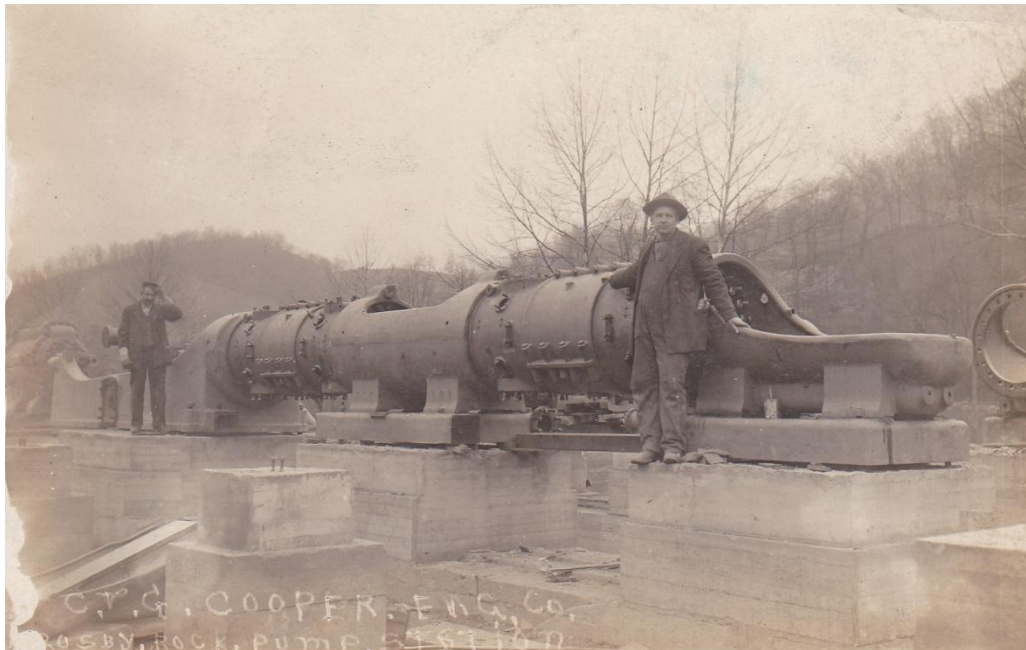


HISTORY OF C & G COOPER COMPANY AND SN 2581

By Roger A Kriebel

The foundry of C & G Cooper in Mt. Vernon, OH, started building steam engines in 1836 to power their iron furnace. By 1853 they had built their first wood burning steam locomotive. Cooper hired Julius E. Debes, and Engineer from the Corliss Steam Engine Works, to design an efficient engine which was built and sold in 1869. Around the same time period they were building portable and traction engines as well as sawmills and steel mill blowing engines.

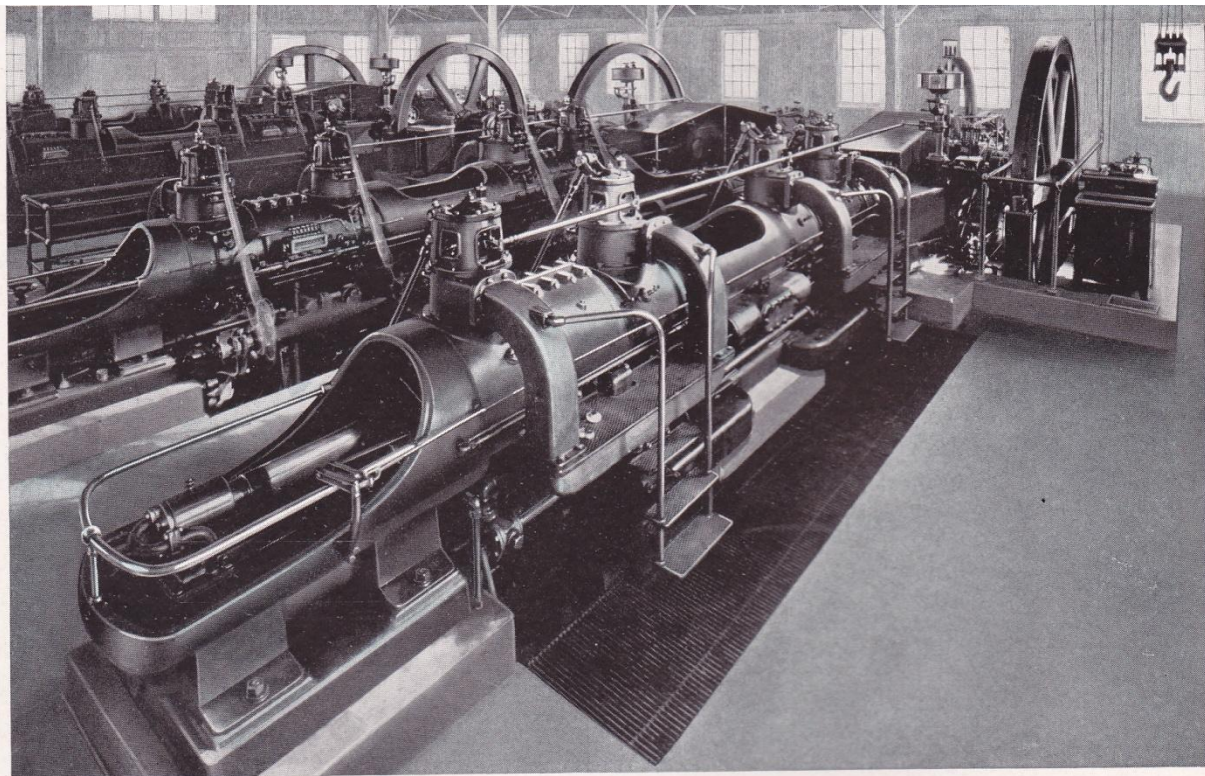
In the early 1900's natural gas was becoming an important fuel and the decision was made to enter the internal combustion engine field. Since they did not have any experience in this field they hired a German gas engine designer by the name of Martin A Thiel. In July 1909 they had built and shipped their first gas engine-compressor combination with 730 brake horsepower to the Manufacturers Gas & Heat Co in Rosby Rocks, WV. This engine, S/N 2233, was a twin tandem-double acting (two rows of cylinders with the flywheel between them) with a 20" bore and 42" stroke.



Here is a photo of SN 2233 being set up at Rosby Rocks, WV

At this time serial numbers of steam and gas engines were intermingled until the last steam engine was shipped in 1920.

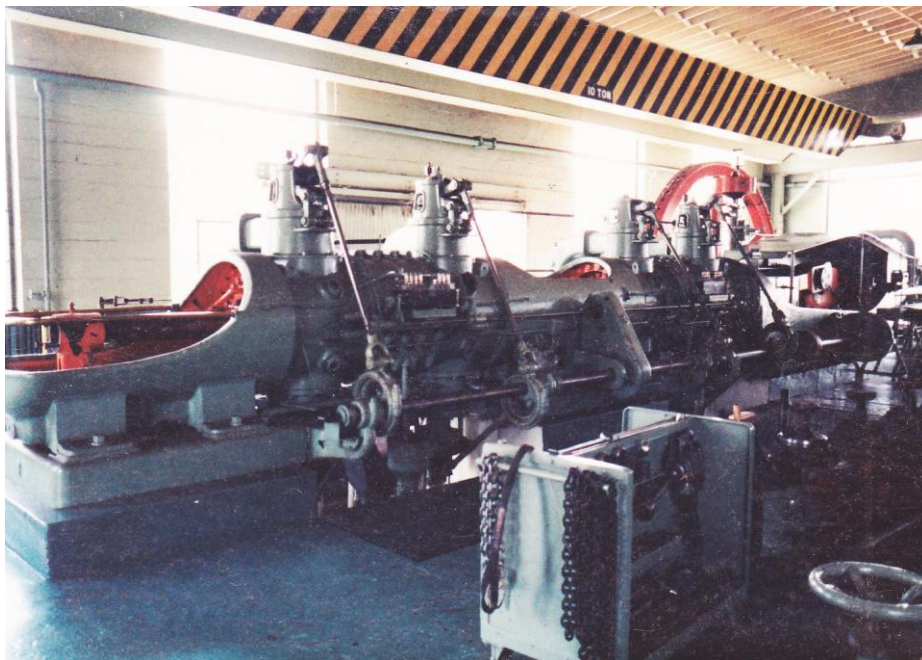
S/N 2581 (Rough & Tumble engine) was built in 1913 and shipped to the West Salem Compressor Station of Medina Gas & Fuel Co. in West Salem, OH, which later became part of the Columbia Gas Co. This was the 17th Gas Engine built by C & G Cooper.



WEST SALEM COMPRESSOR STATION—THE MEDINA GAS AND FUEL COMPANY, WEST SALEM, OHIO
Contains four 485 Brake Horse Power Single Tandem Cooper Gas Engines, direct driving Compressor Cylinders, for pumping natural gas

This is a photo of SN 2581 (second from right) from the 1920 C & G Cooper Engine Catalog.

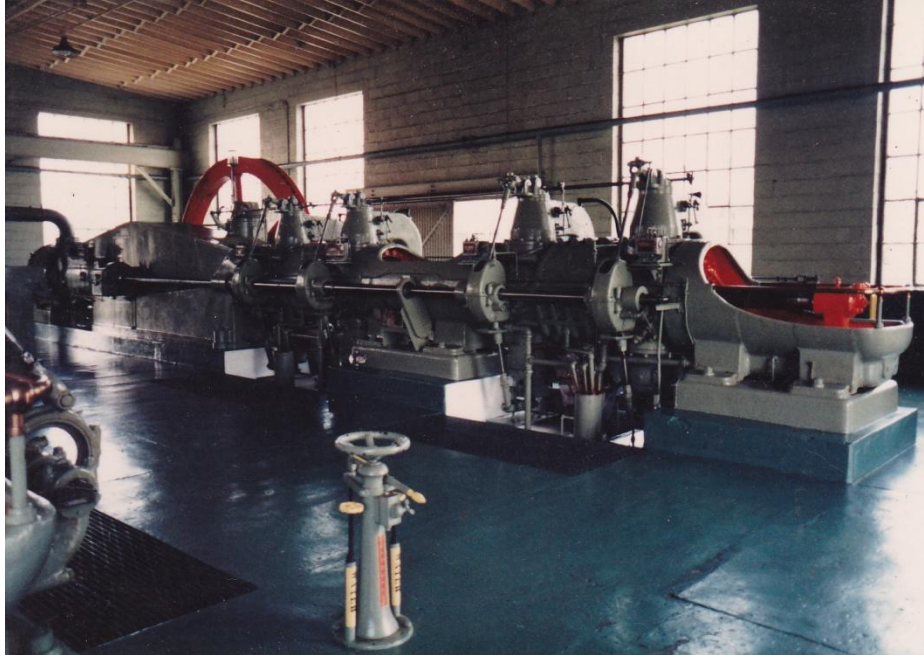
In 1942 S/N 2581 was removed from the West Salem Station and re-erected at the York Compressor Station in Medina, OH. This engine was at York Station until removed in 1999 by Rough & Tumble Engineers Historical Assoc



Pictured above is No. 2581 at York Station

An interesting note is regarding Cooper's participation in the war effort during WW I, which was declared in April 1917. Cooper built 50 high speed steam-hydraulic presses that were used to forge large guns and shells. They also built 69 large gas engines to pump natural gas to relieve energy shortages.

In 1920 Cooper Co. redesigned their 1909 engines to operate valves with cams instead of eccentrics. They also redesigned the gas-air mixers and intake assemblies. These and other changes made Cooper Engines cheaper and more competitive. Both eccentric and cam engines were built at the same time until 1929.

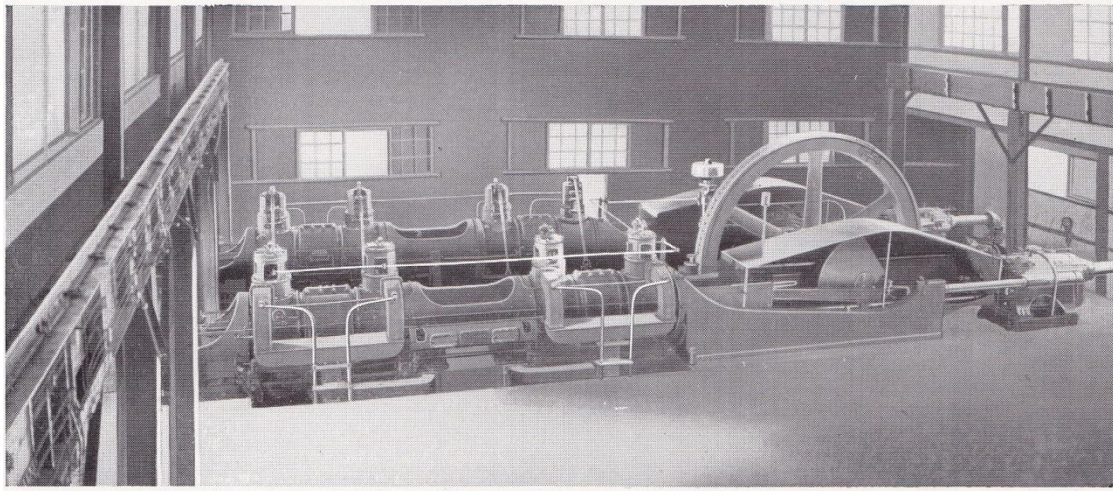


This is a photo of SN 4297, Cam Engine built in 1928, installed at York in 1944. Notice the floor is spotless.

In April 1929 C & G Cooper merged with Bessemer Gas Engine Co in Grove City, PA, to form Cooper-Bessemer. Both manufacturing plants remained open building engines. Both companies were building diesel engines at the time of the merger.

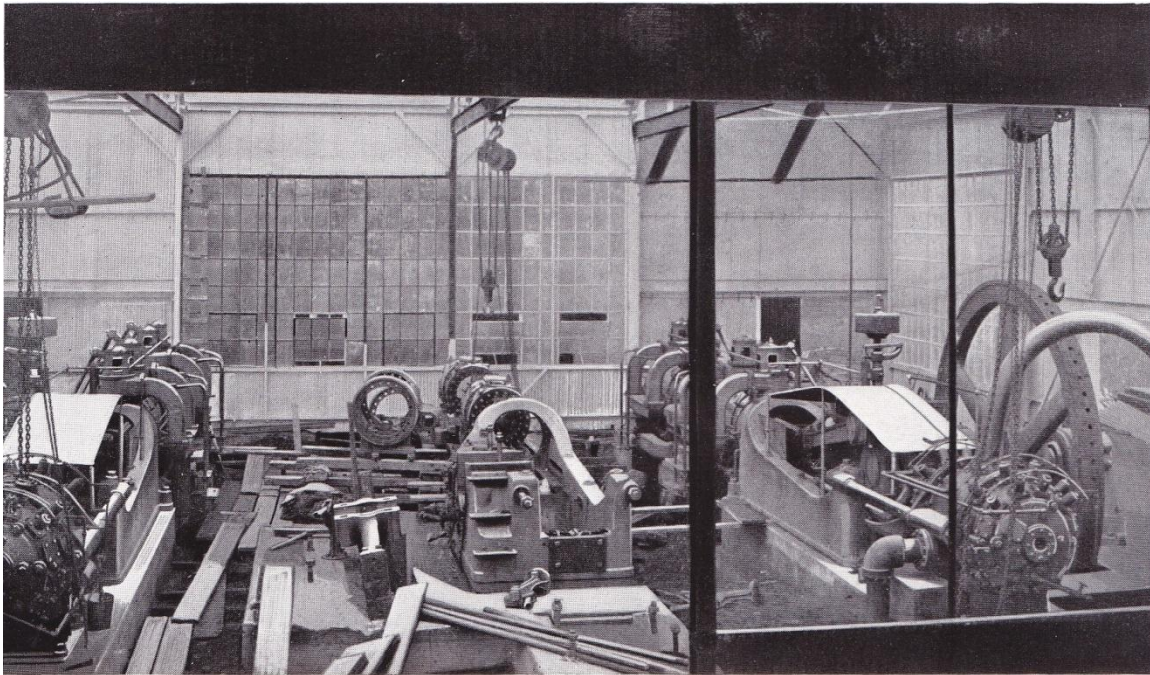
Cooper-Bessemer built TDA engines, "V" type engines, diesels and vertical inline gas engines. The TDA engines were discontinued around 1952 and today there are no Cooper-Bessemer engines being built. Between 1909 and 1952, a total of 865 TDA engines were built, more than all the other TDA manufacturers combined.

Following are a few photos you might find interesting.



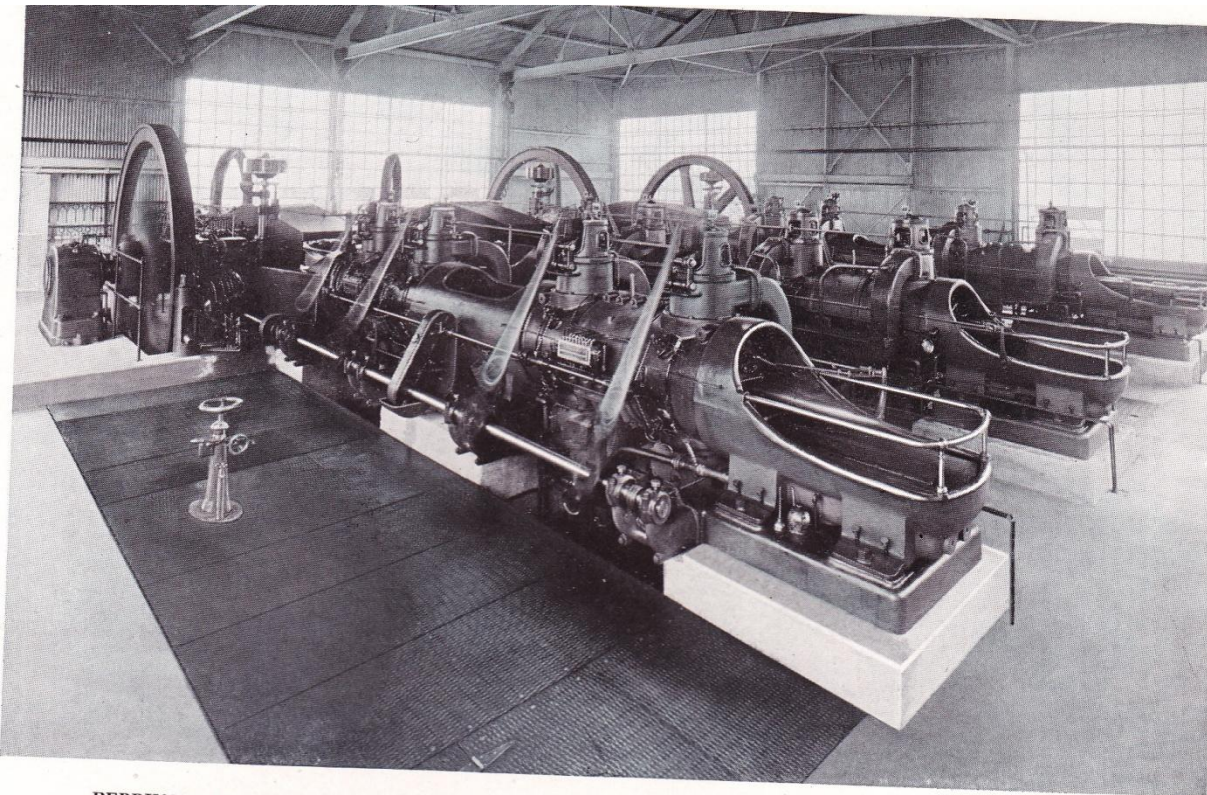
A 24" x 48" Twin Tandem Double-acting Cooper Gas Engine, direct driving Gas Compressors, at the Pavonia, Ohio, Station of The Logan Natural Gas & Fuel Company. This unit delivers 17,400,000 cubic feet of natural gas per day

This is the largest gas engine built by Cooper.



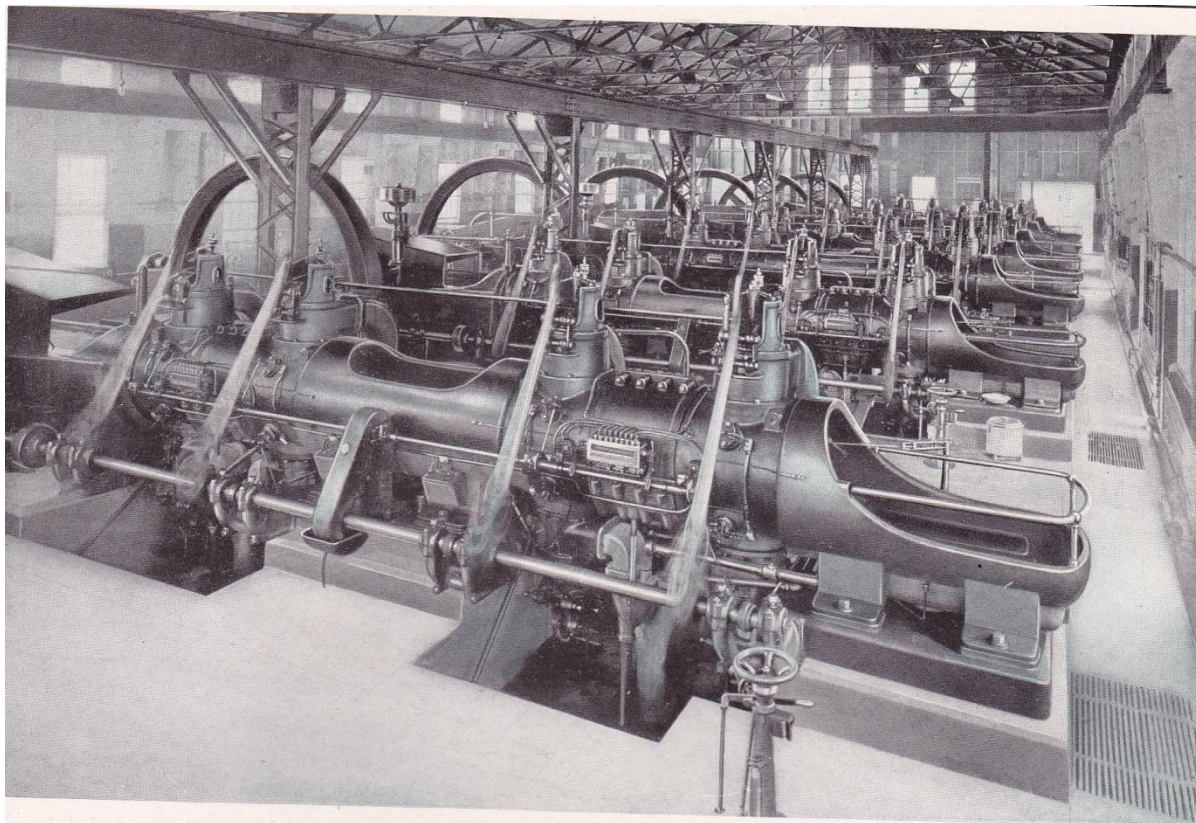
Three 21 1/2" x 36" Single Tandem Double-acting Cooper Gas Engines, for direct driving Gas Compressors, being installed at the Perrysville, Ohio, Station of The Ohio Fuel Supply Company. These units will deliver 19,500,000 cubic feet of free gas in twenty-four hours. This is the second installation of Cooper Gas Engines made by the Ohio Fuel Interests

Originally installed in 1914 and moved to the York Station, when it was built, in 1922.



PERRYSVILLE COMPRESSOR STATION—THE OHIO FUEL SUPPLY COMPANY, PERRYSVILLE, OHIO
Contains three 485 Brake Horse Power Single Tandem Cooper Gas Engines direct driving Compressor Cylinders, for pumping natural gas

This is the Perrysville Ohio Station completed.

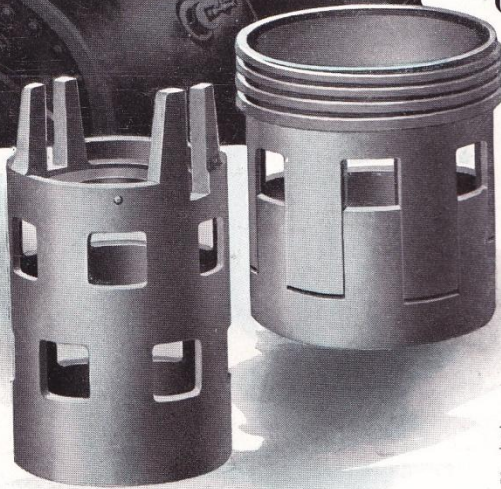
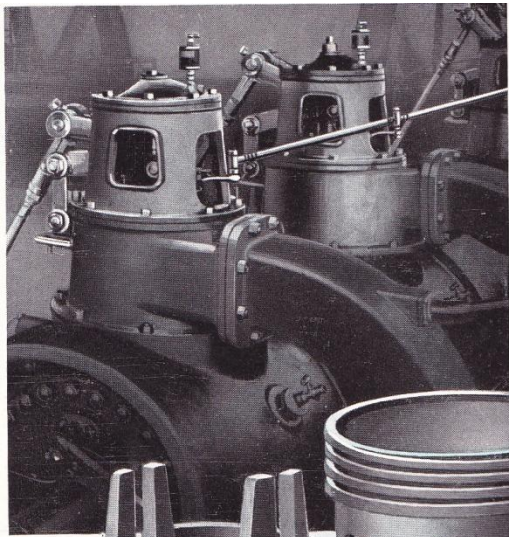


BRANCLAND COMPRESSOR STATION—THE COLUMBIA GAS AND ELECTRIC COMPANY, BRANCLAND, W. VA.
Contains eight 485 Brake Horse Power Single Tandem Cooper Gas Engines, direct driving Compressor Cylinders, for pumping natural gas

The Branchland Compressor Station in WV shows eight of the 485 HP engines.



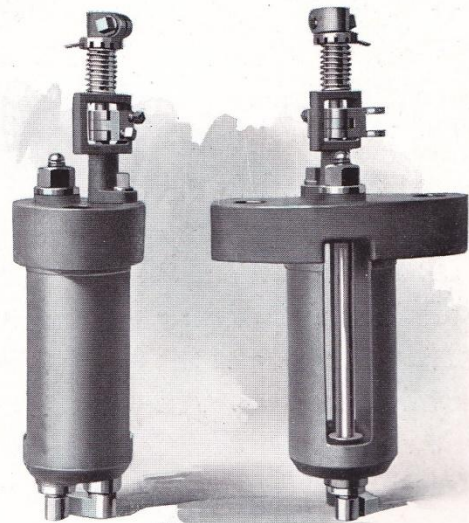
Picture from a glass negative of two Coopers in a compressor station, location unknown.



points are low carbon steel. They both have a large cross section to conduct the heat away rapidly, which prevents over-heating. The oxidation caused by an electric arc between cast iron and low carbon steel is very small, which insures long life for the terminals. Each combustion chamber is fitted with two Igniters simultaneously in action to produce rapid ignition of the fuel charge, which is an important factor in gas engine economy and "smooth running."

Ignition

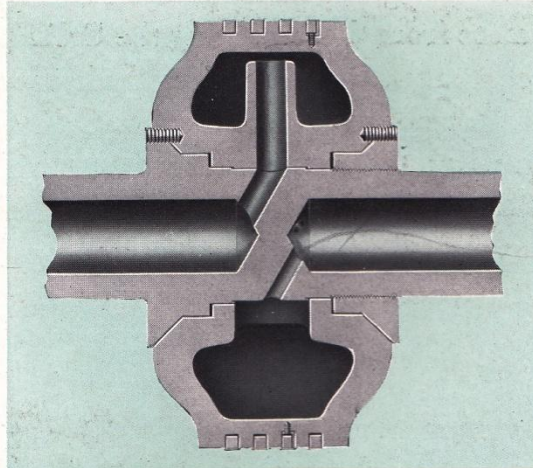
THE superior regulating quality of Cooper Gas Engines is due in a measure to the marked precision of the ignition system. Through the application of our improved mechanical make and break system, and method of driving the Igniters, the sparks may be timed to a small fraction of the stroke collectively by a single lever, or each one may be adjusted independently. The Igniters, which are protected by patents, are pointless, and double insulated to reduce short circuiting to a minimum. The moving terminals are made of refined cast iron, while the



Top of page the throttle sleeves are shown.

Pistons

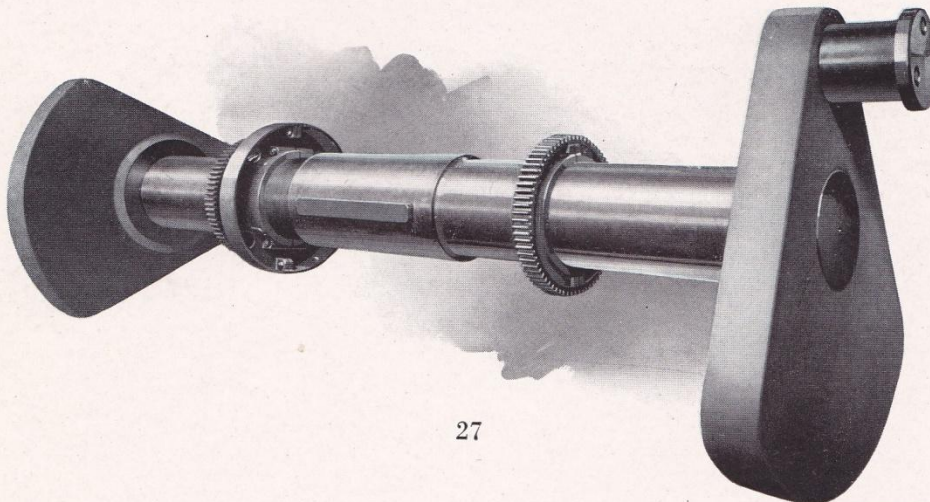
THE Pistons are cast in one piece, free from internal ribs to avoid any casting strains. Special importance is attached to a uniform distribution of the metal. Each Piston is fitted with four snap rings. The Pistons are forced on to the piston rods and held in addition by means of flushed nuts. Special provision is made to insure free circulation of cooling water through the Pistons. They are supported by the rods and crossheads and float clear of the cylinder walls, leaving the packing rings alone in contact with the cylinders, thus reducing friction to a minimum.



Shows cross section of piston.

Crank and Main Shaft

THE Side Crank construction is the accepted standard for high grade gas engines, the same as in steam engine practice. The Crank is a high carbon open hearth steel casting, having the counter-weight and crank pin cast solid with it. In this way the pin may be the maximum allowable diameter, and being cast with the pin extending downward in the mold, a clean and homogeneous texture of metal is secured. The Crank is forced on to the main shaft under hydraulic pressure, and keyed in place.

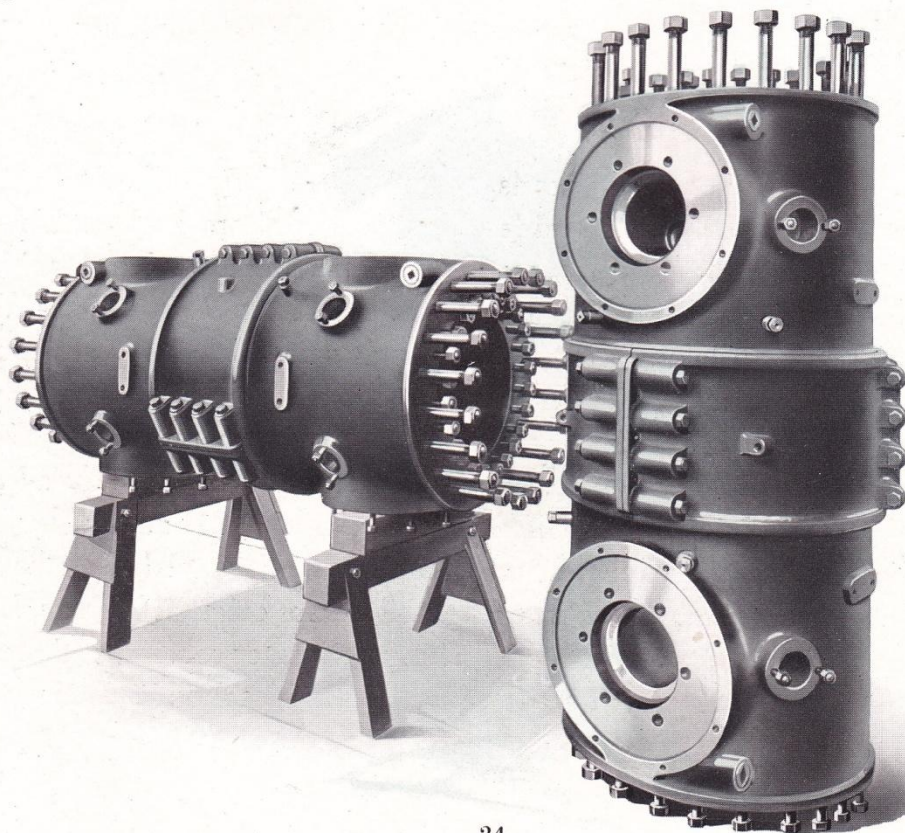


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Crankshaft for a twin engine.

Cylinders

THE Cylinders are made from a special mixture of hard close-grained iron, known to be best suited to resist the temperature and pressure of gas engine work. They are symmetrical one-piece castings, provided with jacket bands made in three segments and carefully designed to protect the Cylinder Barrels which take all the longitudinal strains. The jacket bands act as expansion joints, are easy to pack and provide ample and unobstructed passages for water circulation. The Cylinders are supported in the counterbores of the main bed plate, distance piece and tail guide, which insures permanence of alignment. Both Cylinders are held rigid by a complete circle of studs separate from those holding the Cylinder Heads, which permits inspection of either set of studs without removing the heads. As the piston and piston rods are carried by the crossheads, it is clear that the Cylinders support nothing but their own weight and are free to expand and contract with varying temperatures without straining the jacket walls. Quick access to the inside of the Cylinders may be had through the inlet valve openings without removing the Cylinder Heads. The Cylinder Heads are water-cooled and carry the split casings for the piston rod packings.



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Shows cylinder without associated parts.

...Some information in this article came from catalogs, Cooper Industries 1833-1983 and Cooper-Bessemer serial number records.

