

(No Model.)

T. E. HILL.  
RAILWAY SIGNAL MECHANISM.

No. 472,808.

Patented Apr. 12, 1892.

Fig. 1.

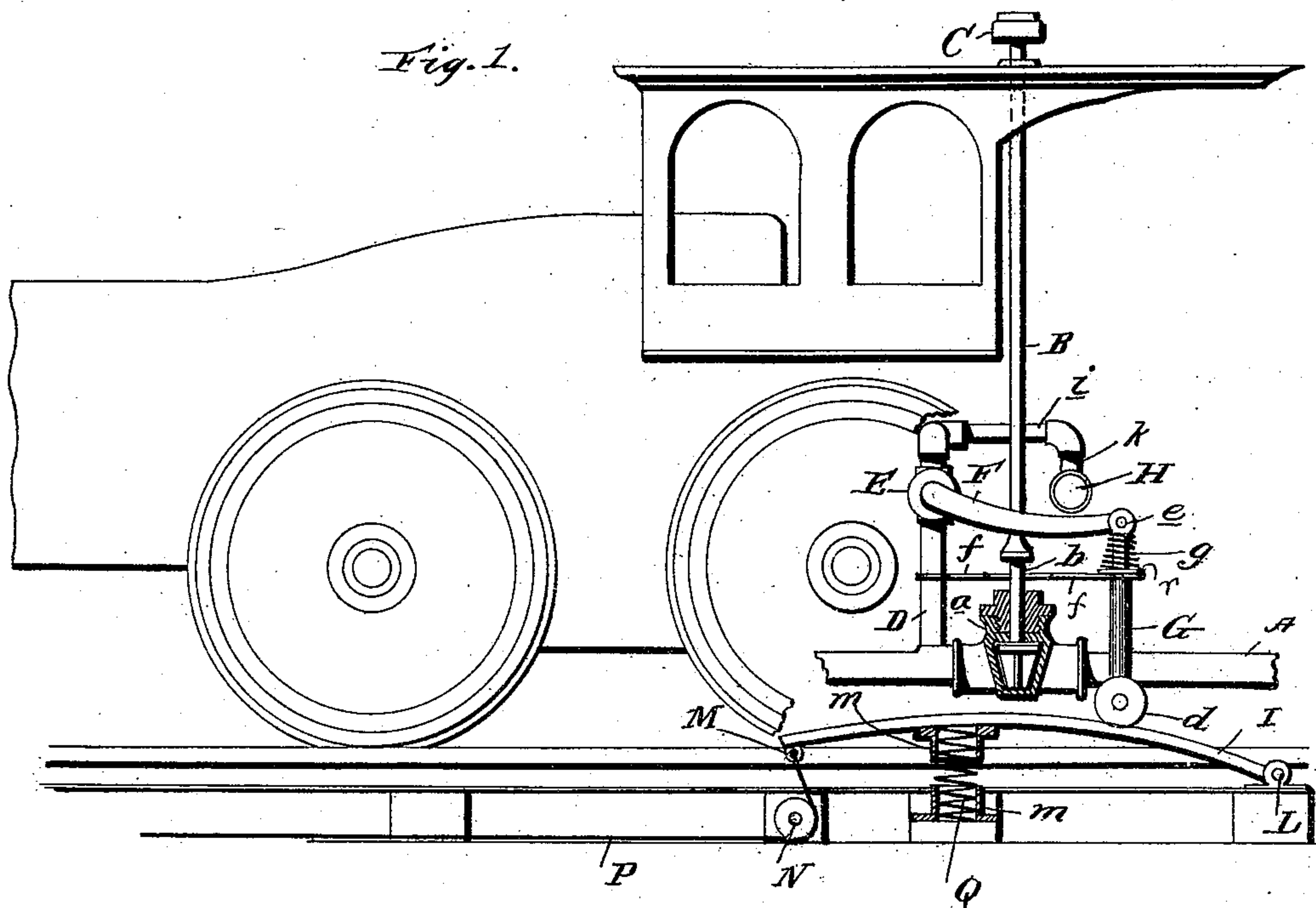
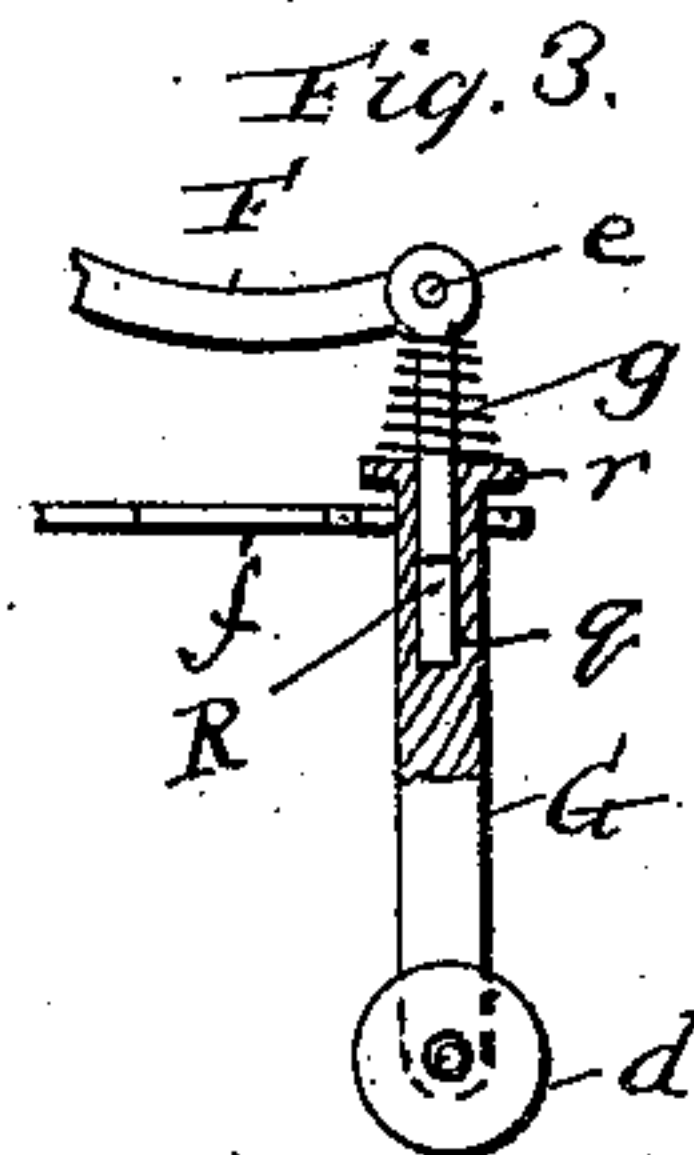
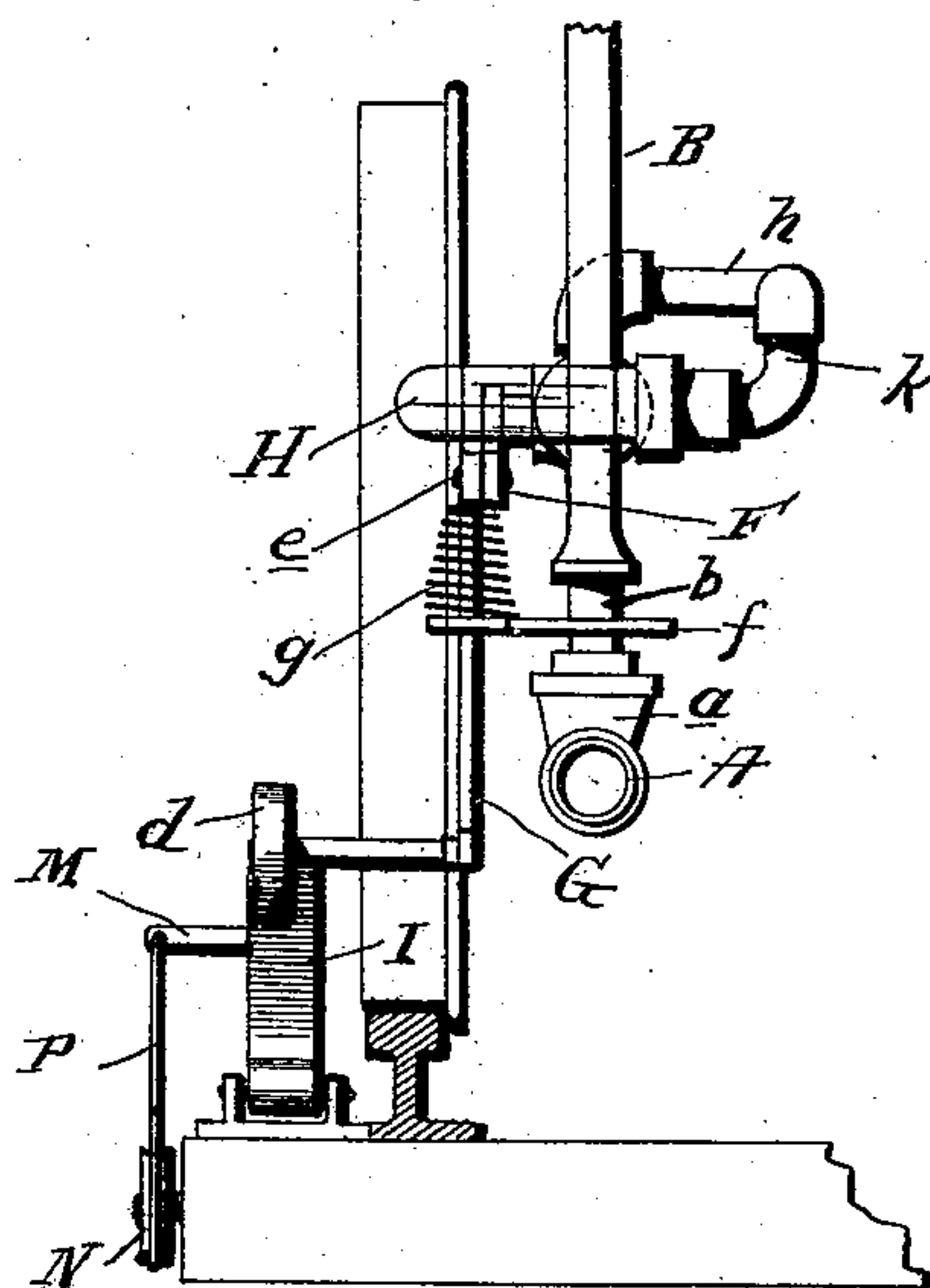


Fig. 2.



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# UNITED STATES PATENT OFFICE.

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## RAILWAY SIGNAL MECHANISM.

SPECIFICATION forming part of Letters Patent No. 472,808, dated April 12, 1892.

Application filed July 17, 1891. Serial No. 399,869. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS ENGLISH HILL, a citizen of the United States, residing at Rahway, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Mechanism for Operating Railway-Signals and Connections for Draw-Bridges; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in devices to be carried by a locomotive and operate in conjunction with the line-pipe or supply-pipe of a fluid-pressure or air-brake system to exhaust the air or fluid and apply the brakes.

The invention further relates to devices adapted to be placed in connection with a railway, and serve, in conjunction with a draw-bridge or the like, to bring into operation the devices carried by a locomotive whereby the movements of a train may be lessened and the brakes applied to stop the same.

The invention has for its object, among other things, to provide such devices of the character above mentioned which will be durable and not liable to get out of order and which will be always ready for operation regardless of the attention which may be given by the engineer, thereby rendering such devices automatic in their operation and positive in their action.

The invention will be fully understood from the following description and claims, when taken in connection with the annexed drawings, in which—

Figure 1 is a side view of a portion of a locomotive, showing my improvements applied, with some of the parts in section and some broken away. Fig. 2 is a front view of the improvements, showing one of the wheels of the locomotive, and also the attachments in connection with one of the rails of a track; and Fig. 3 is a detail view of the vertically-movable rod G, with its spring and attachments.

Referring by letter to said drawings, A indicates a line-pipe leading from the cab of the locomotive, and which may be the line-pipe

or supply-pipe as used on the well-known fluid-pressure or air-brake system. This pipe I have shown as provided with a valve *a*, and leading from said valve a rod or stem *b*, which is in turn connected with a vertically-disposed rod B, which has its bearing in the roof of the cab and carries a laterally-disposed arm C, so that it may serve, in connection with the ordinary semaphore system, to exhaust the air and apply the brakes, and while these devices form no part of my present invention, yet I desire to show a locomotive equipped so that it may work in conjunction with the semaphore-signals usually employed.

D indicates a pipe tapping the pipe A. This pipe is here shown as vertically disposed, and pivotally connected therewith at one end is an arm F for a purpose which will be presently explained.

G indicates a vertically-movable rod or post. This post carries at its lower end a friction-roller *d*, and its upper end is provided with a vertical socket *g* and an external flange or shoulder *r*, which latter is designed to bear upon a brace or bearing *f*, which is suitably arranged in a horizontal position at a convenient point, and through which brace the post G passes and is limited thereby in its downward movements.

R indicates a vertical rod, which is seated in the socket of the post G and is connected in a hinged or pivoted manner, as shown at *g*, with the outer end of the lever F, which lever, as before described, is pivoted at its opposite end to the upper end of the pipe D or to any other suitable support.

*g* indicates a spiral spring, which surrounds the exposed portion of the vertical rod R and is confined thereon between the upper end of the post or rod G and the outer pivotally-connected end of the lever F for a purpose which will presently appear.

H indicates a tube of glass or other fragile material, which is designed to form a cap for the outlet or free end of the pipe D, which connects with the air or fluid pipe A. This glass tube H is arranged in a plane above the arm F and in close relation thereto, so that any upward movement of the vertical rod G, and consequently the rod R, would cause said



arm to crush the glass tube, so as to exhaust the air or fluid and apply the brakes. This glass tube may be connected in any suitable manner with the pipe D, and in the present illustration I have shown said tube connected with the pipe by means of a lateral branch *h*, a branch *i*, leading from one end of the branch *h* and at right angles thereto, and a short depending branch *k*, with suitable elbows connecting said parts, although I do not wish to confine myself to such construction, as it is obvious that the arrangements may be varied so as to have the glass tapping-tube for a pipe tapping the line-pipe so arranged that it will be crushed or broken by a lever or arm connected with the vertically-movable rod R. It will be readily seen that an engine thus equipped may serve to apply the brakes of an air-brake system by having the friction-roller of the vertically-movable rod engage or contact with elevations arranged along the track, and such equipments will be found very effective in applying the brakes in such cases as an approach to an open draw of a bridge, the misplacement of a switch, or the like.

It will be observed that I have illustrated a cable which is designed to connect with a mechanism of a draw-bridge and lead to elevations arranged on the roadway at a suitable point from the entrance to the bridge. These elevations, as better shown in Fig. 1 of the drawings, may comprise a bar I, which is hinged or pivoted at one end to a bracket L, arranged on one of the cross-ties, and its opposite end is connected with a cable, as shown at M, a suitable guide-pulley N being arranged beneath the level of the track to guide the cable P. This bar I is raised, when the cable has been slackened, by means of a spring Q, which bears against the under side of said bar, and its opposite ends are seated in sockets *m*. It is obvious, however, that any form of spring might be used, as it is simply necessary to provide such yielding devices as will elevate the bar I when the cable P has been slackened, as caused by the opening of a draw, and allow said bar to be depressed to the level of the track or slightly below the same when the cable has been drawn, such as caused by the closing of the draw. It is also obvious that the cable might be carried to signal devices of any suitable character, and in some cases may be connected with switches, so that the train can be stopped in its approach to a misplaced switch.

In the illustration of my invention I have represented the elevation on the outer side of the track-rails, and I prefer to have it arranged in that position, although, if desirable, it may be placed between the rails.

In operation it will be seen that as a train approaches a draw-bridge or other point of danger and the elevations are raised to indicate that such draw has been opened the roller *d*, contacting with the elevations, will be

raised so as to raise vertically the rod or post G, and this in turn, raising the rod R, will force the lever F against the glass cap H, so as to crush the same and exhaust the air or fluid which was held therein under pressure, thus exhausting the air from the line-pipe and applying the brakes. It is obvious that a cock should be employed for cutting off the exhaust after the brakes have been applied and until another cap of glass has been replaced. The spring *g* will aid in depressing the rod or post G, and also assist in raising the rod R, and consequently the lever F, so as to assist in the coaction of the parts.

Having described my invention, what I claim is—

1. The combination, with a line-pipe or supply-pipe of an air-brake system, of the vertical pipe tapping the same, the horizontally-arranged glass tube, the branch pipes connecting the said tube with the pipe tapping the supply-pipe, the pivoted lever vertically movable below the glass tube, the vertically-movable rod carrying a friction-roller at its lower end and having a socket at its upper end, the rod arranged in said socket and connected with one end of said pivoted lever, and a spring surrounding said rod above the socket and below the lever, substantially as specified.

2. The combination, with the supply-pipe of an air-brake system, of a pipe tapping said supply-pipe, a cap of glass or fragile material sealing or closing said tapping-pipe, a pivoted lever movable in a plane below the glass cap and capable of crushing the same, a vertically-movable rod carrying a friction-roller to contact with elevations along the track, and a rod bearing in said rod carrying the roller and connected with one end of the lever for crushing the glass cap, substantially as specified.

3. The combination, with a supply-pipe of an air-brake system, of a pipe leading therefrom and having a cap of glass or other fragile material, the lever pivoted below said glass cap and adapted to crush the same, the vertically-movable rod arranged in the bearing and having a socket at its upper end, and also an external shoulder or stop, and a friction-roller at its lower end, the rod arranged in the socket of said vertically-movable rod or socket-rod and pivotally connected at its upper end with one end of the lever, and a spring surrounding the latter rod and bearing at one end upon the socket-rod and its opposite end bearing upwardly against the outer end of the lever, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

THOMAS E. HILL.

Witnesses:

WAM. H. LITTLE,

WILLIAM H. FREEMAN.