charged and the tank filled with water, is obvious. This, of course, requires two signals, one for movements in each direction. The out-door signal may be either the Hall disc signal as used in the block system of this company or the semaphore shown below.

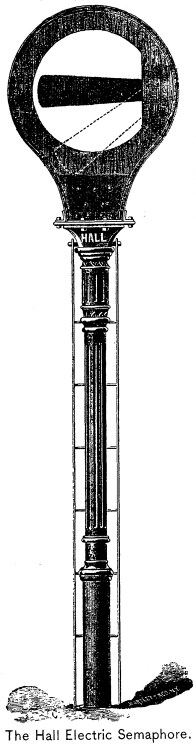
The electromagnet *S*, in fig. 1, represents the signal instrument, the presence of the electric current in the coils holding the signal in the safety position as shown. *D* represents the "drop," which is mounted in a cabinet fixed at some place in the office where the operator must leave his desk in order to reach it. It will be seen that whenever the circuit is opened the armature, in falling away, opens its own circuit in such a way that it can be again closed only by lifting the armature of *D* by hand. As will be seen in fig. 2, this armature carries a tablet lettered so as to warn the operator of the fact that a train order is on hand. The opening of the circuit permits this tablet to fall from its hidden position to a stop which leaves it in front of a glass-covered opening in the case.

On receiving an order for a train the operator sets the signal at danger by opening the switch *C*, which is located on his desk. If now, when the train arrives, he should forget that he is to stop it, and should attempt to clear the signal by closing the key *C*, he would find that the signal remained at danger, and on going to the cabinet *D*, to close the circuit by lifting the armature, would be reminded by the tablet of the presence of the train order. The lifting of the armature is accomplished by means of a large push button or plunger, and this button can be arranged with a clip to receive a folded order, so that the circuit cannot conveniently be closed without first picking up the order.

Two of these signals have been erected at Somerville, N. J., on the Central of New Jersey, one for westbound and one for eastbound trains, and the Hall Signal Company, on Thursday of last week, exhibited their workings to a party of railroad officers, taking them by special car from New York. The manufacturers entertained the party with an elegant lunch on the train and incidentally gave them a chance to see a fine new passenger station—that of the Central road at Somerville. This station is small, but in tasteful appointments and well arranged conveniences is a model.

The Hall Illuminated Electric Semaphore.

In connection with the train order signal described above, the Hall Company exhibited at Somerville its new form of semaphore, shown in the accompanying cut. The mechanism for operating this signal is precisely the same as that used in the Hall disc signal, heretofore described in the *Railroad Gazette*. In the disc signal the counterweight is lighter than the signal, but in the semaphore it is made heavier so that the arm shall assume the horizontal position in case of failure of the circuit or operator. The cut shows the signal as actually used at Somerville, the case being a modification of the pattern used for disc signals, but the company is making plans for a case with a glass-covered opening of a different shape. With a rectangular opening of the right proportions the ordinary semaphore can be quite closely imitated, the side of the case answering for the post. The angle shown by the dotted line in the cut does not indicate the limit of the power of the magnet.



The Hall Electric Semaphore.

The opening in the case, which furnishes a light background for the dark blade, is covered with transparent glass in front, and with ground or painted glass at the back. The lamp for illuminating the signal at night is placed 18 in. or more away from the case, and is fitted with a reflector shaped to diffuse the rays of light equally over the whole surface of the glass. The blade is made of silk or cloth stretched on a hollow wire, the same as the Hall disc, and is therefore sufficiently translucent to show its color at night. It can be made of any desired color that contrasts sufficiently with white.

Wrecking Outfits and Handling Wrecks.*

BY P. W. HYNES, WRECKING FOREMAN B., C. R. & N. R. R.

V.—DERRICKS.

Among the most important of modern appliances for handling wrecks may be mentioned the portable derrick which will be dealt with in this chapter.

*Copyright, 1890, by P. W. Hynes.

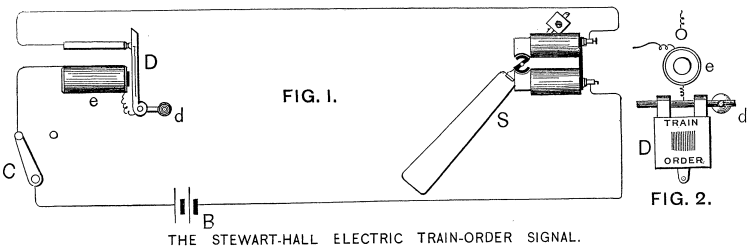


FIG. 1. FIG. 2.

THE STEWART-HALL ELECTRIC TRAIN-ORDER SIGNAL.

Arrangement of Instruments and Wires.

The portable steam derrick has been widely introduced of late, and has often engaged the attention of the mechanical engineers who have sought to solve by means of it the always vexing problem of delays. Great sums have been spent to accomplish this end, but I do not think they have been justified by the results. By the use of steam there is always a tendency to try to accomplish by force what can be better done by strategy. In consequence the steam derrick is often broken and the repairs are costly. Moreover, the breakdown always occurs at the scene of a wreck and adds vastly to the delays.

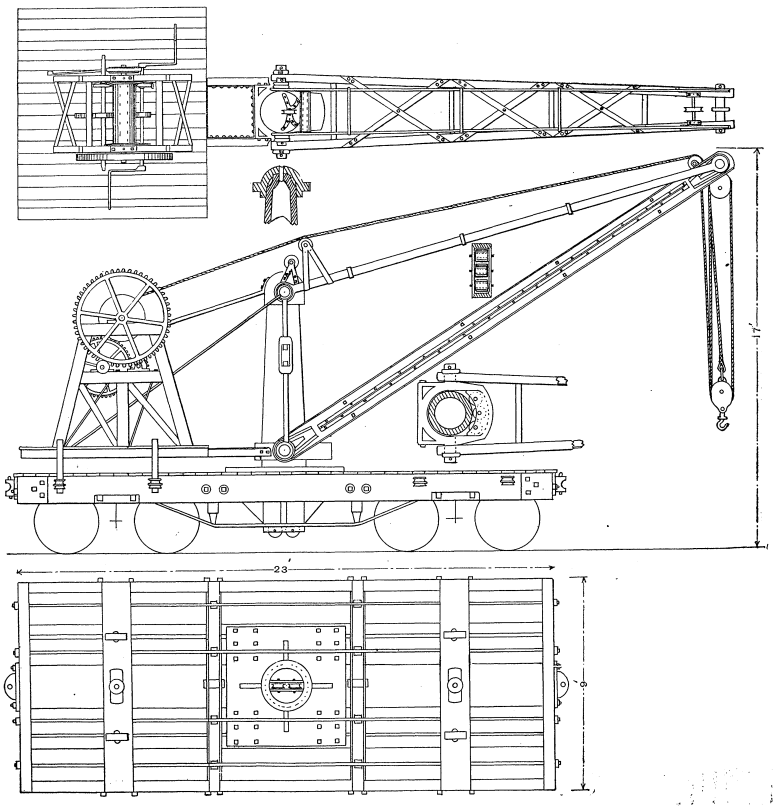
Another form of steam derrick is the combined steam shovel and derrick. This is a makeshift and is fortunately seldom available, being usually safely side tracked in some remote gravel pit. Still another pattern is that in which the line is worked by the locomotive. There are several forms of derricks which are worked either partly or altogether by hand power, and these form a class by themselves. They may be sub-divided into three classes, however, those having a derrick at each end of a flat car, those having a derrick at one end only, and those having one derrick placed in the middle of the car. The first has, to a certain extent, the advantage of stability, owing to the greater weight of the long car. The second is very undesirable because it is useless if turned wrong end foremost. The last named pattern meets the general conditions with the fewest drawbacks and is the one of which I shall treat.

The sketch attached shows, in plan and elevation, the outlines without dimensions of a derrick car designed to handle weights of 15 tons lift. It is so arranged as to operate by hand power or by means of a locomotive drawing on a line which passes down through the pillar and under the car.

The truck has a frame of forged steel, oak bolster, 33-in. wheels and M. C. B. standard journals and boxes. All springs are omitted. In order to give play to the trucks the car is raised on the centre so as to leave ⅝ of an inch between the side bearings.

The car is framed of seasoned oak 23 ft. long and 9 ft. wide over all. The side and end sills are 14 in. × 5 in., and the six intermediate sills are 10 in. × 6 in. These latter are placed three on each side of the centre and 2 in. apart, leaving a middle space of 24 in. or thereabouts. The frame is fitted together in the usual way and strengthened by longitudinal and transverse truss rods, corner plates and cross ties. The rods are of 1¼-in. round iron. The deck is laid as usual and the seams calked with oakum and melted pitch to exclude water. In the centre of the car above the floor is a cast iron plate 5 ft. square and 2 in. thick. Under this, on the lower side of the intermediate sills, is a similar plate which, however, is cast in one piece with a deep sleeve and strengthening brackets. These two plates are firmly bolted together by 24 one-inch bolts, of which four pass through each of the intermediate stringers or sills. The pillar is also of cast iron and made hollow. It is 11 ft. high, including the cap, and has a diameter of 22 in. outside and 15 in. inside at the car floor. From this point it tapers to an outside diameter of 12 in. and an inside diameter of 5 in. at the bottom of cap. The top of the pillar is turned to fit the inside of the cap and the foot is turned to a nice fit with the sleeve of the lower plate. When in position the pillar is stepped in the sleeve, being supported by a ½ in. shoulder which rests upon the top of the lower plate. The cast iron cap is fitted with trunnions diametrically opposite each other, and has also a strong sheave which leads down directly through the centre of the cap and pillar. The sleeve of the lower plate has two corresponding pulleys, as shown, so that the hauling line may be carried down to the bottom of the pillar and thence in either direction under the car to couple with a locomotive.

Supported by suspension rods, with appropriate turn buckles, from the trunnions of the cap, is a collar which



FIFTEEN-TON PORTABLE DERRICK.