

THE MINING CATALOG

(METAL AND QUARRY EDITION)

First Issue (1921)

A Consolidation of Catalogs Pertaining to Metal Mining, Quarrying,
Milling and Smelting Machinery and Appliances

TOGETHER WITH

ENGINEERING DATA COVERING THE VARIOUS
OPERATIONS PERTAINING THERETO

DEvised, COMPILED, EDITED AND PUBLISHED BY

Keystone Consolidated Publishing Co., Inc.

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PITTSBURGH, PA.

Assaying, Laboratory and Engineering Section



FOR INDEX TO ALL ENGINEERING DATA SEE PAGES 5, 6 AND 7.

**THE FOLLOWING MANUFACTURERS AND DEALERS
ARE REPRESENTED IN THIS SECTION**

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Buff & Buff Manufacturing Co.
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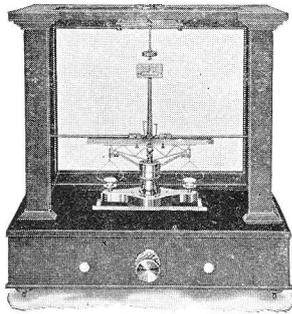
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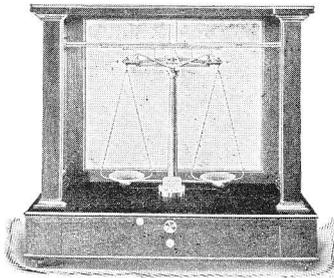
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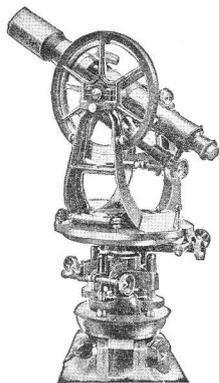
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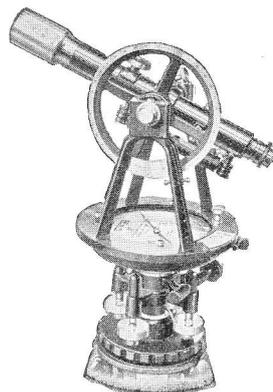
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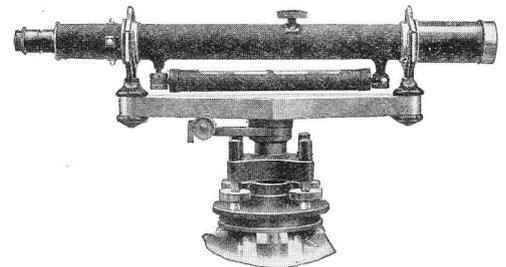
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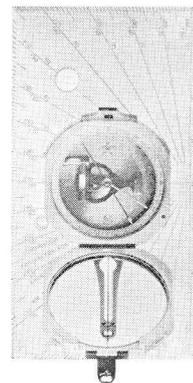
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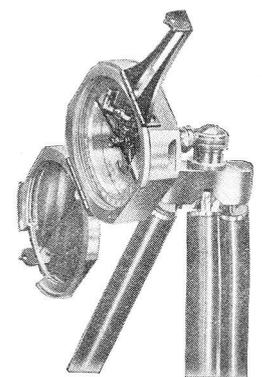
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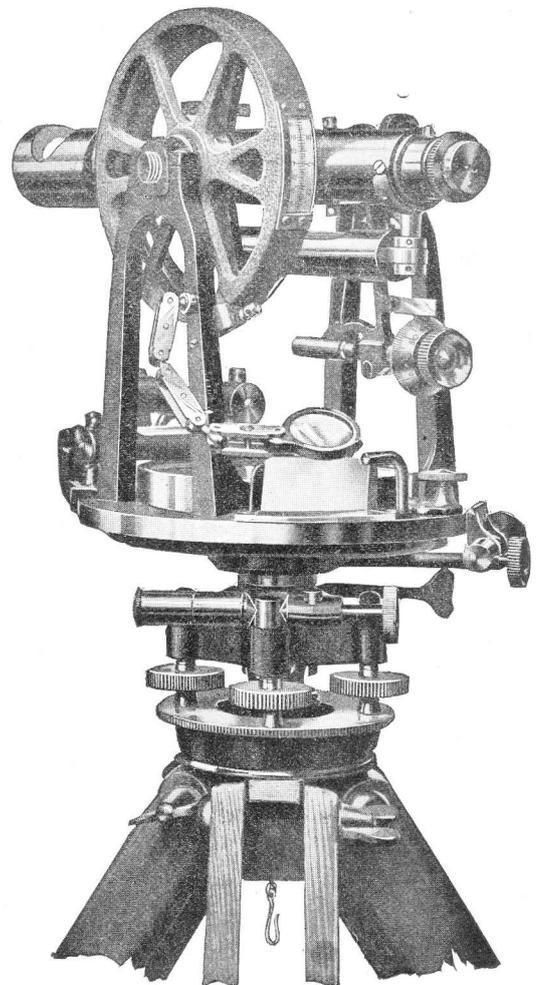
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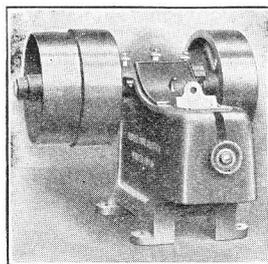
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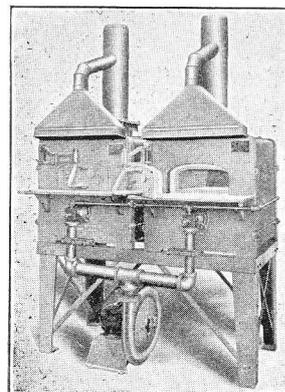
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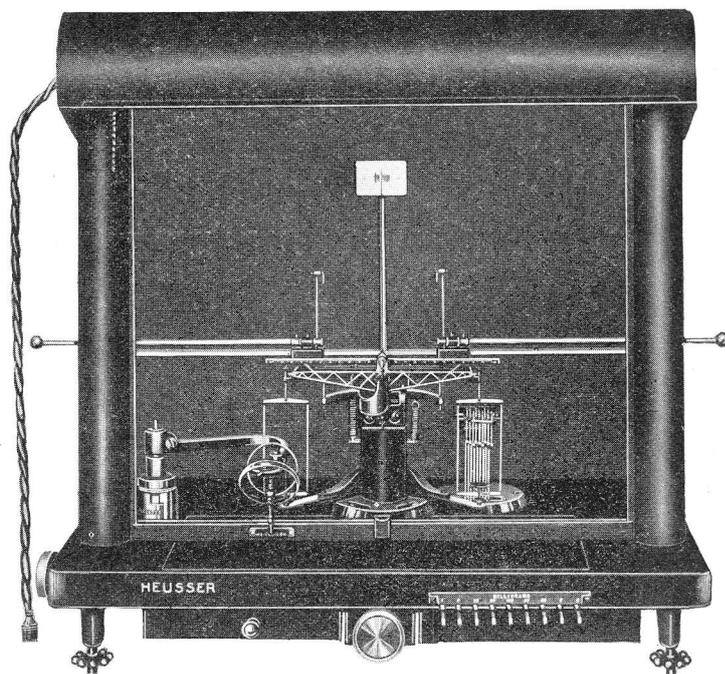
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Explosives Section



FOR INDEX TO ALL ENGINEERING DATA SEE PAGES 5, 6 AND 7.

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Atlas Powder Co.
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General Explosives Co.
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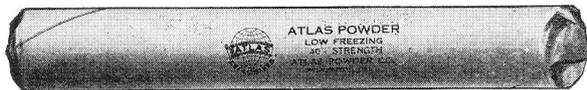
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BLASTING EXPLOSIVES

The high quality, uniformity and dependability of Atlas Explosives are recognized by the powder men of all the great metal mines. All grades for

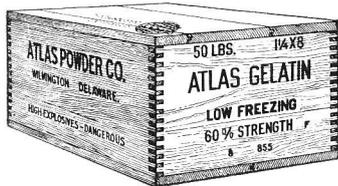


Cartridge—Atlas Powder L. F. 40%

every requirement can be furnished conveniently by the nearest one of our many distributing points. We now offer a new series of non-freezing powders. Low freezing explosives are furnished on all orders unless the high freezing grades are specified. Nothing weaker than a No. 6 blasting cap should be used to detonate Atlas High Explosives.

Atlas Non-Freezing—A new explosive that will not freeze. Made in 5 grades, covering all blasting requirements. No headaches. No premature explosions.

Atlas Extra—15% to 60%. Spreads and heaves when exploded. Fumes not objectionable. Not water-proof. Especially recommended



Case—Atlas Gelatin L. F. 60%

for headings, strippings, cuts and underground blasting that is not wet and where a shattering effect is not desired.

Atlas Gelatin — 25% to 90%. Practically non-freezing and fumeless. Water-proof. For tunnel driving and rock blasting of all kinds in mines or under water.

Atlas Powder—15% to 75%. Very quick and shattering. Fumes objectionable underground. Partly water-proof. Recommended for outside work in hard rock that must be broken small.

Atlas Permissible—COALITE. Nine grades to meet every coal mining requirement. No objectionable fumes. Moisture and cold resisting. All grades have been tested and approved by the U. S. Government Bureau of Mines.

Atlas Low Freezing R. R. P.—Granular, low grade explosive, invaluable in cuts, strippings or other open excavating that is not wet. Twice as strong as blasting powder. Exploded with dynamite primer. Put up in 12½-lb. paper bags; packed in 50-lb. cases.



Keg—Atlas Blasting Powder

Atlas Blasting Powder —All standard granulations. The smaller the grains, the quicker and more shattering the effect. Little smoke. Hard pressed, dense, regular, moisture resisting grains. Glazed or unglazed. Packed in 25-lb. kegs and 5-lb. cans.

BLASTING SUPPLIES

Atlas Blasting Caps—No. 6 and No. 8. Detonated by fuse. Packed 25 or 100 to the tin box, 500 or 5,000 to the case.

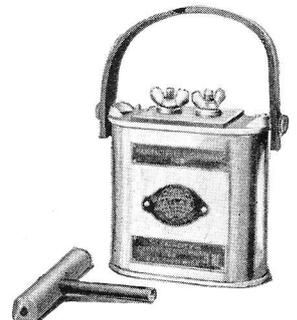


Atlas Electric Blasting Cap No. 8

Atlas Electric Blasting Caps—No. 6 and No. 8. Copper or iron wires. Detonated by electric blasting machine. Packed 25 and 50 to the carton—10 cartons to the case. Wires 4 ft. to 30 ft. long. Longer lengths supplied on request.

Atlas Blasting Machines—Six sizes, ranging in weight from 3¼ lbs. to 45 lbs., and in capacity from 5 to 150 electric blasting caps.

Davis No. 1 Blaster—Particularly suited for blasting where not more than 5 shots are fired together. Dimensions: 2"x4"x2½". Weight, 3¼ lbs. (net).



Davis No. 1 Blaster

Fuse—Eleven different brands for detonating blasting caps or exploding blasting powder under all conditions. Wrapped in rolls of 100 feet. Packed 10 to 60 rolls to the case.

Atlas Cap Crimpers—No. 4, Cut Throat Crimp; No. 5, Broad Jaw Crimp—for attaching blasting caps to fuse in a safe, secure and reliable way.

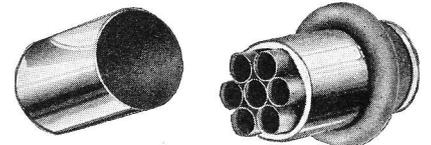
Connecting Wire—Small, insulated copper wire for connecting electric blasting caps to each other. 1-lb. and 2-lb. spools. About 210 ft. to the lb. for No. 20 wire; about 260 ft. to the lb. for No. 21 wire. Sold by the lb.

Leading Wire—Heavily insulated copper wire, used to carry the current from blasting machine to the charge. Single leading wire runs about 52 feet to the lb.; duplex, about 26 feet to the lb. Sold by the lb.

Atlas Galvanometers—For testing electric blasting circuits. This instrument is covered by a leather carrying case, with a sling strap.

Atlas Rheostats—For testing the capacity of blasting machines. Dimensions: ¾"x1¾"x5½". Weight: 5½ oz.

Atlas Moisture Proof Blasting Cap Carrying Case—The first device of its kind offered the miner that enables him to take proper care of a day's supply of blasting caps. Made of aluminum, 7/8"x2½"; holds seven No. 6 or No. 8 blasting caps.



Atlas Moisture Proof Blasting Cap Carrying Case

Other Atlas Blasting Supplies include Tamping Bags, Thawing Kettles, Delay Action Exploders, Delay Action Igniters, Fuse Lighters, Portable Magazines, Electric Squibs, Miners' Squibs, etc.

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Blasting Accessories: Pompton Lakes, N. J.

High Explosives, Blasting Powder and Blasting Accessories

In the course of more than a century's experience we have acquired a very extensive and practical knowledge of the use of explosives for all purposes. This applies equally well to the explosives used in metal mining and in quarrying.

In the following paragraphs we can only cover briefly some of the merits of Du Pont explosives and accessories. More complete data is available in the form of books, catalogs, and special booklets. In these will be found information enabling the reader to determine which explosive to select, and how to use it to secure the greatest efficiency at the lowest cost of materials, time and labor.

E. I. du Pont de Nemours & Company, Inc., supplies a complete list of high explosives for every class of blasting. All these explosives are made from carefully selected material and every precaution is exercised in the manufacture to insure quality and uniformity.

HIGH EXPLOSIVES FOR MINING

Du Pont Straight 25-60%. This explosive is quick and powerful, resists water well and is recommended for open work where a shattering action is desired. It is low-freezing. Suitable for both mining and quarrying.

Red Cross Extra 20-60%. This is an all-year-round explosive that works extremely well in mining soft ore. It is also suitable for hard ore where it is not desired to shatter the material. Red Cross Extra is low-freezing.

Red Cross Gelatin 35-90%. A low-freezing explosive that will resist water, such as Red Cross Gelatin, will always find favor among miners. It is plastic, dense and the fumes are comparatively unobjectionable. These qualities make it suitable for close work.

Du Pont Gelatin 30-75%. Where other explosives are inefficient this gelatin does its best work. It is adapted to a wider range of work than any other gelatin dynamite for it has all the virtues of density, plasticity, water resistance, comparative freedom from obnoxious fumes, and is low-freezing. It is especially adapted for close work of every kind, mining and tunneling in the hardest rock under the most adverse conditions.

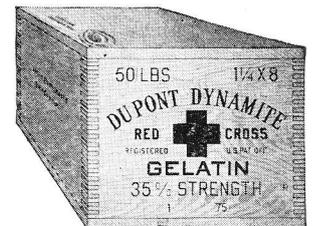


Repauno Gelatin 35-75%. This is a dense, plastic, highly water-resisting, and low-freezing explosive which gives a minimum of fumes on explosion. It is particularly suitable for wet work or where ventilation is deficient.

Du Pont Blasting Gelatin 100%. This is the strongest and quickest high explosive manufac-

ured. It can be used in close work as it gives a minimum of fumes when exploded. It is practically waterproof but is not low-freezing. It is especially suitable for blasting hard material in tunnels or in driving shafts.

Packages: Du Pont High Explosives cartridges measure from 7/8" by 8" to 2" x 8". They are shipped in cases which contain from 33 to 225 cartridges to the 50-pound case.



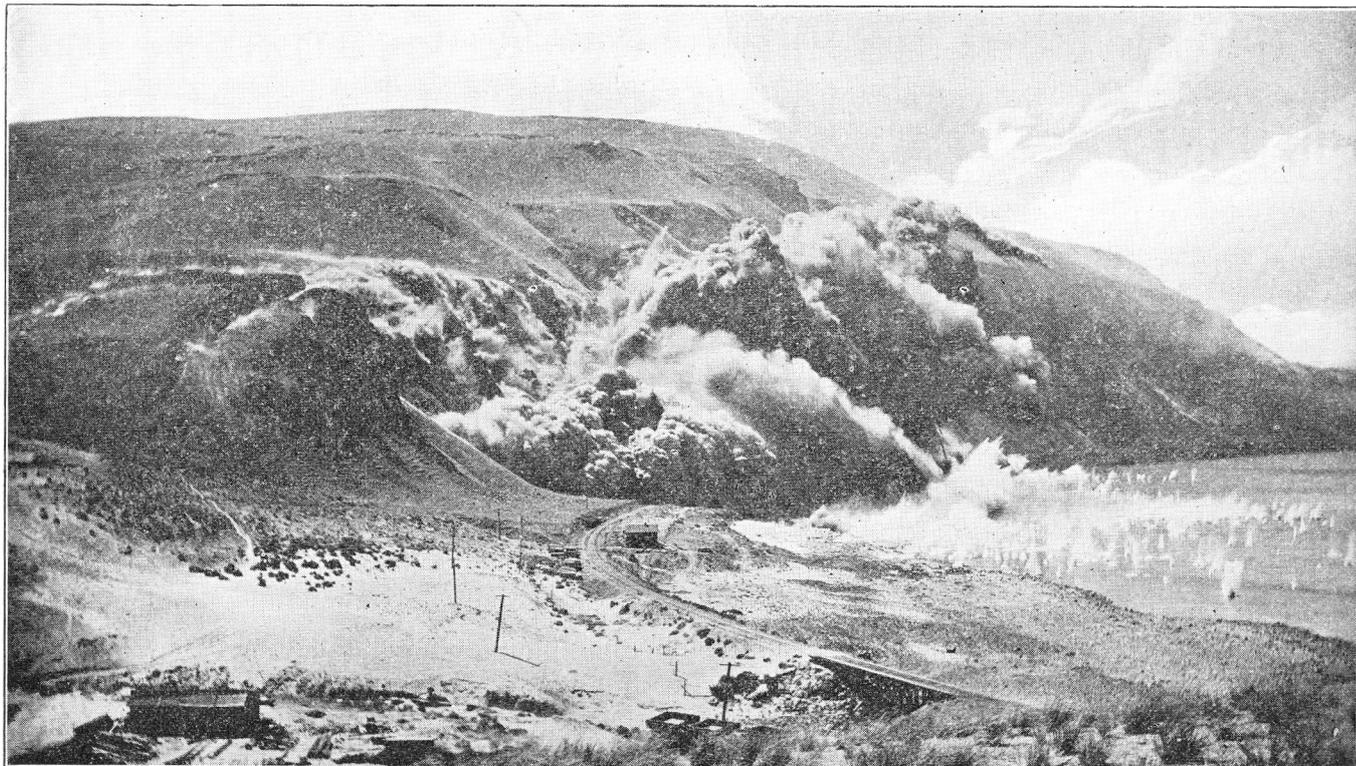
Blasting Powder For Mining

Blasting Powder is the principal explosive used for blasting where it is necessary to remove the rock or earth covering ore veins. The blasting powder breaks and loosens the ore, earth and rock so that it can readily be loaded with steam shovels. It is not wasted or scattered as would be the case if high explosives were used.

Today the "B" Blasting Powder of the Du Pont Company is recognized as the standard by which other blasting powder is rated. The high quality of materials used and their thorough incorporation by means of special machinery gives the miner a reliable, efficient explosive. That the miners recognize this is shown by the increasing demand.

"B" Powder is made in seven granulations. This variation in the size of the grains enables the selection of a grain exactly suited to individual requirements. The finer grains are much quicker in their action than the coarser.

Packages: Blasting Powder is packed in 25-pound metal kegs having a moisture proof cap.



Blast of 17,231 Kegs of Du Pont Blasting Powder and 13,658 Pounds of Du Pont Red Cross Dynamite in 68 Small Tunnels on O. W. & N. R. R. at Ayer, Washington. 300,000 Cubic Yards of Earth and Rock Blasted

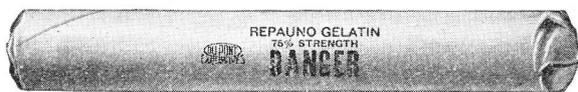
EXPLOSIVES FOR QUARRYING

Many of the explosives which are used for ore mining are also suitable for quarry blasting inasmuch as the nature of the work is often similar. There are, however, in addition to the explosives which will meet the requirements of both quarrymen and miners, some explosives which are used only for quarry blasting.

The following list gives the brands of Du Pont explosives for quarrying and the properties of each:

Red Cross Extra 20-60%. This explosive will rarely freeze in the coldest weather and is water resisting to a certain extent. It will not shatter the rock when properly loaded.

Red Cross Gelatin 35-90%. This is a moderately slow explosive that is low-freezing and only slightly affected by water.



Du Pont, Repauno and Forcite Gelatin 30-75%. For moderately slow, low-freezing and water resisting explosives these three can be recommended to quarrymen. Du Pont Gelatin is perhaps adapted to a wider range of work than any similar explosive. For quarrying hard rock in wet places any one of the three can be used.

Du Pont Blasting Gelatin 100%. For a quick, shattering explosive this will serve best. It is not low-freezing but is not affected by water.

Du Pont Straight 25-60%. Recommended for open work, in wet, hard material. It is low-freezing.

Du Pont Extra 30-60%. Where it is not desired to shatter the rock in quarry blasting, Du Pont Extra should be used. It is better suited for blasting soft material than Straight Dynamite but is not low-freezing and does not resist water well.

Du Pont R. R. P. This is the weakest and slowest high explosive—ranking between blasting powder and dynamite. It will rarely freeze in cold weather but even when frozen it will explode properly if the lumps are crumbled.



Blasting Powder for Quarrying

Blasting powders are weaker and slower than high explosives. "A" powder is made in six granulations and "B" in seven. The fine granulations are quicker than the coarser. These blasting powders exert a lifting and heaving, rather than a shattering effect. They cannot be used in wet work although "A" Blasting Powder resists moisture better than "B" Blasting Powder. Neither is affected by cold.

EXPLOSIVES TO MEET VARIOUS QUARRYING CONDITIONS

	DU PONT STRAIGHT	RED CROSS EXTRA	DU PONT EXTRA	GELATIN	BLASTING POWDER	R. R. P.
To shatter and throw hard stone.....	X			X		
To shatter and throw medium hard stone.....	Lower Strength					
To turn out hard, tough stone.....		X 40 to 60%	40 to 60%			
To turn out medium hard stone.....		Lower Strength	Lower Strength			X
To turn out soft or dimension stone.....					With air spaces	With air spaces
For wet work.....				X		
In cold weather.....	X	X		Except Blasting Gelatin	X	X
To avoid shattering.....					X	X

Packages—All except R.R.P. (in bags) and Blasting Powder (25 lb. keg) are put in 25 and 50 lb. cases.

Du Pont Blasting Accessories

Connecting Wire
Leading Wire
Tamping Bags
Electric Blasting Caps
Fuse

Blasting Caps
Delay Electric Igniters
Galvanometers
Delay Electric Blasting Caps

Rheostats
Thawing Kettles
Blasting Machines
Electric Squibs
Cap Crimpers

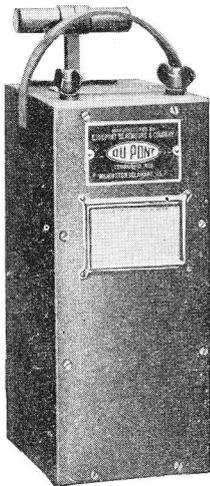
With so much money involved in the preparation for blasting, it is readily apparent that it is true economy to buy only the best blasting accessories. The confidence miners and quarrymen have in Du Pont Blasting Accessories is manifested by the steadily increasing demand.

In designing the Du Pont Accessories, care has been exercised to obtain simplicity of construction and to ensure a positive and effective performance of the machine or device employed. This is particularly true of the Du Pont Blasting Machines and testing apparatus. The detonators are composed of the very best materials and the ingredients are selected because of their fitness to accomplish what is required—imparting the necessary shock to the explosive charges to effect complete detonation.

As the largest manufacturers of explosives and because of its extensive experience in the explosives field, the Du Pont Company is competent to devise and introduce detonation apparatus especially suited to explosives used in quarrying or ore mining.

If you wish to save time and money, if you desire to get complete detonation of every charge of explosives, insist upon the use of dependable Du Pont blasting accessories.

Du Pont Blasting Machines—The Du Pont Company makes several sizes of Blasting Machines having capacities of 1 to 150 No. 6 Electric Blasting Caps fitted with copper wires. The most popular sizes are the Pocket Blasting Machine and Nos. 3 and 4.



Blasting Machine

The No. 3 Blasting Machine is illustrated to the left. The Pocket Blasting Machine also is shown on this page.

Blasting Machines Nos. 3 and 4 fire 30 to 60 copper wire electric blasting caps. They weigh 25 and 42 pounds, respectively. The machines are compact, as shown in the illustration, easy to operate and portable. The No. 3 Blasting Machine is the standard size for quarry and mine. No. 4 is popular for large quarry blasts.

The Pocket Size fires from one to three electric blasting caps at a time. It has a removable handle to prevent anybody but the shot-firer from firing the charges—a “safety - first” device greatly appreciated by quarrymen and miners. A quick, sharp turn of



Pocket Blasting Machine

the handle generates the current which passes through the two terminals seen at the top of the case, and then through leading wires attached to the terminal posts.

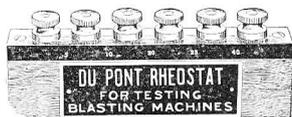
Much depends on the blasting machine, and the safest thing to do is to purchase the best.



Thawing Kettle

by the receptacle for the hot water.

Galvanometers, Rheostats—Practically indispensable accessories in electric blasting in mine or quarry are the galvanometer and the rheostat illustrated on this page. The galvanometer is a small, direct-reading ohm-meter used to detect breaks, short circuits, and points of high resistance in blasting circuits.

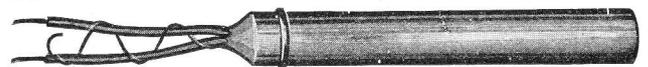


The rheostat is an electric resistance bridge for testing blasting machines.



Galvanometer

Electric Blasting Accessories. The Du Pont Company offers a complete line of supplies for blasting by electricity. In addition to the galvanometer, rheostat, blasting machine and blasting caps, it also manufactures connecting and leading wires. Blasting powder is best ignited in the center, and the best way is to use Electric Blasting Squib. Delay Electric Blasting Caps and Delay Electric Igniters are also supplied.



Du Pont No. 8 Electric Blasting Caps—Exact Size

Electric Blasting Caps. After careful experiments extending over many years, the Du Pont Company has selected the No. 6 and No. 8 Electric Blasting Caps as best fitted for all general work. The selection of the materials and the care in assembling the parts assure a blasting cap that will give complete detonation. The wires on the blasting caps are furnished in lengths varying from four to twenty feet. Waterproof blasting caps are also made by the company.

Packages: The Du Pont Electric Blasting Caps are supplied in cartons of fifty.

In addition to the accessories mentioned, the company manufactures cap crimpers in two types—No. 1 and No. 2. The No. 2 Cap Crimper is also used for cutting fuse. One handle in both types of instrument is pointed to serve as a punch for putting holes in cartridges.



Cap Crimper

Safety fuse is made in coils of fifty feet. Two rolls—one packed inside the other—are shipped in wooden cases. There are different types of Safety Fuse manufactured for dry, damp or wet work and work under water.

DU PONT EXPLOSIVES SERVICE

For 118 years it has been the constant aim of the Du Pont Company to deliver explosives where they are needed—when they are needed. Today this aim has been achieved by a system of mills and magazines, strategically located near practically every great industrial district.

Prompt delivery is but one factor of Du Pont Service. We aim to see that our customers use the kind of explosives that will give the best results for their particular work at least expense—and that they are handled, stored and used most efficiently.

In short, Du Pont Service is the result of a sincere effort on the part of the Du Pont Company to meet and follow the demand, and to pass on to the users of their products, in a practical way, the results of their 118 years of experience and research in the manufacture of explosives.

When you buy from Du Pont, you buy more than explosives; you buy Du Pont Service.

E. I. DU PONT DE NEMOURS & CO., INC.
Sales Department Explosives Division
WILMINGTON, DELAWARE

GENERAL EXPLOSIVES COMPANY



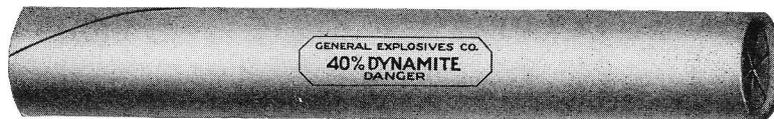
72 West Adams Street
CHICAGO

ST. LOUIS, MO. DENVER, COLO. JOPLIN, MO.
BIRMINGHAM, ALA. NEW ORLEANS, LA.



High Explosives Permissible Explosives
Blasting Powders Blasting Supplies

HIGH EXPLOSIVES



GENERAL NITROGLYCERIN DYNAMITE is the old reliable "Nitro" powder compounded on scientific principles so as to produce the maximum results. It is very quick and shattering in action

and is used for mud capping and for blasting extremely hard rock.

Made in both high and low freezing grades and in strengths ranging from 15% to 60%. A 50-lb. case contains about 100 1¼x8" cartridges.



GENERAL SPECIAL (Ammonia) DYNAMITE is a very economical powder for many kinds of mining work both above and below ground except in wet holes or where extreme shattering is required. It produces but little fumes and can be

used wherever moderately good ventilation exists. Made in both high and low freezing grades. Most mines prefer to use the low freezing grade in winter and some use it the year round. Made in strengths from 20% to 60%. A 50-lb. case contains about 100 1¼x8" cartridges.



GENERAL GELATIN is without any question the most satisfactory explosive on the market for underground work. Its plastic consistency, which facilitates loading in uppers, and its freedom from fumes, have made it invariably the favorite wherever used. Long experience in the powder business combined with expert technical knowledge of

the requirements has enabled us to accomplish these results.

It withstands water better than any other form of explosive and is made in both high and low freezing grades in strengths from 30% to 90%. A 50-lb. case contains about 85 to 90 1¼x8" or 100 to 105 1½x8" cartridges.

THE GIANT POWDER CO., CON.

SAN FRANCISCO, CALIFORNIA

BRANCH OFFICES
Butte, Montana
Denver, Colorado
Los Angeles, California



BRANCH OFFICES
Portland, Oregon
Salt Lake City, Utah
Seattle, Washington
Spokane, Washington

"Everything for Blasting"

BLASTING EXPLOSIVES

Giant Explosives

Made by the pioneer company in the explosive industry, are still the most popular brand in the West, because their qualities are recognized as superior in meeting every western requirement. When ordering any of the following grades, specify whether low freezing or high freezing explosives are wanted. A new series of non-freezing powders is now offered. Nothing weaker than a No. 6 blasting cap should be used with Giant Explosives.

Giant Non-Freezing

A new explosive furnished in five grades. Cannot freeze. No premature explosions. Does not cause headaches. Any size cartridge furnished.

Giant Powder—15% to 75%

For open work where shattering is demanded.

Giant Extra—15% to 60%

For all rock and ore blasting not exceptionally wet. Fumes not objectionable.

Giant Gelatin—25% to 90%

For rock blasting, tunnel driving and all wet work. Waterproof. Practically fumeless.

Giant Coalite

A permissible explosive furnished in nine grades to meet every coal mining requirement. Tested and approved by U. S. Bureau of Mines. Moisture and cold resisting. Unobjectionable fumes.

Giant Judson Improved Powder—5% to 20%

For open excavation blasts that are not wet. A granular, low powder, twice as strong as blasting powder. Put up in 12½ lb. bags; packed in 50 lb. cases.

Giant Blasting Powder

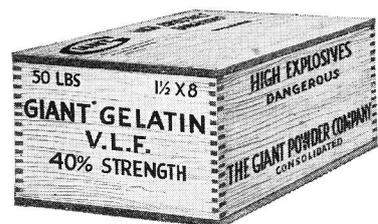
For all dry work where a quick acting explosive is not required. All standard granulations. Glazed or unglazed. Packed in 5 lb. cans and 25 lb. kegs.



Case—Giant Extra L.F. 60%



Keg—Giant Blasting Powder



Case—Giant Gelatin V.L.F. 40%

BLASTING SUPPLIES

Giant Blasting Caps—No. 6 and No. 8. For blasting with fuse.

Giant Blasting Cap Carrying Case (Moisture Proof). Carries and protects seven No. 6 and No. 8 blasting caps. The only safe and convenient means for the miner to carry his day's supply of blasting caps.

Giant Electric Blasting Caps—No. 6 and No. 8. Copper or iron wires. For blasting with electric blasting machines.

Giant Blasting Machines—Six sizes, including the Davis No. 1 Blaster, which is small and lightweight and fires five electric blasting caps. Other five sizes have capacity of from 10 to 150 electric blasting caps.



Giant Cap Carrying Case

Fuse—For detonating blasting caps or exploding blasting powder. Eleven brands.

Giant Cap Crimpers—For attaching electric blasting caps safely and securely to fuse. Two styles: No. 4 and No. 5.



Giant Electric Blasting Cap No. 8

Connecting Wire—For connecting electric blasting caps to each other. Small, insulated copper wire wound on 1 lb. and 2 lb. spools.

Leading Wire—For carrying electric current from blasting machine to charge. Heavily insulated copper wire.

Giant Galvanometers—For testing electric blasting circuits. No. 1 Galvanometer: Dimensions—2"x3"x5½". Weight, 1 lb. No. 2 Galvanometer: Dimensions—1¾"x3½"x4½". Weight 11½ lbs.

Giant Rheostats—For testing capacity of electric blasting machines. Dimensions: ¾"x1¾"x5½". Weight, 5½ oz.

Other Giant Blasting Supplies
—Include Delay Action Electric Blasting Caps, Delay Electric Igniters, Electric Squibs, Magazines (Portable and Storage), Miners' Squibs, Tamping Bags, Thawing Kettles, etc.



Giant Blasting Machine No. 6

HERCULES POWDER CO.

WILMINGTON, DELAWARE



Chicago
Denver

Hazleton, Pa.
Joplin

Chattanooga
New York

Pittsburg, Kan.
Pittsburgh, Pa.

Salt Lake City
San Francisco

St. Louis
Los Angeles

BRANCH OFFICES

Explosives, Blasting Supplies and Flotation Oils

Hercules Gelatin Dynamite

Hercules Low Freezing Gelatin Dynamite is distinguished by plasticity, high density, imperviousness to water, and freedom from noxious fumes. It is made in strengths from 25% to 75%.

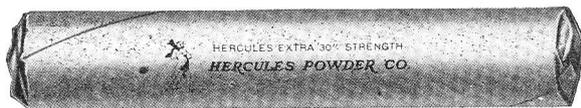
Hercules Gelatin is good for wet work, or for use where ventilation is poor. Its plasticity enables it to be loaded easily and effectively in holes having an upward slant, and the density and plasticity make it extremely well adapted for tight blasting in hard rock, such as tunnel driving, shaft sinking, etc.

It is packed in standard cartridges, 50 lbs. to the case.



Extra (Ammonia) Dynamite

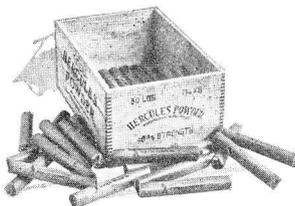
Hercules Low Freezing Extra Ammonia Dynamite is made in strengths from 15% to 60%. It is less expensive than the Gelatin or Straight Nitroglycerin Dynamites and is recommended for mining,



quarrying, digging wells, road and railroad construction, clay blasting and mud capping. It is not as waterproof as Gelatin or Straight Nitroglycerin Dynamites, but this defect is largely overcome by double dipping in paraffine. Packed in standard cartridges, 50 lbs. to a case.

Straight Nitroglycerin Dynamite

Hercules Low Freezing Nitroglycerin Dynamite is manufactured in strengths from 15% to 60%. It is suitable for work where a strong and quick explosive is required, and is, therefore, recommended for all kinds of hard, tight work where finely broken material is desired, and where the ventilation is good. It is also adapted for mudcapping, scrapping boilers and castings, propagated ditch and canal excavation. Packed in standard cartridges, 50 lbs. to the case.



Blasting Gelatin

Blasting Gelatin is the strongest, quickest and most waterproof explosive manufactured for commercial purposes, having a strength of 100%. Hercules Blasting Gelatin is especially adapted for use in cut holes, hard rock tunnel rounds, loads at the bottom of deep well-drilled holes, submarine blasts in hard rock, and as a primer for gelatin under special conditions. Packed in standard cartridges, 50 lbs. to the case.



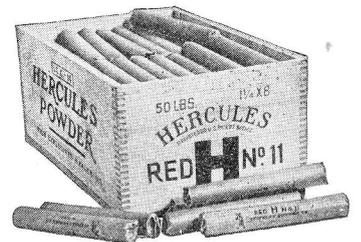
R. R. P.

Hercules R. R. P. belongs to the class of explosives known as granular dynamite, often called Judson. It is best adapted for use in soft seamy material and for large tunnel or "coyote hole" blasts in hard rock. Packed in paraffine paper bags containing 12½ lbs. The standard case holds

four of these bags, making a net weight of 50 lbs.

Red H

Hercules Red H is listed by the U. S. Bureau of Mines as a permissible powder for use in coal mining. Certain grades of Red H are used very successfully in open pit mining work. The weight for weight strength of Red H approximates very closely that of 60% Dynamite. On account of their bulkiness, different Red H grades will average about one-third more cartridges of a given size to the case than is found in a similar case of regular dynamite having the same sized cartridges; but each cartridge is equal to a cartridge of 35% Dynamite. Red H Nos. 11 and 14 will average 50% more cartridges per case than is found in a case of regular dynamite of the same sized cartridges, and their cost per cartridge is more than 30% less than the cost per cartridge of 40% Extra Dynamite.



Red H is packed in standard cartridges, 50 lbs. to the case.

Special No. 1

Hercules Special No. 1 is "bulkier" than ordinary dynamite and, therefore, contains a greater number of cartridges for any given weight. It will average 270 sticks (1¼"x8") per hundred pounds compared to an average of two hundred for 40% Extra Dynamite. For this reason, it costs approximately 25% less per cartridge than 40% Extra Dynamite. It is a very effective and economical explosive to use in many kinds of open pit, mining or quarry work, in either warm or cold weather.

HERCULES BLASTING SUPPLIES

Hercules Blasting Machines

An apparatus for generating electric current used in firing electric blasting caps, squibs, and igniters; made in six sizes with capacity for detonating from three to one hundred and fifty caps in series.



Blasting Machine	Capacity
Midget—Pocket Size.	3 Electric Blasting Caps
No. 2	10 Electric Blasting Caps
No. 3	30 Electric Blasting Caps
No. 4	50 Electric Blasting Caps
No. 5	100 Electric Blasting Caps
No. 6	150 Electric Blasting Caps

Galvanometers



A reliable and compact instrument for testing electric blasting circuits, electric blasting caps, and for locating breaks, short circuits, faulty connections. Weight 1 pound.

Hercules Rheostats



A small instrument offering the easiest and most effective means of testing the strength of a blasting machine without actually firing a series of electric blasting caps. This instrument gives a resistance equal to from 5 to 100 electric blasting caps, with 30 ft. copper wires.

Electric Blasting Caps

These are used to detonate charges of high explosives by means of electricity. They are made in two strengths, No. 6 and No. 8. These are furnished with insulated copper wires from 4 to 30 ft., or with iron wires from 4 to 8 ft. Packed 25 or 50 to the carton, 10 cartons to the case.



Electric Squibs



Hercules Electric Squibs are similar in appearance to Electric Blasting Caps, and are used to fire charges of blasting powders. Electric Squibs are made with 4 to 8 ft. iron wires, and 4 to 30 ft. copper wires. Packed 25 and 50 to the carton, 10 cartons to the case.

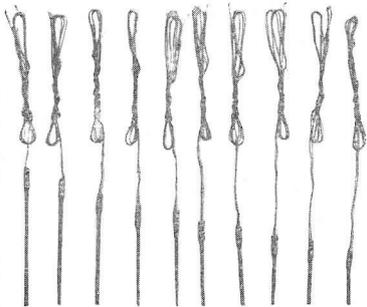
Delay Electric Blasting Caps

These are made in two delays. Three different periods can be obtained by using regular Electric Blasting Caps in the same circuit. Delay Electric Blasting Caps are made with copper wires 4 to 30 ft. Packed 25 and 50 to the carton, 10 cartons to the case.



Delay Action Electric Exploders

A combination Electric Igniter, Fuse and Blasting Cap, properly waterproofed, designed to fire charges in rotation by electricity, made in ten different delay periods. Furnished with copper wires, length 4 to 20 ft. Packed 25 and 50 to a carton, 10 cartons to the case.



Delay Electric Igniters

These igniters are similar to delay action exploders, made in six delays and used for firing charges of black powder in rotation. If desired, blasting caps may be crimped on the end of the igniter and used to fire high explosives. Connected with copper wires 4 to 20 ft. Packed 50 to a carton, 10 cartons to a case.

Leading Wire

Hercules Leading Wire is an insulated copper wire (No. 14 B. & S. gauge) used for connecting electric blasting caps to the blasting machine. It is furnished in coils from 200 ft. to 500 ft.

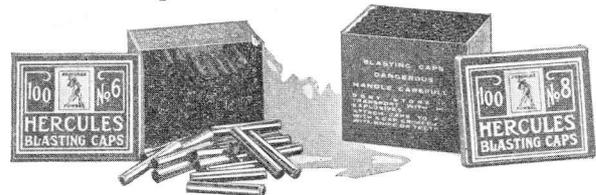


Connecting Wire

Hercules Connecting Wire is used to join the wires of electric blasting caps. It is a high grade insulated copper wire (No. 20 B. & S. gauge), and is put up in one and two pound spools.

Blasting Caps

Blasting Caps are used to detonate charges of high explosives. As the efficiency of any high explosive depends on the initial detonation, we do not recommend caps smaller than Hercules No. 6.



Standard sizes Nos. 6 and 8. Packed 100 in a box, 5 to 50 boxes in a case.

Safety Fuse

The Hercules Powder Company carries all standard brands of fuse. These are adapted to all kinds and conditions of work. All brands have definite burning speeds, and are packed in coils of 100 ft. Cases contain from 5 to 60 coils.

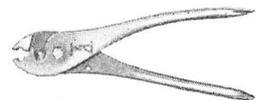


Cordeau Bickford Detonating Fuse

Cordeau is a fuse that detonates throughout its entire length, and is particularly effective in large charges of explosives. It is waterproof. Cordeau is wound on spools containing from 200 ft. to 500 ft. each, and it may be shipped by express.

Cap Crimpers

Hercules Combined Fuse Cutter and Cap Crimpers are especially constructed pliers made for the purpose of fastening blasting caps securely to fuse. They are equipped with a special fuse cutter, and one handle is made round and pointed for punching holes in sticks of dynamite in which the detonators are placed. These crimpers are nickel-plated, packed in cartons, 12 to the box.



Storage Magazines

The Hercules Powder Co. carries a complete line of sidewalk and steel storage magazines, having a capacity of from 1 to 924 fifty lb. dynamite cases.



Tamping Bags

Hercules Tamping Bags are made of heavy water resisting paper. They are very convenient and inexpensive. Made in sizes from 1" x 8" to 2" x 18". Packed in bales containing 5,000.

Consult with the Hercules Service Division on All Your Blasting Problems. For Further Detailed Information Write for Our Book, "Hercules Products"

THE GRASELLI POWDER COMPANY

CLEVELAND, OHIO

PITTSBURGH, PA.
UNIONTOWN, PA.
CUMBERLAND, MD.
CLARKSBURG, W. VA.



CHICAGO, ILL.
PHILADELPHIA, PA.
POTTSVILLE, PA.
WILKES-BARRE, PA.

For every blasting job there is a Graselli explosive exactly fitted for that job. We here list briefly the general characteristics of our various grades, and shall be glad to have one of our practical service men call and explain them to you in detail. He will also, if you desire, go over your blasting proposition with you and assist in selecting the grade best suited to conditions in your operation.

and therefore more desirable for many classes of work. It is less impervious to water than nitro glycerine grade, but the fumes are less objectionable.

Made in low-freezing and straight grades. 1 1/4 x 8 inch sticks pack 100 per 50-pound case; other sizes in proportion.

Nitro Glycerin Grade

Made in strengths from 20% to 60%.

A powerful, hard-hitting explosive for shooting hard, tough material. Not as suitable for underground work as other grades, as fumes are more objectionable. Can be shot successfully in wet holes.

Made in low-freezing and straight grades. 1 1/4 x 8 inch cartridges pack 100 to the 50-pound case; other sizes in proportion.

Gelatin Grade

Made in strengths from 30% to 75%.

The ideal explosive for wet work and where ventilation is not good. It is free from objectionable fumes and particularly adapted to tunnel work, shaft sinking, etc. Its plasticity enables it to be effectively loaded in upward-slanting or even in vertical overhead holes.

Made in low-freezing and straight grades. Averages 88 1 1/4 x 8 inch sticks per 50 pound box; other sizes in proportion.

Ammonia Grade

Made in strengths from 20% to 60%.

A general, all-around explosive. Its action is not as quick or shattering as the above grades, producing more of a lifting and heaving action,

Special Grades

We also manufacture special grades to meet certain special conditions. They vary as to speed, expansion, etc., according to the requirements of the job for which they are to be used.

Blasting Powder

Made in various granulations from CCC which is of slow, heaving action, to FFFF, for shooting material requiring a sharp, quick and more shattering action.

Blasting Supplies

Blasting Caps.

Electric Blasting Caps—Copper or Iron Wires—Various Lengths.

Safety Fuse—All Grades.

Cordeau-Bickford—The Detonating Fuse.

Cordeau Accessories.

Blasting Machines—For Firing Electric Blasting Caps—Capacities 1 to 150 holes.

Rheostats—For Measuring Strength of Blasting Machines.

Galvanometers—For Testing Blasting Circuits.

Cables, Lead and Connecting Wire, etc.

ILLINOIS POWDER MFG. COMPANY

General Offices

1548-51 Pierce Building, ST. LOUIS

Works: GRAFTON, ILLINOIS

Branch Offices

Steger Bldg., 28 E. Jackson Bl.
CHICAGO

1419 Central Bank Bldg.
MEMPHIS, TENN.

309-310 Victor Bldg.
KANSAS CITY, MO.

And Many Other Distributing Points

Makers of

“Gold Medal Dynamite”

Manufacturers Also of

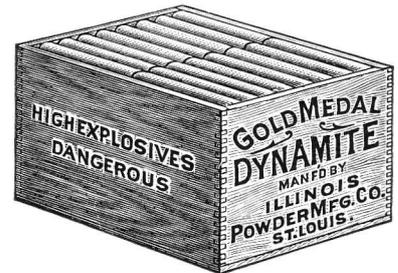
BLACK DIAMOND PERMISSIBLES AND BLASTING SUPPLIES—BLASTING POWDER

“GOLD MEDAL” DYNAMITE
A variety for every need.

“GOLD MEDAL” GELATIN
All Grades. All Strengths.

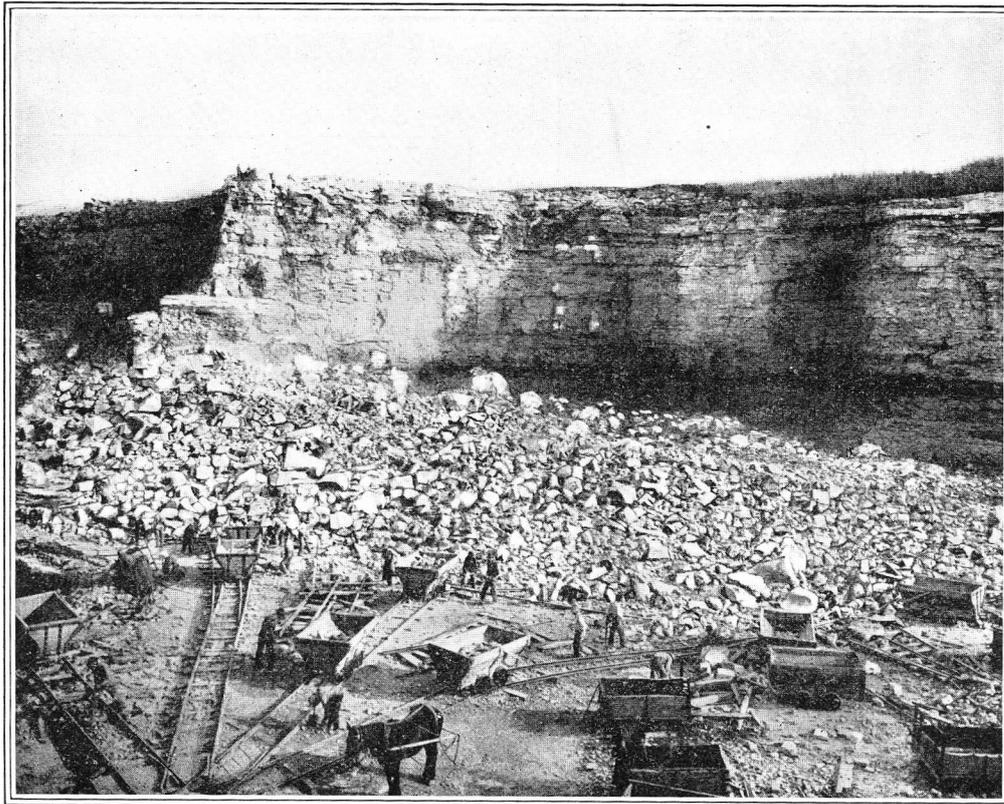
“GOLD MEDAL” PRODUCTS are Dependable—Uniform.

No requirements too small to receive our careful attention.
No demand too large for our facilities.



BLASTING SUPPLIES

The Illinois Powder Mfg. Co. carries a complete stock of Blasting Machines, Blasting Caps, Safety Fuse, Cordeau-Bickford Detonating Fuse, Electric Blasting Caps, Leading and Connecting Wire, Thawing Kettles, and all other Blasting Supplies. Every order is given careful and prompt attention. Your requirements are solicited.



THE RESULT! It Certainly Shows For Itself

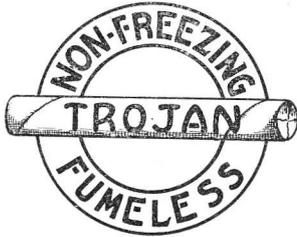
“GOLD MEDAL” DYNAMITE—“Stronger and Goes Further”

TROJAN POWDER COMPANY

General Office
ALLENTOWN, PA.

	Branch Offices	
NEW YORK	CHICAGO	MAHANoy CITY, PA.
PORTLAND, ORE.	DULUTH, MINN.	SAN FRANCISCO

Never requires thawing in cold weather.
Contains no liquid base to leak from cases.



For
Safety,
Efficiency
and
Economy
Use
Trojan
High Explosives

No "Powder Headache."

The accompanying illustrations show the effectiveness of TROJAN Powder in blasting large bodies of Copper Ore.

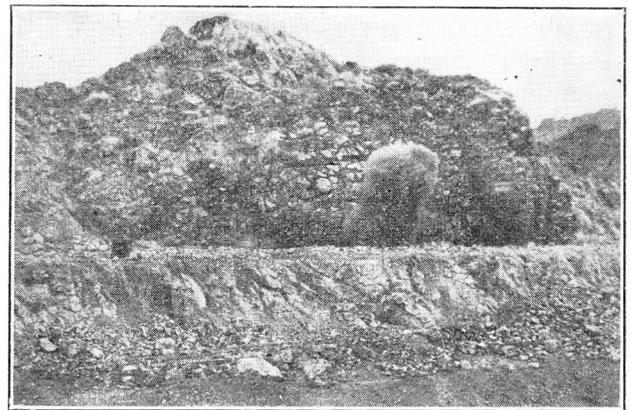


Fig. 2

Fig. 2 shows the hill of Copper Ore at the instant blast was fired.

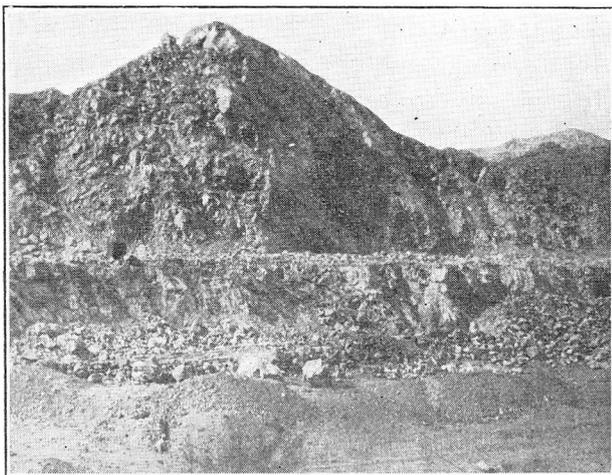


Fig. 1

Fig. 1 shows the hill of Copper Ore before the blast.

In a blast made with TROJAN Powder, more than a million (1,000,000) tons of hard trap rock were successfully brought down at one time and practically no secondary shooting was required to prepare the stone so the shovels could handle it.

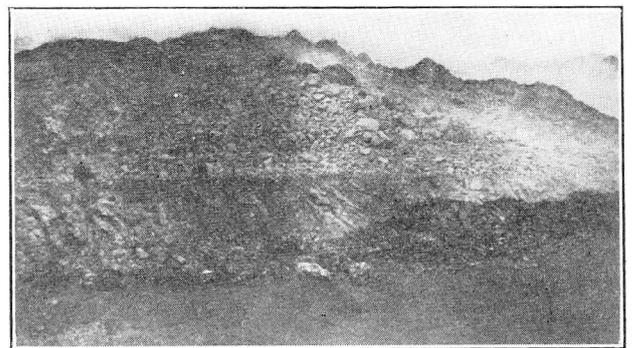


Fig. 3

Fig. 3 shows the pile of well broken Copper Ore after the blast. This single blast brought down 179,500 tons of ore, which required very little powder for secondary shooting. This was a "Tunnel Blast," and from the results obtained it is considered one of the most successful blasts ever made.

**Our Blasting Experts Can Show You How to Obtain Similar Results with TROJAN Powder
in All Classes of Quarrying and Mining**

THE NATIONAL FUSE & POWDER CO.

DENVER, COLORADO

Manufacturers of

Safety Fuse for All Kinds of Blasting

It is essential for the purpose of safety and economy to purchase a fuse adapted to the work for which it is to be used. We advise the use of the following brands for work in metal mining, and to the purchaser we give the following brief descriptions:

Sylvanite

A moderate price fuse for use in dry or damp work. Has no tape but is cotton countered with greyish-black finish.

Single Tape

Is same grade as Sylvanite, having a tape, with greyish-black finish.

Double Tape

For use in wet work. Has two tape coverings, adding strength and waterproof qualities.

Triple Tape

For use in wet work. Has three tape coverings and is to be used in very wet work.

Bear

Is a single taped, cotton countered, white finished fuse, adapted to wet work.

White Monarch

Is a double cotton countered, white finished fuse for wet work and reliable for general mining work.

Black Monarch

Same as White Monarch except it has greyish-black finish and adapted for work in very wet places.

Recommendations

In extremely wet work Black Monarch, Bear and Triple should be used.

If work is to be done in extremely cold places, Sylvanite, Monarch and Bear should be used in preference to Single, Double and Triple.

Speeds of Burning

All our brands have a speed of 41 seconds per foot when burned in the open at an elevation of 5,280 feet, with an allowable variation of 10% either way from standard.

Shipments

Fuse is packed in a roll, containing two 50-foot coils. It is packed in the following sized cases:

No. 0.....	500 ft.
No. 1.....	1000 ft.
No. 2.....	2000 ft.
No. 3.....	3000 ft.
No. 6.....	6000 ft.

Prices, sample cards and further information furnished on request.

Mine Lighting Section



FOR INDEX TO ALL ENGINEERING DATA SEE PAGES 5, 6 AND 7.

THE FOLLOWING MANUFACTURERS AND DEALERS ARE REPRESENTED IN THIS SECTION

Dewar Manufacturing Co., Inc.
Edison Storage Battery Co.
Justrite Manufacturing Co.
Shanklin Manufacturing Co.
Union Carbide Sales Co.
Wolf Safety Lamp Company of America, Inc.

FOR LIST OF EQUIPMENT USED IN MINING AND QUARRYING
SEE PRODUCTS INDEX (Blue Sheets)

Edison Storage Battery Company

Factory and Main Office

316 LAKESIDE AVENUE, ORANGE, N. J.

Manufacturers of the

Edison Electric Safety Mine Lamp



NEW YORK
ATLANTA
NEW ORLEANS

BOSTON
CLEVELAND
DETROIT

Distributors in
PHILADELPHIA
PITTSBURGH
WASHINGTON

CHICAGO
ST. LOUIS
MONTREAL

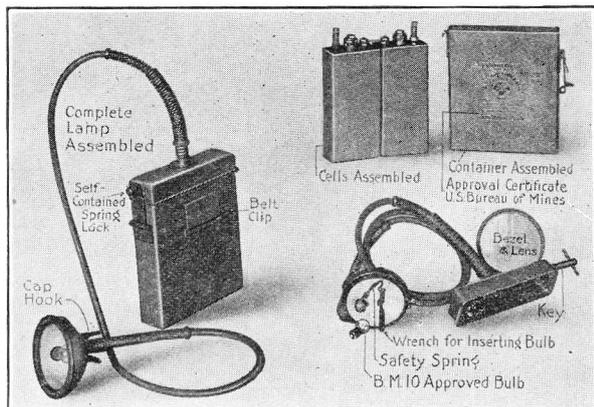
SAN FRANCISCO
SEATTLE
LOS ANGELES

General Distributors

Mine Safety Appliances Co., Pittsburgh, Pa.

The Edison Electric Safety Mine Lamp

The Edison Mine Lamp is a **permissible** portable Electric Mine Lamp. It is the first to be approved by the Bureau of Mines for Safety, Practicability, Efficiency and General Durability in Mine Service.



Unassembled View Edison Mine Lamp

Standard in over 1,000 mines, over 175,000 in use in Metal and Coal Mines of the United States.

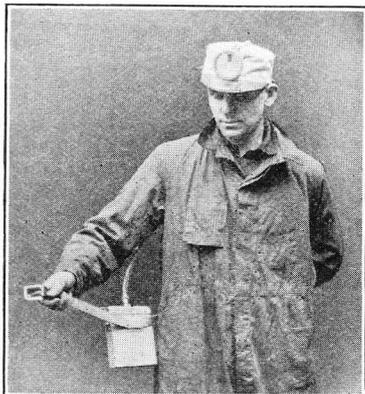
Older installations show uninterrupted service over five years.

Burns 12 hours without recharge.

Fire Protection for your valuable operation.

Method of Attaching

The miner straps the battery case to his back by an ordinary belt. The lamp is attached to the



Method of Attaching

leather support in his cap, leaving his arms entirely free of lamp, cord and battery case.

Described in Bulletin No. 300.

See Page 271 for details of the Edison Battery.



Edison Shot-Firing Battery. Showing how special cover for shot-firing is attached to regular Edison Mine Lamp.

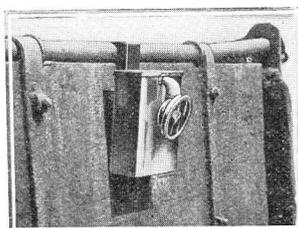
The Edison Electric Shot-Firing Battery

Showing cover for M-8 Mine Lamp Battery arranged for shot-firing. Shot-firing cable is attached to a key furnished with cover. Key is then inserted in receptacle on cover, and detonation accomplished by pressing key into contact. Cover is furnished with or without fittings for lamp attachment.

It is simple, light-weight, strong and durable. One charge of the battery is capable of firing a great many shots.

Edison Electric Safety Trip Lamp

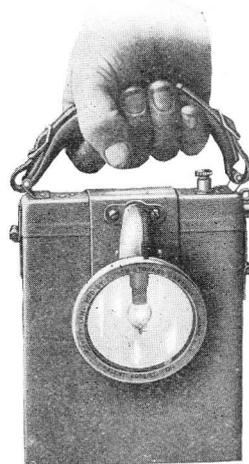
Consists of M-8 (Mine Lamp) Battery in steel case with special cover and lens. The case is provided with hook for attaching to mine car as "head" or "tail" light. This device is approved by the Workmen's Compensation Insurance Inspectors.



Edison Trip Lamp—Hooks Over Either End of the Car

Edison Electric Safety Hand Lamp

Illustration shows arrangement of Edison Safety Mine Lamp as a hand lamp. This consists of a standard M-8 Battery in steel case with special cover. The lamp is attached directly to cover and the cover provided with bails for attaching leather handle. Largely used as Inspector's, Official's and Visitor's lamp.



Electric Safety Hand Lamp

DEWAR MANUFACTURING CO., Inc.

BROOKLYN, N. Y.

Manufacturers of

CARBIDE LAMPS

FLOAT  FEED
CARBIDE HAND LAMPS



CARBIDE CAP LAMPS

Products

Carbide lamps in all sizes and styles for every mining purpose. Models here illustrated are most desirable for metal mining. Also manufacture smaller size Cap or Pit lamps.

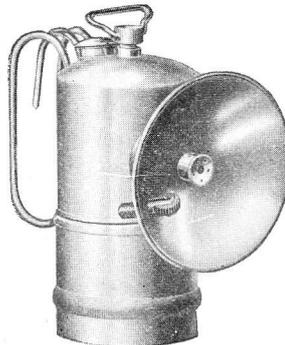
All lamps shown, excepting No. 150 and No. 160, are made of heavily tinned drawn steel—Ears and Handles are welded.

No. 150 and No. 160 made of extra weight drawn brass, nickel plated. These numbers are generally used by Superintendents, Shift Bosses, etc.

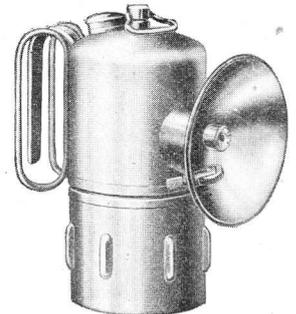
The ITP Float Feed automatically regulates the water flow and governs the gas pressure. The flame size is constant, as steady as a ray of sunshine, with never a need of hand regulation.



No. 205



No. 160



No. 203

No. 205

Height 6½ inches; Height to top of bail 9¾ inches; Weight 19 ounces; Burning capacity—9 hours. Wind and Drip Proof.

No. 160

Height 5¼ inches; Weight 11 ounces; Burning capacity—6 hours. Wind and Drip Proof. Hinged Wire Handles.

No. 203

Height 6½ inches; Weight 19 ounces; Burning capacity—9 hours. Wind and Drip Proof. A substantial inspectors lamp.

No. 210

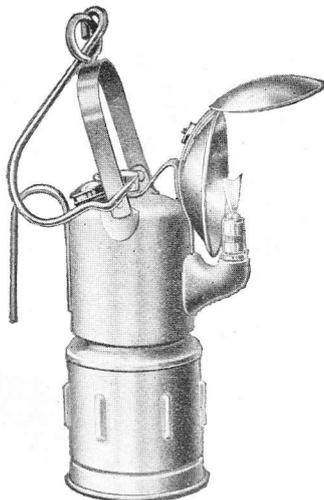
Height 7 inches; Height to top of bail 10¼ inches; Weight 2 lbs; Burning capacity—6 hours. Flat Flame Burner.

No. 150

Height 5¼ inches; Height to top of bail 7 inches; Weight 12 ounces; Burning capacity—6 hours.

No. 215

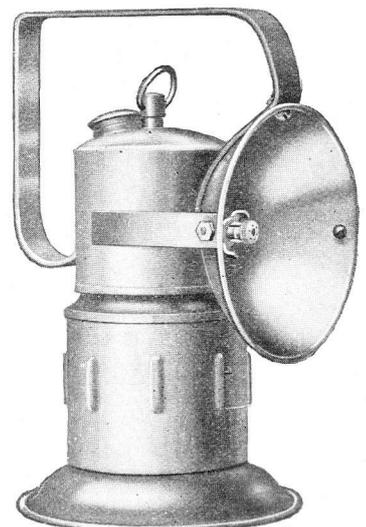
Height 7½ inches; Height over all 9½ inches; Weight 2 lbs; Reflector 4½ inches in diameter; Burning capacity 9 hours.



No. 210



No. 150



No. 215

JUSTRITE MANUFACTURING CO.

2061-2081 Southport Ave., CHICAGO, U.S.A.



Manufacturers of
Carbide Miner's Lamps

For All Mining Purposes

Products

Miner's Lamps—all types—in brass, steel and aluminum.

Miner's Caps—Carbide Flasks—Burner Tips—and all necessary supply parts.

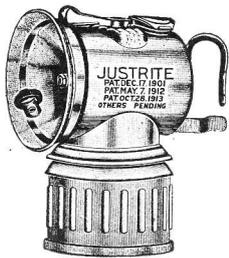
Sanitary Pails and Oily Waste Cans.

The models illustrated on this page are the most desirable for metal miners, and are known as "Metal Mine Lamps."

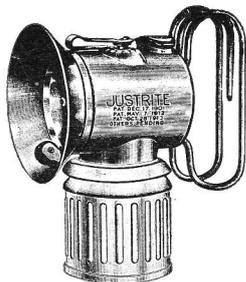
All lamps are equipped with self-lighter attachment. "Justrite" Lamps are constructed on scientific principles—only the very best material and workmanship being used. Every lamp is guaranteed.

If interested in other models, consult our general catalog.

LARGE TYPE LAMPS



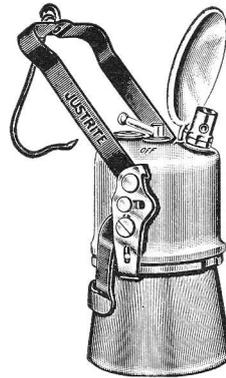
Cap Lamp
No. 407—Wire Feed
No. 707—Polygon Feed
Burns 2½ hrs.
Brass or Nickel



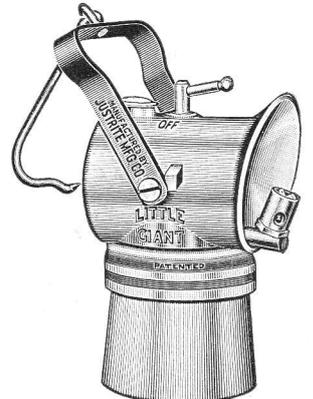
Superintendent's Lamp
No. 95—Burns 4 hrs.
No. 302—Burns 5 hrs.
Brass Nickelplated



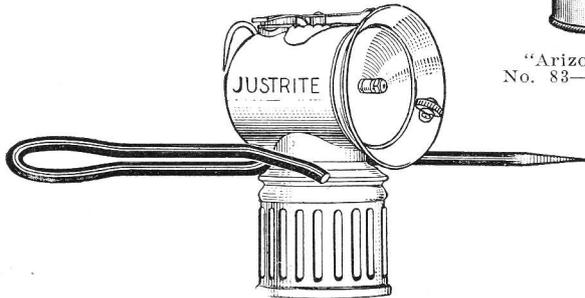
"Arizona Special"
No. 83—Burns 5 hrs.
Brass



"Uncle Sam"
No. 306—Burns 6 hrs.
No. 308—Burns 8 hrs.
Aluminum



"Little Giant"
No. 110—Burns 6 hrs.
Aluminum



Candle Stick Lamp
No. 103—Brass. Burns 4½ Hours

**The New "Acme" Steel Lamps
Rustproof Finish—Half Shift Size**

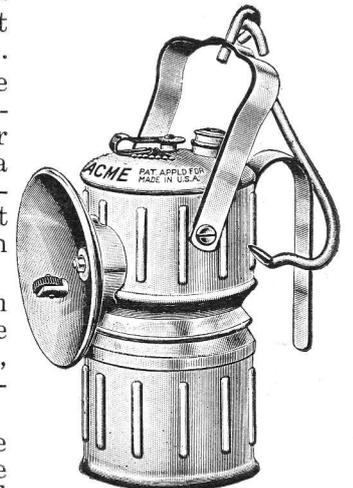
"A Strong and Rugged Steel Lamp."

The "Acme" Lamp is so constructed that it will give the miner a dependable and efficient light at the most economical cost.

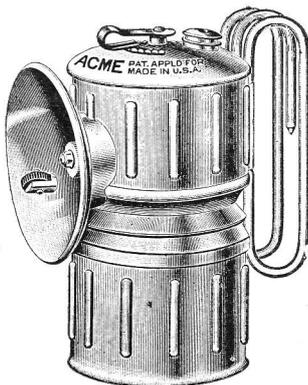
Note particularly the reflector, which fits snugly into the reflector brace, and is held in a permanent and rigid position by the knurled nut—not easily bent, broken or lost.

This lamp has been tried by many of the large mining companies, and has given most excellent service.

Consistent with the cost of this lamp, it is the best value of any steel lamp on the market.



No. 50—With Bail and Hook
Steel



No. 56—With Folding Handle
Steel

SPECIFICATIONS

- Burning Capacity—5 to 6 hrs.
- Candle Power—18 C. P.
- Weight—15¼ ounces.
- Charge (¼" Carbide) 5 ozs.
- Height of Lamp—5½ inches.
- Height to top of bail—7¾ in.
- Diameter Bottom—2⅞ inches.
- Diameter Reflector—3 inches.

WRITE FOR CATALOG

WORLD'S LARGEST MANUFACTURERS OF CARBIDE MINER'S LAMPS

SHANKLIN MANUFACTURING CO.

2725-27-29 S. Eleventh St., SPRINGFIELD, ILL.

Miners' Carbide Lamps and Supplies

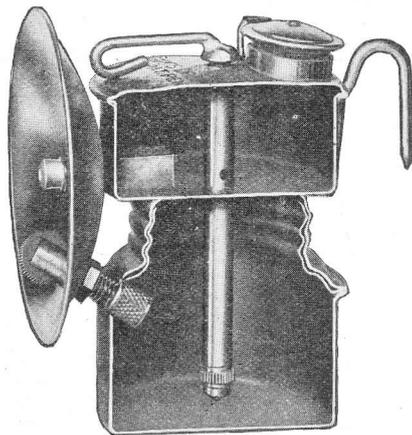
Products

Miners' Carbide Lamps; Carbide Lamp Supplies.

Shanklin's Carbide Lamps

These lamps are made in a wide variety of styles, as described below.

The outstanding feature of all lamps is the Guy Patented Water Dropper, which was perfected several years ago by Mr. Frank Guy, a practical miner, and we have used it for eight years in our lamps, during which time it has proved to be a most accurate and thorough device for feeding water to our Carbide Lamps.



Guy's Patented Water Dropper

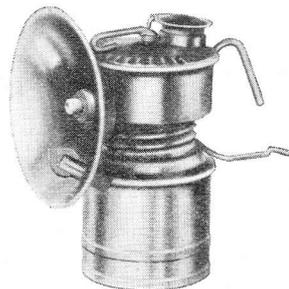
A feature of the Guy Water Dropper is the Valve Cleaner, which is a knurled thimble put on the dropper between the button and the end of the dropper tube. If dirty water is used and the dropper becomes clogged, a few turns of the valve cleaner with the fingers will open it up.

No. 22 S. L. Lamp

Has 2 3/4" polished reflector, fastened to lamp with lock-nut screwed on burner tube. Reflector is strongly reinforced on back to protect it from accidents. Intended for use in rooms or entries with high roofs.

Brass lamp only, retail price \$1.00.

No. 22 Lamp, same as No. 22 S. L., without self-lighter added to reflector. Retail price \$1.00.



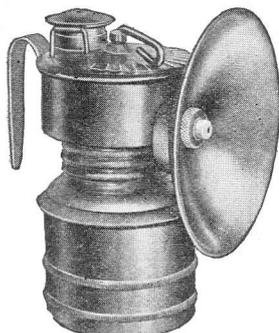
Round or Hex. Bottom; Flat Hook or Round Hook and Brace

No. 220 S.L. Lamp, same as No. 22 S. L., but nickel plated. Retail price \$1.25.

No. 23 Lamp

Has large, deep, highly polished 3-inch reflector, fastened to lamp by lock-nut screwed to burner tube. Reflector strongly reinforced on back to protect it from injury.

Intended for inspectors and workmen needing an extra large light.



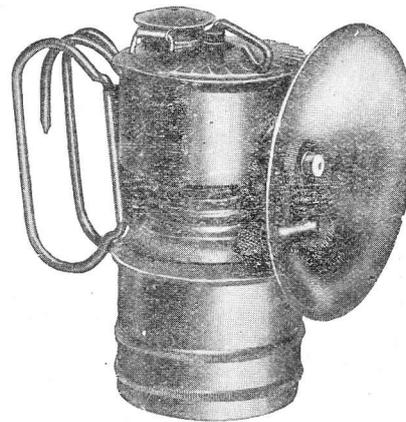
Round or Hex. Bottom; Flat Hook or Round Hook and Brace

Throws a bright spot of light 50 feet.

Brass lamp only. Retail price \$1.00.

No. 23 S. L. Lamp has self-lighter attachment on reflector. Retail price \$1.15.

No. 230 S. L. Lamp is same as No. 23 S. L., but nickelplated. Retail price \$1.40.



Superintendent's Lamp

No. 10 S. L. Lamp Superintendent's hand lamp. Can be furnished with any of our reflectors, but is usually equipped with the No. 23 S. L. reflector.

Has 50 per cent. more capacity than our regular lamp and will burn 4 hours. Has large hook and large folding handles.

Can be worn on the cap.

Brass lamp only; retail price \$1.50.

No. 100 S. L. Lamp. Same as No. 10 S. L., but nickelplated. Retail price \$1.75.

No. 6 S. L. Lamp

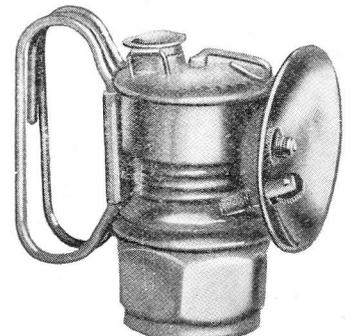
Has an extra large, deep 2 3/4-inch reflector highly polished. Reflector fastened to lamp by lock nut in usual manner. Reflector strongly reinforced on back to prevent injury. Intended for superintendents or inspectors needing an extra large, strong light. Throws a bright spot of light 50 feet. Lamp is same size as regular cap lamp and equipped with handles. Can be worn either on the cap or carried in the hand.

Retail price \$1.35.

No. 60 S. L. Lamp. Same as No. 6 S. L., but nickel-plated. Retail price \$1.60.

No. 4 Candlestick

Slips on over bottom of lamp. Much stronger and better than a stick that clamps around the screw cap. Does away with the screw cap spreading and making a gas leak around the rubber gasket. Fits our cap lamps and four-hour lamps.



No. 6 S. L. Lamp



Candlestick

Retail price 30 cents each.

No. 6 Candlestick

Same as No. 4, but made to fit our half-shift lamps. Retail price 35 cents each.

Supply Kit

Contains an assortment of lamp supplies most frequently called for by the miner; also, the repair parts most likely to become lost or worn out, and which require replacement.

Conveniently arranged in a strong, durable cardboard box with hinged cover.

No. 1—\$8.00; No. 2—\$4.50.



Supply Kit

Wolf Safety Lamp Company of America, Inc.

227 Grand Avenue, BROOKLYN, N. Y.

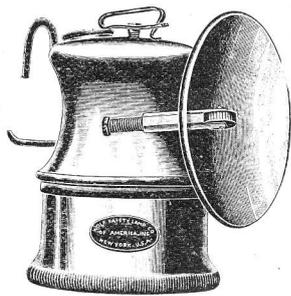
Miners' Carbide Lamps

Products Made in U. S. A.

Miners' Carbide Lamps for hand, cap and trip. Miners' Safety Lamps burning naphtha, vegetable oil and carbide. Tools and accessories for all types of lamps. Newton Oiling Device for mine car wheels.

Wolf's Carbide Cap Lamp No. 911-c (Made in Brass) (Patent Pending)

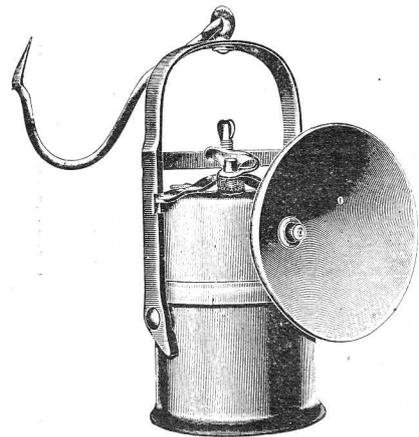
The lamp is furnished with an automatic non-adjustable water-feed, which, if desired, can be made adjustable by simply removing the wire pin from the water dropper. The lamp is double-locked, rendering it impossible for gas to escape at the joints between the carbide and water container. We have designed the lamp large enough to burn about four hours, thus only requiring one refilling during the shift—yet the lamp is light enough to be carried on the cap without discomfort. Every part on the lamp can be replaced. The lamp is well built, durable and economical.



No. 911-c. Carbide Cap Lamp.

Wolf's Carbide Hand Lamp No. 905-a

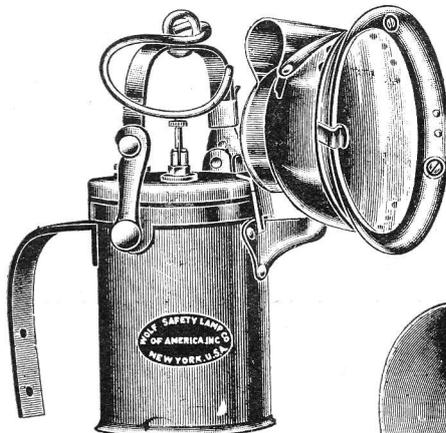
With parabolic reflector with stiff bridle lever lock, made in steel or in brass in half or full shift size. The construction of the reflector, which pro-



No. 905-a. With Parabolic Reflector.

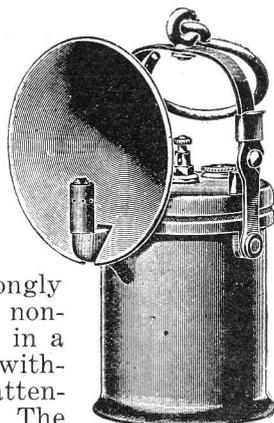
Wolf's Carbide Lamps No. 856 for Hand or Trip

Made in steel or in brass in half or full shift size. This lamp is equipped with a simplified bridle



No. 856. Lamp with Reflector Hood (Trip Light)

lock and is simply but strongly constructed. The automatic non-adjustable waterfeed results in a steady bright burning flame without necessitating constant attention to the water-regulation. The durability of the lamp is shown by the fact that lamps of this type have been in use continually without requiring any attention.

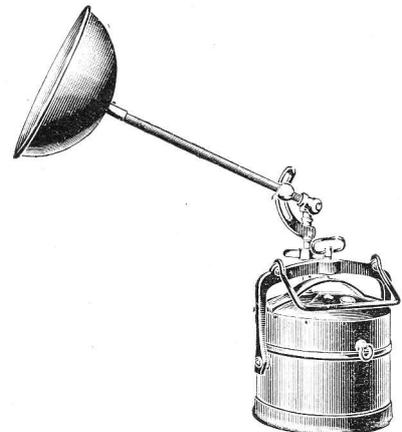


No. 856. Lamp with Ordinary Reflector.

protects the flame against dripping water, makes this an ideal lamp for use in wet mines. This lamp also is sturdily built and of greatest durability. The water feed on this lamp is adjustable.

Wolf's Stationary Acetylene Lamp No. 762

With movable reflector. This lamp is made in one size and steel only. It burns about 14 to 16



No. 762. Lamp, With Movable Reflector.

hours with about 100 c. p. It is a suitable lamp for lighting large working places and has found great popularity in mines and tunnels.

There is a Wolf Lamp for every purpose. We make various types and styles of carbide lamps and lanterns. Do not fail to ask for our special catalog.

UNION CARBIDE SALES COMPANY

NEW YORK
Carbide and Carbon Bldg.
30 East 42nd St.

CHICAGO
Peoples Gas Bldg.

SAN FRANCISCO
Balfour Bldg.

Sole Distributors of

"Miners Lamp" Union Carbide

Union Carbide

Is a manufactured, gas producing substance, in general appearance and weight resembling crushed granite. It will not burn, cannot explode, and will keep for years in the original package without deterioration.

Where and How It Is Made

Union Carbide is manufactured by the Union Carbide Company, original producer of Calcium Carbide and today the world's largest maker of this product. The Union Carbide plants are located at Niagara Falls, N. Y., and Saulte Ste. Marie, Mich.

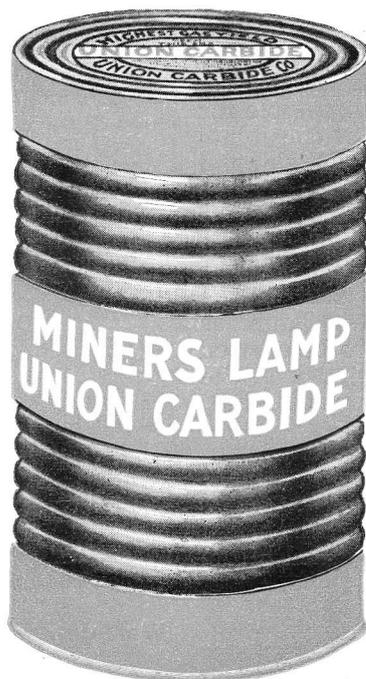
Union Carbide Purity and High Gas Yield

The most exacting precision is employed in grinding and mixing the materials during manufacture. This, combined with the fusing of the mixture in electric furnaces at a temperature of 6,000° Fahrenheit, assures the user of Union Carbide, a product of the highest commercial purity. And every pound of Union Carbide will furnish about 5 cubic feet of acetylene gas when used in the acetylene generating apparatus.

What Union Carbide Is Used For

Union Carbide is extensively used for mine lighting—both in miners' cap lights and hand lamps. It is also used in acetylene generators to

supply gas for lighting country houses, hospitals, schools, churches, factories and town lighting plants. Used in conjunction with oxygen, Carbide Gas—acetylene—produces the hottest flame known to science, as developed in the oxy-acetylene process for welding and cutting metals.



"Miners Lamp" is the size of Union Carbide specially selected and adapted for use in miners' carbide lamps.

How Union Carbide Is Packed

UNION CARBIDE IS ALWAYS PACKED IN BLUE AND GRAY DRUMS.

For the convenience of distributors and miners, "Miners Lamp" is packed in 100-lb. and 25-lb. steel drums; also in 2-lb. and 10-lb. metal cans packed in cases. Every drum or can of "Miners Lamp" Union Carbide is plainly marked.

How Union Carbide Is Sold and Distributed

Union Carbide Sales Company is the sole distributor of Union Carbide.

For the service of acetylene users, we maintain warehouses in the cities listed below, where large stocks are maintained at all times. Immediate shipment can be made on all orders sent direct to Union Carbide Sales Company at any of the addresses given below.

List of Warehouses of Union Carbide Sales Company Located in Districts Reached by This Book

Alabama Birmingham Mobile Montgomery	E. St. Louis Marion Monmouth Peoria Quincy Streator Springfield	Maine Portland	New Jersey Camden Newark	Mansfield Steubenville Toledo Zanesville Youngstown	Texas Dallas El Paso Houston San Antonio Waco
Arizona Phoenix	Indiana Evansville Fort Wayne Indianapolis Terre Haute	Maryland Baltimore Cumberland Salisbury	New York Albany Binghamton Buffalo Geneva Hurleyville Jamaica Kingston Niagara Falls Poughkeepsie Utica Watertown Whitehall	Oklahoma Oklahoma City Tulsa	Utah Salt Lake City
Arkansas Ft. Smith	Iowa Davenport Des Moines Dubuque Fort Dodge Ottumwa Sioux City Waterloo	Massachusetts Springfield Worcester	North Carolina Charlotte Wilmington Raleigh	Oregon Portland	Virginia Lynchburg Norfolk Richmond
California Fresno Los Angeles Sacramento San Diego San Francisco	Kentucky Louisville Middlesboro	Michigan Detroit Grand Rapids Hancock Iron Mountain Jackson Muskegon Saginaw Saulte Ste. Marie	North Dakota Fargo	Pennsylvania Beaver Du Bois E. Greensburg Erie Harrisburg Johnstown Pittsburgh Pottsville Scranton Shamokin Williamsport	West Virginia Bluefield Charleston Elkins Fairmont Huntington Morgantown Wheeling
Colorado Denver	Louisiana New Orleans	Minnesota Minneapolis Virginia	Ohio Canton Cincinnati Cleveland Columbus Dayton Lima	South Carolina Charleston	Washington Seattle Spokane
Connecticut Hartford		Mississippi Vicksburg		Tennessee Chattanooga Knoxville Memphis Nashville	Wisconsin LaCrosse Madison Milwaukee
District of Columbia Washington		Missouri Kansas City St. Joseph St. Louis			
Florida Jacksonville Tampa		Nebraska Omaha			
Georgia Atlanta Savannah					
Illinois Chicago Decatur					