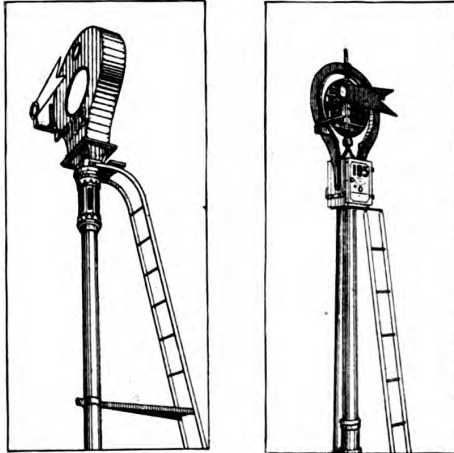


OUT OF ORDER INDICATOR FOR AUTOMATIC BLOCK SIGNALS.*

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Considerable dissatisfaction has arisen with the ordinary way of showing that a signal was out of service, by hanging a green disc over the number, which was liable to be blown off in a very high wind, and the difficulty has led to very crude devices by the maintainers when the regular disc was lost, damaged or too far away to go after, such as tying on of any old piece of gunny sack or fabric of any kind they could get hold of which was large enough to cover the number. The greatest disadvantage of the whole matter is that it is impossible to get a night indication out of such devices.

Walter Gravit, the assistant master carpenter of the Lake Shore road at Elkhart, devised a small fish-tail blade so attached as to hide the number and permit the use of the regular single lamp to give a corresponding night indication. This was later



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shifted to stand full in front of the regular signal disc, so that there should be no change in the location of the indication, and also the number was left exposed, enabling the engineer to see the number and not depend on his memory for it, if it was necessary to make any report on the signal in question. The blade with its glass and bracket is all one piece and can be easily placed in the small socket which is permanently placed on each signal. Each maintainer is supplied with one or more of these blades, according to the number of signals he is caring for, and can very easily take one along when going to a signal that has been reported defective, or should his territory be large it could be kept in the section house nearest to the signal, and the section foreman be instructed to apply it as soon as the signal went wrong, thus avoiding full service stops at a signal out of order between the time it first goes wrong and the time when it is possible for the maintainer to get to it. There is really nothing more to be said about this device, the engraving accompanying making the details perfectly clear. The cost of these indicators complete is about \$4.75 each.

The Hayden Feed Water Purifier.

In the course of the numerous considerations given to the matter of feed water purification by the Master Mechanics' Association it has been suggested that distillation by plants located in connection with the water tanks would afford the necessary relief from hard waters. The expense of the installation and maintenance of such plants has, however, been such as to be practically prohibitive except in extreme cases. The device herein described is intended to meet this demand, and to afford the means for purification within such limits as to enable the apparatus to be applied to locomotive boilers without interference with the duties of the engineman. The device works upon the principle that carbonates when heated to 212 degrees F. are no longer held in solution, and sulphate of lime becomes less soluble with the higher temperatures. Sulphate of magnesium begins to dissociate at a temperature of 212 degrees F., and is probably entirely broken down at a temperature of 270 degrees F. In view of these facts, what is necessary to secure pure feed water is a device which will first secure a temperature of at least 270 degrees F., and second, which will remove the impurities held suspended in the water and prevent the sulphuric acid arising from dissociation of magnesium sulphate from corroding the boiler.

The necessities of a device for this purpose are that the

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machine shall be capable of purifying a large volume of water in a short space of time, and that the appliance be compact and simple in operation. The dimensions of the device in question are 40 inches in length by 19 inches in diameter, and it is therefore applicable to the locomotive without obstructing the running board or the view from the cab.

The requisite temperature for the process is secured by means of a live steam heater located in a delivery pipe between the injector and the purifier and taking steam from the boiler. A feed water temperature of 275 degrees or over is thus insured, and the live steam is restored to the boiler without other loss than that of radiation. It is claimed that this is compensated for by the improved circulation due to the high temperature of the feed water delivered.

After leaving the heater the water passes to the purifier, entering a lower chamber thereof in such a way as to impart a centrifugal motion to the water contained therein. Suspended matter is here entrapped and blown off by surface or sediment blow-off cocks, according to the specific gravity of the matter. The purest water is in the middle of the chamber and from this point it is passed through a filter chamber with 20 inches of filtering material, which removes not only the scale-forming elements but the mud as well. The collected sediment is removed at intervals by flushing, a simple arrangement of two valves being sufficient to operate the blow-offs and flush the machine.

The device is made wholly of bronze metal and barring accidents should last forever. The attention required is an occasional flushing, which can be done by the fireman without interference with his ordinary duties. The cost of maintenance is said to be limited to a renewal of the filter gravel once a month. The device is furnished by the Hayden Feed Water Purifier & Heater Company, Columbus, O.

Harbor Improvements at Chicago.

In removing the obstructions to navigation and the flow of water through the Chicago River, the trustees of the Sanitary District of Chicago, who have this problem in charge, are pushing their work vigorously and as rapidly as the many obstacles to be overcome will permit. The first and probably the most important part of the work consists in the ultimate removal of the center-pier swing bridges. The swing bridge at Taylor street has been entirely removed and replaced by a Scherzer rolling lift bridge, recently completed. The specially obstructive railroad bridge which is near the Taylor street bridge will be removed within a few months, as the new double-track rolling lift bridge of 275 feet movable span will soon be completed and placed in service. Contracts have been awarded and work has commenced upon the new Scherzer bridges replacing the swing bridges at Canal and Main streets. Bids are advertised to be submitted on May 8, 1901, for a Scherzer bridge to replace the swing bridge at Randolph street.

The Scherzer Rolling Lift Bridge Company, Chicago, have also recently completed plans for a new bridge at State street, to replace the present swing bridge, which was extremely obstructive to navigation on account of a sharp bend in the channel of the river at the site of this bridge. The new bridge will give a clear, unobstructed channel for navigation 140 feet wide; the movable span, center to center of bearings, will be 161 feet 8 inches; the roadways, center to center of trusses, will be 40 feet 6 inches wide, with two sidewalks, each 11 feet wide. As State street is the principal retail business street of the city of Chicago, and the bridge is near the business center, it was decided to make the outlines of the new bridge as artistic as possible without increasing the present cost of the structure. The bottom chord is arched and the top chord projects but slightly above the roadway, thus giving a deck bridge with an unobstructed view. The new bridge when completed will not only facilitate navigation, but will present a striking contrast to the present unsightly swing bridge. The bridge without extra cost for ornamentation will be in harmony with the growing demand for more artistic bridge structures at Chicago. The bridge is so designed that appropriate ornamentation may be added at any time in the future, when funds are available for such purpose.

Plans have also been completed for new rolling lift bridges, to replace the swing bridges at Harrison street and Eighteenth street, and within a few weeks the Scherzer Company will have completed plans for a new bridge to replace the swing bridge at Polk street. All of the above new bridges will give an unobstructed channel of 140 feet in width, or wide enough to pass side by side two of the largest lake or ocean vessels likely to enter the harbor of Chicago for many years to come. The wide channels provided will enable vessels to pass these bridges very rapidly, and time will also be saved, as all bridges are designed to be operated by electricity, and may be opened or closed within 30 seconds.

As soon as these bridges are completed and placed in service, the work of removing the other obstructive swing bridges can be proceeded with without unduly obstructing the street traffic across the bridges. After all the swing bridges have been removed and replaced by the more modern type of bascule bridge, and the obstructive tunnels have been lowered or re-