IMPROVED RAILWAY SIGNAL.

The system of railway signaling herewith illustrated presents many features which may be studied with advantage by those interested in the careful running of trains. The various operations of this method—all of which are positively automatic—may be enumerated as follows: A train in passing the signal moves the hands of the clock to the XII mark; the clock then runs as an ordinary one, marking the time from XII, which is considered zero. When the next train arrives, the engineer notes upon the clock the time which has elapsed since the passage of the preceding train. The opening of the switch or the turning of the bridge throws a red danger signal in front of the face of the clock, which of course may be placed at any desired distance from the switch or draw and at any height above the track. When so set the danger signal cannot by any means be removed from the face, except by the closing of the switch or draw.

The tube which carries the minute hand is provided with a heart cam (shown in the detail view), the notch or point of least eccentricity of which is exactly in line with the hand, so that when the arm of a lever is brought down upon the cam by a passing train, through the intermedium of mechanism described below, the tube will be turned to set the hand back to the XII mark. A similar device also sets the hour hand back to the starting point. This simple arrangement causes the lever when depressed by the downward movement of the operating bar, B, to act upon the heart cams and reset the hands accurately back to XII, no matter what position they may occupy at the time upon the dial.

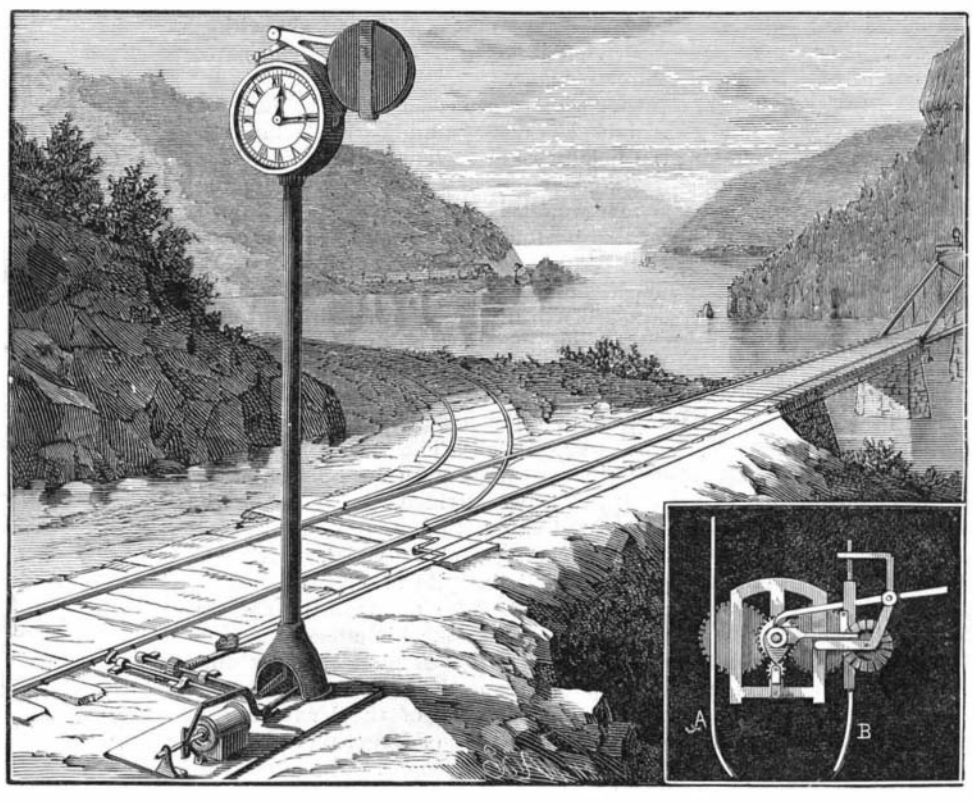
At the time the lever is operated to set back the hands the tubes carrying the hands must be free to turn upon their spindle independently of the clock mechanism; and after the resetting the tubes must again connect with the clock mechanism as soon as the lever is elevated out of contact with the heart cams, so that the hands will then be moved to indicate the interval of time between trains. The device for accomplishing this is simple in construction, accurate, and not liable to get out of order. The operating rod, B, reaches down through the hollow standards, and it acts by gravity, which is one of the principal features of this system, so that the signal mechanism is entirely relieved of excessive shock by passing trains. Normally, this rod rests upon a lever, which is connected to a shaft set at the side of the track and provided with a crank, arranged near the rail, to be depressed by passing trains, which will lower the forward end of the lever and permit the rod, B, to drop, and thus operate the clock mechanism.

This shaft, after the passing of each train, may be returned by a weight or other suitable device to cause the lever to lift the bar, B, ready for another action; but in order to make the lever dwell a short time after being depressed, to permit the train to pass on without each truck striking the crank and operating the signal, its outer end is connected by links and a slotted crosshead with the piston rod of a pneumatic clock cylinder, the spring of which returns the lever as the air slowly leaks out of the cylinder through a small opening. This construction is plainly shown in the perspective view. It will be understood that when the rear end of the rod is elevated by a passing train, the piston head will be moved in the cylinder to compress a spring, and at the same time air will be taken freely into the cylinder through an inwardly opening valve The air, when the piston returns, will close the valve and retard the piston a greater or less length of time, according to the size of the small escape opening.

The dial of the clock is transparent, and back of it is placed a lamp which serves to illuminate the signal and also to keep the interior of the casing warm, to insure the proper working of the clock in cold weather.

Connected with the casing by a casting is a semaphore, which is moved to a position in front of the dial or within its own case by means of the rod, A, which passes down through the hollow standard, and connects with a lever attached to a shaft provided with a pinion, beneath which is a rack adapted to be moved longitudinally for turning the shaft to operate the signal plate. This rack is connected so that, when the switch is opened, the signal plate is made to drop in front of the dial to indicate danger. The closing of the switch causes the plate to return within its casing. The signal plate is also arranged to be operated by the opening and closing of the drawbridge. The connections for making the movements of the signal are very simple and well designed, so that the reliability of the action of the red signal is assured. By lengthening the connecting rods, the signal post may be set at any desired distance from the switch or draw, so as to give the engineer ample time to stop his train, should either be open. Connected to the rack is a lever, to which is attached a wire running along the track; so that, in case of delay or accident between signal stations, a train hand can, by pulling this wire, display the signal to block oncoming trains.

This system of railroad signaling is the invention of Mr. W. J. Tripp, whose address is Grand Boulevard, between West 142d and 143d Streets, New York city, where a working model may be seen.



TRIPP'S IMPROVED RAILWAY SIGNAL.

BARNES' IMPROVED EMERY GRINDER.

The accompanying engraving represents an improved method of mounting an emery wheel, which possesses advantages which are apparent at a glance. To the front of the treadle, which is pivoted to the rear standard and bent to encircle the water column, is attached a chain, leading to a lever whose free end carries a float. By pressing with the foot upon the treadle, the float may be made to enter the water chamber, thereby displacing the water and forcing it to rise and supply the wheel. When the machine is not in use, the float rises and the water settles back out of the way of the wheel.

This arrangement does away with all pumps and valves, which are liable to get out of order, simplifies the machine, and makes it more practicable under all conditions.

The chamber in which the float is suspended—resting upon the water—is divided from the chamber in which the wheel revolves by a partition, in the lower part of which is a small hole through which the water slowly enters the wheel chamber. Without this partition, the water would be flooded in to the wheel in a body or rush, which would not be desirable. The small hole being in the bottom edge of the partition allows all the water in the wheel chamber to flow back into the reservoir when the float rises. The curved treadle can be conveniently reached, no matter what position the operator may assume when grinding.

This construction not only greatly simplifies the machine and renders it far more efficient, but it also allows it to be used in shops where there is no piping, while it does away with the expense of piping in shops where there is no system of piping. This emery grinder is manufactured by the W. F. & John Barnes Co., of Rockford, Ill., who will furnish further particulars.

WINNECKE'S COMET.—A telegram from the Cape Observatory announces the discovery of the periodic comet known as Winnecke's on August 20th. It is a matter for congratulation that one of our royal observatories has a discovery placed to its credit, especially when it is remembered that an organized body of comet seekers exists. The observation at the Cape was made at 5:48 P. M. (Greenwich time) on Aug. 20, the comet then being in right ascension 13 h. 10 m. 21·5 s. and north polar distance 91° 8′ 17″, the daily motion being 3 m. and 32′ (both increasing). At the above time the comet was circular, about 1′ in diameter, with central condensation, but no tail, and about equal in brightness to a star of the tenth magnitude. This comet was first discovered in 1819, June 12, by M. Pons at Marseilles, and the period between successive returns to perihelion found to be about 5½ years. It, however, passed perihelion six times without being noticed, until Winnecke discovered it on March 8, 1858, since which date it has escaped observation on two returns, viz., 1863 and 1880, but was observed in 1869 and 1875. Some astronomers thought it probable that 1819 was not the first year of observation, but that the comet was the same as that discovered by Pons in 1808; but recent observations do not support this hypothesis.—*London Times.*

Prize for a War Ship Design.

The Navy Department offers a prize of $15,000 for the best design for a war ship.