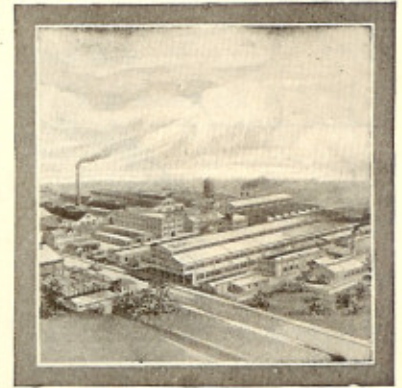


Jeffrey Mine Equipment

as used by the Consolidated Arizona Smelting Co.

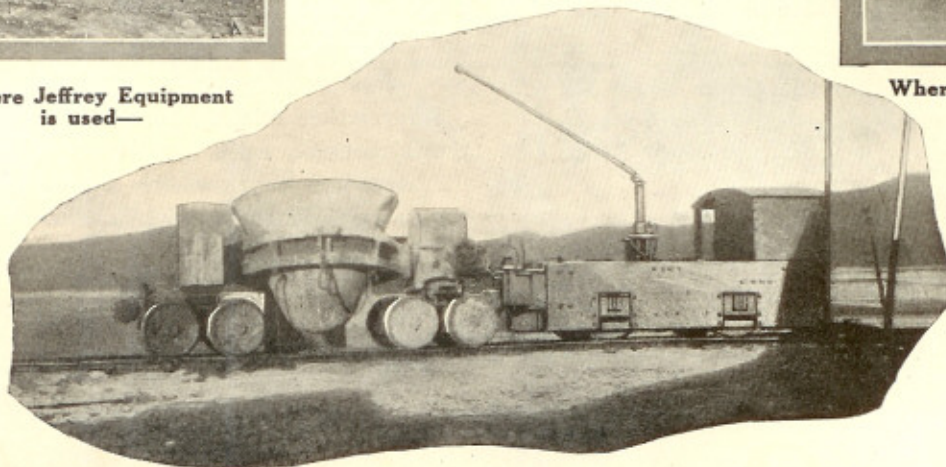


Where Jeffrey Equipment
is used—



Where Jeffrey Equipment
is made—

ELECTRIC LOCOMOTIVES



SLAG pots at the smelter of the Consolidated Arizona Smelting Co., Humboldt, Ariz., are handled by two 15-ton Jeffrey Electric Locomotives.

Each is equipped with two 78-hp. motors; has a rated draw-bar pull of 7500 pounds, and a speed of $6\frac{1}{2}$ miles per hour.

The frame used on these locomotives is of the Jeffrey Armorplate type—employed for 8-ton and larger-sized locomotives. Made of rolled steel slab, it is designed not only for greatest strength, but also to ensure the greatest possible space for

motor equipment that the gauge of track and allowable over-all width will permit.

Other important features of Jeffrey Locomotives include the large-capacity motors, controllers and resistance. Renewable wearing parts are provided at all points subject to wear, and parts are readily accessible.

The Jeffrey Class 15-A Incandescent Headlight—now standard on all Jeffrey Locomotives—has a two-socket feature that permits the use of either concentrated filament bulb or a common incandescent light.

The Jeffrey Manufacturing Company, Columbus, Ohio

NEW YORK, 30 Church Street
PITTSBURGH, 606 Second Ave.

CHICAGO, 858 McCormick Bldg.

PHILADELPHIA, 515 Real Estate Tr. Bldg.
MONTEREAL, CANADA, Power Bldg.

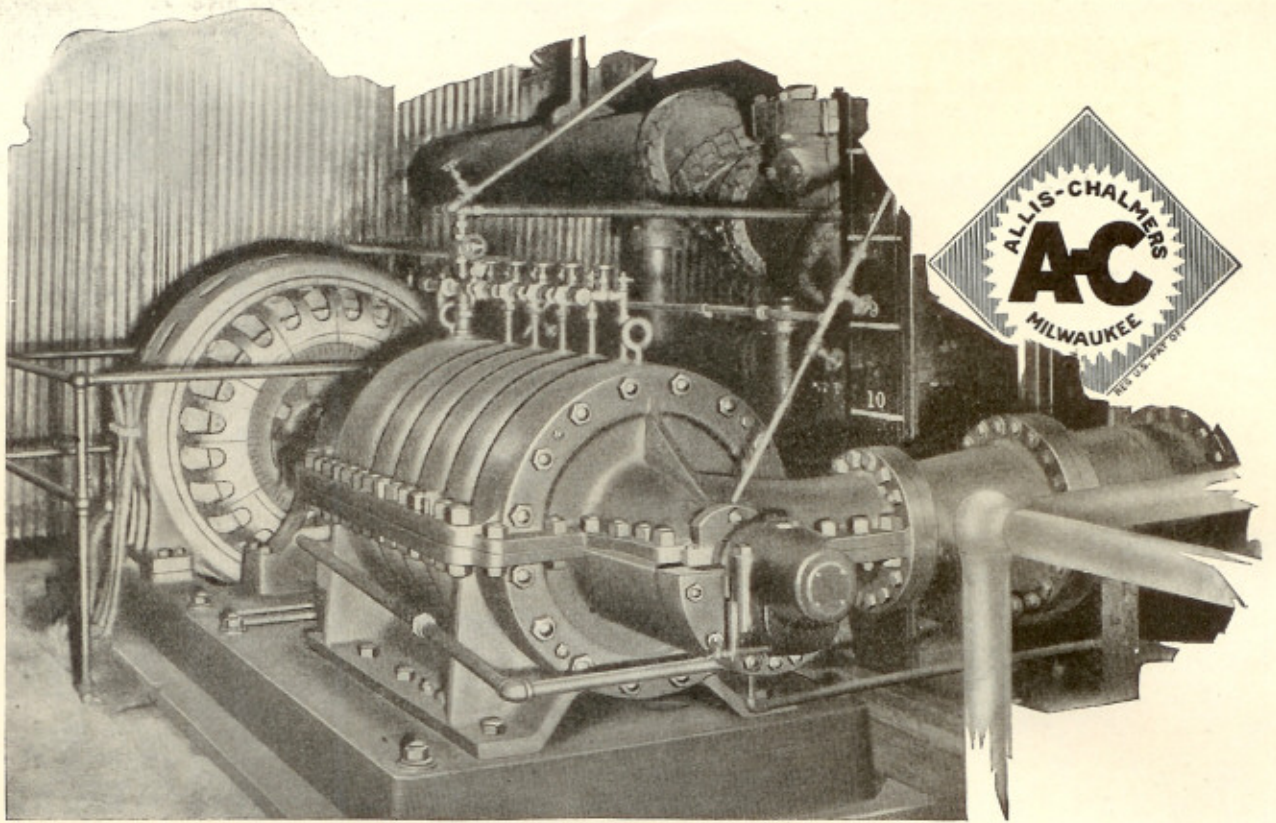
SCRANTON, PA., 518 Union Nat'l Bank Bldg.
CLEVELAND, OHIO, 1519 Guardian Bldg.
DENVER, COLO., 1751 Wazee Street

ST. LOUIS, MO., 606 Pontiac Bldg.
DETROIT, MICH., 455 Book Bldg.
MILWAUKEE, WIS., M. & M. Bldg.
CINCINNATI, OHIO, 62 Plum Street

BOSTON, MASS., 141 Milk Street
LOS ANGELES, CAL., H. W. Hellman Bldg.
CHARLESTON, W. VA., 914 Kanawha Street

JEFFREY

MINE EQUIPMENT

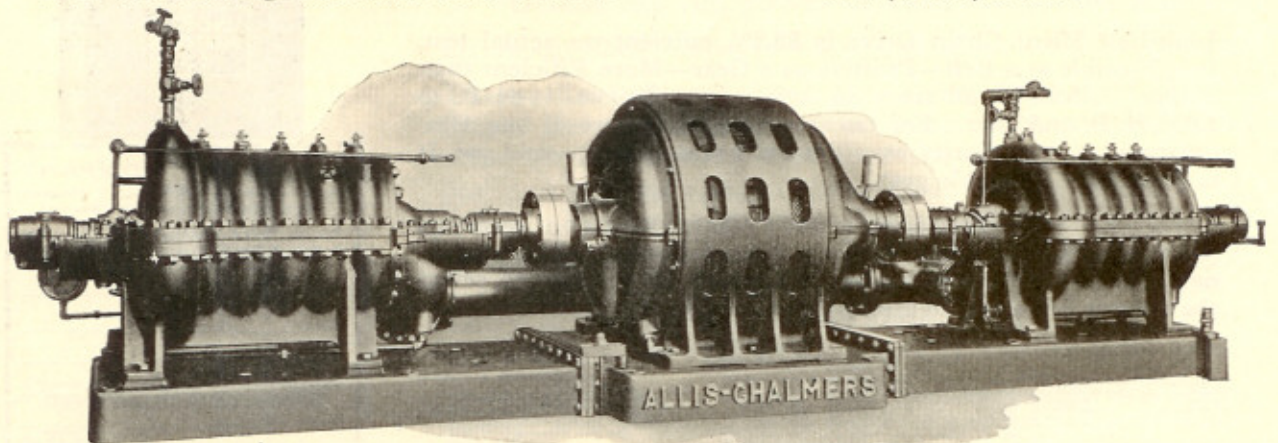


YESTERDAY AND TODAY In the Coal Mine

The installation picture shows a 10-in. six-stage pump as it is installed in service today pumping 3,000 G.P.M. of acid mine water against 300-foot head. This unit was one of an order for eight mine pumps purchased eight years ago by a large coal company. The 8-in. twelve-stage unit shown below is one of

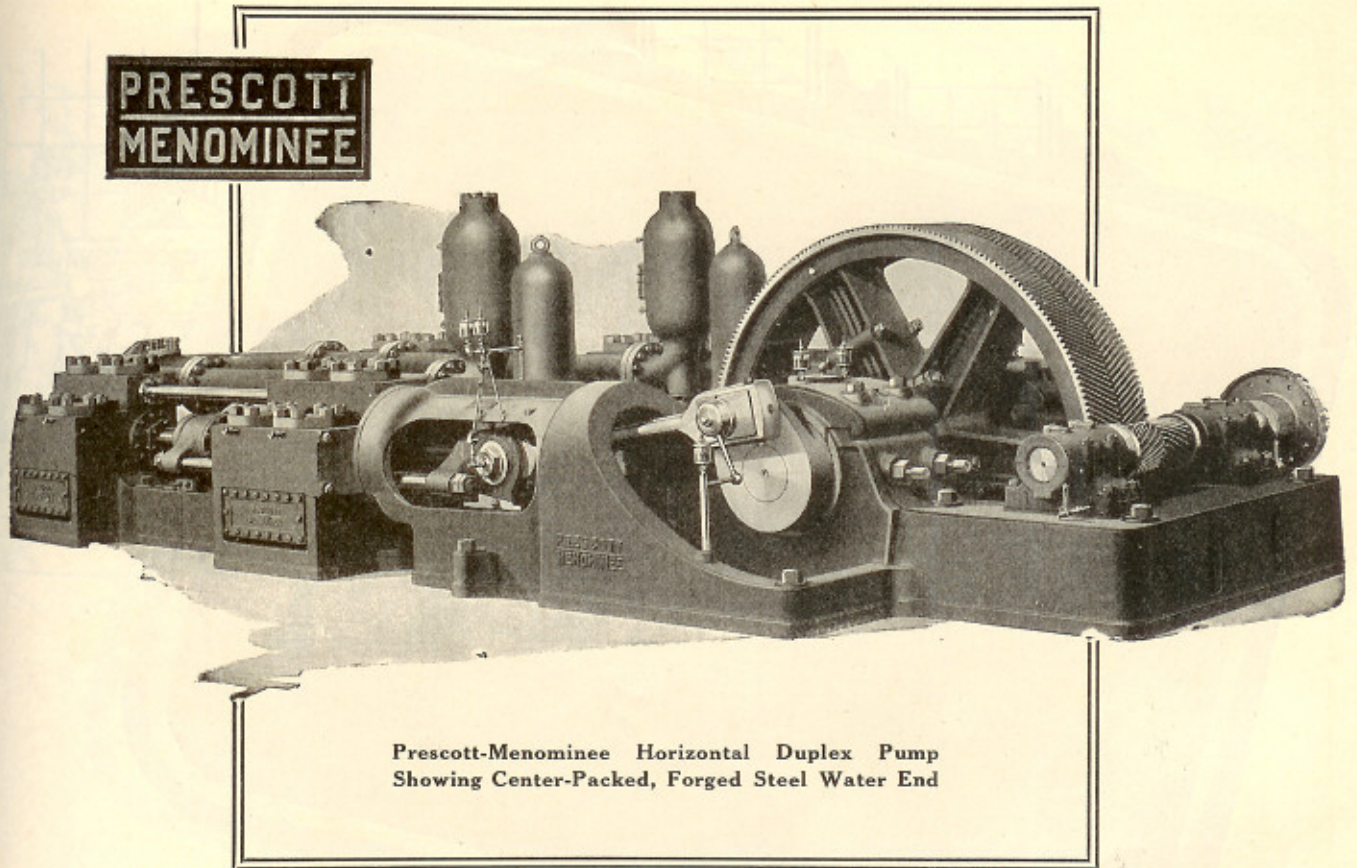
two units shipped this year to the same company which shows that Allis-Chalmers Centrifugal Pumping Units can be bought with confidence for the hardest kind of service.

*If you are interested in mine pumps,
write for Leaflet 2060.*



ALLIS-CHALMERS

MILWAUKEE, WIS. U. S. A.



Prescott-Menominee Horizontal Duplex Pump
Showing Center-Packed, Forged Steel Water End

Mine drainage with minimum cost

The use of Prescott-Menominee Duplex Mine Pumps is effecting a saving in draining very deep mines that amounts in some cases to as much as \$20,000 annually, compared with the cost of relay pumping methods.

The saving reported by one mine recently, where Prescott-Menominee Pumps have done away with all relay or booster equipment, amounts to \$16,800 on *labor alone*. One pumping crew now does the work that it formerly took four crews to do, not men-

tioning the tremendous saving in power, and smaller investment in equipment.

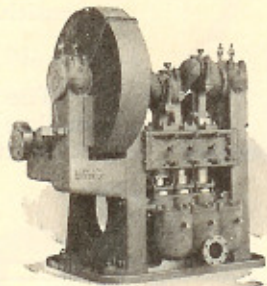
Prescott-Menominee Pumps are built for just such severe duty as the above. These pumps make single-lift pumping possible for mines of every depth. Their dependability eliminates all pumping worries.

Inquiries from mines with pumping problems to be solved are invited. The long experience of Prescott Company engineers is at your service, and no obligation entailed.

The Prescott Company

FRED. M. PRESCOTT, President
Menominee, Michigan

Prescott-Menominee
Vertical Triplex
Mine Pump



Showing oil-tight
guard completely enclosing
herringbone gears

CP-5 "One-Man" Drifters

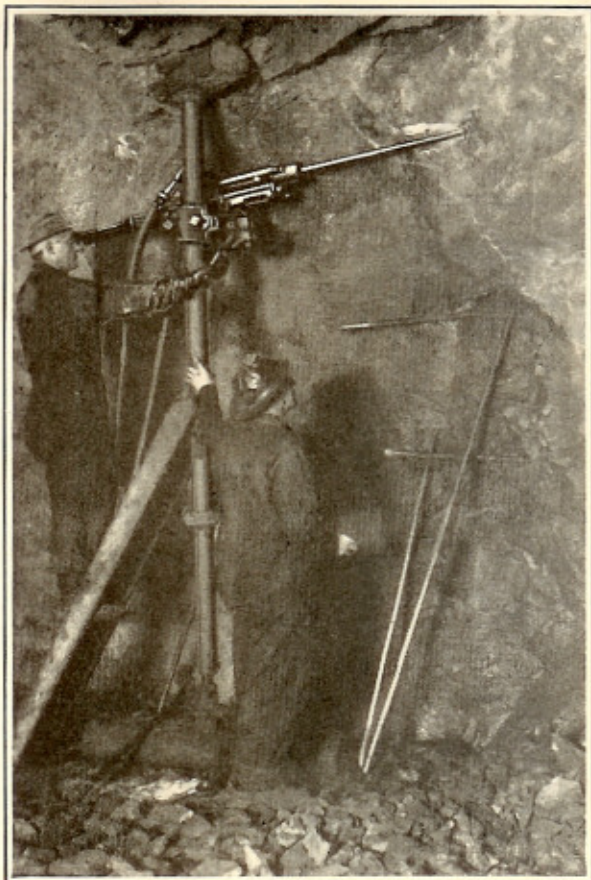
ARE you not interested in a "one-man" drifter—not a cradle-mounted hand drill—but a real DRIFTER, one that in most formations outdrills machines 35 to 60 pounds heavier?

Then you are looking for the CP-5 Drifter. And it weighs only 112 pounds! Men like to run it because it is fast-cutting, easy to operate and it stays on the job.

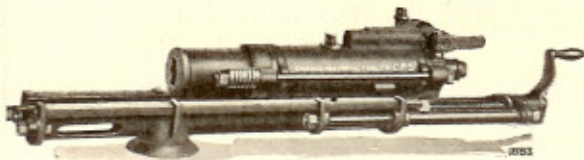
The internal vibration that racks a drill and tends toward rising costs has been reduced to a minimum in the CP-5 with its true running balance. This, together with proper materials, workmanship and heat treatment, accounts for the exceptionally low upkeep cost. One of the large copper mines in Tennessee reports its CP-5 upkeep expense 50% lower than any other drifter used.

Consider the saving in weight—lighter drills, lighter mountings—and the saving in man power, also that the CP-5 is light enough for use in places where cradle-mounted hand drills have been employed heretofore and that a material increase in footage per drill may thus be obtained.

The trend is now towards lighter drills since the CP-5 has conclusively shown that correct design makes them possible. Many of you who have had experience with the CP-5 in various parts of the country can verify the foregoing statements. You who have not, are invited to make a thorough test of CP-5 Drifters under your own conditions, in your own way. Write our nearest branch office for details and Special Publication 697.



CP-5 Drifter in Champion Copper Company mine, Painesdale, Mich.



CP-5 Drifter

Chicago Pneumatic Tool Company

6 East 44th Street, NEW YORK, N. Y.

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| *Cincinnati | Houston | *New York | Salt Lake City | Tulsa | *Buenos Aires | Durban | Johannesburg | Milan | Osaka | Santiago | Tampico | *Vancouver |
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Canadian Pneumatic Tool Company, Ltd., Montreal, manufacturers of Chicago Pneumatic products in Canada
 Consolidated Pneumatic Tool Company, Ltd., London, manufacturers of Chicago Pneumatic products in England

R-60

BOYER PNEUMATIC HAMMERS · LITTLE GIANT PNEUMATIC AND ELECTRIC TOOLS
 CHICAGO PNEUMATIC AIR COMPRESSORS · VACUUM PUMPS · PNEUMATIC HOISTS,
 GIANT OIL AND GAS ENGINES · ROCK DRILLS · COAL DRILLS

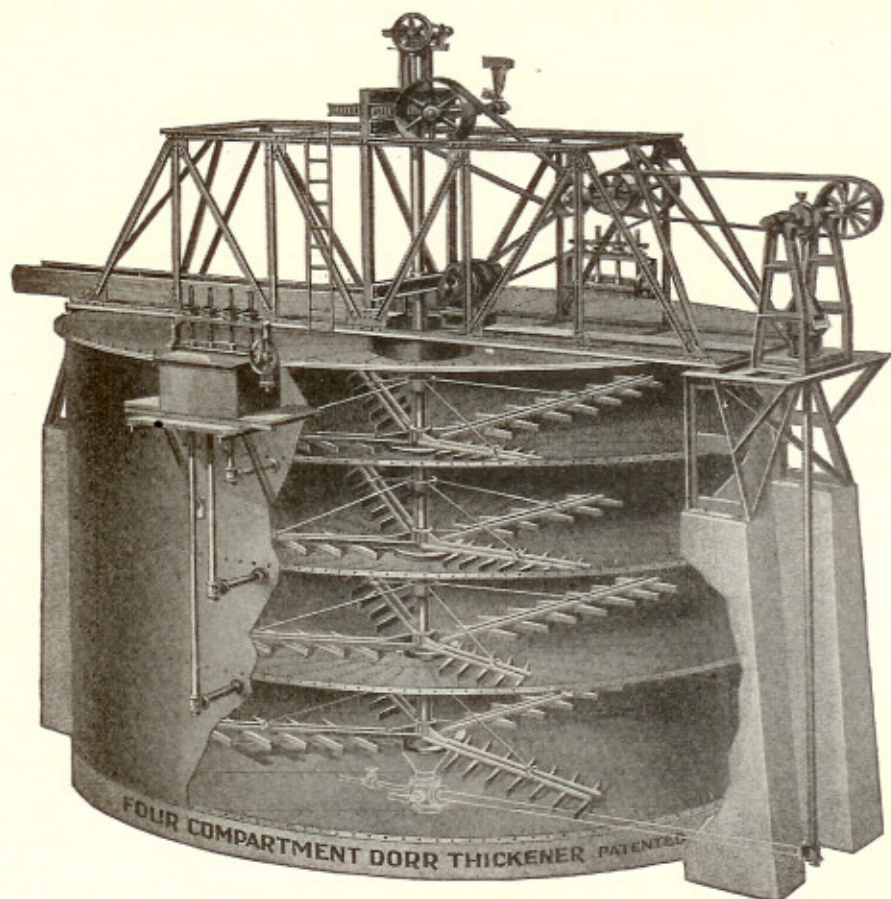
CHICAGO

Rock



PNEUMATIC

Drills



ECONOMY

The economy of utilizing several compartments in the same Dorr Thickener by means of trays has been thoroughly proven by many installations.

The actual saving under the heads of housing, heating, piping, floor space and installation costs is an attractive feature of this type.

The Calumet and Hecla Mining Company, for instance, started using four compartment thickeners several years ago. They have added this type from time to time till today they have thirty-five, ranging from 25 to 40 ft. in diameter.

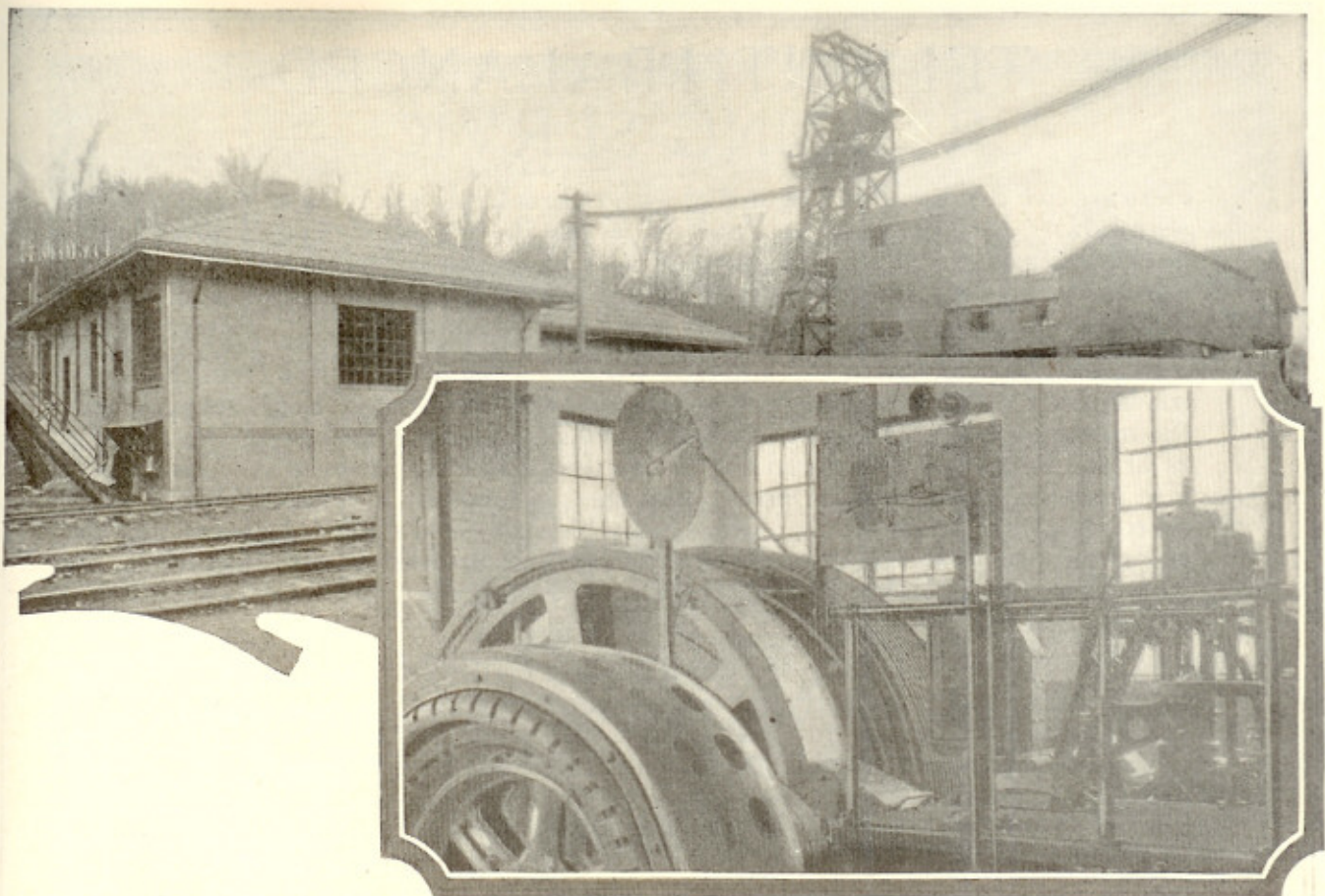
Our engineers can determine the possibility of increasing your thickening capacity by installing trays.

The Dorr Company Engineers

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TESTS DESIGN

London, E. C.
EQUIPMENT



2,175 feet per minute and no danger of overtravel

The Vulcan Patented Travel Limit and Overspeed Device prevents overtravel and overspeed. And the operator cannot start the hoist the wrong way.

It's a 700 hp. Vulcan Hoist installed at the colliery of the Union Coal Company of Pittsburgh. It is completely equipped with Vulcan Safety Devices.


Capacity per hour, 450 tons. Weight of cage, 12,000 lbs.; car, 4,000 lbs.; coal, 7,000 lbs.

Let us advise you on the type of electric or steam hoist best suited to your conditions.

VULCAN IRON WORKS
1733 Main Street, Wilkes-Barre, Pa.

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Vulcan Equipment**

- Steam Locomotives
- Gasoline Locomotives
- Rotary Kilns, Dryers,
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- Mine Ventilating Fans
- Cages and Skips
- Sheave Wheels
- Corliss Engines
- Coal Crushers and Rolls
- Gray Iron Castings
- Open Hearth Steel Castings
- Gears, Moulded and Cut
Teeth
- Special Machinery

VULCAN **OF
WILKES-BARRE**

HOISTS

TELSMITH BALANCED CRUSHING SERVICE—

Here are two crushers, both equipped with unbreakable pillar-shaft, *steel* frame, *steel* crown—both of short and massive design—both automatically lubricated in every bearing, with a big oil storage tank for cooling, straining and settling the reserve oil supply. These machines are designed for tandem operation, one for coarse crushing and the other for secondary reduction.

TELSMITH PRIMARY BREAKER (Fig. 1): Size for size, this crusher has the largest feed area and the biggest crushing bowl of any gyratory breaker on the market. The crushing stroke is *horizontal*—as long at the top of the head as at the bottom. It is surprising to see that straight, business-like “pinch” bite into the larger rock. One nip and the big fellow is a g-o-n-e-r, which is quite important when you consider that a breaker cannot crush faster than it feeds. Slippage is the great enemy of capacity. Telsmith copes with that enemy more adequately than any other breaker. That’s the “why” of Telsmith’s larger output.

TELSMITH REDUCTION CRUSHER (Fig. 2): The only secondary crusher that will take an unregulated gravity flow of coarse rock. Forget about feeders and automatic controls. Just fill up the hopper and keep it full. With a properly sized feed, free from fines, the Telsmith Re-crusher will run all day, full to the muzzle, oil cool and bolts tight. With its heavy *steel* structure and the limited weight in rotation, tramp iron is not a serious menace. Frame, crown and central shaft are guaranteed for two years, including breakage by drill points, etc. Intruding metal may be released by loosening the main frame bolts.

Glad to send you, without obligation, Catalog No. 168 (Telsmith Primary Breaker) and Bulletin No. 2F1 (Telsmith Reduction Crusher.)

SMITH ENGINEERING WORKS

3195 LOCUST ST., MILWAUKEE, WIS.

CANADIAN REPRESENTATIVES, CANADIAN INGERSOLL-RAND CO., MONTREAL, P. Q.

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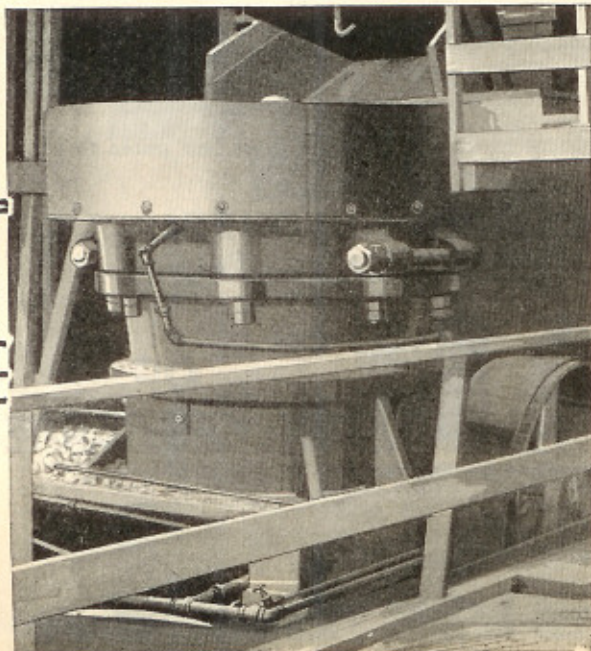


FIG.
NO.
ONE

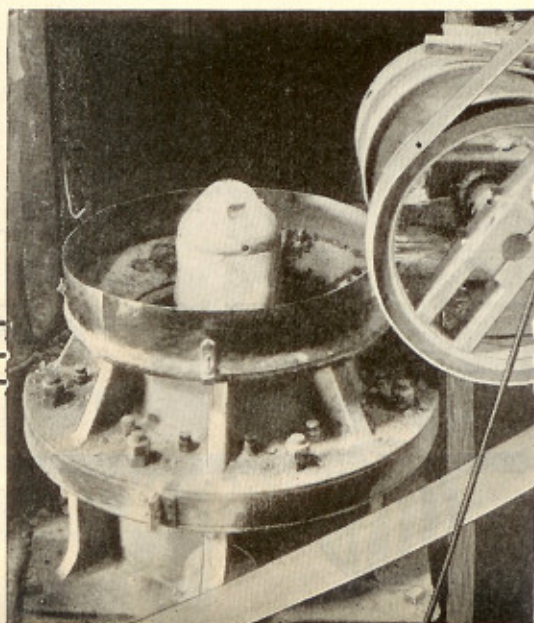
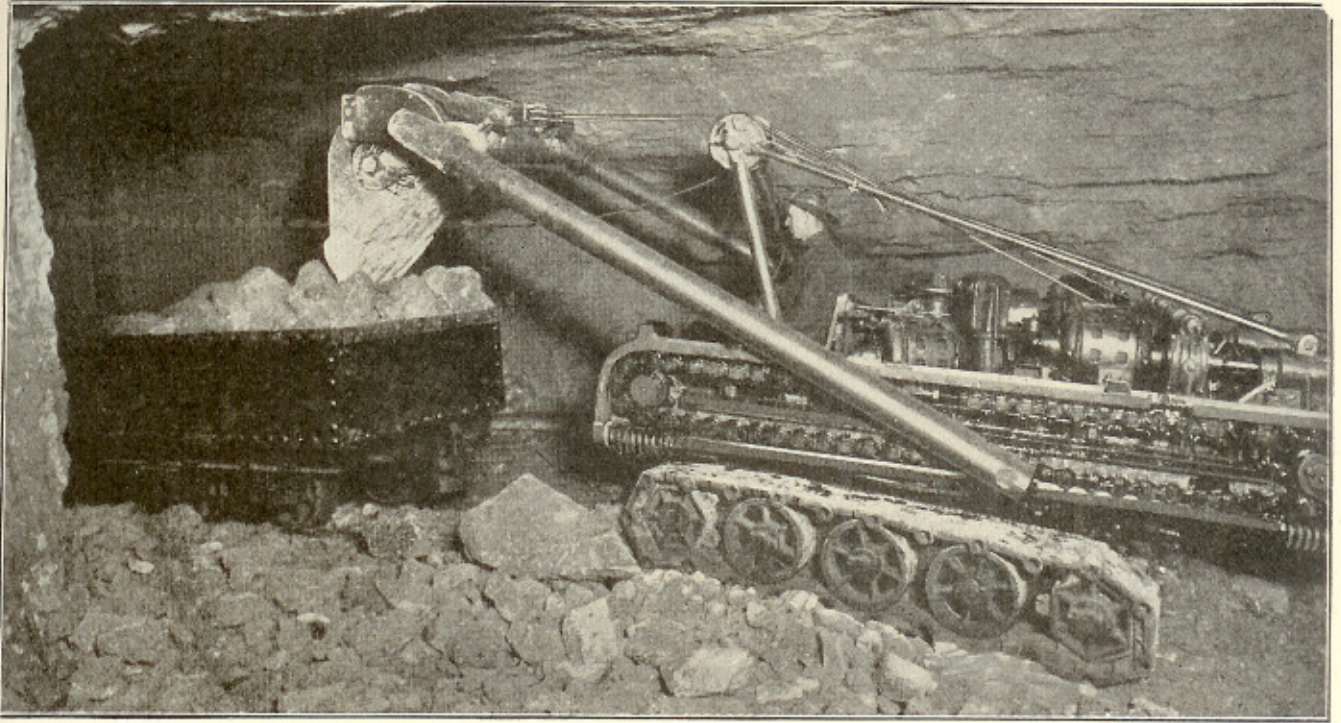


FIG.
NO.
TWO



Clean Up Range

Most loaders haven't enough range. They are efficient in a small radius but their capacity is limited.

The Type S is a full revolving shovel with a clean up radius of 16 feet. Due to its ability to retract the dipper arms it can swing for loading in less than 9 feet with a full dipper. The dipper can quickly and easily be spotted over the car.

It doesn't have to stop work when one room or stope is finished. With its continuous tread truck it moves quickly to the

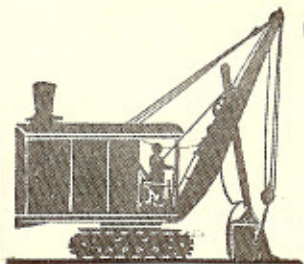
next working regardless of the footing.

If the drifts are low, the upper frame that carries the sheaves can be dropped to make the machine less than 5 feet high. It is only 6 feet wide.

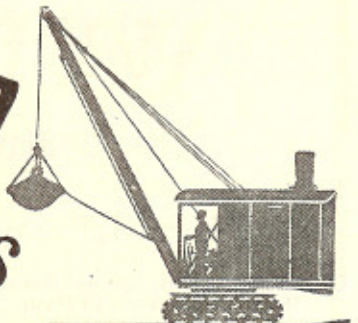
Picture such a machine with its wide clean up, its minimum rotating radius and its great mobility. All these with its 7' 6" working height make it ideal for your conditions.

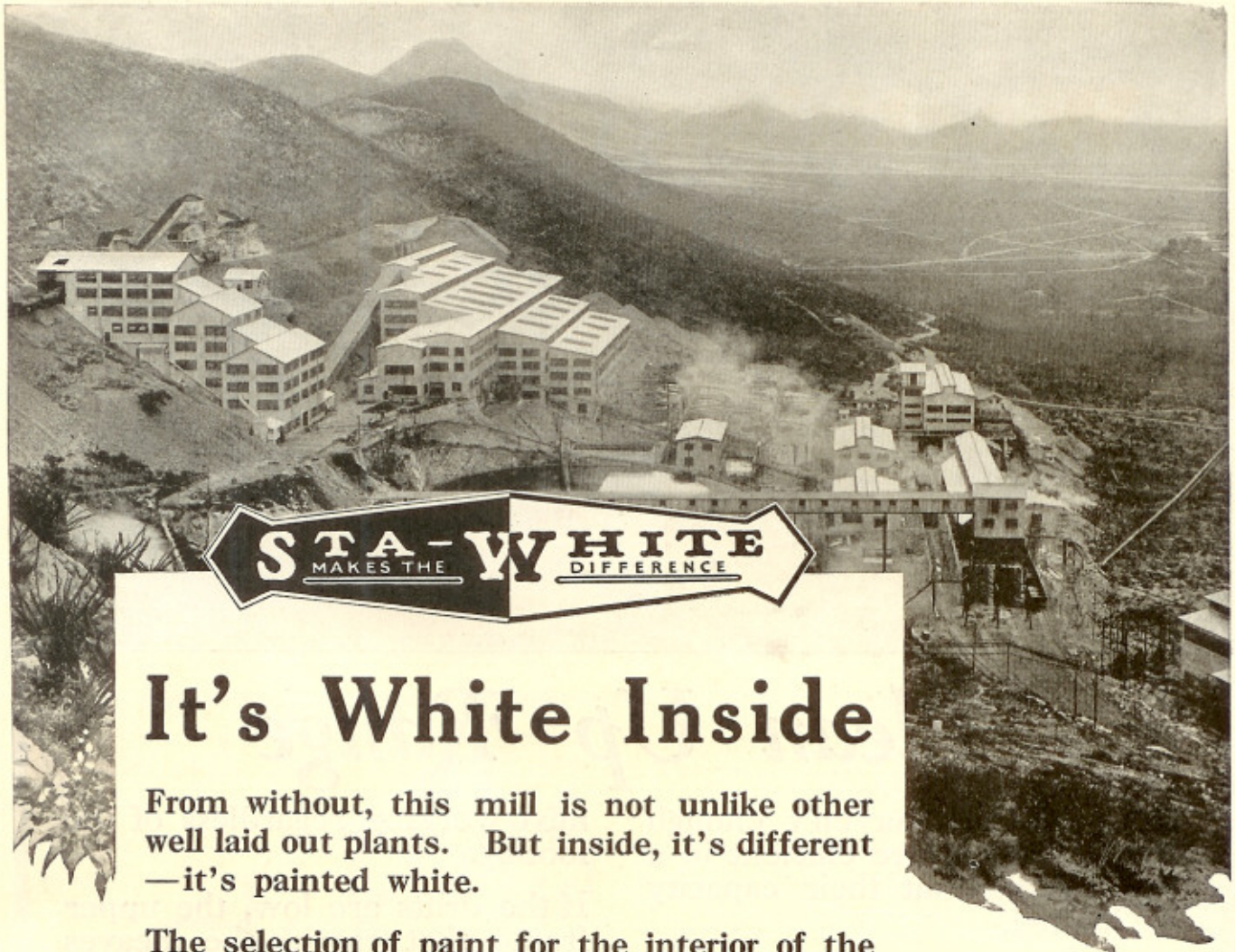
Bulletin S covers these points in detail. It is yours for the asking.

THE THEW SHOVEL COMPANY, LORAIN, OHIO



Thew Power Shovels





STA-WHITE
MAKES THE DIFFERENCE

It's White Inside

From without, this mill is not unlike other well laid out plants. But inside, it's different — it's painted white.

The selection of paint for the interior of the Copper Queen Mill was made by men who demand KNOWN paint value. They wanted a lighter, brighter mill and a paint that would stay white and stay right.

Naturally they selected Sta-White for the job, just as they selected Superior Graphite Paint for the protection of metal surfaces.

Some day you'll use white paint. It will pay you to remember Sta-White.

DEGRACO PAINTS

All Colors for Your Particular Needs

MADE BY

Detroit Graphite Company

509 Twelfth Street

DETROIT U.S.A.

*Manufactured in Canada by
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*DEGRACO PAINTS are sold through
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Anti-Aqua-Damp-proof coating
Degraco Gas Holder
Paint
Degracolin-Concrete floor hardener
Degraco Enamels
Industrial Finishes



Rastus, hunting 'possum inside tree: "What all's that darkening up that hole?"

Sam, engaged otherwise: "If this here tail-hold lets go, you gwine know darn quick."

The "Tail-Hold" of a BUCHANAN Never Lets Go!

P. S.
Bea
Wo

Tale of a Tail

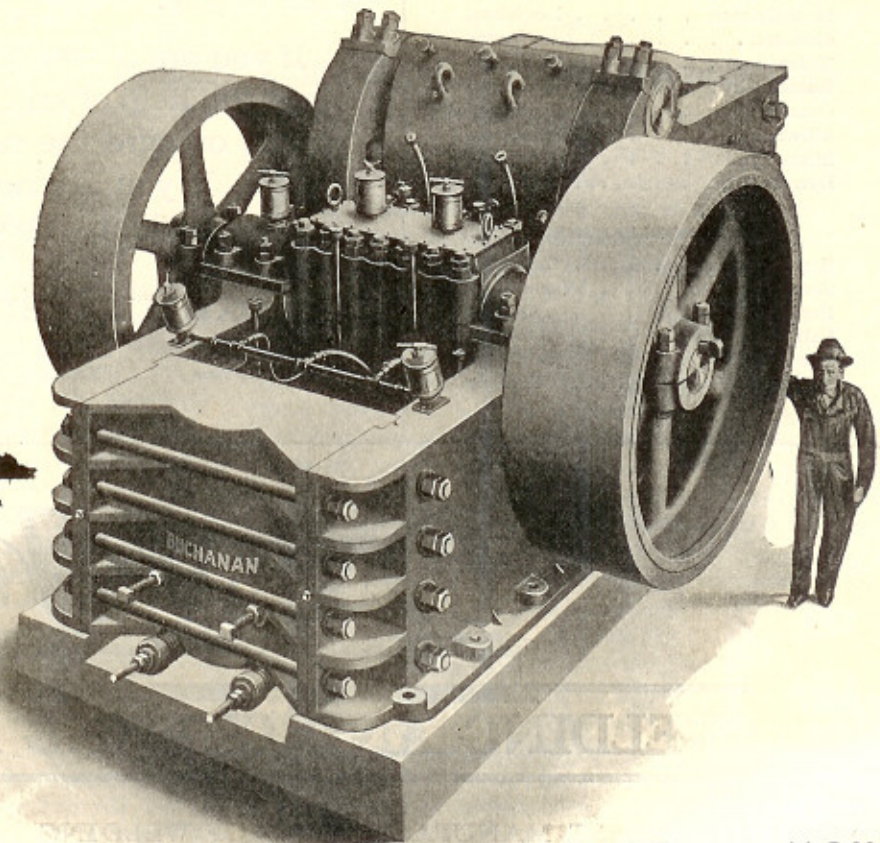
Don't let a broken "tail-hold" cause a shutdown of your preliminary crusher that will "darken the hole" as regards your mine's productive operation.

Buchanan Crushers are built to give a "tail-hold" strong enough to stand any thrust-energy aimed at this vital spot, no matter how sustained and severe the service. That hold won't let go—and its tremendously strong construction is typical of Buchanan Crusher construction throughout all parts of all Buchanan Crushers.

For the full tale of Buchanan construction, write for

- | | |
|--|---|
| <input type="checkbox"/> Bulletin 10—Large Crushers. | <input type="checkbox"/> Bulletin 9—Small Crushers. |
| <input type="checkbox"/> Bulletin 13—Crushing Rolls. | <input type="checkbox"/> Bulletin 14—Magnetic Separators and Pulleys. |

C. G. Buchanan Co., Inc.
West and Cedar Sts., New York City



**P.S. It's a
Bear for
Work!**

Type "C"

Old-Fashioned Quality

OVER SEVENTY-FIVE years ago the inventive genius of Erskine Hazard and his son Fisher Hazard produced the first Wire Rope making machinery in the United States.

They originated the underlying principle which forms the basis of all present-day Wire Rope Machinery.

Honesty, sincerity and earnest purpose to fill the real needs of Wire Rope users actuated these pioneers.

Through all the years we have kept the faith, and HAZARD Wire Rope still carries old-fashioned, honest quality in its make-up, aided by all the skill and knowledge that can be supplied by experience and modern engineering.

Hazard Manufacturing Company Wilkes-Barre, Pa.

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Erskine Hazard
1789-1865

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AND
AERIAL WIRE ROPE TRAMWAYS
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SINTER YOUR FINE ORES

Special Problems in Ore Treatment

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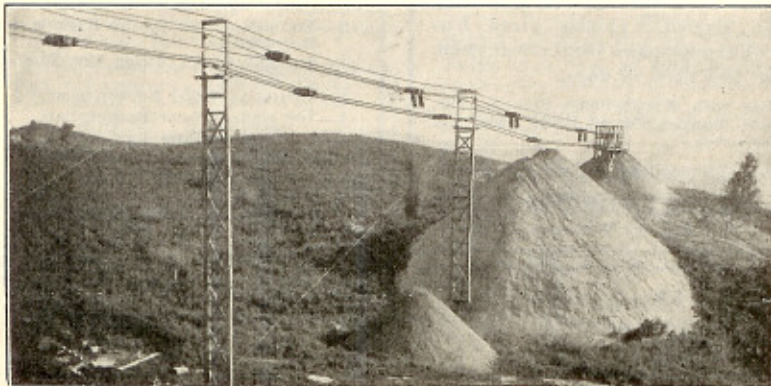


RIBLET AERIAL TRAMWAYS

Automatic, High-Speed; Self-Adjusting Positive Grip

Tell us in detail what you wish to accomplish

Riblet Tramway Co., Spokane, Wash.



What About Your Slate and Refuse?

Troublesome and obnoxious slate dumps may be removed from your mine mouth by the

Automatic Aerial Tramway

Send for Catalogue

Interstate Equipment Corporation

25 Church Street, New York City

No Weather Blockade Here

Ice, slush, bog or snow can't block haulage where a B & B Aerial Tramway is installed.

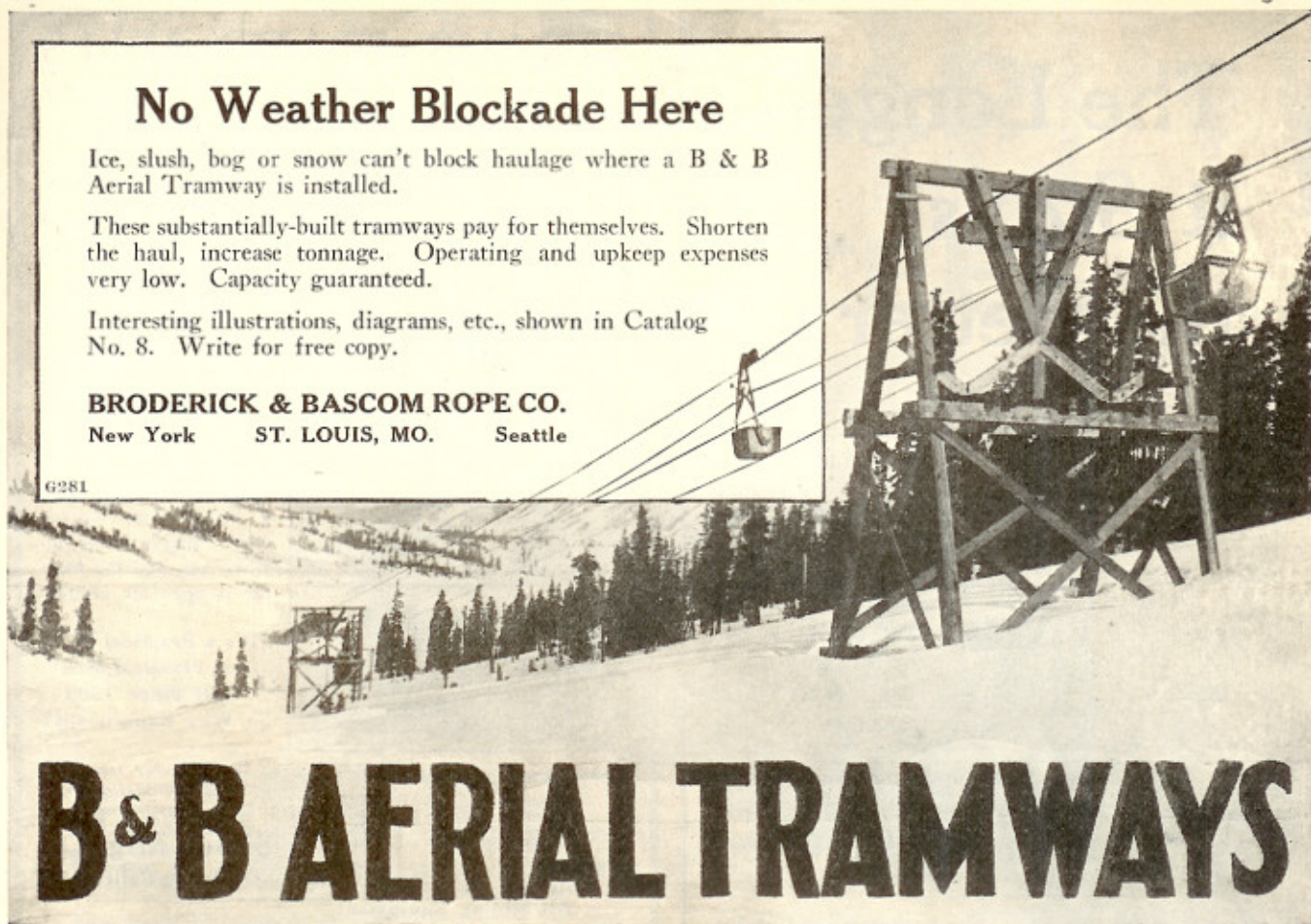
These substantially-built tramways pay for themselves. Shorten the haul, increase tonnage. Operating and upkeep expenses very low. Capacity guaranteed.

Interesting illustrations, diagrams, etc., shown in Catalog No. 8. Write for free copy.

BRODERICK & BASCOM ROPE CO.

New York ST. LOUIS, MO. Seattle

G281



B & B AERIAL TRAMWAYS

Leschen Aerial Tramways

are daily demonstrating their practical efficiency in various parts of the world. They are economical carriers because—

- they can often be run by gravity
- they are not affected by weather conditions
- installation and operating costs are not materially increased by irregular ground conditions
- maintenance and operating costs are low
- they are correctly designed and made of high-grade material throughout.

We have had many years of experience in this line of manufacture, and will be glad to furnish full information to anyone interested.

Established 1857

A. Leschen & Sons Rope Company

MAKERS OF

Wire Rope and Aerial Wire Rope Tramways

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"HERCULES" (RED STRAND) WIRE ROPE
(REG. U.S. PAT. OFF.)

VANADIUM RED STAR DRILL STEEL

Smuggler Union Mining Camp
Telluride, Colorado



COLONIAL No. 7
a Vanadium
TOOL STEEL

THE HIGH value of Vanadium in Tool Steel has been demonstrated for years in the work of Colonial No. 7. Used in dies, dollies, tappets, pistons and hammers—it increases the service.



More Carload Orders

IT IS the month after month service of Red Star Vanadium that causes the big mines to steadfastly standardize on this exceptional Drill Steel.

Carload orders, and repeated carload orders, indicate in a way most substantial that Red Star Vanadium is giving satisfaction beyond all other drill steels.

It cuts faster, holds its edge and its gauge longer, increases footage, reduces breakage. Red Star Vanadium economy is in its reduced breakage and long-lasting keen edge. Its increased footage is a source of continuous greater profit to your mine.

If you are not using this tough, fast-cutting Drill Steel, its work will be a discovery for you. Any Colonial Warehouse can take care of your needs. If you are at any time in Pittsburgh a visit to our mill to see Red Star Vanadium in the making would be of interest.

Colonial Steel Company

Pittsburgh
Denver

New York
Salt Lake City

Chicago
Wallace, Phoenix

St Louis
Edw. L. Soule Co., San Francisco

Birmingham

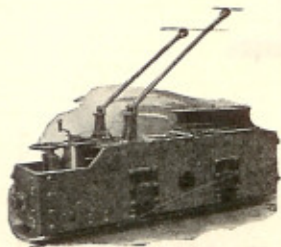
ATLAS Is Prepared to Build Your Specially Designed Equipment

No matter what your haulage problems, Atlas is prepared to solve them. Our files are full of drawings for special equipment. Our staff of engineers, with years of experience back of them, is at your service.

The ATLAS Car & Mfg. Co.
Cleveland, Ohio

Engineers

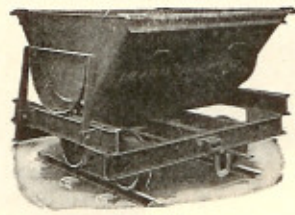
Manufacturers



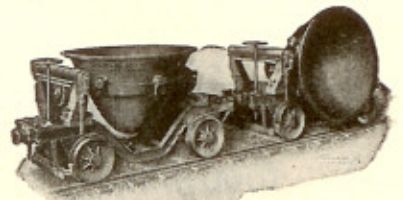
No. 6425
Electric Locomotive



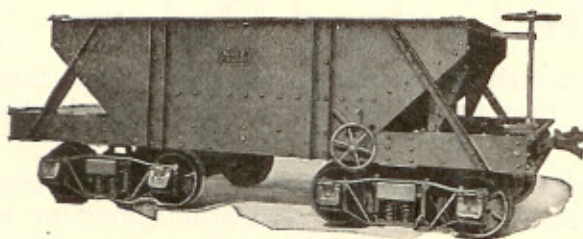
No. 261
Standard Scoop Car, rotary



No. 173
End Rocker Dump Car, with brake,
large capacity



No. 194
Hot Metal or Ladle Car



Builders of
GOOD CARS

Since 1863

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West Virginia Rail Co.
Manufacturers
Light Steel Rails
and Accessories
12-16-20-25-30-35-40-45-lbs. per yd.
Huntington, W. Va.

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GRAVITY, ELECTRICAL OR PNEUMATIC DRIVE

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PITTSBURGH
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THE MECHANICAL SPRAGGER
AUTOMATIC TRIP CONTROL EQUIPMENT

ROTARY CAR-DUMPERS FOR
STANDARD GAUGE RAILROAD CARS

Represented by
LAKE SHORE ENGINE WORKS,
Marquette, Michigan.

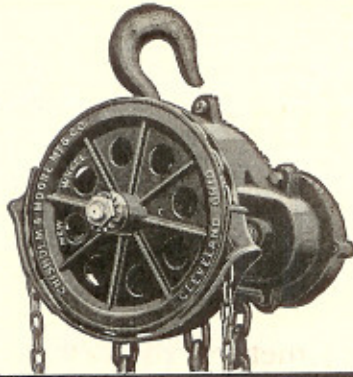
Western Air Dump Cars Are Dependable

At Babbitt, Minn. they handle the ore-rock. ON other parts of the Range they are used in stripping and hauling low-grade ore. It is the same at the Arizona copper mines.

There is a Western Dump Car for every haulage problem, —backed by nearly 50 years of manufacturing experience.

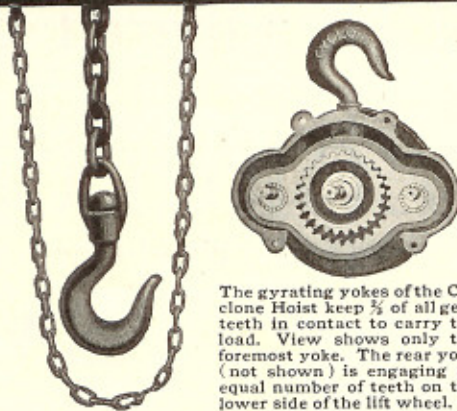
Talk over your Haulage Problem with us and let us help if we can.

WESTERN WHEELED SCRAPER COMPANY
Founded 1877
Earth and Stone Handling Equipment
Aurora, Illinois



CYCLONE HOISTS

HIGH SPEED



The gyrating yokes of the Cyclone Hoist keep $\frac{2}{3}$ of all gear teeth in contact to carry the load. View shows only the foremost yoke. The rear yoke (not shown) is engaging an equal number of teeth on the lower side of the lift wheel.

—carry the load on more teeth!

WE show above a cutaway view of a portion of the lifting mechanism so that you can see at a glance how the gyrating yoke of a Cyclone Hoist means a safer, stronger hoist, and minimizes vibration and wear.

The gyrating yoke is a patented engineering improvement found in no other hoist but the Cyclone. *Its peculiar gyrating motion keeps two thirds of the drive and lift gear teeth in contact at all times.*

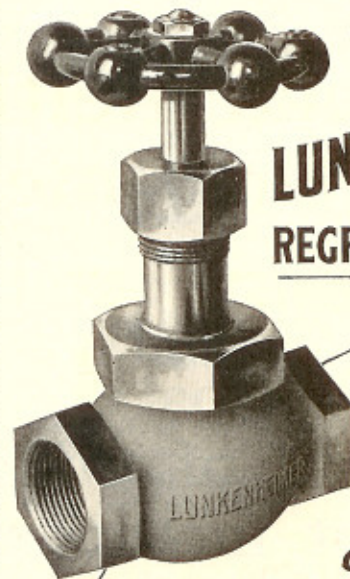
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FIG. 407

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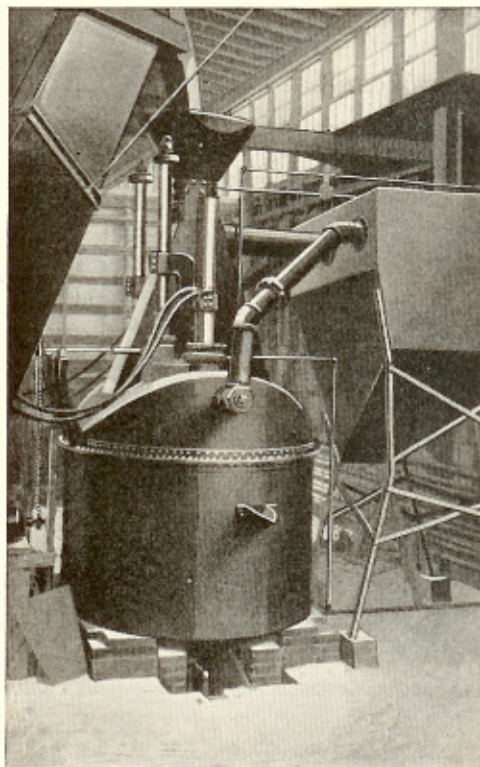
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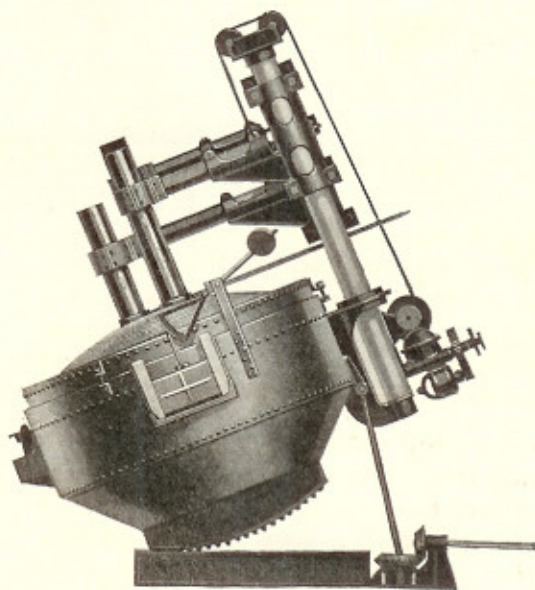
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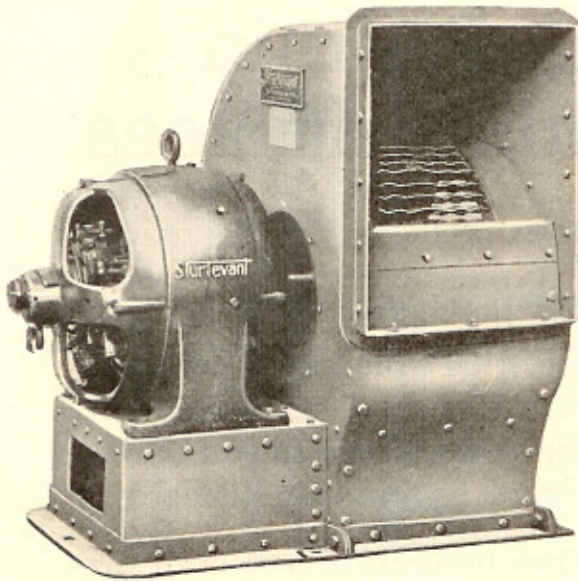
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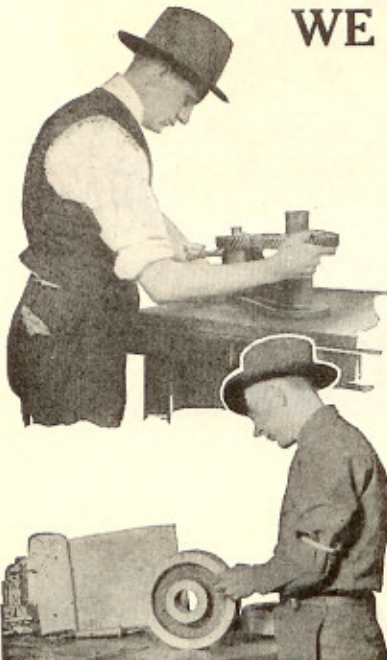
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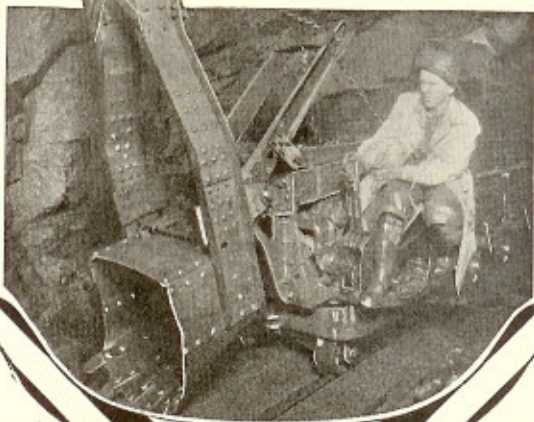
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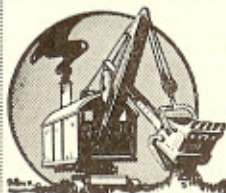
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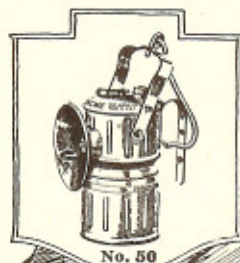
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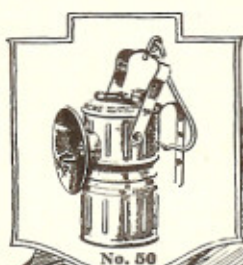
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