

1904

THE NEW

1904

BIRDSALL COMPANY

AUBURN N.Y. U.S.A.

THRESHERS
CORN HUSKERS

ENGINES -
SAW-MILLS -



The
New
Birdsall

1904

Co.,

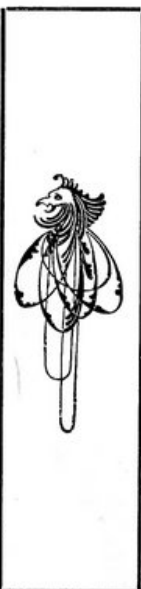


Auburn,

New

York,

U. S. A.



THRESHERS,
ENGINES,
SAW MILLS.

PORTABLE ENGINES,
6, 8, 10, 12, 16, 18, 20 & 25
Horse-Power.

SKID ENGINES,
6 to 25 Horse-Power.

TRACTION ENGINES, Single,
12, 16, 18 & 20
Horse Power.

TRACTION ENGINES, Double,
18 & 20 Horse Power.

COAL, WOOD AND STRAW
BURNING ENGINES.

Grain Threshers
and Separators.

Self-Feeders for
Threshers.

Wind Stackers
for Threshers.

Variable Friction
Feed Circular
Saw Mills.

REPRESENTED BY

G. A. WILLEY, St. Louis, Mo., 316 and 318 S. Eighth Street.

THE NEW BIRDSALL COMPANY., Toledo, O., 559 Central Avenue.

DALLMANN & COOPER SUPPLY COMPANY, Fond du Lac, Wis., 20 and 22 Third Street.

THE WRIGHT MACHINE COMPANY, Peoria, Ills.

MALSBY & COMPANY, 41 South Forsyth Street, Atlanta, Ga.

DAVID BRADLEY & COMPANY, Council Bluffs, Iowa.

For Western Iowa, Nebraska and South half of South Dakota.





IN presenting our Catalogue for 1904 we desire to call the reader's attention to several improvements made in our machinery, for the purpose of more fully meeting the requirements of the trade which is continually making new demands.

We have added to our line a double cylinder engine for the larger sizes of traction engines.

It will be noted that we have a full line of sizes of engines and threshers; that we are the only manufacturers of the open-faced traction wheel, but are prepared to furnish either solid or open wheels. We are also the only manufacturers of the celebrated hinged steering gear, now adopted almost exclusively by the manufacturers of automobiles. In fact, we have the most up-to-date line of machinery on the market.

Having remodeled our factory and added new machinery, we are better prepared than ever to take care of the constantly increasing trade and to render better service to customers by taking care of their orders more promptly. Bear in mind, it is more advantageous to all, to get your orders in early before the goods are needed, so as to give ample time to get them out.

For full particulars, write our agencies or the home office.

THE NEW BIRDSALL CO.,

AUBURN, N. Y.

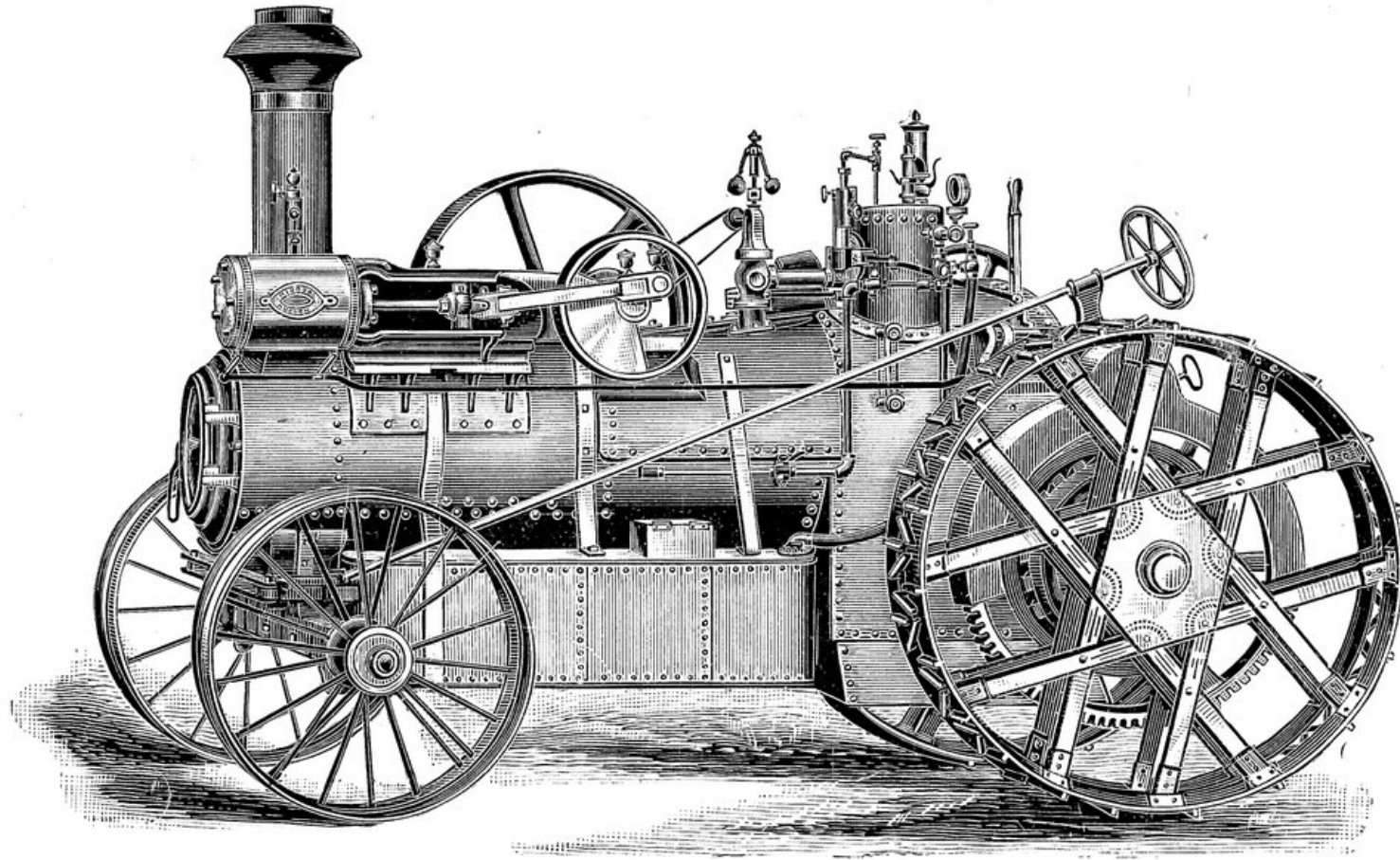
The New Birdsall Traction Engines.

THE work required of a Traction Engine is so much greater than it was a few years ago, that manufacturers have been obliged, from year to year, to build heavier and stronger engines. The result is that many of them are such mammoth affairs, that they cannot be used where the ordinary country bridge has to be contended with.

Our Energies have been devoted to the construction of a practical Traction Engine; one that is as equally serviceable in the mountains of Tennessee as on the great plains of the Northwest, and as serviceable in thickly populated New York and the New England States, where good roads and bridges are protected by state laws, limiting the amount of load allowed on the highways. That we have succeeded in accomplishing this end, is manifest by the greatly increased trade from all sections of this country, as well as abroad.

In Designing our boiler, the matter of expense for material and construction is not considered. The boiler is constructed with a view of getting a large amount of heating surface and steam room in a compact form and of getting the most thorough and rapid circulation of the water possible. The result, of course, is the most efficient locomotive type of boiler in use, with less weight. We are enabled to greatly reduce the weight of castings in many parts by substituting steel and malleable iron for gray iron castings. Do not be misled by the statements, that the greater the weight, the greater the traction power.

Read the following pages describing the traction parts, and especially the wheels, and be convinced that with an experience of over twenty years on Traction Engines we know what we are talking about. If experience did not teach us that we are right, we should not continue this line.



ROAD OR TRACTION ENGINE. SIDE VIEW SHOWING TANK.

The Cut on opposite page illustrates our ROAD or TRACTION ENGINE, showing the cylinder, the method of attaching same to boiler, the four-barrel suspended water tank, patent steering-gear, compensating gear, governor, injector, throttle, etc.

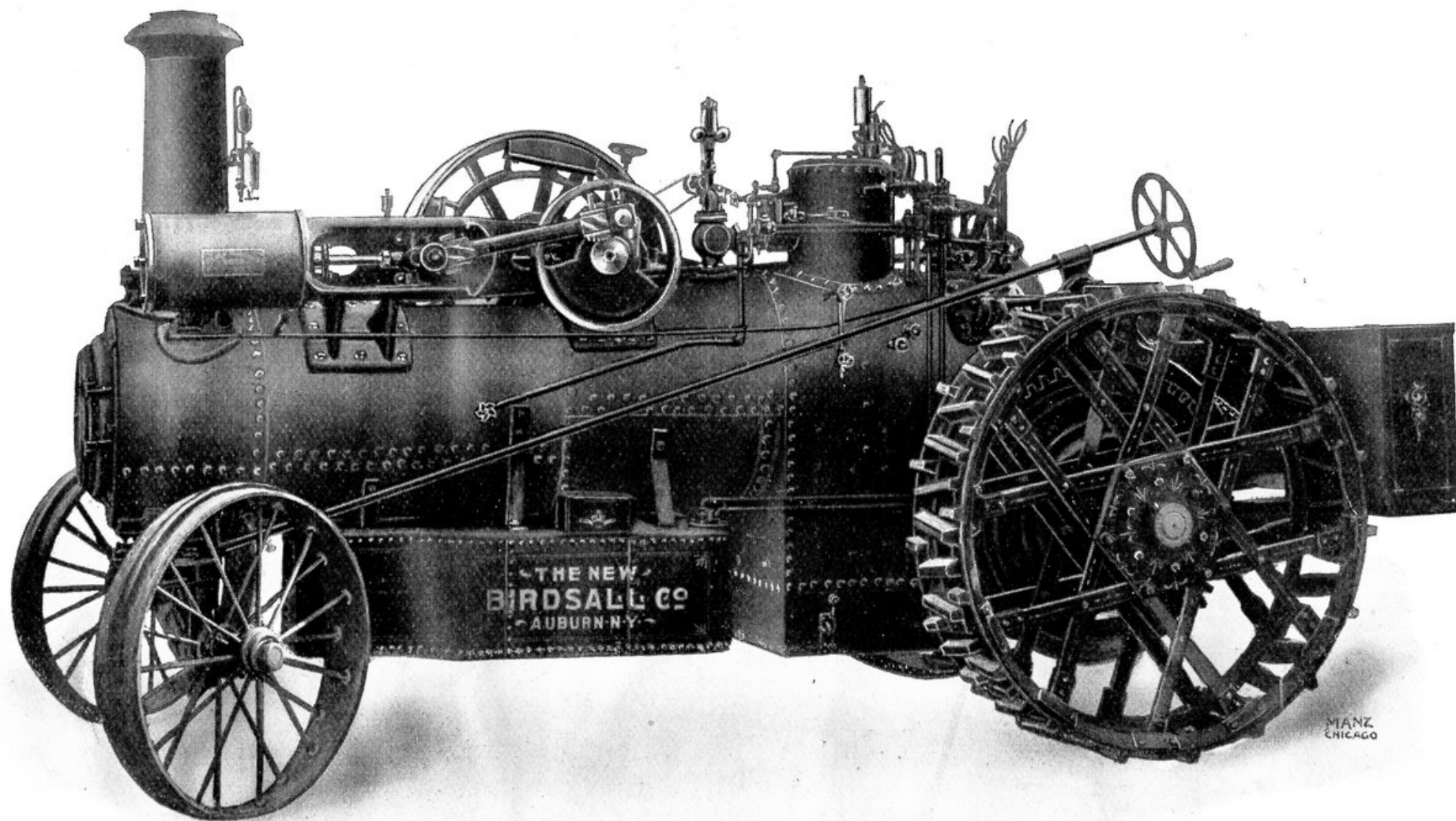
The Steam is taken from the inside of the dome near the top, and passes through a pipe to the throttle attached to the forward side of the dome—a device of our own which has proven to be very durable and is easily operated by a lever as shown in cut. From the throttle the steam passes to the governor, thence inside of the boiler to the smoke-box, where the steam is superheated, thence direct to the cylinder.

The Boiler is raised over the fire-box and surmounted by a dome. This part of the boiler is connected to the shell by a taper waist. The diameter of the boiler is small, but as the flues are correspondingly small, we are enabled to place a large number of them in each boiler; consequently the water is well cut up and therefore easily heated, as more heating surface is secured in small space than would be the case if larger flues were used. We use Shelby seamless drawn tubes, exclusively. For full dimensions of all sizes of boilers, see table of dimensions on page 18.

The Cylinder is of the Corliss pattern, and is cast with the ways and brackets in one piece. The cylinder and ways are bored at one operation, always insuring alignment.

The Compensating Gear is placed directly on the rear axle, in a diaphragm inside of the large spur driving-gear, and the power is transmitted to it from the large gear through heavy steel coil springs, thereby forming a perfect cushion to protect the gearing from sudden shocks or severe strains when starting the engine in either direction.

The Cross-Head is adjustable to take up wear, and the slides have large wearing surfaces, which are concave and prevent cramping or heating.



18 AND 20 HORSE-POWER TRACTION ENGINE,

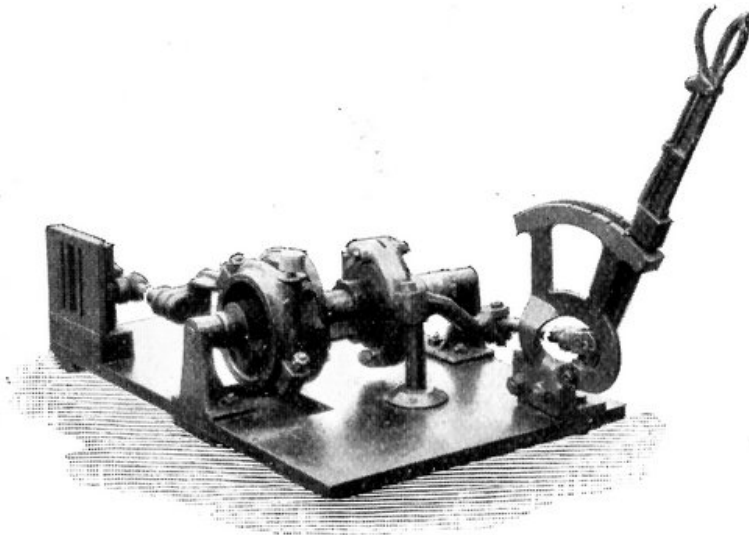
The Connecting Rod is so constructed as to be practically free from vibration. Result, a perfectly smooth-running engine, even under the strain of a heavy load.

The Crank Head is perfectly balanced, as is also the fly-wheel.

The Cut on opposite page illustrates our 18 and 20 horse-power Traction Engines, showing construction of wheels, cylinder, cross-head, crank-head, governor, throttle and fittings.

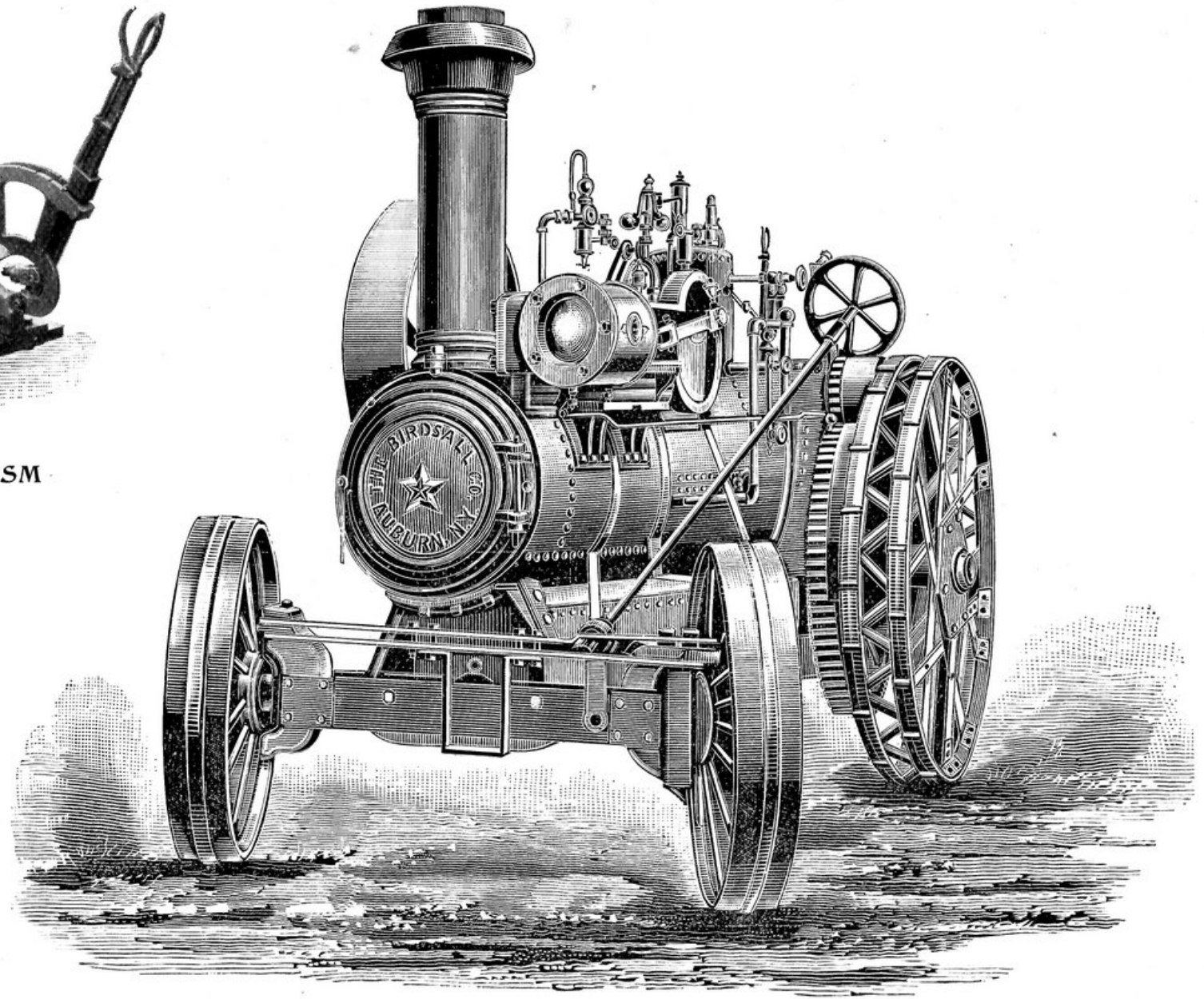
The Traction Wheels are formed of angle-irons rolled and riveted to the open-faced tire or lugs which allows the mud and sand to pass through, thereby offering the least possible resistance to the wheel. The angles form a V, which effectually prevents the wheel from sinking deep into soft places; consequently the engine, having less weight, is enabled to draw a load through mud where otherwise it would be almost impossible for the engine to move itself. The spokes are crossed in basket form and riveted together, also riveted to the spoke sockets, which in turn are riveted to the angle iron of the wheel. It will readily be seen that the entire wheel is so firmly tied together that it is impossible for it to give out. Another feature of these wheels is that it is unnecessary to carry any attachments to bolt on in order to enable the engine to get over soft places or up slippery hills. The wheel is always serviceable in any kind of ground. Some of our readers have had the unpleasant experience of stopping to clean the mud from the face of solid wheels in order to bolt on mud cleats or clamps to get out of soft places. The width of wheels for 12 and 16 horse, are 12-inch face and for the 18 and 20 horse, 16-inch face; solid wheels are furnished when ordered, 16 inches wide on the 16 horse, and 20 inches wide on the 18 and 20 horse.

Springs.—The corner brackets are firmly attached to the boiler with holes through them, allowing two posts or support rods on each side to pass through. These support rods are connected firmly to the axle boxes at the bottom and to the corner countershaft boxes at the top, holding the parts firmly together as in a frame. Under the brackets, attached to the boiler, are placed coil springs, which rest on the axle boxes, and allow the boiler to ride up and down on the springs. Result, greater durability, less jar and strain, and ease for the operator.



REVERSING MECHANISM

BIRDSALL
TRACTION
ENGINE,
WITH
PATENT
STEERING
GEAR.

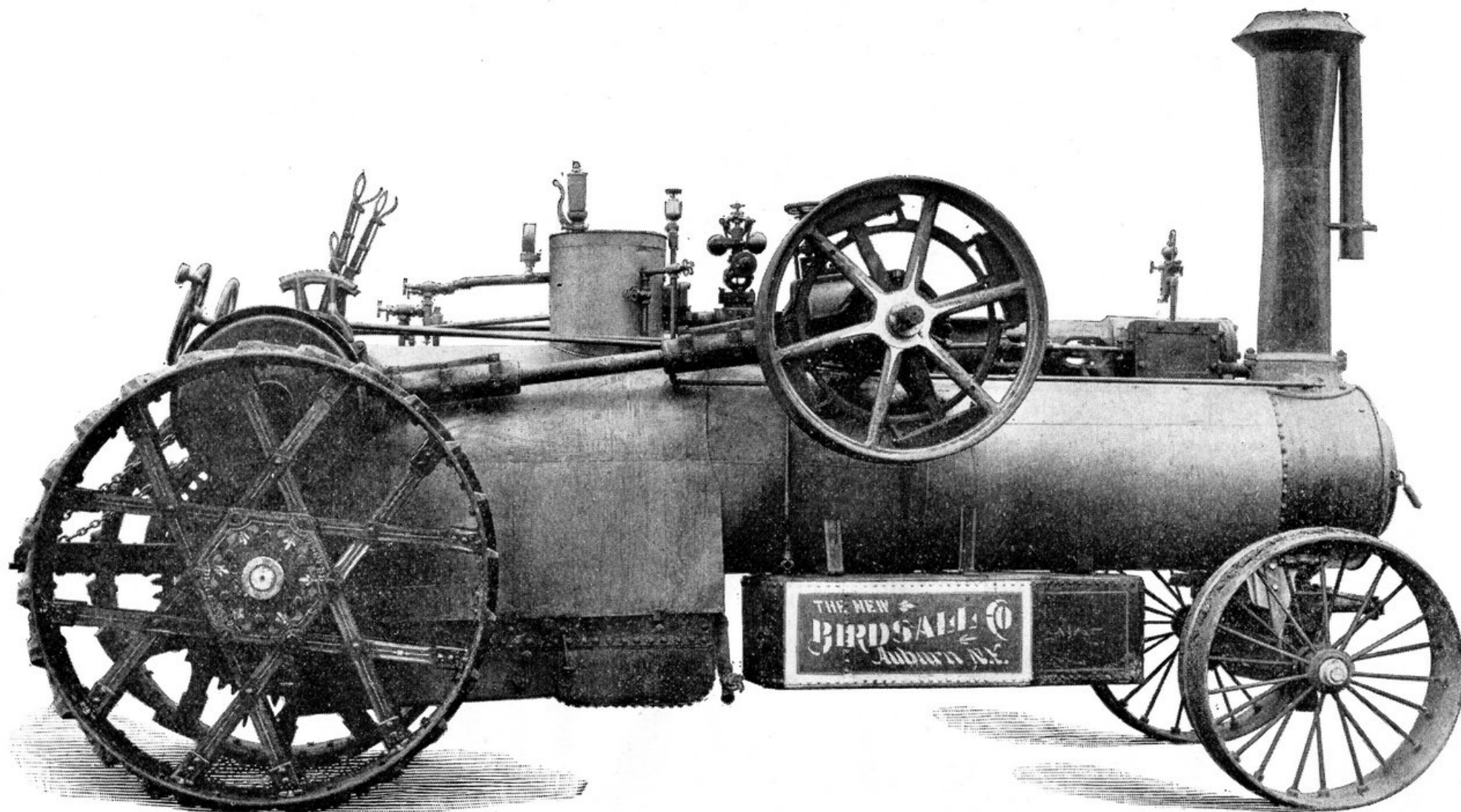


FRONT VIEW.

Patent Steering Gear.—The arrangement for guiding our Traction Engine is something entirely new, dispensing with the roll and steering-chains. The axle is fastened securely to the front end of the boiler by a heavy bracket. It stands parallel to the rear axle and is rigid in the direction of travel, but oscillates in passing over uneven surfaces. The axle arms are hinged to the axle-frame, and are provided with lever arms attached to their upper journals, which are connected by a rod at their outer ends. One of these arms is provided with a segmental worm-gear, which is operated by a screw on steering shaft, and which controls the direction of the engine by an ordinary hand wheel. This steering device requires fewer turns of the hand-wheel than any other style in use, and enables the engineer to handle the engine more quickly and easily. The front axle being perfectly rigid in the direction of travel, the engine will run straight on the road when properly set. With this road steering-gear, we have ample room to suspend a four-barrel steel water-tank under the boiler. Between boiler and axle, inside of bracket is placed a heavy double coil spring, which adds greatly to the durability in running over rough roads. This tank is provided with a steam ejector and hose for filling.

When desired we furnish a chain-steering apparatus with roll, similar to those used on other makes of engines.

Reversing Mechanism.—Our patent reverse motion is a very simple and efficient device. It is operated by a single eccentric, and none of the joints are wearing while the engine is in motion, except as they are moved by the engineer. It is a variable cut-off, and will perform all that a link can—stop, start, back, or control the engine perfectly when running down steep grades; is positive in its action, so the engine can be reversed without shutting off the steam, and is the most durable reverse motion in use. See illustration of same on page 8.



STRAW-BURNING TRACTION ENGINE.

Straw-Burning Traction Engine and Boiler.



OUR Straw-burning Boiler is of the locomotive style, and has the usual fire-box. Large flues, four inches in length, connect the fire-box with the combustion chamber, forming a three-inch water-space between the fire-box and combustion chamber. The latter consumes all the straw and gases that pass through the short flues, and deposits all the ash and refuse at the bottom, from which it can be removed at any time by pulling a slide and allowing it to drop into the ash pan. From this chamber another set of flues pass through the shell of the boiler to the smoke-box. As everything that passes from the fire-box is consumed or deposited in the combustion chamber, the flues are perfectly clean at all times. We get the most perfect combustion with this boiler. Another important feature is the convenience in cleaning. There are the usual cleaning places at the four corners of the fire-box; in addition, there is a plug on each side, opposite the water-space, between the fire-box and chamber, which allows of the most convenient method of cleaning this space, where the largest amount of deposit will take place, as this is the hottest point in the boiler, and circulation here is the most rapid. We use a very effective smokestack and a tight ash-pan, so that danger from fire is reduced to a minimum.

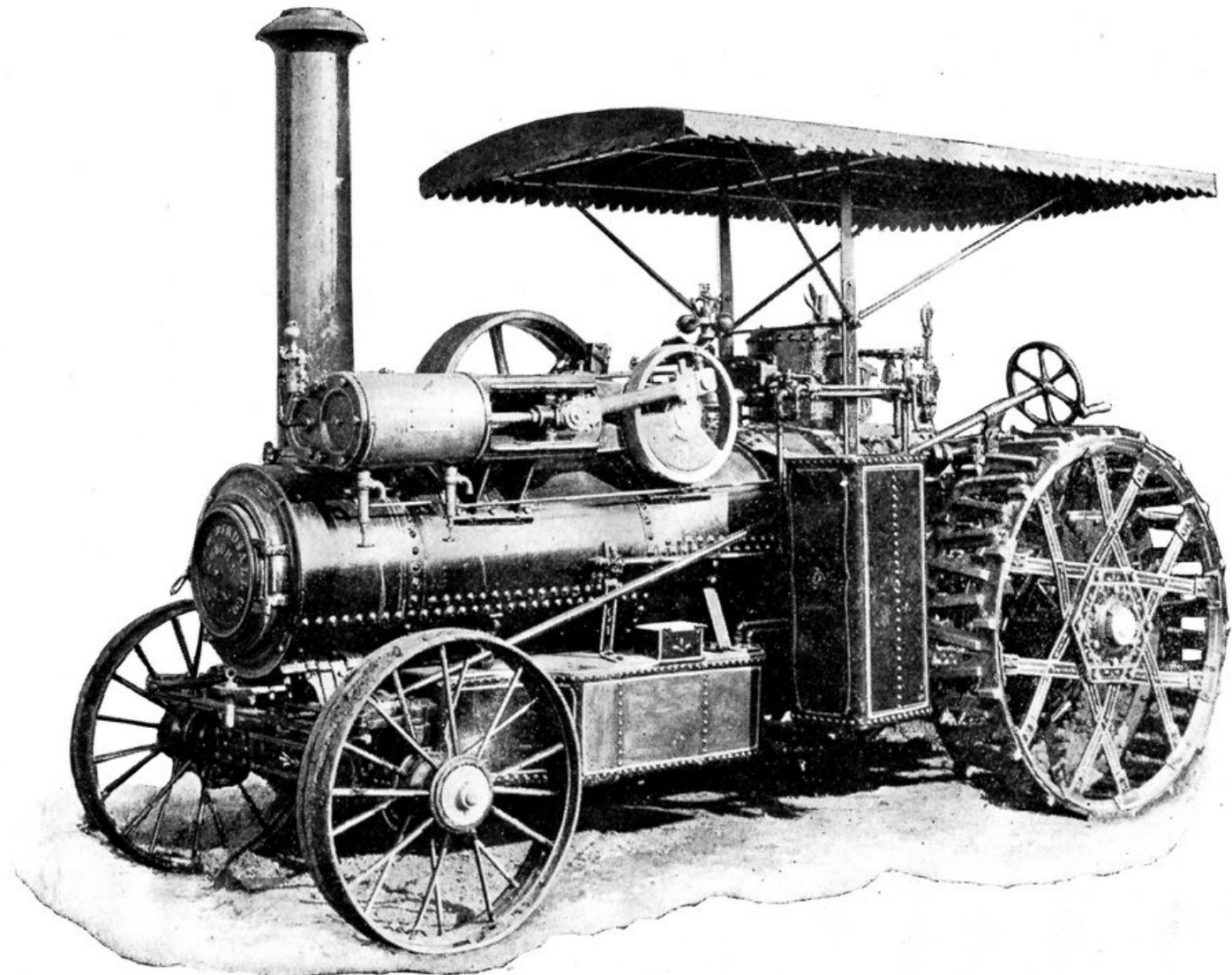
The Boiler is jacketed by a non-conducting covering, over which is placed a neat steel jacket. We also use the ordinary funnel for feeding the straw into the fire-box, with the swinging door and shut-off opening, and furnish both coal-burning and straw-burning grates.

These Engines are furnished with or without four-barrel suspended tank, as desired; also provided with two injectors for supplying the boiler with water. When the four-barrel tank is used, the usual ejector and hose for filling the water-tank are furnished. Twenty-inch solid-faced wheels used on straw burning engines.

Following are some reasons why we claim the Birdsall Traction Engine and Boiler to be the best:

1. **Boiler.**—Its design, large steam space, great economy in fuel, and durability. All boilers are made at our works, and under our own supervision.
2. **Entire Weight of Boiler** mounted on springs.

Traction Engines fitted with short cab or full length cab as desired, at extra price. See list prices.

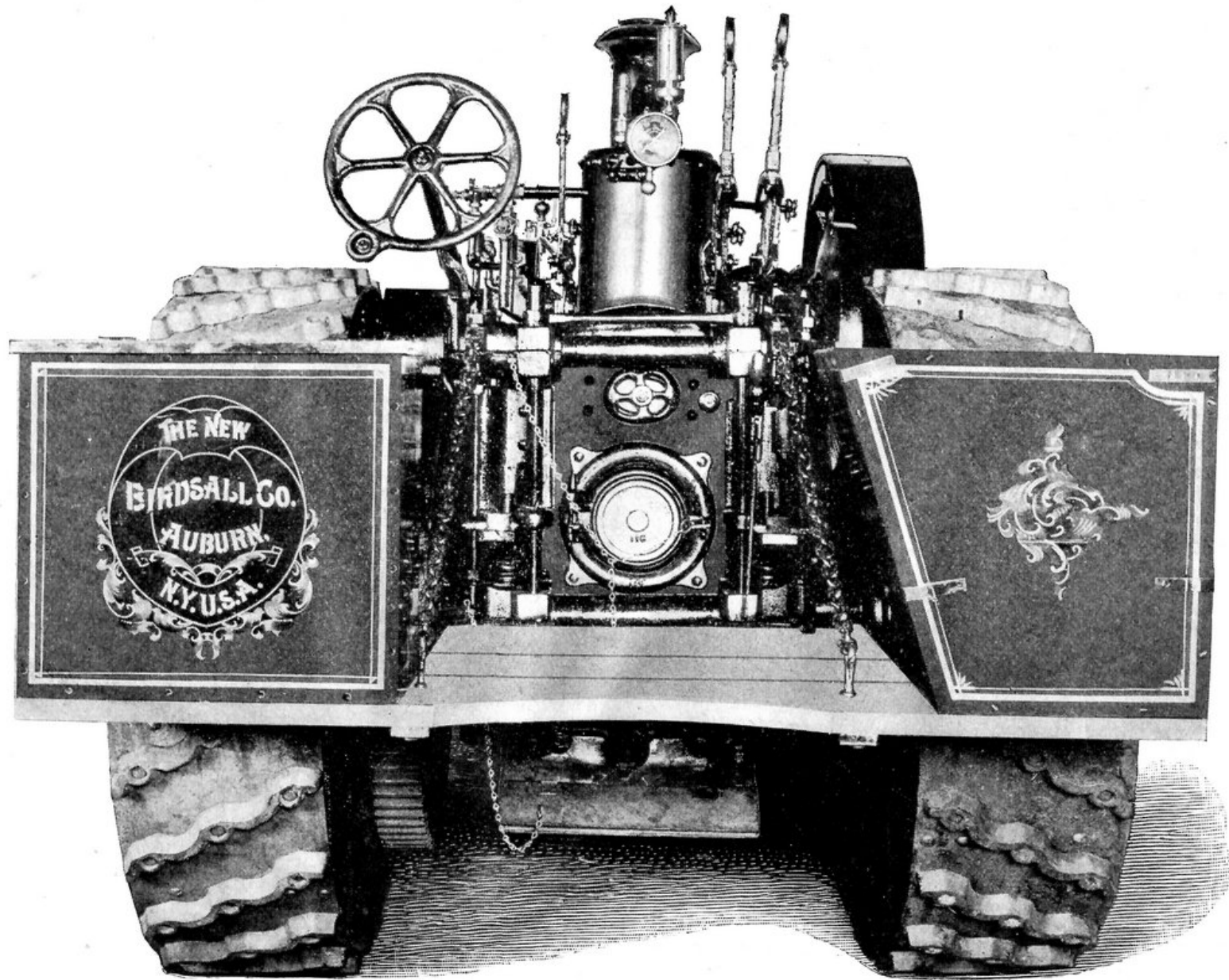


SPECIAL HAULING ENGINE, 18 AND 20 HORSE-POWER.

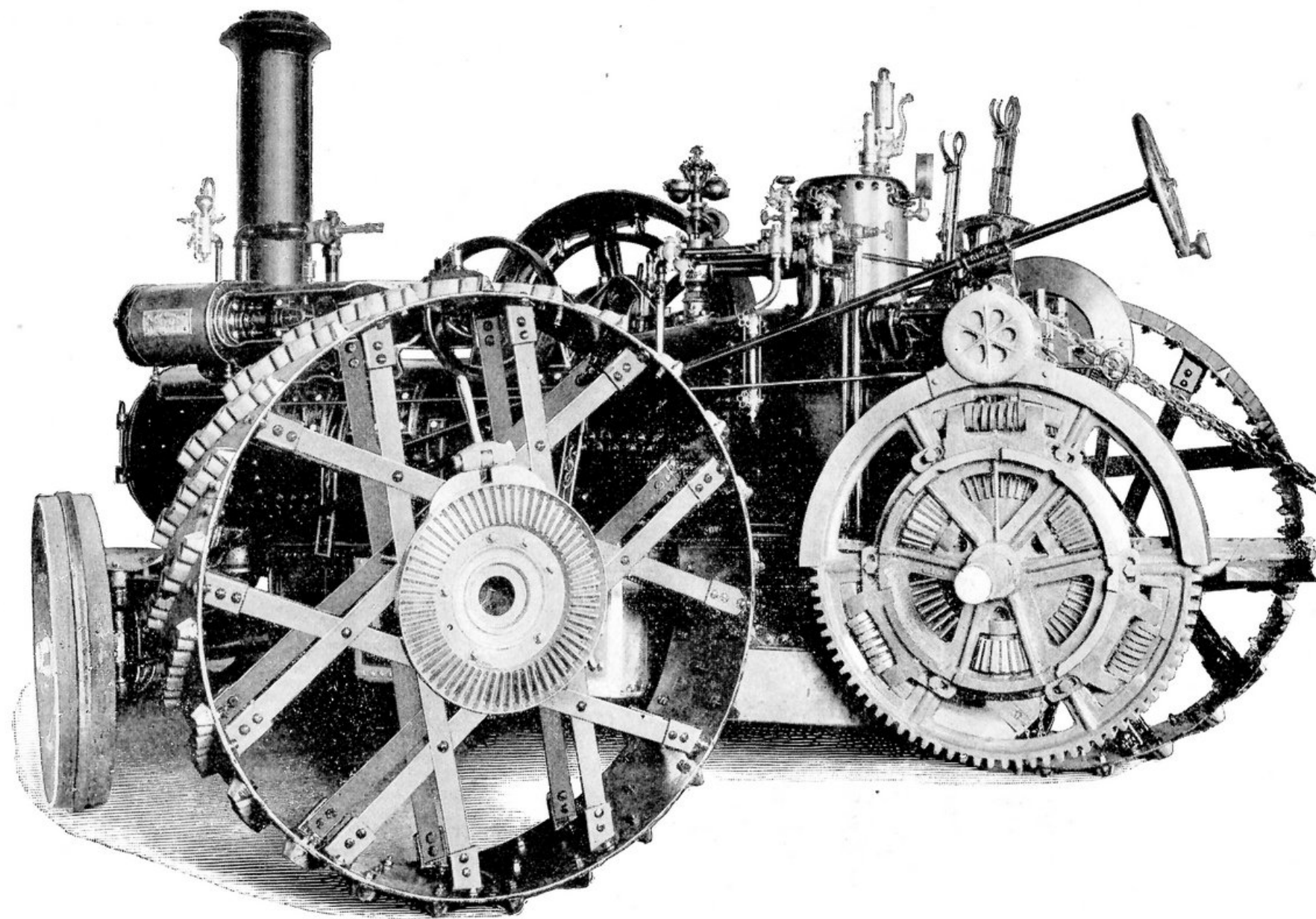
3. **Patent Reversing Mechanism**, being a perfect cut-off and free from wear.
4. **Counterbalance** of crank-head and fly-wheel.
5. **Patent Open-Faced Driving or Traction Wheels** and their peculiar construction.
6. **Method of Revolving Rear Axle in Metal Boxes** instead of wheels revolving on stationary axles. By this method hubs cannot cut out.
7. **Front Wheels** cast iron with wrought iron spokes.
8. **Patent Steering Device**.—The most serviceable, convenient, and easily controlled device in use.
9. **Suspended Tank**, provided with ejector and hose for filling tank.
10. **Connecting Rod** free from vibration.
11. **Cross-Head and Ways**.—Device for taking up wear.
12. **Method of Transmitting Power** from crank-shaft to traction wheels.
13. **Compensating Gear** being placed directly on driving axle of engine.
14. **Throttle** and method of taking steam to cylinder. There are no leaky throttles to endanger lives of operators.
15. **Lightest and Strongest Traction** manufactured, and will draw heavier loads over hills, through mud and sand.

It Will be Observed that the Birdsall Traction Engine and Boiler are constructed on different lines from those of any other manufacture, and cost more than many of the other makes to build; the question then is, why do we continue to build this particular style of engine after twenty years' experience, if there is not some good reason for it? Read "Some of the reasons why," and consider the above remarks and make up your mind without being influenced by the talk of salesmen who are simply trying to earn their salaries.

The fact that the Engine is entirely mounted on springs, the cushioned gear, superior arrangement for getting dry steam, and its great traction power in all conditions of ground, enabling it to draw a greater load than a much heavier engine can, are incontrovertible facts.



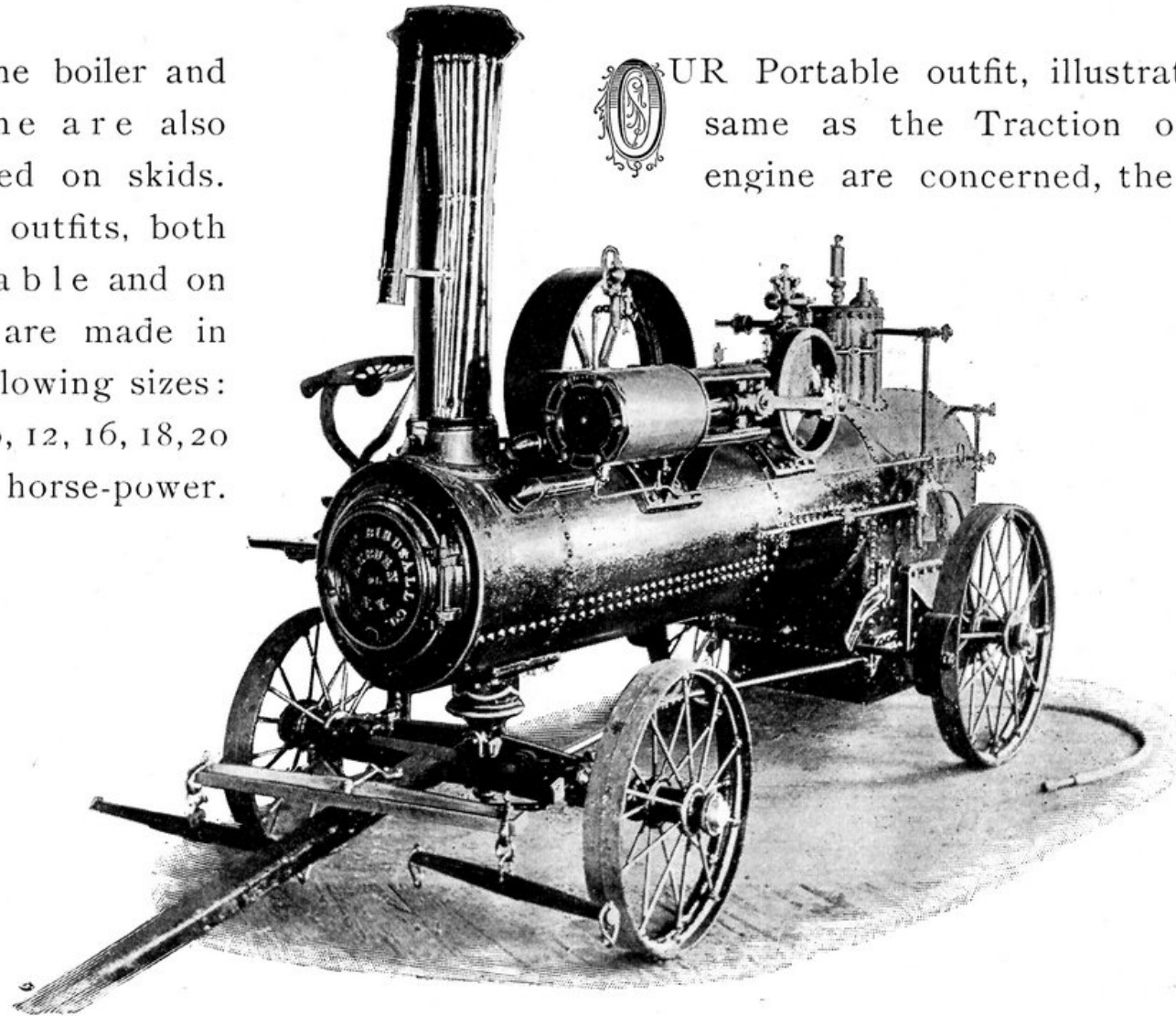
SHOWING REAR END OF THE NEW BIRDSALL TRACTION ENGINE.



SHOWING DIAPHRAGM AND COMPENSATING GEAR OF TRACTION ENGINE.

THIS same boiler and engine are also mounted on skids. These outfits, both portable and on skids, are made in the following sizes: 6, 8, 10, 12, 16, 18, 20 and 25 horse-power.

**OUR
PORTABLE
ENGINE
AND
BOILER.**



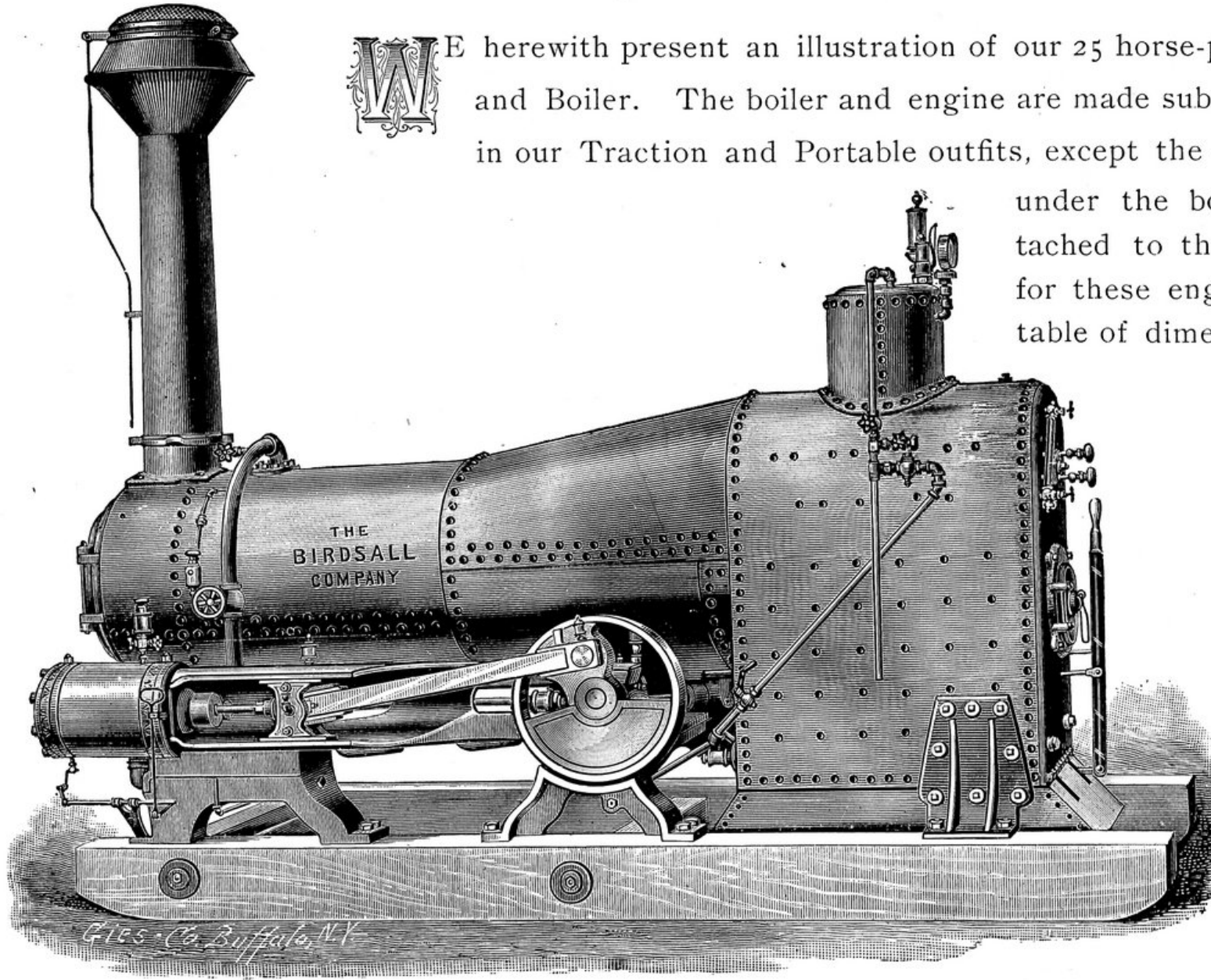
OUR Portable outfit, illustrated herewith, is exactly the same as the Traction outfit, so far as boiler and engine are concerned, the only difference being it is

mounted on iron trucks and is provided with pole, whiffletrees, neckyoke, and a good serviceable brake, with seat for driver in front of flywheel on right hand side.

We also manufacture Center Crank Portable Engines in 18 and 20 horse size, provided with two flywheels.

WE herewith present an illustration of our 25 horse-power semi-portable Engine and Boiler. The boiler and engine are made substantially the same as those in our Traction and Portable outfits, except the engine is mounted on skids

under the boiler, instead of being attached to the boiler. Full dimensions for these engines will be found in the table of dimensions on opposite page.



SEMI-
PORTABLE
ENGINE.

25 HORSE-
POWER.

TABLE OF DIMENSIONS.

DIMENSIONS OF ENGINES.						DIMENSIONS OF BOILERS.							
Rated Horse-Power.	CYLINDER.		BAL. WHEEL.		Revolutions per Minute.	Rated Horse-Power.	FIRE-BOX.			TUBES.			Diameter of Waist in Inches.
	Diameter in Inches.	Length in Inches.	Diameter in Inches.	Width of Face.			Width in Inches.	Length in Inches.	Height in Inches.	Number of.	Diameter in inches.	Length in inches.	
6	6	8	36	8 1/2	250	6	20	26	24	36	1 3/4	48	24
8	6 1/2	8	36	8 1/2	240	8	20	26	24	36	1 3/4	48	24
10	7	9	40	8 1/2	230	10	20	26	24	46	1 3/4	66	24
12	7 1/2	9	40	8 1/2	230	12	20	26	24	46	1 3/4	66	24
16	8	9	40	10 1/2	230	16	22	34	29	54	1 3/4	66	26
18	8 1/2	10	40	11 1/2	230	18	24	34	31	63	1 3/4	72	28
20	9	10	40	11 1/2	230	20	24	39	31	63	1 3/4	85	28
25	10	12	50	12 1/2	200	25	26	44	36	56	2	90	30

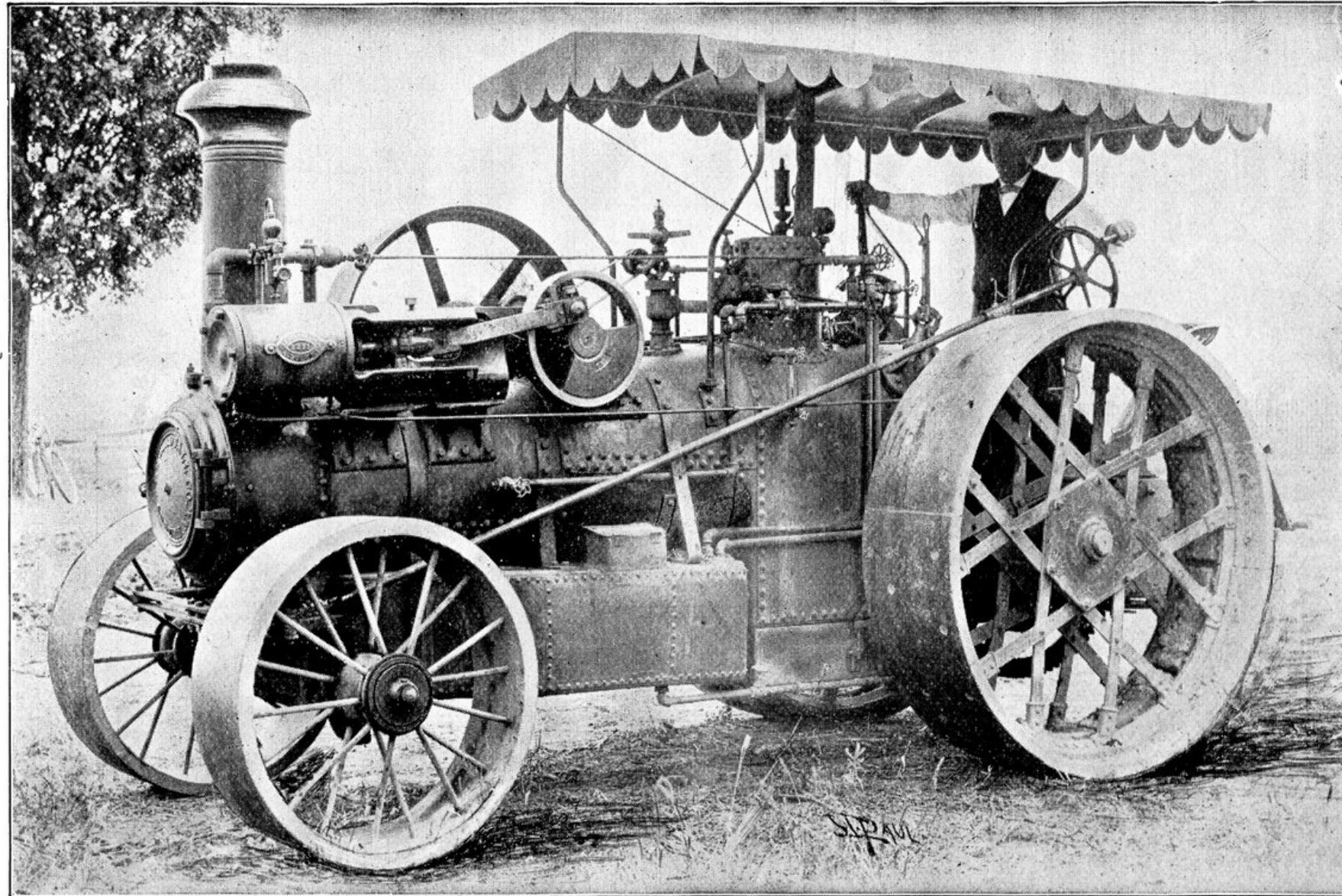
FRICITION CLUTCH.

WE have a very efficient friction clutch that is attached to all sizes of Traction Engines, which is operated by a lever and quadrant placed beside the reverse lever, within easy reach of the operator.

A STUDY of the above table of dimensions will show that great care has been taken in getting the best relative proportions between engine and boiler, which is a very important feature in Traction and Portable Engines. It is necessary to keep the weight down as much as possible, consistent with necessary strength, and by a wise and proper computation of the strength required and careful proportionment of the parts, much unnecessary weight is saved.

Impure Water is used in boilers of this class, causing sediment and impurities to settle in the boiler, which is an element to be considered in apportioning the amount of heating surface necessary.

The Greater the quantity of water to heat in proportion to the heating surface, the more fuel required; too little water in proportion to heating surface will drive the water into the cylinder, or to use a common expression, "Causes it to prime." It will, therefore, be seen that proper proportion is of the utmost importance.



ROAD
ROLLER
AND
ROAD
ENGINE
COMBINED

THREE
SIZES, 16,
18 AND 20
HORSE-
POWER

Road Roller Attachment for Traction Engines.

THERE has been great interest aroused during the past two or three years, in the "Good Roads" movement. Many townships and villages are buying road machinery which usually consists of a stone crusher, engine to run it, a road machine or scraper and a horse roller. To meet the demand of these new requirements, we manufacture a traction engine that will drive the stone crusher for crushing the stone; draw the road machine for grading the road or opening ditches, then by attaching our roller wheels, the same engine can be used for rolling the crushed stone or gravel, after it is placed on the road.

The Roller Attachment consists of two 18-inch solid roller wheels in place of the regular traction wheels, and are provided with scrapers. There are holes through the face of the rim for the purpose of inserting spikes for breaking up the old road bed. The front wheels have smooth solid rims 12-inch face, and are also provided with scrapers. This attachment can be used with the 16, 18 or 20 horse-power traction engines. These engines are also provided with a steel platform forming coal-box and water-box, thus making a total water supply on the engine of about six barrels. The roller is also provided with a canopy top. This roller can be sold for very much less than the ordinary steam roller, besides being more efficient, especially for country road work. The front wheels being spread, instead of together, the roller can be run along the edge of a ditch or bank, without the front end sliding off, as one wheel is always on solid ground.

When it is necessary to cross bridges that will not stand the weight of a roller, the roller attachment can be taken off, and the traction wheels put on, when it is possible to cross any bridge that will carry the ordinary traction engine.

	On 16 H. P.,	space between rear wheels is	3 ft. 9 in.,	wheels 18 in. face.
" 16 "	" "	" front "	3 ft. 4½ in.,	" 12 in. "
" 18 "	" "	" rear "	3 ft. 11 in.,	" 18 in. "
" 18 "	" "	" front "	3 ft. 4½ in.,	" 12 in. "
" 20 "	" "	" rear "	3 ft. 11 in.,	" 18 in. "
" 20 "	" "	" front "	3 ft. 4½ in.,	" 12 in. "

The Weight of the 16 horse roller is ten tons, 18 horse, twelve tons and 20 horse, thirteen tons. The draw bar on rear of platform is arranged to draw from center or from either side, which is a convenience when plowing or scraping.

Special Combination Traction Engine for Township Work.

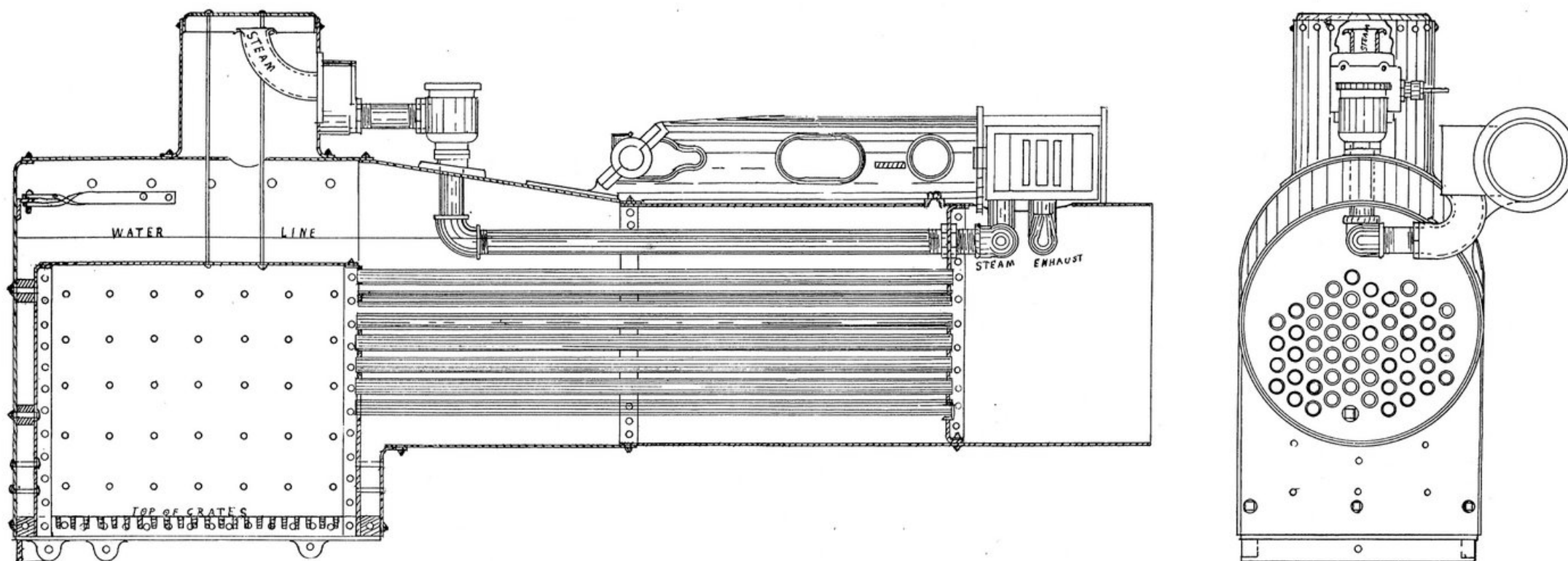
WHERE Townships are not able to invest in steam road rollers, or where their bridges are unsafe to carry such a weight, we have added a feature to our traction engines which is one of the most important points connected with the making of good roads, and that is, we put on a style of driving wheel which can be used as a roller wheel as well as a traction wheel, enabling the engine to be used to roll down the crushed stone and make a hard and firm road-bed.

This change is effected by our furnishing in place of the regular open-faced drivers, wheels with steel rim tire, either 16 or 20 inches wide, with cleats that bolt on and which can be easily removed, leaving the face of the wheel smooth. In front we furnish wheels with 12-inch face, with a detachable center tire, bolted on in two sections, which also can be removed, leaving the face of the wheels smooth. In this manner it is very easy to convert the traction engine into a road roller, which answers almost every purpose for country road work, making it about as effective as a heavy steam roller that costs nearly twice as much, and which if it ever should get ditched, would take all the teams in the town to haul it out.

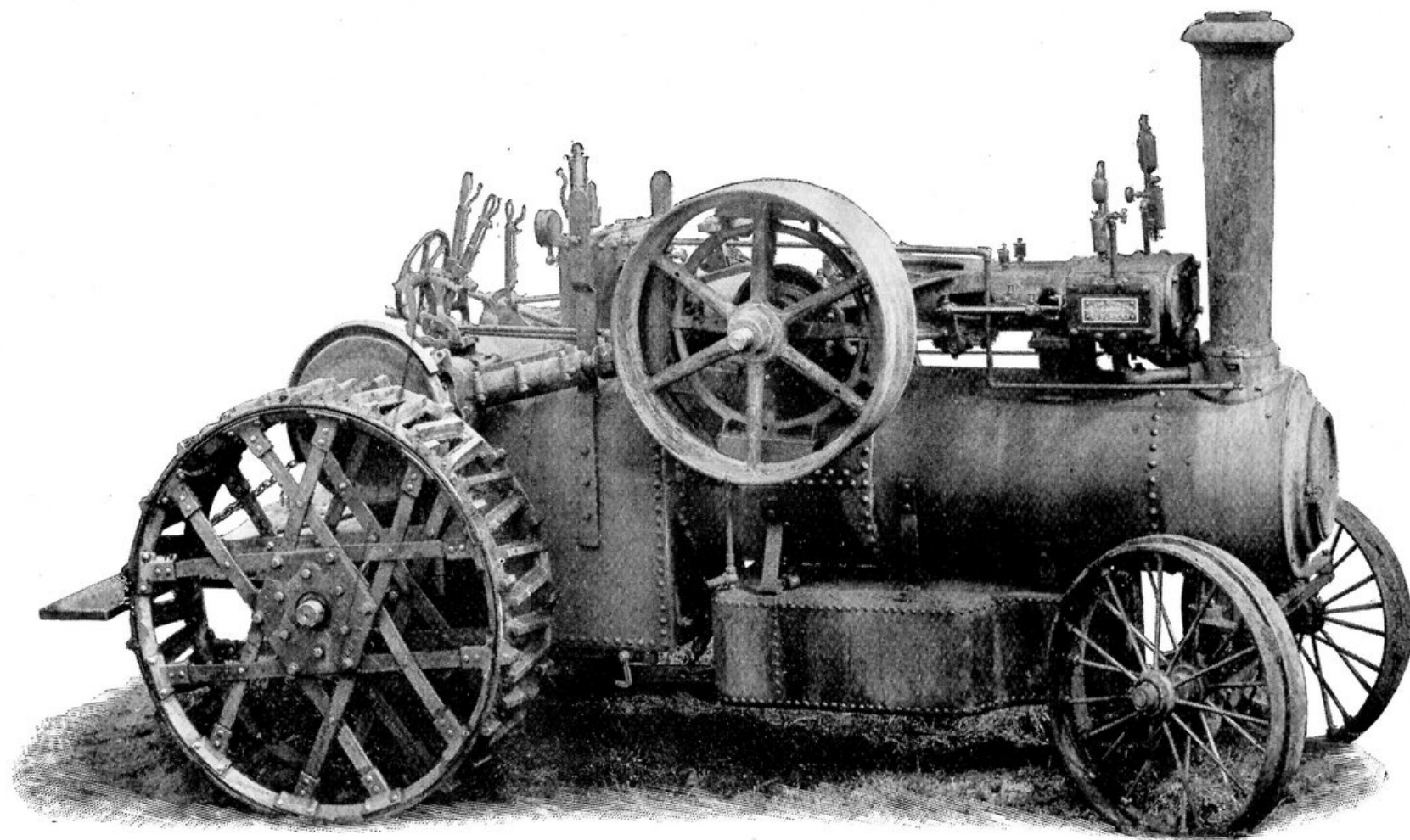
Too much importance cannot be attached to this combination of the wide smooth wheels for rolling purposes, as it does not increase the cost of the engine materially, but it increases its efficiency for road-making purposes, at least ten-fold. With this arrangement of the solid faced wheels on our 16 and 18 horse power tractions, they can be converted into 7 to 9 ton rollers, according to the size of the engine, and at the same time their efficiency for regular traction engine work, such as hauling the crusher or road scraper and driving the crusher, is not impaired in the least. This combination of three machines in one is indispensable for country road work.

Anyone who has ridden over a crushed stone road without its having been rolled down, knows that it is a thing to be shunned, and until it becomes beaten down, the public prefer to drive to one side of the road, rather than travel over the loose stone.

We have Sold a number of this style of engines to different townships, and wherever they are used they are giving universal satisfaction.



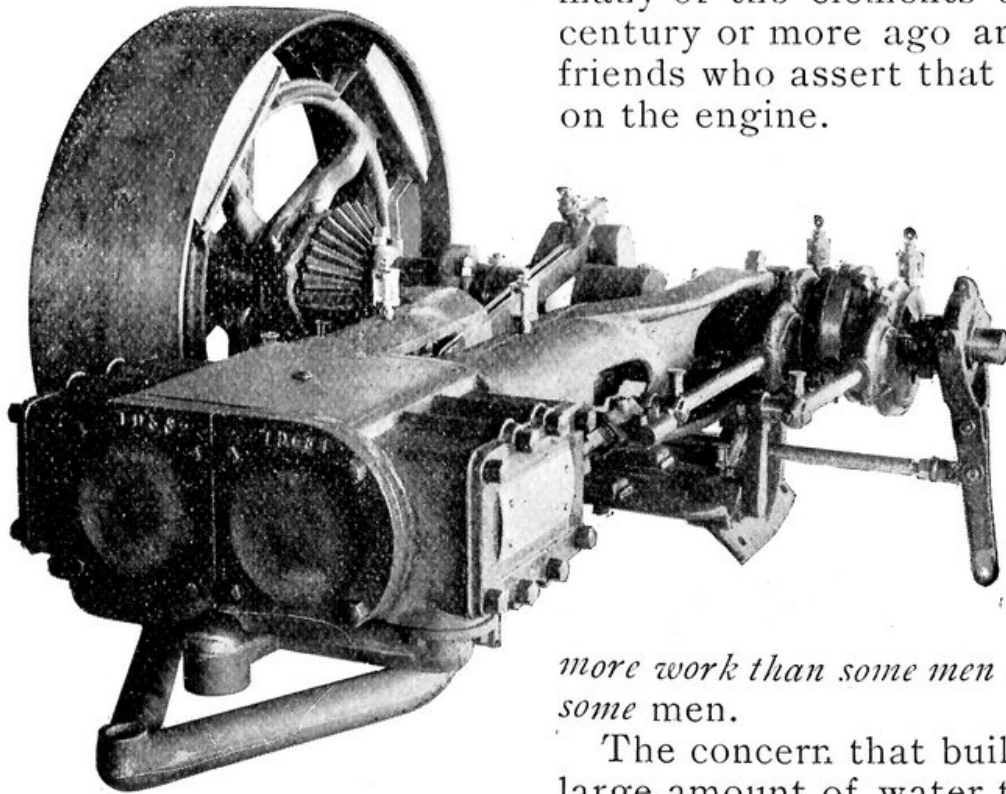
CUT OF SECTIONAL VIEW OF BOILER SHOWING DRY PIPE, STEAM PIPE, WATER LINE, FLUES AND LOCATION OF GRATES.



RIGHT HAND SIDE VIEW OF DOUBLE CYLINDER TRACTION ENGINE.

Our Double Cylinder Traction Engines.

SOME of our competitors truthfully say, the idea of Double Cylinders for Traction Engines is not new and that they were abandoned years ago as being impracticable. Hundreds of other experiments and inventions of a quarter or half a century ago have been revived, and this progressive age has made them a success. No one questions the practicability of the corn husker; yet corn huskers embodying many of the elements of the machine of today were invented a quarter of a century or more ago and proved impracticable at that time. So we say to our friends who assert that the double engine is impracticable, that it all depends on the engine.



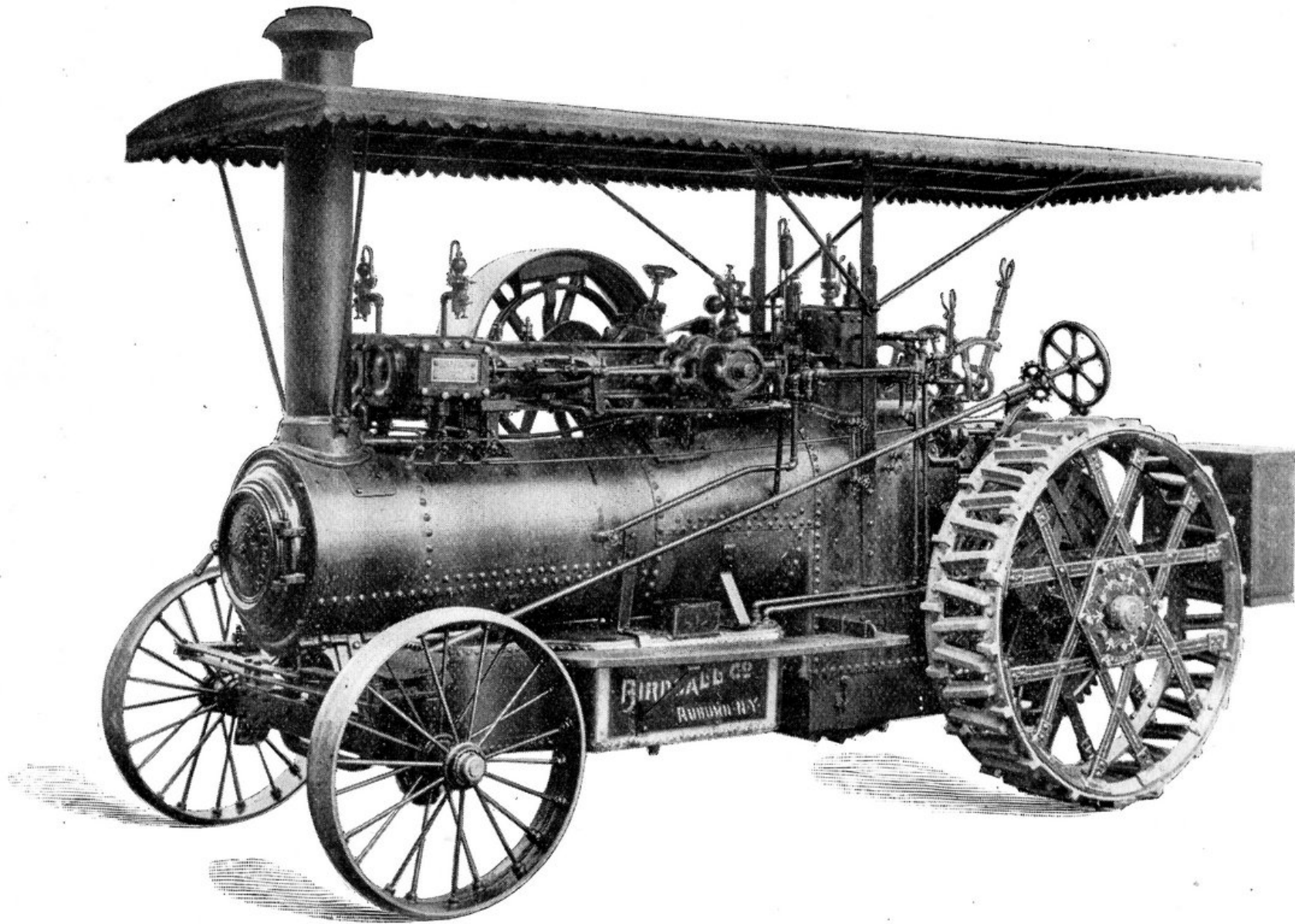
The man who owns a horse and does not possess an automobile will say that automobiles are impracticable; but automobiles and double cylinder traction engines have come to stay. It is impossible to stand still in this world; we must progress or deteriorate. The momentum acquired by a past reputation will not carry a business very far in these days of wide-awake competition.

One competitor says, referring to double engines: "If it costs as much to feed a boy as a man, would you 'hire and feed' two boys to do one man's work?" Our reply is: *We know some boys that will do*

more work than some men and at less expense. Our boys do not eat half as much as some men.

The concern that builds a boiler and engine that are fuel eaters and require a large amount of water to run them, will not make a success of double engines. Our reputation on single cylinder engines is second to none, and we are prepared to furnish double cylinder engines that are just as successful.

We are prepared to furnish whatever customers want, single or double engines; and a perusal of the following pages, we think, will convince those interested that we are prepared to make good what we claim.



LEFT HAND SIDE VIEW OF DOUBLE CYLINDER TRACTION ENGINE.

Double Cylinder Traction Engines.

MANUFACTURED in two sizes, 18 H. P. and 20 H. P. The 18 H. P. cylinders are $6\frac{3}{4} \times 9$ inches. The 20 H. P. cylinders are 7×9 inches. They are mounted directly on top of the boiler and are operated with our single eccentric reversing mechanism used on all our single cylinder Traction Engines.

The Crank Shaft is a double crank made from a special quality of steel, and is made from one solid piece. The bearings being long and rigid, the fly wheel being perfectly balanced, causes the engines to run very smoothly and without vibration.

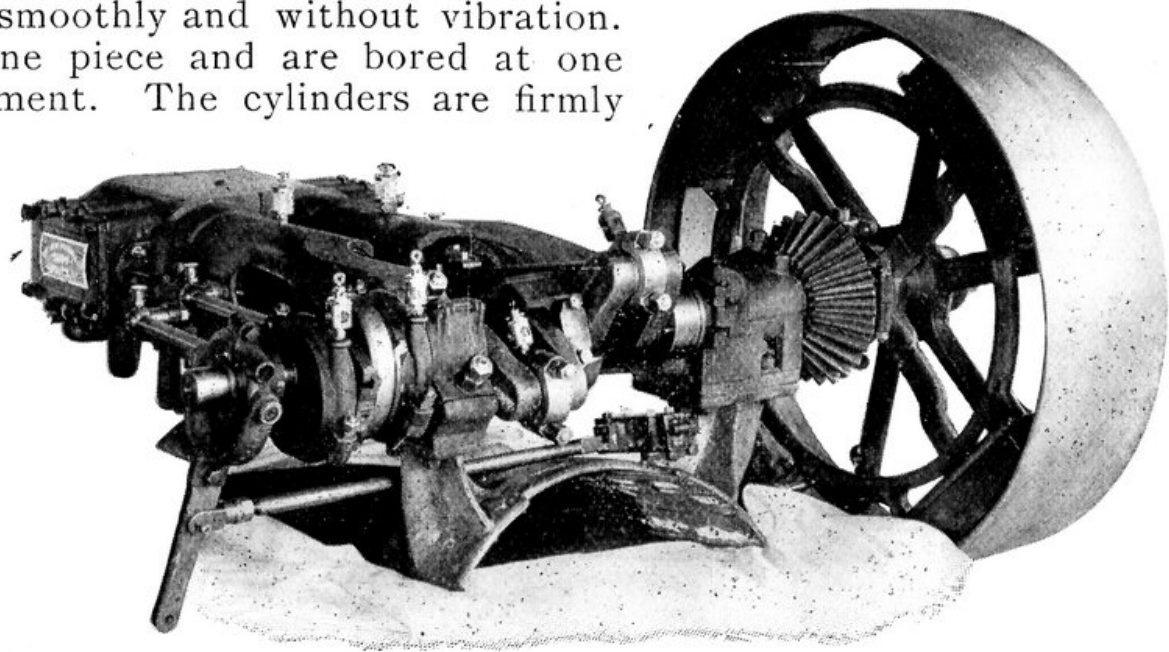
The Cylinder and Ways are cast in one piece and are bored at one operation, thus assuring perfect alignment. The cylinders are firmly bolted to brackets attached to the boiler in such a manner as to keep them perfectly rigid at all times.

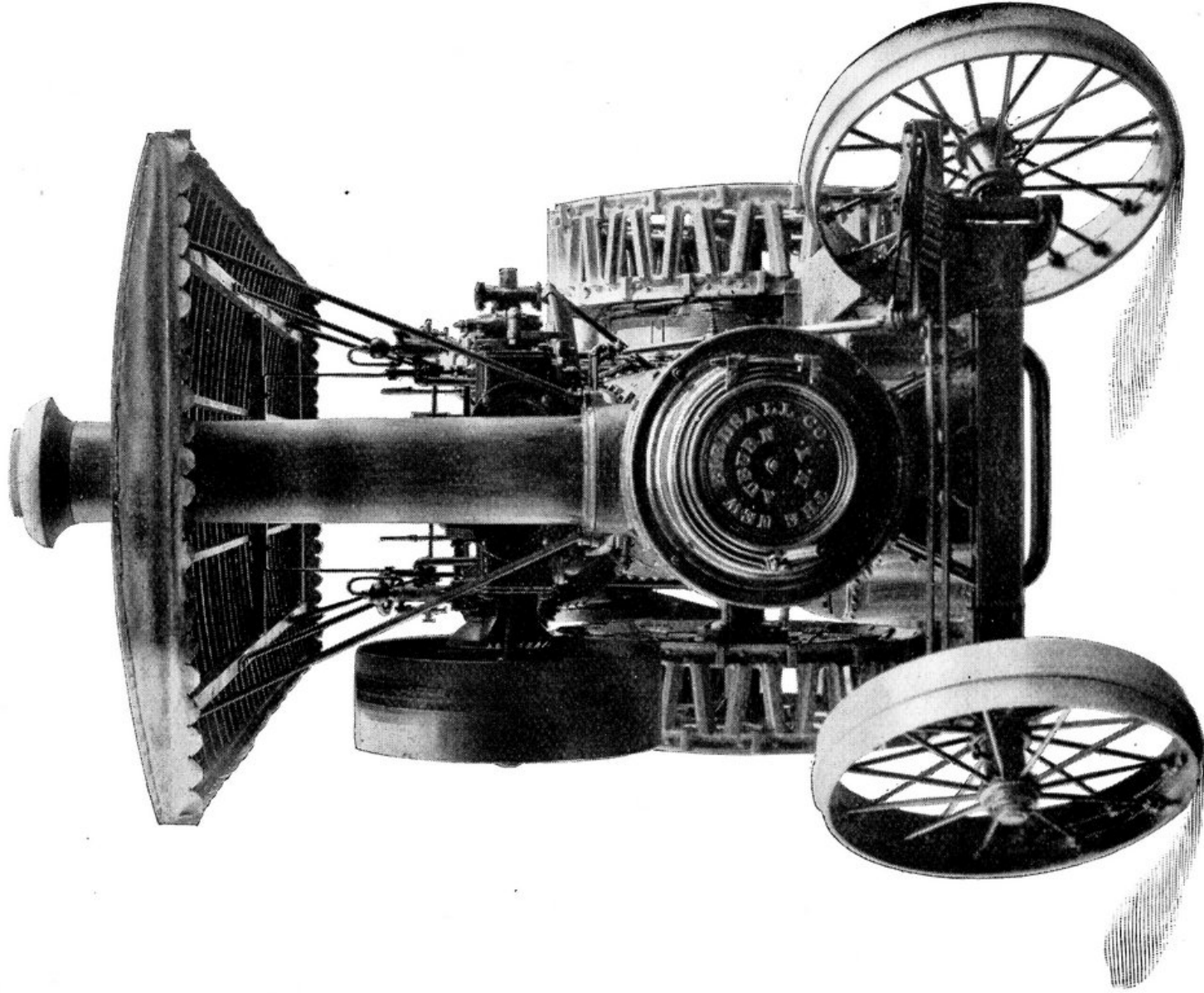
The Cross Heads are adjustable for taking up wear and the wearing surfaces, being concave, offer large surfaces to wear and are therefore very durable.

The Steam Pipe passes through the inside of the boiler from the dome and governor, and through the smoke box; thence to the cylinders, thus exposing the least possible pipe to the outside air, which enables us to deliver very dry steam to the cylinders.

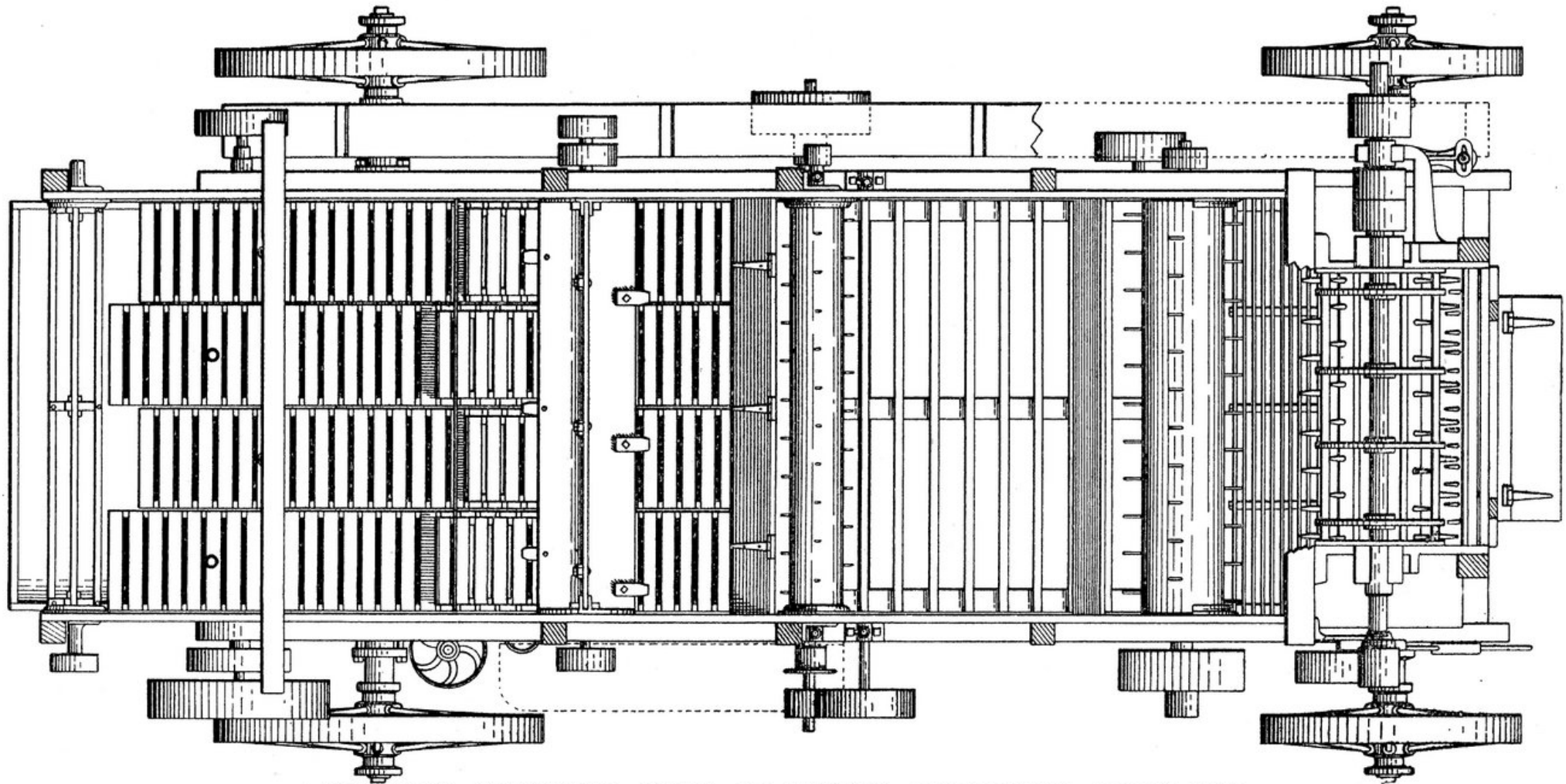
Exhaust. The cylinder end of the engines being placed near the smoke stack, our exhaust pipes are very short and being large, offer the least possible resistance to the escaping steam, therefore reducing back pressure on the piston to the minimum.

Friction Clutch. These engines are furnished with or without friction clutch, as desired. For full particulars regarding description of Traction Attachment, Boiler, Wheels, etc., see description of our Single Cylinder Traction Engines.

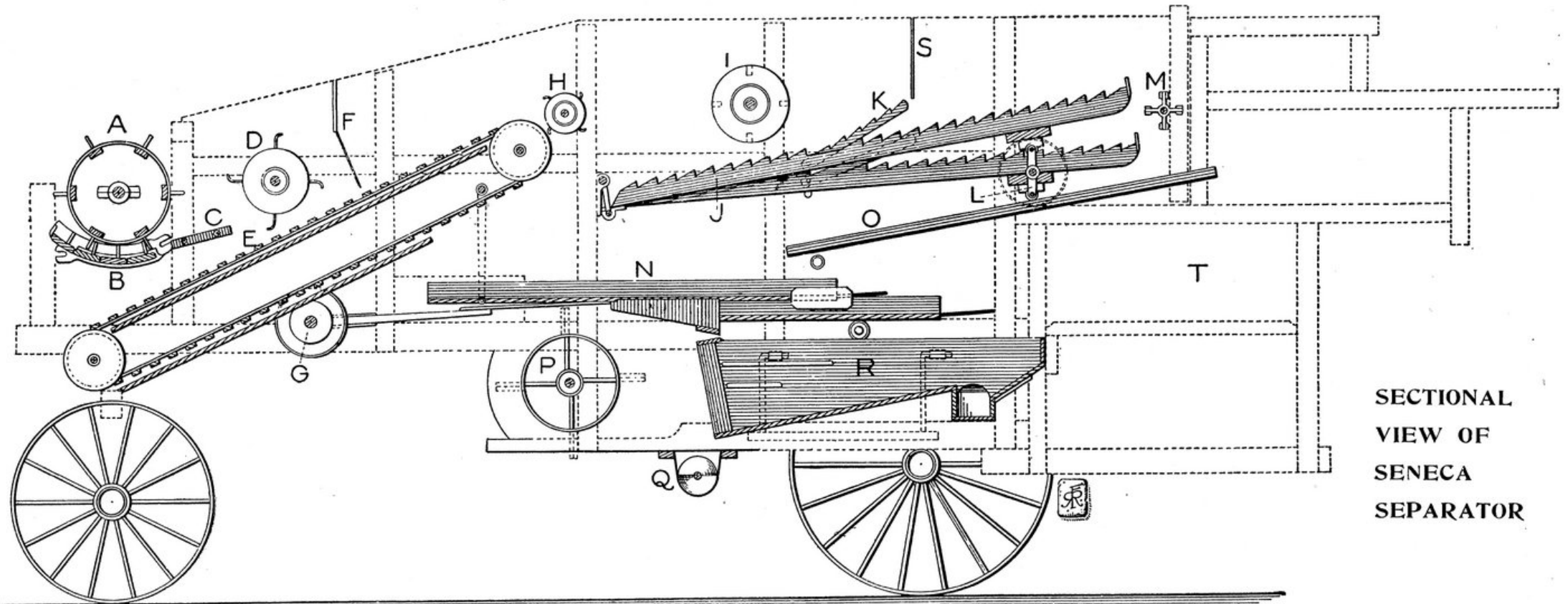




FRONT VIEW OF DOUBLE CYLINDER TRACTION ENGINE.



INTERIOR SECTIONAL VIEW OF SENECA SEPARATOR FROM TOP.



SECTIONAL
VIEW OF
SENECA
SEPARATOR


A 8 Bar Cylinder
B Concaves
C Grate
D No. 1 Drum Beater
E Rake

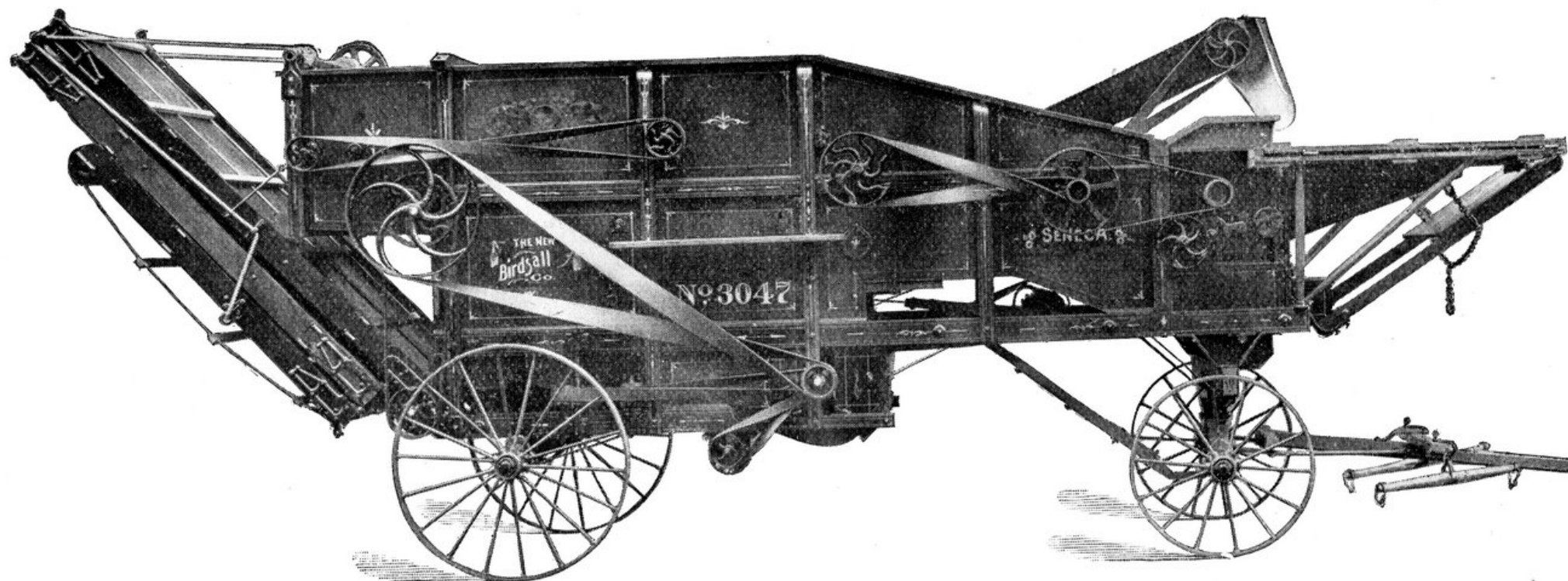
F Sheet iron Curtain
G Crank to drive Pan
H Picker
I No. 2 Open Beater
J Oscillators

K Rip raps
L Oscillator crank
M Whipper
N Grain pan end shake
O Pan under Oscillator

P Fan
Q Conveyor
R Body side shake shoe
S Canvas curtain
T Wind Stacker Case.

General Construction of Seneca Separator.

N the opposite page will be found a sectional view of the new Seneca Separator, with reference letters which fully explain all the details. It will be noticed that back of the cylinder is placed a steel grate, over which revolves a drum beater, which delivers the straw over the grate to a straw belt. At the upper end of the straw belt is placed a small steel picker, running much faster than the straw belt, which combs the straw out into a thin sheet, giving an opportunity for the grain to separate and drop to the grain pan below. The straw then passes to the oscillators, which are suspended at the lower end on iron hangers. At the upper or rear end is a crank shaft. There are four oscillators attached to this crank shaft, which consist of notched strips of wood connected by pieces of flat steel two inches wide, and set on an incline with a space three-fourths of an inch wide and one inch deep, permitting any grain that may be left in the straw to pass through to the grain pan below. Over the oscillators revolves a second beater, placed there for the purpose of preventing the straw from bunching on the oscillators, and to assist the straw in passing over the riplaps placed on the oscillators just back of the beater. The straw drops from the riplaps on to the oscillators again, which are oscillated by the motion of the crank shaft. At the rear end of the machine is placed a whipper, for the purpose of delivering the straw uniformly to the stacker, underneath which is placed a grain pan to catch any grain that may have been left in the straw, where it is carried back to the distributing riddle, which is a steel-lipped sieve with the lips turned down. The grain pan placed under the oscillators has a perforated board in the center, to assist in separating the grain from the chaff; and attached to this pan is the distributing sieve, which has an end-shake and carries off all chaff and coarse material, the grain falling through to the sieve and shoe below. The shoe has a body side-shake. With this arrangement, it will be seen there is what practically amounts to two shoes, an end-shake and a body side-shake, making the most perfect cleaning arrangement ever placed in a separator.



LEFT HAND SIDE OF SENECA SEPARATOR, WITH COMMON STACKER.

The Cylinder has steel shaft and iron bars held in place by four wrought-iron bands shrunk on, and the cylinder is given a running balance. We furnish 8 or 12 bar cylinders as desired.

The Concaves are open, and are raised and lowered, both front and rear, by convenient levers on the outside of the cylinder side plate, to which they are attached.

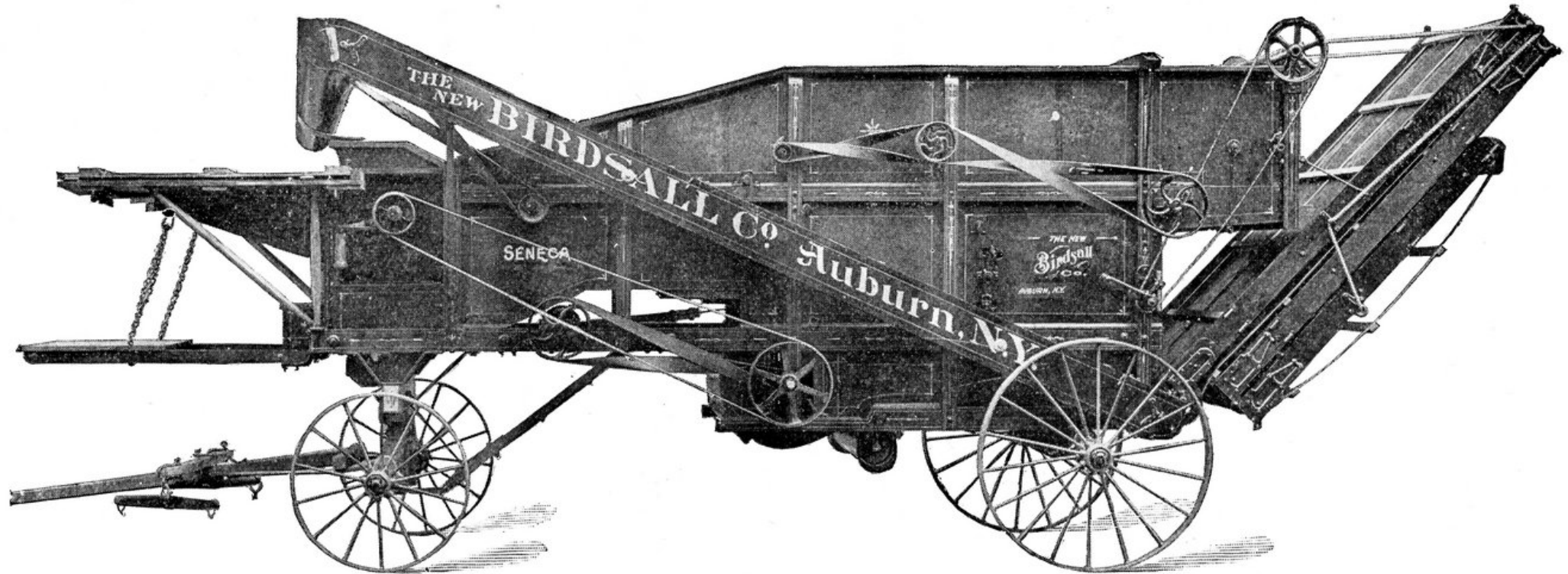
The Folding Stacker is strong, being held together with rods, and folds up in a very compact and convenient manner for moving on the road. The stacker or raddle belt is made with three straps; the flanges on the driving end being covered with leather, causes the belt to drive strong.

Wind Stacker.—We use the Seneca Wind Stacker, with telescope chute and stacker-fan, driven by a bevel-gear on a counter-shaft, to which is attached a pulley which is driven by a belt from cylinder shaft.

Feeder.—We use the well-known Parsons' Self Feeder and Band Cutter which has given the best of satisfaction to thousands of users.

Bagger.—We are prepared to furnish a very convenient bagger on our separator which tallies the bags correctly. It is driven by a belt directly from the fan-shaft of the separator and is attached to the side of the machine by a wrought-iron bracket. It is easily removed and placed upon the run-board of the separator when moving on the road. It can be used on either side of the separator.

Weighers, &c.—We furnish to order weighers, wagon-box elevators, and bagging attachment.



RIGHT HAND SIDE SHOWING ELEVATOR SIDE OF SEPARATOR WITH COMMON STACKER.

24-INCH BY 40-INCH.

Size for 6 to 8 Horse-Power Engine.

Length of Cylinder, in.	24
Diameter of Cylinder, in.	17
Number of Teeth.....	40
Number of Revolutions	1200
Width of Separator, in.	40
Size of Riddles, in.....	42½x32½

28-INCH BY 45-INCH.

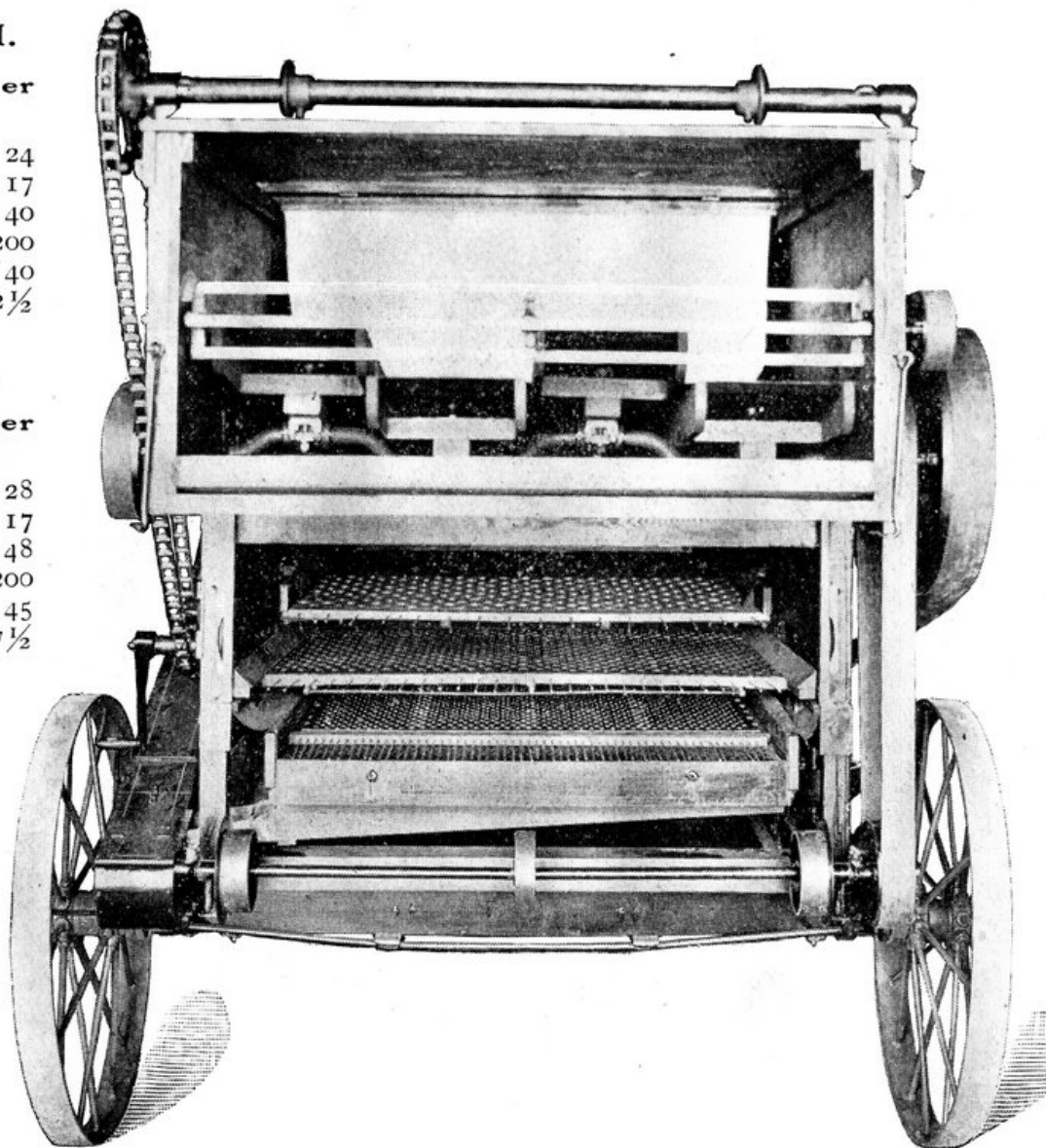
Size for 6 to 10 Horse-Power Engine.

Length of Cylinder, in.	28
Diameter of Cylinder, in.	17
Number of Teeth.....	48
Number of Revolutions	1200
Width of Separator, in.	45
Size of Riddles, in.....	42½x37½

The above are

**DIMENSIONS
OF
SENECA
SEPARATOR**

**SENECA
SEPARATOR,
REAR VIEW.**



32-INCH BY 48-INCH.

Size for 8 to 10 Horse-Power Engine.

Length of Cylinder, in.	32
Diameter of Cylinder, in.	17
Number of Teeth.....	52
Number of Teeth in 12	
Bar Cylinder.....	78
Number of Revolutions	1200
Width of Separator, in.	48
Size of Riddles, in.....	42½x40¼

36-INCH BY 54-INCH.

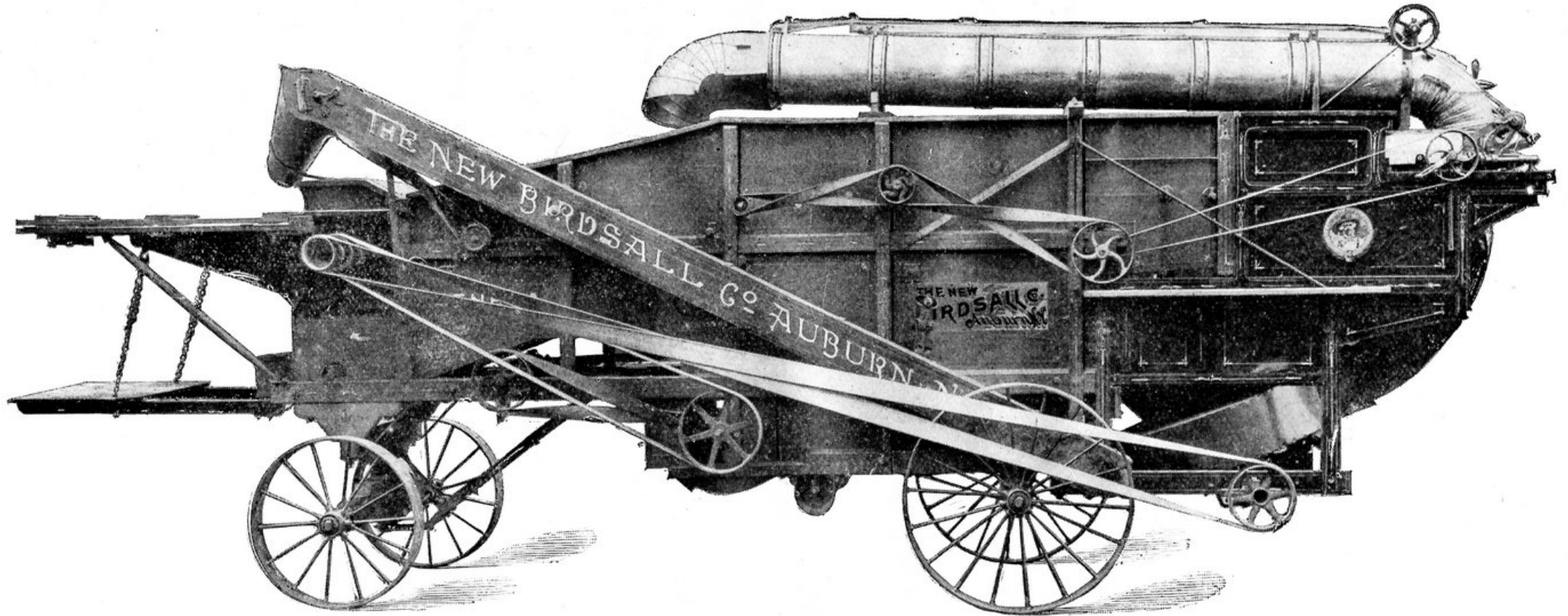
Size for 12 to 16 Horse-Power Engine.

Length of Cylinder, in.	36
Diameter of Cylinder, in.	17
Number of Teeth.....	60
Number of Teeth in 12	
Bar Cylinder.....	90
Number of Revolutions	1200
Width of Separator, in.	54
Size of Riddles, in.....	42½x46½

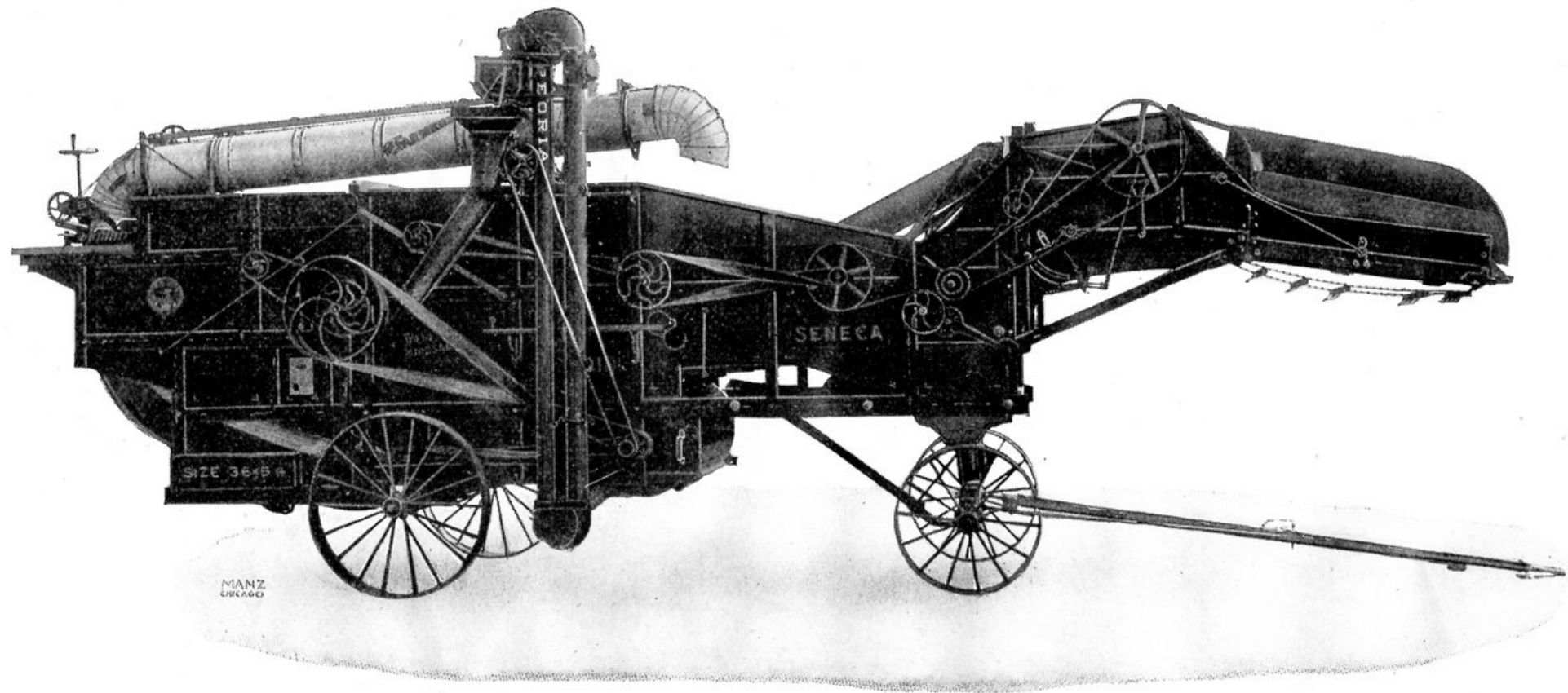
36-INCH BY 60-INCH.

Size for 16 to 18 Horse-Power Engine.

Length of Cylinder, in.	36
Diameter of Cylinder, in.	17
Number of Teeth.....	60
Number of Teeth in 12	
Bar Cylinder.....	90
Number of Revolutions	1200
Width of Separator, in.	60
Size of Riddles, in.....	42½x52½
40 x 60 same as above, except	
cylinder and concaves are 40	
inches long. 8 Bar Cylinder	
has 64 spikes and 12 bar 96	
spikes.	



SHOWING SEPARATOR WITH WIND STACKER.



NEW BIRDSALL "SENECA" SEPARATOR, WITH PARSONS FEEDER, PEORIA WEIGHER AND WIND STACKER.

Sattley Stacker.



WE have made arrangements with the owners of the patents of the Sattley Stacker to manufacture this machine and we expect to be prepared to furnish them for the year of 1904. It is considered by all that there is no attached stacker made that can equal the Sattley. It has all of the desirable improvements and all of the essentials necessary to make a first-class machine. It is the only machine of its kind we know of that delivers all of the straw and chaff and everything on to the stack and leaves everything clean around the separator.

This machine is so constructed that the discharge end of the stacker remains approximately over the center of the stack, thus avoiding the laborious work of pitching back in order to build a good stack. The lower section of this stacker is stationary so far as any vertical movement is concerned and it has two raddles in it, and by reason of these two raddles it is not necessary to use such a wide chute. The straw goes up between these raddles and is delivered to the outer chute in such shape that it is well taken care of and is delivered on to the stack in the best possible condition for handling.

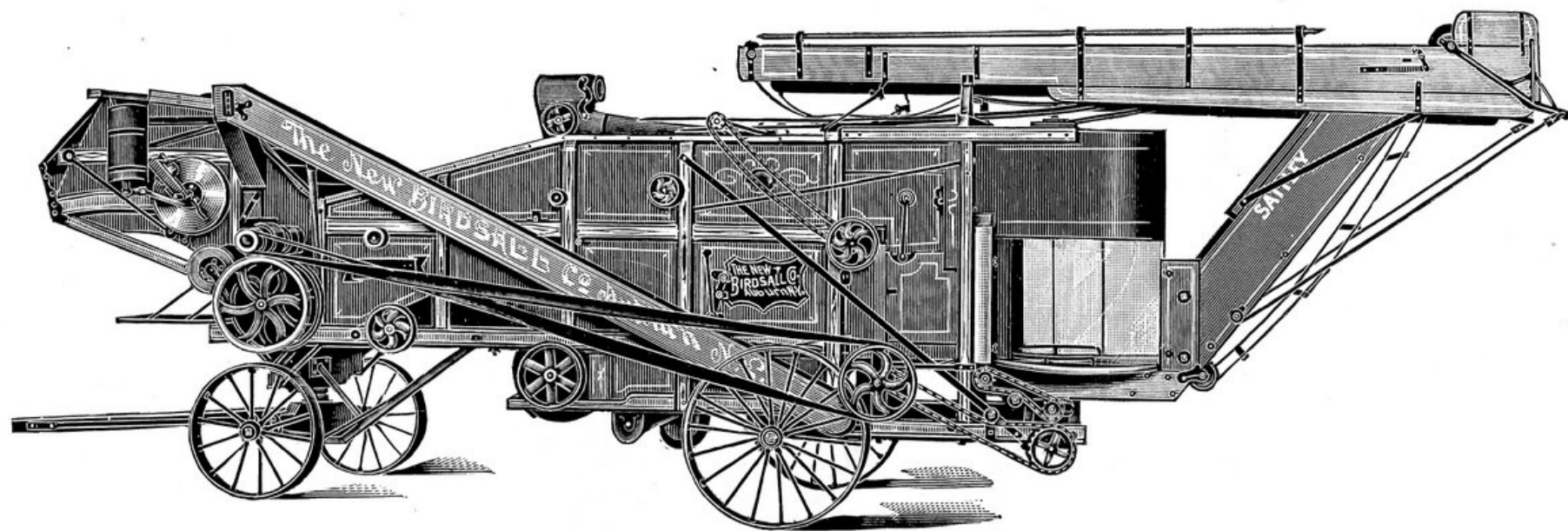
One peculiarity of this stacker is the fact that the rear of the separator is housed in by a sheet steel housing and the aperture which usually exists between such housing and the turn-table of the stacker is closed up by curtains on each side which are attached to rollers on the separator. The shafts of these rollers are wound on heavy clock springs and they pay out and take up automatically as the stacker oscillates.

A very valuable feature of this machine over other straw stackers of like character, is the straw pressers which are composed of two long strips of wood extending from the lower chute to the outer end of the upper chute. These straw pressers are so arranged that they keep the straw from rolling back when the upper chute is elevated to its highest point, and not only that, but it prevents the straw from being blown off the chute during a heavy side or tail wind. These pressers take care of this automatically and require no attention whatever from the operator.

The weight of this stacker is so distributed that it does not injure nor rack the separator. This is proven by actual experience in the field for the past three or four seasons. The stacker, however, oscillates and builds the stack in the form of an arc of a circle.

It is the only machine that can be folded over and made ready for the road in ten seconds. It does not require much power to run it, and from the fact that it delivers the straw on the stack in such splendid condition, there is no objection made by the men on the stack in stacking after it.

We guarantee this machine to be absolutely the best attached straw stacker there is on the market, and we assure those who desire this kind of machine, that they will be better pleased with it than with any other. "It saves the straw."

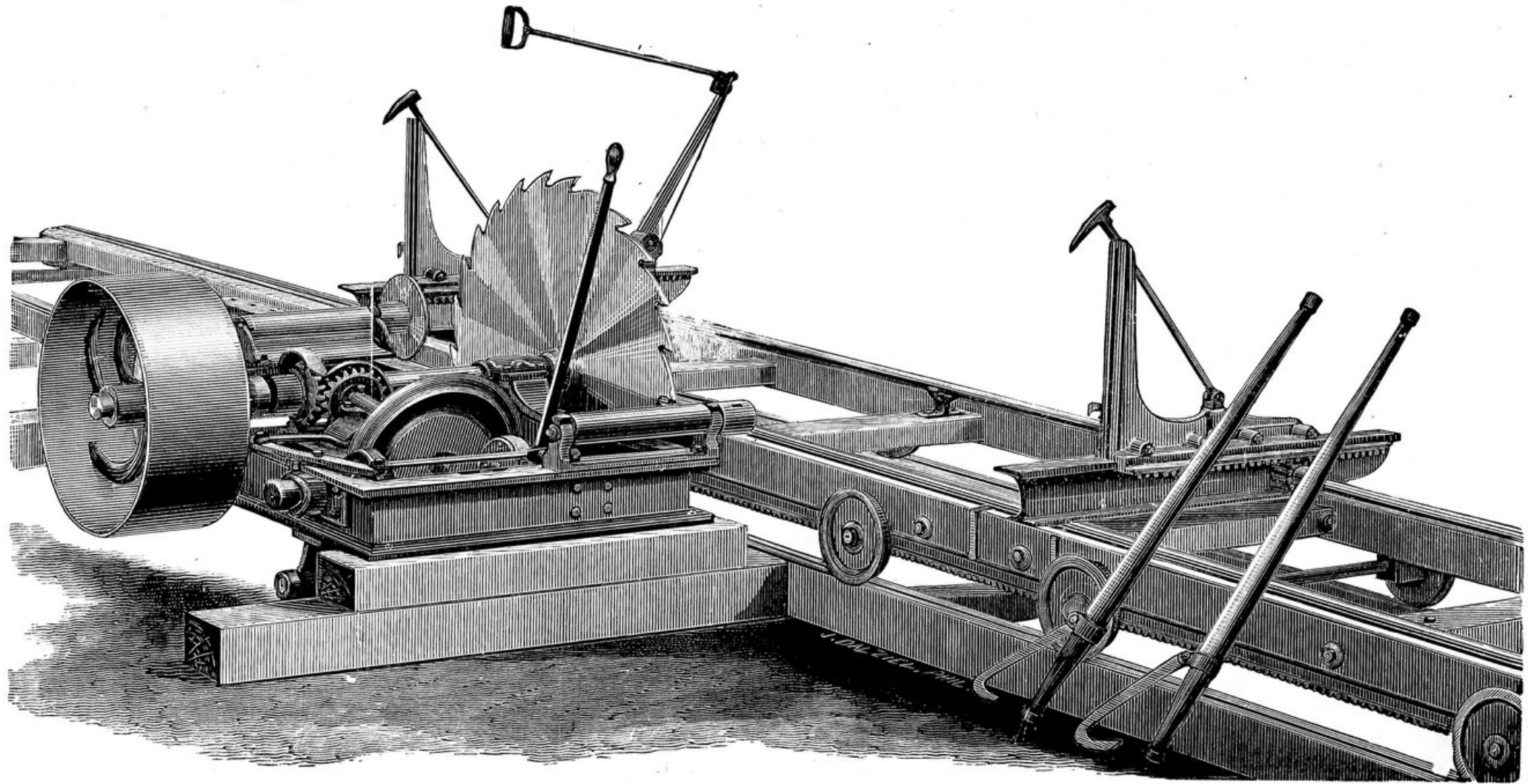


SENECA SEPARATOR WITH SATTLEY STACKER ATTACHED.

Patent Variable Friction Feed Circular Saw Mill.

THE Cut on following page represents our latest Improved Patent Variable Friction Feed Circular Saw Mill, which we confidently recommend as being superior to any mill made in the United States for a small or medium lumbering business, and where it will not pay to use steam feed stationary mills. The artist has made the illustration so plain that an explanation of the mill is hardly necessary.

The Husk Frame is of iron and is cast in one solid piece. It is much stronger and heavier than is generally used for this class of saw mills and is superior to any wood frame because it is more rigid, is not injured by being exposed to the weather; the working parts are not so liable to get out of line and it will look as good as new after years of use. The mandrel of this mill is made of a special quality of steel for this purpose and is very strong and heavy, being $2\frac{7}{8}$ inches in diameter, enabling it to stand the work of fifty-horse power. It runs in very wide, self-oiling bearings which are lined with the best anti-friction metal. The end motion of the mandrel is regulated by a collar on the mandrel at the bearing furthest from the saw, and the saw collar at saw end of mandrel is not allowed to touch the bearing. This feature in our mills will be appreciated by all experienced sawyers who have had trouble with heated saw collars, as it effectually prevents all heating at the saw collar end of mandrel. No saw will run properly on a mandrel that runs at all warm, because the heat expands the center of the saw, making it concave and out of line with the carriage. The saw guide can be adjusted while the saw is in motion. It is a very simple and solid device.



OUR PATENT VARIABLE FRICTION FEED CIRCULAR SAW MILL.

The Feeding Device on this mill is original with us and is used only on our mills. It is the only arrangement of the kind in use that does not crowd the mandrel endways, causing it to heat. It consists of a disc keyed fast to a shaft that is connected at right angles with the saw mandrel by a bevel gear that works easily, smoothly and positively, and the motion is transmitted to the carriage by friction wheels, arranged to be brought in contact with the face of the disc, and so arranged that the friction wheel can be shifted towards the center of the disc when a slow feed is required, or from the center when a faster feed is desirable, the different feeds from slow to fast being produced by sliding the face of the disc from center to circumference, or *vice versa* across the friction wheel. The sawyer has perfect control of the feed at all times, and can change it instantly to slow or fast while the saw is in the cut, without stopping or making any change whatever, except a movement of his lever. By use of this device the sawyer can always use all the power of his engine whenever in a light or heavy cut. The feed is variable from nothing up to four inches to each revolution of the saw, and thus is adapted to any size or power. They can be run successfully by an engine as small as eight-horse power, are equally well adapted to engines of forty or fifty-horse capacity, and a greater amount of work can be done with these mills with the same size engine, whether large or small, and same amount of help, than any other portable saw mills. This mill has no belts whatever, is always ready, has no complicated parts and is very compact, solid, simple and convenient.

The Carriage is made strong and solid and is held together with screw bolts extending through both sides, making it strong and rigid. It is mounted on solid iron flanged rollers nine inches in diameter; they

are connected by wrought iron axles that extend across the carriage and run in self-oiling bearings; they are capable of supporting the carriage and the heaviest timber without trembling, and the trucks being large in diameter, less power is required to move the carriage than in the ordinary mills on the market. The standard length of carriage is 24 feet, with 32 feet of feed rack, so that the mill will saw logs about 30 feet in length. The track is wrought iron, and scrapers are provided on the carriage for keeping the track clean of saw dust, bark, etc. The head blocks are solid iron, heavy, and open 38 inches. They are nicely fitted up. Standards are high and solid. Chisel dogs are provided for holding the last board where special dogs are not used. The head blocks are simultaneous and very accurate; are lever setting and so arranged that the sawyer can set the log without leaving his position at the lever that controls the movement of the carriage. The position of the sawyer on front side of the carriage enables him to handle the logs with ease and determine the proper set in slabbing at a glance.

In the Mill represented herein we believe we have approached nearer perfection in the feed device than has ever been attained by any saw mill manufacturers, in that the mill without any change whatever can be driven by a smaller engine than is required to drive any other mill in use, and at the same time it is better adapted for use with large size engines than other mills, owing to the ability of the sawyer to ease or favor the saw in cutting through large knots or tough butt ends and to instantly change from the slowest to the fastest speed when required, without losing any time. There are so many points of excellence and merit embodied in the mill—which any practical sawyer and lumberman will notice—that it is unnecessary for us to name them, and we trust that anyone contemplating purchasing a saw mill or engine will examine ours and get our prices and terms before ordering.

SPECIFICATION Of Our No. 1 Saw Mill.

- Husk Frame**, 3 ft., 8 in. wide, 6 ft., 2 in. long and 8 in. high, made of iron, cast in one solid piece, fitted with our patent, variable friction feed, board roller, disc spreader, adjustable saw guide.
- Steel Arbor**, $2\frac{7}{8}$ in. diameter, 5 ft., 1 in. long, running in self-oiling adjustable journal boxes.
- Arbor Pulley**, 24 and 30 in. diameter, 12 in. face.
- Carriage**, Standard length, 24 ft., rack stick 32 ft. long, width of carriage 47 in., made from $5\frac{1}{2}$ in. square timbers. (Can furnish any length of carriage at additional cost).
- Trucks**. Six set of trucks with 9 in. wheels, on $1\frac{1}{2}$ in. axles, running in self-oiling babbited boxes.
- Track**. One hundred and four feet of track irons with screws for same.
- Two Head Blocks**, opening 38 in., each fitted with Birdsall adjustable improved log dog, holding timber firmly, operated by our improved simultaneous ratchet set works. (Can furnish extra head blocks at an additional expense).
- Set Shaft**, 18 ft. long, 2 in. diameter with flange couplings, key-seated entire length.
- Other Shafts**. Friction shaft, 1 11-16 in. diameter, disc shaft also 1 11-16 in. diameter and rag shaft 2 in. diameter.
- Wrenches**, oil can and 2 cant hooks.
- This Mill** will take any size saw up to 60 in., and handle any size timber from 6 in. x 4 ft., up to 48 in. by 30 ft. long, and can be run with any size engine from 10 to 40-horse power and will cut from 4,000 to 12,000 feet of board lumber per day.
- Capacity**, 500 feet board lumber per day for each horse power used.

OUR VARIABLE FRICTION FEED CIRCULAR SAW MILL No. 2.

The Demand for a light mill that can be sold for less money than our standard No. 1 Mill has induced us to place on the market this No. 2 Mill, which possesses all the important features of the larger mill, but is lighter and more easily moved from place to place. The husk frame is made of wood, and is put together in a solid and substantial manner. The mandrel is $2\frac{3}{8}$ inches in diameter, and is made of a special quality of steel rolled for that purpose and runs in long, self-oiling boxes, lined with the best anti-friction metal. The collar on the mandrel to take up end-play is on the opposite end from the saw, thus preventing any tendency to heat. The feeding device is similar to that described in our No. 1 Mill. This mill has no belts whatever, is always ready, no complicated parts, very compact, solid, simple and convenient.

The Standard Length of carriage is 18 feet, and will saw 24 feet in length. The track is of wrought iron, and scrapers are provided on the carriage for keeping the track free from saw dust, ice, etc. The trucks of the carriage are larger than those used on most mills of this size, thus causing the carriage to run easily. The head blocks are solid iron and nicely finished, and open thirty inches. The setting arrangement is a new device and is very strong, substantial, and not liable to get out of order, and will set accurately. The dogs are similar to those on the No. 1 Mill. The largest saw this mill will carry is 54 inches in diameter. We have endeavored to construct this mill so that it will do as good work and as accurate work as the larger mill, but it is not intended for as heavy work. It is adapted to horse-power ranging from ten to twenty. Those contemplating purchasing a saw mill are earnestly requested to look into the merits of our mills before placing their orders elsewhere. We call your attention to the cut on page 45 illustrating our new set works. The same design is used on both mills.

SPECIFICATION Of Our No. 2 Saw Mill.

Husk Frame, made of wood, length 6 ft., 6 in.; width, 3 ft., 6 in and depth of timbers 11 in. Fitted with our Patent Variable Friction Feed, Board Roller, Disc Spreader and Adjustable Saw Guide.

Steel Arbor, 2 5-8 in. diameter, 5 ft., 1 in. long, running in self-oiling adjustable journal boxes, 10 in. long.

Arbor Pulley, 24 and 30 in. diameter, 12 in. face.

Carriage, 18 ft. long, rack stick 24 ft. long, width of carriage 29 in., made of 4½ in. square timbers. (Can furnish any length of carriage desired at additional cost).

Trucks. Six set of trucks with 9 in. wheels on 1½ in. axles, running in self-oiling babbited boxes.

Track. Eighty feet of track irons with screws for same.

Two Head Blocks, opening 30 in. fitted with Birdsall adjustable improved log dogs, holding timber firmly, operated by our improved simultaneous ratchet set works. (Can furnish extra head blocks at an additional expense).

Set Shaft, 16 ft. long, 1¾ in. diameter, key-seated entire length, with flange couplings.

Other Shafts. Friction shaft, 1 11-16 in. diameter, disc shaft 1 11-16 in. diameter, and rag shaft 1¾ in. diameter.

Wrenches, oil can and 2 cant hooks.

This Mill will take any size saw up to 54 in., and handle any size timber from 6 in. x 4 ft. up to 36 in. x 24 ft. long, and can be run with any size engine from 10 to 20-horse power and will cut from 3,000 to 8,000 feet of board lumber per day.

Capacity, 400 feet board lumber per day for each horse power used.

CABLE FEED.

Cable Feed. When desired, we furnish cable feed in place of rack feed to our carriage, at an additional cost. This cable feed consists of a grooved drum, sixteen inches in diameter with sheaves attached to the track at either end, and the best transmission cable is used for drive. This makes a very satisfactory mill, and by many is preferred to the rack feed. Cable feed, however, is only furnished on special orders.



KNIGHT'S PATENT LOG DOGS.

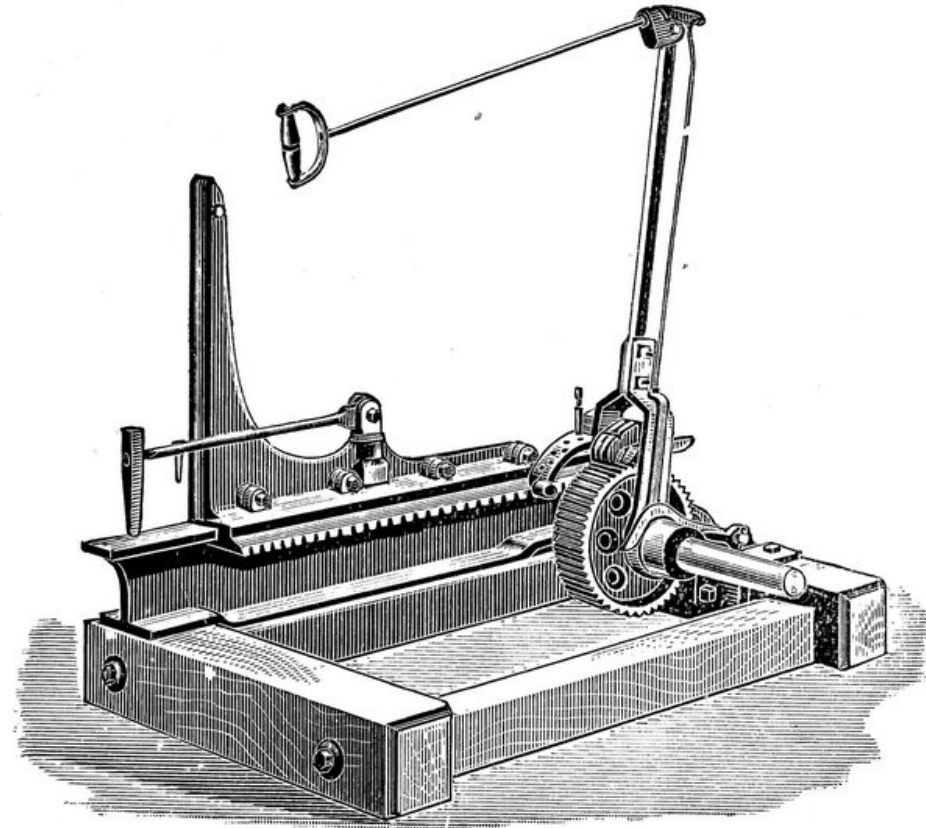
Knight's Patent Log Dogs. We are prepared to furnish these dogs, either single or duplex, at reasonable prices, or can furnish the Birdsall adjustable improved log dogs which is about as efficient as the Knight's, at less than half the expense.

SET WORKS.

There has been a demand among our customers for a set that would better stand the work of setting heavy logs, as logs are often placed on mills of this class heavier than the mill is intended to carry. For this reason we have constructed the set works illustrated above. You will notice that all the dogs are operated by one lever, which is also used to set the logs. There are seven dogs on the set side with a slight variation in the length of each; therefore, one is always in place at whatever point the lever is set. On the back side are three dogs, used for running the head blocks back; under these are seven more dogs, similar to those in front. These dogs are used to hold the head blocks at any point desired, and are thrown out simultaneously with the feed dogs when desired and the same motion of the lever throws in the reversing dogs. This set is attached to a piece of shaft two feet long, which is connected to the long set shaft by a flange coupling with slotted holes, which permits of easy adjustment of the head blocks.

SAWS.

We furnish any size of saw, either solid or inserted tooth, at manufacturers' prices, but do not usually have them in stock. We order saws from the factory as an accommodation to our customers and WILL NOT be held responsible for any delay in delivery.



SET WORKS.

Directions for Starting

The New Birdsall Traction Engine

To Fill the Boiler, unscrew the plug in the top of boiler at the rear of the smokestack, and use the cast-iron funnel which is furnished with each engine. A little more than one gauge, or an inch of water in the glass, is sufficient to fire up on.

As soon as the steam has raised sufficiently to show on the steam gauge, the steam blower may be used to increase the draft and hasten the getting up steam.

Before starting the engine, see that all wearing surfaces are thoroughly lubricated with good oil. Grease or heavy oil is the best for the gearing, and must be used constantly, but good oil should be used on the wearing surfaces of the engine.

Holes will be found in the hubs of the forward road wheels of the engine for the purpose of oiling, without removing them from the axle. The rear or traction wheels will need but very little oil, and the one on the right hand side of the engine needs none, as it is fastened to the axle and turns with it. The axle boxes should be oiled through the pipe in the center of the springs. A little cotton waste or wool placed in the cast-iron oil cups, will make them feed more evenly and save oil.

Before starting the engine, be sure the cylinder cocks are open, and if it has been standing for some time, it should be run with the gears out of mesh long enough to clear the cylinder

of water, and to see that everything about the engine is in good working order. To make the engine run faster and *stronger*, screw *up* the thumb nut on speeder, which is connected to the governor valve stem, and screw it down to make the engine run slower.

When ready to start the engine on the road, place the mitre gears next to the fly-wheel box in mesh, and the reverse lever in the forward motion. To back the engine, shift the reverse lever to the back motion. When stopping the engine, if the reverse lever is set in the middle notch, that is, between its forward and back notches, before the throttle is entirely closed, the engine will not stop on its dead center.

To operate the injector, open the globe valve between it and the boiler wide and regulate the supply of water by the globe valve in the suction.

A bar is provided with each engine, one-half inch thick by fourteen inches long, and tapered in the form of a wedge, which should be placed in the hole cast in the front axle support for boiler in order to prevent the boiler from teetering upon the front axle spring when the engine is running. Keep all boxes as tight as they will run without heating, leave all drip cocks open in freezing weather and clean the flues every day.

The front axle support can be oiled from either side of the flange casting, where it is bolted to the boiler.

Always keep the tank clean, and use clean water if possible, and you will prevent burning out your boiler, and make the engine last much longer.

HINTS TO ENGINEERS.

Causes Which Prevent Injectors Working: One of the main causes which prevents an injector from working, is air in the suction pipe, caused by leakage in the pipe or improper packing or lack of proper packing in stem of valve in suction pipe. The lower end of suction pipe should be surrounded and submerged in a solid body of water and entirely free from air.

Sediment and scale in nozzle, also are frequent causes of injectors failing to work properly. The nozzle should be removed occasionally and thoroughly cleaned. See that the strainer is kept clean, as this will occasionally get clogged and prevent a sufficient amount of water from being admitted.

If the injector gets water and fails to force it into the boiler, it may be there is too much or too little water, or there is some obstruction between the injector and boiler, or sediment in the delivery tube.

To ascertain the Circumference of a Circle.—Rule.—Multiply the diameter of the circle in inches, by 3.1416. The product will be the circumference in inches.

To find the Area of a Circle.—Rule.—Square the diameter in inches and multiply the product by the decimal, .7854.

To determine the Diameter of a required Pulley.—Rule.—Multiply the diameter of the given pulley in inches, by the number of revolutions per minute, and divide the product by the number of revolutions the required pulley is required to make per minute, and the quotient will give the diameter of the required pulley.

Example.—Say an engine runs 225 revolutions per minute, and the pulley is 40 inches in diameter, you wish to run a thresher cylinder 1200 revolutions per minute, what size pulley would be required?

Formula:

$$\frac{225 \times 40}{1200} = 7.5 \text{ inches,}$$

225 Revolutions of engine
 40 Diameter of engine pulley
 Revs. of thresher 1200) 9000.00 (7.50 = 7½ inches.
 8400
 ———
 6000
 6000
 ———
 0

To determine the Speed of a Shaft, the Diameter of the Pulleys and the Speed of the Driving Shaft being given.—Rule.—Multiply the number of revolutions of the driving shaft by the diameter of the pulley in inches and divide the product by the diameter of the pulley on the shaft, the speed of which is to be ascertained and the quotient will be the number of revolutions of said shaft.

Example.—An engine runs 225 revolutions, and the drive pulley is 40 inches in diameter, the pulley on cylinder of thresher is 7½ inches in diameter. How many revolutions will the thresher cylinder make?

Formula:

$$\frac{225 \times 40}{7\frac{1}{2}} = 1200 \text{ Revolutions.}$$

Care of Boiler. Durability and economy of a boiler depends largely on the care given it by the engineer. If the boiler is not kept washed out and free from mud and scale, it will soon burn out or crack. The flues should be kept clean, so as to enable the heat to come in as direct contact with the water in the boiler as possible. If flues are badly coated inside, a large amount of heat that otherwise would pass into the water, passes out through the smoke-stack and is lost. The boiler should be blown off once a week, and thoroughly washed out with a force pump. The hand hole plate over fire door should occasionally be taken out, and see that scale is not allowed to form on the crown sheet over safety plug so as to prevent the escape of steam when the plug fuses. Be careful to see that mud and scale do not accumulate in the legs of the boiler, around the outside of the fire-box.

REPAIRS AND SAMPLE GOODS.

At our different warehouses at Auburn, N. Y., St. Louis, Mo., Peoria, Ill., Fond du Lac, Wis., Toledo, O., Atlanta, Ga., Council Bluffs, Ia., and other places, will be found a full line of repairs and all orders will receive prompt attention. Upon application, our customers will receive a price list of repairs which will show just what parts wanted will cost, before ordering. When ordering, give the number and name of the piece, and also the number of the engine or machine when you can. When ordering extras for

saw mills, state whether for iron or wooden frame mill; and whether right or left hand; also be sure to state plainly your express office and postoffice, and sign your letter.

REBUILT ENGINES.

Owing to the large amount of business we do each year, we necessarily accumulate quite a number and variety of second-hand engines of about all the different makes and styles.

These engines are put through a regular course of repair, being thoroughly overhauled and when they are ready for the paint shop, are in first-class condition. We give them as thorough a test as we do our new engines.

Some we rebuild, so they are virtually as good as new and for all practical purposes are just as good as a new engine. Thus we are able to furnish a customer with almost anything he may want in this line at very reasonable prices.

Send for our list giving a full description and prices, and we are pretty certain you will find something that will be of interest to you.

The early part of the season is the best time to buy, as then you have a better assortment from which to make your selection.

We usually have a few separators in stock, that have been built over. These rebuilt machines are in every respect as good as new, and will give just as good service as a machine just out of the shop. These can be bought at considerably less price than new goods.

1904

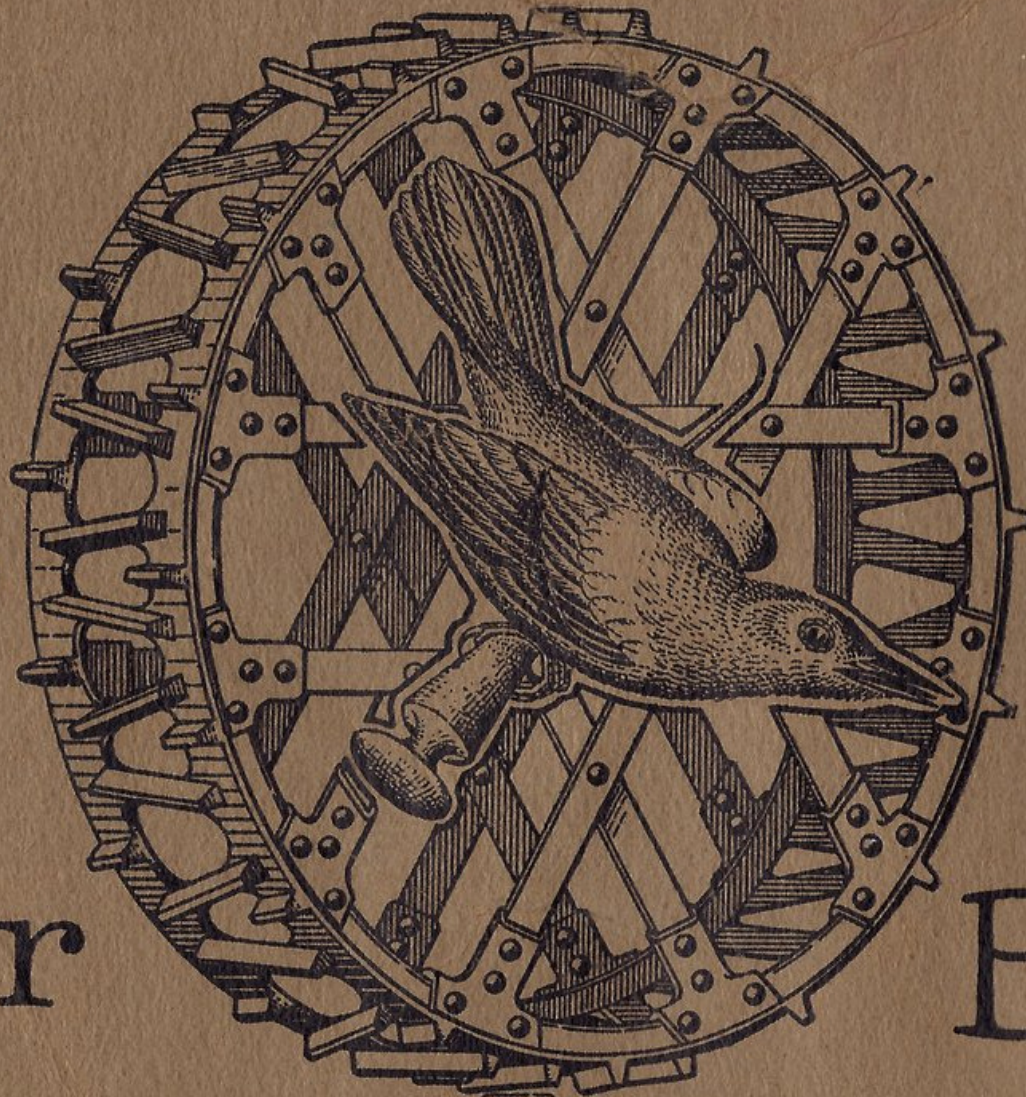
1904

BIRDS

ALL

Year

Book



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