"Buffalo"

Universal Iron Workers *and* Diagonal Combination Machines

WITHOUT CHANGING TOOLS . . .

- Punch
- Shear Angles
- Cut Bars
- Slit Plates
- Notch
- Cope

BULLETIN 360-F

BUFFALO FORGE COMPANY

BUFFALO, NEW YORK

Canadian Blower and Forge Co., Ltd., Kitchener, Ont.

foreword

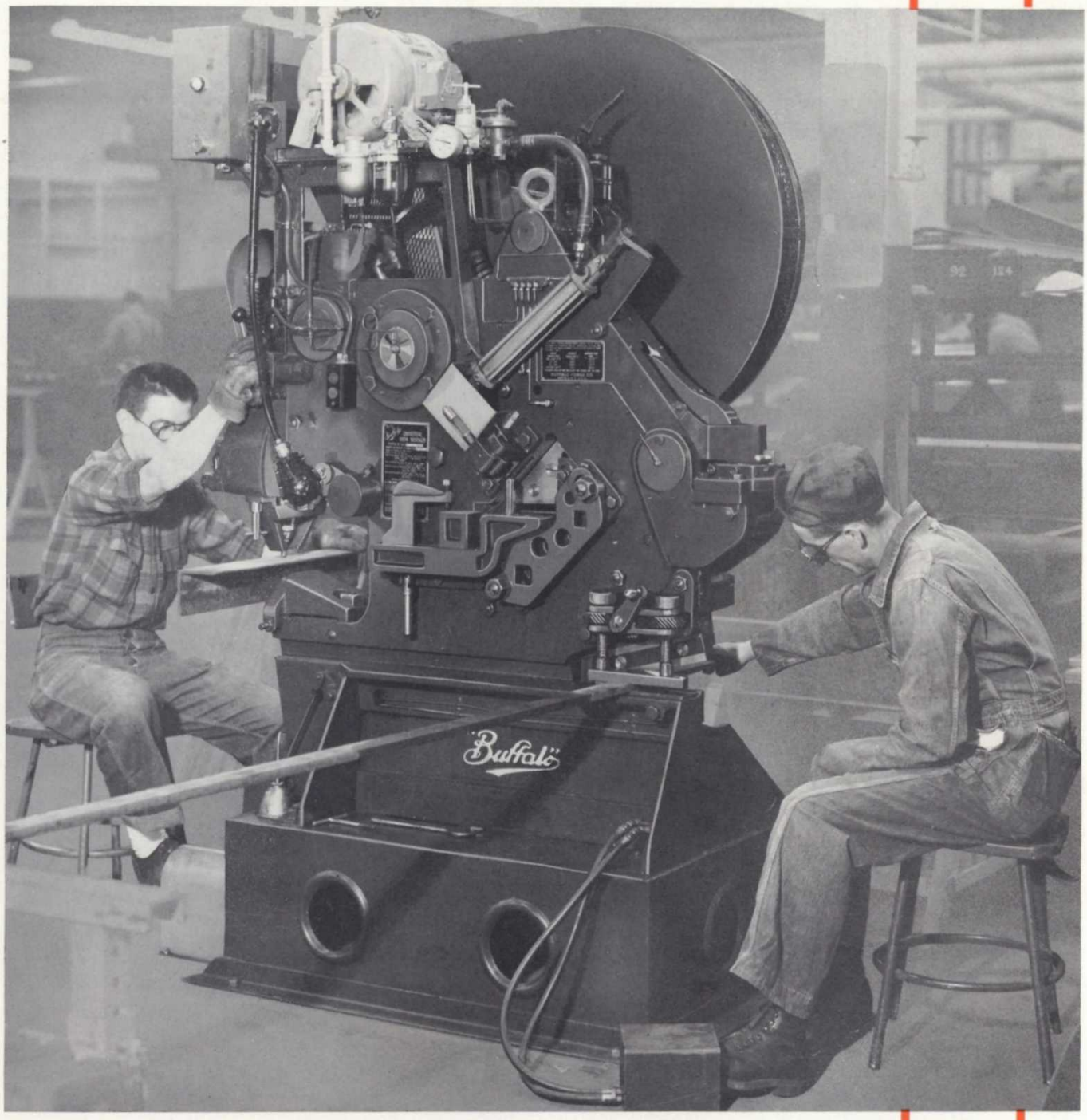
Each passing year adds to the prestige of the proud name of "Buffalo." Every machine bearing this name attests to the progressiveness and integrity of its builders. Having its beginnings in the last century the "Buffalo" Iron Worker has been steadily improved in keeping with the requirements of the metal working industry and manufacturing facilities.

By availing ourselves of better materials and methods in design and construction, we have consistently produced machines that are proving their superiority in every type of shop and factory. A continually growing demand for "Buffalo" Universal Iron Workers indicates better than mere words their popularity and undisputed leadership. The widespread reputation of the "Buffalo" line accounts for the relatively large number of orders that are being received from foreign countries.

The machines shown and described in this bulletin are only a part of the large "Buffalo" family. Other metal working machines built by "Buffalo" are Structural Iron Workers, Billet Shears, Angle Shears, Sprue Cutters, Single and Double End Vertical Punches, Slitting Shears (straight knife type), Horizontal Punches, Special Bar Cutters, Mill-type Shears, Horizontal Bending and Straightening machines, Bending Rolls for angles and shapes, Wrapping Rolls, Single and Multiple Drilling machines for the heavy floor mounted types, Bench Drills and Tapping machines.

A request will quickly bring you a descriptive Bulletin covering any one of the above "Buffalo" products.

BUFFALO FORGE COMPANY
BUFFALO, NEW YORK
CANADIAN BLOWER & FORGE CO., LTD., KITCHENER, ONT.



Punching and shearing simultaneously on a Buffalo No. ½ Universal Iron Worker. Note how shear stripper holds flat tightly against lower knife. Centralized oiling system insures permanent proper lubrication.

"Buffalo" Universal Iron Workers Nos. 0, ½ and 1½

THE "Buffalo" Universal Iron Worker of today represents the accumulated experience of many years. Its principles have been work-tested, man-tested and time-tested in thousands of installations. It is a composite of advanced design and proven efficiency. Its superior features have been zealously preserved and constantly improved.

From the smallest structural shop to the largest fabricating plant, from the simplest maintenance department to the biggest ship-yard, this power-packed Iron Worker represents an indispensable packaged unit of five machines. In considering your requirements of a machine that will do the most work, do the best and most accurate work, occupy the least space, and give you profitable returns from your investment over a longer period, — weigh carefully the facts listed in the following pages.

1. Buffalo Universal Iron Workers are built in three standard sizes, and capacity ranges, — No. 0, No. ½, and No. 1½. See page 11 for all capacities. For Structural Iron Workers see Bulletin No. 3813.

2. All main frames are constructed of specially rolled heavy steel plate electrically welded and stress relieved. Throats are reinforced with rigid, plug-welded separators and fillers giving a maximum of strength where most needed to prevent dangerous deflection under load.

3. All working parts are of high grade steel castings machined to close fits within thousandths of an inch.

4. All shaft bearings are fitted for a running clearance of .001" for each inch of shaft diameter. All bearings are of a high grade honed bronze.

5. "Buffalo" offers the improved floating punch head with the free-moving adjustable-position lever for effortless work-spotting or punch and die-alignment. The large flexible counterbalance spring permits easy adjustment of tension for quickly converting punch-head to

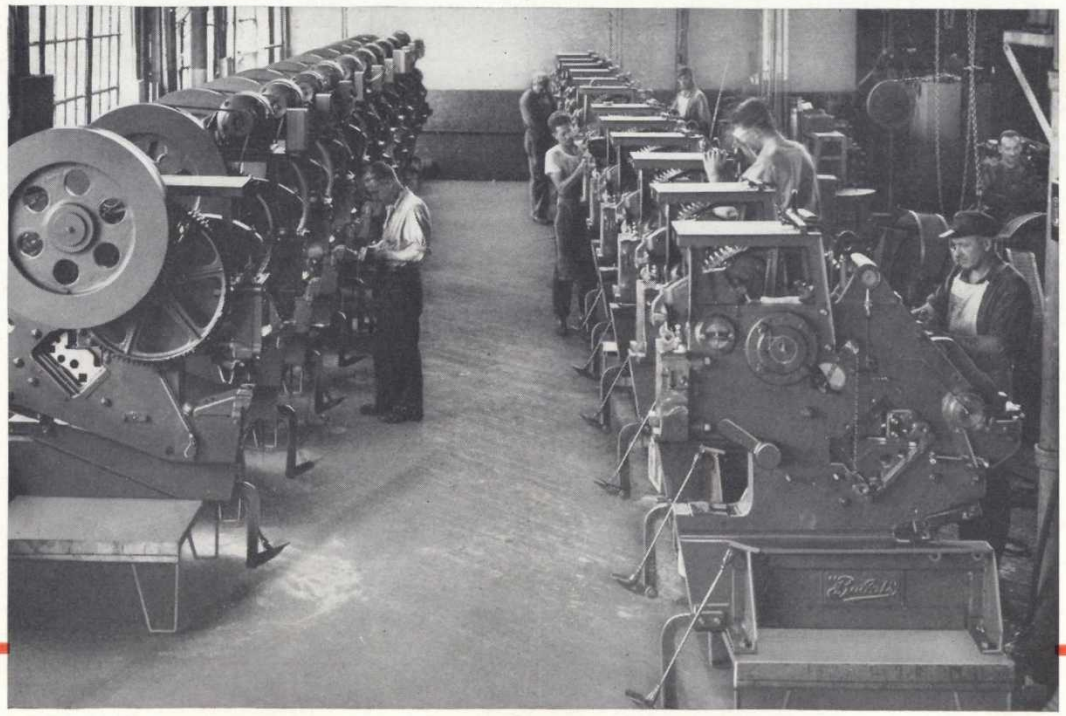
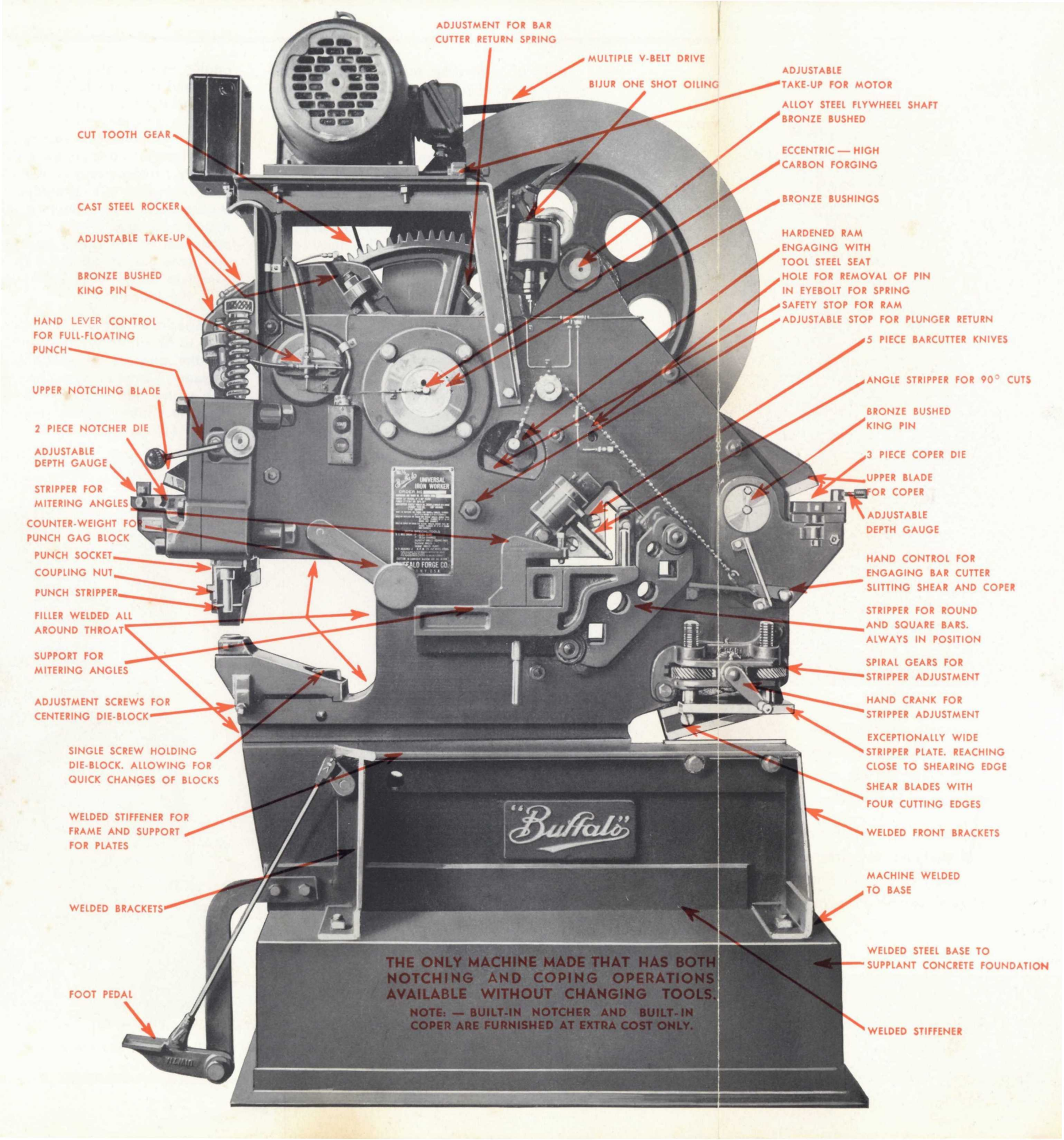


Figure 1. Part of one assembly line on No. 0 Universal Iron Workers


ADJUSTMENT FOR BAR CUTTER RETURN SPRING
MULTIPLE V-BELT DRIVE
BIJUR ONE SHOT OILING
ADJUSTABLE TAKE-UP FOR MOTOR
ALLOY STEEL FLYWHEEL SHAFT BRONZE BUSHED
CUT TOOTH GEAR
ECCENTRIC — HIGH CARBON FORGING
CAST STEEL ROCKER
BRONZE BUSHINGS
ADJUSTABLE TAKE-UP
HARDENED RAM ENGAGING WITH TOOL STEEL SEAT
BRONZE BUSHED KING PIN
HOLE FOR REMOVAL OF PIN IN EYEBOLT FOR SPRING
HAND LEVER CONTROL FOR FULL-FLOATING PUNCH
SAFETY STOP FOR RAM
ADJUSTABLE STOP FOR PLUNGER RETURN
5 PIECE BARCUTTER KNIVES
UPPER NOTCHING BLADE
ANGLE STRIPPER FOR 90° CUTS
2 PIECE NOTCHER DIE
BRONZE BUSHED KING PIN
ADJUSTABLE DEPTH GAUGE
3 PIECE COPER DIE
STRIPPER FOR MITERING ANGLES
UPPER BLADE FOR COPER
COUNTER-WEIGHT FOR PUNCH GAG BLOCK
ADJUSTABLE DEPTH GAUGE
PUNCH SOCKET
HAND CONTROL FOR ENGAGING BAR CUTTER SLITTING SHEAR AND COPER
COUPLING NUT
PUNCH STRIPPER
STRIPPER FOR ROUND AND SQUARE BARS. ALWAYS IN POSITION
FILLER WELDED ALL AROUND THROAT
SUPPORT FOR MITERING ANGLES
SPIRAL GEARS FOR STRIPPER ADJUSTMENT
ADJUSTMENT SCREWS FOR CENTERING DIE-BLOCK
HAND CRANK FOR STRIPPER ADJUSTMENT
EXCEPTIONALLY WIDE STRIPPER PLATE. REACHING CLOSE TO SHEARING EDGE
SINGLE SCREW HOLDING DIE-BLOCK. ALLOWING FOR QUICK CHANGES OF BLOCKS
SHEAR BLADES WITH FOUR CUTTING EDGES
WELDED STIFFENER FOR FRAME AND SUPPORT FOR PLATES
WELDED FRONT BRACKETS
MACHINE WELDED TO BASE
WELDED BRACKETS
WELDED STEEL BASE TO SUPPLANT CONCRETE FOUNDATION
FOOT PEDAL
WELDED STIFFENER
THE ONLY MACHINE MADE THAT HAS BOTH NOTCHING AND COPING OPERATIONS AVAILABLE WITHOUT CHANGING TOOLS.
NOTE: — BUILT-IN NOTCHER AND BUILT-IN COPER ARE FURNISHED AT EXTRA COST ONLY.
UNIVERSAL IRON WORKER
"Buffalo"

work as a floating punch adaptable to any material thickness. For example, the punch height may be set for ¼" thick plate so that the tip of the punch just barely touches the plate surface. This facilitates quick location of the punch tip within the prick-punch layout mark. The operator steps on the treadle. The punch is driven thru the plate and then rises high enough to strip and then drops back to the top of the plate. This feature is standard equipment on all "Buffalo" Iron Workers.

6. Every "Buffalo" Iron Worker has the architectural type of jaw. Each machine includes in its standard equipment single punching tools. On the No. 0 both low and high die blocks are furnished with the machine. On the No. ½ and No. 1 ½ single die blocks are furnished serving the function of the low and high type in a single combination.

7. The bar cutter section will shear angles square, also miters angles both right and left hand to 15°, 30° and 45°. A broad shelf for square and miter angle shearing provides safe and convenient support at knife opening height. Accurately located stops permit quick mitering to correct degree angles. Quickly adjustable strippers are provided for both square and miter shearing of angles. Round and square bars are sheared directly below the angle openings within the same set of combination knives. A complete set of these knives is included with the machine.

8. Special knives may be ordered at any time to fit within the bar cutter opening for the purpose of shearing channels, I-Beams, T-bars or any other profile section within the capacity range of any machine. These knives are separately priced extras.

9. Every "Buffalo" Universal Iron Worker is equipped with a slitting shear arrange-

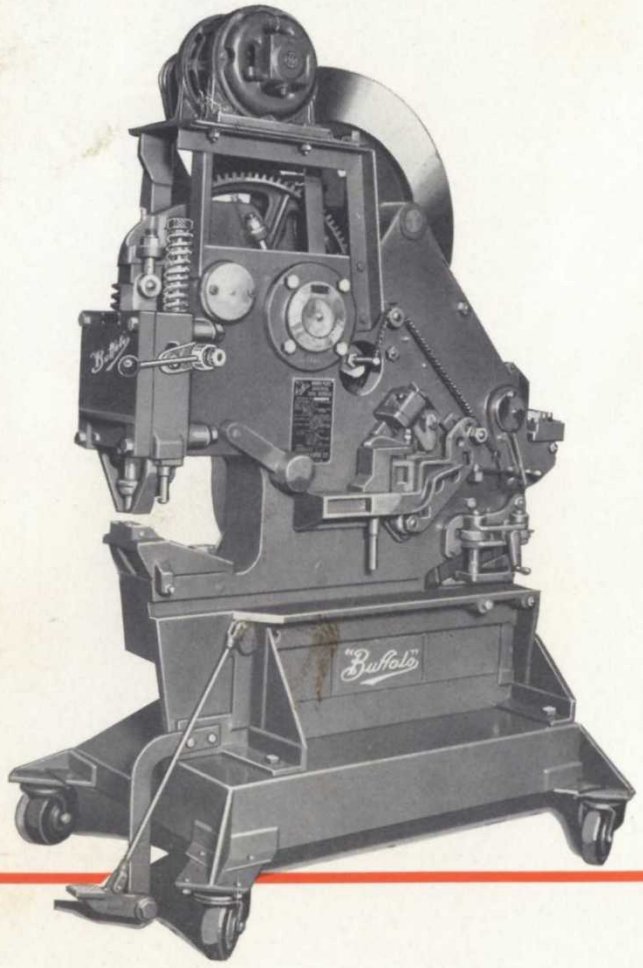


Figure 3. No. ½ U. I. W. on Casters.

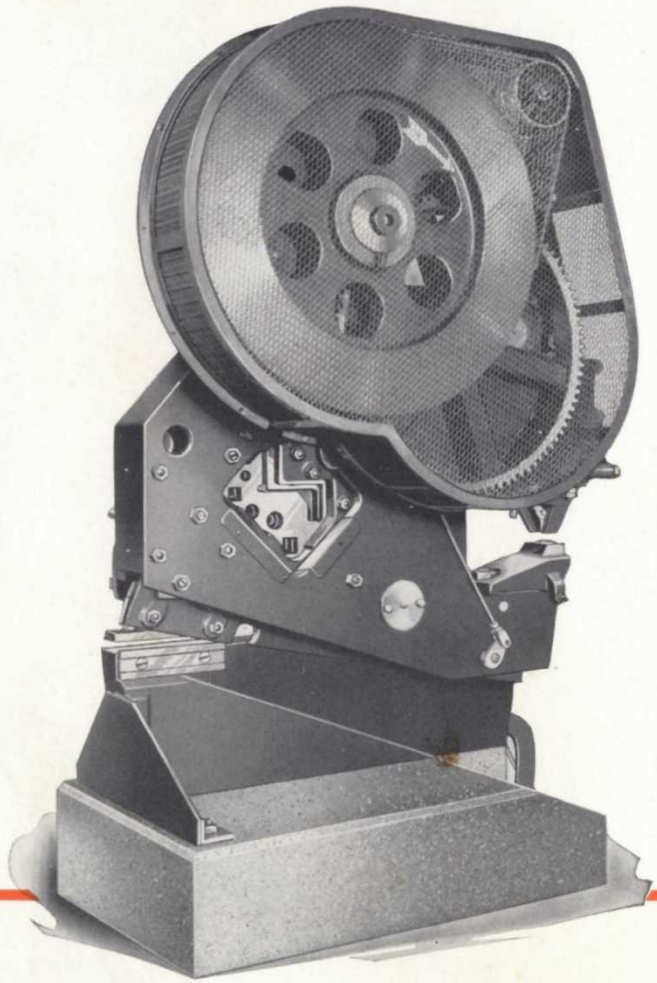


Figure 4. Rear View of No. ½ U. I. W.

ment located below and to the right of the bar cutter section. It is sufficiently far enough from the central bar cutter knives to provide clearance and freedom for use of this feature without crowding an operator at either position. This shear feature can be used either for slitting of plates, cross shearing of flats, trimming of plate or for trimming one leg of angle regardless of the angle length. These knives have four cutting edges. A special upper knife with a low rake angle is available, as an extra, for the purpose of cross cutting flats and strips without distortion or curling.

A broad clamping hold-down, or stripper, is provided for the shear. It is quickly and easily raised or lowered by means of a crank which operates thru spiral cut gears to adjust two large vertical screws which are fastened to the wide hold-down bar.

A wide support shelf extends across the full length of the frame for supporting the work that is being sheared. This shelf is flush with the clearance or guide slot that keeps the work square and parallel with the knives. This slot is free from obstructions of any nature. It is **not** necessary to remove pedal rods, chains or cables before the slitting feature can be used.

10. Only "Buffalo" Iron Workers offer the double feature of both a 90° notcher and a square coper in place and independently operated. This means no time loss changing tools from one type to the other. It also enables the use of a generously wide coper punch instead of the narrow type used on interchangeable designs.

"Buffalo" design permits the location of the notcher on either the punch end or the shear end of any size Iron Worker.

The combination set-up always places the notcher on the punch end and the coper on the shear end. With both tools, both operations may be performed simultaneously by two operators.

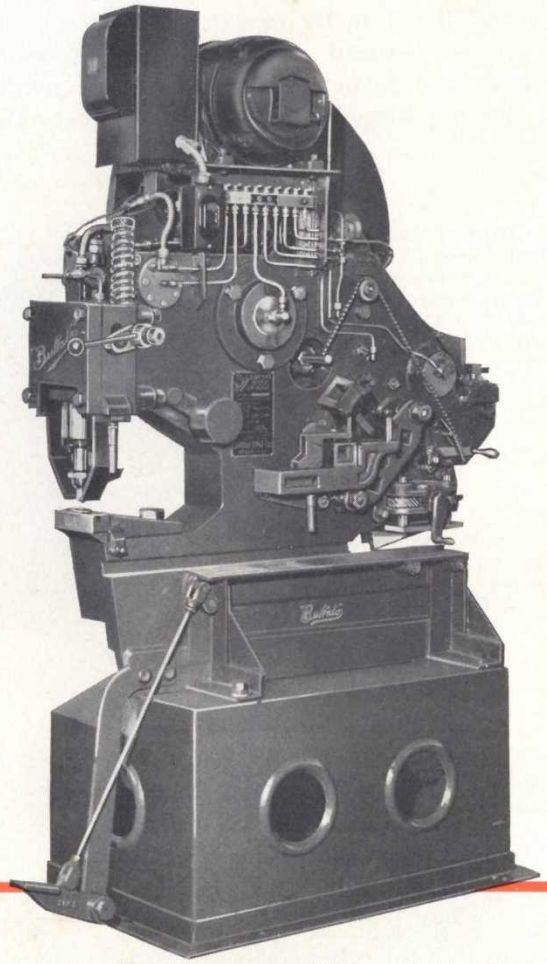


Figure 5. No. 0 Universal Iron Worker with "built-in" notcher on shear end, equipped with centralized oiling system and mounted on steel base. Low dieblock in place, high dieblock not shown.

USERS INCLUDE

A. C. Spark Plug Co. (2)
American Laundry Machinery Co.
Arcand Spring Co.
Allis Chalmers Mfg. Co. (3)
Anchor Post Fence Co.
American Brass Co.
G. S. Blodgett Co., Inc.
Buck & Hickman, Ltd., London, England (3)
Bethlehem Shipbuilding Corp. (2)
Barker Jennings Hardware Co.
Bucyrus-Erie Co.
Bethlehem Steel Co. (6)
Boston & Albany R. R.
C. F. Braun Co.
Buffalo Ankorite Gold Mines, Ltd., Ontario, Canada
Campbell Boat Co.
City of New York, Department of Sanitation
Cuban Dominican Sales Corp.
Coeur d'Alene Hardware & Foundry Co.
Continental Gin Co.
Consolidated Aircraft Corp.
Colonial Iron Works
Chevrolet Mfg. Co. (3)
Carnegie-Illinois Steel Co. (5)
Chevrolet Motor Co.
Colts Patent Fire Arms Mfg. Co.
Chicago Rapid Transit Co.

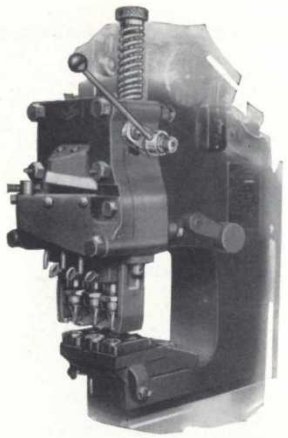


Figure 8. Triple punching attachment and "built-in" notcher in punch head of No. 1½.

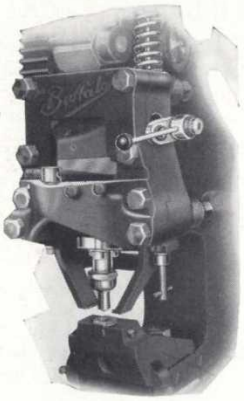


Figure 9. Standard single att't. on punch end of same machine.

Figure 10. Special attachment on No. ½ U. I. W. for punching 6" hand holes.

11. All internal slide surfaces are provided with bronze faced gib adjustments to compensate for wear. Scientifically designed oil grooves insure a positive distribution of lubrication to every part of the contact areas. No grease is used anywhere in "Buffalo" Iron Workers. Only oil is used for lubrication. One-shot pressure lubricating systems are available as extras. These systems insure correct amounts of oil at every point.

12. Smooth silent Vee-belt drives are standard equipment. Drive motors are mounted on the uppermost part of the machine, on adjustable bases with take-up provision for regulating Vee-belt tension.

"Buffalo" expanded metal, small mesh, gear guards not only protect all gears but also fully cover motor pulley, vee-belts and flywheel.

13. "Buffalo" offers the choice of optional welded steel bases to save user high costs of concrete foundation blocks above the floorline. The bases make it easy to change the machine location in the shop whenever a change is desired. On the No. 0 and No. ½ size Iron Workers steel bases mounted on casters are available, when it is desired to make the machine portable.

14. A single hand lever control operates the bar cutter section, the slitting shear and the coper. This lever is located conveniently for an operator using any one of these three features. If the purchaser wishes a foot treadle control instead of the hand-operated type, it is available as an extra. If there is compressed air available at the location where the machine is to be used, an air-cylinder

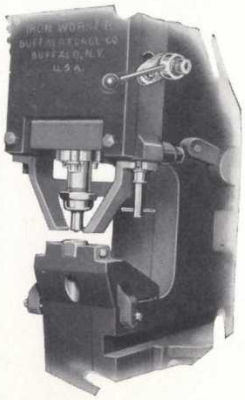


Figure 11. Standard combination die-block for punching I-beams and channels in web or flange, in addition to plates, angles, flats and tees, on Nos. ½ or 1½.

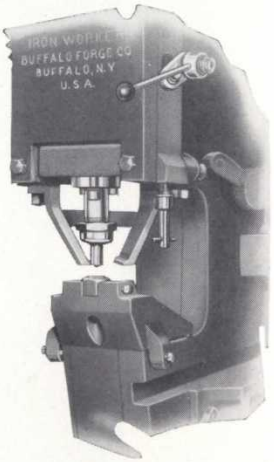


Figure 12. Stripper provided on these machines, which may be swung out of place when changing dies and punches. No tools are required for shifting stripper.

Figure 13. Knives for I-beams and Channels.

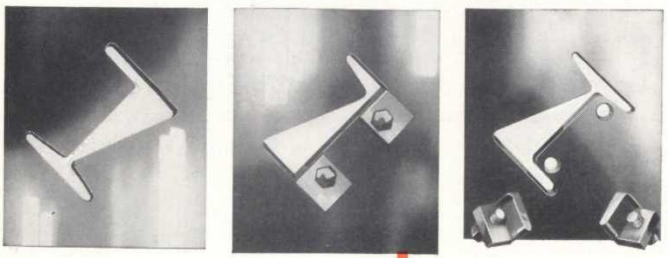
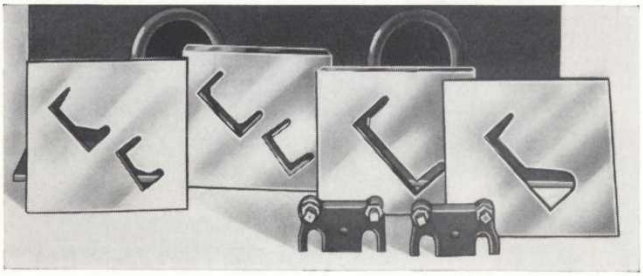


Figure 14. Knives for Channels.



arrangement with a foot valve on the floor provides effort-less operation of all the three shearing features, the bar cutter section, the slitting shear and the coper. This air-operated control is optional at the same price as the mechanical foot-treadle.

15. A triple punching attachment is available for any size "Buffalo" Iron Worker. It may be purchased with the machine, or any time later. The punch plungers are all drilled and tapped to receive this attachment. This tool enables the user to have three separate sizes of punches and corresponding dies always in place. Selective gags permit the use of either size punch while the other two float. The triple punch attachment is used only for plate and angle punching.

16. Over-size punching attachments may be ordered at any time for "Buffalo" Iron Workers to handle punches and dies for holes larger than the maximum standard sizes. Special shape punches and dies are always subject to customer's order and specification.

17. With regard to die blocks, it has already been stated that on the No. 0 Universal Iron Worker, both low and high die blocks are furnished as standard equipment. However, on the No. ½ and on the No. 1½, only combination die blocks are furnished. The combination die blocks will handle both flange and web punching of all I-Beams and channels specified within the range of the capacity of these two machines. Low and high die blocks are **not** available for these two machines. If a greater range of structural sections is desired, the customer should select the No. ½ or No. 1½ **Structural** Iron Worker. See Bulletin No. 3813. These two latter types are provided with a higher tooling space that permits the use of the high and low die blocks.

As an extra, there are available special die blocks on the Universal Iron Workers No.'s, ½, 1½ and 2½, for punching flanges, or webs of the small sections, — i.e., 3", 4" and 5" I-beams and channels.

18. For a clearer understanding of the types of die blocks for the three sizes of "Buffalo" Universal Iron Workers, we show on the following pages, outline diagrams of each die block together with a table showing just what sections may be punched on each size and type. General outline dimensions are also shown for each die block for test lay-outs.

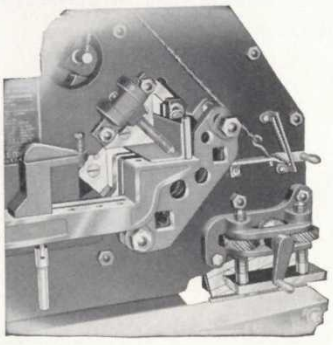


Figure 15. Position of stripper screw when cutting an angle at 90°. Again no tools are required to set the stripper screw. Note the heavy bar-cutter support. No possibility of breakage here.

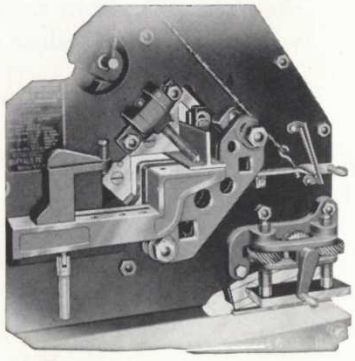


Figure 16. When cutting tees the gauge used for cutting angles square is removed without using tools. Rounds and squares of all sizes up to capacity are handled with only five openings.

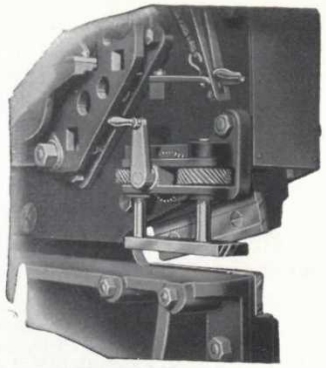


Figure 17. Note the stripper which enables cutting of short pieces, by reason of its width; and which is adjusted by a crank, requiring no tools.

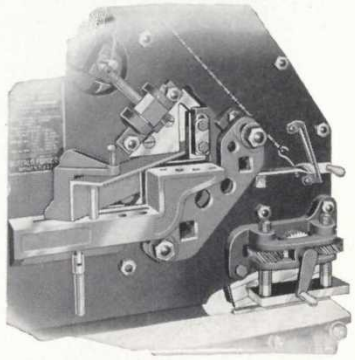


Figure 18. Mitering an angle leg down at 45°, thus giving left and right hand miters for making frames, legs in or out. Set screw at left for holding angle down may be adjusted without tools.

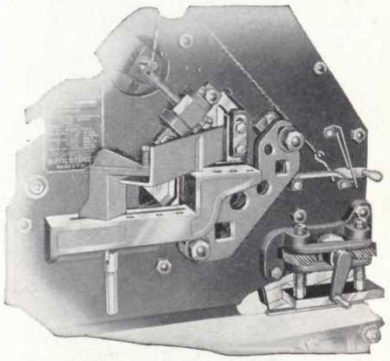


Figure 19. Angle being mitered at 45° with leg up. Note that the stripper screw does not interfere with insertion of the angle in the machine, consequently does not have to be removed.

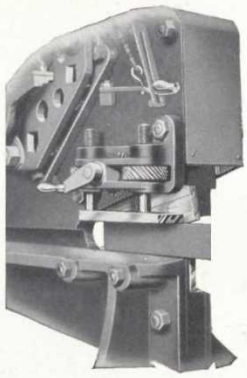


Figure 20. A popular feature of "Buffalo" construction on this type of machine; stripper can be raised high enough to trim off one leg of angle.

Built-in Coper and Notcher exclusive in "Buffalo" design

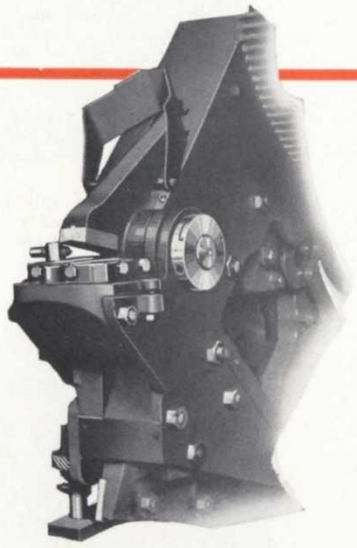


Figure 21. Detail of square coper on shear end.

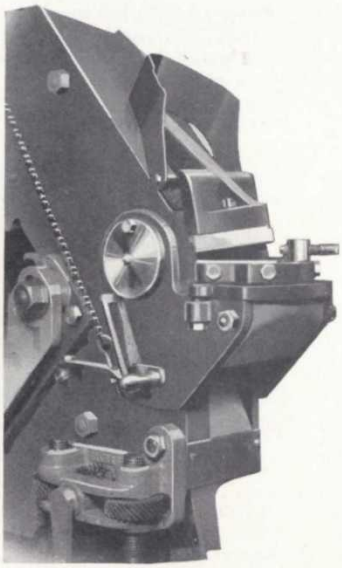


Figure 22. Detail of 90° V-notcher on shear end.

THE most advanced development in metal working machinery in years . . . the new "built-in" coping and notching device, either one on the shear end . . . a notcher only on the punch end. These features are found exclusively in "Buffalo" Universal Iron Workers.

For shops that use the punch more extensively than the bar-cutter and shear sections, the 90° notching tools can be furnished on the shear end instead of in the punch head.

Square coping tools can be furnished on the shear end only. The square coper on the shear end and the 90° notcher in the punch head form the best combination, as in this case no time is lost for tool changes.

The individual square coping attachment is necessary for producing copes in the center of long bars such as beams, channels or angles, or for removing portions of the flanges by making successive cuts; a V notcher will not do this because it can only cope the ends of beams, channels and tees, (flanges only), or angles, by inserting the material diagonally; suitable stops are provided for either square coping at the ends or 90° "V" notching in the center.

For both operations, the material is fed into the dies without tilting, making it easy for the operator to cut on the line.

The new notchers and copers above the shear on "Buffalo" Universal Iron Workers are of an advanced design, the two supports for the dies being welded to the frames and not depending on studs to carry the load. The heavy king pin on which the bronze bushed rocker oscillates also has a beneficial effect on the stiffness of the frame and owing to the welding feature, we have been able to keep the size of the die supports to a minimum which means less interference with clear vision when using the slitting shear.

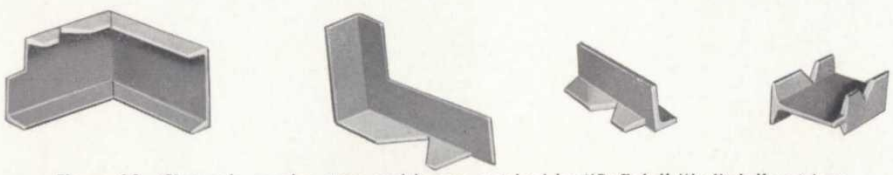


Figure 23. Channels, angles, tees and beams notched by "Buffalo" "built-in" notchers.

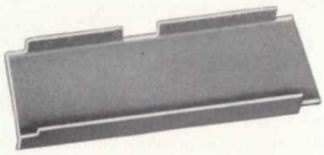


Figure 24. I-beam coping done by "built-in" square coper over shear.

Figure 25. Channel coping done by "built-in" square coper over shear.

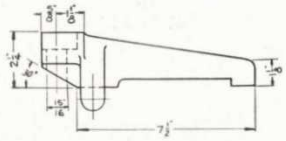
Figure 26. Angle coping and notching done by new "built-in" coper and notcher.

CAPACITIES Nos. O, ½, 1½ U. I. W.

	No. 0	No. ½	No. 1½	
PUNCH - - -				
Channels in Flanges	13/16" x 7/16"	1 3/16" x 5/8"	1 1/16" x 3/4"	With Standard Dieblocks
I-Beams in Flanges	3/4" x 1/2"	1 3/16" x 3/4"	7/8" x 7/8"	With Standard Dieblocks
Channels in Web	3" to 8"	6" to 12"	6" to 15"	With Standard Dieblocks
I-Beams in Web	3" to 8"	6" to 12"	6" to 20"	With Standard Dieblocks
In Flange, Bethlehem I-Beam	3" to 10"	5" to 15"	6" to 15"	With Standard Dieblocks
In Web, Bethlehem I-Beam	3" to 10"	5" to 15"	6" to 24"	With Standard Dieblocks
In Flange Carnegie H-Sections	8" to 10"			With Standard Dieblocks
In Web, Carnegie H-Sections	8"			With Standard Dieblocks
Beams and Channels, Flange or Web	4" to 5"			With Standard Dieblocks
	4" to 5"	3", 4", 5"	3", 4", 5"	With special dieblock not furnished with machine
SHEAR . . .				
Plates	3/8"	1/2"	5/8"	
Flats	4" x 1/2"	6" x 5/8"	6" x 3/4"	
Flats — with special upper knife	1 1/2" x 1/2"	2" x 5/8"	2 1/2" x 3/4"	
Flats — with special upper knife	7" x 3/16"	8" x 5/16"	10" x 3/8"	
Length of Knives	8"	10"	12"	
Trims One Leg of Angles up to	2 1/2" x 3/8"	3" x 1/2"	4" x 5/8"	
BUILT-IN 90° NOTCHER IN PUNCH HEAD . . .				
Angles	2" x 1/4"	3" x 5/16"	3" x 3/8"	
Tees — Flanges	1 3/4" x 1/4"	2 1/2" x 5/16"	3" x 3/8"	
Flanges of Beams	3" to 4"	4" to 6"	4" to 7"	
Flanges of Channels	3"	4" to 5"	4" to 6"	
Plates	1/4"	5/16"	3/8"	
Depth of Cut	1 3/4"	2 3/4"	2 3/4"	
BUILT-IN 90° NOTCHER ON SHEAR END . . .				
Angles	2" x 1/4"	3" x 3/8"	3" x 1/2"	
Tees — Flanges	2" x 5/16"	3" x 3/8"	3" x 1/2"	
Flanges of Beams	3" to 4"	3" to 6"	3" to 7"	
Flanges of Channels	3"	3" to 6"	3" to 7"	
Plates	1/4"	5/16"	3/8"	
Depth of Cut	1 3/4"	2 3/4"	2 3/4"	
BUILT-IN SQUARE COPER ON SHEAR END . . .				
Angles	3" x 1/4"	3" x 3/8"	3" x 1/2"	
Tees	2" x 5/16"	3" x 3/8"	3" x 1/2"	
Flanges of Beams	3" to 4"	3" to 6"	3" to 7"	
Flanges of Channels	3"	3" to 6"	3" to 7"	
Plates	1/4"	3/8"	1/2"	
Width of Cut	2"	2"	2"	
Depth of Cut	2 3/4"	3"	3"	
BAR CUTTER WILL SHEAR . . .				
Rounds	1 1/4"	1 5/8"	1 7/8"	With Standard Knives
Squares	1 1/8"	1 1/2"	1 3/4"	With Standard Knives
Angles — 90°	3" x 3" x 3/8"	4" x 4" x 1/2"	5" x 5" x 1/2"	With Standard Knives
Angles — 45°	2" x 2" x 5/16"	3" x 3" x 5/16"	4" x 3" x 3/8"	With Standard Knives
Tees — Square (Given Size Only)	2 1/2" x 2 1/2" x 1/4"	3" x 3" x 3/8"	4" x 4" x 3/8"	With Special Knives
Beams and Channels	4"-7.5 lb.	5"-12.25 lb.	6"-14.75 lb.	With Special Knives
Channels only	5"-6.5 lb.	7"-12.25 lb.	8"-13.75 lb.	With Special Knives
Angles — Square	4" x 4" x 1/4"	3 1/2" x 6" x 5/16"	5" x 5" x 3/8"	With Special Knives
Angles — Square	3" x 4" x 5/16"	3 1/2" x 5" x 3/8"	4" x 6" x 3/8"	With Special Knives
Angles — Flare	4" x 5" x 5/16"	5" x 5" x 3/8"	6" x 6" x 7/16"	With Special Knives
SPECIFICATIONS . . .				
Revolutions per Minute	290	300	277	
Horsepower required	2	3	3	
Number of Strokes per minute	44	43	38	
Height of Stroke	7/8"	1 1/8"	1 1/4"	
Depth of Throat	12"	12"	20"	
Weight, Motor Drive	1840 lbs.	3500 lbs.	6230 lbs.	
Shipping Weight, additional	120 lbs.	150 lbs.	200 lbs.	
Ram Pressure	30 tons	50 tons	65 tons	
WE FURNISH WITH THE MACHINE . . .				
Round Punches for Bolt and Rivet Size	5/8" & 3/4"	3/4" & 7/8"	3/4" & 1"	
Straight Die for Bolt and Rivet Size	3/4"	7/8"	1"	
Bevel Die for Bolt and Rivet Size	5/8"	3/4"	3/4"	

Shear Blades for Plates and Flats. Bar-Cutter Blades for Rounds, Squares, Angles and Tees. We can also furnish triple punching attachment, as shown on page eight. This is an exclusive feautre on this type of machine. Only one nut to be loosened to change dieblock for this. The capacities given above are actual capacities based on soft steel . . . 60,000 tensile and we guarantee the machines to handle them satisfactorily.

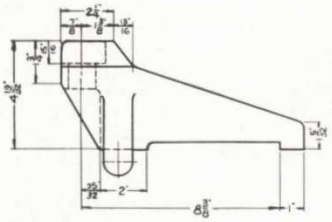
STANDARD LOW DIE BLOCK



WILL PUNCH IN FLANGES
CHANNELS - 3" TO 8" INC.
I-BEAMS - 3" TO 8" INC.
WIDE FLANGE BEAMS 8" TO 10"
CARNEGIE H-BEAMS 4" TO 5"
PLATES - UP TO 1/2" THICK ANGLES - UP TO 1/2" THICK

NO. 0 U.I.W.

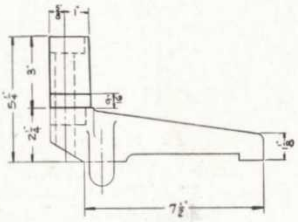
STANDARD COMBINATION DIE BLOCK



WILL PUNCH FLANGES OR WEBS
CHANNELS - 6" TO 12"
I-BEAMS - 6" TO 12"
CHANNELS - 5" TO 15"
I-BEAMS - 5" TO 15"
PLATES - UP TO 5/8" THICK ANGLES - UP TO 5/8" THICK

NO. 1/2 U.I.W.

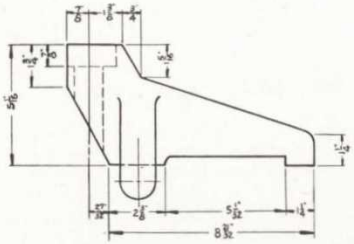
STANDARD HIGH DIE BLOCK



WILL PUNCH IN WEBS
CHANNELS - 3" TO 10"
I-BEAMS - 3" TO 10"
WIDE FLANGE BEAMS - 8"
CARNEGIE H-BEAMS - 4" TO 5"

NO. 0 U.I.W.

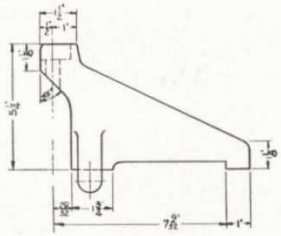
STANDARD COMBINATION DIE BLOCK



WILL PUNCH FLANGES OR WEBS
CHANNELS - 6" TO 15"
I-BEAMS - 6" TO 20
CHANNELS - 6" TO 15"
I-BEAMS - 6" TO 24"
PLATES - UP TO 3/4" THICK ANGLES - UP TO 3/4" THICK

NO. 1-1/2 U.I.W.

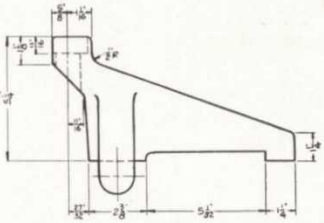
SPECIAL DIE BLOCK



WILL PUNCH FLANGES OR WEBS
CHANNELS - 3" - 4" - 5"
I-BEAMS - 3" - 4" - 5"

NO. 0 - U.I.W.

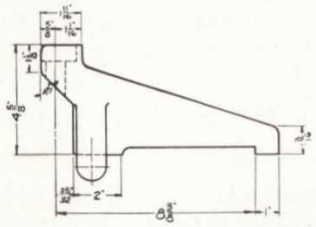
SPECIAL DIE BLOCK



WILL PUNCH FLANGES OR WEBS
CHANNELS - 3" - 4" - 5"
I-BEAMS - 3" - 4" - 5"

NO. 1-1/2 U.I.W.

SPECIAL DIE BLOCK



WILL PUNCH FLANGES OR WEBS
CHANNELS - 3" - 4" - 5"
I-BEAMS - 3" - 4" - 5"

NO. 1/2 U.I.W.

NEW!

"Buffalo"

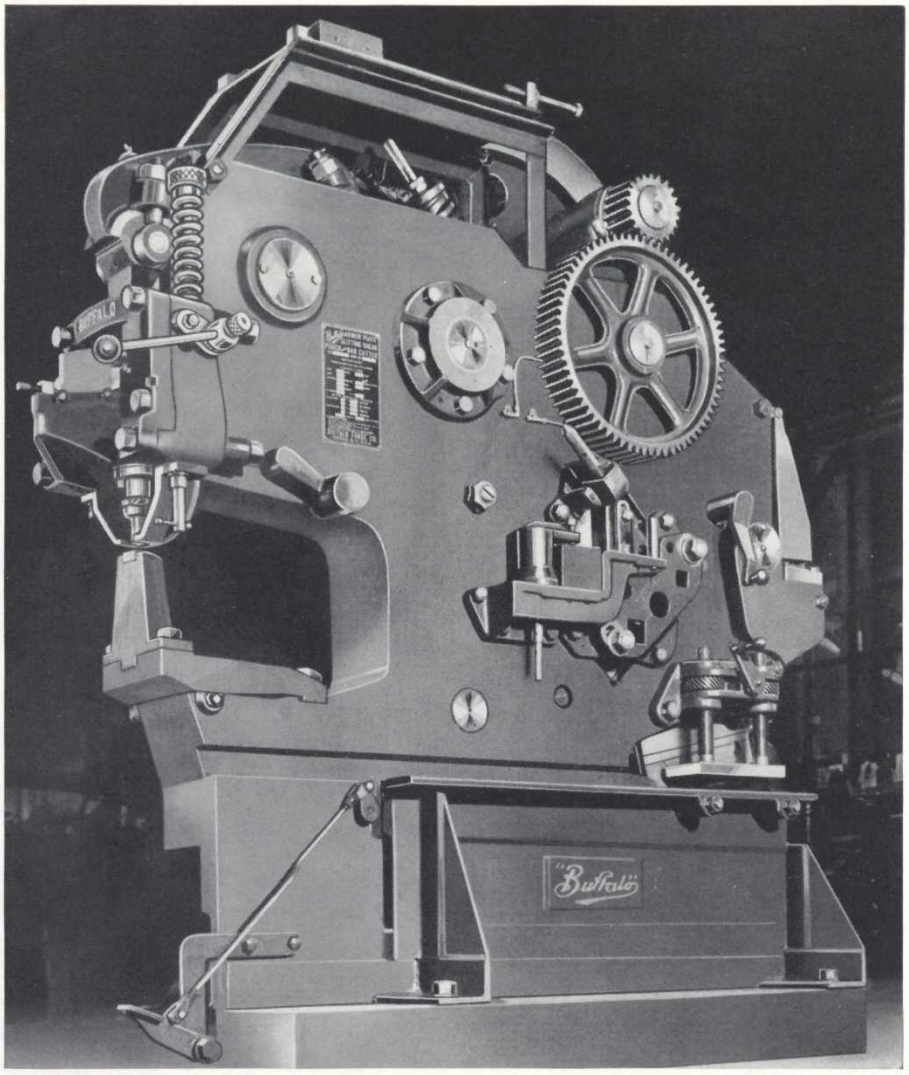


Figure 27. The No. 2½ Unistructural Iron Worker with high die block in place.

UNISTRUCTURAL IRON WORKERS

A NEW member has been added to the already great family of "Buffalo" Iron Workers. A study of today's requirements among steel fabricators has revealed the need for a bigger and better machine that will do more but will not cost any more. The twofold demand for more production and a more rigid economy is answered by the new No. 2½ Unistructural Iron Worker.

This newly designed machine is a combination of all the best features of three "Buffalo" machines now re-produced in one super unit. Every advantage that was formerly available only in three separate machines is now to be found in the Unistructural Iron Worker. Nothing has been taken away or sacrificed.

The new unit gives the increased punching capacity of the No. 2¾ Universal Iron Worker as well as its deeper throat. It also has increased angle shearing capacity. It gives the higher throat and tool space of the No. 2½ Structural Iron Worker plus the additional tool variety. As an extra bonus, the operating speed has been increased and the motor horse power has been decreased. That is the new No. 2½ Unistructural Iron Worker.

In addition to the regular operations performed by all "Buffalo" Iron Workers, (such as punching of standard beams, channels, angles, plates and flats; the shearing and mitering of angles; shearing of round, square, tee and flat bars; and slitting of plates of any length and width; also the 90° notching and square coping of angles, the flanges of beams and channels

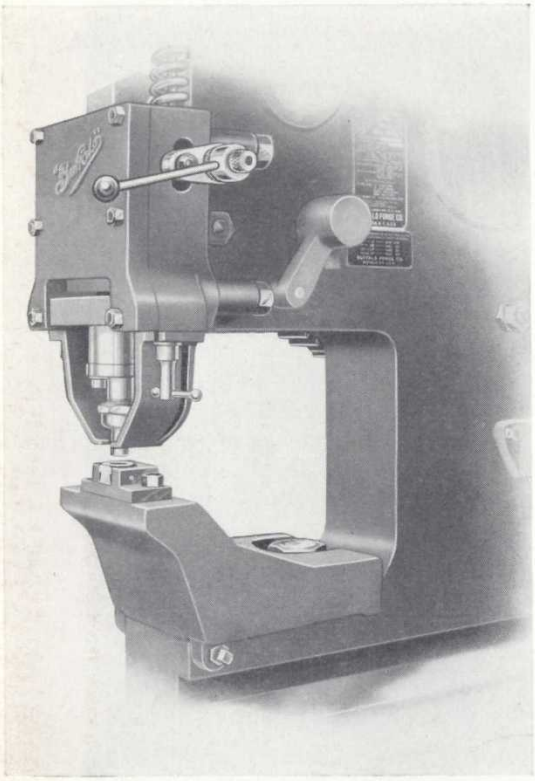
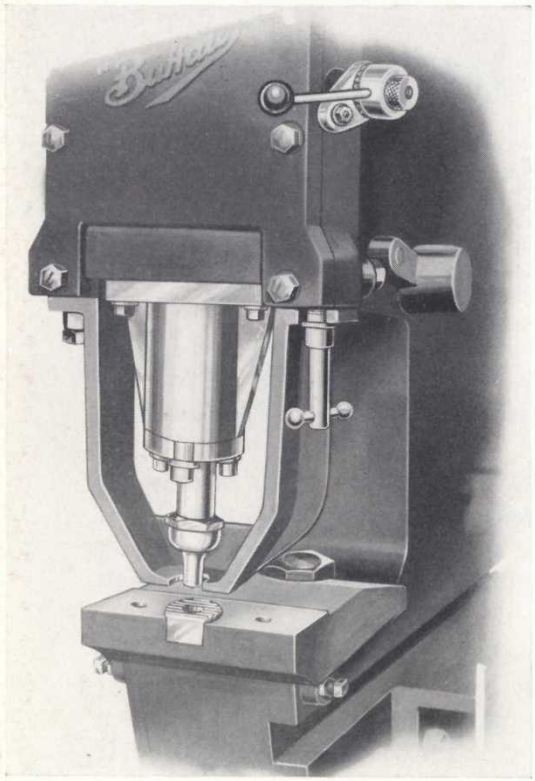


Figure 28. Gooseneck die block which may be furnished as an extra. Punches sections in both flange and web without changing die blocks.

Figure 29. Low die block for punching flanges of beams, channels and wide flange beams.



and tees or plates) the Unistructural Iron Worker will punch wide flange beams and channels in flanges or webs. All of the operations listed above are accomplished without replacing tools — machine performing five distinct operations without loss of time by changing of attachments.

The punch end of the machine is equipped with the new style full floating head which is operated by means of a hand-lever providing a convenient and rapid method for spotting punch on the work and for centering punches and dies. The lever is adjustable in any radial position to suit the operator. In addition to this feature, it is now possible to quickly convert the punch head by an easy adjustment into a full floating automatic spotting set-up for any thickness of material within the punching capacity of the machine. A tapered bronze liner for take-up of wear is standard equipment on all punch heads. The strippers are of the swinging type, easily adjustable without the use of tools.

Each machine is equipped with high and low dieblocks for the single punching attachment. This includes the punch socket separator and two strippers. Extras in the way of tools are available in the form of a triple punching set of tools, a goose-neck dieblock for special sections as well as a special dieblock for the punching of flanges and webs on the very smallest I-beams and channels.

Many mechanical improvements have been incorporated in this new design which tend to give the machine longer operating life and greater access for maintenance. The built-in notcher and built-in coper are still optional features so that the machine may be purchased with or without these tools. However, the machine represents the most efficient productive unit if equipped with both of these items.

The bar cutter section has a support for shearing angles, with means for cutting standard miters without the necessity of a previous layout. Bar cutter knives for angles, tees, rounds and squares are interchangeable with special knives for shearing beams, channels and other shapes.

The frame is of heavy welded steel plate construction, electrically welded into a solid unit that is rigid under maximum load. All bearings are bronze bushed with the exception of the flywheel bearing which is of the self-aligning roller bearing type. Lubrication is controlled by a centralized high pressure one shot system. This is an optional extra but highly recommended as an essential.

All gears are of steel, the pinions heat-treated alloy steel, with machine-cut teeth. The drive consists of a 7½ horse power motor mounted on an adjustable bracket at the top of the machine driving through V-belts directly to the flywheel.

Range of Sections that can be Punched with High and Low Dieblocks

Punches in Webs			Punches in Flanges	
Section	Wgt., Lbs.	No. Holes Punched	Wgt., Lbs.	Gauge
5" I	14.75	One hole in center		
5" H	18.9	One hole in center		
6" H	27.5	2 holes-turn over	27.5	$2\frac{5}{8}$"-$2\frac{3}{4}$"
8" H	37.7	2 holes-turn over	37.7	$2\frac{3}{4}$"-$3\frac{1}{2}$"
5" WF	18.5	One hole in center		
6" WF	25	2 holes-turn over	25	$2\frac{3}{8}$"
8" WF	67	2 holes-no turn	67	$2\frac{3}{4}$"-3"-$5\frac{1}{2}$"
10" WF	112	2 holes-no turn	89	$3\frac{1}{8}$"-$5\frac{1}{2}$"
12" WF	161	2 holes-no turn	106	$3\frac{1}{2}$"-$5\frac{1}{2}$"
14" WF	136	3 holes-no turn	127	$4\frac{7}{8}$"-$5\frac{1}{2}$"
16" WF	96	3 holes-no turn	96	$3\frac{1}{2}$"-$5\frac{1}{2}$"
18" WF	114	4 holes-no turn	114	$3\frac{1}{2}$"-$5\frac{1}{2}$"
21" WF	142	5 holes-no turn	127	$5\frac{1}{2}$"
24" WF	160	6 holes-no turn	145	$5\frac{1}{2}$"
5" to 24" beams, 5" to 18" channels.			6" to 24" beams, 6" to 18" channels.	

SPECIFICATIONS AND CAPACITIES

All "Buffalo" dies and dieblocks are flattened in front to permit close gauge punching. This gauge is $\frac{15}{16}$" on standard blocks, maximum hole size $1\frac{7}{16}$", and $\frac{5}{8}$" on special dieblock, with maximum hole size $\frac{3}{4}$".

Punch capacity	$1\frac{5}{16}$"x1" — $1\frac{7}{16}$"x$\frac{7}{8}$"
Strokes per minute	38
Length of stroke	$1\frac{1}{2}$"
R.P.M. Flywheel	525
Motor — H.P. & R.P.M.	$7\frac{1}{2}$" H.P. x 1500 or 1800
Depth of Punch Throat	24"
Height of Punch Throat	$20\frac{3}{4}$"
Length of Machine	80"
Width of Machine	33"
Height of Machine	100"

Weight (including high & low dieblocks) —

Shipping	10250 lbs.
Packed for Export	11400 lbs.
Weight of Steel Base	250 lbs.
Measure (no base, nor motor)	220 cu. ft.
Ram Pressure	105 tons

Shear Capacity:

Plates (thru center)	$\frac{3}{4}$"
Plates (trim only)	$\frac{7}{8}$"
Flats — with standard knives	8 x $\frac{7}{8}$"†
Flats — with special knives	3" x $\frac{7}{8}$"††
Flats — with special knives	12" x $\frac{3}{8}$"††
Trim Legs of Angles	6"
Length of Knives	14"

† — Cut off piece deformed.
†† — Cut off piece only slightly deformed.

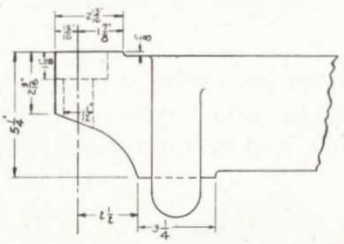
Bar-Cutter Capacity, (Standard Knives):

Rounds	$2\frac{1}{4}$"
Squares	2"
Angles — Square	6" x 6" x $\frac{1}{2}$"
Angles — 45°	4" x 4" x $\frac{1}{2}$"
Tees — Square	4" x 5" x $\frac{1}{2}$"

Bar-Cutter Capacity, (Special Knives):

I-Beams	9" — 21.8 lbs.
Channels	10" — 20 lbs.
Angles — Square	$3\frac{1}{2}$" x 7" x $\frac{1}{2}$"
Angles — Flare	6" x 6" x $\frac{3}{4}$"
H Columns	6" — 20 lbs.
B Beams	9" — 20.5 lbs.
T — Square	4" x 4" x $\frac{5}{8}$"
Flat bars, no deformation	4" x 1" or 5" x $\frac{13}{16}$" or 6" x $\frac{5}{8}$" or 8" x $\frac{1}{2}$" or 10" x $\frac{3}{8}$" or 12" x $\frac{5}{16}$"

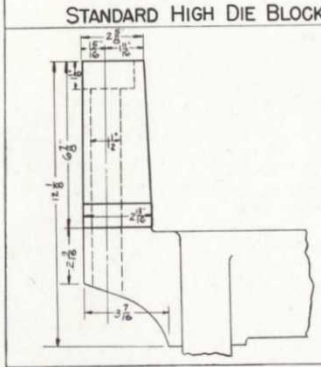
STANDARD LOW DIE BLOCK



WILL PUNCH IN FLANGES	
C	CHANNELS – 5" TO 18"
I	I-BEAMS – 5" TO 24"
I	WIDE FLANGE BEAMS 6" TO 24" (145 #)
I	H-BEAMS – 6" TO 8"
F	PLATES UP TO 1" THICK ANGLES UP TO 1" THICK

SK-889 | NO. 2-1/2 UNISTRUCT. I.W.

STANDARD HIGH DIE BLOCK

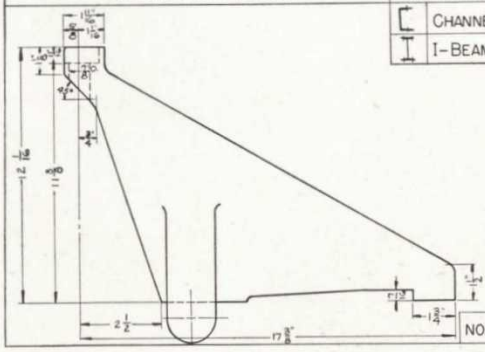


WILL PUNCH IN WEBS	
⌐	CHANNELS – 5" TO 18" *
⊢	I-BEAMS – 5" TO 24" *
H	WIDE FLANGE BEAMS 5" TO 24" (160 #) *
H	H-BEAMS – 5" TO 8" *

*WITHOUT TURNING SECTION OVER EXCEPT 6" x 8" H–, AND 6" W.F.

SK-890 | NO. 2-1/2 UNISTRUCT. I.W.

SPECIAL DIE BLOCK



WILL PUNCH IN FLANGES	
C	CHANNELS – 3" TO 5"
I	I-BEAMS – 3" TO 5"

SK-892 | NO. 2-1/2 UNISTRUT. I.W.

Built-in 90° V-Notcher in punch head:

Angles	3" x $\frac{7}{16}$"
Tees-flanges	3" x $\frac{7}{16}$"
Beams-flanges	5" to 9"
Channels-flanges	5" to 8"
Plates	$\frac{7}{16}$"
Depth of Cut	$3\frac{1}{4}$"

Built-in 90° V-Notcher on shear end:

Angles	4" x $\frac{1}{2}$"
Tees-flanges	4" x $\frac{1}{2}$"
Beams-flanges	4" to 10"
Channels-flanges	4" to 9"
Plates	$\frac{1}{2}$"
Depth of Cut	$3\frac{1}{2}$"

Built-in Square Coper on shear end:

Angles	4" x $\frac{1}{2}$"
Tees-flanges	4" x $\frac{1}{2}$"
Beams-flanges	4" to 10"
Channels-flanges	4" to 9"
Plates	$\frac{1}{2}$"
Width of Cut	$2\frac{1}{4}$"
Depth of Cut	$3\frac{1}{2}$"

"Buffalo" Universal Diagonal Machines
Low Throat Type - Nos. 3½ and 4½ U.D.

"Buffalo" U. D. Machines are made in two sizes, Nos. 3½ and 4½. They were developed to meet the demand of shops that require larger capacities than offered by Universal Iron Workers. The punch end is equipped with high and low die-blocks for punching beams and channels in webs and flanges.

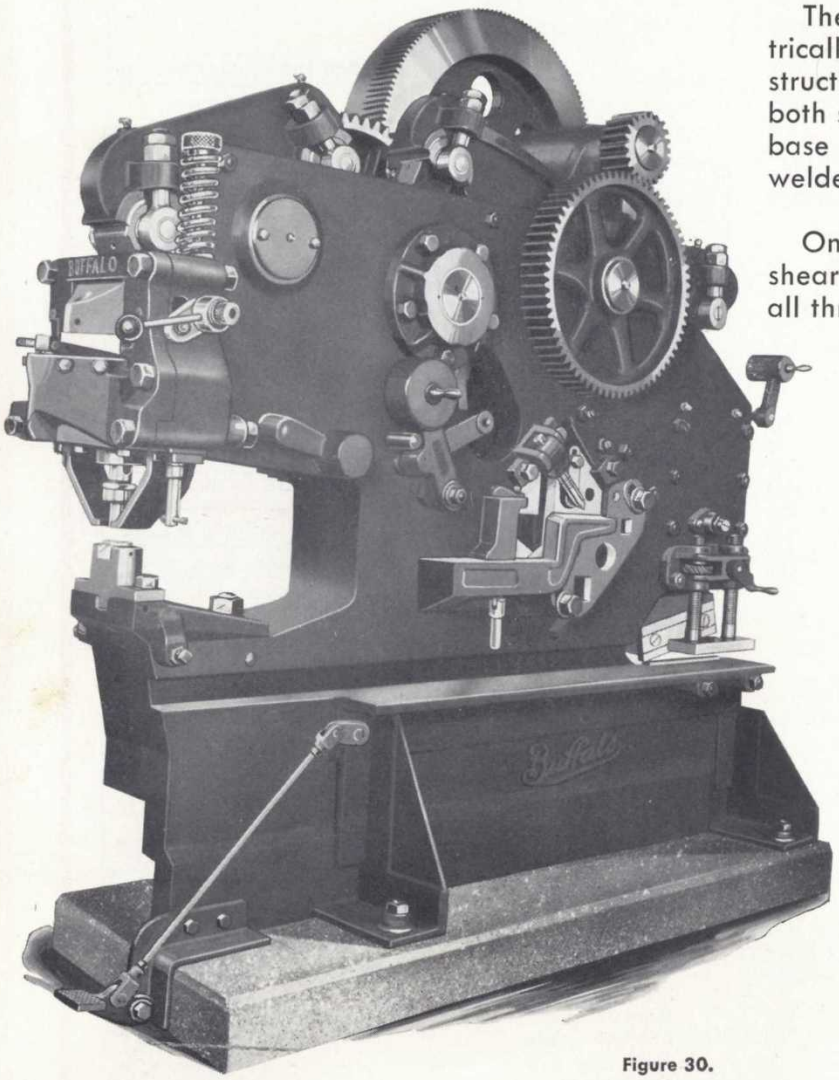


Figure 30.

The frames are made of the well known electrically welded steel which is the strongest construction known. They are carefully machined on both sides and welded into one-piece. Stiffening base angles and filler on the punch end are welded to the frame.

One eccentric runs all three tools . . . punch, shear and bar-cutter . . . in succession; that is, all three tools are actuated during the course of one revolution of the eccentric but not at the same instant. This prevents overloading the machine and yet permits using three separately controlled parts of the machine at the same time.

Triple punching attachments can be furnished at additional cost either at time of purchasing machine or at a later date. The triple punching attachments will punch angles at close gauges, in addition to flat and plate stock . . . but are not suitable for punching beams and channels.

A built-in notcher is available only in punch head and we suggest it be specified at time of ordering machine as it is much more expensive to install at a later date, due to necessity of replacing the whole head.

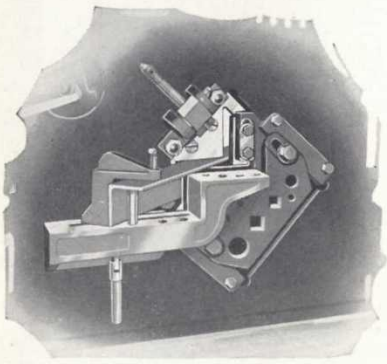


Figure 31.
Mitering Angles Left Hand.

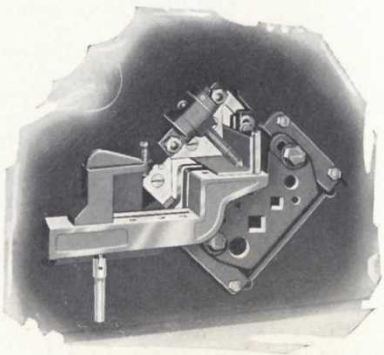


Figure 33.
Cutting Angle Square

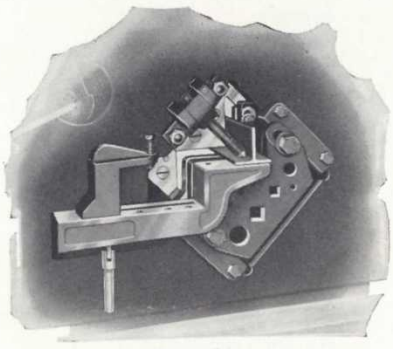


Figure 32.
Cutting Tee Bars Square.

All punching tool set-ups, single, triple or special, are carefully designed in such a manner as to require the minimum of time and effort in making changes from one set-up to another. Although all die blocks are held to the punch table securely from moving in any direction, they may be quickly changed by removing only one large nut. Even the stripper bars are arranged so that they may be quickly and easily loosened and swung out of the way for changing of punches without removing the stripper completely. A special stripper screw does away with the necessity of using a wrench.

Note setscrews with locknuts on either side of die block to simplify the centering of the tools. Die flattened in front for close gauge punching of beams, channels and angles.

Bevel dies are corrugated as a safety feature to prevent beams from slipping when dies are oily.

Interchangeable high and low die blocks on the punch end handle beams, channels, girders, Bethlehem beams and H-sections.

The shear blades furnished with these machines are of solid tool steel. They are designed for long life and hard service with four cutting edges each, making it possible to turn the blade four times before regrinding. A generous thickness provides ample material for a considerable number of regrinds. Special attention is given to proper heat-treatment of the carefully selected steel of which these knives are made.

The shear stripper is sturdily built and clamps the stock securely for the full length of the knives. It operates freely for quick raising or lowering. It is specially arranged for high position clamping when trimming down angles.

The U. D. machines have three plungers, permitting use of the shear independently of the barcutter. This is a distinct advantage for a shop having a considerable amount of shearing to do.

The punch plungers are of the full floating type and are standard equipment on all U. D. machines.

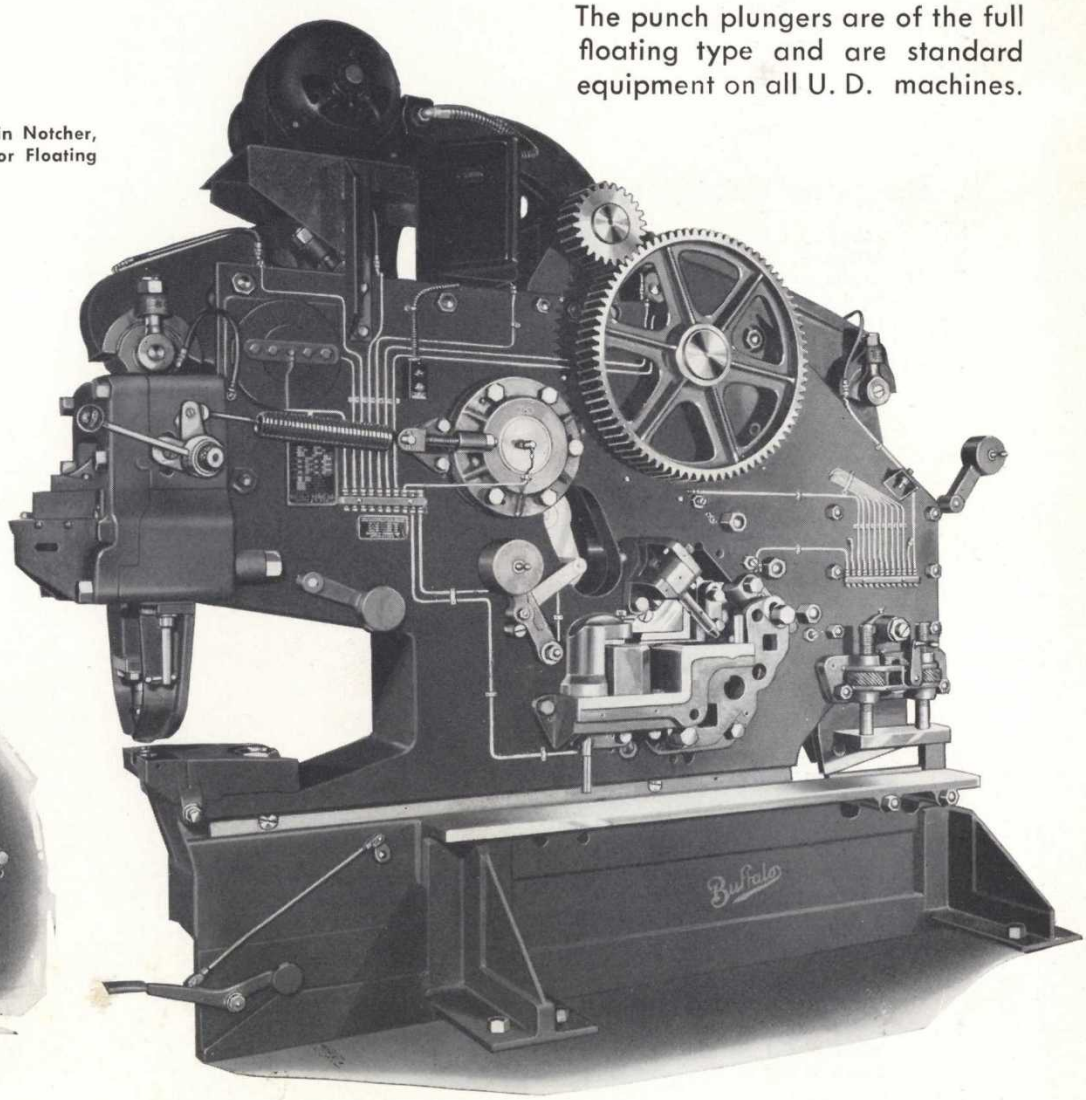


Figure 35. No. 4½ U. D. with Built-in Notcher, showing new type equalizer spring for Floating Head, also Centralized Oiling System.

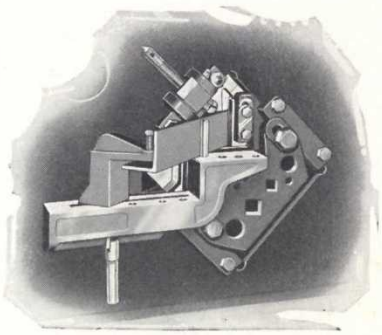


Figure 34.
Mitering Angles Right Hand.

CAPACITIES Nos. 3½, 4½ U. D.

The capacities given below are actual capacities based on mild steel . . . 60,000 tensile and we guarantee machines to handle them satisfactorily.

PUNCH . . .	No. 3½	No. 4½
Diameter and Thickness	1 7/16" x 7/8" 1¼" x 1"	1 9/16" x 1¼" 1⅜" x 1⅜"
Flanges of I-Beams	4" to 24"	4" to 24"
Channels	4" to 18"	4" to 18"
Girders	8" to 26"	8" to 30"
Bethlehem Beams	8" to 30"	8" to 30"
H-Sections	4" to 14"	4" to 14"
Webs of I-Beams	4" to 24"	5" to 24"
Channels	4" to 18"	5" to 18"
Girders	8"	8" to 24"
Bethlehem Beams	8" to 18"	8" to 30"
H-Sections	4" to 8"	5" to 12"

BUILT-IN 90° NOTCHER IN PUNCH HEAD		
Angles	4" x 3/8"	5" x ½"
Tees — Flanges	4" x 7/16"	6½" x ½"
Flanges of Beams	6" to 10"	6" to 12"
Flanges of Channels	6" x 9"	6" to 12"
Plates	7/16"	½"
Depth of Cut	3¾"	4¾"

SHEAR . . .		
Plates — Through Center	7/8"	1¼"
Trimming	1"	7½" x 1⅜"
Flats — With Standard Knives	7" x 1"	1⅜"
With Special Upper Knife	3½" x 1"	4" x 1½"
	12" x ½"	14" x ¾"
Trims Angles	6" x 7/8"	6" x 1"
Length of Knives	13¾"	16½"

BAR CUTTER WILL SHEAR . . .			
Rounds	With Standard Knives	2½"	3"
Squares		2⅛"	2 5/8"
Angles — 90°		6" x 5/8"	6" x 7/8"
Angles — 45°		4" x 9/16"	6" x 5/8"
Tees — 90° (Given Size Only)			6½" x 6½" x 6½"
I-Beams	With Special Knives	10" - 30 lb.	12" - 35 lb.
Channels		10" - 30 lb.	12" - 35 lb.
H-Sections		6" - 23 lb.	8" x 35 lb.
Bethlehem Beams		9" - 22 lb.	12" - 36.5 lb.
Angles — Square		6" x 8" x ½"	8" x 8" x 5/8"
Angles — Slight Flare		6" x 6" x ¾"	8" x 8" x ¾"
Tees		6½" x 6½" x 6½"	

SPECIFICATIONS - - -		
Revolutions per Minute	400	400
Size of Motor, H.P.	15	20
Number of Strokes	26	24
Height of Stroke	1¾"	2"
Depth of Throat-Punch	20"	30"
Length	7' - 7"	10' - 5"
Width	4' - 0"	5' - 6"
Height	8' x 0"	9' - 9"
Weight	12000 lbs.	26500 lbs.
Ram Pressure	110 tons	190 tons

WITH SPECIAL TOOLS . .		
Will Notch 90° Angles	4" x 3/8"	5" x ½"
Will Notch Tees — Flanges	4" x 7/16"	6½" x ½"
Will Notch Plates	7/16"	½"
Will Cope Angles Square (2 cuts)	5" x ½"	6" x 5/8"
Will Cope Tees — Flanges	4" x 9/16"	6½" x ½"
Will Cope Flanges of Beams	5" to 10"	5" to 12"
Will Cope Flanges of Channels	5" to 9"	5" to 10"
Plates	½"	5/8"
Width of Cut	1"	1¼"
Depth of Cut	2¼"	2½"

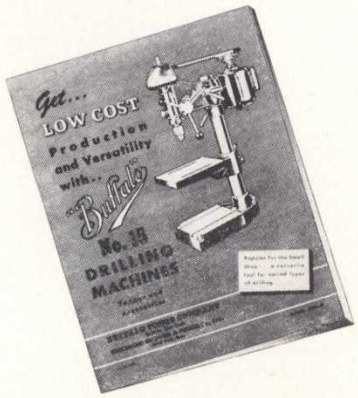
OTHER "Buffalo" MACHINE TOOLS

BUFFALO Bending Rolls are used for circle, segment and spiral bending of angles, tees, channels, flats, tubes, pipes, squares, rounds and special shapes. They are made in several types in a wide capacity range. Bulletin 352-C gives complete details.

BUFFALO "RPMster" is a drill of 100 speeds, changed instantly at the touch of a hand on the speed control lever. It has a highly efficient Vee-belt drive, six-spline alloy steel spindle, positive drive, all-geared, semi-automatic feed and alloy steel back gears. Two sizes, with capacities to 1" and 1½" in cast iron. Bulletin 3257-A gives complete information.

BUFFALO Billet Shears are used in hundreds of forging shops, cold-cutting steel billets and bars up to 10" diameter and squares up to 9"; flat bars up to 28" x 4". Fully automatic hold down, air counter-balance and air-operated clutch are features of the "Buffalo" design. Automatic feed tables also available. Full details in Bulletin 3295-B.

BUFFALO No. 18 Drilling Machines were built to offer the metal working industries moderately priced, accurate and powerful drilling machines in the capacities most frequently required. They have chrome nickel alloy spindles 15/16" in diameter, capable of drilling 1" in cast iron; large, heavy columns; large accurate working spaces. Bench and floor types, single and multispindle. Ask for Bulletin 3123-E.



BUFFALO No. 15 Drills are production tools designed to give long life, accurate, speedy operation and maximum facility in operating. Available in bench and floor models, in single and multispindle arrangements, these husky, low-cost drills are sensitive and convenient for small diameter drilling, yet husky enough for drilling up to ½" in cast iron. Thousands in use. Bulletin 2963-G gives details.

Bulletin No. 360-F 5M 6-54

Printed in U. S. A.


"Buffalo"