

(No Model.)

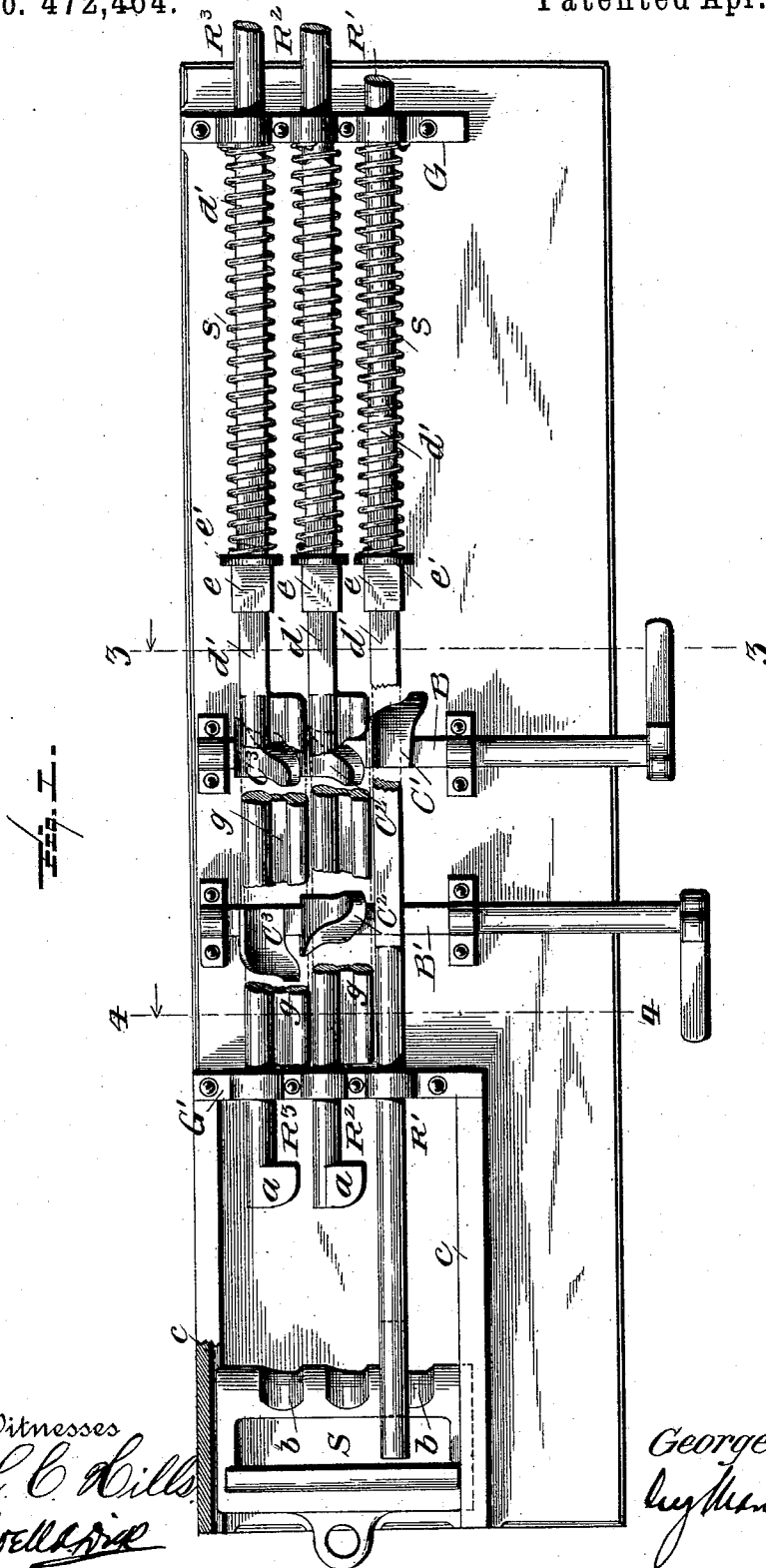
2 Sheets—Sheet 1.

G. H. PFEIL.

SWITCH AND SIGNAL OPERATING APPARATUS.

No. 472,464.

Patented Apr. 5, 1892.



Witnesses
L. C. Hills
E. W. Hill

Inventor:
George H. Pfeil,
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(No Model.)

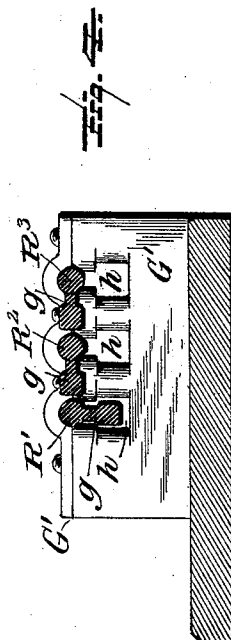
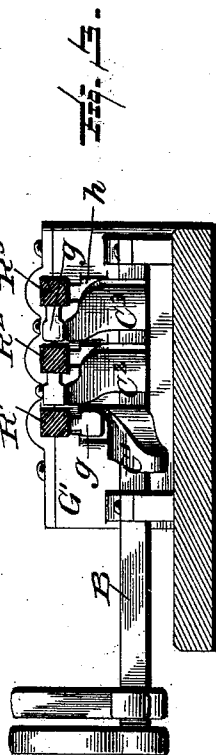
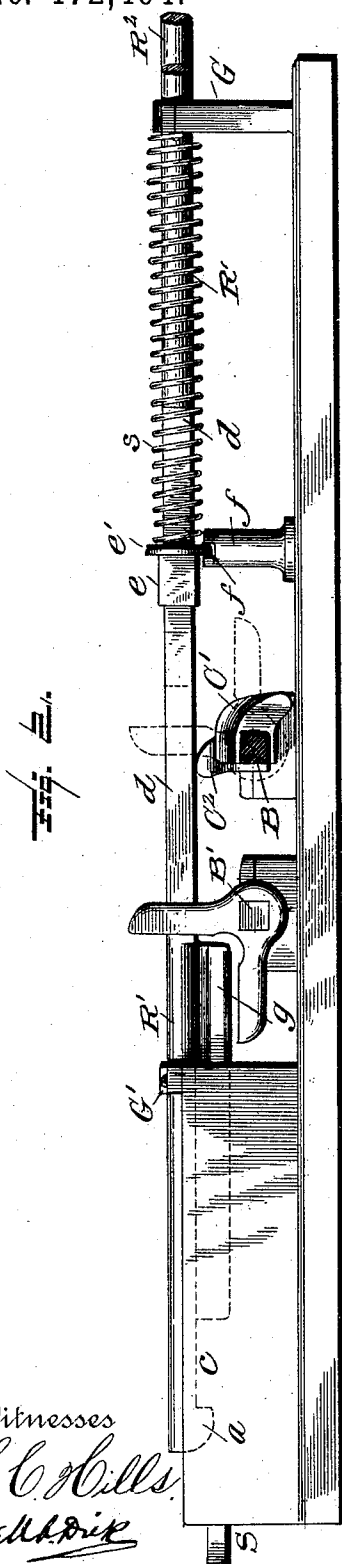
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UNITED STATES PATENT OFFICE.

GEORGE H. PFEIL, OF EASTON, PENNSYLVANIA, ASSIGNOR TO THE NATIONAL SWITCH AND SIGNAL COMPANY, OF SAME PLACE.

SWITCH AND SIGNAL OPERATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 472,464, dated April 5, 1892.

Application filed December 12, 1891. Serial No. 414,871. (No model.)

To all whom it may concern:

Be it known that I, GEORGE H. PFEIL, of Easton, in the State of Pennsylvania, have invented a new and useful Improvement in Switch and Signal Operating Apparatus, of which the following is a specification.

My invention relates to interlocking switch and signal apparatus, and has particular reference to that portion of said apparatus termed the "selector," which is a mechanism whereby the switch-operating devices when they are actuated are caused to adjust the signal connections in such manner that only the signal appropriate to the route to which the switch or switches have been adjusted can be operated, the other signal or signals under these conditions remaining locked against movement. Such mechanism usually comprises a single longitudinally-movable shifting-bar connected to and operated by the signal-lever in the tower and two or more signal-rods longitudinally movable for the purpose of operating the signals and brought into and out of engagement either by a proper movement of their own other than that by which they operate the signals or through the intermediary of coupling devices by whose movement they are connected to or disconnected from the shifting-bar, this latter movement of the rods themselves or of the coupling devices being occasioned by the same motion which shifts the switch or switches.

My invention relates to that particular kind of selector in which the signal-rods themselves are moved into and out of engagement with the shifting-bar; and, briefly stated, it consists in imparting to the signal-rods for this purpose an axial rotary movement, or, in other words, I combine with the signal-shifting bar two or more signal-rods longitudinally movable for the purpose of operating the signals and capable also of a movement of partial rotation, whereby they are thrown into and out of engagement with the shifting-bar. This movement of partial rotation is effected by the same motion which shifts the switch appropriate to the signal rod or rods acted on and can be brought about by a variety of intermediaries. I have represented in the drawings accompanying this specification the means which I believe to be on the whole the

best for the purpose; and I shall now proceed to a more particular description of my invention by reference to the drawings, in which—

Figure 1 is a plan view of the mechanism. Fig. 2 is a side elevation of the same. Fig. 3 is a section on line 3 3, Fig. 1, looking in the direction of the transverse rock-shafts which carry the cams that impart a partial rotary movement to the signal-rods. Fig. 4 is a section on line 4 4, Fig. 1, looking toward the rear guide-bearing through which the signal-rods pass.

In the particular apparatus shown in the drawings there are three signal-rods $R^1 R^2 R^3$, supported and longitudinally movable in front and rear guides $G G'$ and also capable of rotation therein. Each rod at its rear has a toe or projection a , which when the rod is partially rotated in the proper direction will enter and engage a slot b in the longitudinally-movable shifting-bar S . The shifting-bar is supported and slides in suitable guides c , and is to be connected to and operated by the signal-lever in the tower, as will be understood without further explanation. Each signal-rod is further formed for a portion of its length with a squared part d' , upon which loosely fits a collar e of corresponding shape. To the collar is made fast one end of spiral spring s encircling the rod and attached at its other end to the front guide G . This spring tends to rotate the rod in a direction opposite to that in which the latter is rotated by its appropriate cam on the rock shaft or shafts, as will be presently described. To restrain the collar from following the longitudinal movement of its rod it is provided with a circular flange e' , which fits in and engages a slot f' in a stop-piece f , attached to the base of the apparatus. Each signal-rod also is provided with a longitudinal wing g , which is acted on by the cam for rotating the rod, and also serves as a weight to act upon the rod in the same direction as the spring s .

I here remark that the wing may be of size sufficient in itself to furnish weight enough to turn the rod back into the position from which it is moved by the cam; but I prefer to supplement it by the spring in order to insure certainty of action.

Beneath and extending crosswise of the sig-

nal-rods are two rock-shafts B B', supported in suitable bearings and designed to be connected to and operated by the switch-operating mechanism by any of the devices usually employed for that purpose. The rock-shaft B has three cams C' C² C³ on it—one for each signal-rod. Each cam is like the others and is of the form shown. The rock-shaft B' has two cams C² C³ only, which are designed for and operate the signal-rods R² R³, respectively. These two cams on shaft B' are set at ninety degrees to each other. Upon shaft B, however, the same two cams are set in coincidence with each other, but at ninety degrees to the cam C', which operates rod R'. Each cam by wiping against the wing *g* of its signal-rod will rotate the rod partially against the stress of the spring *s* and in a direction to turn the toe *a* of the rod out of engagement with the signal-shifting bar S.

In the position of parts represented in the drawings the signal-shifting bar is retracted. The signal-rod R' only is in engagement with the bar, and consequently has been drawn back by the bar, while the other rods R² R³ by their cams have been partially rotated in a direction and far enough to carry their toes *a* out of engagement with the bar.

The rear guide G' has in it openings or slots *h* of size and shape to permit the passage of each rod and its wing when the rod is in the position where it interlocks with the shifting-bar. At other times, however, the wing *g* is turned out of register with its slot *h*, as shown in the drawings in the case of the two rods R² R³, and thus locks its rod against possibility of rearward movement.

The number of rock-shafts and the number and position of their cams will of course vary with the number of signal-rods and the various combinations which it may be desired to make; but each signal-rod will be thrown

into and out of engagement with the shifting-bar by a movement of partial rotation, brought about by suitable devices actuated by or from the switch-operating mechanism. It is this feature which characterizes my invention. Various forms of mechanism manifestly can be availed of to accomplish this result. I therefore do not restrict myself to the particular details herein described and shown in illustration of my invention; but What I desire to secure by Letters Patent is—

1. In interlocking switch and signal operating apparatus, the combination, with a signal-shifting bar, of two or more signal-rods longitudinally movable for signal-operating purposes and capable also of axial rotary movement, whereby they are caused to engage and to be disengaged from the signal-shifting bar, substantially as and for the purposes hereinbefore set forth.

2. The combination of the signal-shifting bar, the signal-rods capable of both longitudinal movement and rotation, the wings *g* on said bars, and the rock-shaft and cams for operating on said wings, substantially as and for the purposes hereinbefore set forth.

3. The combination of the signal-shifting bar, the signal-rods capable of both longitudinal movement and rotation, the wings on said bars, the rock-shaft and cams for turning the rods in one direction, and the springs tending to turn the shafts in the other direction, substantially as and for the purposes hereinbefore set forth.

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

GEORGE H. PFEIL.

Witnesses:

J. BRUNNER,
J. W. LATTIG.