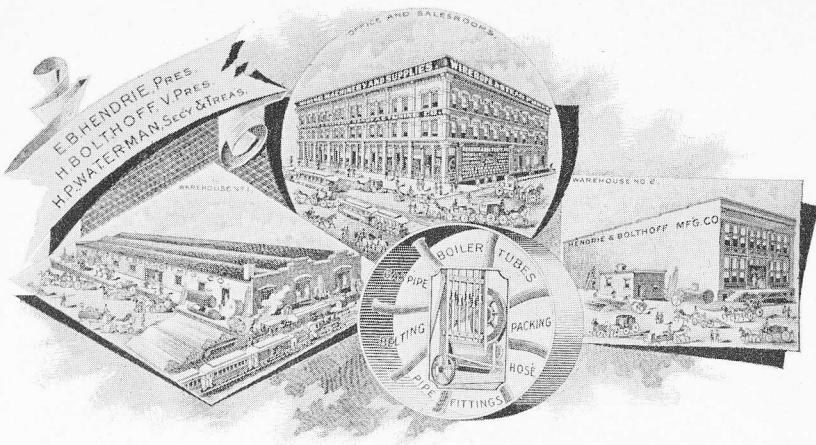


<sup>THE</sup>  
**HENDRIE & BOLTHOFF**  
MANUFACTURING CO.  
No. 6 • DENVER, COLORADO, U.S.A.



# Hendrie & Bolthoff Manufacturing Co.

MANUFACTURERS OF

MINING AND MILL MACHINERY  
AND RAILWAY SUPPLIES,

STAMP MILLS,  
SMEILING WORKS,  
HOISTING ENGINES  
AND BOILERS.



CONCENTRATORS,  
SAMPLING MACHINERY,  
SAW MILLS.

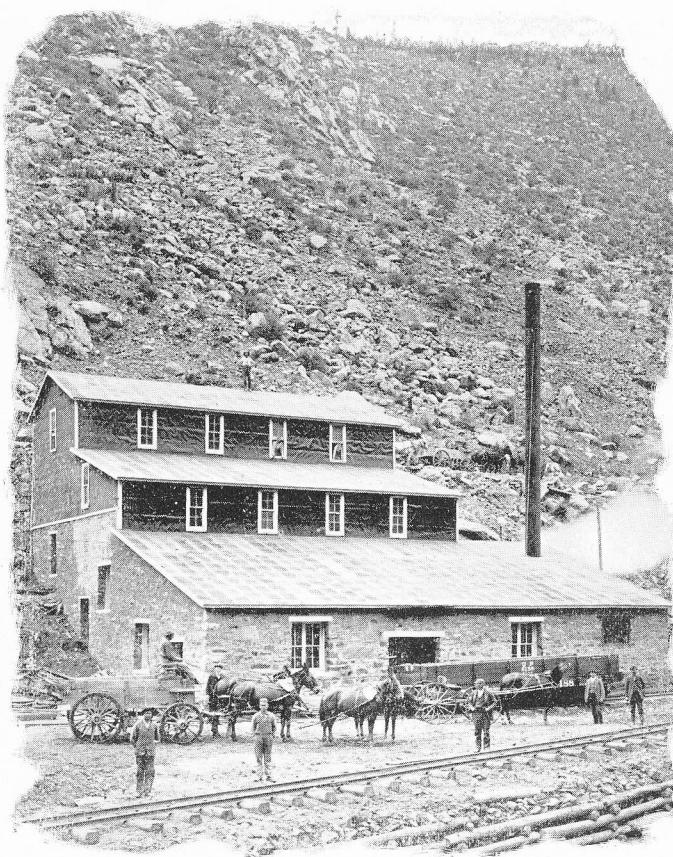
DEALERS IN

WIRE CLOTH AND HOISTING ROPE, HOSE, PACKING, BELTING,  
GAS PIPE, BOILER TUBES, PIPE FITTINGS,  
STEAM AND HAND PUMPS, AIR COMPRESSORS,  
AND ALL MINING AND MILL SUPPLIES.

1601 TO 1611 SEVENTEENTH ST., DENVER, COLORADO, U. S. A.

1898.

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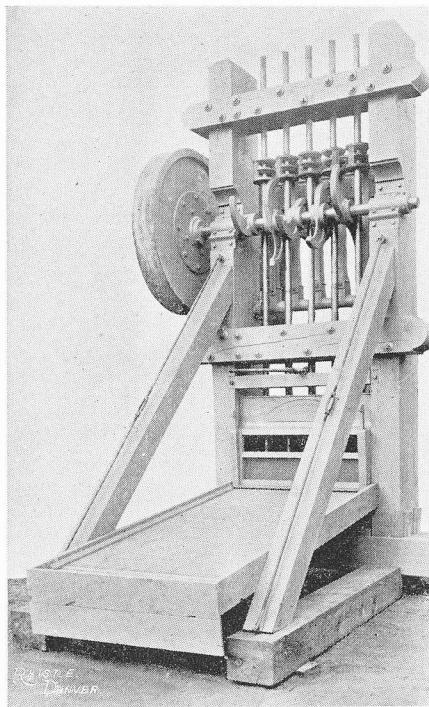


A MODEL AUTOMATIC RAPID DROP STAMP MILL.

25 750 LB. STAMPS.  
9 X 15 BLAKE CRUSHER.

BUILT BY

**HENDRIE & BOLTHOFF MANUFACTURING CO.,**  
DENVER, COLO.



The above shows our Patent Improved Rapid Drop 5 Stamp, 550 pound Portable Mill. This mill is equipped with patent eccentric jack shaft and fingers for raising stamps. The design of the mortar is shown on page 6.

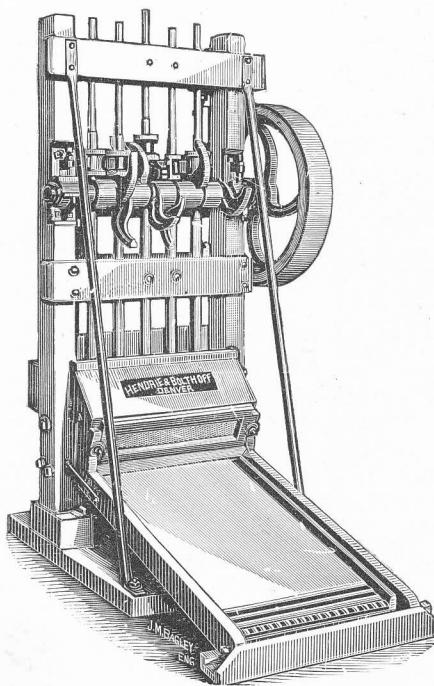
Before shipment the mill is erected as shown in the cut, and all timbers and parts marked, so that the mill can be put together by the most inexperienced millwright or carpenter.

The heaviest weight of any single piece is 3,000 pounds. We can build any weight of stamp of the same design.

#### PRICE LIST.

Weight each stamp	Total weight, 5 stamps with frames	Total weight, iron work only, 5 stamps	Price, 5 stamps, with frames and coppers	Price, 10 stamps, with frames and coppers
300 pounds -----	6,000 pounds.	4,000 pounds.	\$500 00	-----
550 pounds -----	11,500 " "	8,000 " "	600 00	-----
650 pounds -----	14,000 " "	10,000 " "	700 00	-----
750 pounds -----	15,000 " "	11,000 " "	750 00	-----

When Coppers or Frame Work are not wanted, the cost of same will be deducted.

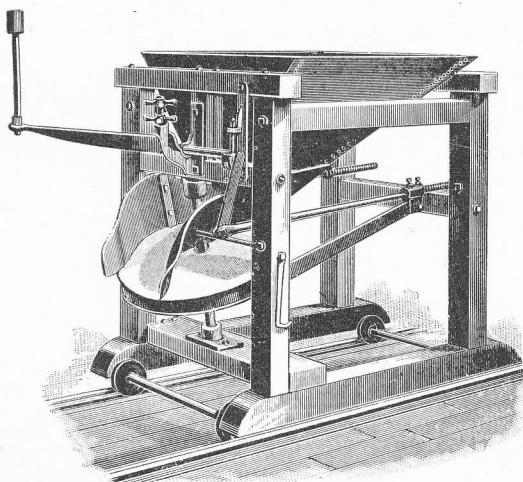


Having had frequent inquiries for Prospecting Machinery, we have built several machines, by which, with small expense, mines can be worked and tested, and among them our

### "PONY STAMP MILL."

This cut represents the Mill mounted on a wooden frame (which experience has proved to be a better material than metal), with mortar for wet crushing, having copper plate inside, and copper table attached to reduce and amalgamate free gold ores. For dry crushing we can supply a different mortar, and dispense with the coppers. They are built of the best material and furnished with our patent pressed shoes and dies, and the whole Mill is so constructed that it can be taken apart or put together in an hour. It requires but one horsepower to drive it, for which purpose we can furnish any kind of motor desired. In ordering, state whether for wet or dry crushing.

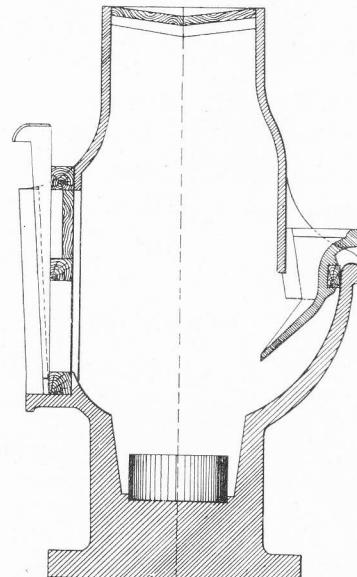
Total weight.....	1500 pounds
Weight of heaviest piece.....	350 pounds
Weight of stamp.....	100 pounds
Drops per minute.....	60 to 80
Capacity per hour.....	300 to 400 pounds
Diameter of pulley.....	30 inches
Power required.....	one horse
Price.....	\$250 00



Patented July 30, 1896.

### THE BOLTHOFF IMPROVED CHALLENGE ORE FEEDER.

A revolving disk feeder without gears or clutches. Feed controlled by a band friction. Built for both Stamp and Huntington Mills.

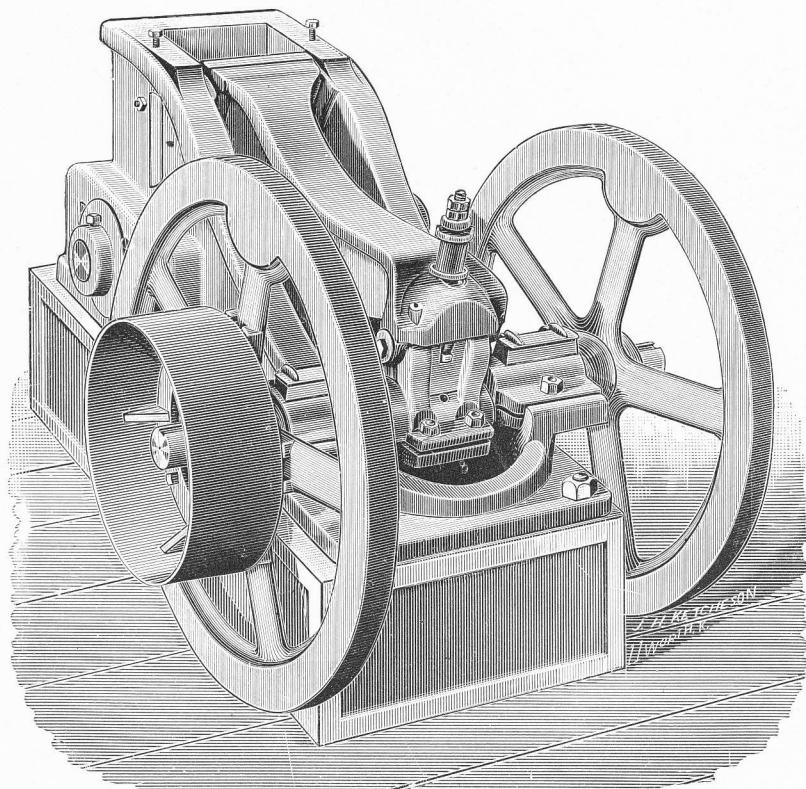


Patented March 6, 1894.

### BOLTHOFF GOLD MORTAR.

Especially designed for gold ores and used extensively. We can also furnish Gilpin County low mortars.

## IMPROVED LEVER PATTERN CRUSHER.



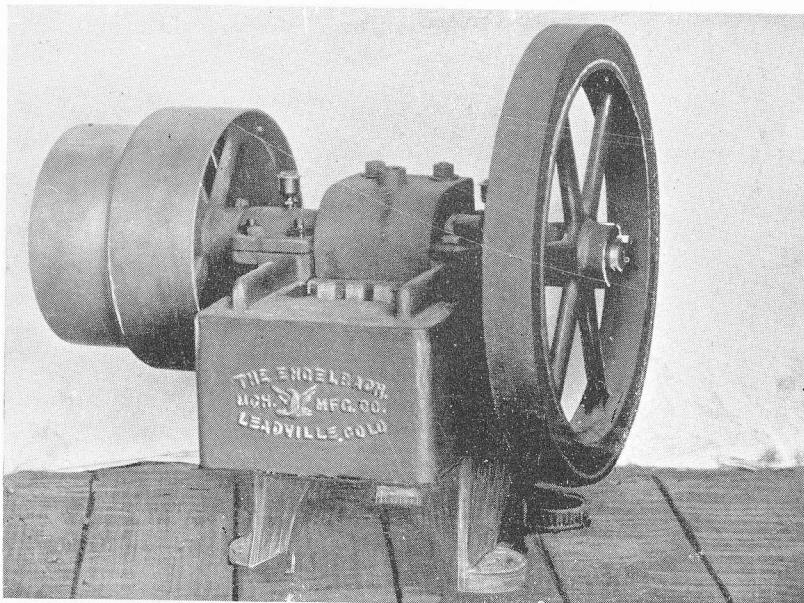
**DODGE STYLE.**

It is made extra heavy and is provided with cast-iron safety blocks, fitted behind the journal boxes of the jaw-shaft designed to break and allow the jaw more opening, should the Crusher, by accident, become choked from any cause, and thus prevent breaking the jaw or other heavy and expensive parts. By keeping an extra set of safety blocks on hand, only a few minutes time is required to take out the broken ones and replace with new ones.

**LIST.**

Size of receiving capacity	Weight of heaviest piece	Total weight	EXTREME DIMENSIONS			DRIVING PULLEY		Proper speed	Horse power required	Cash price on cars at our works
			Length	Breadth	Height	Diam.	Face			
Inches	lbs.	lbs.	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.			
4½ x 6	515	1,200	4 0	3 6	2 0	1 0	0 4	250	1½ to 2½	\$-----
11 x 7½	2,450	5,000	6 0	5 8	4 0	1 8	0 7	250	4 to 7	-----
15 x 9	4,300	9,800	7 9	7 6	4 8	2 6	0 10	250	8 to 12	-----

## ENGELBACH IMPROVED CRUSHER.

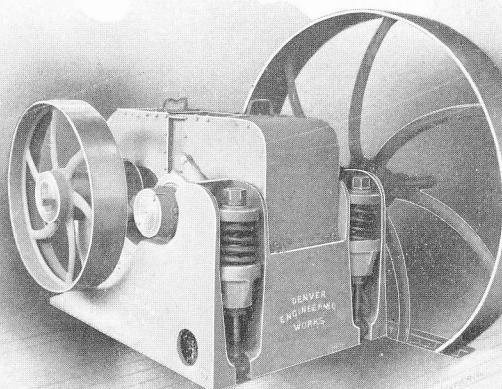


This crusher is of an entirely new design, it is very simple in construction, composed of but very few parts and requires a comparatively small floor space, it is compact and durable, it weighs less than one half that of some other makes of crushers of same capacity, and is therefore cheaper, both in first construction and freights. The motion of this crusher is at once peculiar and novel, it being more of a rolling or grinding than a dead thrust, and is capable of crushing much finer than any other make of crusher. It is provided with both tight and loose pulleys, the bearings are long and heavy and the crusher in itself is of a very stout and symmetrical design and the workmanship and materials are of the best.

### LIST.

Size	Shipping Weight	Price
5 x 8 .....	.....	.....
6 x 9 .....	.....	.....
8 x 10 .....	.....	.....

## DENVER CRUSHING ROLLS.



### COMPLETE WITH HOUSING.

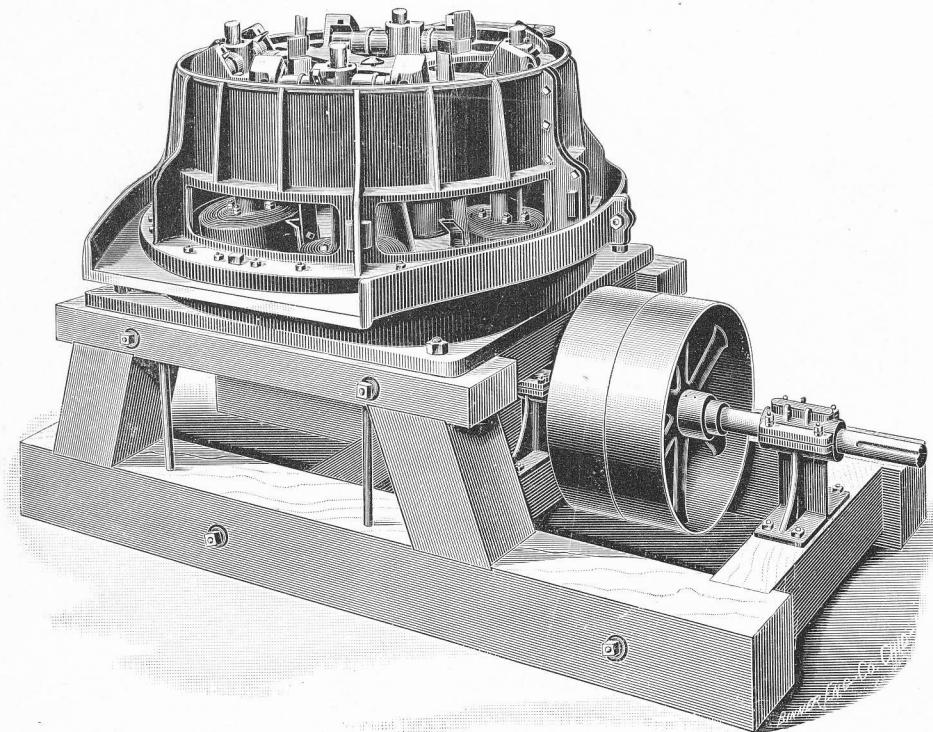
These Rolls as now perfected are of simple design, possessing great strength and rigidity and embodying new features and improved details. The frame is *cast in one piece*, of sufficient weight and strength to absorb the vibrations, and of such design as to take the strains in the best possible manner. The rolls are self-contained and require no separate foundation. The shafts carrying the rolls are of the best hammered iron, very large in diameter, having bearings three times the diameter of the shaft. The bearings are of the self-aligning, ball and socket type, perfectly seated in the frame and movable arm, permitting of perfect alignment and adjustment under all conditions. The bearings are provided with Phosphor Bronze bushings, easily removable.

### PRICE LIST AND DIMENSIONS. BELT DRIVEN ROLLS.

Size of Roll, Inches	Weight	Size of Main Driving Pulley	Size of Small Driving Pulley	Revolutions	Price without Feeder	Price with Feeder
12x12	3,600	48x8	24x6	150	\$ 335 00	\$ 380 00
12x20	6,500	60x10	30x6	130	675 00	735 00
14x27	13,000	84x13	40x8	110	900 00	1,000 00
16x36	17,000	96x13	48x8	85	1,300 00	1,400 00
16x42	23,000	96x16	48x11	60	1,650 00	1,750 00

### GEARED ROLLS.

Size of Roll, Inches	Weight	Size of Counter- shaft Pulleys	Revolutions of Pulleys	Revolutions of Rolls	Price without Feeder	Price with Feeder
12x12	3,800	20x6	260	65	\$ 355 00	\$ 400 00
12x20	6,800	28x8	260	60	835 00	935 00
14x27	13,500	40x10	240	50	1,000 00	1,100 00
16x36	17,800	48x12	180	40	1,450 00	1,550 00
16x42	24,000	54x15	150	30	1,800 00	1,900 00



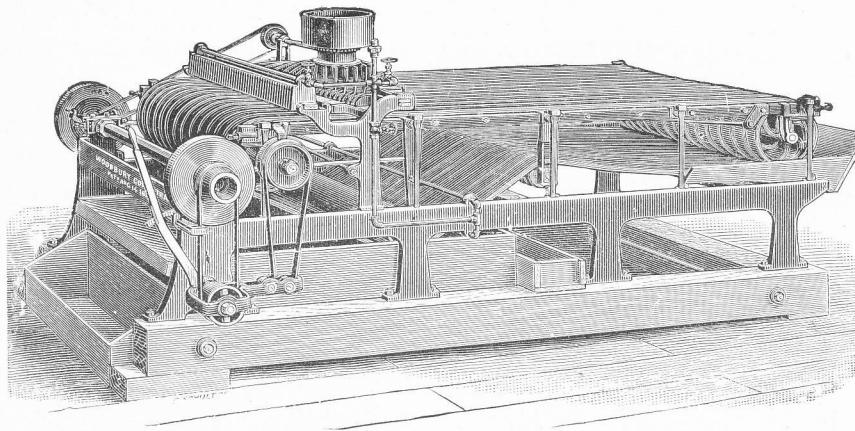
## IMPROVED HUNTINGTON MILL.

Size	Weight	Revolutions	Capacity	Price	
3½ feet Diameter	8,000 lbs.	90	12 tons	\$ 850 00	4 H. P.
5 feet Diameter	15,000 lbs.	70	20 tons	1,500 00	6 H. P.
6 feet Diameter	24,000 lbs.	55	30 tons	2,250 00	8 H. P.
3½ feet Diameter, built in sections for packing				950 00	4 H. P.

These machines are especially adapted for crushing and amalgamating gold ores, also for crushing ores direct for fine concentration, for crushing the tailings from jigs, in coarse concentrating mills, for subsequent treatment on Woodbury's or other slime concentrating machinery.

The discharge is so perfect that it makes little or no slimes, and leaves the pulp in good condition for concentration. The rollers are suspended, leaving a space of one inch between them and the bottom of the mill, thus allowing them to pass freely over the quicksilver and amalgam without grinding it or throwing it from the mill, while it agitates it sufficiently to make amalgamation perfect.

## WOODBURY ORE CONCENTRATORS.



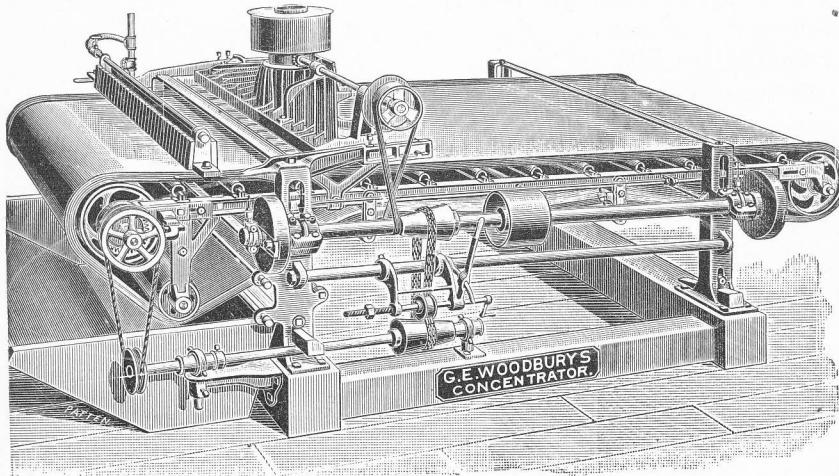
Multi-Belt Type, Price \$500.

So well and favorably known are the Woodbury Belt Concentrators that it is unnecessary to give a lengthy description. These machines are built in both the single and multi-belt types. The single in 4, 5 and 6 foot widths, and the multi-belt in 4 and 7 belt sizes.

We have a patent on the fluted or crimped edge of our belts. (Plain edges stretch about one inch to the foot in passing over the drums.) This improvement prevents the edges from stretching, as they have only to straighten out. Continuous stretching soon causes the rubber to crack and wear away rapidly. Our crimped edge entirely obviates this difficulty.

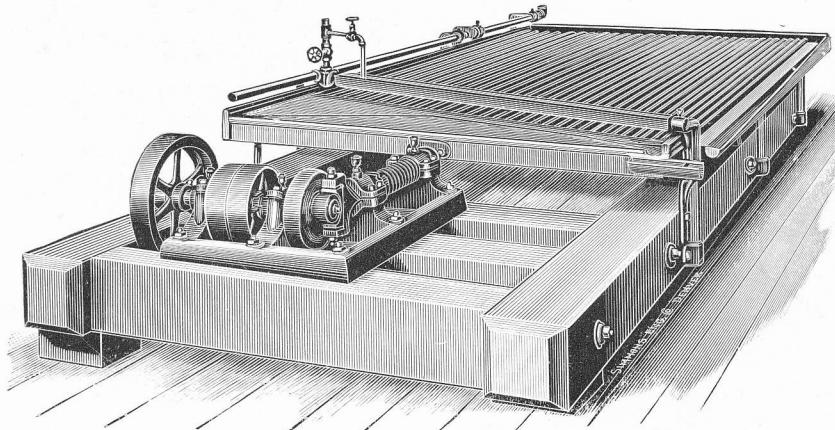
A word in regard to the construction of these Concentrators: The main frame is made of iron, giving it stability and durability; the main shaft is two-inch steel; the main boxes are self-oiling; the connecting boxes are large and self-oiling; the connecting rods are steel; the shaking frame is of wrought iron, thereby preventing it from warping or cracking, especially in a dry climate. Everything about this machine is constructed in a workmanlike manner.

A special catalogue of these tables will be mailed on application.



Single Belt Type, Price \$500.

## WOODBURY'S IMPERIAL CONCENTRATING AND AMALGAMATING TABLE.



Price \$400.

The Imperial Concentrating and Amalgamating Table is the latest invention of Mr. Geo. E. Woodbury, whose fame as one of the pioneer concentrator builders is world-wide, machines of his manufacture being in general use in every country on the globe where the milling of ores is carried on.

This Table is, however, built on entirely new lines, differing materially from either the well known belt or bumping table types of concentrators.

It consists of a red wood top, 12 feet long by 6 feet wide, covered with a corrugated copper, this top being carried on six upright hard wood springs, which are inserted in malleable iron sockets securely fastened to the foundation frame.

By a most ingenious device of very great simplicity, consisting of a combination of an eccentric, cam and a spring, a variable longitudinal motion is imparted to the bed or top of the table.

The tailings are carried off through the trough on the side, no re-elevating being required.

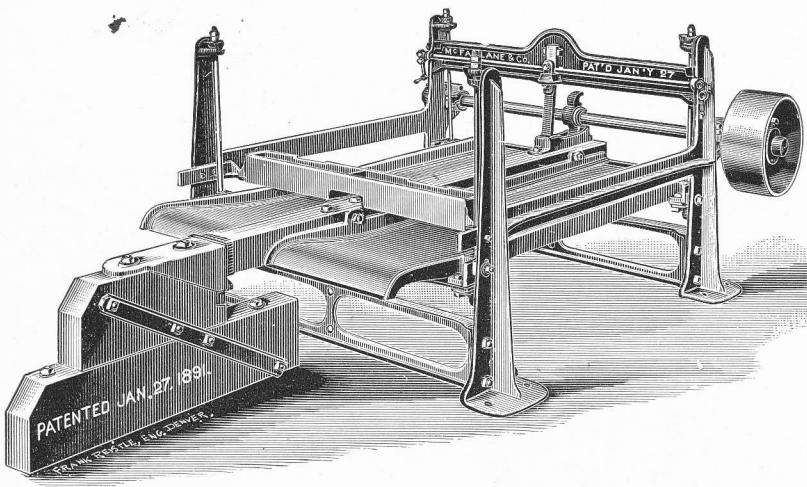
The concentrates are carried forward and delivered through a small opening as shown in cut.

The advantage of the copper top is apparent at a glance, making it possible to save all free gold values.

The arrangement for adjusting the grade of the table and the length of the stroke permit of the most accurate results.

The pulp is fed on at the upper left hand corner of the table, and the device for supplying fresh water meets every requirement for the most thorough distribution of a small amount of water.

## GILPIN COUNTY GILT EDGE CONCENTRATOR.



The Gilpin County "Gilt Edge" Concentrator, or "Bumping Table," as it is sometimes called, has been in exclusive use in all the mills in Black Hawk and Gilpin county and in all the principal gold and silver mills in the entire Rocky Mountain mining regions, ever since it was first put on the market. It is also extensively used in Australia, Africa, New Zealand, France, Austria, Norway, Russia, Nova Scotia, South America, and, in fact, all parts of the world where man seeks to separate valuable mineral from worthless sands, and in every case has given the most unqualified satisfaction.

It is adapted to the treatment of any ores, the mineral of which is of higher specific gravity than the gangue that contains or accompanies it, or, in other words, ANY HEAVY CONCENTRATING ORES.

We manufacture three different kinds—cast iron, rolled steel and soft copper. We especially recommend the cast iron table, as it has proven by actual tests, side by side, on same ore, to save from 7 to 10 per cent. more mineral than either the steel or copper, and its comparative durability is several times greater. One advantage, however, of the steel or copper over the cast iron, is in being lighter, freight expense for long distance shipment is not so great, which is sometimes to the purchaser an item worthy of consideration. The cast iron table is made in three parts and is more convenient for mule-back transportation.

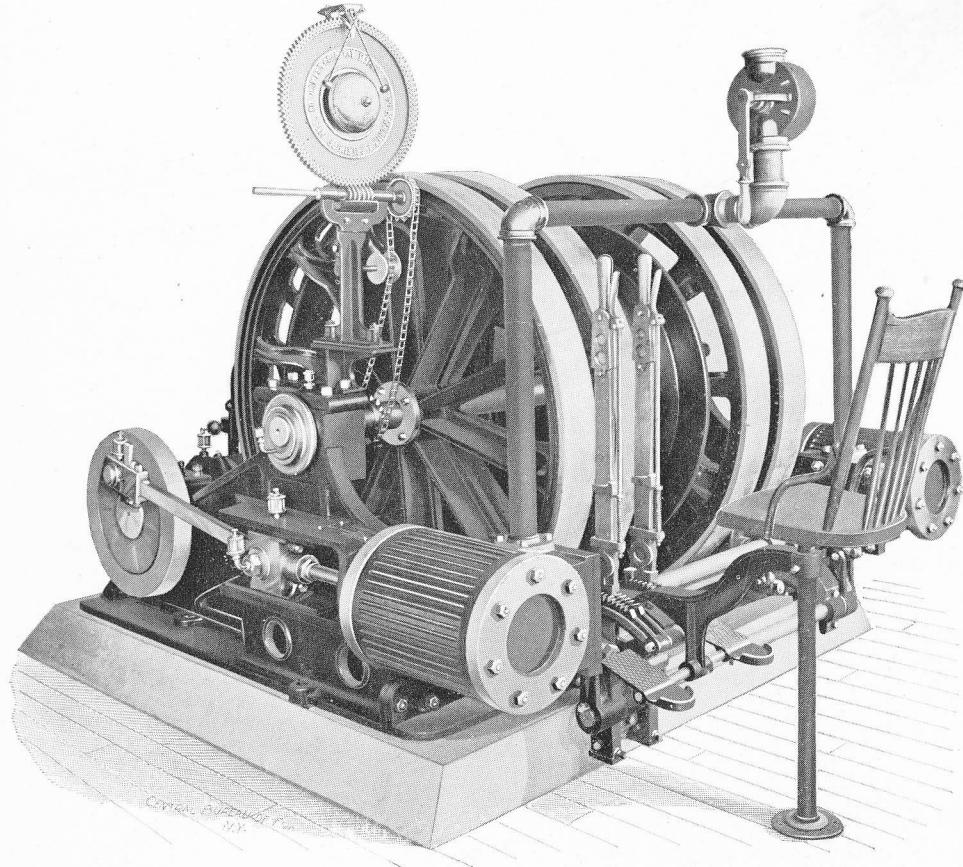
Instructions for setting up and operating are sent out with each machine, and any mechanic of ordinary skill can arrange one in place, connect all launders and have it in running order in two days.

### LIST.

Cast Iron .....	Weight 1100 pounds .....	Price ... \$175.00
Soft Copper .....	" 700 "	" ... 150.00
Rolled Steel .....	" 600 "	" ... 135.00

**OUR DOUBLE CYLINDER  
QUADRUPLE FRICITION HOIST.**

Patented March 28, 1893.  
Sept. 11, 1894.  
Jan. 29, 1895.



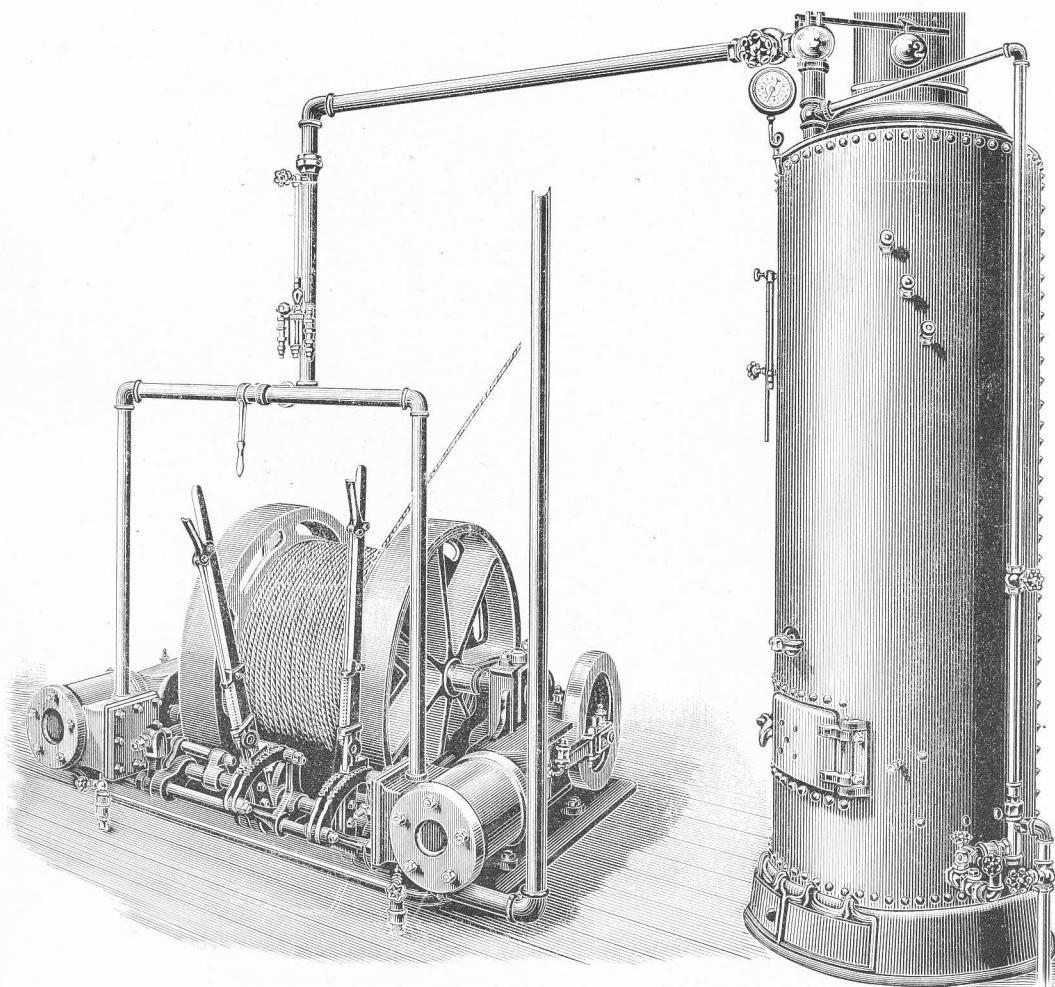
The fixtures comprise steam pipes as shown in cut, patent balanced throttle valve, oil cups, nickel-plated double sight-feed lubricator, oil cans, set steel forged wrenches and foundation bolt ends.

Size of cylinders	Horse-power	Drums		Pipes		Hoisting capacity		Approximate shipping weight	Price complete
		Diam.	Length	Steam	Exhaust	Speed	Pounds		
6x 8	15-20	28	16	1½ ins.	1½ ins.	300	2,000	4,000	-----
7x10	20-30	32	25	2 ins.	2 ins.	400	3,000	6,000	-----
9x10	40-50	40	25	2½ ins.	2½ ins.	450	4,000	8,000	-----
10x12	55-65	42	22	3 ins.	3 ins.	500	5,000	11,000	-----
12x12	70-80	50	27	3 ins.	3 ins.	600	6,000	15,000	-----

The diameter and length of drums can be changed to suit any special work.  
Every engine tested and guaranteed.

**OUR PATENT LIGHTNING DOUBLE ENGINE  
FRICTION HOIST**

**WITH UPRIGHT BOILER.**

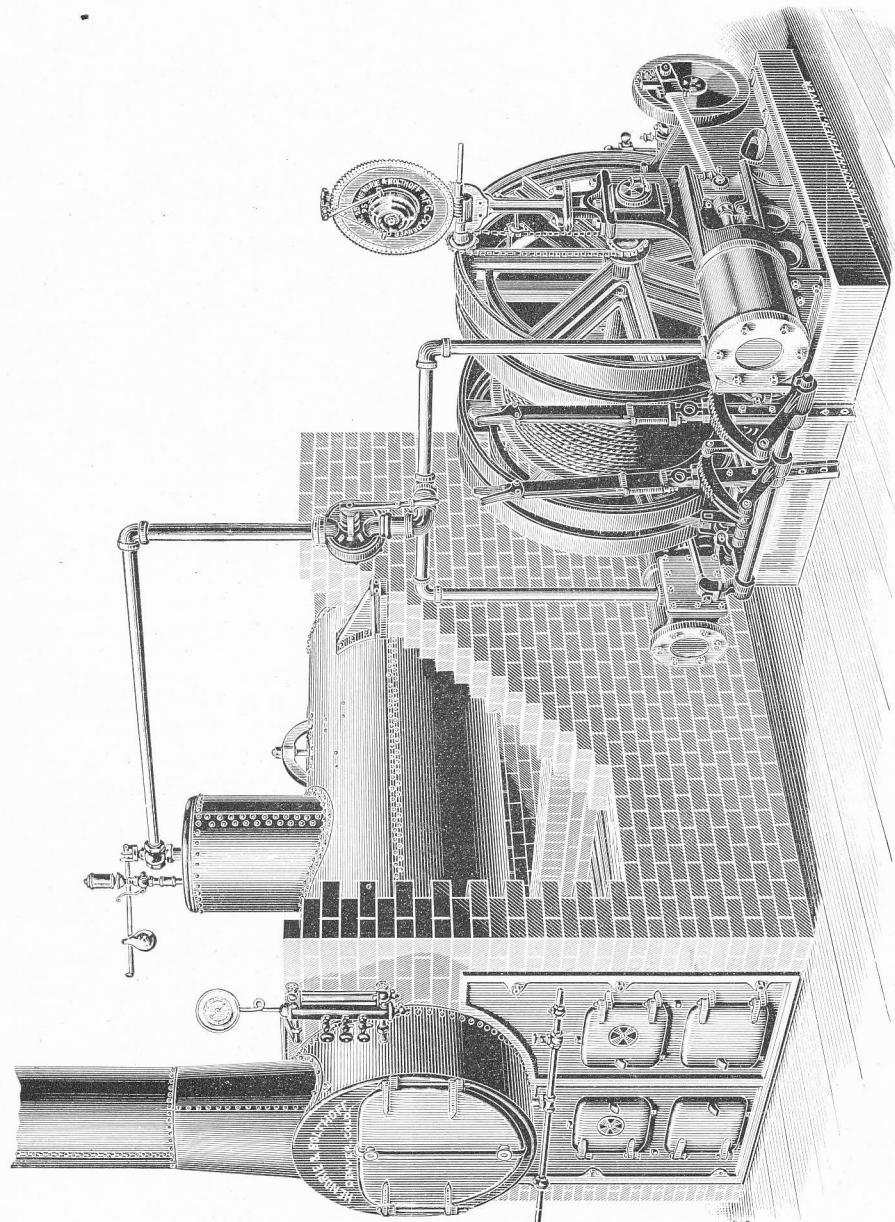


**ONLY 6X8 HOISTS MADE IN ABOVE STYLE OF FRICTION.**

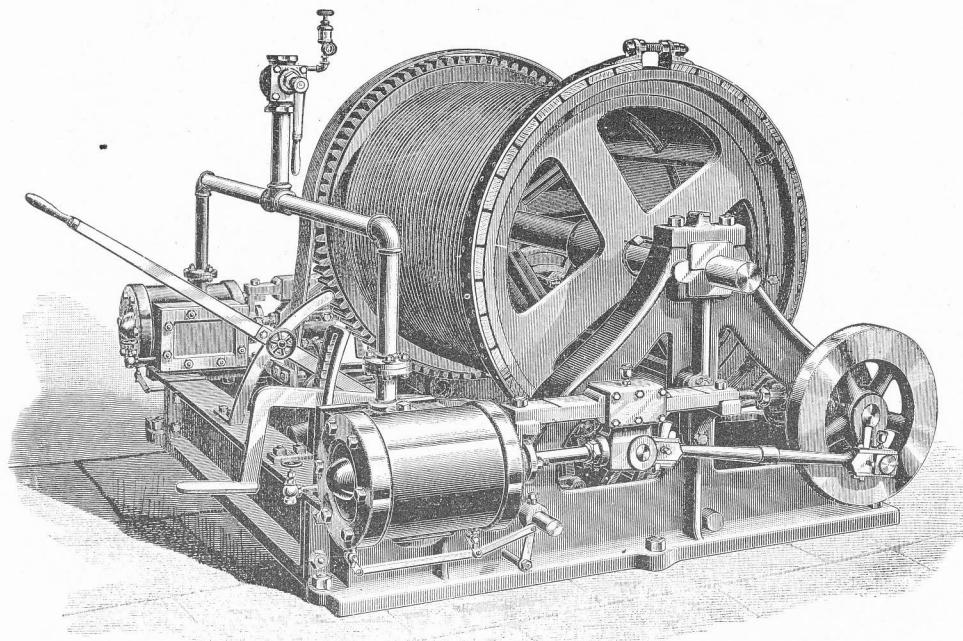
We are prepared to furnish extra brake stands for all of our hoists, so that they may be operated from the collar of the shaft.

**OUR PATENT QUADRUPLE FRICTION DOUBLE  
ENGINE HOIST.**

WITH HORIZONTAL TUBULAR BOILER.



## IMPROVED HOISTING ENGINES FOR MINES.



### DOUBLE CYLINDER REVERSIBLE LINK MOTION HOISTING ENGINE.

These Engines are specially designed for developing mines where it is desired to sink a shaft from 100 to 1000 feet or more in depth. They answer equally well for either a double or single compartment shaft, in which cages or buckets are to be used. They are fitted with reversible link motion and hoist, hold and lower the load by steam; and also have band brake which will hold securely any load the Engine can hoist. They are substantially made, of the best quality iron and steel, and of superior workmanship, and are mounted on a strong bed plate. The bed plates are usually made in two or three pieces and bolted together, in order to facilitate transportation. The Engines are very simple in construction and easily set up, and will do good work if erected on an ordinary timber foundation.

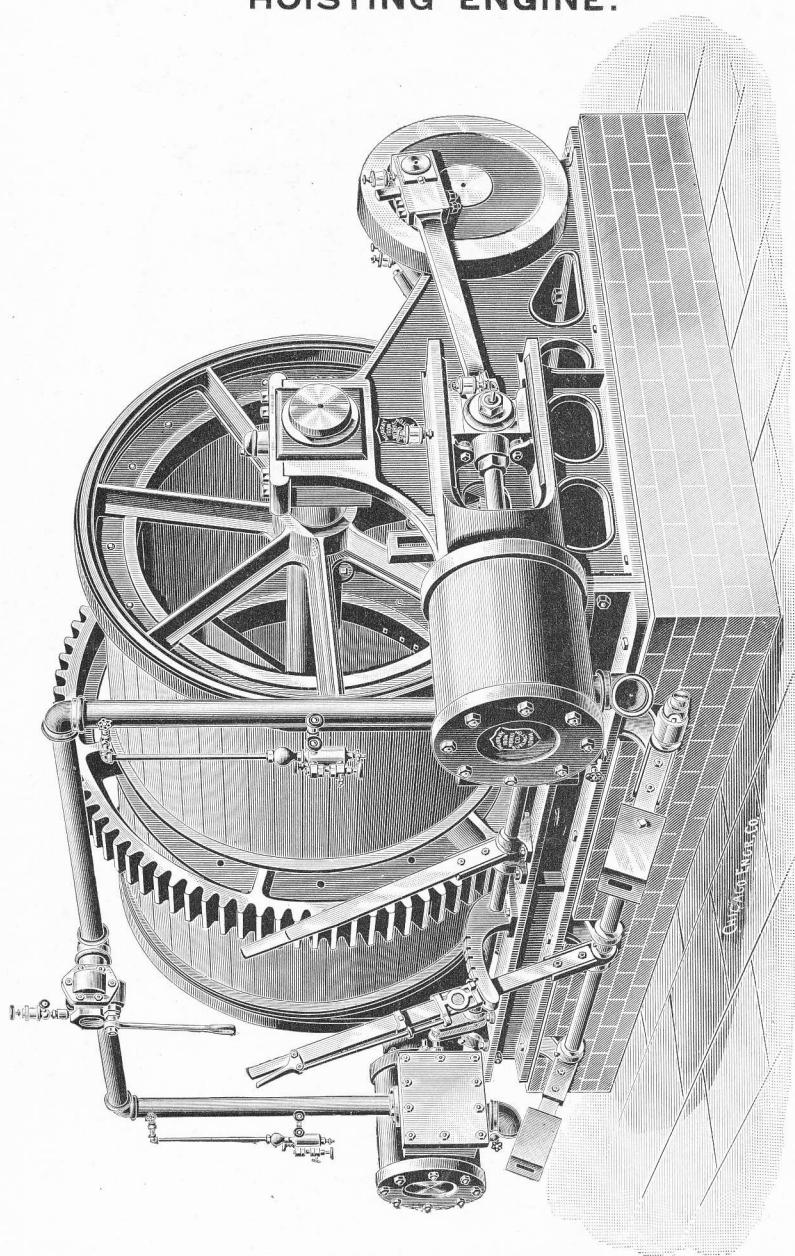
#### PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

Size, number of engine	Horse-power	Dimensions of cylinders		Size of hoisting drum		Size of wire rope for which drums are grooved; di- ameter, inches	Average weight engines hoist, pounds	Size of base or engine bed plate		Estimated ship- ping weight of engines only, pounds	Price of engines com. plate without boiler or fixtures, wire rope or sheave wheels
		Diameter inches	Stroke inches	Diameter inches	Length inches			Width inches	Length inches		
53	12	6 <sup>1</sup> / <sub>4</sub>	8	23	22	5 <sup>5</sup> / <sub>8</sub>	1,500	49	59	3,125	\$ 725 00
54	20	7	10	29	23	3 <sup>3</sup> / <sub>4</sub>	2,000	54	72	4,925	875 00
55	30	8 <sup>1</sup> / <sub>4</sub>	10	41	39	7 <sup>7</sup> / <sub>8</sub>	3,000	72	73	7,350	1,200 00
56	40	8 <sup>1</sup> / <sub>2</sub>	12	47	42	1	4,000	83	84	11,500	1,650 00
57	50	10	12	53	42	1	4,500	86	89	12,500	1,750 00
58	75	12 <sup>1</sup> / <sub>4</sub>	15	59	54	1	6,500	102	110	21,500	3,000 00
59	100	14	18	65	63	1	7,500	117	124	28,750	3,250 00

### DOUBLE CYLINDER PATENT FRICTION HOISTING ENGINE.

60	12	6 <sup>1</sup> / <sub>4</sub>	8	24	26	5 <sup>5</sup> / <sub>8</sub>	1,500	49	59	3,050	\$ 750 00
61	20	7	10	29	26 <sup>1</sup> / <sub>2</sub>	3 <sup>3</sup> / <sub>4</sub>	2,000	54	72	5,125	975 00
62	30	8 <sup>1</sup> / <sub>4</sub>	10	41	40	7 <sup>7</sup> / <sub>8</sub>	3,000	72	73	8,000	1,250 00
63	40	8 <sup>1</sup> / <sub>2</sub>	12	47	43	1	4,000	83	84	12,000	1,750 00
64	50	10	12	53	42	1	4,500	86	89	14,050	1,850 00
65	75	12 <sup>1</sup> / <sub>4</sub>	15	59	54	1	6,500	102	110	21,750	3,400 00
66	100	14	18	65	64	1	7,500	117	124	28,750	3,600 00

These Engines are also built with double spur gearing, and are specially recommended for heavy work or deep shafts on account of their superior strength and durability.  
All drums turned off true and spirally grooved for wire rope.

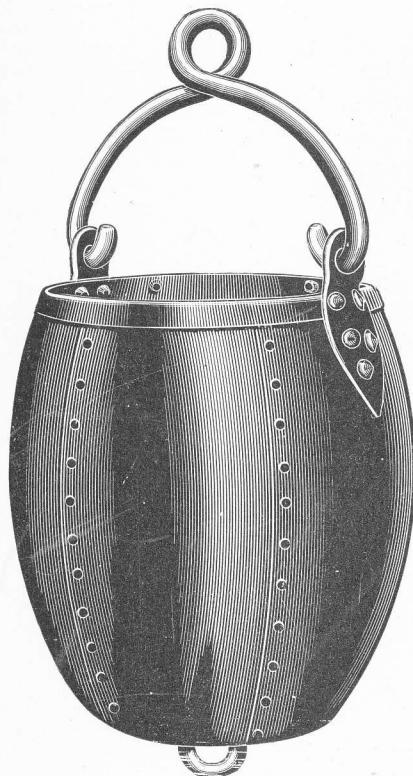
**HOISTING ENGINE.**

HOISTING ENGINE—DOUBLE CYLINDER, DOUBLE DRUM, SINGLE GEAR, REVERSIBLE LINK MOTION.

**SPECIFICATIONS.**

Size of cylinder		Drums	
Diameter	Stroke	Diameter	Face
5	8	30	24
6	8	30	30
7	10	30	36
8	10	36	36
9	10	42	36
10	12	48	36
12	12	60	36
12	16	72	36

## ORE BUCKETS.



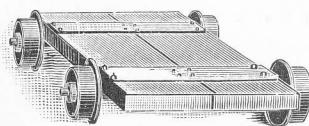
Our Buckets are made of the very best tank steel. The ears are of forged steel and the bails of the best Norway iron. They are made by the most improved machinery and are tight and smooth with dished bottom and ring for dumping.

We are giving special attention to furnishing Buckets that are first-class in every particular.

No.	Height	DIAMETER			No. steel	CAPACITY		Weight	Price with band	Price without band	Price extra for strips on side
		Top	Centre	Bottom		Cubic feet	Avg. lbs. ore				
1	30	21	24	17	9	6 $\frac{1}{2}$	750	140	16 00	16 00	4 00
2	30	21	24	17	11	6 $\frac{1}{2}$	750	125	14 00	-----	4 00
3	32	24	27	21	8	9	1,100	195	20 00	19 00	6 00
4	37	28	34	23	$\frac{1}{4}$	15	1,700	400	43 00	41 00	8 00
5	37	24	28	22	$\frac{1}{4}$	11	1,300	350	34 00	32 00	7 00
x 6	24	20	22	16	$\frac{1}{4}$	4 $\frac{1}{2}$	550	67	9 00	-----	3 00
x 7	19	17	19	14	16	2 $\frac{1}{2}$	300	35	8 00	-----	2 00
8	16	16	--	14	16	1 $\frac{3}{4}$	200	33	3 60	-----	Windlass
9	15	18	--	14 $\frac{1}{2}$	16	2	250	35	3 60	-----	Windlass
10	40	27	32	23	$\frac{1}{4}$	15 $\frac{1}{2}$	1,800	400	43 00	41 00	8 00

### BUCKET CARS.

A small Bucket Car which is quite useful for handling buckets when no ore cars are used. When the bucket is hoisted, run the car under it, lower the bucket on the car, unhook the safety hook and run the car out on the dump, where the bucket can be emptied and returned.

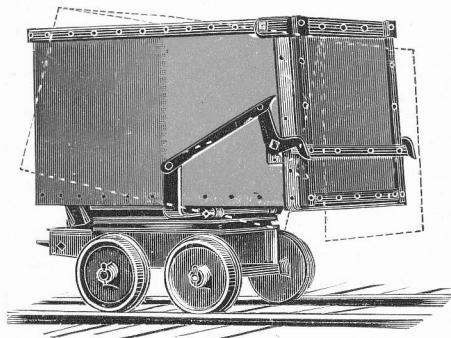


Car, 6-inch wheels, \$6 00

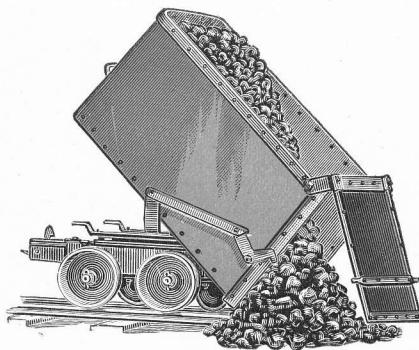
Car, 7-inch wheels, \$7 00

Car, 8-inch wheels, \$8 00

## TRUAX IMPROVED AUTOMATIC ORE CARS



Pat. Jan. 5th, 1892, and Aug. 27th, 1895.



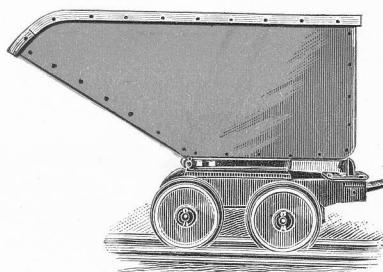
Pat. Jan. 5th, 1892, and Aug. 27th, 1895.

### PRICE LIST AND DIMENSIONS.

No.	Width of body inches	Length of body inches	Height of body inches	Capacity cubic ft	Shipping weight lbs.	Diam. of wheels inches	Gauge of track inches	Thickness of steel sides	Thickness of steel bottoms	Price
No. 14 A	24	44	21	13	430	10	18	No. 12	No. 8	\$35 00
" 14 B	24	44	21	13	450	10	18	12	1/8	36 50
" 14 C	24	44	21	13	490	10	18	10	1/4	39 00
" 14 D	24	44	21	13	522	10	18	12	1/4	41 00
" 17 A	24	48	24	16	495	10	18	12	1/8	40 00
" 17 B	24	48	24	16	555	10	18	10	1/4	48 00
" 17 C	24	48	24	16	650	10	18	10	1/4	50 00
" 20 A	24	44	24	14 1/2	500	10	18	12	1/8	45 00
" 20 B	24	44	24	14 1/2	525	10	18	10	1/8	47 00
" 20 C	24	44	24	14 1/2	565	10	18	10	1/4	50 00
" 20 D	24	44	24	14 1/2	637	10	18	12	1/8	58 00
" 19 A	30	54	24	22 1/2	630	heavy 12	18	10	1/4	55 00
" 19 B	30	54	24	22 1/2	685		12	18	10	1/8
" 19 C	30	54	24	22 1/2	765		12	18	10	1/4
" 19 D	30	54	24	22 1/2	835		12	18	10	1/6
" 21 A	30	54	30	27	745	12	18	12	1/4	60 00
" 21 B	30	54	30	27	825	12	18	10	1/4	66 00
									1/8	66 00

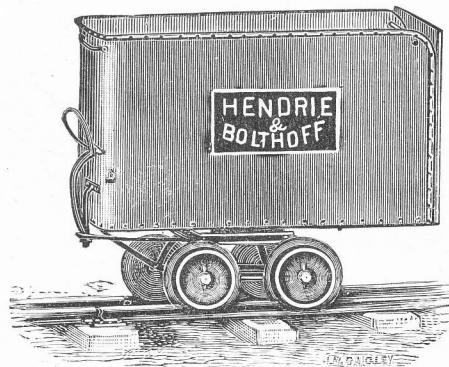
## SCOOP CARS.

	Scoop 23
Width of body -----	inches 24
Length of body -----	inches 48
Height of body -----	inches 21
Shipping weight -----	lbs. 360
Price -----	each \$35 00



NOTE—In ordering cars for cages it would be well to give us exact measures of the length and width of the cage. We usually place the step under the body of the car.

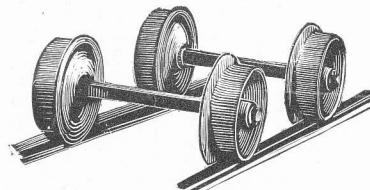
## STANDARD ORE CARS.



Number	Size of box			Thickness of steel		Size axles inches	Size wheels inches	Capacity cubic feet	Weight	Price
	Length inches	Width inches	Depth inches	Sides	Bottom					
1 (Ex. light) .....	44	24	20	No. 14	No. 12	1 1/4	10	13	375	\$22 00
2 (Light) .....	44	24	20	" 14	" 12	1 1/4	10	13	410	25 00
3 (Medium) .....	48	24	20	" 10	" 8	1 1/4	10	14	510	30 00
4 (Heavy) .....	48	24	20	1 3/8	1/4	1 1/2	10	14	570	36 00

## SELF-OILING CAR WHEELS.

Size of Wheels .....	inches	6	8	10	12	14
Weight, per set .....	lbs.	70	92	126	196	230
Price per set of four .....		\$2 75	\$3 25	\$4 25	\$6 50	\$7 50



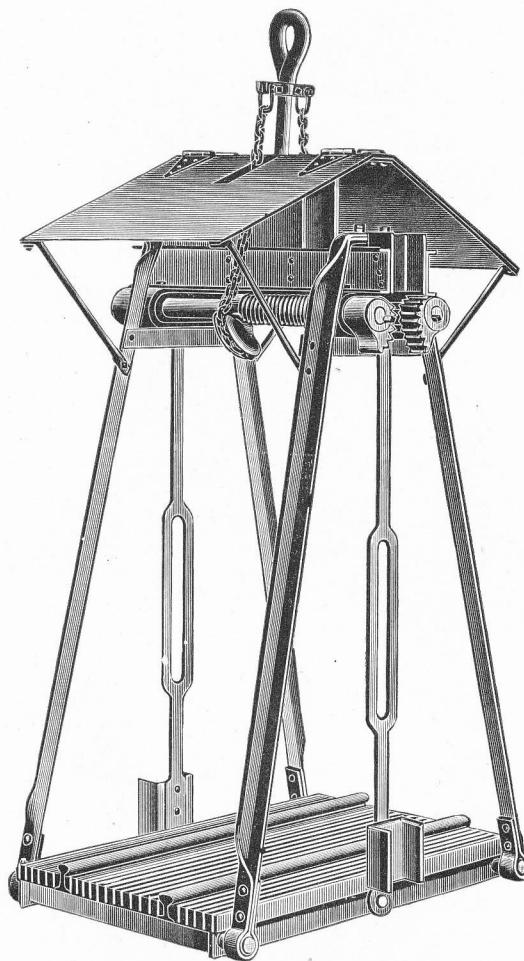
## PLAIN WHEELS.

Size of Wheel .....	inches	6	8	10	12	14
Weight, per set .....	lbs.	60	82	116	186	216
Price, per set of four .....		\$2 00	\$2 50	\$3 50	\$5 50	\$6 50

## AXLES.

Size .....	inches	1 1/4	1 1/4	1 1/4	1 1/4	1 1/2	1 1/2	1 1/2
Tread .....	inches	18	24	30	36	18	24	30
Weight .....	lbs.	20	26	35	40	30	37	46
Price, per set of two .....		\$1 25	\$1 60	\$2 25	\$2 75	\$2 00	\$2 30	\$2 50
Size .....	inches	1 3/4	1 3/4	1 3/4	1 3/4	2	2	2
Tread .....	inches	18	24	30	36	18	24	30
Weight .....	lbs.	45	55	67	80	55	70	85
Price, per set of two .....		\$2 80	\$3 25	\$3 45	\$3 65	\$4 50	\$4 75	\$5 00

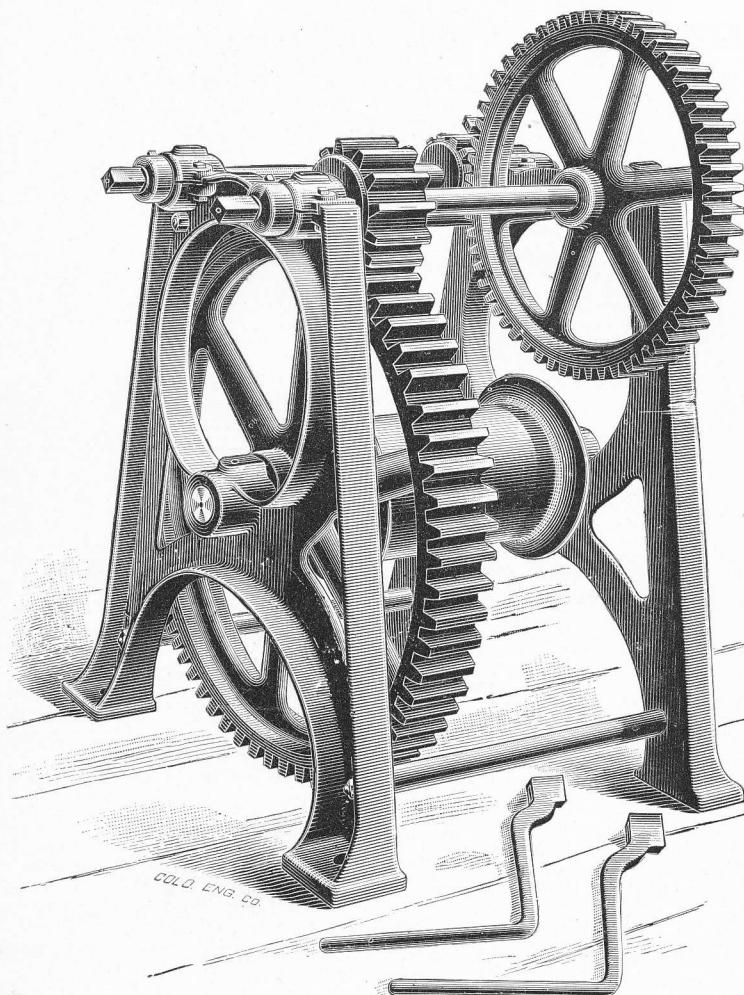
## STEEL SAFETY MINING CAGE.



The above illustration shows our latest pattern Steel Cage for gold or silver mines. This Cage combines lightness and strength in the highest degree, and embodies all the improvements suggested by our long experience in the practical working of these Cages. They have spring draw bar, steel safety dogs, operated by steel springs. The floor is of steel grating and the decks are hinged so as to be lashed back to receive rails or large timbers. These Cages are made double decked when desired. We can furnish them to suit any shaft and guides, the size below being a standard with many of our customers.

Platform	Guides		Load	Weight	Price
	Size	Between			
3 ft. x 4 ft.	4 x 6 inches	3 ft. 4 inches	2,000 lbs.	1,000 lbs.	On application

## HOISTING WINCH.



The Hand Winch illustrated herewith, has been designed especially for handling heavy loads. It is very powerfully geared, and capable of standing all the strain required of it. As shown, it is provided with a straight drum, for wire rope. We also build them with a curved winch head, for manilla rope.

For lightness, simplicity and strength, it has no equal.

No. 1.—Ratio of gearing ----- 36 to 1.

Shipping weight ----- 1,020 lbs.

Load hoisted ----- 10,500 lbs.

Price ----- \$100 00

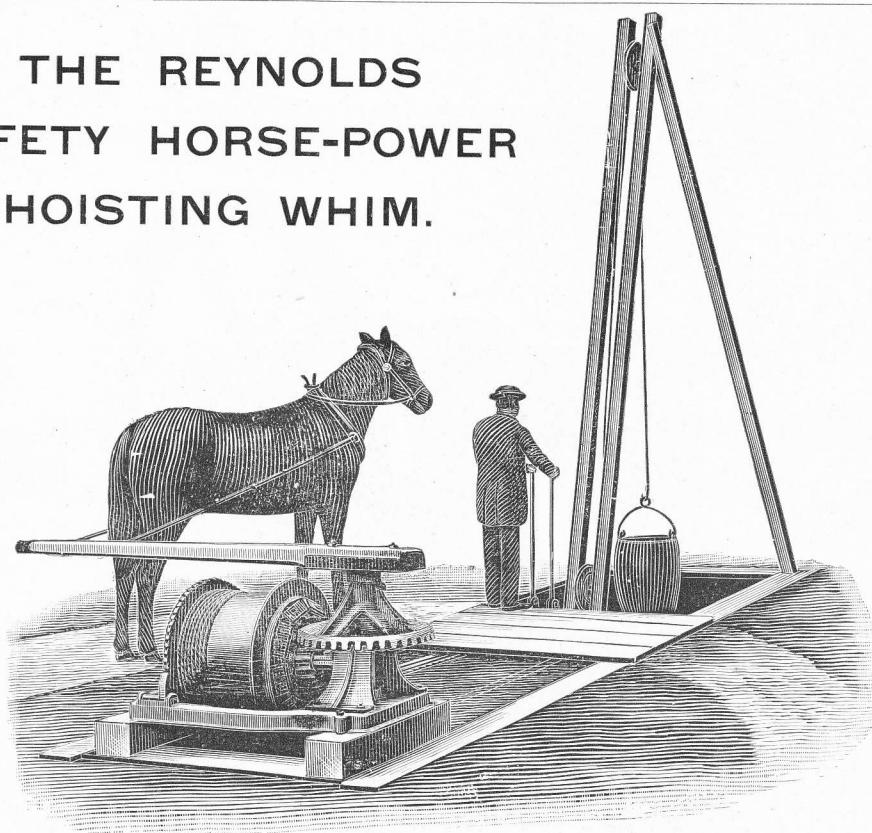
No. 2.—Ratio of gearing ----- 36 to 1.

Shipping weight ----- 600 lbs.

Load hoisted ----- 5,250 lbs.

Price ----- \$50 00

## THE REYNOLDS SAFETY HORSE-POWER HOISTING WHIM.



### DESCRIPTION.

The prospecting and development of mines in our camps has called for an efficient Horse-Power Hoisting Whim having safe and positive motions. The great importance of having perfect control of the lifting and brake devices is evident to all miners.

The Reynolds Whim is simple, compact and as light as any in the market, and has lifting and brake motions, easy in action, which insure perfect safety. The construction allows the horse to travel continuously, all motions being under the control of two hand levers. The lifting lever controls a cam surface which throws the main drum for the cable on and off a friction-cone.

The second lever controls a powerful band-friction brake. Both motions are positive and require but very little force on the hand levers.

The brake has been subjected to severe tests and never fails. The wearing parts of the driving friction-cone and the band-brake are of wood and may be easily renewed.

The large driving, bevel gear has its teeth on the under side, which is an advantage in preventing undue wear of the teeth from falling refuse.

Many manufacturers make a point of having but one lever to operate all motions. In such cases the brake is usually applied by counterweights or like devices. It will be evident to miners that a separate and powerful hand-brake is superior construction.

A novel and important feature of this Whim is the safety pawl, which is positive and allows the load to be suspended at any point without holding or fastening the levers. This allows one man to operate the Whim and bucket at the top of the shaft.

This Whim is light, easily erected, and considered by all miners perfect in its working and far superior to any other make.

The gallows frame is simple and may be constructed of rough hewn timber, though the timber construction shown in the drawing is preferred by many.

### ADJUSTMENT.

All Whims are shipped adjusted for use, and the lever rods are cut to right lengths for a distance of 13 feet 10 $\frac{1}{2}$  inches from center of main drum shaft of Whim to center of bolt hole in the lever stand.

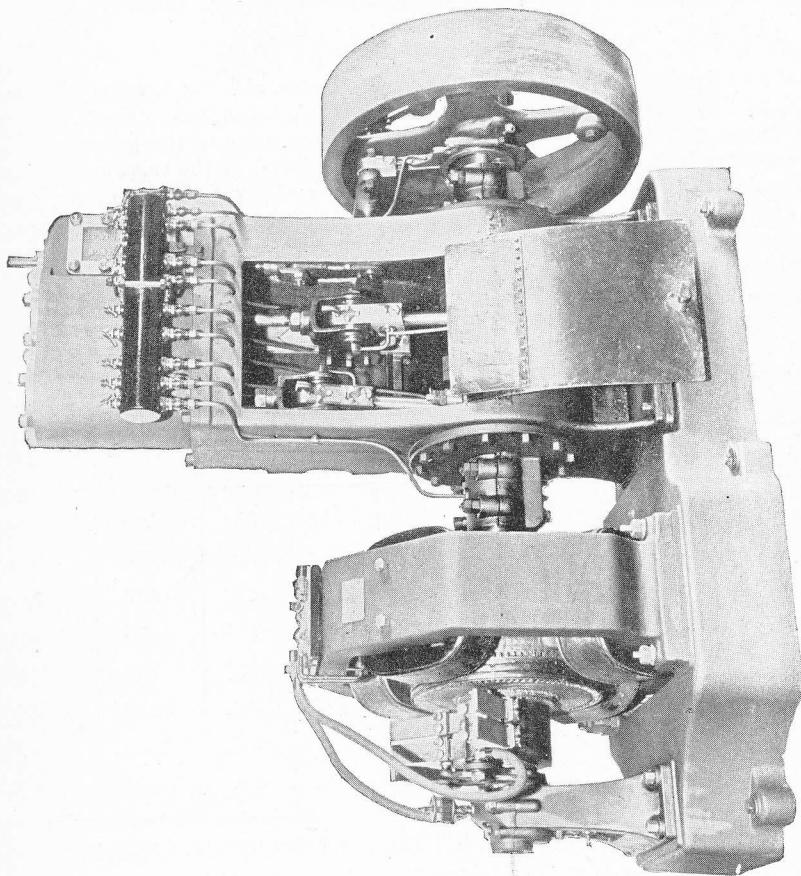
Lost motion may be taken up on the hoisting motion by setting in the wooden blocks of the friction-cone. The band-brake may be tightened by set nuts on the end of band.

The weight of machine is 1,200 pounds. Total shipping weight, including lever, sheaves and sweep, 1,400 pounds.

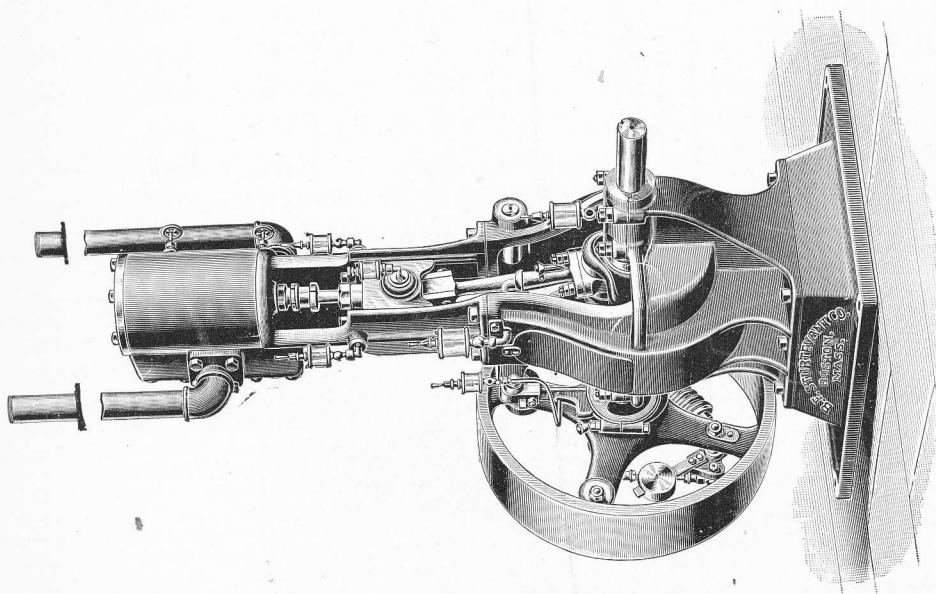
Price of Whim complete, including sweep, hand levers, lever rods, lever stand, 2 sheaves for rope F. O. B. cars Denver, \$100.

## SELF-CONTAINED ENGINE.





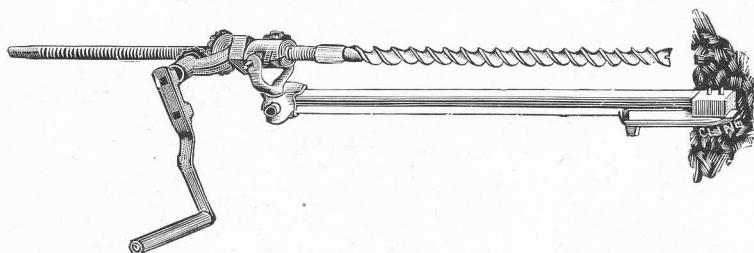
THE STURTEVANT  
DOUBLE ENCLOSED UPRIGHT ENGINE  
AND DYNAMO.



THE STURTEVANT AUTOMATIC SINGLE  
UPRIGHT ENGINE.

## HARDSOCG PATENT DRILLS.

### GRIP MACHINE.



Anybody can use it. Will drill closer to the floor, roof or rib than any other machine in the world. When a boxing wears out you have only a boxing to buy, not a complete gear frame as with other machines. Has largest thread-bar and strongest gearing furnished with any machine.

The cut represents the machine set up in position for working.

The machine consists of a horizontal or vertical support, a boxing mounted on same "carrying a steel feed bar," one 2, 4 and 6-foot auger, and a crank or gearing for imparting motion. We also furnish "extra" an auger extension if desired.

We can furnish thread-bars and boxings having threads cut 8, 10, 12 and 14 threads to the inch, the size commonly furnished, unless otherwise ordered, being 8 threads to the inch, and the harder the substance the finer the threads should be. Augers, thread-bars, grip-bars, post and auger extensions are all made of the best grades of steel, no iron being used in the construction of these machines.

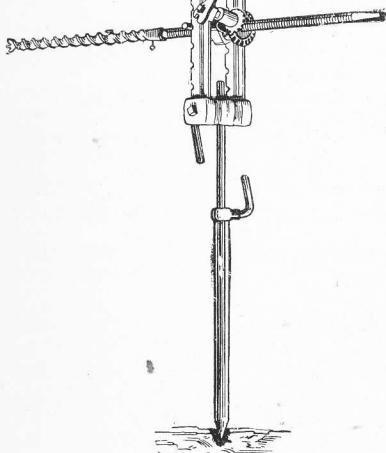
### HOW TO OPERATE.

When changing augers, turn crank backwards a few turns to release strain off thread-bar, then open boxing and insert the next longest auger in thread-bar. Close boxing over thread-bar, which will prevent all stripping of threads which would otherwise occur.

### POST MACHINE.

This is the strongest machine we manufacture, having the largest and strongest thread-bar and most substantial post and gearing, and is adapted to extra hard drilling coals, slate, etc.

### HEIGHT OF DIFFERENT SIZES OF POSTS.



- No. 1 Post, adapted to coal seam from 5 to  $8\frac{1}{2}$  feet thick.
- No. 2 Post, adapted to coal seam from 4 to  $7\frac{1}{2}$  feet thick.
- No. 3 Post, adapted to coal seam from 3 to  $6\frac{1}{2}$  feet thick.
- No. 4 Post, adapted to coal seam from 2 to  $5\frac{1}{2}$  feet thick.

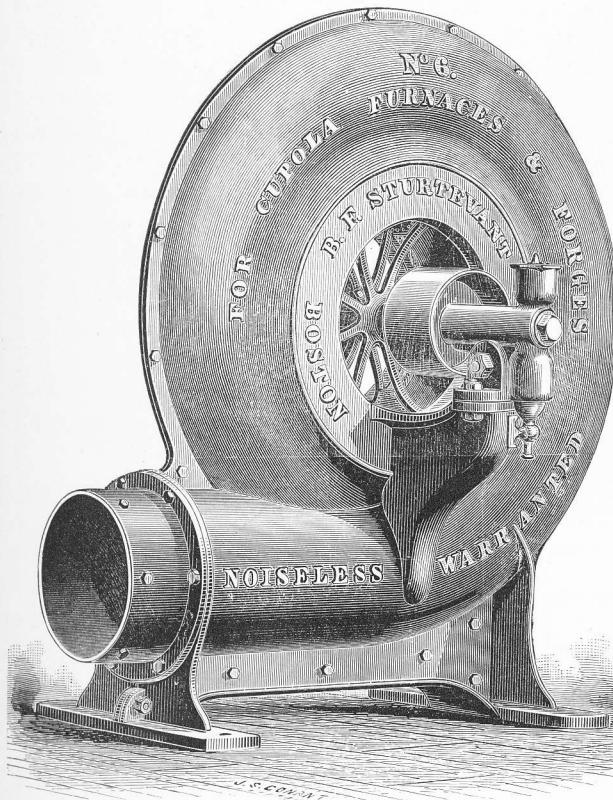
Always give number of post when ordering Post Drills.

### PRICE LIST.

Price of Post Drill, with gear	\$16 00
Price of Post Drill, less gear	13 00
Price of Grip Drill, with gear	14 00
Price of Grip Drill, less gear	11 00
Price of Auger Extension, 2 feet long	1 15

## B. F. STURTEVANT'S STEEL PRESSURE BLOWER.

Made expressly for iron foundries and furnaces, and will probably produce a stronger blast with the same amount of power than any other Blower.



The Blowers are built much heavier and stronger than our Pressure Blowers have heretofore been made, particularly in the running parts, where they are subject to the most wear; and are especially adapted to cupola furnaces and forges, as formerly.

Any machinist of ordinary skill will readily understand how to adjust, keep in order, and repair it.

Attention is called to the journal boxes, which contain many new and useful improvements over the old ones, and duplicate sets of these journals will be furnished to purchasers desiring them at a small advance above cost.

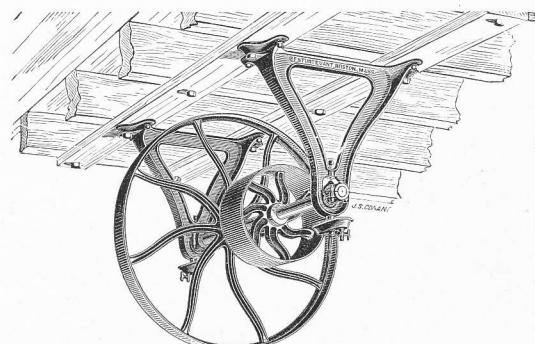
### REDUCED PRICE LIST.

Size of blower, in inches	Number of blower	Diameter of pulley, in inches	Face of pulley, in inches	Diameter of outlet	Price, with- out coun- ter-shafts or pulleys
0000	1 $\frac{1}{8}$	1 $\frac{1}{8}$	2 $\frac{3}{4}$	\$ 15 00	
00	2 $\frac{3}{8}$	1 $\frac{1}{8}$	3 $\frac{1}{2}$	20 00	
0	3	2 $\frac{1}{8}$	4	26 00	
1	3 $\frac{1}{2}$	2 $\frac{1}{2}$	4 $\frac{7}{8}$	36 00	
2	3 $\frac{3}{8}$	2 $\frac{1}{2}$	5 $\frac{3}{8}$	44 00	
3	4 $\frac{1}{2}$	3	6 $\frac{1}{4}$	55 00	
4	5	3 $\frac{1}{2}$	7 $\frac{3}{8}$	70 00	
40	5	5 $\frac{3}{4}$	4	8 $\frac{1}{8}$	90 00
45	6	6 $\frac{1}{4}$	4 $\frac{1}{2}$	10 $\frac{1}{4}$	115 00
53	7	7 $\frac{1}{8}$	5 $\frac{1}{4}$	12	180 00
64	8	9 $\frac{1}{8}$	6 $\frac{1}{4}$	13 $\frac{7}{8}$	225 00
75	9	10 $\frac{1}{8}$	8	16	325 00
81	10	12 $\frac{1}{8}$	9 $\frac{1}{4}$	18 $\frac{1}{2}$	450 00

In ordering Blowers with counter-shaft and pulleys, the purchaser should always be particular to give speed of main line of shafting and the largest pulley which can be used thereon, so that pulleys may be sent to suit the circumstances of the case. It is desirable to get as much speed as possible from main line. Always use as large a pulley as possible on counter-shaft for main belt. All our Blowers and Exhausters (except Pressure Blowers for cupola furnaces and forges) are built with one pulley to run with one belt (unless ordered for two belts). Our Pressure Blowers, from Nos. 4 to 10, inclusive, for cupola furnaces and forges, have two pulleys and run with two belts.

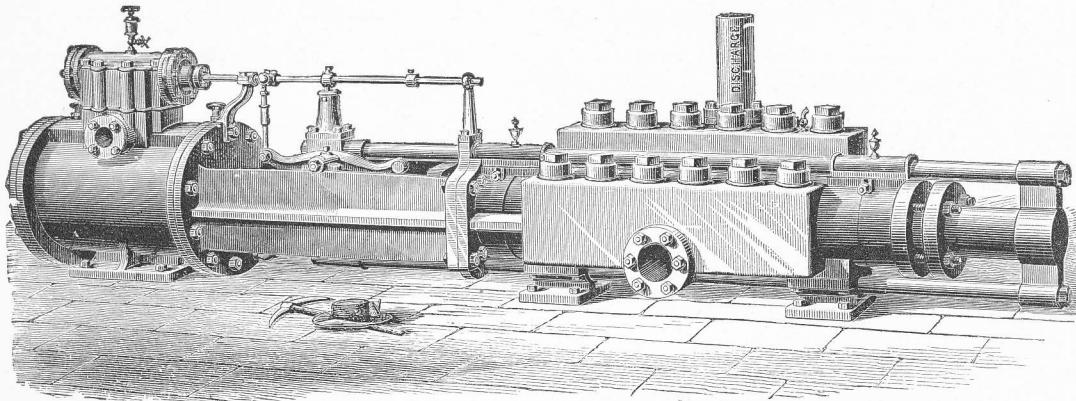
### PRICE LIST AND DIMENSIONS OF COUNTERSHAFTS.

Number of blower	Diameter of driving pulley	Diameter of pulley for main belt, inches	Diameter of shaft, inches	Price, with two driv- ing pulleys	Price, with one driv- ing pulley
0000	14	5 $\frac{1}{2}$ , 6	$\frac{7}{8}$	\$ 10 00	\$ 8 00
00	16	6, 7	1	12 00	10 00
1	18	7, 8	1 $\frac{1}{6}$	15 00	12 00
2	21	7, 8, 10	1 $\frac{1}{4}$	20 00	16 00
3	24	8, 10, 12	1 $\frac{1}{2}$	25 00	22 00
4	28	10, 12, 14	1 $\frac{5}{8}$	35 00	30 00
5	32	12, 14, 16	1 $\frac{3}{4}$	45 00	40 00
6	36	12, 14, 16, 18	1 $\frac{15}{16}$	60 00	50 00
7	42	14, 16, 18, 20	2 $\frac{7}{16}$	80 00	68 00
8, 9	48	18, 20, 22, 24	2 $\frac{15}{16}$	100 00	85 00
9, 10	54	18, 20, 22, 24	2 $\frac{15}{16}$	125 00	100 00

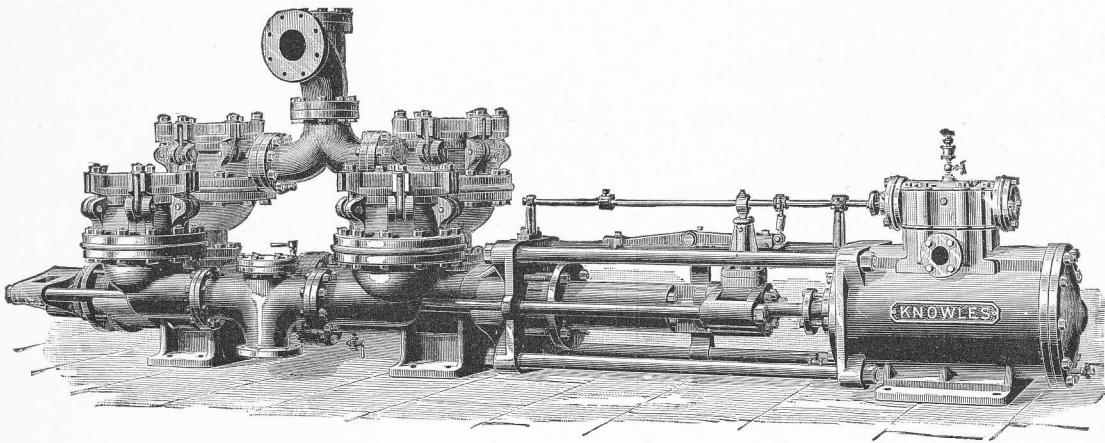


Counter-shafts, hangers and pulleys.

## KNOWLES PATENT MINING PUMPS.



KNOWLES PLUNGER MINING PUMP—PATENT “SOLID CYLINDER” PATTERN.



KNOWLES PLUNGER MINING PUMP—PATENT “POT VALVE” PATTERN.

### DOUBLE-PLUNGER PATTERN.

Plunger Pumps have always been held in high esteem by users of mining machinery, for they are the most satisfactory pumps, all things considered, especially where the water is bad and the pressure heavy. The Knowles Plunger Mining Pumps combine all the advantages of the best designs of this class of pumps, while they possess original features which place them, in point of excellence, beyond anything of the kind that is built in this or any other country. FOR HEAVY DUTY, especially in coal mine work where the water is likely to be strongly impregnated with acid, we construct these pumps of the hardest iron it is possible to work, making the metal from *two to three inches thick*, and all water passages equal in area to the plungers. This form of pump, supplied with water valves of special form, working on seats made entirely of gun-metal composition, is almost indestructible in bad water. *These features will be appreciated by every mining engineer.* In each of the engravings above, it is shown that there are two single-acting plungers attached to strong cross-heads by heavy rods of wrought iron; these connecting-rods are supported by and slide on adjustable guides or bearings, thus keeping the plungers in line and preventing uneven wear. The piston-rod does not enter the pump cylinder, and is therefore not exposed to the action of the mine water. The plungers have outside stuffing boxes which can be readily packed, and being in sight, any leakage of water through the glands can be quickly detected. The plungers not passing through any sleeve or stuffing-box in center of cylinder, but being “outside connected,” it is not possible for any water to leak by or to pass from one end of the cylinder to the other—the displacement of water at each stroke is exactly *equal*.

### KNOWLES PATENT SOLID CYLINDER PATTERN.

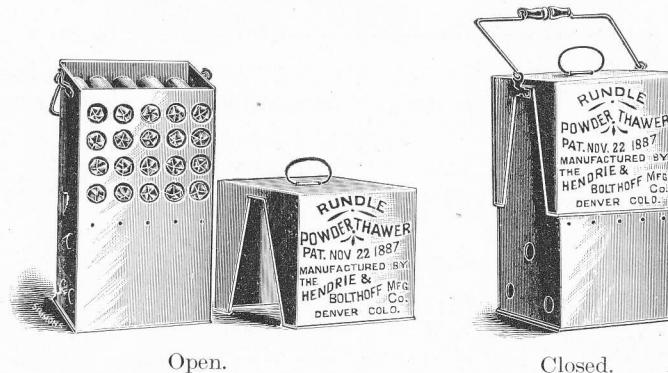
This special form of Mining Pump is original with us and has many advantages not found in other forms of plunger pumps. It is especially adapted for the heaviest work, and will pump in a single lift of 1000 feet as well as one of 300 feet high. The heavy castings, absence of joints and peculiar arrangement of valves and plungers, render this pump *exceedingly* durable. Practically the only wearing point in the entire water end is the packing in the stuffing-boxes. It is provided with two hand-hole plates, so that the cylinder can readily be cleaned.

### KNOWLES PATENT “POT-VALVE” PATTERN.

This form of Mining Pump differs from the above only in the arrangement of water valves, which (as the engraving shows) are enclosed in heavy “pots.” These valves are of special design (patented) and possess the double advantage of quiet action and great durability. The valves work on *gun-metal composition seats*; the valves and seats can be readily taken out in one movement after the covers of the “pots” are removed. The “pot-valve” form of mining pumps is one that has long been popular with old mining engineers. We have complete patterns for every size of both of the above styles of Improved Plunger Mining Pumps.

## THE RUNDLE POWDER THAWER

Is endorsed by the Colorado State Commissioner of Mines, and recommended by users generally.



We feel in presenting this Thawer to the public that it is about the only safe device made for thawing giant powder and other high explosives.

The powder is less confined, as both ends of the tubes are open, and there is no danger of a part of the stick sticking in the tubes. Warm water completely surrounds the tubes, and the powder is constantly kept in a working condition.

They are constructed of the best galvanized iron, and are very durable. They are also economical and safe. In fact, accidents are almost impossible when handling explosives in these machines.

### DIRECTIONS.

Fill reservoir with water. Place the powder in the tubes and put two snuffs in bottom of can. It is a good idea to fill the bottom of candle stick with water.

Price, each ----- \$5 00

Miners' Lamps, per dozen	-----	\$3 00
Miners' Candlesticks, per dozen	-----	5 00
Miners' Candles	-----	prices on application
Miners' Spoons, per dozen	-----	\$4 00
Miners' Checks, per thousand	-----	7 00

## SILVER-PLATED COPPERS.

Heavily Silver-Plated Coppers, warranted not to blister, furnished to order.

## GOLD PANS.

Copper-bottom pans, price -----	each, \$3 00
Planished pans, price -----	each, 50
Aluminum pans, price -----	each, 1 75
Planished amalgam scoops, price -----	each, 35
Table brushes, price -----	each, 2 25
Clean-up rubbers, price -----	per lb., .90

## ORE SACKS.

Cotton, 16 inches by 24 inches, price -----	each, \$0 20
Cotton, "Boss," 16 by 24 inches, price -----	each, 25
Jute Seamless, 16 by 24 inches, price -----	each, 14
Jute Sewed, 16 by 24 inches, price -----	each, 10
<hr/>	
Metal workers' crayons -----	per doz., \$0 50
Metal workers' pencils -----	per doz., 35



Bare copper wire—gauges 10, 12, 14, 16 and 18-----per lb., 40

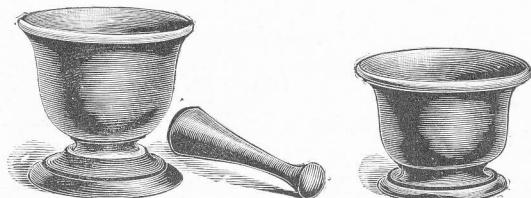
## ANNEALED IRON, STONE OR WEAVING WIRE.

No. 16-----	per lb., \$0 14	No. 27-----	per lb., \$0 28
No. 17-----	per lb., 15	No. 28-----	per lb., 29
No. 18-----	per lb., 16	No. 29-----	per lb., 30
No. 19-----	per lb., 19	No. 30-----	per lb., 32
No. 20-----	per lb., 20	No. 31-----	per lb., 33
No. 21-----	per lb., 21	No. 32-----	per lb., 35
No. 22-----	per lb., 22	No. 33-----	per lb., 37
No. 23-----	per lb., 23	No. 34-----	per lb., 40
No. 24-----	per lb., 24	No. 35-----	per lb., 45
No. 25-----	per lb., 25	No. 36-----	per lb., 55
No. 26-----	per lb., 26		

Galvanized telegraph and telephone Wire, No. 54 to 14-----per lb., ----

We are agents for John A. Roebling's Sons Co. full line of Bare and Insulated Electric Wire.

If any other brand of Wire is desired send for our special Wire Catalogue.

**GOLD MORTARS.**

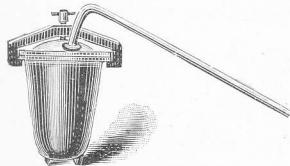
These Mortars, on account of their smooth finish and extra heavy wedgewood-shaped pestles, are better adapted to testing gold and silver ores than any other made.

**LIST.**

Three gallons	Two gallons	One gallon	Two quarts	One quart	One pint
\$5 00	\$3 00	\$2 00	\$1 00	75c	50c

**GOLD RETORTS.**

Complete with condensing pipes.



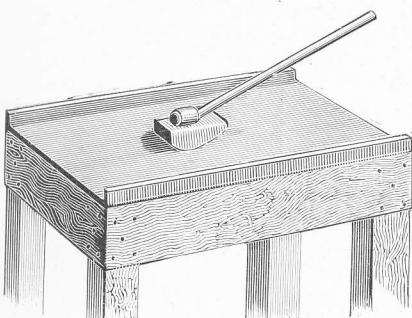
These Retorts are made from new and improved patterns, are finely polished on the inside and have the cover turned and ground air-tight; the pipe is screwed tight into the cover.

**LIST.**

Two gallons	One gallon	Two quarts	One quart	One pint	Half pint
\$6 00	\$5 00	\$3 50	\$2 75	\$2 50	\$2 25

**GILPIN COUNTY PATTERN—EXTRA HEAVY.**

One gallon, \$25 00      Two quarts, \$15 00      One quart, \$10 00

**BUCKING PLATES AND MULLERS.**

18 x 20 inches	-----	\$10 00
20 x 24 inches	-----	12 00
24 x 36 inches	-----	16 50

Extra Mullers, 10c per pound.

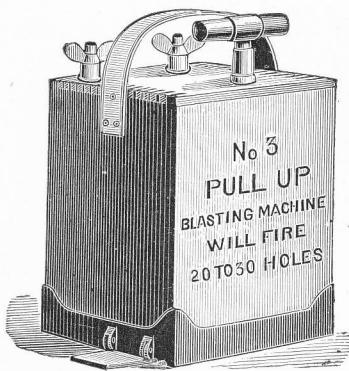
**LADLES.**

Size	inches	2½	3	3½	4	5	6	7	8
Standard	per doz.	\$3 00	\$3 85	\$4 40	\$5 50	\$7 50	\$9 25	-----	-----
Extra heavy, for smelter use	-----	-----	-----	-----	-----	18 00	\$21 50	\$27 00	-----

We can furnish anything needed by assayers at the very lowest market rates.

## “PULL UP” BLASTING MACHINES.

Patented February 9, 1892.



### MADE IN THREE SIZES.

No. 3 will fire 20 to 30 holes.....	price, \$25 00
No. 4 will fire 40 to 50 holes.....	price, 50 00
No. 5 will fire 75 to 100 holes.....	price, 75 00

These machines are operated by a very easy and simple motion, which works smoothly and without any strain upon the parts. The operating bar, after being pulled up to fire, will fall back into its place of its own weight, and is ready to be used again. All parts are made strong and durable, there being no coils to burn or springs to break; they do not easily get out of order, consequently require no expensive repairs—a fact that will be appreciated by all contractors and miners.

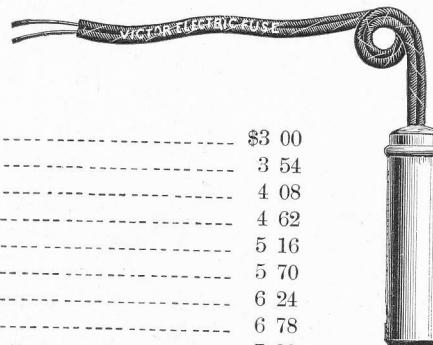
### DIRECTIONS FOR FIRING.

Notice the projecting iron flanges at bottom of box; stand on these flanges with both feet to hold the machine firmly down; then pull up the bar quickly with one continuous stroke—with both hands—when the blast will take place. After firing, the bar will drop back into its place. Make sure the bar is all the way down when starting to pull it up. Increase the speed of your stroke from start to finish. The quicker the stroke the more current is generated.

## VICTOR ELECTRIC PLATINUM FUSES.

Patented December 11, 1888.

Superior to all others for exploding any make of dynamite or blasting powder. Each fuse folded separately and packed in neat paper boxes of 50 each. All tested and warranted. Single and double strength, with any length of wires. Improved water-proof insulation.



### PRICE LIST.

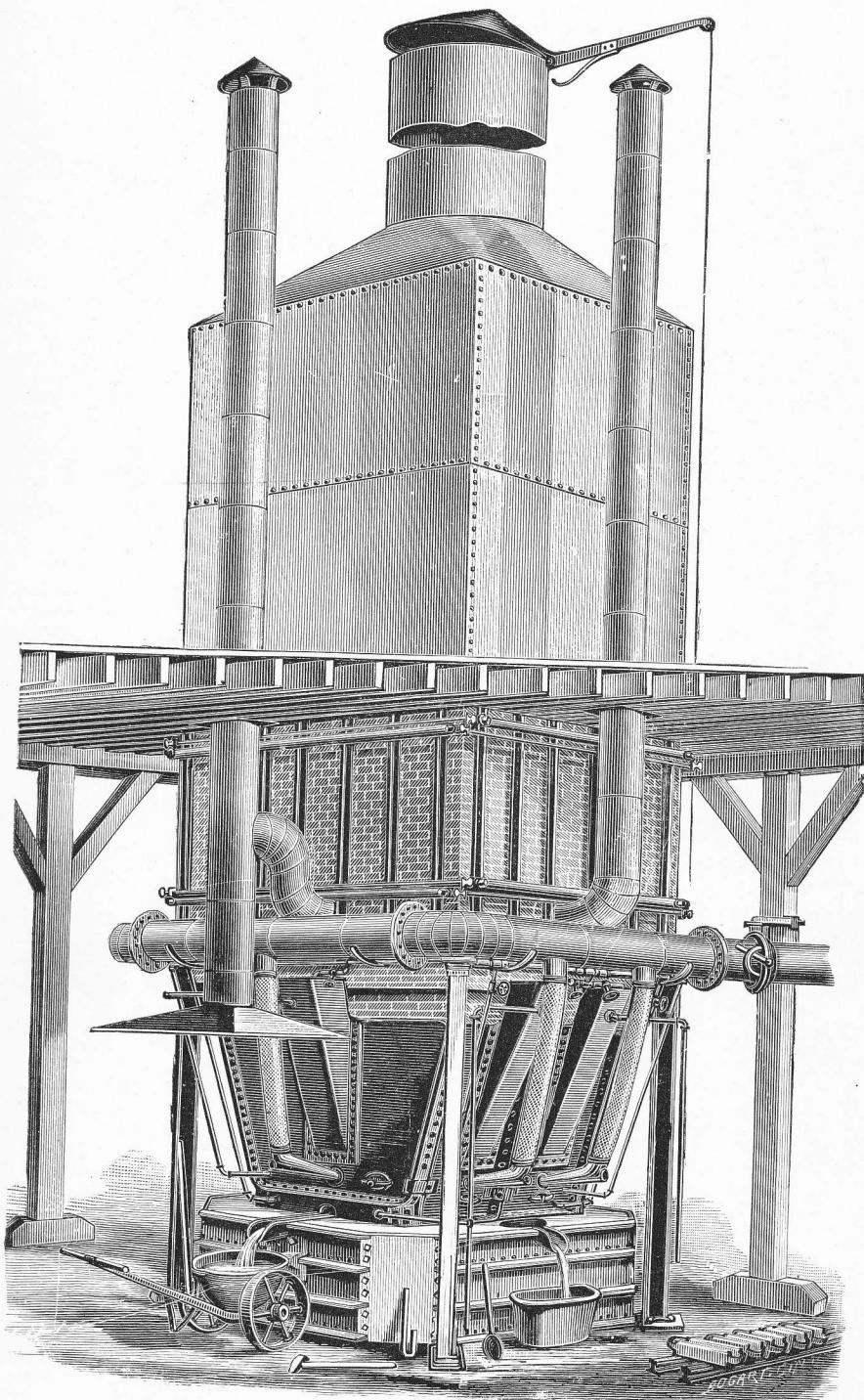
4 feet wires, per 100.....	\$
6 " " "	3 00
8 " " "	3 54
10 " " "	4 08
12 " " "	4 62
14 " " "	5 16
16 " " "	5 70
18 " " "	6 24
20 " " "	6 78
	7 32

Fuses with longer wires furnished at short notice.

No. 14 leading wire, and Nos. 18 and 20 connecting wires, 40c per pound.

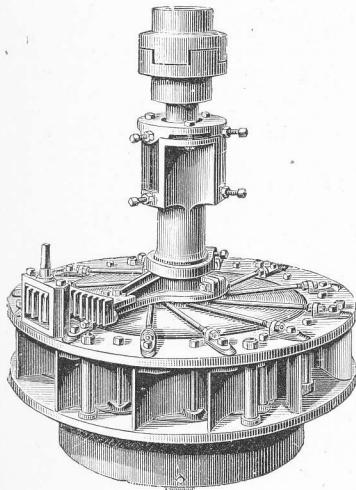
We are not agents for any particular brand of giant powder, but can furnish any brand at market rates.

## COLORADO SMELTING FURNACE.

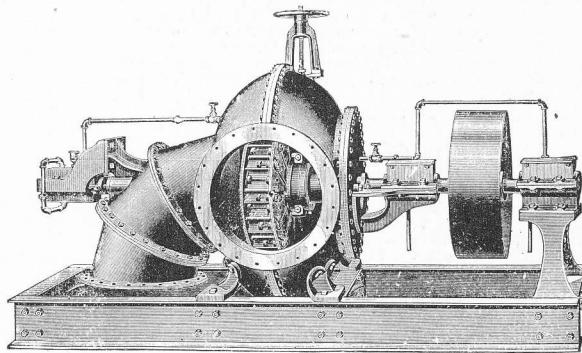


As used by all Colorado smelting works. We furnish these of any size required. Improved slag carts and cars, bullion moulds, etc.

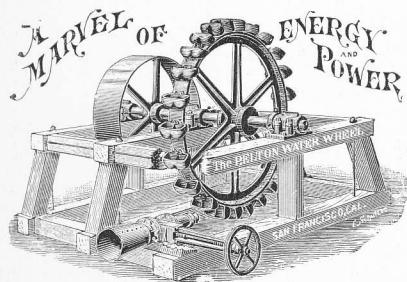
## TURBINE WATER WHEELS.



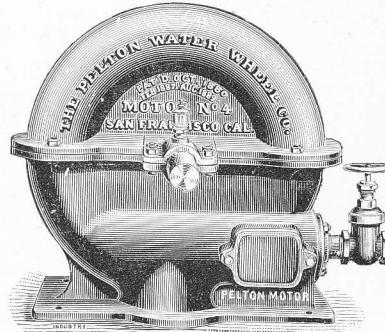
IMPROVED DOUBLE TURBINE  
WATER WHEEL.



HORIZONTAL SHAFT.



PELTON WATER WHEEL.



WATER MOTOR.

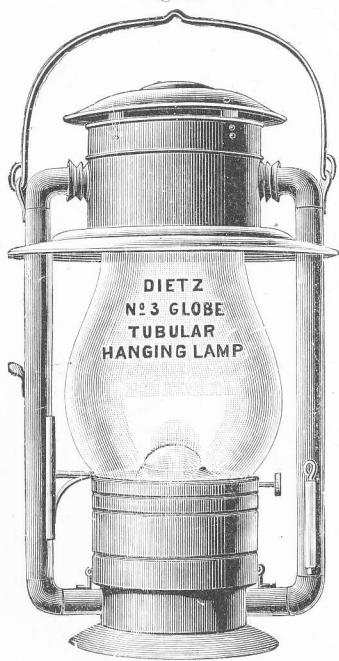
Owing to the vast amount of detail necessary to cover the various conditions under which Water Wheels are to be placed and operated, and sizes, etc., determined upon, we have concluded to issue a separate and distinct catalogue, covering this particular line of machinery.

Parties wanting the above class of machinery will do well to write us for our Water Wheel Catalogue.

Governors to regulate the speed for electric light power, furnished with the above.

## GLOBE TUBULAR HANGING LAMPS.

Fig. A.



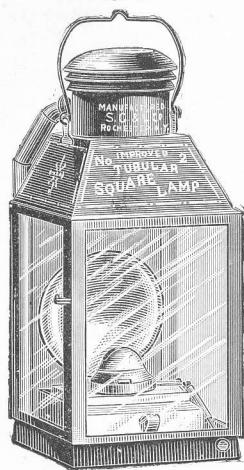
LIGHT EQUAL TO 22 1-2 CANDLE POWER,  
ACTUAL TEST.

These Lamps have automatic extinguisher. No chimney. New globe lifter. Improved burner. Outside wick regulator. Do not smoke. Light equal to gas at a less cost. Will not blow out in the strongest wind, and can be regulated to burn a stated number of hours.

No. 2 Globe Tubular Hanging Lamp	-----	each \$4 00
No. 3    "    "    "    "	-----	" 4 50

## SQUARE TUBULAR HANGING LAMPS.

Fig. B.



These Lamps have no chimney. Improved burner. Outside wick regulator. Will not blow out. Made in three sizes, with silvered glass reflectors.

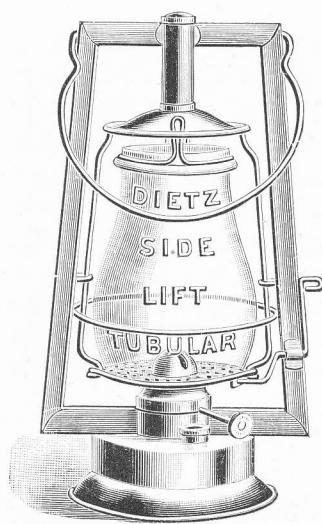
No. 1—1 -inch wick, 6-inch reflector	-----	each \$4 00
No. 2—1½-inch    "    8-inch    "    "	-----	" 5 00
No. 3—1½-inch    "    12 inch    "    "	-----	" 6 00

The above Lamps also furnished guarded at an additional cost of 75 cents each.

## HEAD-LIGHTS WITH SPUN COPPER SILVER PLATED REFLECTORS.

11-inch cable	-----	each \$15 00	16-inch cable	-----	each \$35 00
12-inch    "	-----	" 22 50	23-inch    "	-----	" -----
14-inch    "	-----	" 25 00			

Fig. A.



### VICTOR SIDE LIFT TUBULAR LANTERNS.

No. 1,  $\frac{5}{8}$ -inch wick for kerosene-----each, \$0 60

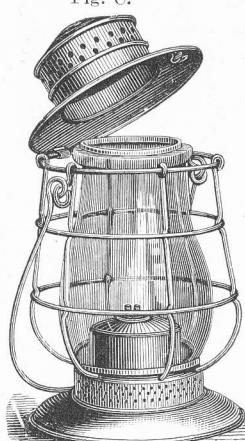
The crank at the side of the lantern raises and lowers the globe and securely locks the burner in place when down.

### NO. 39 R. R. LANTERN.

Standard size; burns lard oil.  
Bail attached to the guard frame  
and is so arranged that when the  
lantern is in use the bail stands  
upright.

No. 39 R. R. Lantern, double guards -----each, \$0 75

Fig. C.

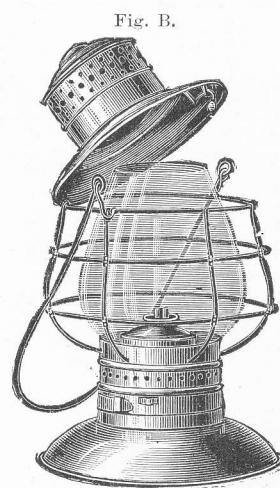


A-NO. 1.

### A-NO. 1 LANTERN.

Three burners for oil, candle and kerosene. Bail fast to guard; Sangster spring on oil pot. A heavy, strong lantern for general use.

A-No. 1 Lantern, price -----each, \$0 60

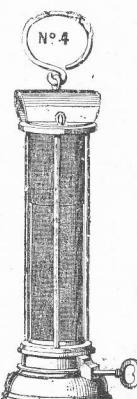
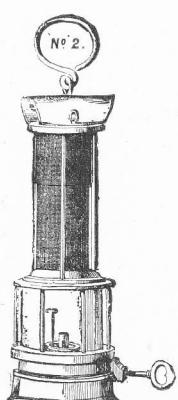


No. 39 R. R.

### MINERS' SAFETY LAMP.

No. 2, Universal Clanny, price-----each, \$2 90

No. 4. Newcastle Davy, price -----each, 2 10



### PRICE OF LAMP PARTS.

All iron gauzes with caps-----per dozen, \$2 90

Bristle brushes for cleaning ----- " 2 90

White glasses ----- " 2 00