

(No Model.)

C. BORGHESE.
AUTOMATIC RAILWAY SIGNAL.

No. 497,530.

Patented May 16, 1893.

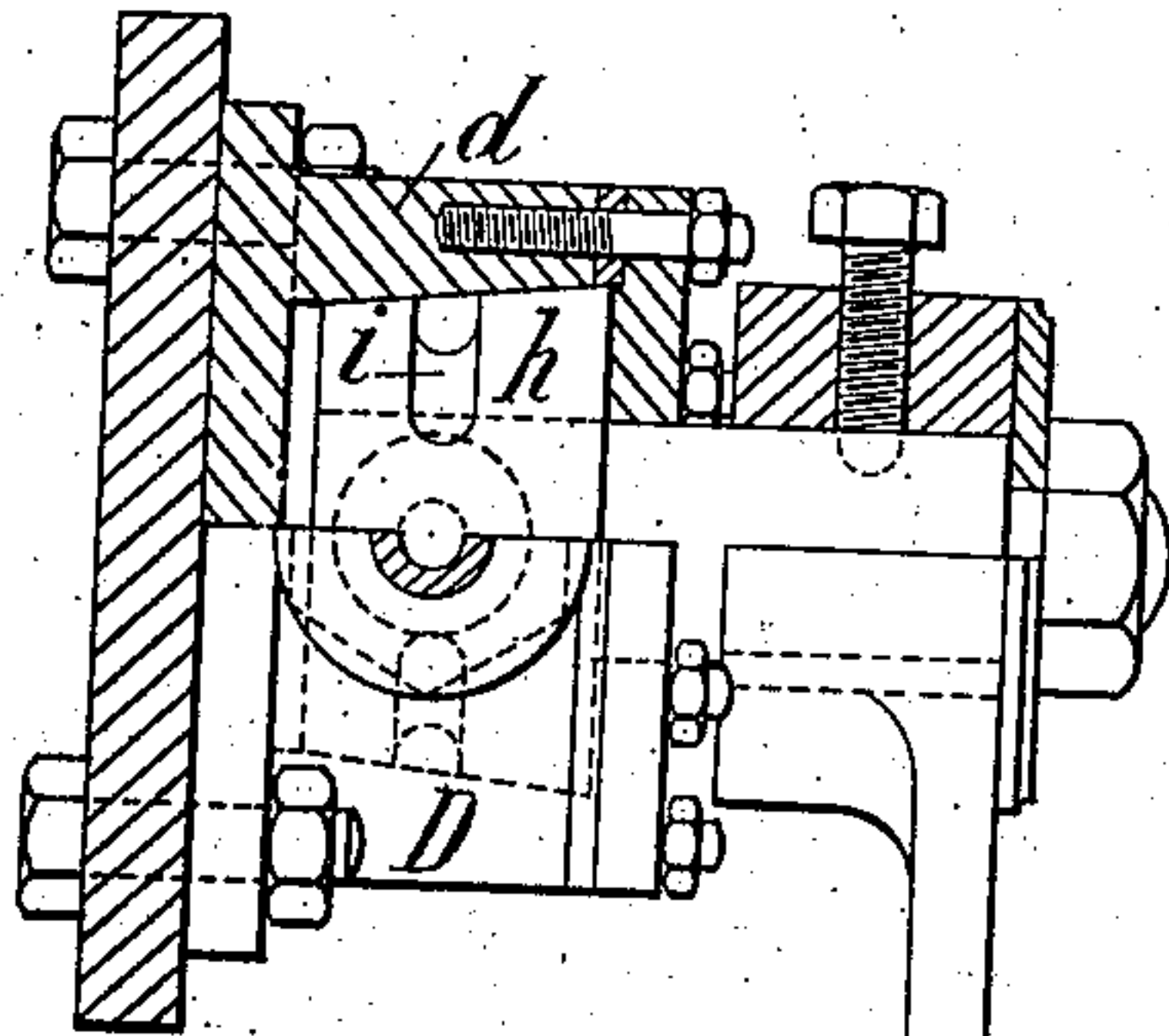


Fig. 1.

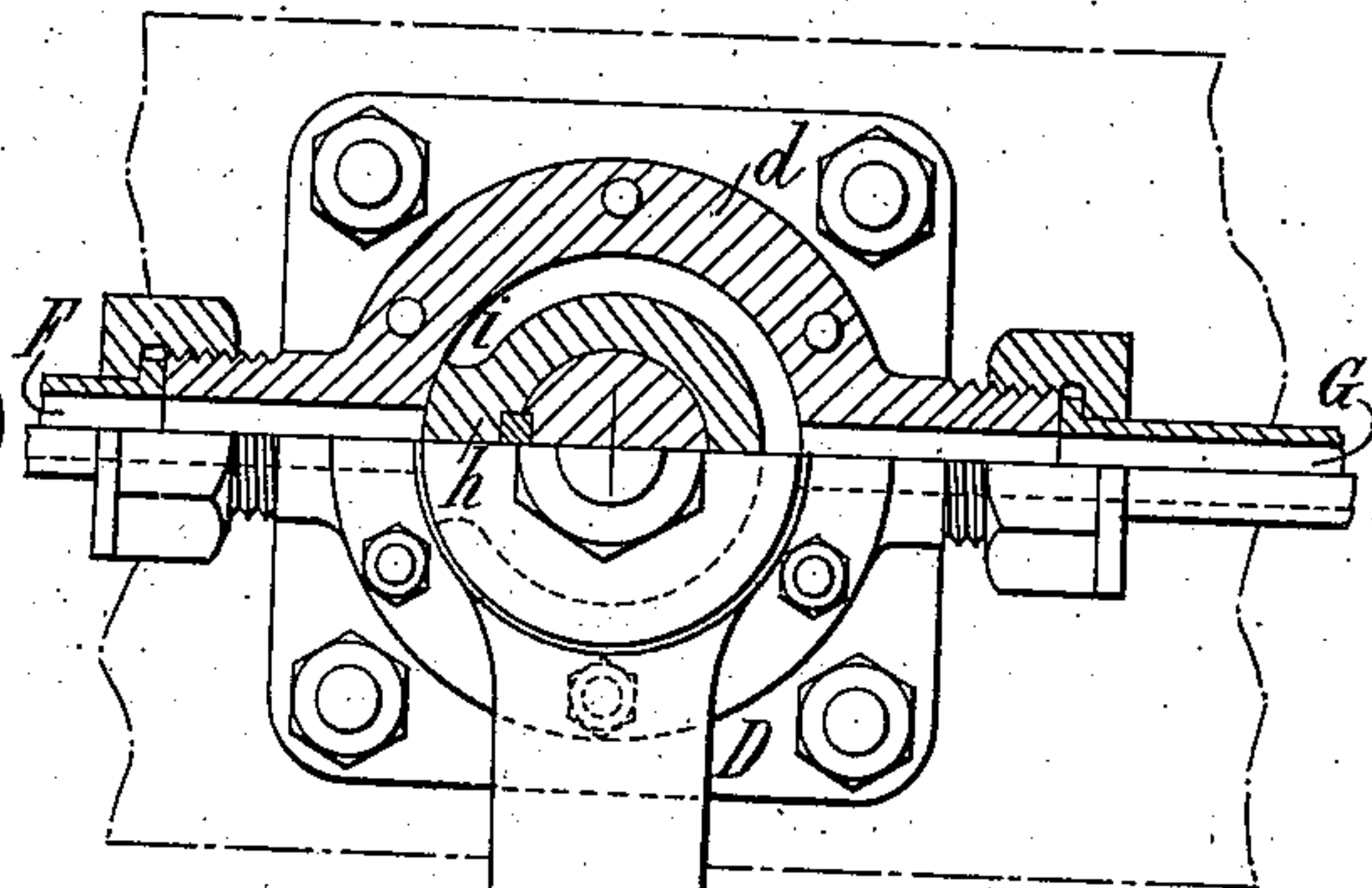


Fig. 2.

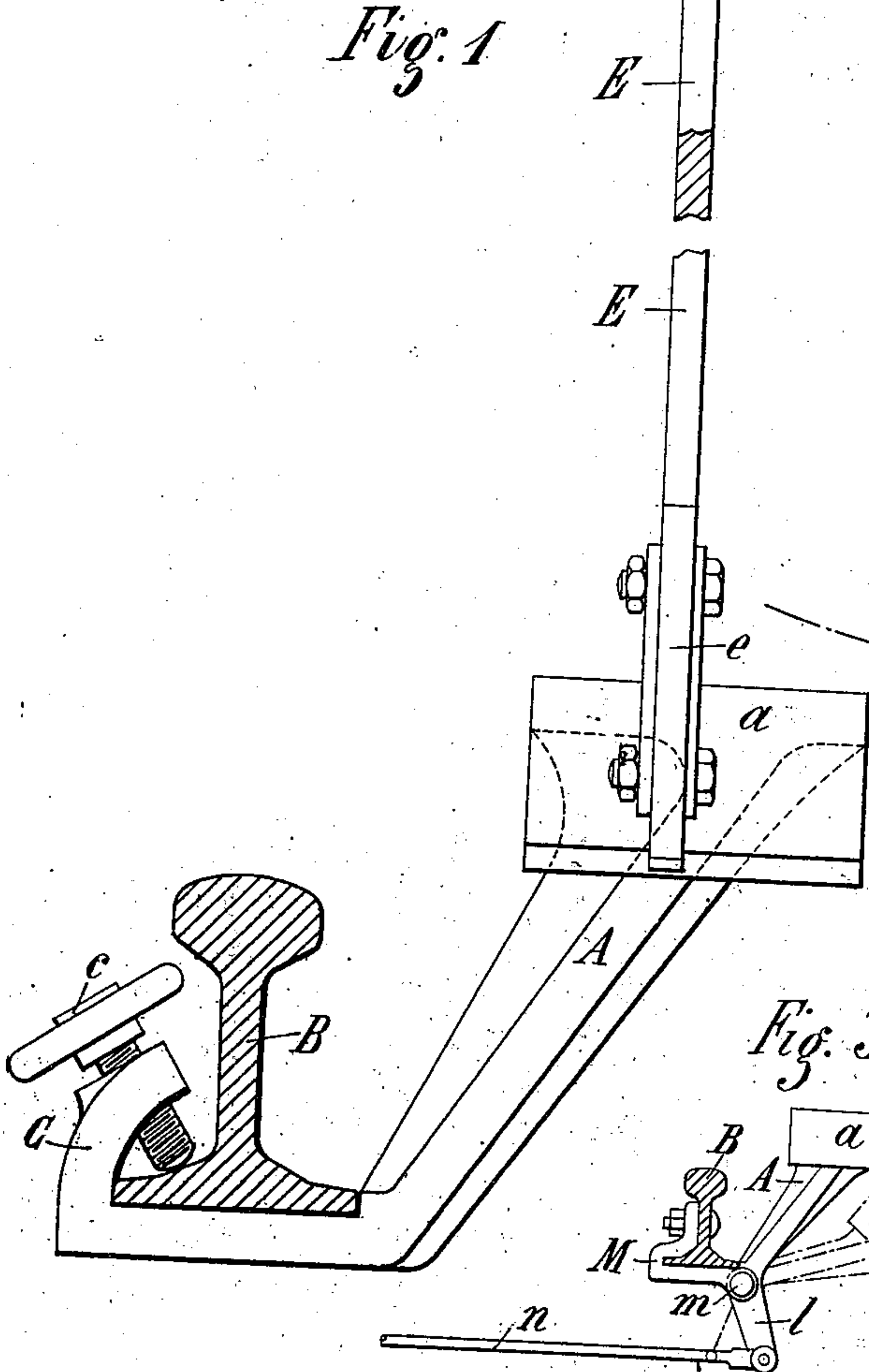


Fig. 3.

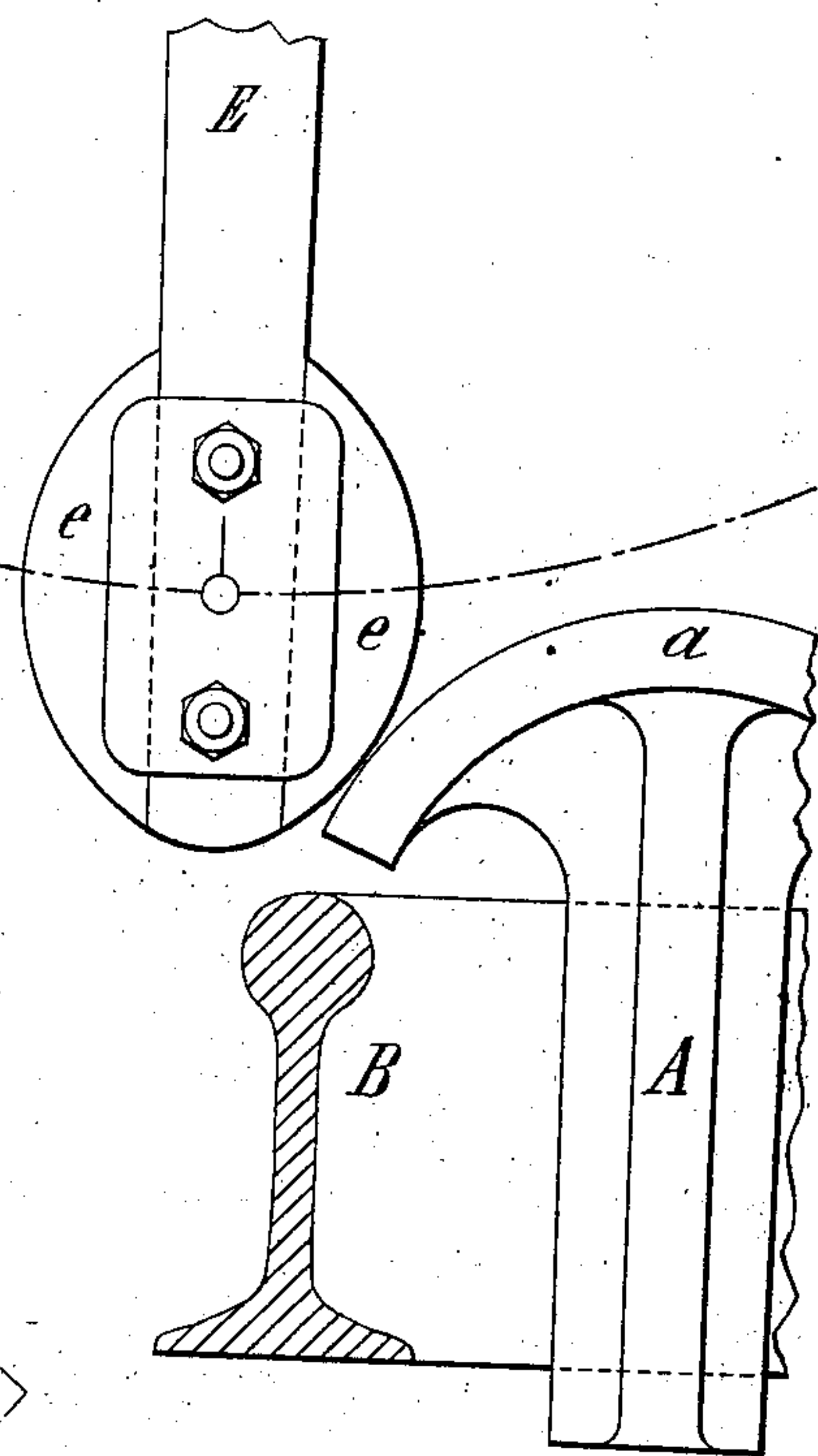






Fig. 4.

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UNITED STATES PATENT OFFICE.

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AUTOMATIC RAILWAY-SIGNAL.

SPECIFICATION forming part of Letters Patent No. 497,530, dated May 16, 1893.

Application filed June 7, 1892. Serial No. 435,803. (No model.)

To all whom it may concern:

Be it known that I, CARLO BORGHESE, a subject of the King of Italy, residing at Turin, Italy, have invented certain new and useful Improvements in Automatic Railway-Signals, of which the following is a specification.

This invention relates to the class of railway signaling devices designed to operate a signal on a moving train to warn the engineer when a particular point is reached by the train. The signal produced by the present invention may be visual or acoustic, but the latter is preferred. The signal may be employed in conjunction with, or as a substitute for the ordinary signals, and it may be employed to automatically set or operate the continuous brakes on a passing train.

The invention comprises as its essential features two devices, one of which is placed on the track and the other carried by the moving train. The device placed on the track is in the nature of an obstacle, which may be either fixed in a permanent manner at some particular point on the track, or be adapted to be fixed hurriedly in a temporary manner to a rail, a sleeper, or some other convenient part of the track. The device carried by the train, and perhaps most conveniently by the locomotive drawing the train is designed to produce the signal by its encounter with the obstacle on the track when the train passes the signaling point. The obstacle secured in place on the track may have various forms to suit the circumstances so long as it is adapted to encounter and actuate the corresponding device on the train. It may, as stated, be portable, and provided with means for quickly fixing it to a rail or sleeper, or be set in place in a permanent manner. In the latter case, it may be provided with, or combined with means for operating it from a distance, as in the case of other visible or acoustic signaling devices. The device carried by the train may be fixed on the locomotive, for example, at any point where it will encounter the obstacle on the track. The signals operated by the device may be of varied kinds, optical, acoustic, &c.; it will serve to employ an acoustic signal loud enough to be easily heard by the engineer and trainmen. This signal may be a whistle,

an electric bell, a steam or compressed air signal, &c. In ordinary cases where the device is mounted on the locomotive, it will be convenient to employ a steam whistle as a signal, but it is preferable to employ another than the regular whistle of the locomotive.

In the accompanying drawings an embodiment of the invention is illustrated, Figure 1 being a view of the signaling device adapted for sounding an acoustic signal produced by steam or compressed air, and Fig. 2, a view of the same taken at right angles to Fig. 1. Fig. 3, is a view on a smaller scale showing a construction adapted for operating the obstacle on the track from a distance. Fig. 4, is a diagram illustrating the adaptation of the device to a block signal system.

Referring primarily to Figs. 1 and 2,—A, is the obstacle or device fixed on the track. These views represent the portable form of the device adapted to be fixed to the rail B, by means of a base piece which takes under the rail between the sleepers, having on its extremity a hook C, and a set-screw c, as seen in Fig. 1. On the upright portion of the device is an arched or convex crown, a, situated in the path of the lever-device carried on the train. This latter device consists essentially of a cock or valve D, and a pendent signal operating arm or lever E, which is secured to and controls the oscillating plug of the cock and swings in a vertical plane parallel with the track. The lower end of the arm E, is furnished with cushions e, e, of rubber or the like to ameliorate the shock when the arm encounters the obstacle A. The fixed box, d, of the cock D, has two oppositely arranged ports, in communication, respectively, through pipes F and G, with a steam boiler or compressed air reservoir on the one hand, and with a whistle, or other analogous signal, on the other hand, the cock D cutting off the communication, normally, between said boiler and whistle. The plug h, of the cock D, is not pierced as usual, but has a circumferential groove, i, which extends nearly around the plug and is in connection with one of the pipes (G in Fig. 2) at all times, and whenever the arm E, is swung toward either side of the perpendicular a little way, one or the other extremity of the groove

2 will communicate with the other pipe (F in Fig. 2). When the cushion *e* on the end of the arm E encounters the obstacle A, when passing, in which ever direction the train may be moving, the arm will be swung to one side and the alarm sounded, and the alarm will continue to sound while the arm is displaced, thus warning the personnel of the train. The arm E, or the stem of the cock-plug, may have a cord or arm attached to it so that the engineer or trainman can, if necessary, return the lever to its normal position, and the trainman may ascertain by this arm or device whether the arm E, is displaced in case the signal does not sound. These parts are not shown in the drawings as they are not indispensable and may be supplied by any good workman if they are needed.

I have shown one of the many ways in which the displacement of the arm E may be made to sound an acoustic signal, and I do not deem it necessary to show other ways; it will suffice to say that the arm E, or some equivalent device, may be arranged to close a circuit through an ordinary electric bell. This could be effected by any one with some knowledge of electricity.

Fig. 1, as I have said, shows an obstacle A adapted to be attached to the track rail at any point, and in a temporary manner; and in Fig. 3 I have shown how the obstacle may be secured in place in a permanent manner and be set to operate, or so as to be inoperative or inert, from a distant point. In this figure; a base-piece, M, embraces the foot of the rail and is secured to the web of the rail by a bolt, and the obstacle A is hinged or pivoted to the base-piece at *m*, so that it may be let down to the position seen in dotted lines, when its crown will not be in position to encounter the arm E on a passing train. On the obstacle A is an arm *l*, to which is coupled an operating rod, *n*, which may extend to a considerable distance from the point where the obstacle is placed on the track. This type of the device is best suited for fixed installations, and is well adapted for use with disk or semaphore signals of the usual kind. In such a case the same rod, *n*, may set the semaphore and the obstacle A, and the engineer will then receive an acoustic signal at the same time that the semaphore is displayed. It will only require ordinary skill and judgment to furnish the me-

chanical details to adapt the signal to different situations and different roads.

It will be understood that my device as herein shown may be employed to set the brakes of a passing train, and particularly the ordinary continuous compressed air and vacuum brakes. In this case it will only be necessary to suppose the pipes F and G to represent the train-pipe, and the valve D to represent the ordinary train-valve or an analogous valve. The setting of the brakes will be a signal to the engineer and the trainmen, although not, in the ordinary sense, either an acoustic or visible signal.

My improvements are adapted to any system of signal service on railways, either the block system or other systems, and as well to double track, as to single track roads. For example, as seen in Fig. 4, P and Q are two successive stations; *p* and *q* are the two signaling posts nearest these stations on the main line. I am able to establish that when the station P should send a train toward station Q, it warns it and at the same time warns the post *q* to set its obstacle so as to arrest; the station Q, responding, notifies the post *p* to open the line to its tower. It will thus be seen that the line will only be open when the two stations are in accord. If each post closes the line after the passage of the train until further orders, each train remains blocked and all danger is avoided.

Having thus described my invention, I claim—

1. In a railway signal, the combination with a movable obstacle on the track, of the signal-operating arm E, carried by the locomotive or car, said lever having a yielding cushion, *e*, at the point where it impinges upon the obstacle set on the track, substantially as set forth.

2. In a railway signal, the combination with a movable obstacle on the track having an arched or rounded crown, of the signal-operating arm E, carried by the locomotive or car, said lever having a yielding cushion *e*, with a convex or rounded surface at the point where it impinges upon the obstacle set on the track, substantially as set forth.

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