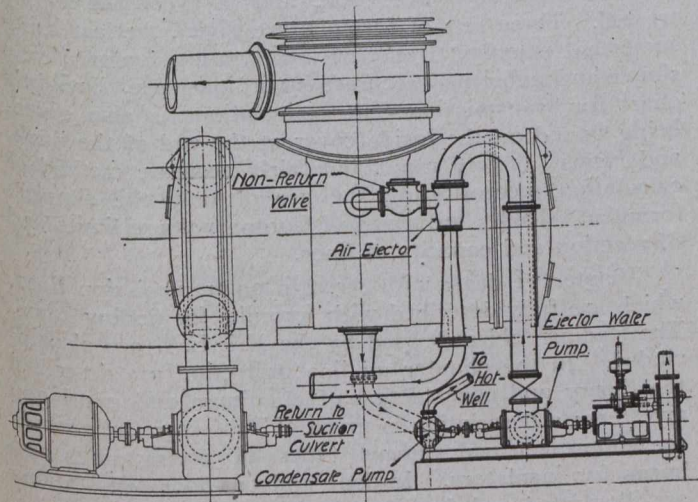


TESTS ON SURFACE CONDENSING PLANT.

FOLLOWING are the results of tests carried out on one of five similar surface condensing plants with Willans rotary air pump system, installed at the Durnsford Road power house of the London & South Western Railway Co., England:—

	Test No. 1.	Test No. 2.	Guarantees.
Load, lbs. of steam per hour	68,176	68,389	68,000
Vacuum at steam inlet to condenser, corrected to 30" barometer	28.73"	28.76"	28.5"
Corresponding steam temp.	86.6° F.	86° F.	92° F.
Condensate temperature	82° F.	82.5° F.	87° F.
Difference between condensate and vacuum temperatures.	4.6° F.	3.5° F.	5° F.
Circulating water inlet temp.	58.5° F.	58.5° F.	65° F.
" " outlet "	80.8° F.	81.1° F.	83° F.
Difference between circulating water outlet and vacuum temperatures	5.8° F.	4.9° F.	9° F.
Cooling water, gals. per hour	318,000	317,600	396,600
Duration of test	60 min.	60 min.	



The tests were carried out after the plant had been in service for a considerable period, and in the presence of the representatives of the consulting engineers, Kennedy & Donkin, and of Herbert Jones, chief electrical engineer of the railway.

As mentioned above, the station contains five identical plants in addition to two smaller similar plants. Each of the plants embodies the rotary air pump system devised by Willans & Robinson, Limited, of Rugby, England. The main feature of this system is that the circulating water is passed through an ejector, which is shown in the accompanying drawing, and which takes the place of the ordinary air pump. A separate condensate pump is provided to withdraw the condensed steam from the surface condenser and to return this to the hot well. An automatic non-return valve is placed between the air ejector and the main condenser body, so as to prevent water being drawn into the condenser in case of failure of the ejector.

There are three common forms of application of the system known as the "series," the "shunt" and the "separate pump" types. In the case of the "series" type of plant, the whole body of the circulating water is passed through the air ejector before entering the condenser. That is, the circulating pump is designed for the normal quantity of water required by the condenser, but allowance

is made in calculating the head for the necessary drop across the air ejector.

In the case of the "shunt" system, the cooling water for the condenser and the ejector water are delivered in parallel, and the ejector water is returned to the source of supply or to the circulating water suction. In other words, the circulating pump is designed for the normal head required by the lay-out of the plant with allowance for condenser friction and the quantity delivered is that needed for the condenser itself, plus the necessary water for the air ejector.

The "separate pump" type, of which the L. & S. W. installation is an example, differs from the "shunt" system only in that a separate pump is provided for delivering the air ejector as apart from the main circulating water pump which supplies the condenser in the ordinary way.

In the L. & S. W. installation, both the main circulating pump and the ejector pump draw their water by means of a common suction pipe from the main suction culvert, which runs the full length of the engine room. The water coming from the condenser itself is, of course, heated and passed to the delivery culvert, but the air ejector water is returned to the suction or inlet culvert.

It will be noted that in this instance the circulating pump is driven by means of a continuous current motor, whereas the ejector pump and condensate extraction pump are driven by a small steam turbine.

The tests show that the vacuum attained is substantially above that guaranteed, and that there is very slight difference between the circulating water outlet and vacuum temperatures.

PIPES OF ELECTROLYTIC IRON.

A firm at Grenoble, in France, is now manufacturing pipes of electrolytic iron up to five metres (16.4 ft.) in length, 300 mm. (nearly 12 in.) diameter and 3 mm. (3/16 in. bare) thick. The metal as taken from the bath is hard and very brittle, but after a special and careful heat treatment becomes of excellent quality and has a tensile strength of over 25 tons per square inch in any direction. They are stated to be superior to cast-iron pipes in several respects.

AMERICAN LOCOMOTIVE BUILDING.

The demand for locomotives in the United States continues active. The Southern Railroad Co. contemplates buying 45 engines, the Chicago, Burlington and Quincy 30, the Union Pacific 15 and the Duluth, Mesaba and Northern 6. The American Locomotive Co. will build 40 consolidation engines for the Italian State Railways, 10 Pacifics for the El Paso and South-Western Railroad, and 5 each for the Delaware, Lackawanna and Western, the Central Railroad of New Jersey and the Western Pacific. The Louisville and Nashville is building 8 Mikados in its own shops, and will soon begin 8 more.

The Southern Canada Power Co., Limited, have removed from 42 St. Francois Xavier St., to 330 Coristine Building, Montreal.

The mining industry in Spain has acquired more importance than is generally known. The output of iron ore in 1915 was 5,617,839 tons. Pyrites were raised to the extent of 730,568 tons; iron ore briquettes to the extent of 555,357 tons and manganese ore to the extent of 14,328 tons.

The promoters of the Oriental Iron Smelting Co., of Japan, propose to work the Taochun iron mine at Anhui, China, by taking over a concession obtained by the Chino-Japanese Industrial Development Co., from the Peking Government. The company proposes to start with a capital of \$12,462,500.

4