E. P. JESSOP.

AUTOMATIC BRAKE APPLYING DEVICE.

APPLICATION FILED MAR. 11, 1909.

936,905.

Patented Oct. 12, 1909.

2 SHEETS—SHEET 1.

Fig. 1.

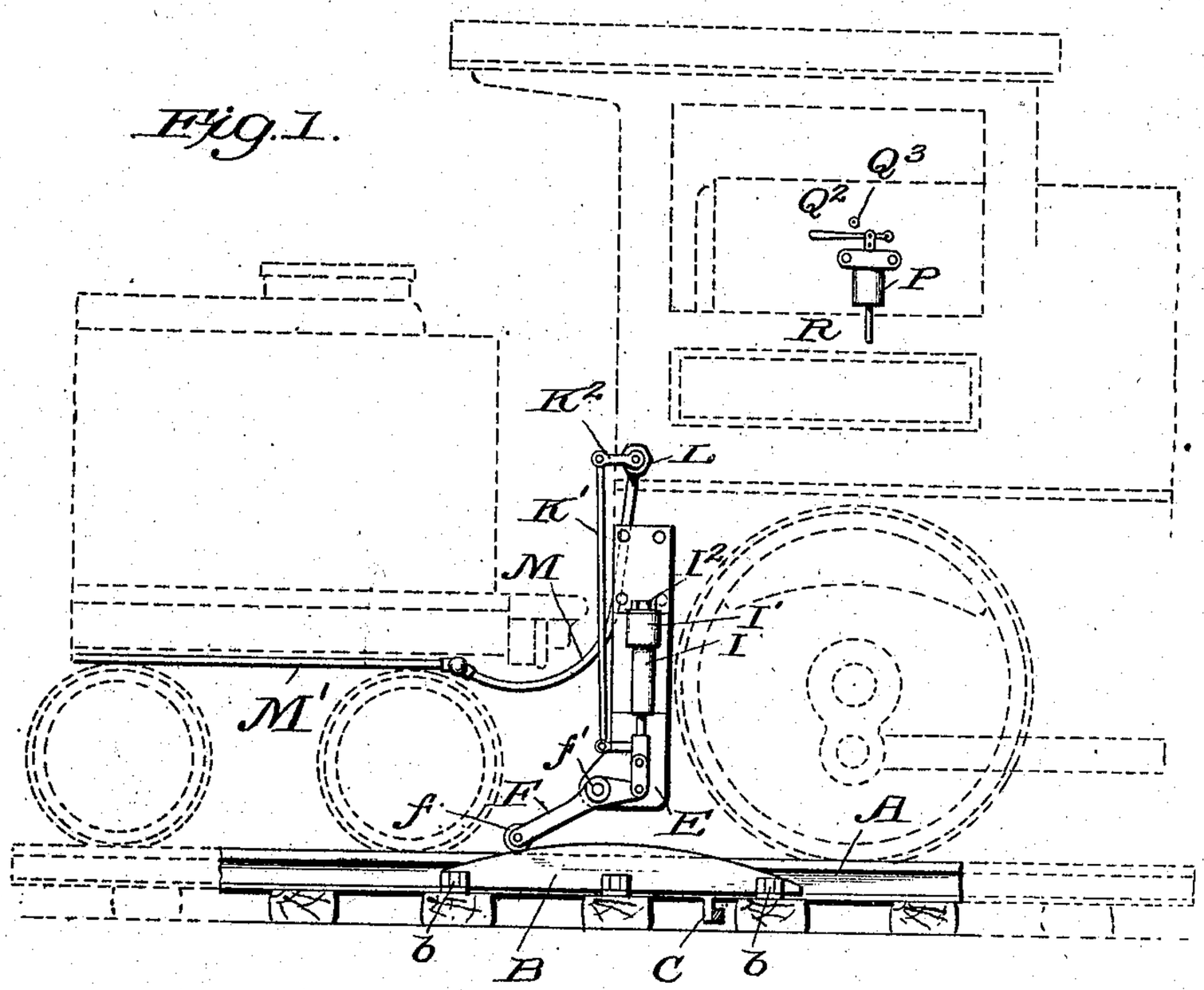
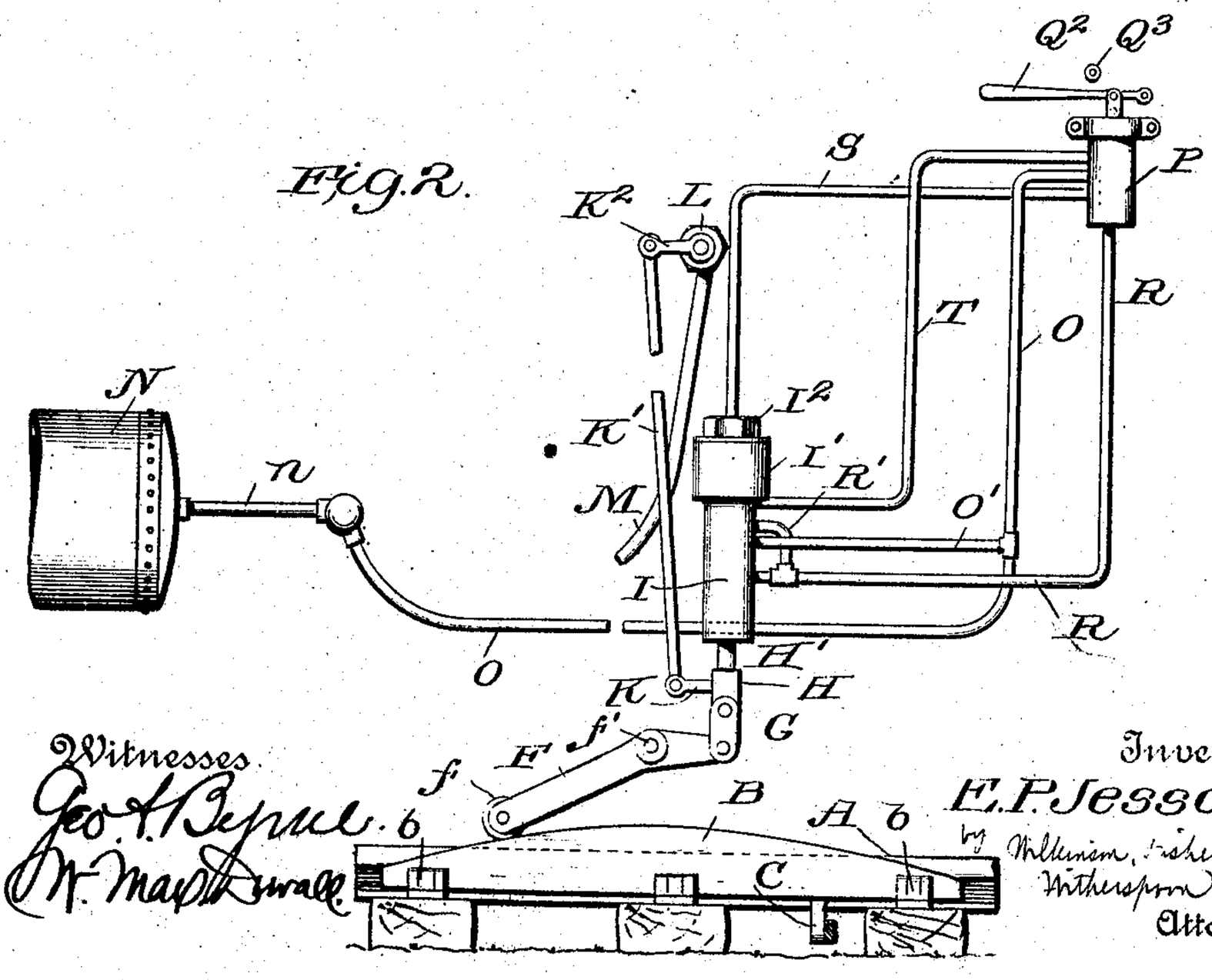


Fig. 2.



Witnesses.

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2 SHEETS—SHEET 2.

Fig. 3.

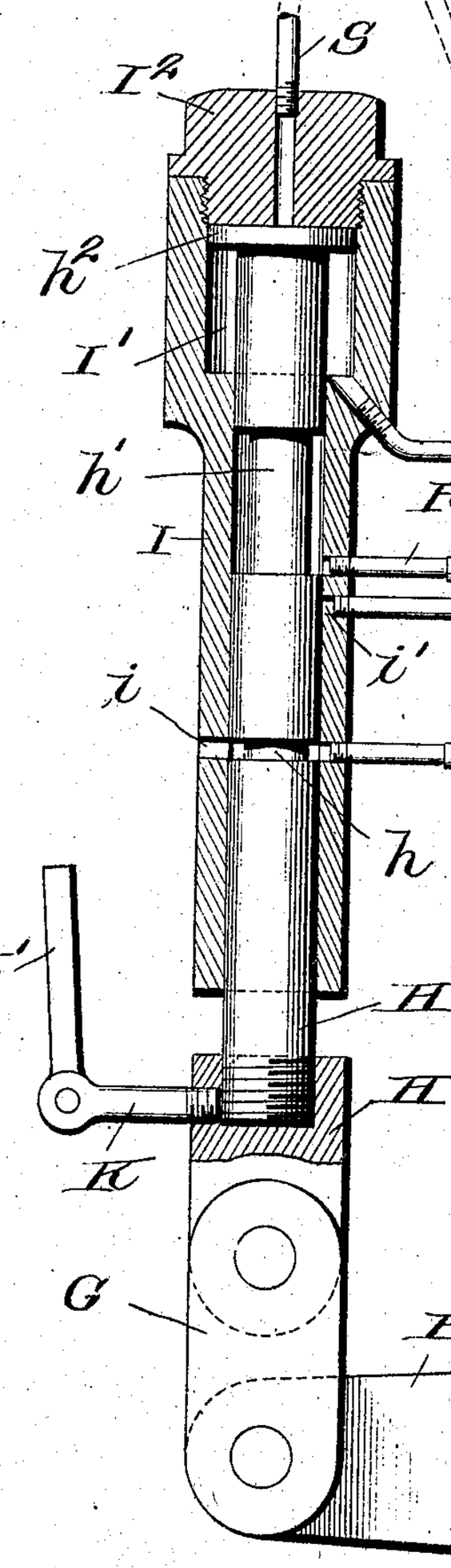


Fig. 4.

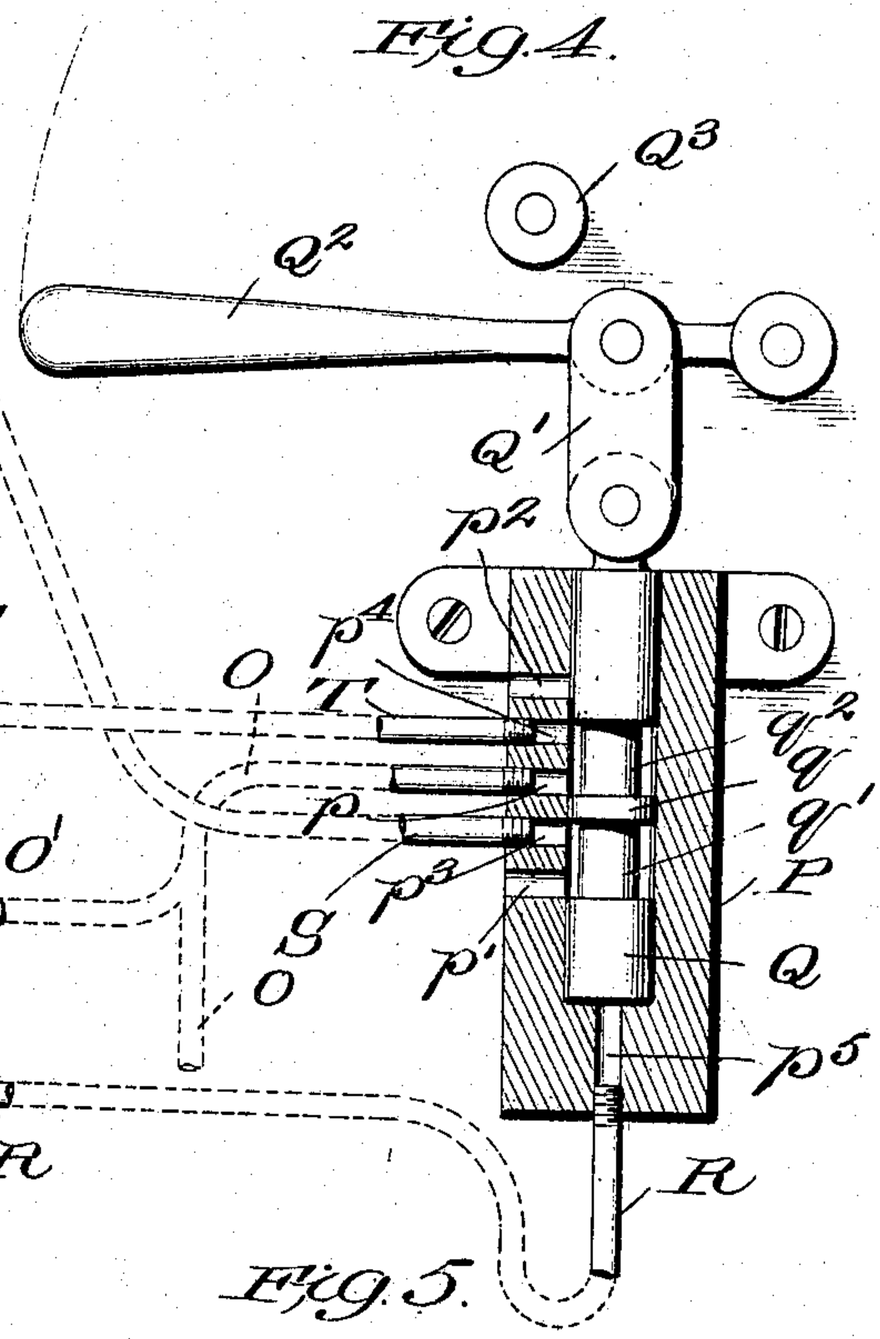


Fig. 5.

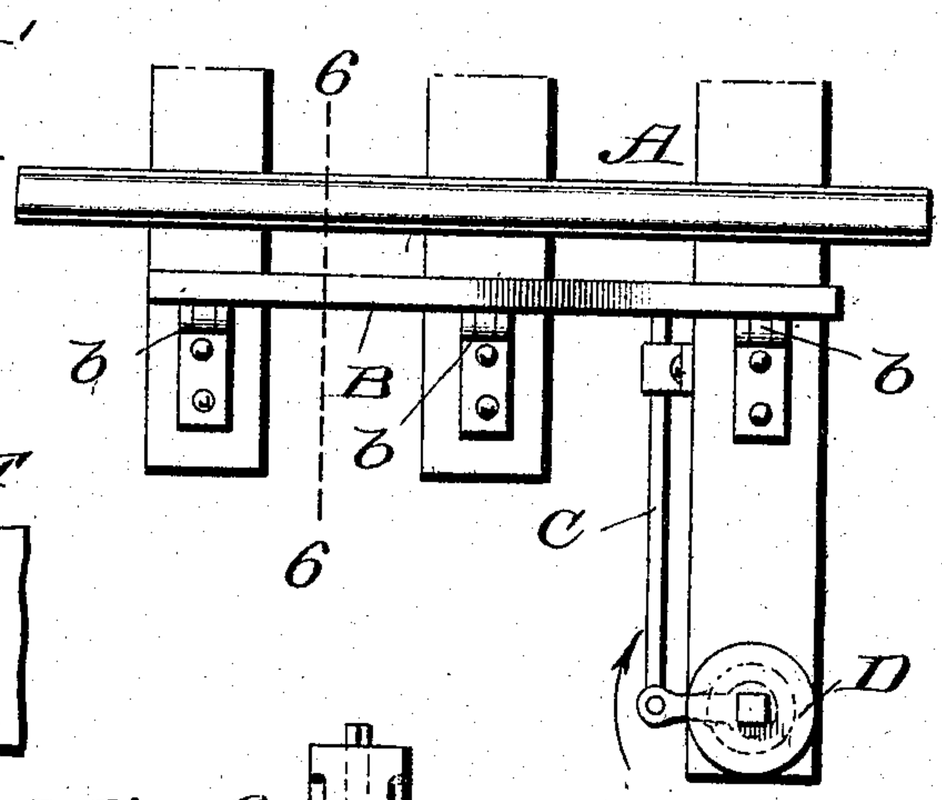
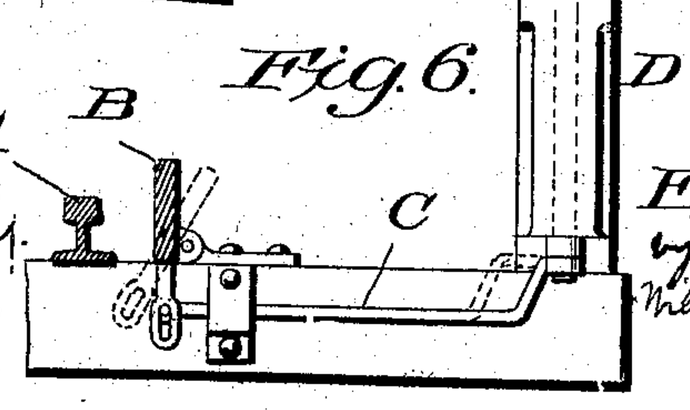


Fig. 6.



Witnesses

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UNITED STATES PATENT OFFICE.

EARL P. JESSOP, OF THE UNITED STATES NAVY.

AUTOMATIC BRAKE-APPLYING DEVICE.

936,905. Specification of Letters Patent. Patented Oct. 12, 1909.

Application filed March 11, 1909. Serial No. 482,797.

To all whom it may concern:

Be it known that I, EARL P. JESSOP, a citizen of the United States, and a lieutenant in the U. S. Navy, stationed on the *U. S. S. Milwaukee*, navy-yard, Puget Sound, Washington, have invented certain new and useful Improvements in Automatic Brake-Applying Devices; and I do hereby 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.

My invention relates to improvements in apparatus for automatically setting the air brakes on railway cars, and the system comprises a tripping block on the road-bed, a lever carried by the car or train striking said block, and mechanism controlled by said lever for setting the brakes and maintaining the parts in the thrown position until the action is reversed by manually-controlled mechanism, as will be hereinafter described.

My invention will be understood by reference to the accompanying drawings, in which the same parts are indicated by the same letters throughout the several views.

Figure 1 is a side elevation of the device as applied to the cab of an engine, the cab and tender being indicated in dotted lines. Fig. 2 illustrates diagrammatically the connection of the various parts. Fig. 3 shows a section through the valve mechanism controlled by the lever. Fig. 4 shows a section through the valve mechanism manually controlled by the engineer. Fig. 5 is a plan view of the track device, and Fig. 6 shows a section along the line 6—6 of Fig. 5, looking in the direction of the arrows.

Referring to Figs. 1, 2, 5 and 6, A represents one of the track rails. B represents a tripping block, having wedge faces whose angle of inclination may be varied to suit the conditions as to speed, etc., likely to be encountered. This tripping block is hinged, as at *b*, to the cross-ties, and may be thrown into and out of operative position, as shown in full and dotted lines in Fig. 6, by a rod C, and any suitable device D which may be operated either by hand, or from a distance, as is well known in the art.

F, see Fig. 2, is a lever pivoted, as at *f'*, to the plate E, secured to the cab of the engine, which lever carries at one end the roller *f*, and at the other end is connected by the link G and block H to the piston valve H', which will be hereinafter called the operating valve, while the valve in the cab will be hereinafter called the engineer's valve. This piston valve H' is in the form of a cylinder cut away, as at *h* and *h'*, (see Fig. 3), and is provided with a piston h^2 at its upper end, fit snugly in the large chamber I' of the cylindrical valve casing I, which casing is provided with an exhaust port *i*, which exhaust port registers with the annular chamber *h* when the valve is in the raised position shown in Fig. 3. It will be noted that the distance between the port *i* and the inlet of the pipe R' is materially less than the throw of the valve H', to secure results hereinafter to be explained. Projecting from the block H, and moving with the valve H', is the stud K, connected to the rod K', which is pivoted to the arm K^2 of the valve L, which valve is connected by the hose M to the train pipe M', see Fig. 1.

N represents an air flask, connected by the pipe *n* to the pressure pipe O, which pipe is connected at its other end to the port *p* in the valve casing P, containing the engineer's valve Q. This valve casing is provided with ports *p'* and p^2 open to the atmosphere, p^3 connected to the pipe S, and p^4 connected to the pipe T, and p^5 connected to the pipe R. The pipe S opens into the upper end of the valve casing I, above the piston h^2. The pipe T opens into the chamber I', beneath said piston h^2. The pipe O is provided with a branch O' connected to the valve casing I. The pipe R is provided with a branch R', which opens into the annular chamber *h'* when the valve H' is in the raised position shown in Fig. 3. This pipe R also opens into the annular chamber *h*, and the other end of this pipe opens into the casing P beneath the valve Q, as shown in Fig. 4. The valve Q is in the form of a cylinder with annular chambers *q'* and q^2 separated by the rib *q*, fitting snugly in the valve casing, as shown in Fig. 4. This valve may be controlled by hand by means of the lever Q^2 and link Q'. Q^3 is a stop provided to limit the throw of the lever Q^2.

The operation of the device is as follows:—It being desired by the station operator to apply the brakes to the train, he throws the tripping block B from the position indicated in dotted lines in Fig. 6 to the position indicated in full lines in said figure. Then when the train approaches, the roller *f* will roll up on the inclined surface of said block, causing the lever F to pull the valve

H′ down. The downward movement of this valve will cause the rod K′ to open the valve L, and permit the escape of air from the train pipe, which will apply the emergency operation of the brakes in the usual way. The downward movement of the valve H′ will close the exhaust port *i*, and will unmask the port *i′*, permitting pressure to flow through the branch pipe R′ and pipe R to the lower end of the valve casing P. This will force the engineer's valve up until its movement is stopped by the lever Q^2 striking the stop Q^3. In this position, the pipe T will be open to the atmosphere through the port p^2, thus relieving the pressure in the chamber I′ beneath the piston h^2 and the exhaust port p' will be closed, causing pressure to flow from the pipe O through the pipe S to the upper side of the piston h^2, and thus the pressure from the pipe O will hold the engineer's valve in the raised and the operating valve in the lowered position indefinitely. It will be seen that the valve H′ need only be moved through a small part of its travel by the lever F before the port *i′* is unmasked when the further movement of the valve H′ will be automatically effected by the air pressure. The amount of lift which the tripping block B will impart to the lever F, resulting in a corresponding pull on the valve H′, will vary on account of the jump and vibration of the train, and if this lift of the lever F alone were depended upon to complete the motion of the parts, a varying throw would be secured, and possibly also an insufficient throw of the train pipe valve L; also the engineer's control would be less satisfactory.

When it is desired to restore the parts to the initial position, the engineer presses down on the lever Q^2, restoring the engineer's valve to the position shown in Fig. 4. This will allow the pressure from the pipe S to escape through the port p' and the pressure from the pipe O to flow into the pipe T, forcing the operating valve upward again, and unmasking the exhaust port *i*, which will relieve the pressure in the pipe R, and the engineer's valve will remain seated, due to its own weight. Thus it will be seen that I provide automatic means for setting the brakes and for holding them set until released by the engineer, or other operative of the car.

The device being air controlled on a full pressure and wide open exhaust system, it is not liable to be thrown out of order by leakage. Moreover, it is very simple in construction and arrangement, and is not liable to get out of order from other causes.

Should it be desired to test the apparatus, if the engineer's valve is pulled up by hand, pressure will be applied through the pipe S to the top of the piston h^2, which will force the operating valve down and cause the rod K′ to open the valve L and lower the pressure in the train pipe for setting the brakes, which can be immediately released by pushing the engineer's valve down again to the position shown in Fig. 4.

It will be obvious that any suitable signal may be controlled by the movement either of the engineer's valve or of the operating valve if desired.

Having thus described my invention, what I claim and desire to secure by Letters Patent of the United States is:—

1. In a system of the character described, the combination with a movable tripping block located on the road-bed, a lever carried by the car and adapted to strike said tripping block when in the operative position, valve mechanism operated by said lever, means controlled by said mechanism for varying the pressure in the train pipe, a second valve mechanism controlled by the operation of the first, a source of fluid pressure connected to both valve mechanisms, and a system of pipes connecting the said valve mechanisms, whereby the throw of the first valve effects the throw of the second, and restoring the second valve to the initial position effects the restoration of both mechanisms to said position, substantially as described.

2. In a system of the character described, the combination with a movable tripping block located on the road-bed, a lever carried by the car adapted to strike said tripping block when in the operative position, valve mechanism operated by said lever, means controlled by said mechanism for varying the pressure in the train pipe, a second valve mechanism controlled by the movement of the first valve, means for moving said second valve by hand, a source of fluid pressure connected to both valve mechanisms, and a system of pipes connecting the said valve mechanisms, whereby the throw of the first valve effects the throw of the second, and restoring the second valve to the initial position effects the restoration of both mechanisms to said position, substantially as described.

3. In a system of the character described, the combination with a movable tripping block located on the road-bed, a lever carried by the car adapted to strike said tripping block when in the operative position, a valve casing provided with a series of inlet ports and an exhaust port, a slide valve in said casing and operated by said lever, means controlled by the movement of said valve for varying the pressure in the train pipe, a second valve casing provided with a plurality of inlet and exhaust ports, a slide valve mounted in said second valve casing, a source of fluid pressure connected to both valve casings, and a system of pipes connecting the said inlet ports in the two casings, whereby the throw of the first valve effects the throw

of the second, and restoring the second valve to the initial position effects the restoration of the first valve to said position, substantially as described.

4. In a system of the character described, the combination with a movable tripping block located on the road-bed, a lever carried by the car adapted to strike said tripping block when in the operative position, a valve casing provided with a series of inlet ports and an exhaust port, a slide valve in said casing and operated by said lever, means controlled by the movement of said valve for varying the pressure in the train pipe, a second valve casing provided with a plurality of inlet and exhaust ports, a slide valve mounted in said second valve casing, a hand lever connected to said second valve, a source of fluid pressure connected to both valve casings, and a system of pipes connecting the said inlet ports in the two casings, whereby the throw of the first valve effects the throw of the second, and restoring the second valve to the initial position effects the restoration of the first valve to said position, substantially as described.

5. In a system of the character described, the combination with a movable tripping block located on the road-bed, a lever carried by the car and adapted to strike said tripping block when in the operative position, a valve casing carried by the car, a valve mounted in said casing and operated by said lever, a second valve casing also carried by the car, a valve mounted in said second casing, a source of fluid pressure connected to both valve casings, suitable inlet and exhaust ports in said casings, and a system of pipes connecting the said valve casings, whereby the throw of the first valve effects the throw of the second, and restoring the second valve to the initial position effects the restoration of the first valve to said position, substantially as described.

6. In a system of the character described, the combination with a movable tripping block located on the road-bed, a lever carried by the car and adapted to strike said tripping block when in the operative position, a valve casing carried by the car, a valve mounted in said casing and operated by said lever, means controlled by the movement of said valve for varying the pressure in the train pipe, a second valve casing also carried by the car, a valve mounted in said second casing, a hand lever connected to said second valve for moving the same by hand, if desired, a source of fluid pressure connected to both valve casings, suitable inlet and exhaust ports in said casings, and a system of pipes connecting the said valve casings, whereby the throw of the first valve effects the throw of the second, and restoring the second valve to the initial position effects the restoration of the first valve to said position, substantially as described.

7. An apparatus of the character described, comprising a lever carried by the car, means located on the road-bed for tripping said lever when desired, a piston valve H′ provided with annular grooves h, h' and piston h^2, a valve connected to the train pipe for relieving the pressure therein when desired, means operated by the movement of the said piston valve for opening and closing said train pipe valve, a valve casing I for said piston valve, provided with an enlarged chamber I′ to receive said piston h^2, and with an exhaust port i normally registering with said annular recess h, an engineer's valve Q in the form of a piston provided with annular grooves q', q^2, a casing P for said engineer's valve provided with exhaust ports p' and p^2 opening into the atmosphere, ports p^3, p and p^4 located between said exhaust ports, and a port p^5 opening into the end of said casing P, a source of pressure, and pipes O, O′ leading therefrom to both piston valve casings, the pipe R opening into said port p^5, and into the valve casing I opposite the annular groove h when the valve H′ is in the normal position, a branch pipe R′ opening into said casing I abreast said annular groove h', the pipe T connecting said port p^4 and the chamber I′ at the lower side of the piston h^2, and the pipe S connecting said port p^3 and said chamber I′ at the upper side of said piston, substantially as and for the purposes described.

8. An apparatus of the character described, comprising a lever carried by the car, means located on the road-bed for tripping said lever when desired, a piston valve H′ provided with annular grooves h, h', and piston h^2, a valve connected to the train pipe for relieving the pressure therein when desired, means operated by the movement of the said piston valve for opening and closing said train pipe valve, a valve casing I for said piston valve provided with an enlarged chamber I′ to receive said piston h^2, and with an exhaust port i normally registering with said annular recess h, an engineer's valve Q in the form of a piston provided with annular grooves q', q^2, a casing P for said engineer's valve provided with exhaust ports p' and p^2 opening into the atmosphere, ports p^3, p and p^4 located between said exhaust ports, and a port p^5 opening into the end of said casing P, a source of pressure, and pipes O, O′ leading therefrom to both piston valve casings, the pipe R opening into said port p^5, and into the valve casing I opposite the annular groove h when the valve H′ is in the normal position, a branch pipe R′ opening into said casing I abreast said annular groove h', the pipe T connecting said port p^4 and the chamber I′ at the lower side of the piston h^2, and the pipe S connecting said port p^3 and said chamber I′ at the upper side of said piston, the hand lever Q^2 connected to said engineer's valve,

and a stop for limiting the throw of said lever, substantially as and for the purposes described.

9. In a system of the character described, the combination with a movable tripping block located on the road-bed, a lever carried by the car adapted to strike said tripping block when in the operative position, a valve casing provided with a series of inlet ports and an exhaust port, a slide valve in said casing and moved through a part only of the throw by said lever, means controlled by the movement of said valve for varying the pressure in the train pipe, a second valve casing provided with a plurality of inlet and exhaust ports, a slide valve mounted in said second valve casing, a source of fluid pressure connected to both valve casings, and a system of pipes connecting the said inlet ports in the two casings, whereby the partial throw of the first valve by the lever effects the complete throw of the first valve, and the complete throw of this valve effects the throw of the second, and restoring the second valve to the initial position effects the restoration of the first valve to said position substantially as described.

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

EARL P. JESSOP.

Witnesses:

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T. M. TIPTON.