Action of Explosives

Lesson No. 1 of
BLASTERS' HANDBOOK

All explosives are solids or liquids that can be instantaneously converted by friction, heat, shock, sparks or other means into large volumes of gas. That sounds simple, but this fundamental principle of the action of explosives is modified by a host of circumstances.

First there are "high" and "low" explosives. Then there are all the circumstances of purpose, methods of loading and firing and handling and storing. Explosives are measured principally by these general characteristics: Strength, Velocity, Water Resistance, Density, Fumes, Temperature of Freezing, and Length and Duration of Flame.

Chapter One of the Blasters' Handbook makes this seemingly complicated subject very easily mastered. Charts and tables explain relative energy of different strengths. Other characteristics are explained in classroom terms, and amply illustrated.

Many of the leading technical colleges, universities and schools are using the Blasters' Handbook in their classroom because of its perfect practicality. Made up by du Pont field service men out of their own experience in a great many fields over a great many years. The textbook of the "school of experience."

You ought to have this experience text-book. A valuable reference and study work. Yours for the mere asking. Here's a coupon for your convenience.
WHEREVER WHEELS AND SHAFTS TURN

Industry's profile cuts the sky—express trains glide by—traffic whistles shriek, sirens snort, bells clang. In the thick of industry and transportation are Timken Bearings in railroad and street car journals, electric motors, buses, trucks, motor cars and machinery of all kinds—saving lubricant, reducing friction, and prolonging machine life.

Where roads are to be made, rivers bridged—where men mine the earth or use its soil for growing grain or pierce it deep to tap the oil supply—there again are Timken Bearings and Timken benefits.

Everything we eat or wear, buy, sell or use—every move we make in transporting people or products—there are Timken Bearings with their exclusively combined Timken tapered construction, Timken POSITIVELY ALIGNED ROLLS and Timken electric steel.

For wherever power is applied through moving parts, Timken Bearings are bettering the work of the world—cutting costs and increasing production wherever wheels and shafts turn. So universal has this condition become that every student engineer owes it to himself to include in his course a thorough and detailed study of the application of Timken Tapered Roller Bearings to all types of industrial equipment.

THE TIMKEN ROLLER BEARING CO.
CANTON, OHIO

TIMKEN Tapered Roller BEARINGS
MARCH, 1929
The Modern Dinosaur
— a beneficent monster that wars on coal mine costs

The new Sullivan Coal Loader is a giant in power and speed. But it responds quickly to sensitive controls. It moves steadily to the working place, opens great jaws to gather up coal, and swings its steel tail to load the cars—with only two men to guide it.

Primarily, the machine consists of a shovel plate, with a bit-studded roller, and two conveyors. It is equipped with a substantial frame, and crawler traction.

Each digging, conveying, and moving member is independently controlled. The machine forges its own way into the pile, and the coal is pulled by the roller, onto the conveyors which deliver it to the cars in the rear.

These loaders will handle 200 to 300 tons in an 8-hour shift.

Sullivan Coal Mining Equipment has pioneered for more than a generation, in improving mining efficiency.

Catalogs on Loaders, Coal Cutters, Diamond Core Drills, Air Compressors, Rock Drills, and Hoists will be sent free to engineering students, on request.

Ask also for the booklet outlining your opportunities if you should join the Sullivan organization.

SULLIVAN MACHINERY COMPANY, 164 S. Michigan Ave., Chicago

MARCH, 1929
Back of the five remarkable qualities that give Reading Genuine Puddled Wrought Iron Pipe its long, long life stands the flame-filled puddling furnace—the time-tested method of making genuine puddled wrought iron.

It is in the puddling furnace that the fiery, hot, pure iron and silicious slag are stirred and worked together until every inmost particle of the iron is coated with corrosion-defying slag. Out of the puddling furnace comes genuine puddled wrought iron—the same wrought iron that has been so famous for generations.

You can buy proved pipe dependability, freedom from frequent replacements and uninterrupted production by insisting on Reading Genuine Puddled Wrought Iron Pipe. Your protection from untried substitutes is the Reading name, date of manufacture and spiral knurl mark on every piece of Reading Pipe.

READING IRON COMPANY, Reading, Pennsylvania

Atlanta Cincinnati Pittsburgh Fort Worth
Baltimore Detroit Cleveland Seattle
Boston Houston St. Louis Philadelphia
Buffalo Los Angeles Tulsa New Orleans
Chicago New York San Francisco

Reading tubular goods are furnished in sizes ranging from \( \frac{3}{8} \)" to 20" in diameter.
Cameron Pumps are built to last.
Correct hydraulic design, conservative speeds, and comfortable margins of capacity make for smoothness and durability. And a continuing interest by the manufacturer after the pump is sold rounds out a service policy that completely protects the individual user.

Cameron Pumps are built and sold by Ingersoll-Rand Company, 11 Broadway, New York.

Ingersoll-Rand
A.S. Cameron Steam Pump Works, 11 Broadway, New York
Conquering the Cascades

SNOW falls every month in the year where the Great Northern crosses the Cascades. Steep, tortuous grades increase the difficulty of the railroading problem. Nature has stubbornly resisted man's effort to conquer the range.

In January, 1929, the new Cascade tunnel was opened. Man, with electricity as an ally, had conquered the Cascades.

The eight-mile bore was driven in three years—a record impossible without electric power. And electrification has been extended to the entire 75-mile route through the mountains.

The conquests of electricity on the land and on the sea, in the air, and underground, are making practicable the impossibilities of yesterday. As our vision encompasses wider horizons, electricity appears as a vital contribution to future industrial progress and human welfare.