

CATALOG NO. 22

THE MINE AND SMELTER SUPPLY COMPANY

MACHINERY AND
GENERAL SUPPLIES

FOR MINES, MILLS AND SMELTERS
STEAM, ELECTRIC, GAS AND WATER POWER
PUMPING, IRRIGATION AND INDUSTRIAL PLANTS
CONTRACTORS AND RAILROADS
ASSAYERS AND CHEMISTS

DENVER, COLORADO
SALT LAKE CITY, UTAH
EL PASO, TEXAS
MEXICO CITY, D. F.

GENERAL OFFICES, NEW YORK CITY

Cable Address for General Offices and U. S. A. Branches : "MINTERPLY"
For Mexico City Branch : "MEXMINE"

CODES USED : Western Union, New Business, Lieber's, Bedford McNeill

INTRODUCTORY

IN the preparation of this book we have steadfastly kept in view as our objective the production of a practical aid to the buyers of the products listed therein, to the end that necessary information relating to these products might be readily obtained. It being obviously impossible to include within the limited scope of a single book all of the items required and which we are able to supply, we solicit your inquiries for items not shown herein, and assure you that our large and experienced organization will serve you well. We take this opportunity to thank our customers for past favors, and we hope this book will make new friends for us among the many buyers of Machinery and Supplies.

The Mine and Smelter Supply Co.

JANUARY 1, 1912.



AJAX DRILL SHARPENERS

D 24 AJAX DRILL SHARPENER

RIGHT OR LEFT HAND

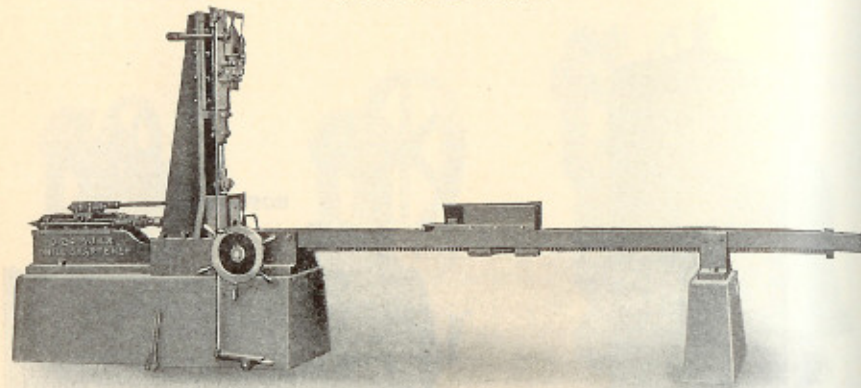


Fig. 235

The "Ajax" Drill Sharpener is designed for forging and sharpening drill bits by means of compressed air hammers. Exceptional records have been made with this machine, and a man familiar with its operation can turn out two finished bits per minute. In its several sizes the machine will handle steels of all lengths and bits of all diameters. It will not only sharpen dull bits, but it will forge new bits from round, octagon or cruciform steel. The bits thus made are true to gauge and of exceptional wearing qualities. Experience has shown that machine-sharpened bits will cut 30 to 50 per cent. more rock than hand-sharpened steels, and their uniform gauge practically does away with all "rifling" of the hole.

Two sizes of the "Ajax" meet all conditions of drill sharpening. The "D-24 Ajax," illustrated above, is for bits 1½ to 4 inches in diameter, and for steels from 10 to 35 feet long. It will handle both chisel and cross bits. The "A-86 Ajax" handles steels up to ten feet in length, with bits from 1½ to 2¼ inch diameter. It produces chisel, cross or rosette bits.

"D-24" machine makes chisel and cross bits from 1½ to 4 inches wide. For drills up to 10 ft. long; shipping weight, 4000 lbs.; price	\$1200.00
"A-86" machine makes cross chisel and six wing bits from 1½ inches to 2¼ inches wide; shipping weight, 2800 lbs.; price	600.00

Dies for one shape are included with the machine. Can be used as either right or left hand machine. Sectionalized if required.

Correspondence solicited.

HOLMAN DRILLS

1911 MODEL

ON DOUBLE SCREW COLUMN

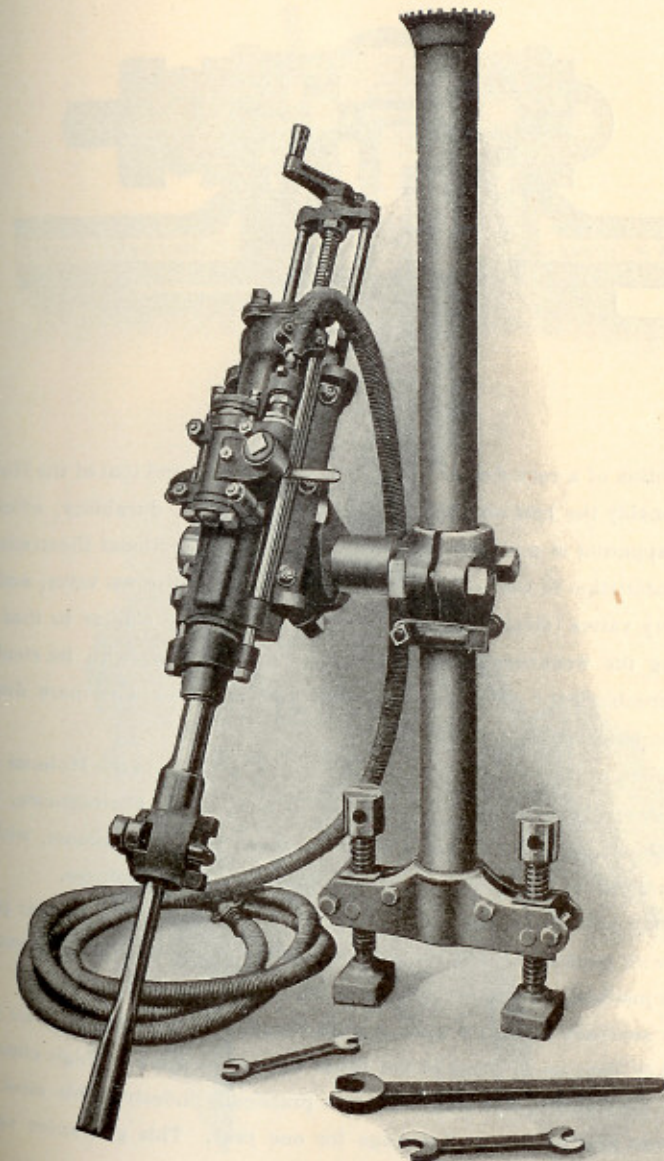


Fig. 240

HOLMAN DRILLS

HOLMAN VALVE MOTION

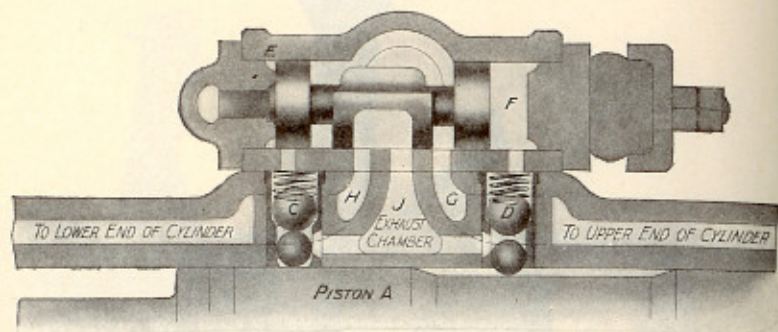


Fig. 241

The valve motion of a rock drill is of primary importance, and that of the Holman drill is unquestionably the best on the market. Its simplicity, durability, efficiency and economy is apparent at a glance. As will be seen in the sectional illustration, it is a practical combination of the well-known Independent air thrown valve, and two trigger or auxiliary valves (steel balls), the function of which is similar to that of a tappet. Avoiding the weakness of each, the Holman air valve, with its steel ball auxiliary valve, combines the advantages of both, and in addition is more durable because subject to less wear and shock.

The arrangement of the piston and the valve is quite positive in the Holman drill, hence there can be no "sticking" or "fluttering" of the valve. Furthermore, there is absolutely no chance of live air passing over the valve into the exhaust, which is the case in the majority of drills, and contributes to their air wastefulness.

The Holman air valve permits the drill to work effectively with a slacker piston than is possible with most types, and strikes an uncushioned blow, a common enough claim not always justified, but positively true of the Holman.

The Holman auxiliary valve is a distinct improvement on any tappet or air valve drill on the market, because in place of the usual expensive piece of high class but frequently tricky mechanism, it is simplified to a practically indestructible steel ball, which we guarantee against wear or breakage for one year. This guarantee cannot safely be made for any other type of valve.

Send for the Holman Drill Catalogue and learn of its many valuable features.

HOLMAN UNIVERSAL TRIPOD DRILLS

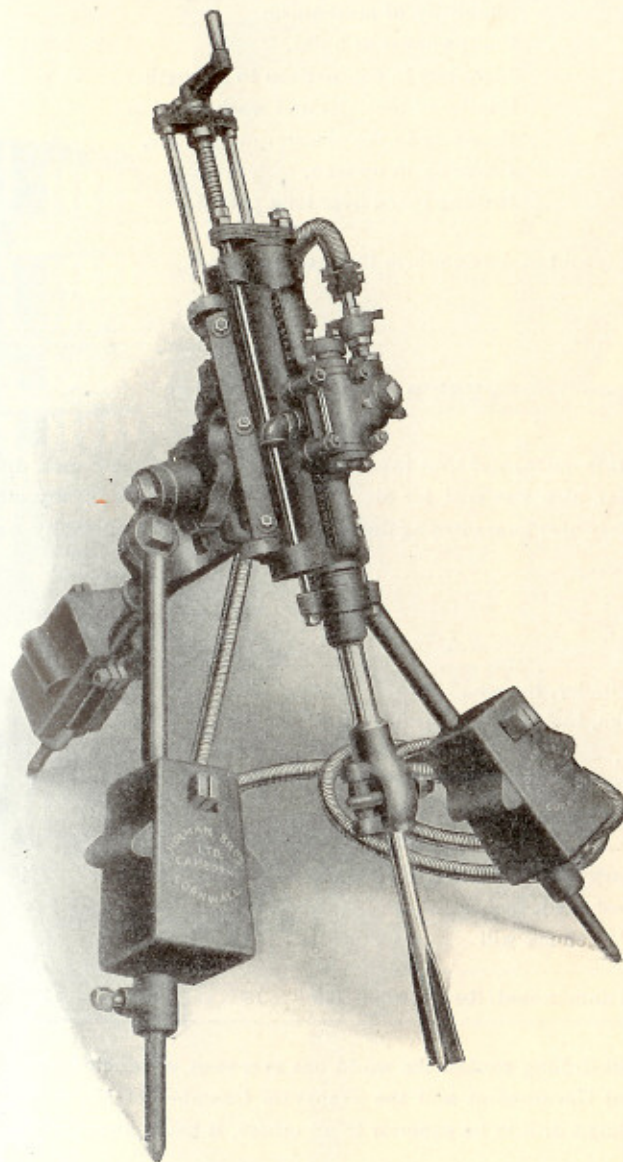


Fig. 242

HOLMAN DRILLS

Holman Drills excel all competitors in these seven points of superiority:

- Simplicity of mechanism.
- Compactness of build.
- Lightness in comparison to strength.
- Quality of material and workmanship.
- Economy in the consumption of air.
- Economy in upkeep.
- Drilling speed over long periods.

30,000 Drills sold to date confirm these claims.

THE HOLMAN GUARANTEE

Holman Bros. guarantee that taken over long periods, their rock drills will drill a greater footage at a less cost for air and repairs than those of any other make of equal size. They also guarantee against defective material and faulty workmanship.

Size and type	A	B	C	D	E	F
Diameter of cylinder, inches....	2 $\frac{1}{8}$	2 $\frac{1}{2}$	2 $\frac{3}{4}$	3	3 $\frac{1}{4}$	3 $\frac{1}{2}$
Length of stroke, inches.....	5	6	6 $\frac{1}{2}$	6 $\frac{1}{2}$	7	7
“ “ feed, “	18	24	24	24	27	30
Supply inlet, inches	$\frac{3}{4}$	$\frac{3}{4}$	1	1	1	1 $\frac{1}{4}$
Depth of vertical hole will drill easily, feet	6	8	10	14	16	20
Diameter of starter drill bit, in..	1 $\frac{1}{2}$	1 $\frac{3}{4}$	2 $\frac{1}{4}$	2 $\frac{1}{2}$	2 $\frac{3}{4}$	3
“ “ steel used, inches ..	$\frac{7}{8}$	$\frac{7}{8}$ & 1	1 & 1 $\frac{1}{8}$	1 $\frac{1}{8}$ & 1 $\frac{1}{4}$	1 $\frac{1}{8}$ & 1 $\frac{1}{4}$	1 $\frac{1}{4}$ & 1 $\frac{1}{2}$
“ “ “ chuck will take, inches.....	$\frac{7}{8}$	$\frac{7}{8}$	1	1 $\frac{1}{8}$	1 $\frac{1}{8}$	1 $\frac{1}{4}$
Weight of drill unmounted, lbs..	100	140	180	230	295	380

The greatest drilling contest the world has ever seen, conducted under the auspices of the Transvaal Government and the Transvaal Chamber of Mines during 1908-'09, proved the Holman drill to be superior to all others, it being awarded a cash prize of \$12,000.

Send for the Holman Drill Catalogue and learn of its many valuable features.

STAMP MILLS

TEN STAMP BATTERY WITH WOOD MORTAR BLOCK

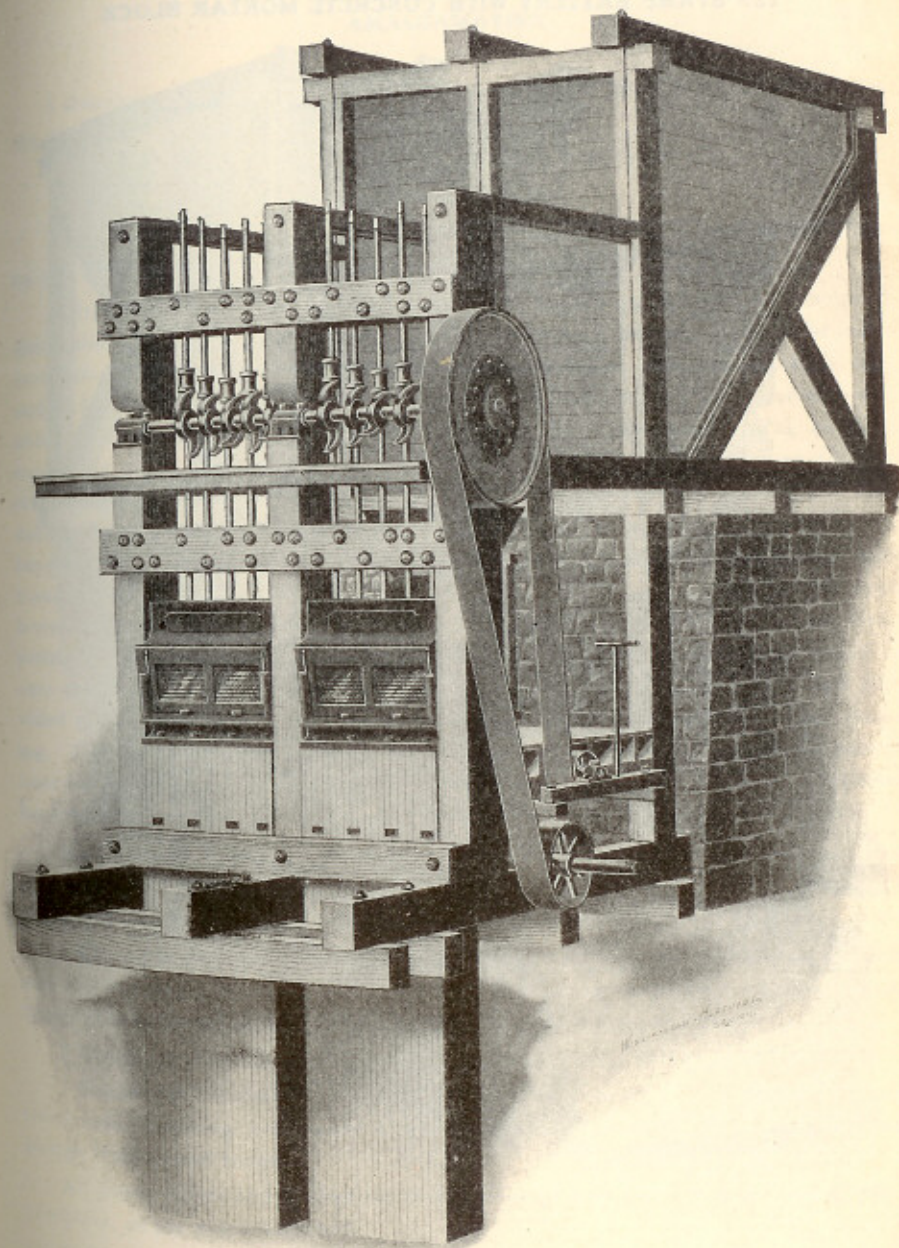


Fig. 260

STAMP MILLS

TEN STAMP BATTERY WITH CONCRETE MORTAR BLOCK

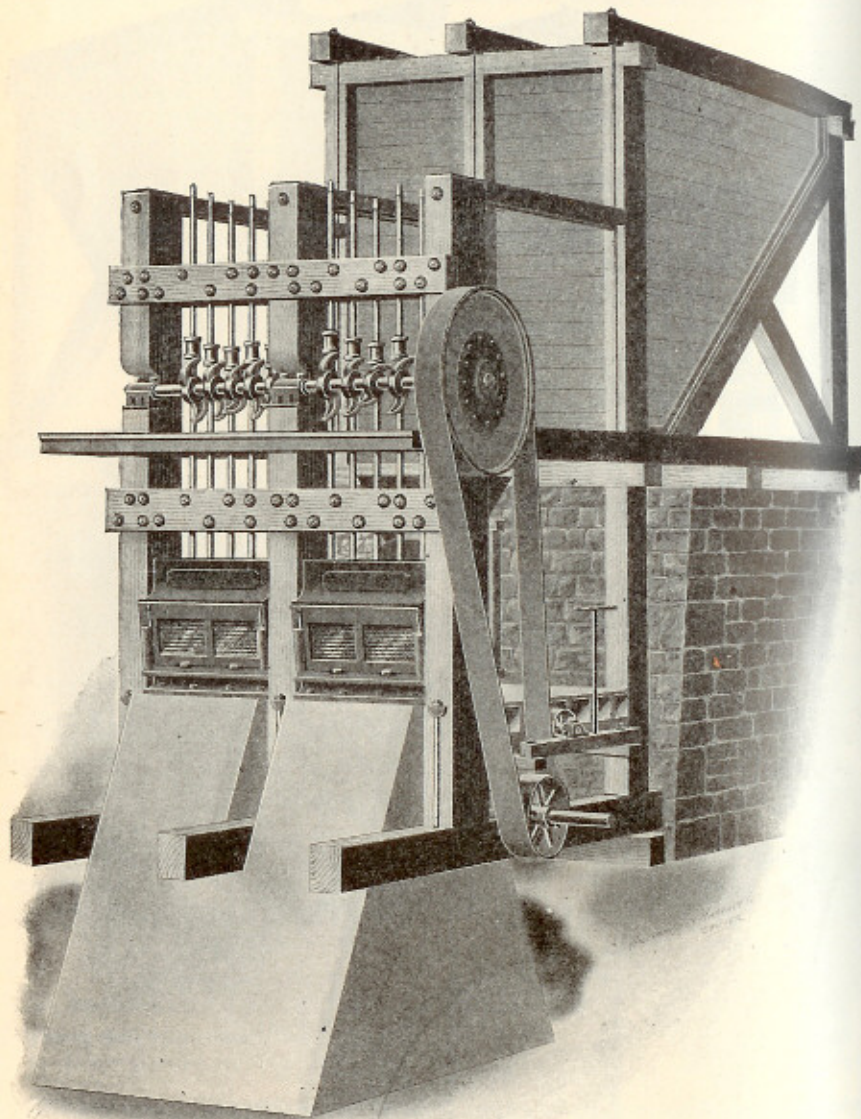


Fig. 261

SPECIFICATIONS FOR A TEN-STAMP GOLD MILL

AMALGAMATING

1 Grizzly or Ore Screen, 4x10 ft.; 1 Blake Crusher, 10x7 in.; 2 Ore-Bin Gates, 18x24 in.

2 Automatic Ore Feeders, standing or suspended type.

All necessary bolts and washers for ore bins.

1 Ten-Stamp Mill of 1000 lbs. each stamp; arranged to run in one battery driven by belt and tightener from stamp countershaft; as follows:

2 High Mortars of latest improved design, having screen frame seats machined, and foundation bolt holes drilled to templet and bottoms planed. Arranged for inside amalgamation, and fitted with removable linings. 2 Sets of hard iron liners for sides and ends of mortar. 2 Wood Screen Frames with Keys and fitted to mortars, with extra screens. 1 Set of three sizes of wooden chuck blocks and holding keys for equalizing depth of the discharge. 10 Stamp shoes and dies of forged or Chrome steel. 10 Cast iron stamp heads, bored for stems on one end and recessed for shoe necks. 10 Stamp stems of steel, tapered both ends. 10 Cast or Chrome steel 3-key tappets, with gibs and keys. 2 Feed tappets in halves. 10 Chrome steel cams with Canda Fastenings, fitted to cam-shaft. 1 hammered iron cam-shaft, with open type boxes and steel collars. 10 Stamp fingers, with jack shafts, boxes, and sockets, complete. 1 Cam-shaft pulley of wood, with iron center, turned and painted, keyed to cam-shaft. 1 Set (2) of standard solid hard wood guides, bored for stems, and provided with guide bolts, nuts and lock washers. 2 Mortar pads of $\frac{1}{4}$ in. rubber packing. 1 set of water spray pipes for 10 stamps, with valves and fittings, and rubber hose for washing plates. 1 Set of bolts, rods, nuts and washers, with lock washers for framework for 10 stamps, including foundation bolts and washers for mortars.

Inside plate coppers $\frac{3}{16}$ in. thick for lining mortars and mortar lips. 2 Sheets Copper 54 in. x 96 in. x $\frac{1}{8}$ in. thick for tables in front of mortar, all silver plated with one ounce silver per square foot of surface.

1 Belt Tightener, complete. All Shafting, Pulleys, Bearings and Belting, necessary for driving all of the above described machinery in accordance with our plans. Water pipe as specified. 1 Overhead Crawl, with track iron, and chain block.

1 Stationary Slide-Valve Steam Engine, of proper size, as may be specified.

1 Horizontal Tubular Steam Boiler, of proper size, complete, with all fixtures and trimmings, breeching and smoke stack, as may be specified, including boiler-feed pump, injector and heater.

All pipes, valves and fittings for steam, exhaust and water to make power plant complete, as per plans furnished.

Setting plans and Battery frame drawings are supplied to enable millwrights to erect the mill.

PORTABLE STAMP MILLS

250-LB. STAMP MILL

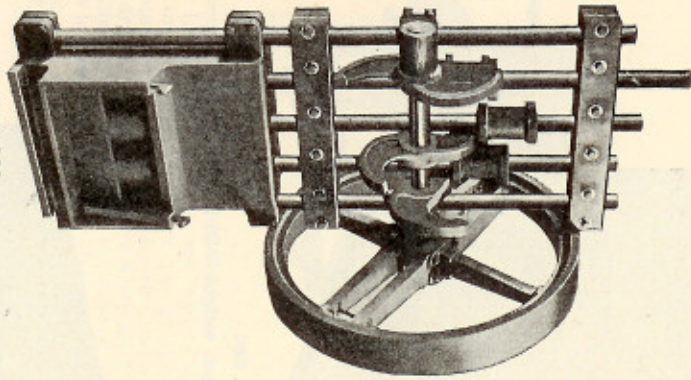


Fig. 288

500-LB. STAMP MILL

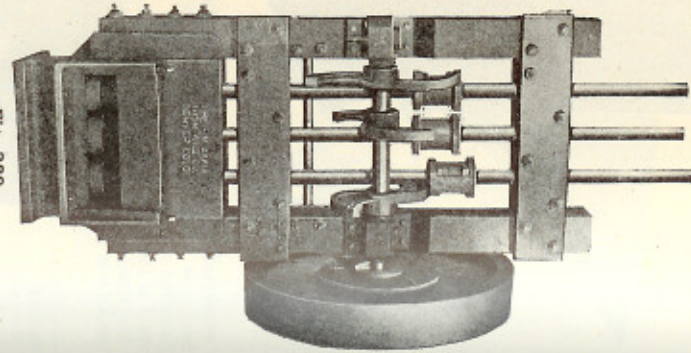


Fig. 289

Portable 3-Stamp Mills designed for prospecting and development work; self-contained and easily erected; when necessary can be sectionalized for mule-back transportation, no piece weighing more than 350 pounds.

The complete 3-stamp battery includes the following: 1 High Mortar, about 1000 pounds, arranged for inside amalgamation, with planed screen frame seats and drilled for foundation bolts; screen frame, steel screens and keys; the framework, bolts, ironwork and battery guides per illustration above; steel shoes and dies; cast iron stamp heads, tappets, and cams, mild steel stems and stamp fingers; cam-shaft, pulley, boxes and collars; silver plated copper plates; shafting, pulleys and beltng, all complete with the exception of motive power and according to our drawing and specification covering the same, which will be supplied on application.

Weight of Stamp, Pounds.	Horse Power Required.	Size Copper Plate, Feet.	Weight of Mortar, Pounds.	Total Weight of Mill, Pounds.	Price, Mill, Complete.	Price, Sectionalized to 350 Pounds.
250	3	2x6	900	2500	\$350.00	\$400.00
500	5	3x7	1700	5400	675.00	750.00

A combined vertical 3 H. P. Engine and Boiler is required for the 250 pound mill, and 5 H. P. Engine and Boiler for the 500 pound mill. These are not included in above figures. We make a specialty of supplying these outfits.

STAMP MILL PARTS

DIMENSIONS AND WEIGHTS

Weight of stamp, pounds	850	900	950	1000	1050	1150	1250
Diameter of die, inches	8 $\frac{3}{4}$	8 $\frac{3}{4}$	9 $\frac{1}{4}$	9 $\frac{1}{4}$	9 $\frac{1}{4}$	9 $\frac{1}{4}$	9 $\frac{1}{4}$
Weight of forged steel die, 6 inches high, pounds	106	106	112	112	112	112	112
“ “ “ “ “ 7 “ “ “	121	121	140	140	140	140	140
Dimensions of Shoe; diam. by height of Body, inches	8 $\frac{1}{2}$ x8	8 $\frac{1}{2}$ x8	9x8	9x8	9x8	9x9	9x9
Weight of forged steel shoe, pounds	150	150	170	170	170	185	185
Dimensions of head; diam. by height, inches	8 $\frac{1}{2}$ x18	8 $\frac{1}{2}$ x19 $\frac{1}{4}$	9x17 $\frac{3}{4}$	9x17 $\frac{3}{4}$	9x19	9x20	9 $\frac{1}{4}$ x22
Weight of cast steel head, pounds	232	247	252	252	270	286	350
Dimensions of stem; diam. by length, inches	3x168	3 $\frac{1}{8}$ x168	3 $\frac{3}{4}$ x168	3 $\frac{3}{8}$ x168	3 $\frac{1}{2}$ x168	3 $\frac{5}{8}$ x168	3 $\frac{3}{4}$ x168
Weight of mild steel stem, pounds	337	365	395	426	455	493	530
Dimensions of 3 keyed tappet; diam. by height, inches	9x12	9x12	9x12	9 $\frac{1}{8}$ x14	9 $\frac{1}{8}$ x14	9 $\frac{1}{4}$ x16	9 $\frac{1}{4}$ x16
Weight of 3 keyed tappet, cast steel, pounds	136	136	136	155	155	180	180
Dimensions of cam; diam. by width of face, inches	*x2 $\frac{1}{2}$	*x2 $\frac{1}{2}$	*x2 $\frac{1}{2}$	*x2 $\frac{1}{2}$	*x2 $\frac{1}{2}$	*x2 $\frac{1}{2}$	*x2 $\frac{1}{2}$
“ “ “ “ hub by length of hub, ins.	11x5 $\frac{1}{4}$	11x5 $\frac{1}{4}$	11x5 $\frac{1}{4}$	12x5 $\frac{1}{4}$	12x5 $\frac{1}{4}$	13x5 $\frac{1}{2}$	13x5 $\frac{1}{2}$
Diam. of 10 stamp cam shaft, 14 ft., 6 in. long, ins.	5 $\frac{3}{8}$	5 $\frac{3}{8}$	5 $\frac{1}{2}$	5 $\frac{3}{4}$	6	6 $\frac{1}{2}$	6 $\frac{3}{8}$
Wt. “ 10 “ “ “ 14 “ 6 “ “ lbs.	1120	1120	1170	1280	1395	1635	1800
Dimensions of cam shaft pulley, diam. by face, ins.	72x12	72x14	78x14	78x16	84x16	84x18	84x18

*Diameter of Cam, see page 164.

ORE CARS

LEADVILLE

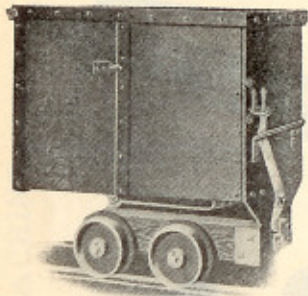


Fig. 400

STANDARD

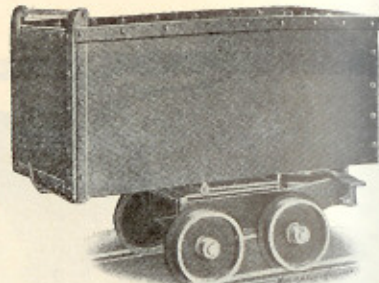


Fig. 401

STANDARD ORE CARS, ROTARY DUMP

No.	Capacity, Cubic Feet.	Size of Box, Inches.			Thickness of Steel.		Size of Wheels, Inches.	Size of Axle, Inches.	Weight, Pounds.	Price, Each.
		Length.	Width.	Depth.	Sides.	Bottom.				
0	10	40	22	19	No. 16	No. 16	8	1 1/4	250	\$25.00
1	13	44	24	20	" 14	" 14	10	1 1/4	375	30.00
2	13	44	24	20	" 12	" 12	10	1 1/2	440	35.00
3	14	48	24	20	" 10	" 10	10	1 1/2	512	40.00
4	14	48	24	20	3/16	3/16	10	1 1/2	600	45.00
5	16	48	24	24	1/4	1/4	10	1 1/2	650	60.00
6	20	48	30	24	1/4	1/4	10	1 1/2	700	75.00
7	23	54	30	24	1/4	1/4	12	1 3/4	800	80.00

LEADVILLE ORE CARS, ROTARY DUMP

1	14	42	24	24	No. 10	3/16	10	1 1/2	650	\$60.00
2	14	42	24	24	3/16	1/4	10	1 1/2	750	70.00
3	16	48	24	24	No. 10	3/16	10	1 1/2	800	75.00
4	16	48	24	24	3/16	1/4	10	1 1/2	850	80.00
5	20	48	30	24	3/16	1/4	10	1 3/4	900	85.00
6	22	54	30	24	3/16	1/4	12	1 3/4	950	90.00
7	28	54	30	30	1/4	1/4	12	2	1200	100.00
8	32	60	30	30	1/4	1/4	12	2	1400	125.00

*SPECIAL CAGE CARS, ROTARY DUMP

37A	15	40	26	26	No. 10	3/16	10	--	600	\$60.00
37B	15	40	26	26	" 10	1/8	10	--	625	62.50
37C	15	40	26	26	3/16	1/4	10	--	650	65.00
37D	17	44	26	26	No. 10	3/16	10	--	675	75.00
37E	17	44	26	26	" 10	1/8	10	--	700	77.50
37F	17	44	26	26	3/16	1/4	10	--	725	80.00
37G	17	44	26	26	1/4	1/4	10	--	750	82.50

DIMENSIONS OVER ALL

Number.	Height Above Rail, Inches.	Width, Inches.		Length, Inches.
		Standard	Leadville	
37A to 37C	41	30	30	45
37D to 37G	41	30	30	49

All the above cars are for 18 inch track gauge, unless otherwise ordered. Dust proof caps for oil or grease cups net extra, per car, \$3.00. *If with 12 inch self-oiling wheels, add net extra, per car, \$5.00.

TRUAX PATENT IMPROVED ORE CARS

AUTOMATIC

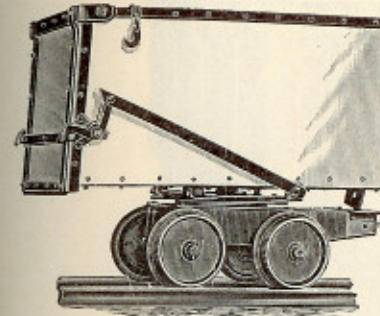


Fig. 402

SCOOP

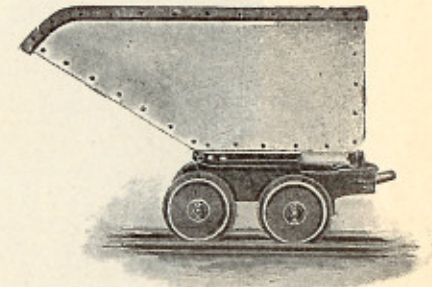


Fig. 403

AUTOMATIC ROTARY DUMP CARS

No.	Capacity, Cubic Feet.	Size of Box, Inches.			Dimensions Over All, Inches.			Thickness of Steel.		Shipping Weight, Pounds.	Price, Each.
		Length.	Width.	Depth.	Length.	Width.	Height Above Rail.	Sides.	Bottom.		
14A	13	44	24	21	53	30	35	No. 12	No. 8	470	\$40.00
14B	13	44	24	21	53	30	35	" 12	3/16	490	41.50
14C	13	44	24	21	53	30	35	" 10	1/4	535	44.00
14D	13	44	24	21	53	30	35	3/16	1/4	580	46.00
17A	16	48	24	24	57	30	38	No. 12	3/16	540	45.00
17B	16	48	24	24	57	30	38	" 10	1/8	570	53.00
17C	16	48	24	24	57	30	38	3/16	1/4	660	55.00
19A	22 1/2	54	30	24	63	36	42	No. 10	3/16	780	60.00
19B	22 1/2	54	30	24	63	36	42	" 10	1/8	820	63.00
19C	22 1/2	54	30	24	63	36	42	3/16	1/4	875	65.00
19D	22 1/2	54	30	24	63	36	42	1/8	1/4	950	71.00
21A	28	54	30	30	63	36	48	No. 10	1/4	900	65.00
21B	28	54	30	30	63	36	48	3/16	1/4	950	71.00

Track Gauge 18 inches, unless otherwise ordered.

NOTE.—Sizes up to and including 16 cubic feet are equipped with 10-inch chilled wheels, capable of sustaining any load. Larger sizes have 12-inch heavy self-oiling wheels. At a cost of only \$3.00 extra per car the wheels may be equipped with caps threaded on hubs, for the use of oil or grease.

To meet cage requirements any of these cars may be shortened four inches in length over all without lessening the capacity.

In ordering cage cars state permissible width and length over all and method of locking car on cage.

SCOOP CARS, ROTARY DUMP

No.	Capacity, Cu. Ft.	Inside Dimensions, Inches.			Thickness of Steel.		Shipping Weight, Pounds.	Price, Each.
		Length.	Width.	Depth.	Sides.	Bottom.		
23	12	48	24	21	No. 12	No. 10	400	\$35.00

Add 2 inches for width and 7 inches for length over all. Other sizes made to order.

COAL OR PIT CARS AND HITCHINGS
COAL OR PIT CARS
STEEL

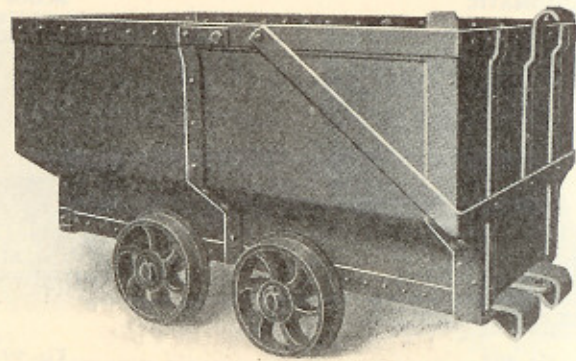


Fig. 404
WOOD

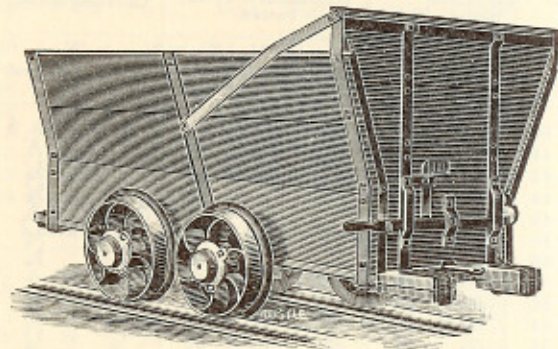


Fig. 405

We make a number of styles of coal or pit cars, with either steel or wood bodies. When specifications are furnished, we will make drawings and give estimates of costs complete, or costs of irons only for wood cars. Give size of body, gauge of track and size of wheels. Prices on application.

MINE CAR HITCHINGS

NO. 1

NO. 2

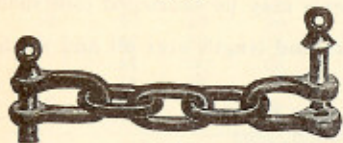


Fig. 406

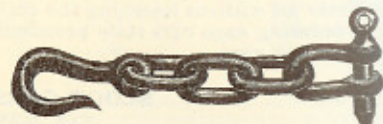


Fig. 407

MADE OF NORWAY IRON

Size Iron in Links, Inches.	Size Iron in Clevis, Inches.	Size Pin, Inches.	Price, Style 1.	Price, Style 2.
3/4	7/8	1	\$2.50	\$2.25
1 1/8	1 1/8	1 1/4	2.75	2.50
1	1 1/4	1 3/8	3.25	3.00

Other sizes made to order.

HAND AND VELOCIPEDE CARS

HAND VELOCIPEDE CAR

ANGLE IRON FRAME

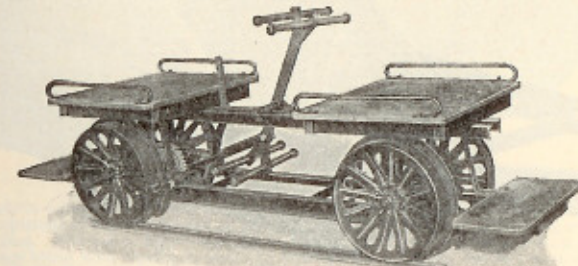


Fig. 408

Carries 8 or 10 men, and serviceable for handling tools, timbers and supplies. Hand and Velocipede Cars of any style built to order. Prices on application.

NO. 10, MOTOR

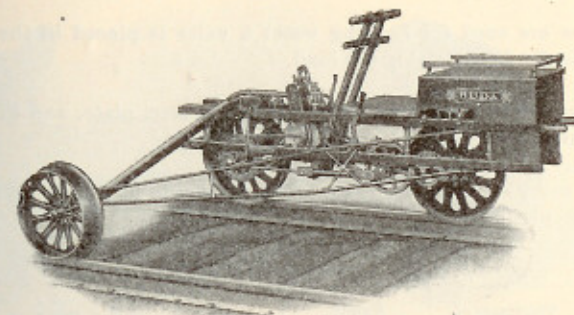
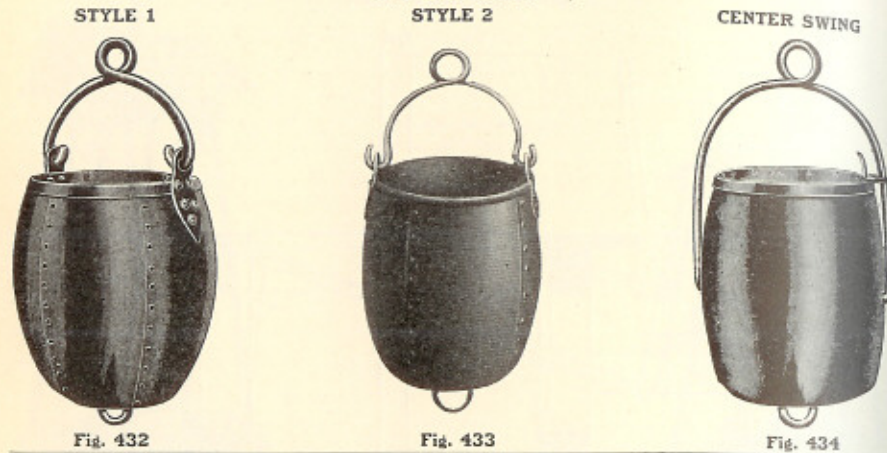


Fig. 409

Engine is 2 1/4 horse power air cooled. Gasoline tank holds supply for 200-mile run. Frame is made of selected ash, axles are steel, wheels are of pressed steel, 17 inches in diameter. For one person.

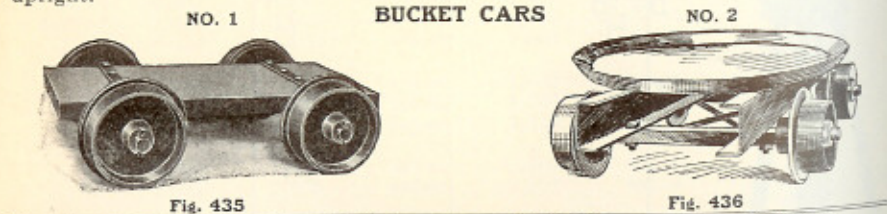
Prices on application.

ORE BUCKETS AND BUCKET CARS



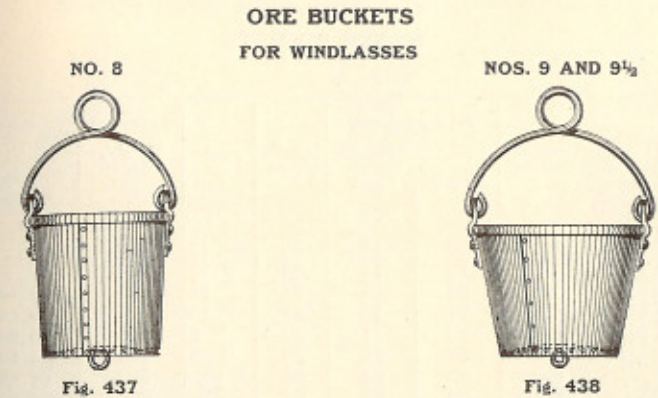
No.	Height, Inches.	Diameter, Inches.			No. Steel.	Capacity.		Weight, Pounds.	Price, Styles 1 and 2.			Price, Center Swing.	
		Top.	Center.	Bottom.		Cubic Feet.	Average Pounds Ore.		With Band.	Without Band.	Extra for Strips on Side.	With Band.	Without Band.
0	14	16	18	13	20	2	---	33	\$6.00	---	---	---	---
1	30	21	24	17	9	6½	750	140	---	\$23.00	\$4.00	---	\$28.00
2	30	21	24	17	11	6½	750	125	19.00	---	4.00	\$24.00	---
3	32	24	27	21	8	9	1,100	195	30.00	28.00	6.00	34.00	32.00
4	37	28	34	23	¾	15	1,700	400	62.00	58.00	8.00	69.00	65.00
5	37	24	28	22	¾	11	1,300	350	48.00	45.00	7.00	58.00	55.00
6	24	20	22	16	14	4½	550	67	12.00	---	3.00	15.00	---
6½	28	20	24	16	14	6	725	75	15.00	---	3.50	18.00	---
7	19	17	19	14	16	2½	300	35	10.00	---	2.00	12.00	---
10	40	27	32	23	¾	15½	1,800	400	64.00	60.00	8.00	69.00	65.00
11	48	26	31	22	¾	17½	2,100	425	67.00	65.00	10.00	---	---
12	40	26	31	22	¾	14½	1,650	375	60.00	58.00	7.00	---	---
13	42	26	31	22	¾	15	1,700	385	63.00	61.00	8.00	---	---
14	28	22	28	19	7/8	7½	900	150	27.00	25.00	4.00	---	---

Unless otherwise ordered, bails are made in style 1 for Nos. 1, 2 and 3 buckets, and in style 2 for No. 4 buckets and larger. The bottoms are dished so that the ring to which the dumping chain is attached does not prevent the bucket from standing upright.



Diameter of Wheels, Inches.	Gauge of Track, Inches.	Price Each, No. 1, Wood Top.	Price Each, No. 2, Iron Top.
6	18	\$8.00	\$10.00
8	18	10.00	12.00
10	18	12.00	14.00

ORE BUCKETS AND SKIPS



Number.	Height, Inches.	Diameter Top, Inches.	Diameter Bottom, Inches.	Number of Steel.	Capacity, Cubic Feet.	Average Ore, Pounds.	Weight, Pounds.	Price Each, with Band.
8	16	16	14	16	1¾	200	33	\$5.00
9	15	19	14	16	2	250	35	8.00
9½	23	22	17	14	3	375	55	10.00

SELF-DUMPING SKIPS FOR USE IN VERTICAL SHAFTS

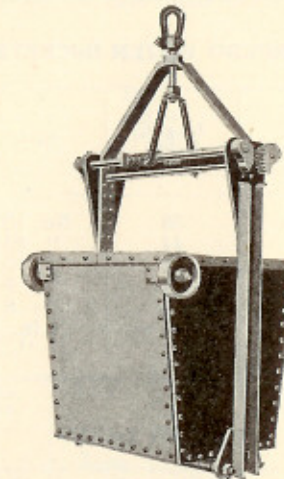


Fig. 439

This Skip permits of a very high rate of hoisting speed; it is provided with guide shoes and safety catches such as are commonly used on cages. The automatic dumping device works accurately and promptly. Where it is desired to raise large quantities of ore and dump automatically this means will prove satisfactory.

Width, Inches.	Height, Inches.	Length Top, Inches.	Length Bottom, Inches.	Capacity, Cubic Feet.	Weight, Pounds.	Price, Each.
30	36	37	27	20	1000	\$150.00
36	42	42	32	31	1400	210.00

TURNTABLES

CAST IRON—BALL BEARING

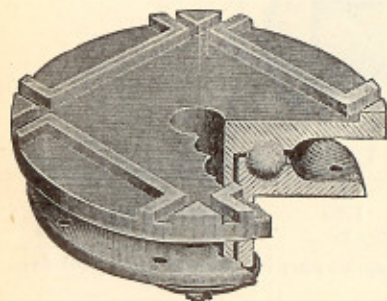


Fig. 460

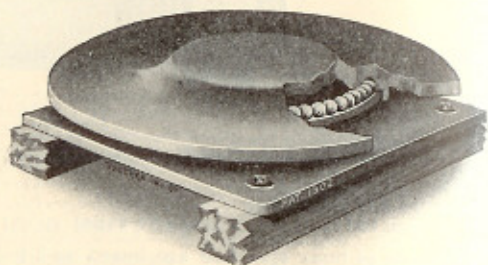


Fig. 461

Track Gauge, Inches.	Fig. 460		Fig. 461		
	Price, Each.		Price, Each.		
	Without Track.	With Track.	Dome Top.	Flat Top.	With Track.
18	\$20.00	\$25.00	\$35.00	\$20.00	\$25.00
24	20.00	30.00	40.00	25.00	30.00
30	---	40.00	---	35.00	40.00

STEEL TURNING PLATES

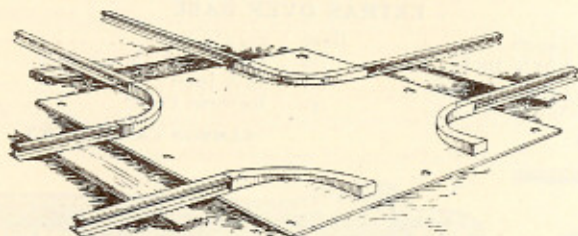


Fig. 462

For turning cars, when revolving turntables are not used. Made of 1/4 inch steel with forged steel points.

Gauge of Track, inches.....	18	24	30
Size of plate, feet.....	3x3	3 1/2 x 3 1/2	4x4
With two sets of rail points.....	\$10.00	14.00	17.00
" three " " " ".....	11.00	15.00	18.00
" four " " " ".....	12.00	16.00	19.00
Weight, pounds.....	125	140	180

ASSAY BALANCES

HEUSSER BALANCE—TYPE 1000

SENSIBILITY 1-500 MG.

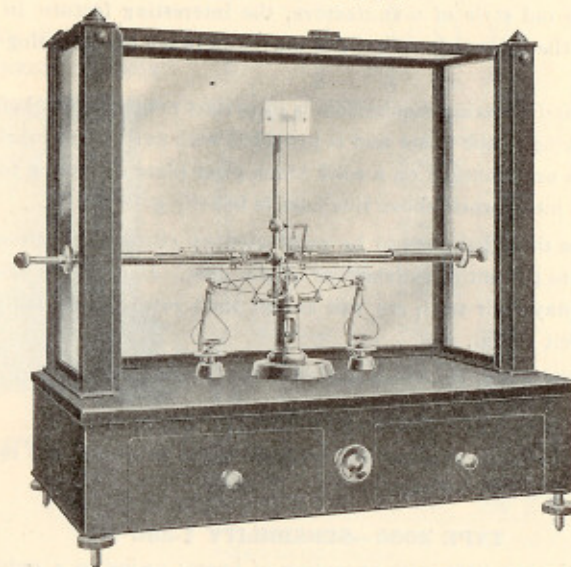


Fig. 475

AWARDED A BLUE RIBBON, FIRST GRAND PRIZE
AT THE ALASKA-YUKON-PACIFIC EXPOSITION

Type No.	Sensibility, Milligrams.	Beam Length, Inches.	One Pointer Division Equals, Milligrams.	Ratio Rider Divisions to Pointer Divisions.	Shipping Weight, Pounds.	Price, Each.
1000	.002	5	.02	2 to 1	50	\$300.00
2000	.004	5	.04	4 " 1	50	
2000B	.01	5	.10	10 " 1	50	250.00
	.004		.04	4 " 1		
3000	.002	5	.02	2 " 1	50	150.00
	.01		.10	10 " 1		

The Heusser Balances are built for rapid work where extreme accuracy is essential. The all metal case with its easy acting door, unaffected by climatic conditions, renders them permanently stable in adjustment as well as being a factor in distributing electrical influences; these features alone are worthy of consideration when a high-class balance is to be purchased.

ASSAY BALANCES

The beams are designed with great care and of the highest type workmanship, being 5 inches between outer knife edges; all bearings are of CARNELIAN AGATE and edges relieved when the balance is at rest. The position of the rider is indicated on scales mounted behind the beam on the so-called rider bar. This is a decided departure from the old style of manufacture, the interesting feature in this arrangement being that the rider indexes are not moved between the deposing and rehooking of the rider.

The raising and lowering mechanism is of perfect construction, being so adjusted as to allow no swing to the beam and is provided with permanent lubrication.

The balances are mounted on a solid block glass plate extending to the outline of the case, and all metal work above this base is heavily gold plated.

We Guarantee these balances to be unaffected by climatic conditions and to perform their work to the entire satisfaction of the user. If they fail to give this satisfaction after 15 days fair trial, we will accept their return and gladly refund your money. We solicit a trial.

Send for Bulletin No. 16, which describes the line in detail.

TYPE 1000—SENSIBILITY 1-500 MG.

In this type the beam is a perfect truss designed to obtain the required rigidity with the least weight and inertia.

TYPE 2000—SENSIBILITY 1-250 MG.

Identical with type 1000, with exception of beam; owing to a reduced sensibility it is practical that the beam should be heavier.

TYPE 2000 B—UNIVERSAL BALANCE—3 SENSIBILITIES 1-100, 1-250, 1-500

This type is distinct in itself, having three sensibilities, making it adaptable for all kinds of assay office use. It is designed in duplicate of type 2000, the beam being more carefully adjusted to accept the 1-500 mg. sensibility; the changes are instantaneous, being effected by means of gold cones of different weight being inserted at the base of the upright needle or indicator, doing away with the changing the position of the gravity bulb on the beam, which is necessary in other makes of balances to effect the same results. Write us for detailed description of this instrument.

TYPE 3000—SENSIBILITY 1-100 MG.

A good moderate priced balance, using the same style beam as type 2000 and 2000B. Owing to the skeleton base in this instrument, all working parts are above the glass plate, being enclosed in the main case and thereby protected from the dust.

Our Special Bulletin No. 16 will give full description on Assay Balances. Send for it.

ASSAYERS' AND CHEMISTS' SUPPLIES

Limited space only is devoted to assayers' and chemists' supplies, because we have just completed a large and complete catalogue which will be gladly furnished on request to any one interested.

ASSAY AND CHEMICAL BALANCES

Besides the M. & S. S. Co. Button Balances we can supply any standard make of balances.

AINSWORTH PRECISION BALANCES

**AINSWORTH TYPE C
WITH MULTIPLE RIDER CARRIER**

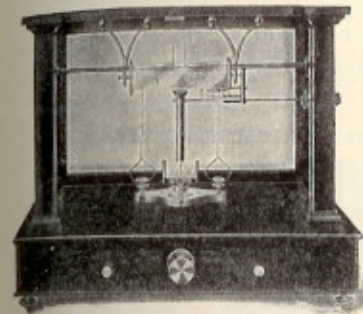


Fig. 476

Type.	Kind.	Beam Length, Inches.	Sensibility, Milligrammes.	Capacity, Grams.	Edges.	Shipping Weight, Lbs.	Price, Each.	*Multiple Rider Carrier.
C	Button	5	0.002	---	Agate	55	\$300.00	\$35.00
D	"	4	0.0025	---	"	55	300.00	35.00
A	"	5	0.005	---	"	50	250.00	35.00
F	"	4	0.005	---	"	50	250.00	35.00
FB	"	4	0.01	---	"	50	160.00	35.00
H	"	6	0.01	---	"	50	135.00	35.00
J	"	6	0.01	---	"	50	125.00	35.00
V	" Inverted	5	0.002	---	"	55	300.00	---
VB	" "	5	0.005	---	"	55	250.00	---
VC	" "	5	0.01	---	"	55	175.00	---
Q	Analytical	7	0.05	200	"	60	125.00	45.00
T	"	6	0.05	200	"	60	125.00	45.00
L	"	6	0.1	200	Steel	50	65.00	---
LA	"	6	0.1	200	Agate	50	75.00	---
†PA	"	10	0.1	200	Steel	50	45.00	---
PC	"	6	0.1	200	"	50	50.00	---
†M	Pulp	6	0.5	200	"	35	30.00	---
†MA	"	6	0.5	200	Agate	35	40.00	---
†N	"	6	1.0	200	Steel	5	15.00	---

*Net additional for Ainsworth Improved Multiple Rider Carrier.
†Have no rider carrier.

THOMPSON BALANCES

Type.	Kind.	Beam Length, Inches.	Sensibility, Milligrammes.	Capacity, Grams.	Edges.	Shipping Weight, Lbs.	Price Each, Without Multiple Rider Carrier.	Price Each, With Multiple Rider Carrier.
5	Button Inverted	5	0.002	---	Agate	50	\$325.00	\$350.00
6	" Regular	4	0.0025	---	"	50	300.00	325.00
8	" "	5	0.0025	---	"	50	265.00	290.00
7	" "	4	0.005	---	"	50	250.00	275.00
9	" "	4	0.005	---	"	50	235.00	260.00
10	" "	4	0.005	---	"	50	200.00	225.00
19	" "	5	0.01	---	"	50	165.00	190.00
20	" "	6	0.01	---	"	50	135.00	160.00
21	" "	6	0.01	---	"	50	125.00	150.00
22	" "	6	0.01	---	"	50	100.00	125.00
28	Analytical	6	0.05	200	"	50	120.00	145.00
29	"	6	0.05	200	"	50	110.00	135.00
27	Button and Pulp No. 37 (Portable)	5	0.01	---	"	15	100.00	---
31	Chemical	6	0.05	200	Steel	50	65.00	---
*33	Pulp	6	0.1	200	"	35	55.00	---
*35	"	-	0.25	200	"	35	35.00	---
*36	"	-	0.25	200	"	35	32.50	---
*37	"	-	1.0	200	"	5	13.00	---

*Have no rider carrier.

**THOMPSON TYPE 6
WITH MULTIPLE RIDER CARRIER**

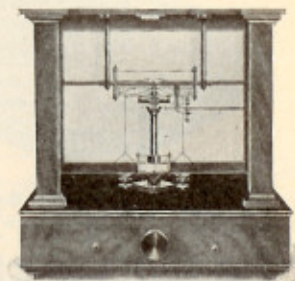


Fig. 477

TONGS AND CANDLESTICKS

TONGS

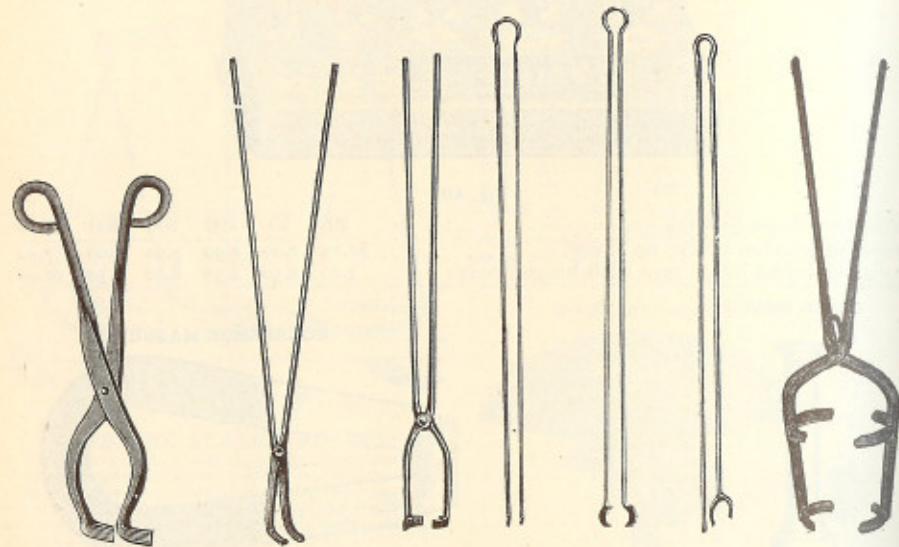


Fig. 490 Fig. 491 Fig. 492 Fig. 493 Fig. 494 Fig. 495 Fig. 496

Fig. 490	Crucible Tong, double bent, Japanned rod iron, 9 inches long, each	.40
" 491	" " single " steel, 30 and 36 inches long, each	1.50
" 492	" " double " " for lifting crucibles vertically, 36 inches long, each	3.50
" 493	Cupel Tong, light steel, 30 and 36 inches long, each	1.00
" 494	" " with flat rounded ends, 30 and 36 in. long, ea.	1.00
" 495	Scorifier and Crucible Tong, light steel, 30 and 36 inches long, each	1.00

Fig. 496—CRUCIBLE TONGS

For lifting Graphite Crucibles or other Heavy Crucibles with a Crane.

For Crucibles, Nos.	10 to 20	25 to 50	60 to 100	125 to 150
Price, each	\$10.00	12.00	15.00	18.00

MINERS' CANDLESTICKS

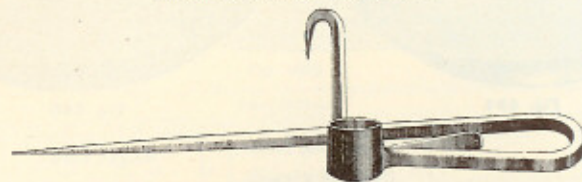


Fig. 497

Hand Forged of 1/4 inch tool steel.

Length, inches	8, 10, 12
Weight, per dozen, pounds	3 3/4
Price, per dozen	\$6.00

BUCKING BOARDS, MORTARS, ETC.

BUCKING BOARD AND MULLER

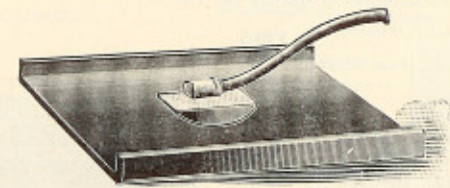


Fig. 500

Size, inches	12x18	18x20	20x24	24x30	24x36	30x36
Price, each	\$8.00	12.00	15.00	18.00	19.00	25.00
Weight of Muller, pounds	15	15	20	25	25	35

EXTRA MULLERS, WITH HICKORY HANDLES

Price, per pound	.12
------------------	-----

GOLD MORTARS

NO. 1
HIGH STYLE

NO. 2
LOW STYLE

**IRON RETORT
FOR MERCURY DISTILLATION**

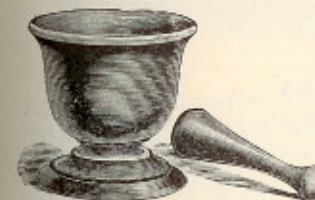


Fig. 501



Fig. 502

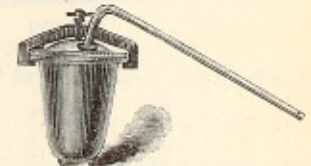


Fig. 503

GOLD MORTARS

Heavy Cast Iron Ground Smooth Inside.

Capacity	1 Pt.	1 Qt.	2 Qt.	1 Gal.	2 Gal.	3 Gal.
Price, each	.50	.75	1.00	2.00	3.75	5.00

IRON RETORTS

Capacity	1/2 Pt.	1 Pt.	1 Qt.	2 Qt.	1 Gal.	2 Gal.
Price, each	\$2.25	2.50	2.75	3.50	5.00	6.00

Our Retorts are made from new and improved patterns, are finely polished on the inside, have the cover turned and ground tight.

IRON RETORTS

Nevada or Oval Top. Furnished with iron delivery pipe. The advantage of this Retort over the old flat top pattern is that it can be filled full of amalgam, thereby holding more than the old style, besides avoiding all danger of explosion, owing to the crown space in the cover, which allows for the expansion. They are made extra heavy, well ground in the joints, and are furnished with a strong Norway iron clamp, having a wrought iron key, which can be driven in or out of place by a single stroke of a hammer.



Fig. 504

Capacity, pints	3	4	5	6	10
Holds quicksilver, pounds	38	50	63	75	125
Weight, pounds	18	25	31	44	66
Price, each	\$7.00	8.00	9.00	10.50	12.00

BULLION MOULDS, DRYING PANS, ETC.
INGOT OR BULLION MOULDS

Capacity of moulds is figured filled to about $\frac{3}{16}$ in. of top.

Size, Inches.	Capacity, Ounces.		Price, Each.
	Pure Gold.	Pure Silver.	
3 1/2 x 1 x 1	20	10	.75
3 1/2 x 1 1/2 x 1 1/2	50	25	1.00
4 x 2 x 2	100	50	1.25
5 1/2 x 2 1/2 x 2 1/2	250	140	2.00
6 1/2 x 3 1/4 x 3 1/4	500	275	2.50
9 x 3 3/4 x 3 3/4	1000	550	3.50
11 x 4 1/4 x 4 1/4	2000	1100	5.50
11 1/2 x 5 1/4 x 4 1/2	2500	1350	6.50
15 x 7 x 6	5000	3000	8.00

Lettering on above moulds, per letter..... .06

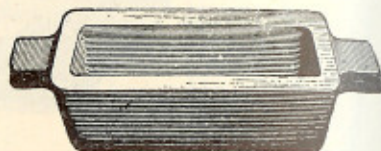


Fig. 505

DRYING PANS

Fig. 506

For drying and roasting gold slimes.

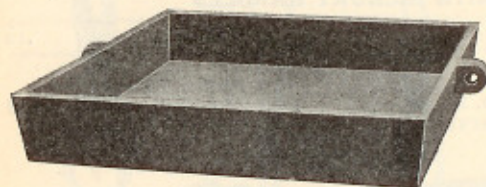


Fig. 506

CONICAL POURING MOULDS

Size for No.	7—Black Lead Crucible, weight,	16 lbs., each		
" " " 10—	" " " "	27 " "	-----	\$2.25
" " " 16—	" " " "	35 " "	-----	4.00
" " " 25—	" " " "	50 " "	-----	5.00
" " " 35—	" " " "	60 " "	-----	6.50
" " " 50—	" " " "	80 " "	-----	7.50
" " " 80—	" " " "	85 " "	-----	8.75
" " " 100—	" " " "	105 " "	-----	10.00
" " " 125—	" " " "	135 " "	-----	12.00
" " " 135—	" " " "	135 " "	-----	12.00

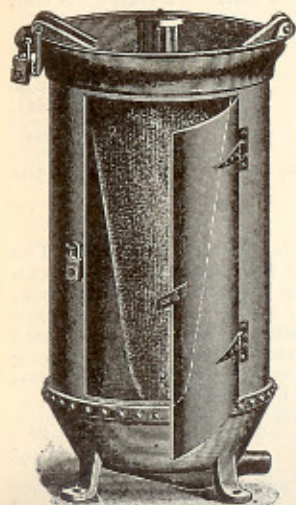


Fig. 507

AMALGAM SAFE

For separating amalgam from excess of quicksilver and for preserving it from theft, the Amalgam Safe is used.

The body is of sheet iron and contains a door provided with a padlock. The top and bottom are of cast iron. A hinged cover is attached to the top and secured by a padlock. The conical canvas bag serves to filter the quicksilver, retaining the amalgam in a thick, pasty condition ready for retorting. The excess of quicksilver is received in the bottom of the safe and drawn off as required.

This safe is a necessity in large stamp mills.

Price (weight, 300 pounds), each \$40.00

For Clean-Up barrel, see page 214.

LABORATORY CRUSHERS, ETC.

LABORATORY CRUSHERS

CLOSED NO. 00 SAMSON OPEN FOR CLEANING

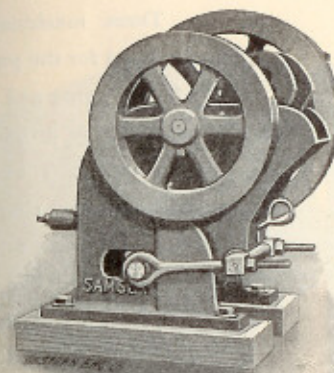


Fig. 508

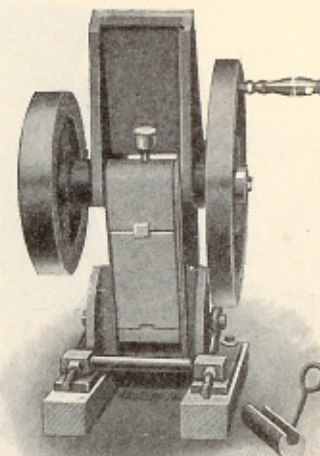


Fig. 509

For laboratory and assay office use, the No. "00" Samson Laboratory Crusher is one of the best machines of its kind on the market.

It is extremely simple, has a large capacity, requires only a limited amount of power, and can be operated either by hand or with a belt.

It can be easily cleaned, as shown in the cut, by pulling down the eye bolt on the front oscillating journal seat. This allows the front journal to drop down, the swinging frame that holds the stationary jaw plate to be turned up as shown, exposing the stationary as well as the movable and side plates for cleaning. No tools are required to open and close this crusher, and the time required is but an instant; it can be opened and cleaned while running at full speed.

Jaw Opening, Inches.	Size Pulley, Inches.	Speed, R. P. M.	Weight, Pounds.	Price, Hand and Power.	Price, with T and L Pulley.	Price, Jaw Plates, Extra per Set.	Price, Check Plate, per Pair.
1 1/2 x 4	12 x 2 1/2	500	250	\$55.00	\$60.00	\$5.00	\$1.50

SAMPLERS AND SCOOPS

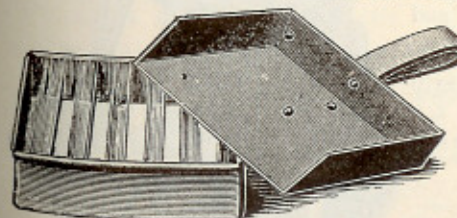


Fig. 510

Size, inches	6x6	9x9	12x12
Width of Tray, inches	1/2	3/4	1
Price complete, each	\$1.50	2.00	3.00
" Sampler only, ea.	1.10	1.50	2.00
" Scoops " "	.50	.60	1.00

TRANSITS

THE IMPROVED BRUNTON PATENT POCKET TRANSIT

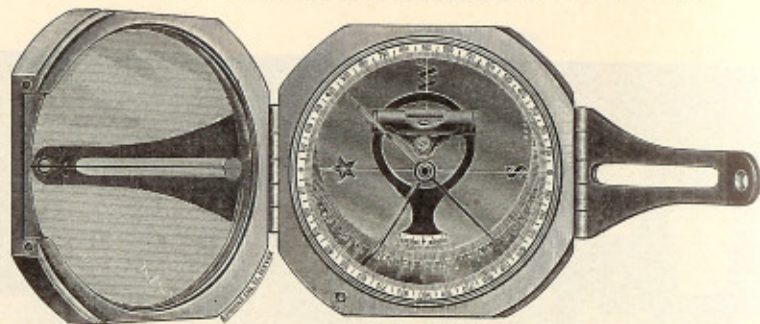


Fig. 540

The most convenient, compact and accurate pocket instrument made for preliminary surveying on the surface or underground. Over 6000 in use by Civil and Mining Engineers, Geologists and Mine Managers. Adopted by the U. S. Geological Survey, Reclamation Service and many State Geological Surveys.

Standard type, as shown	\$25.00
Improved " with sight on cover, slots for attachment to tripod head and compass circle numbered 0 to 360	27.50
Ball and socket tripod head	2.50
Tubular extension tripod	5.00
Leather case with belt loop for instrument only	1.75
" " " sling strap for instrument only	2.00
" " " " " Tripod Head and Tripod	4.00

VERSCHOYLE PATENT TRANSIT

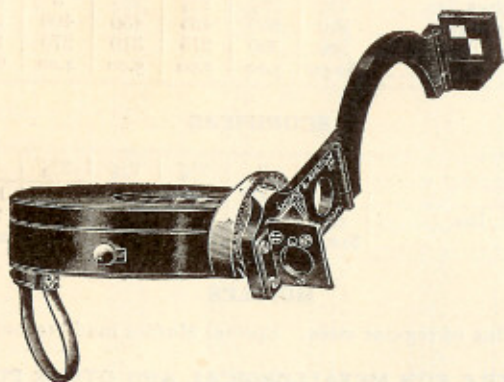


Fig. 541

This instrument combines the useful features of Abney Level Prismatic Compass and Clinometer. The distinguishing feature of the instrument is that, owing to its novel construction, only one observation is necessary to obtain both the magnetic bearing and the vertical angle of any distant point. It is unexcelled for rapid topographical work and working in constrained positions. It is constructed in such manner as to withstand the hard usage an instrument of this kind is liable to receive. Illustration shows the instrument with sight-arm extended ready to make an observation.

Price, net, each \$35.00

ANEROID BAROMETERS AND TRANSITS

ANEROID BAROMETERS

NO. 2709-16000 FEET SURVEYING ANEROID

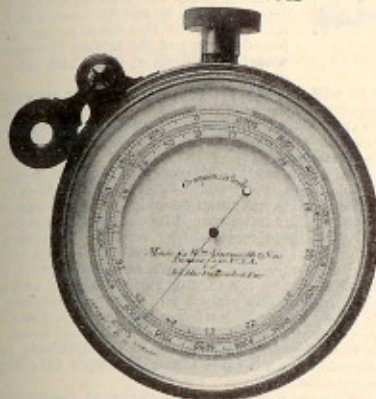


Fig. 542

No.	Size, Inches.	Range, Feet.	Type.	Price, Each.
2305	2½	8000	Pocket	\$20.50
*2505	3	8000	Military	33.75
*2529	4	8000	"	35.75
*2703	3	5000	Surveying	63.00
*2713	5	5000	"	68.00
2709	3	16000	"	69.00

*Have leather sling cases.

All of the foregoing can be furnished with 3000, 12000 or 16000 ft. altitude scales and with thermometers and aluminum cases at advanced prices.

AINSWORTH'S PRECISION TRANSITS

TYPE B. D. MOUNTAIN AND MINING TRANSIT

5 inch Limb, graduated in half degrees on solid silver; 10 inch telescope, with 25 power erecting or inverting achromatic eye-piece and 1¼ inch field; 5 inch, 30 seconds telescope level; axis clamp and tangent gradienter; 3¼ inch compass needle and variation plate; Verniers reading to one minute. Weight transit, net, 9¾ pounds; including carrying case, 16 pounds; tripod, net, 7½ pounds; packed in two boxes for shipment, 60 pounds; packed for export, 70 pounds.

Price complete, with extension tripod \$250.00

TYPE B. E. TRANSIT

Similar to B. D., except that telescope axis is threaded on either side to take a 7½ inch 20 power telescope and counterweight. Net weight transit, 11½ pounds; with carrying case, 18½ pounds.

Price complete, with side telescope, counterweight and tripod \$290.00

TYPE B. F. TRANSIT

Similar to B. D., except telescope axis is so constructed to permit using 7½ inch 20 power auxiliary telescope as either top or side telescope. Net weight transit, 12 pounds; with carrying case, 18¾ pounds.

Price complete, with auxiliary telescope, counterweight and tripod \$310.00

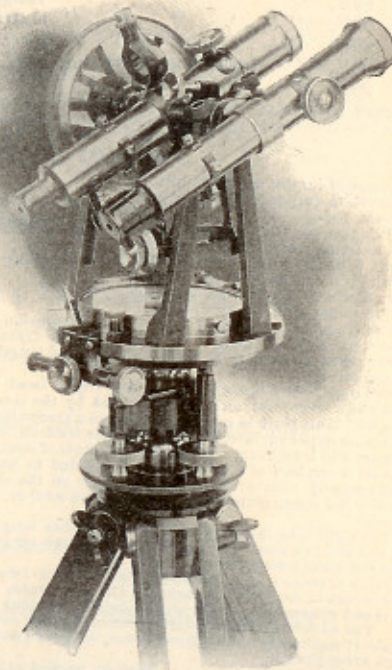


Fig. 543

TRANSITS AND LEVELING INSTRUMENTS

NO. 99 TRANSITS

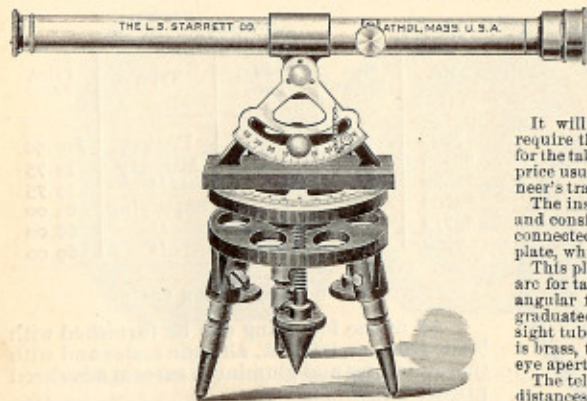


Fig 544

ment is eight inches high. With long extension legs, which fasten on over the short, the height can be from two feet eight inches to four feet eight inches. The sight tube, level case, and graduated arcs are nickel-plated, the other parts are japanned.

It is adapted to almost all kinds of work and warranted perfect and accurate in every respect. When packed and ready for shipment it weighs about 15 pounds.

No. 99A, With plain sight tube and short legs.....	\$15.00
“ 99B, “ “ “ “ “ long “	16.50
“ 99C, “ “ “ “ “ short “ and ground level vial	16.50
“ 99D, “ “ “ “ “ long “ “ “ “ “ “	18.00
“ 99E, “ telescope, short legs and ground level vial	26.50
“ 99F, “ “ long “ “ “ “ “ “	28.00
Target to go on common ten-foot pole, extra	1.50

For architects, carpenters and contractors, to lay out building sites and determine the levels; for masons and millwrights in the construction of foundations and the setting of water wheels; building of dams and raceways, etc.

It will be especially appreciated by all who require the use of a level and some instrument for the taking of angles, but do not care to pay the price usually charged for a surveyor's or engineer's transit.

The instrument is composed of iron and brass, and consists of a tripod, to the head of which is connected by a ball-and-socket joint an upper plate, which can be leveled by the leveling screws.

This plate is recessed to contain a graduated arc for taking angles. On this plate rests a triangular frame, to which are attached a level, a graduated arc for taking vertical angles and a sight tube. The plain sight tube has no lenses, is brass, twelve inches long; in one end is a small eye aperture, in the other the usual cross wires.

The telescope has cross lines, is adjustable to distances, and is same size and length as plain sight tube.

With short legs, as shown in the cut, the instru-

NO. 101 LEVELING INSTRUMENTS

Designed for the use of architects, contractors, carpenters, millwrights, masons, surveyors, etc.

Its lightness, simple construction and extremely moderate price, combined with the wide range of work to which it can be applied, make it very desirable for all who have occasion to use such an instrument.

The tripod is of iron, and has improved extension legs. The upper parts are hollow, to receive within them the lower parts, which may be held at any desired length by clamp screws.

The upper plate is connected to the tripod head by a ball and socket joint, and can be leveled by the leveling screws. This plate is recessed to contain a graduated arc below its upper surface, and has a center stud on which the arc and level turn. The graduated arc is of steel, and has on it one half of a circumference divided to degrees and properly numbered. This arc turns on the center stud of the upper plate, independent of the level or sight tube.

The sight tube is a brass tube twelve inches long, and in one end is a small eye aperture, while the other end has the usual cross wires.

With extension legs, the height can be from two feet six inches to four feet six inches. The sight tube, level case and graduated arcs are nickel-plated, the other parts are japanned.

The advantages of this instrument are as follows: The head is held to the tripod with a bolt and nut, so as to make it stationary at any given point; the graduated arc can be clamped to the base plate by throwing a small cam arrangement.

Weight, packed in box for shipment, 13 1/4 pounds.

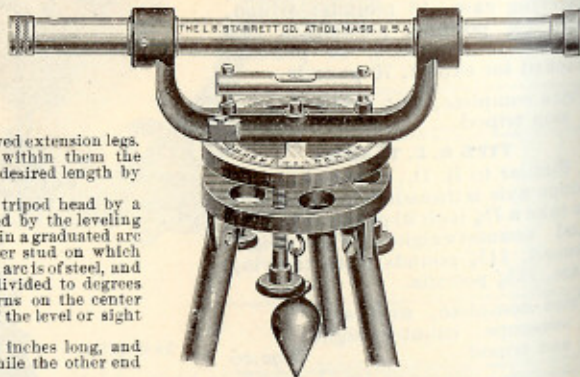


Fig. 545

No. 101A, Japanned, nickered tube.....	\$12.50
“ 101B, “ “ “ with ground vial in level.....	14.00

ASSAYERS' AND CHEMISTS' SUPPLIES

POTASSIUM CYANIDE (Roessler & Hasslachner.)

98-100% in 1 lb. and 10 lb. cans, 100 lb. and 200 lb. cases.

28-30% in 1 lb. and 10 lb. cans.

Prices according to quantity upon application.

ZINC SHAVINGS (Cut fresh to order and very fine.)

In 50 lb. sacks; other containers extra.

Special prices, according to quantity.

QUICKSILVER OR MERCURY

In flasks, net, 75 lbs.; gross, 90 lbs., at market price.

SODA ASH, SODA BICARBONATE, CAUSTIC SODA

POTASH CARBONATE, BORAX AND BORAX GLASS

TEST LEAD AND LITHARGE, c. p. (American Smtg. & Ref. Co.)

FILTER PAPER—Schleicher and Schuell's.

Munktell's.

Baker and Adamson.

Mine and Smelter Standard.

ACIDS & AMMONIA, c. p. and commercial

REAGENT CHEMICALS—J. T. Baker Chemical Co.

Baker & Adamson Chemical Co.

Merck & Co.

Mallinckrodt Chemical Co.

GLASSWARE, Beakers, Flasks, Funnels, etc., PORCELAIN WARE

Complete Stocks of

ASSAYING AND CHEMICAL EQUIPMENT AND SUPPLIES AT

DENVER

SALT LAKE

EL PASO

Write for special catalogue.

ROCK DRILLS

HARDSOEG POST RATCHET ROCK MACHINE
FOR HARD ROCK, HARD FIRE CLAY, IRON ORE AND ALL HARD BORING

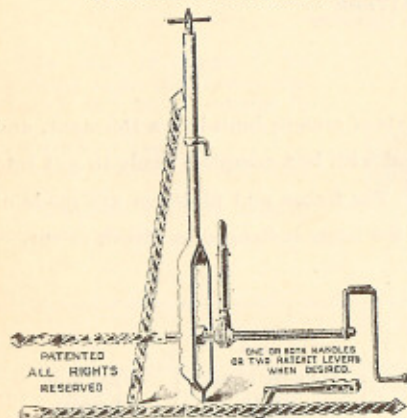


Fig. 3000

The Thread Bars are cut 10, 12 and 14 Threads to the inch, but 10 threads is recommended for all purposes.

Machine to drill 6 ft., having 2, 4 and 6 ft. Augers, price, each	\$26.00
Augers 2 ft. long, " " "	2.00
" 4 " " " " "	4.00
" 6 " " " " "	6.00

HARDSOEG PATENT Q HEAVY GEAR DRILLS

POST DRILL
FOR HARD COAL AND SLATE
SIDE GEAR

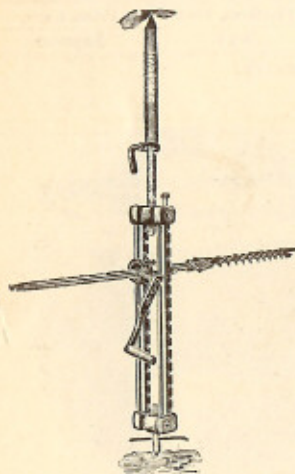


Fig. 3001

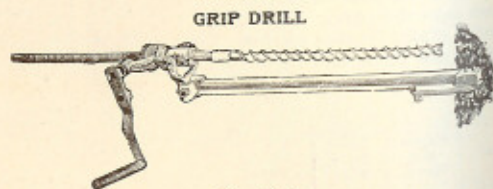


Fig. 3002

Thread Bar is cut 6, 8, 10 and 12 Threads to the inch, but for coal 8 is the thread preferred.

Post Drill, Side Gear, 2, 4 and 6 ft. Augers	\$15.00
" " End " 2, 4 " 6 " "	12.75
" " Side " 2, 4 " 8 " "	13.50
" " End " 2, 4 " 6 " "	11.25

In ordering Post Drills, be sure to state size of post.

No. 1 for seams 5 to 8 1/2 ft. thick.	
" 2 " " 4 " 7 1/2 " "	
" 3 " " 3 " 6 1/2 " "	
" 4 " " 2 " 4 1/2 " "	

BREAST AUGERS, MINERS' TOOLS, ETC.

BREAST AUGERS

NO. 2 SQUARE SOCKET CONNECTION

NO. 4 PATENT AUGER



Fig. 3003

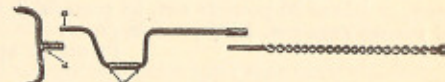


Fig. 3004

Length of Twist, feet	3	4	6
No. 2, per dozen	\$20.00	20.80	25.80
" 4 " "	20.80	22.00	27.00

IRON TAMP CHURN DRILLS

Made of 1 inch Round Iron with Bits 8 1/2 inches long.



Fig. 3005

Price, 5 to 7 foot long, all lengths, per dozen | \$16.00

COMBINED SCRAPER AND TAMPER



Fig. 3006

Has 6 inches of 1 inch Round, making heavy head for firm tamping, balance 1/4 inch, so as to be small at Scraper End.

Price, 5 to 7 foot long, all lengths, per dozen | \$10.00

DOUBLE END SCRAPERS



Fig. 3007

Iron Double End Scrapers, 5 to 7 feet long, all lengths, per dozen | \$5.00

IRON NEEDLES



Fig. 3008

These Needles are drawn ground and polished and are absolutely round and of an exact taper.

Price, 5 to 7 foot long, all lengths, per dozen | \$8.00

BLASTING MATERIAL

POWDER

35%, 40%, 60%, 70% Giant Powder in sticks, 3/8 to 1 1/2 inch in diameter, 8 inches long, in boxes 50 pounds net, 58 pounds gross. Black Powder, F, FF, FFF grades in 25 pound kegs net, 27 1/2 pounds gross.

Prices on application.

POWDER THAWERS

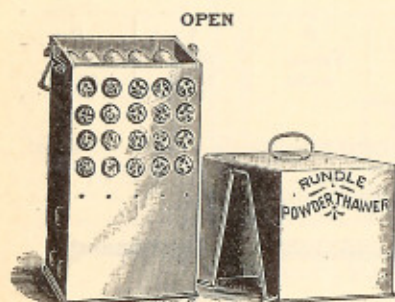


Fig. 3010

This Thawer is endorsed by the Colorado State Commissioner of mines, and is used very generally.

The powder is less confined in this than in other thawers, as both ends of the tubes are open, and there is no danger of a part of a stick adhering to the tube. Water, heated by a candle, 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. Accidents are almost impossible when this device is used for thawing powder.

Capacity of stock size, 20 sticks of 1 1/4-inch powder.

Large sizes made to order.

DIRECTIONS

Take off cover and fill tube basin with water. Place a lighted miner's lamp under tube chamber. Put the powder in the tubes and replace cover. It will need no further attention for eight hours.

Price, weight, 15 pounds, each ----- | \$5.50

ELECTRIC EXPLODERS

WITH COPPER WIRES—NO. 6, ACTUAL SIZE



Fig. 3011

Length of Wire, feet -----	4	6	8	10	12	14	16
No. 4 Single Strength, per hundred -----	\$3.00	3.54	4.08	4.62	5.16	5.70	6.24
" 6 Double " " " -----	3.50	4.04	4.58	5.12	5.66	6.20	6.74
Length of Wire, feet -----	18	20	22	24	26	28	30
No. 4 Single Strength, per hundred -----	\$6.78	7.32	8.32	9.32	10.32	11.32	12.32
" 6 Double " " " -----	7.28	7.82	8.82	9.82	10.82	11.82	12.82

Longer lengths made to order, \$1.00 for each additional 2 feet.

STOCK PACKAGE QUANTITIES

Length of Wires, Feet.	Number of Fuses in Carton.	Number of Cartons in Case.	Number of Fuses in Case.
4 to 16	50	10	500
18 " 30	25	10	250

BLASTING MATERIAL

STAR DELAY ACTION FUSES



Fig. 3012

For firing any desired number of shots in succession with one operation of the battery.

Two inches difference in the length of the gutta percha tape fuse makes a delay of about 2 1/2 seconds in exploding.

WITH COPPER WIRES

Length of Tape, inches -----	2	4	6	8	10	12
Price, 4 foot long wires, per hundred -----	\$3.00	3.10	3.20	3.30	3.40	3.50
" 6 " " " " " -----	3.55	3.65	3.75	3.85	3.95	4.05
" 8 " " " " " -----	4.10	4.20	4.30	4.40	4.50	4.60
" 10 " " " " " -----	4.65	4.75	4.85	4.95	5.05	5.15
" 12 " " " " " -----	5.20	5.30	5.40	5.50	5.60	5.70

FUSE

Domestic Double Tape, Domestic Gutta Percha and Genuine German Gutta Percha in double rolls of 100 feet, in cases containing 6000 feet, weighing about 115 pounds. Prices on application.

CAPS

Grades XXX, XXXX and XXXXX in boxes of 100 each, 25000 in a case. Prices on application.

STOCK PACKAGE QUANTITIES

Case number -----	0	1	2	3	5
Caps to the case -----	500	1000	2000	3000	5000

MILLERS CAP PROTECTORS

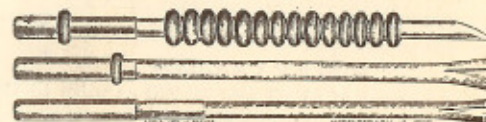


Fig. 3013

For making joint between cap and fuse waterproof without danger of crimping. 50 small packages, 100 each, 5000 in pasteboard box, weight 5 1/2 pounds, price, per thousand ----- | \$10.00

CAP CRIMPERS AND FUSE CUTTERS



Fig. 3014

Price, each ----- | .50

BLASTING MACHINES

PUSH DOWN

Number -----	3	4	5
Capacity, fuses -----	15	50	75
Weight, pounds -----	30	45	65
Price, each -----	\$25.00	50.00	75.00

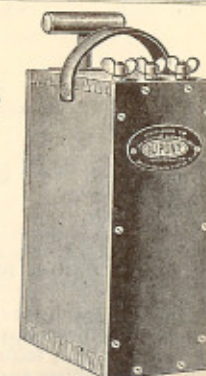
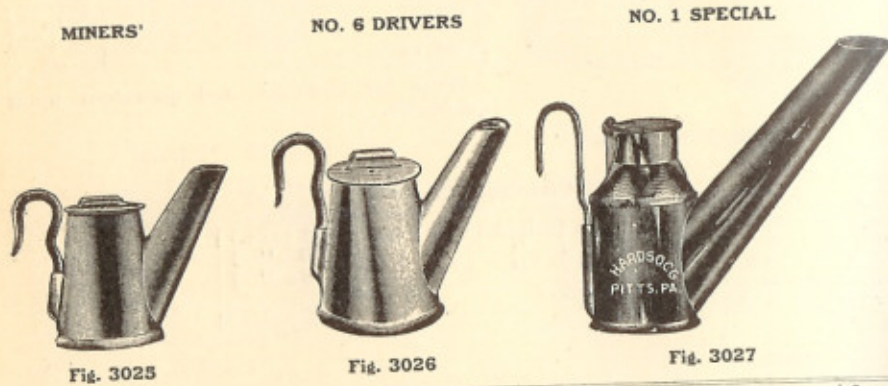


Fig. 3015

MINERS' LAMPS

COAL MINERS' LAMPS



Imperial Miners', Double Spout, per dozen	\$2.20
No. 6 Imperial Drivers, Double Spout, per dozen	3.00
" 1 Special, Spout 5/8x3/8 inches, " "	4.50

MINERS' SAFETY LAMPS

NO. 2 CLANNY

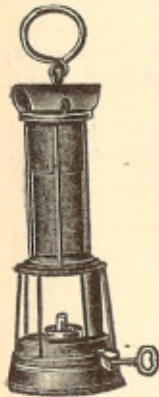


Fig. 3028

No. 2 Clanny, weight 2 3/4 lbs., each	\$2.90
" 4 Davy, weight 2 1/8 lbs., each	2.10

PARTS

Wicks, per dozen	.30
Asbestos Washers or Rings for Glasses, per gro.	1.40
White Glass, 2 1/2 inches, per dozen	2.00
Bristle Brushes for Cleaning, per dozen	2.90
All-iron Gauzes with Caps, per dozen	2.90

WOLF LAMPS

No. 100 Wolf Safety Lamp with Corrugated Removable Shield, made of steel, brass or aluminum with magnetic or key lock, and naptha ignition.

Prices on application.

NO. 4 DAVY

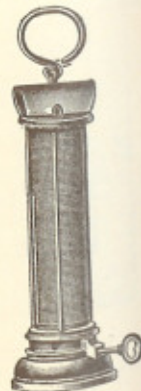


Fig. 3029

BRATTICE CLOTH FOR VENTILATION OF MINES

Widths, 36, 48, 60, 72, 84 and 96 inches, per square yard	.35 to .80
---	------------

Furnished in Rolls of about 50 yards long. This Cloth is prepared from the best quality of Fiber woven for the purpose and coated with an anti-rot Vegetable Compound, preserving it from the damp of the mine and making it nearly air tight.

BALDWIN ACETYLENE LAMPS

NO. 30-CAP PATTERN

NO. 36-SUPERINTENDENT'S



Fig. 3030 CAP PATTERN LAMPS

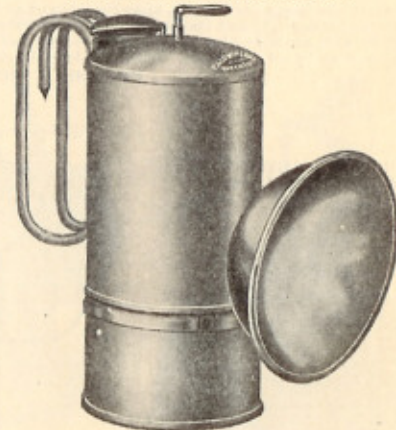


Fig. 3031

Number	30	31	32	33
Height, inches	3 3/4	3 1/2	3 1/2	3 1/2
Weight, pounds	5	5	5	5
Price, each	\$1.00	1.00	1.00	1.00
" extra Carbide Containers, each	.15	.15	.15	.15

One extra Carbide Container with each lamp. No. 30 Lamp is fitted with a Positive Shut-off Valve. It operates under the well-known "Baldwin" method, which insures a steady and uniform flame. It is the most substantial valve made, but we do not recommend valve lamps in low mines, as the first blow against the roof will put the lamp out of commission.

No. 31—Same as No. 30 without shut-off valve and fitted with Cap Hook same as Sunshine Oil Lamps.

No. 32—Same as No. 31 with regular Cap Hook and No. 6 Round Reflector.

No. 33—Same as No. 32 with No. 1 Reflector.

NOS. 34 AND 35—HALF-SHIFT

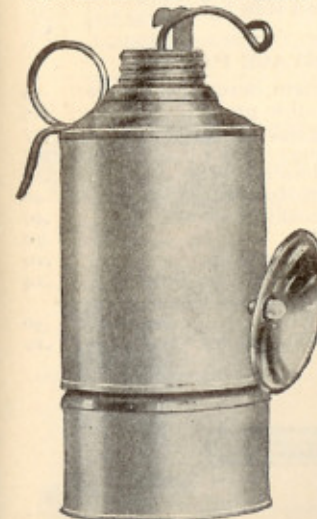


Fig. 3032

NO. 36—SUPERINTENDENT'S LAMPS

Burns on one charge, hours	6
Weight charged, ounces	12
Height, inches	6 1/2
Price, Galvanized Iron, each	\$2.00
" Brass, each	2.00

HALF-SHIFT LAMPS

Number	34	35
Burns on one charge, hours	6	12
Weight charged, hours	11	15
Height, inches	6	6 1/2
Price, each	\$1.25	1.25
" extra Carbide Containers, each	.35	.35

NO. 39 LAMPS

For Gold, Silver or Copper Mining. Similar in design to No. 36 except with Bail, Hook and Chain, which makes it convenient to hang to rock, timber or candlestick.

Height, inches	5 1/2
Weight, ounces	4 1/2
Price, each	\$1.25
" extra Carbide Containers, each	.25

ACETYLENE LAMPS

FOR ENGINEERS, SURVEYORS, MINERS, CAMPERS, ETC.

Acetylene lamps are cleaner, more convenient and cheaper to operate than candles or oil lamps. Acetylene light resembles daylight and facilitates a more accurate examination of veins and ores, especially their color. Notebooks, etc., are not soiled by grease nor the air polluted by smoke.—In fact less oxygen is consumed by acetylene lamps than by oil or candles. They will burn in places where candles and oil lamps go out.

COLUMBIA BICYCLE, BALE AND WATCHMEN'S LAMP PARTS

COLUMBIA AUTOMATIC ACETYLENE LAMPS

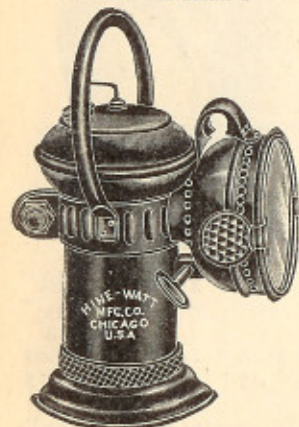


Fig. 3033

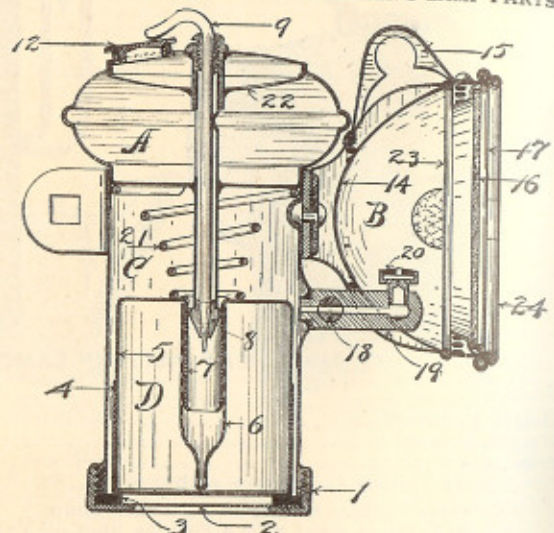


Fig. 3034

Fig. 3033—COLUMBIA AUTOMATIC ACETYLENE LAMPS

Ideal for mining engineers, superintendents, surveyors, campers, watchmen, bicyclists, etc. Made of heavy brass with gun metal finish and have double convex lens, fishtail or pencil burner (as desired), gas and water valves. Burn five hours on one charge. Enclosed and not affected by strong winds.

PRICES

Bale lamp without dark lantern shutter.....	\$3.50
Buggy or Bicycle, bracket extra.....	.40
Watchman's dark lantern with shutter and without colored side lights.....	4.50
“ lamp, without shutter and side lights.....	3.50

Fig. 3034—LAMP PARTS—PRICES POSTAGE PAID

A Lamp Body Complete.....	\$1.80	Gas Valve Stem, Screw and Washer.....	.25
B Head Complete.....	1.00	Burner, Double prong.....	.25
D Carbide Cup Complete.....	.50	“.....	.17
1 Bottom Cap.....	.17	21 Spiral Spring.....	.17
2 “ Plate.....	.10	23 Reflector Retainer Wire.....	.10
3 Rubber Gasket.....	.10	Buggy Dash Bracket.....	.40
5 Carbide Cup Body.....	.30	Bicycle Bracket.....	.40
6 Water Distributer.....	.30	Hand.....	.70
9 “ Valve.....	.15	Thumb Nut and Bolt.....	.10
12 Filler Cap.....	.10	Bracket Extension, no Bolts.....	.14
14 Reflector.....	.30	Front Door, without Glass or Retainer Wire.....	.30
Double Convex Lens.....	.30	Screw and Washer for Gas Valve.....	.10
17 Lens Retainer Wire.....	.10		
18 Gas Valve Complete.....	.40		

BURNER CLEANER



Fig. 3035

Burner Cleaner (wire holder).....	.15
-----------------------------------	-----

WALL TORCHES AND LIGHTS

WALL TORCH



Fig. 3040

MILBURN ACETYLENE LIGHTS

NO. 1

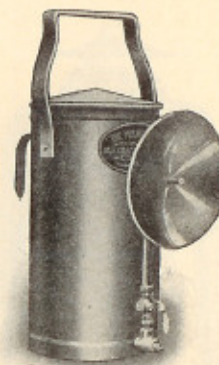


Fig. 3041

NO. 2 AND 3X

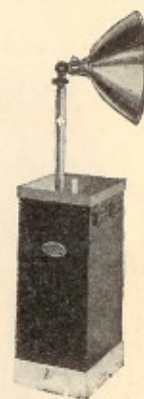


Fig. 3042

WALL TORCHES

Number.....	69
Capacity, quarts.....	6
Price, for Gasoline, per dozen.....	\$24.00
“ “ Kerosene “ “.....	30.00

MILBURN ACETYLENE LIGHTS

Number.....	1	2	3X	4Z
Candle Power.....	50	3000	5000	10000
Lights, feet.....	---	1000	1500	3000
Burning Capacity, hours.....	10	6	12	12
Size, inches.....	6x12	10x30	12x36	12x24x36
Price, complete, each.....	\$13.50	50.00	83.00	125.00

WELLS LIGHTS



Fig. 3043

Number.....	3	5
Candle Power.....	2000	4000
Length of Flame, inches.....	30	36
Oil used per hour, gallons.....	.1	1 1/2
Size of Tank, inches.....	18x24	18x24
Weight, filled, pounds.....	245	245
“ empty, “.....	110	110
Burning Capacity, hours.....	14	14
Price, each.....	\$65.00	75.00
“ extra Burners, each.....	12.00	20.00
“ Carriage, each.....	18.00	18.00

Tripod with 10 feet of hose and Connections.....	\$12.00
--	---------