance between die-bed bolts, $5\frac{1}{2}$ or $7\frac{1}{2}$ inches; size of bed, $8\frac{1}{2}$ x 10 inches; hole in bed, 2 inches diameter.

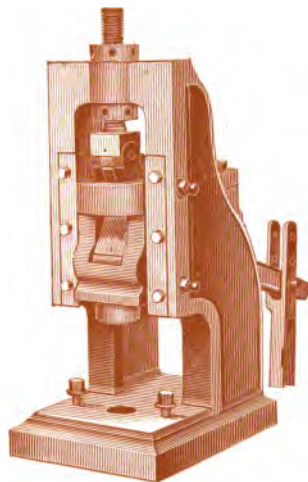
Weight, 185 lbs. Price, \$24.00.



Weighted Compound Lever Foot Press.

Stroke, 1 inch; distance from bed to bottom of guides, $6\frac{1}{8}$ inches; from bed to bottom of slide, when down, 5 inches; from center of slide to uprights, 3 inches; distance between die-bed bolts, $5\frac{1}{2}$ or $7\frac{1}{2}$ inches; size of bed, 13 x 6 inches; opening in bed, $2\frac{1}{4}$ inches diameter.

Weight, 290 lbs. Price, \$45.00.



Knuckle-Joint Foot Press.

	NUMBER OF PRESS,	
	1	2
Stroke,	2 $\frac{1}{8}$ inches.	4 inches.
Distance from bed to bottom of guides,	6 $\frac{1}{4}$ "	6 $\frac{1}{4}$ "
Distance from bed to bottom of slide when down,	4 $\frac{1}{4}$ "	6 $\frac{1}{4}$ "
Distance from center of slide to uprights,	3 "	3 $\frac{1}{2}$ "
Distance between die-bed bolts,	4 $\frac{1}{2}$ or 6 $\frac{1}{2}$ in.	6 $\frac{1}{2}$ or 8 in.
Weight,	275 lbs.	375 lbs.
Price with treadle,	\$60.00	\$83.000

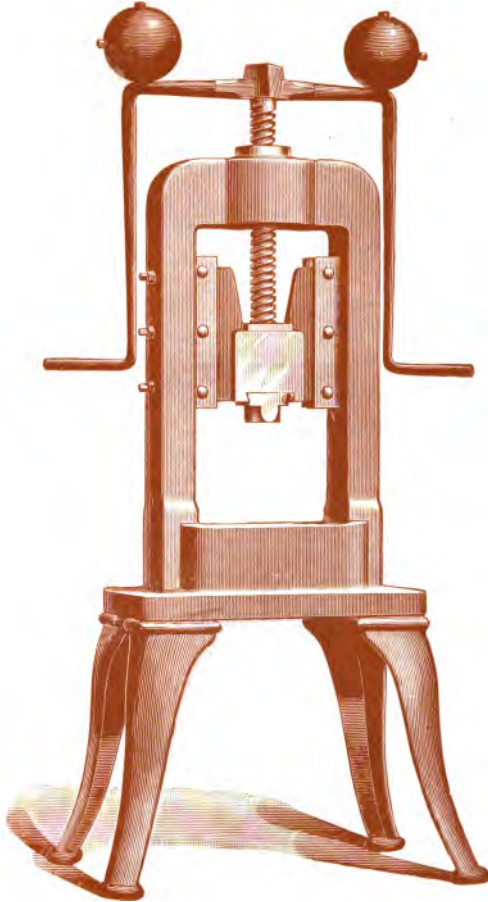


Hand Screw Press.

We make to order a variety of hand screw presses in addition to those described below. We put in gun metal bushing and steel screws with double or triple thread, as may be desirable.

NUMBER OF PRESS,	1	2	3	4
Weight, about	420 lbs.	800 lbs.	1,100 lbs.	1,400 lbs.
Price,	\$80.00	\$120.00	\$150.00	\$180.00
Bed to bottom of slide when up.	6½ in.	8½ in.	9 inches.	10 inches.
Distance back from center of slide,	3 "	6 "	7 "	8 "
Diameter of steel screws,	2 "	2½ "	2¾ "	3 "

Double or triple thread, with pitch as desired.



Arch Screw Press.

This press has been especially designed to supply a first-class screw press for tool-room use in testing new dies. The stroke of slide is $4\frac{1}{2}$ inches; the distance from bottom of guides to bed, 11 inches; distance between uprights, 15 inches; the bed is 10 inches wide, with opening 3 inches in diameter, or as desired; diameter of steel screw, $2\frac{1}{2}$ inches; double thread with $1\frac{1}{2}$ inches pitch.

Weight, 1,750 lbs. Price, \$200.00.



Portable Bench Drop Press.

Distance between poppets, 5 inches.

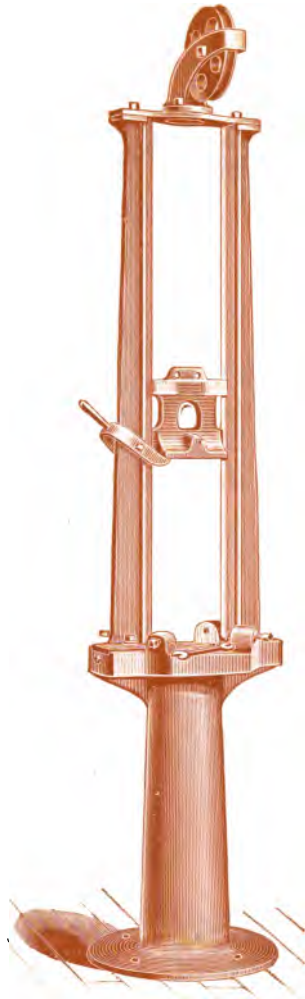
Height from floor to top of base is 15 inches.

Weight of hammer, 25 lbs. to 50 lbs., as wanted.

Weight, 450 lbs. Price, \$65.00.

We make a Heavy Bench Drop as follows:

Weight of Hammer.	Total Weight.	Size of Base.	Height of Base.	Length of Uprights.	Distance between Uprights.	Price.
320 lbs.	3,400 lbs.	38i n. x 18 in.	12 in.	60 in.	26 in.	\$275.00



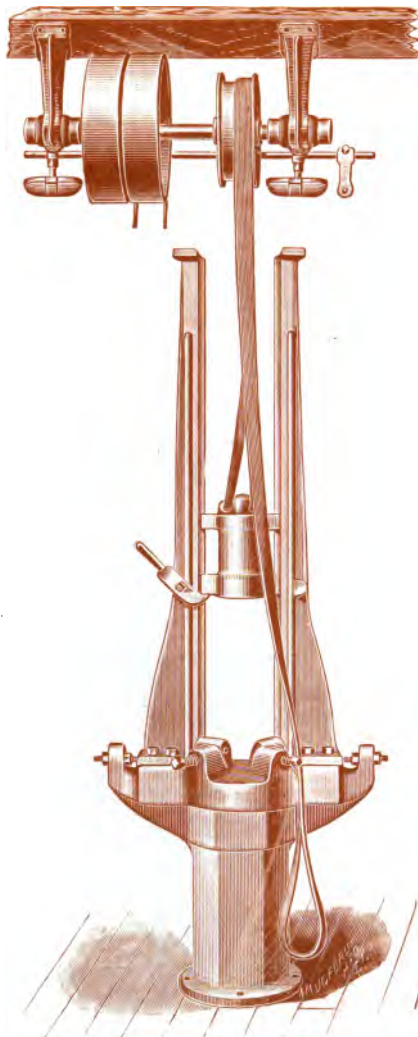
Portable Drop Press.

The above illustration shows portable drop press, with round base 22 inches in diameter at the bottom, and 36 inches high. The rails are 5 feet long. The distance between poppets and between points of rails is $5\frac{1}{2}$ inches. The hammer can be made from 15 to 60 pounds in weight, with any desired holder for punches.

Weight complete, 700 lbs. Price, \$90.00.

Another pattern is just like the above, except the distance between poppets is $5\frac{1}{2}$ inches x $8\frac{1}{2}$ inches, or 8 inches x 8 inches, and the distance between rails is 9 inches.

Weight, 850 lbs. Price, \$100.00.



Four-Poppet Drop Presses.

Made with heavy cast iron poppets and steel screws.

No	Weight of Hammer.	Total Weight.	Diam of bottom of Base.	Height from floor to top of Base	Length of Uprights	Distance between Uprights.	Distance between Poppets.	Price with Counter-shaft
1	80 lbs.	1000 lbs.	14 in.	27 in.	60 in.	7 $\frac{3}{4}$ in.	6 $\frac{3}{4}$ in.	\$130
1 $\frac{1}{2}$	120 "	1600 "	16 "	29 "	68 "	9 "	8 "	150

These presses are popular for all kinds of light stamping. Price includes dove-tail in hammer.

Four-Poppet Drop Presses.

Made with heavy wrought iron poppets and steel screws.

No.	Weight of Hammer.	Total Weight.	Diam. of bottom of Base.	Height from floor to top of Base.	Length of Uprights.	Distance between Uprights.	Distance between Poppets.	Price, with Countershaft.
1	90 lbs.	1000 lbs.	14 in.	27 in.	60 in.	7¾ in.	6¾ in.	\$140
2	150 "	2000 "	16 "	29½ "	68 "	9½ "	10 "	190
2½	175 "	2500 "	20 "	29½ "	72 "	9½ "	12 "	225
3	250 "	3500 "	24 "	30½ "	72 "	12 "	12 "	275
4	350 "	5000 "	26 "	33 "	72 "	14 "	14 "	350
5	500 "	8500 "				20 "		510

Sizes No. 1 and No. 2 we carry in stock, and other sizes built on short notice. We will fit hammers to receive any tools, and make the form and weight as desired. The hammer is raised by aid of flanged pulley on an overhead shaft, by which the operator has the hammer under perfect control, and can deliver a light or heavy blow at will.

If countershaft is not wanted, deduct \$20 from above prices.

The above Drops are the same in general outline as cut on the previous page.

Six-Poppet Drop Presses.

These Drops are designed for stamping spoons, forks and silverware, and are made with heavy wrought iron poppets and large steel screws. The distance between the poppets is made suitable for the required work. We will fit the hammers to receive any tools or fixtures, without extra charge.

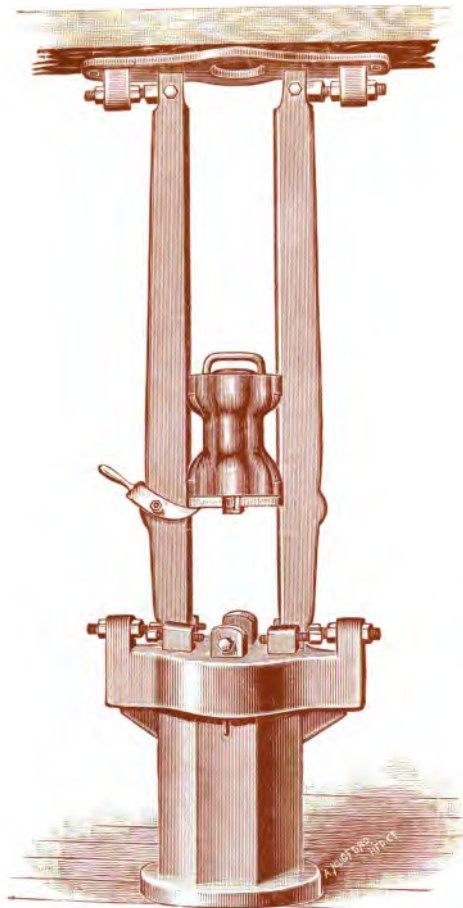
No.	Weight of Hammer	Total Weight.	Diam of bottom of Base.	Height from floor to top of Base.	Length of Uprights	Distance between Uprights.	Distance between Poppets.	Price, including Counter-shaft.
1	200 lbs.	3100 lbs.	20 in.	30 $\frac{1}{2}$ in.	72 in.	8 $\frac{1}{2}$ in.	9x10 in	\$275
2	350 "	4500 "	26 "	32 "	72 "	12 $\frac{1}{2}$ "	12x14 $\frac{1}{2}$ "	400
3	550 "	7250 "	56 "	32 "	78 "	12 $\frac{1}{2}$ "	14x14 $\frac{1}{2}$ "	525
4	800 "	9500 "						650

When Automatic Lifter is wanted, please note description of our new lifter.

These Drops are made from recent designs; the accompanying cut being an old one gives a rather poor conception of the modern press. The rails are held by large bolts extending through the projecting end of the bed, with deep nuts on top, which rest upon bosses built up high on the sides of the rails, in order to strengthen the arch and the bottom of the rail.



Six-Poppet Drop Presses.



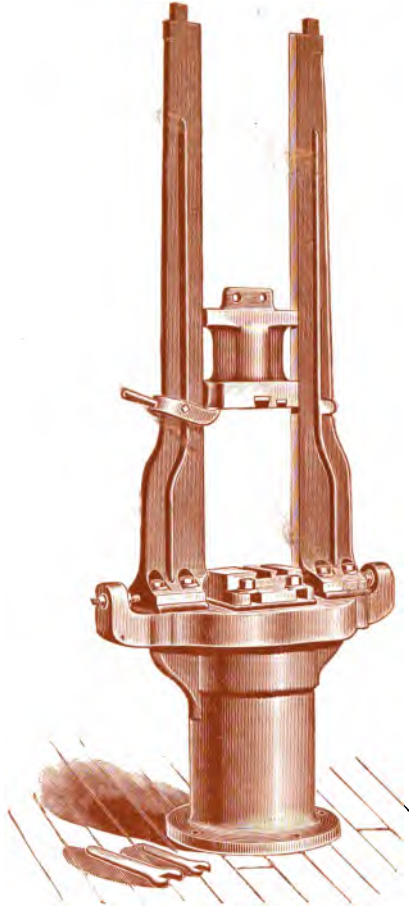
Special Six-Poppet Drop Presses.

With Shackled uprights.

This form of drop is much used for work requiring special adjustment of the upright to bring the dies in proper surface relation to each other, as for spoons, forks, etc. The pivotal connection of the uprights to both base and yoke makes this universal adjustment an easy one. Dimensions of Drop shown are as follows: Weight of hammer, 350 pounds; height of base, 34 inches; length of uprights, 84 inches; distance between uprights, $12\frac{1}{4}$ inches; distance between poppets, 11 x 12 inches.

Total Weight, 5,000 lbs. Price, \$450.00.

We construct (when so ordered) any of our six-poppet Drops with uprights arranged as above.



Drop Presses without Poppets.

FOR CUTLERY AND HARDWARE WORK.

We make all sizes Drops (previously described) without any poppets, and arranged to hold dies of all sizes. The dimensions of special pattern Drop shown in the above cut are as follows: Diameter of bottom of base, 16 inches; height from floor to top of base, 29 inches; length of uprights, 6 feet; distance between uprights, 12½ inches; total weight, 2,900 lbs. Price, including countershaft, \$200.

DROP HAMMERS.

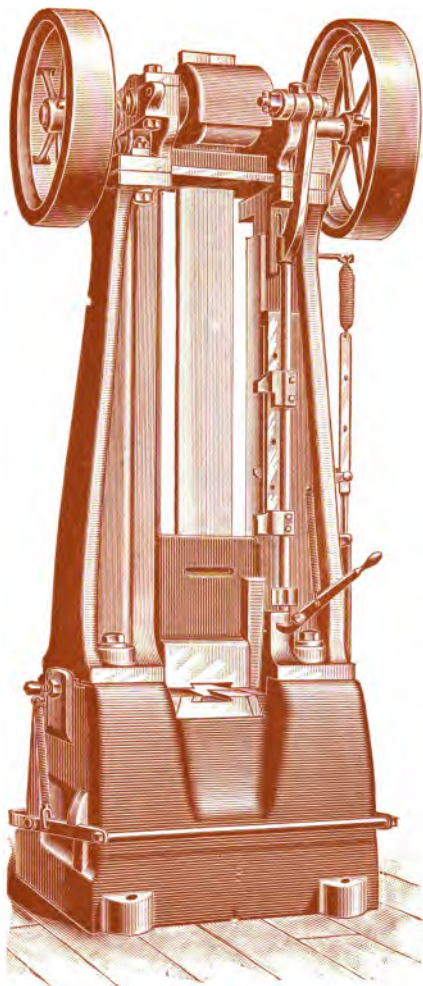
WITH AUTOMATIC LIFTER.

With many years' experience in the manufacture of Drop Presses for various purposes, and after a very careful investigation of the Power Drop, we have taken advantage of the opening in the market for a first-class Drop for forging and for stamping, and have designed a machine which fully meets the demand for a first-class, substantial Power Drop Hammer. Réference to the accompanying illustration, together with the following explanation, giving some details of the improved construction of this press, will show it to be very simple and thoroughly efficient. The base and rails are of extra heavy weight and are made of charcoal iron, the long, heavy bolts used to secure these rails being specially adapted to their particular work.

As the constant jar to which this class of machine is subjected crystallizes its members, especially bolts under strain, we have so arranged that no tapping is done in the cast iron. Every bolt and screw is used in connection with a removable wrought iron nut dropped into a pocket, so that when a bolt is ruptured it can be readily removed and replaced.

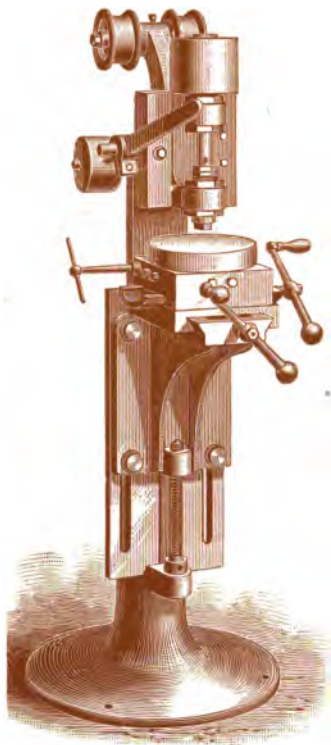
The principle of action in this hammer is old and well tried. The hammer-head, which is of forged steel, is raised by friction rolls acting on the board attached to the head. Both of these friction rolls are belt-driven, one by crossed and one by open belt, thus doing away with objectionable gearing. One of these rolls is carried in stationary adjustable boxes, while the other is supported in an eccentrically-hung frame, in such a manner that the raising and lowering of the rod shown on the front of the right-hand rail will force the friction roll to or from the back roll. When the rod is allowed to drop, its weight is sufficient to clasp the board firmly, and the rotation of the rolls will cause the hammer to rise until the rolls are separated by the rod being lifted, through the action of lugs on the hammer, in the well-known manner. The eccentric-yoke or frame carrying the moving roller is a steel casting, bushed with removable bronze sleeves where the roll-shaft runs. These bearings being in one single casting cannot get out of perfect alignment, and can be easily repaired when worn. The roller-frame is in one casting, with caps to hold the rolls in place. Either roll may be removed without disturbing the other. The several positions from which the hammer may fall are fixed, and the catch-lever may be set in any position desired as this has been found superior to any kind of frictional device for suspending the hammer.

The character of blows and extent of control which the operator has may be summed up as follows: Depressing the treadle releases the catch from the hammer and permits it to fall. If the foot is removed from the treadle as soon as the blow is struck the hammer will return to its set position, and rest. If, however, the treadle is held down, repeated blows are struck from the predetermined height.



Drop Hammers with Automatic Lifters.

Weight of Hammer.	Total Weight.	Length of Uprights.	Height from floor to top of Pulleys.	Distance between Uprights at Base.	Size of Bottom of Base.	Diam. and Face of Pulleys	Revolu. per Minute.	Price.
lbs.	lbs.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.		\$
400 "	8,000 "	5ft. 5in.	9ft. 6in.	14 "	24x34 "	20x6 "	136	700.00
500 "	10,000 "	5ft. 6in.	10ft. 6in.	15 "	24x36 "	24x6 "	125	850.00
700 "	14,000 "	6ft. "	11ft. "	16½ "	30x41 "	30x8½ "	110	1150.00
900 "	18,000 "	7ft. 4in.	12ft. 6in.	19 "	32x45 "	36x8½ "	100	1400.00
1100 "	22,000 "	7ft. 8in.	13ft. "	21 "	34x50 "	36x10½ "	90	1600.00
1250 "	25,000 "	7ft. 8in.	13ft. 6in.	21 "	34x50 "	36x10½ "	85	1800.00
1500 "	30,000 "	7ft. 8in.	13ft. 6in.	21 "	48x54 "	36x10½ "	80	2000.00



Die Sinking Machine.

This machine is useful for all kinds of light drilling and milling operations, and is especially designed for use in tool rooms where light tools and dies are made. The spindle has a vertical movement of $3\frac{1}{2}$ inches. The table has both transverse and longitudinal movement of $4\frac{1}{4}$ inches. It also has a rotary movement and a vertical adjustment of 6 inches. The driving pulley is 5 inches in diameter and calculated for belt $1\frac{1}{2}$ inches wide.

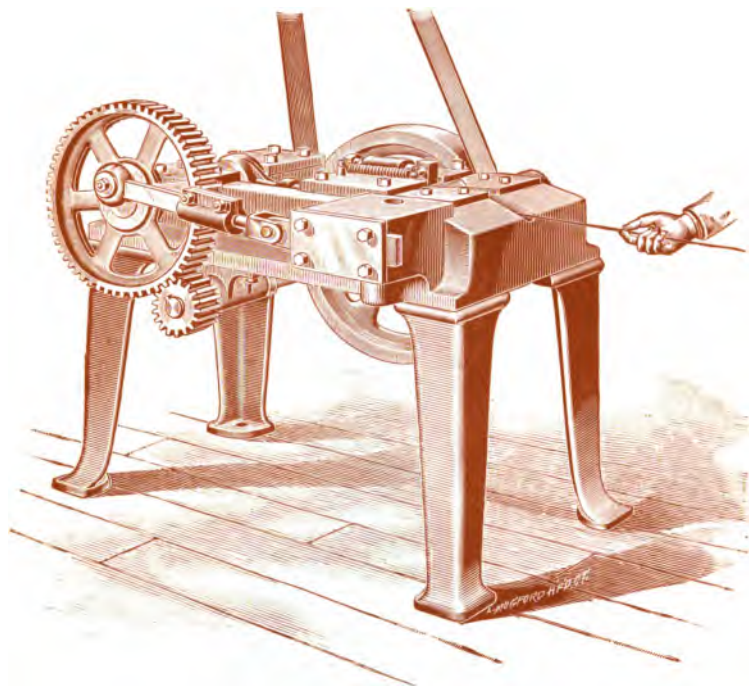
Weight, 650 lbs. Price with Countershaft, \$300.00.



Die Grinder.

This machine will recommend itself to manufacturers using dies for presses, stamps, rivet machines, etc. The spindle is of steel, running in long bearings, and fitted to receive an emery wheel at each end. The work is placed upon the adjustable table and moved back and forth under the wheel. The table is 7 x 10 inches. The greatest distance from table to center of wheel is 15 inches. The driving pulley is 4 inches in diameter and 4 inches face. The countershaft has tight and loose pulleys 6 inches in diameter and $3\frac{3}{4}$ inches face, and driving pulley 14 inches diameter.

Weight, 350 lbs. Price with countershaft, \$75.00.



Bicycle-Spoke Upsetting and Heading Machine.

The illustration represents our Special Single-Stroke Open-Die Header, for heading wire to $\frac{3}{8}$ inches diameter when the wires are too long to be fed automatically. This form of machine is designed especially for upsetting or heading bicycle spokes. The machine is geared 4 to 1; the fly-wheel is 20 x 4 $\frac{1}{2}$ inches. The dies are so exposed as to be readily accessible, and the number of wires that can be headed per minute is from 30 to 40, depending upon the operator's ability to place the wires rapidly. Price includes one set of dies.

Weight, 1,100 lbs. Price, \$375.00.

Extra dies, per set, \$10.00.

Countershaft extra, \$15.00.



Bicycle-Spoke Threading Machine.

The above machine is specially designed for rolling threads on bicycle spokes. In this method of threading wires the thread is formed by rolling up the material, and none of the stock is cut away; the process is very rapid, accurate and economical. The wires are fed in a horizontal position, as it is more convenient to handle them in this way; in our larger thread-rollers the wires are usually in short pieces and are held upright.

Price, including one set of dies, \$225.00.

Additional dies, per set, \$10.00.

: : LIST OF MACHINERY BUILT BY : :
THE WATERBURY FARREL FOUNDRY & MACHINE CO., WATERBURY, CONN.

Rolling Mill Machinery.

Gearing, Shafting and heavy Mill work; Mills for rolling Sheet Brass, Copper, Silver, Steel, Tin-foil, etc.; Brass, Casting Furnaces, Moulds and Mold Racks, Casting Shop Cranes, Copper Furnaces, Annealing Furnaces; Machine for Cabbaging Scrap-metal; Machines for Straightening, for Scraping, for Winding Up, for Drying Out, for Slitting, for Trimming; for Sawing, etc.

Wire Mill Machinery.

Gang Sitters, for slitting wire bars; Rod Moulds; Rolling Mills, with grooved rolls, for rolling rods; Bull Blocks and Draw Benches, for drawing rods; Coiling Machines; Long Spindle and Short Spindle Benches, specially constructed for copper wire, brass wire or iron wire; Wire Thrashing Barrels; Pointing Machines; Straightening Machines; Water Circulating Rolls, for rolling steel wire.

Tube Mill Machinery.

Tube Moulds; Hydraulic Draw Benches and Hydraulic Accumulators; Chain Draw Benches; Annealing and Brazing Furnaces; Machines for Straightening, for Pointing, for Sawing, etc. Of various forms and sizes.

Drop Presses, Foot Presses, Screw Presses.

Of various forms and sizes.

Hydraulic Presses.

Hydraulic Presses planned of any required dimensions, to take any required strain; for Embossing Watch Cases, Britannia Ware, etc.; for making Medals, for Heading Cartridge Shells, for Emery Wheels, etc. Hydraulic Pumps, Hydraulic Valves, with new Automatic Trip Motion.

Power Presses.

Open Back Blanking and Drawing Presses, Arch or Pillar Blanking and Drawing Presses, Solid Back Punching Presses, Horizontal Drawing Presses, Rack and Pinion Drawing Presses, Eccentric-gear Drawing Presses, Adjustable Inclined Presses, Double Acting Crank Presses, Double Acting Cam Presses, Double Connection Presses, Triple Acting Presses, Blasting Presses, Forging and Trimming Presses, Knuckle Joint Presses, Ratchet Dial Feed Attachments, Friction Dial Feed Attachments, Ratchet Roll Feed Attachments, Friction Roll Feed Attachments, Dies and Punches.

Machines for Making Rivets...By Cold Heading.

Single Stroke Open Die Headers, Single Stroke Solid Die Headers, Double Stroke Rod Header, Double End Header. Also Nut Presses, Washer Presses, Bar Presses and Machines for Rolling Threads.

Machines for Making Hinges.

Punching Presses, Bending Machines, Spinning Machines (for upsetting ends of pins), Pin Driving Machine, Broaching Machine, Milling Machine, etc.

Machines for Making Spoons and Forks.

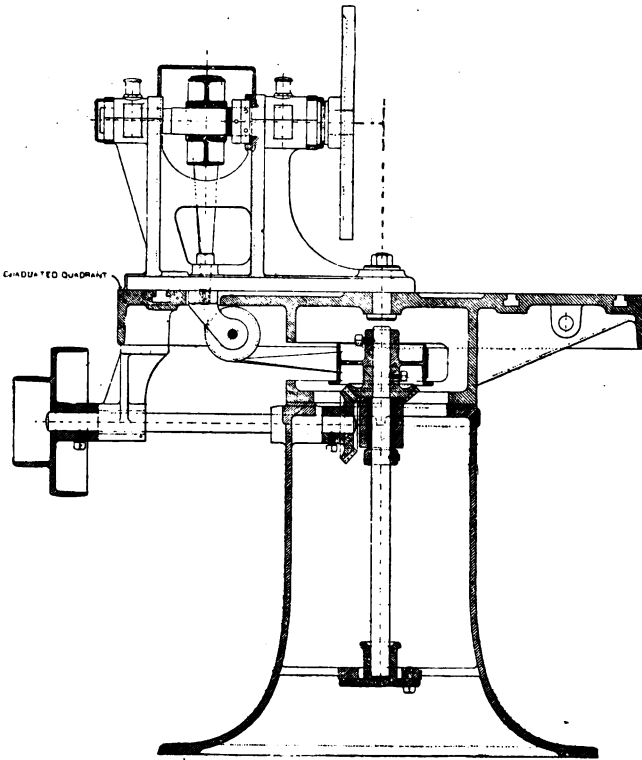
Blanking Presses, Drop Presses, Koiling Mills, Mills for "grading" blanks; Machine for Cutting Lines of Forks, Hydraulic Presses for Hubbing Dies.

Machines for Making Miscellaneous Brass Goods.

Vertical Milling Machines, Die Grinder, Universal Grinder, Screw Press, for tapping, for Knurling, for Screw Cutting.

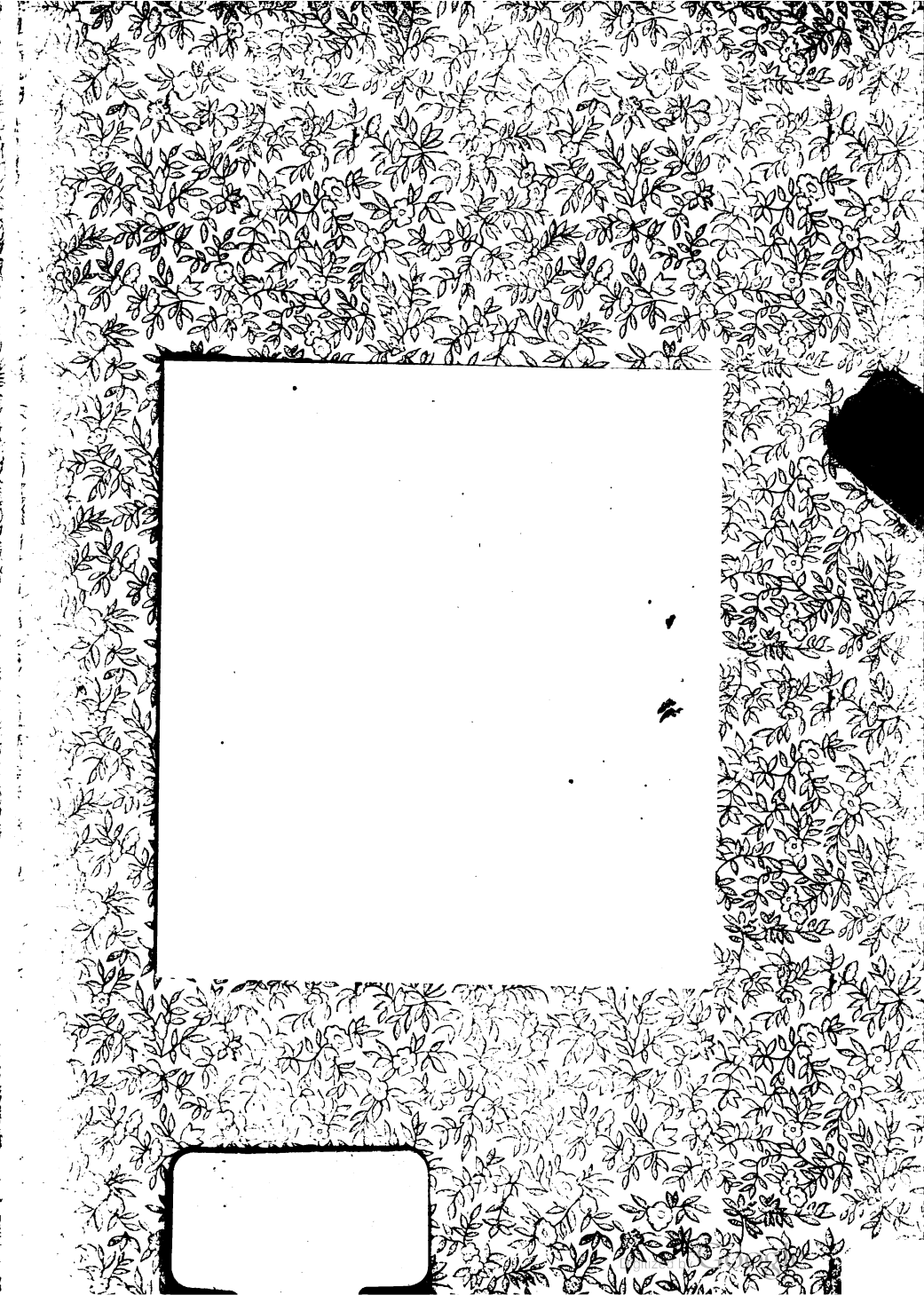
Special Machinery.

Carriage Headers, Trimmers, and Carriage Presses with Automatic Fixtures; Presses and Special Lathes for making Watch Cases; Sub-Presses, Clock Wheel Cutters, Verge Bending Machine, and other Machinery for Clock Manufactures; Machines for Threading Metal Screw Caps; Presses for making Buttons, Coins, Ferrules, Thumbles, etc.; Automatic Machinery.



SECTIONAL DRAWING OF
Universal Grinding Machine.





Eng 1738.93.5
Catalogue and price list.
Cabot Science

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