

AN IMPROVED TYPE OF STEAM NOZZLE.

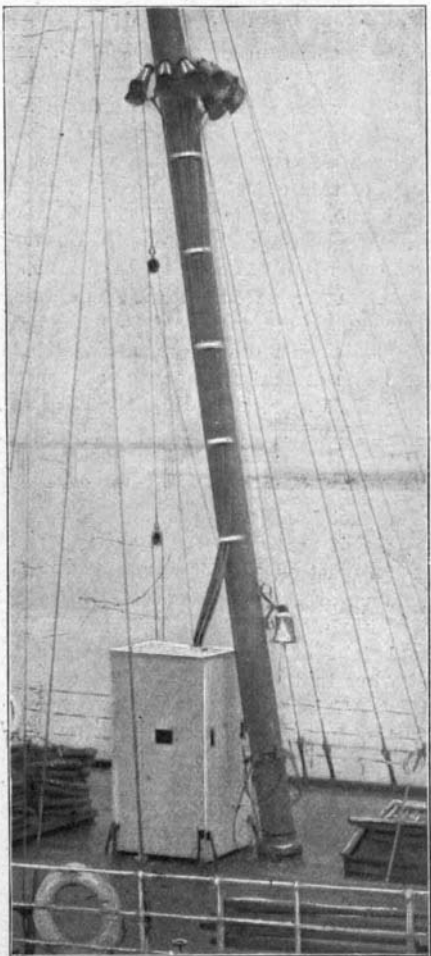
A patent recently obtained by Mr. William S. Clarkson, of Livingston, Mont., covers a new form of steam nozzle, particularly adapted to be used in the smoke-box of a locomotive, for the purpose of utilizing the exhaust steam from the engine to increase the draft upwardly through the smoke-stack. The construction of the steam nozzle is very simple, the device can be very cheaply manufactured, and it possesses the capacity for long and repeated service. It comprises a cluster of tubes of circular, or, preferably, of quadrilateral cross-section, annularly arranged upon a base plate adapted to fit onto the upper end of the exhaust pipe of the locomotive. The center opening formed by the cluster of tubes is closed by a hollow inverted cone, which serves as a spreader to direct the exhaust steam into the annularly disposed tubes. It will be observed that the tubes are tapered so as to form radial channels leading into the center opening above the spreader cone. In operation, the exhaust steam being deflected laterally by the spreader cone, rises through the tubes and emerges from the nozzle in the form of a ring. The steam in rising induces currents of gases within the smoke-box, to pass inwardly into the radial channels to the center of the ring of steam, thereby increasing greatly the effectiveness of the nozzle. It will be observed that the nozzle permits the use of an exhaust pipe of large cross-section, and also smoke-stacks of larger area than hitherto, allowing greater volume of gases to be discharged without increasing the force of gas. In virtue of the conical spreader being hollow, a constant eddy of gases is maintained, which also greatly facilitates the operation of the device.

THE EDEM FOG SIGNAL.

During fog and mist, vessels are exposed to collisions and experience great difficulty in entering harbors. A new fog signal invented by a Belgian, Mr. E. de Meulemeester, is designed to prevent these dangers. The apparatus consists of (1) a receiver of the waves of sound and (2) an indicator of the source of emission of the sounds.

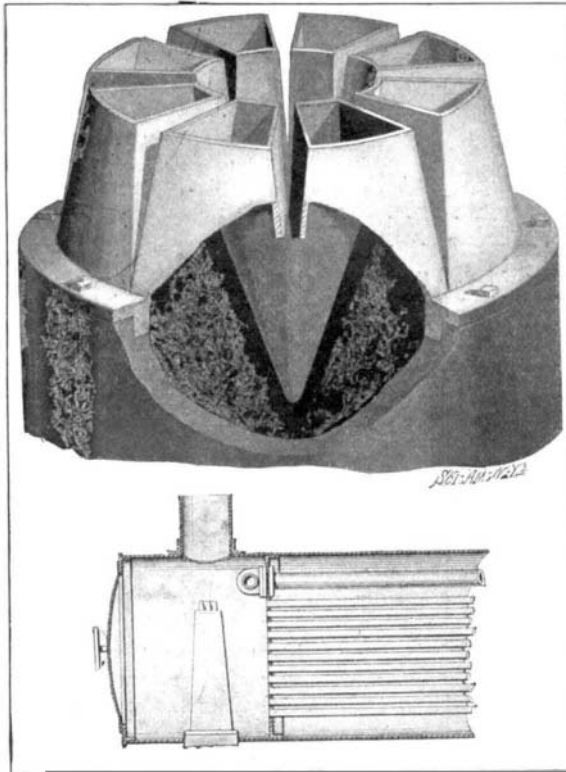
The receiver consists of a series of trumpets arranged in a circle on a mast, with their bells turning to all points of the horizon, the narrow end of each of these trumpets being connected to the indicator by means of a tube.

The indicator, close to the hand of the captain or of the officer of the watch, has a tubular ring, from which issue all the acoustic tubes from the receiver, the orifices being fixed round the ring in order corresponding to the position of the trumpets of the receiver. In this tubular ring is a small opening, to which is attached a hearing tube, by means of which sounds entering the trumpets are heard by the person working the instrument. Each of the acoustic tubes is furnished with a valve or "interrupter" near the orifice, the closing of which intercepts the passage of sound; besides which, the interrupters are supplied with a mechanism enabling the operator to open or close the valves at will. Around the ring of the indicator are marked numbers in an order corresponding with those of the trumpets of the receiver. A movable

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index needle completes the mechanism. By means of a special arrangement, the officer of the watch can perceive the sounds received by the indicator directly and at the same moment as the operator, and so control his work.

When the operator hears a sound coming from some point of the horizon, by means of the mechanism at his hand, he closes all the acoustic tubes passing from the receiver to the indicator, except the one in front of

**STEAM NOZZLE FOR LOCOMOTIVES.**

the index needle. If then he hears nothing, it signifies that the sound does not proceed from the direction toward which the bell of the trumpet, corresponding to the open tube, is turned. He then places the index between two tubes (by which means all the tubes are opened again) and notices whether the sound continues, after which he sets the index at the following number, and so on till he discovers the exact direction of the sound. The whole proceeding takes but a few seconds.

The Edem fog signal, through its rapidity and the exactitude of its signals, indicates immediately to captains of vessels supplied with the necessary appliances their position and their respective courses during fog, so that hesitancy and inaccurate maneuvers liable to bring about a collision are avoided. The signal offers the captain of a vessel facility in finding the entrance of a harbor.

Experiments have been made in the North Sea with two steamers, one furnished with the fog signal and the other without it. The last was ordered to give signals with its siren, maneuvering now at port, now at starboard, passing in front and behind the other steamer. The operator of the first ship could always indicate the position of the other ship in a few seconds by means of the indicator's needle, and follow the alterations of its course. The experiments have proved that one can locate the source of the emission of the sounds in a space of a twelfth of the horizon. By the difference in the intensity of the sound, the approach or retreat of a ship can be indicated.

Cork.

The item of corkage in the bottling of the finer wines is one of the most important details. Only the most select corks, free from brown blemishes and airholes, are used; the common corks being employed for the bottling of cheaper products. Practically all of the corks used in the world are grown in the Mediterranean countries, where it is estimated that between three and four million acres are planted to cork oaks. It would seem as though the cork oak industry in the United States might claim the attention of practical men who favor the production of necessities at home rather than the sending of money abroad for them. An effort was made in 1858 to introduce the cork oak, and acorns were planted and distributed by the Department of Agriculture in California and various of the Southern States. The experiment was not, however, carried to a conclusion,

and it is yet to be demonstrated whether there are varieties of this oak which will produce corks in the United States with profit. From occasional scattered specimens it would seem that the tree will grow and thrive in this country. The importations of cork into the United States have steadily increased during the last three or four years, until in the fiscal year ending June, 1902, they were the highest on record, being in round numbers \$2,500,000. Prior to 1901 they had never passed the two million mark. During the past century cork has advanced over 1,000 per cent in value, the increase being caused by the more general use of bottles.—G. E. M.

"Spliced Rail."

In the effort to overcome the nuisance of the low joint in the construction and maintenance of railroad track, a "spliced rail" is being introduced to the railroad world, by the means of which a continuous rail is practically secured, yet one which it is readily possible to remove and renew at any time with no more difficulty than is experienced with the typical rails now in general use. This rail, which was patented only a few months ago, is of compound construction, consisting of three longitudinal sections. The ball, with downward-extending web portion, is one section, and the base, being divided, with upward-extending web portions, makes the other two sections. The sections being of equal length are bolted together so as to break joints or divide the old method of whole or butt joints into thirds, thereby making a spliced or continuous rail. Thus where the ends of the ball portion come together, making only a third of a joint, the base on either side is perfectly solid and prevents any up and down or hammering motion whatever. This rail is used in the same manner as the present T rail, and in laying the same allowance is made for the expansion of the metal. The parts are bolted together, and when this is done, the rail is laid in precisely the same manner as is the custom at present.

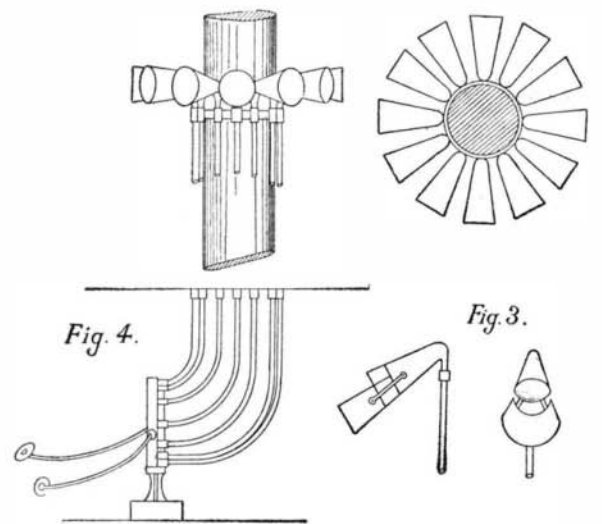
Fig. 1.**Fig. 2.**

Fig. 1.—Collectors on mast. Fig. 2.—Plan view of collectors.
Fig. 3.—Detail of collectors. Fig. 4.—The receiver.

PARTS OF THE EDEM FOG SIGNAL.**THE RECEIVER.**