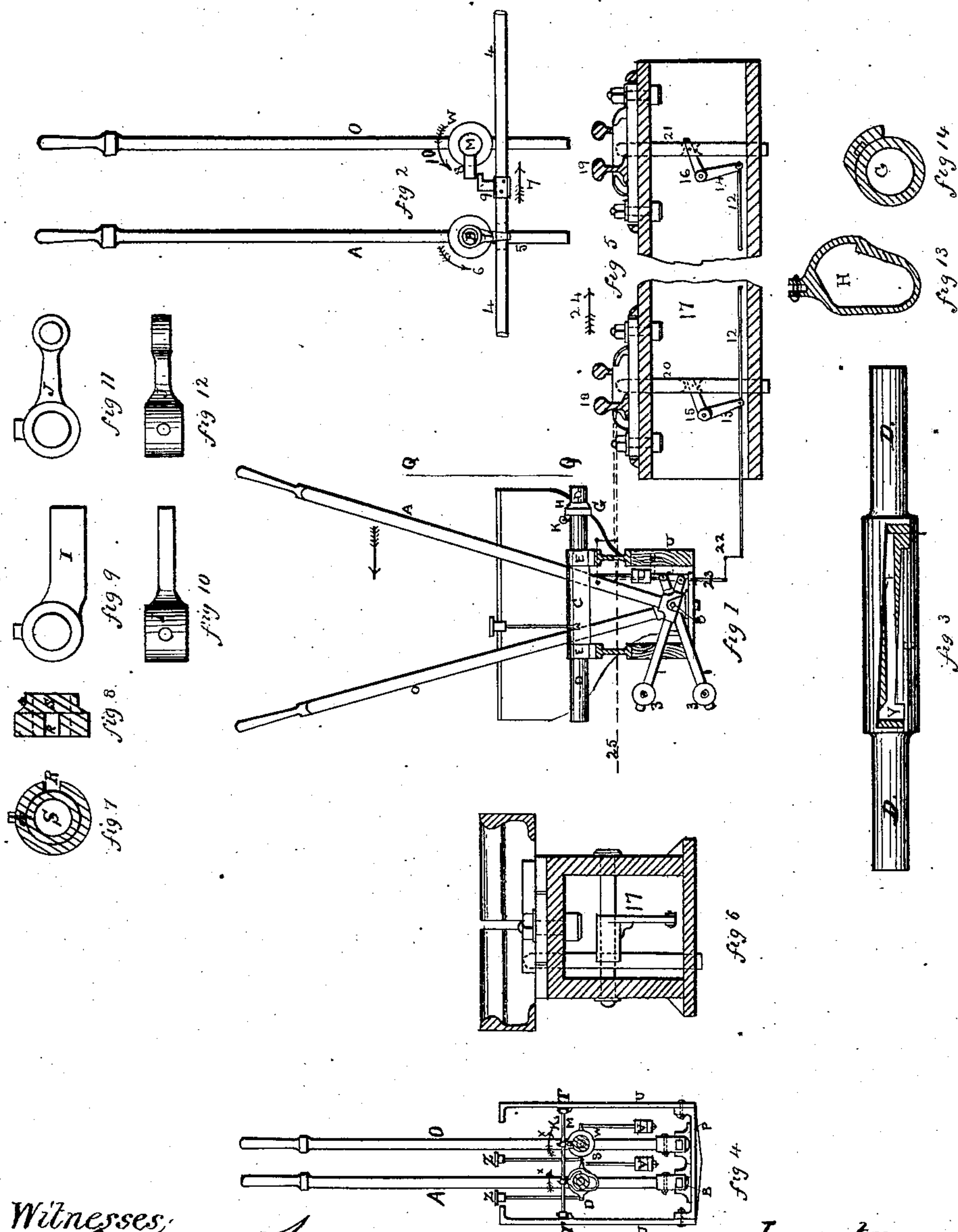


F. W. & W. W. BRIERLEY.
Switch-Signals.

No. 157,308.

Patented Dec. 1, 1874.



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UNITED STATES PATENT OFFICE.

FREDERICK W. BRIERLEY AND WALTER W. BRIERLEY, OF NEW YORK, N. Y.

IMPROVEMENT IN SWITCH-SIGNALS.

Specification forming part of Letters Patent No. **157,308**, dated December 1, 1874; application filed September 26, 1874.

To all whom it may concern:

Be it known that we, FREDERICK W. BRIERLEY and WALTER W. BRIERLEY, of the city, county, and State of New York, have invented certain new and useful Improvements in Switch and Signal Apparatus for Railroads, of which the following is a specification:

The object of our invention is to provide means for operating railroad-switches with certainty, and free from danger, generally arising from misplaced switches or signals, by providing means for locking said switches so that they cannot be moved without first moving the signal connected therewith to a position to indicate danger.

In order to render our invention easily understood, that its novelty and usefulness may be readily perceived, we will proceed at once with the general description, having reference to the accompanying drawings, in which—

Figure 1 represents a side view of the apparatus where only two levers are employed. The number may, however, be increased to any extent that may be found to be desirable or convenient. Fig. 2 represents an end view of the same, showing one means for locking the barrels or cylinders to prevent displacement of the switch. Fig. 3 is a top-plan view of one of the oscillating barrels, showing the spiral slot F and notches or stops Y Y at the ends of said slot. Fig. 4 represents an end view of the cylinders, showing another means of locking the same. Fig. 5 is a longitudinal sectional view of the metallic tie, upon which rest the ends of the switch-rails. Fig. 6 is a cross-section of the same. Fig. 7 is an enlarged view of the locking ring or collar S; Fig. 8, a side view of the same. Fig. 9 represents a side view of the locking-arm, which engages with the notch R in collar S. Fig. 10 is a top view of the same; Fig. 11, an enlarged view of the connecting-arm, to which the yoke H is pivoted; Fig. 12, a top view of the same. Fig. 13 is an enlarged view of the cam-yoke, and Fig. 14 is a view of the cam which operates therein.

A is a lever, pivoted at B, which vibrates in the spiral slot of the cylinder C. (Shown in Fig. 3.) Upon one of the shafts D of the cylinder C is fixed the cam G, which works within the yoke H, which yoke is pivoted to the

arm J. This arm J is rigidly secured to a shaft, K, which has its bearings in the frame upon which the barrels are mounted, but at right angles to and above said cylinders or barrels. The arm I is also rigidly secured to said shaft K, and engages with the notch R of the collar S, which collar is located upon the shaft M extending from the next or adjoining cylinder W. C, Fig. 3, represents one of the barrels or cylinders, showing the spiral slot in which the lever A vibrates, and by which an oscillating motion is imparted to said cylinder, for the purpose of unlocking the other cylinders, any number of which may be used, according as circumstances or convenience may require. In the drawing, however, but two are shown.

It will be obvious that where more than two cylinders are employed the shaft K will be extended, and a separate collar and locking-bar will be employed in connection with each of said cylinders. At each end of the spiral groove is an enlargement or notch at a slight angle with said groove—that is, at the top of said cylinder the notch or enlargement is on one side of the slot, and at the other side of the cylinder it is on the opposite side of the slot, thus locking the lever in a position from which it cannot be moved without first giving a slight rotative movement to the cylinder. This rotative movement is imparted by means of a pedal, Z, (shown in Fig. 4,) to which sufficient pressure is applied to overcome the weights V, which have a tendency to turn the cylinders in the direction of the arrows X.

At the lower ends of the vertical levers are arms extending in opposite directions, and at right angles to the main levers. One of these arms of the lever, which operates in connection with the locking-cylinder, is connected with the signal apparatus, and the corresponding arm of the other lever is connected with the movable switch. To the arms on the opposite sides of the levers are attached weights to assist in changing the positions of the levers when it is desired to operate the switch or signal mechanism.

Another locking mechanism is shown in Fig. 2, which may be substituted for, or used in connection with, that already described. It consists of a reciprocating bar or plate, oper-

ated by an arm, L, located on the shaft of the locking-cylinder. By the vibrating motion imparted to this arm, by the oscillation of the cylinder in the act of moving the lever connected to the signal apparatus to a position to indicate danger, the bar is moved longitudinally a sufficient distance to withdraw the lug 9 located thereon from beneath the arm 8 of the other cylinder.

It will be seen that, by the use of either of the devices described, it is impossible to move the lever connected to the switch until the barrel in connection with which said lever operates is first unlocked, by moving the lever which works in connection with the locking-cylinder, and which is connected with the signal apparatus, to a position to indicate danger, thus insuring a greater degree of safety than has heretofore been attained.

In Figs. 1 and 5 is shown an arrangement for locking the switch-rails, so that they cannot be moved until the lever connected to the signal apparatus is first moved to withdraw the locking-bolts 20 and 21. These bolts are operated by means of bell-cranks, which are mounted upon bolts passing transversely through the metallic tie 17. The bell-cranks are connected together by a rod, 12, which is extended, and also connected, to a bell-crank, 22, which latter is connected to the arm of the lever which operates the signal apparatus. When the lever is operated to set the signal so as to indicate danger, the rod 23 is carried with it, thus giving motion to the bell-crank 22, and through it the rod 12 is operated to turn the bell-cranks 13 and 14. One arm of each of these bell-cranks 13 and 14 projects into a slot in the bolts 20 and 21, so that the latter are withdrawn when the bell-cranks are operated, thus releasing the switch-rails, so that they can be moved. By this arrangement we provide an additional safety-locking device, so that the switch cannot, by any possible chance, be misplaced without first giving a danger-signal to approaching trains.

When it is desired to move the switch, the pedal Z of the locking-cylinder is first depressed, so as to turn the cylinder sufficiently to release the lever from the locking shoulders or notches Y, said lever being then free to be moved to the opposite end of the spiral slot, where it engages with the notch Y in that end as soon as the pressure is removed from the pedal Z, so that the cylinder can be turned

back by the weight V, which is attached to the opposite side of the cylinder. In vibrating the lever, the signal apparatus with which it is connected is set in a position to indicate danger, and at the same time the locking-bolts 20 and 21 are withdrawn to free the switch. By this same vibration of the lever, the cylinder is also caused, by the spiral slot in which the lever operates, to oscillate or turn sufficiently to release the locking devices of the other barrel or barrels, which are then free to be operated in the same manner as the locking-cylinder. Pressure is then applied to the pedal Z of the other cylinder to release its lever, which is then moved to the opposite end of the slot in the cylinder. This last-mentioned lever is connected to the switch-rails in the usual manner, and is used entirely for the purpose of operating the switch. As soon as the switch-lever has been moved, the signal-lever is moved back to its original position, and the signal is set to indicate safety, while, at the same time, the locking-bolts 20 and 21 are moved up to lock the switch against accidental displacement.

Having thus described our invention, what we desire to secure by Letters Patent of the United States is—

1. The combination of the vibrating levers and the spirally-grooved oscillating cylinders, whereby a guide is provided for the levers, and they are also immovably locked by the notches or shoulders Y at the ends of said grooves, substantially as set forth.
2. The combination, with a plurality of spirally-grooved oscillating cylinders, of means for locking said cylinders, substantially as set forth.
3. The combination of the arms L and 8 on the shafts of the cylinders with the sliding bar 4 and lug 9 thereon, as a means for locking or unlocking the cylinders, substantially in the manner and for the purpose set forth.
4. The combination, with the cylinders, of the weights V and pedal Z, arranged on the opposite sides of said cylinders, for the purpose of oscillating them for locking and unlocking the vibrating levers with relation to the notches Y in said cylinders, substantially as set forth.

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