

MODERN AMERICAN AND EUROPEAN HIGH-POWER GAS ENGINES

By Frank C. Perkins.

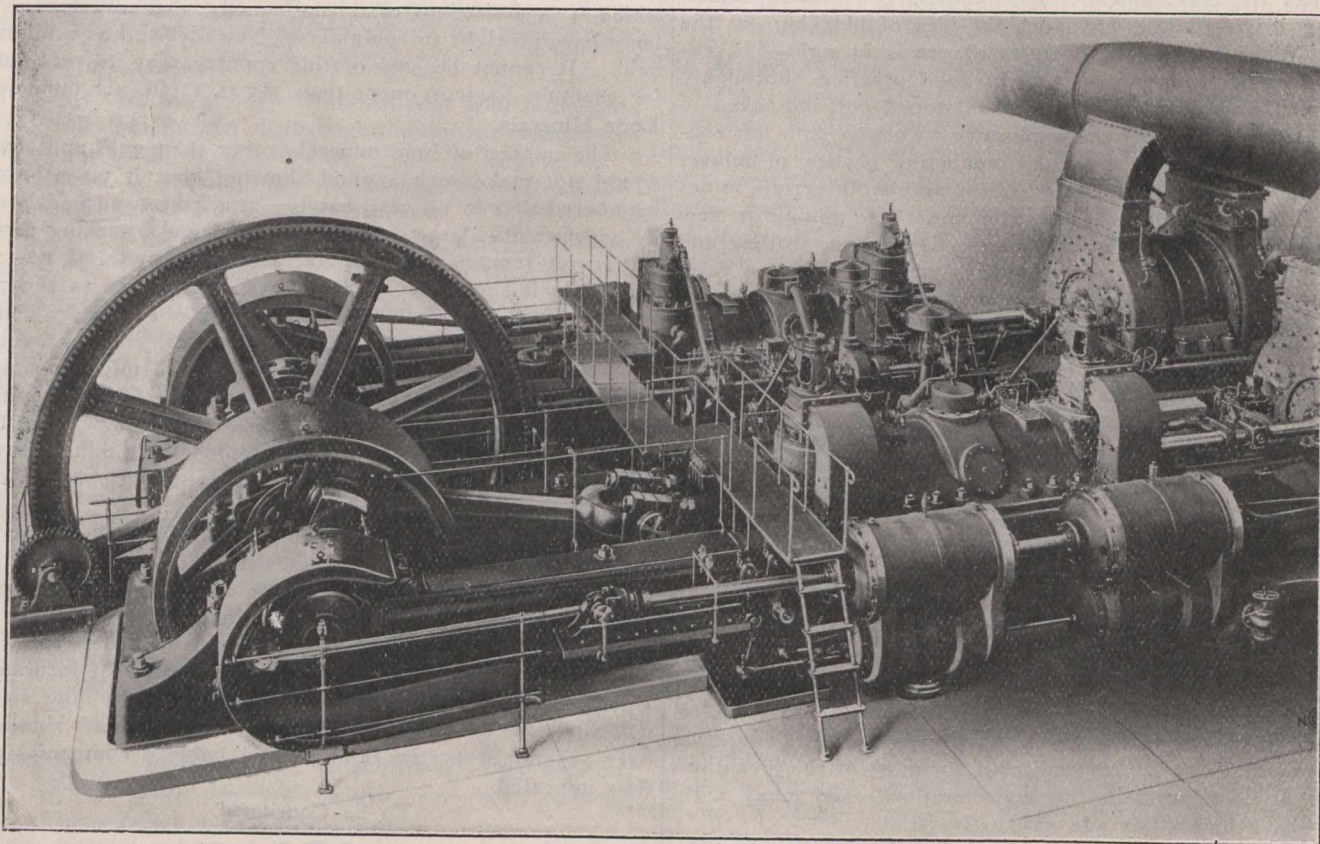
On the continent of Europe the iron and steel works are more largely equipped with high-power gas engines than those of England or America, but the engineers in the latter country are investigating this subject closely and are now beginning to utilize high-power gas engines extensively on account of the great advantage gained by using the waste blast furnace gases as well as on account of the wonderful economy due to the extremely high thermal efficiency of these engines. Prominent American engineers have found it to their advantage to make use of the costly experimental work of European engineers, a number of celebrated American manufacturing firms arranging to utilize European designs for high-power gas engines driving electrical generators as well as blowing engines.

At the Micheville steel works in France the electrical power-house is provided with two gas engines of the single cylinder, double-acting four-cycle type, each having a capacity of 1,100 horse-power. These gas engines operate at a

such as heretofore only high-power steam engines have been applied. A 500 horse-power single-acting 4-cycle engine has been utilized for some time at the rolling mills of Frederick Krupp at Essen.

In August 1904 two 1,800 horse-power double-acting gas engines were installed at Gelsenkirchen for the Aktien-Gesellschaft Schalker Gruben-u. Hütten-Verein. These engines operate at 94 R.P.M., and are directly coupled to direct current and alternating current dynamos, the total output being 3,600 horse-power. A very large blowing engine has also just been installed at the Rhein Stahlwerke at Meiderich, near Ruhrort, having a capacity of 3,200 horse-power at 80 R.P.M. as mentioned above, while a similar engine has also been in operation for a month or more at Volklingen at the power-house of the Rochling'sche Eisen und Stahlwerke.

The Nürnberg gas engines have pistons which are provided with cast iron spring rings, and are mounted upon piston rods of such strength that the weight of the pistons will



Two Cylinder, Double-acting Koerting Gas Engine, Operating Horizontal Blowing Engines.

speed of 100 R.P.M., and are directly coupled to continuous current dynamos, which supply current for operating electrically-driven machine tools and labor-saving devices, as well as various other machinery about the iron and steel plant. The engines were installed in January 1904 for the Soc. Anonyme des Acieries de Micheville by the Vereinigte Maschinenfabrik Augsburg und Maschinenbau Gesellschaft Nürnberg, A. G. These Nürnberg engines are constructed by the Allis-Chalmers Company, Chicago, Illinois.

An enormous Nürnberg gas engine, having a capacity of 3,200 horse-power, has recently been installed at the Rheinische Stahlwerke at Meiderich, near Ruhrort, operating at a speed of from 40 to 80 R.P.M., driving a blowing engine with a capacity of 1,400 cubic meters of air at a normal pressure of 1 atmosphere and a maximum pressure of 1.4 atmospheres.

For driving a rolling mill at the Burbacher Hutte at Burbach, near Saarbrücken, a 1,500 horse-power tandem double-acting 4-cycle gas engine of the Nürnberg type has been installed for working on waste blast furnace gases, and has been giving excellent service since June 1904. This engine operates at a speed of 90 R.P.M., and is doing service

be fully supported by them. Each piston rod is carried at both ends upon a cross head so that no pressure is exerted by it against the cylinder walls other than the slight pressure due to the expansion of the spring rings. The stuffing boxes for the piston rods are provided with a special type of floating metallic packing. The guides for the cross heads, as well as the frame and main pieces, are of such construction that they will not in any way interfere with the ready dismantling or removing of any of the working portions of the machine. The crank is of the double-arm type, and the main bearings of a special construction, giving ample support to the shaft and yet allowing automatic adjustment in line.

Each end of each cylinder is provided with two distinct igniting points, insuring perfect ignition and combustion of the gases, and at the same time constituting a safeguard against a miss fire, even though one of the igniters should fail to act.

In iron and steel plants where a larger amount of power is required than it is possible to develop by burning the entire waste gases from the blast furnace plants under boilers, it is found necessary to use coal for developing the