

(No Model.)

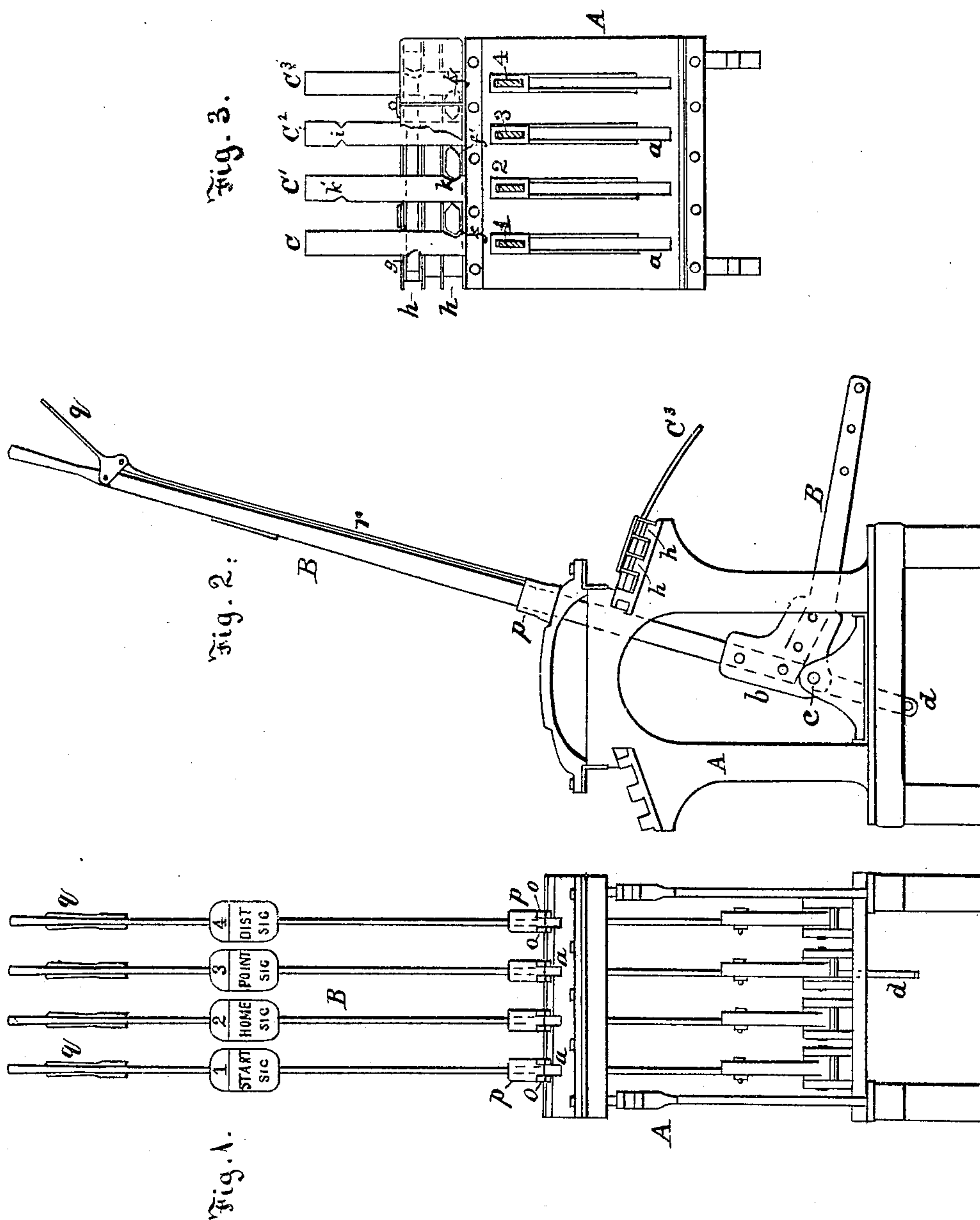
2 Sheets—Sheet 1.

J. W. HARPER.

INTERLOCKING APPARATUS FOR RAILWAY SWITCHES AND SIGNALS.

No. 273,681.

Patented Mar. 6, 1883.



Witnesses :
Arthur L. Morrell.
W. M. Dimmick

Inventor :
John W. Harper.
By *Attorneys.*

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Fig. 5.

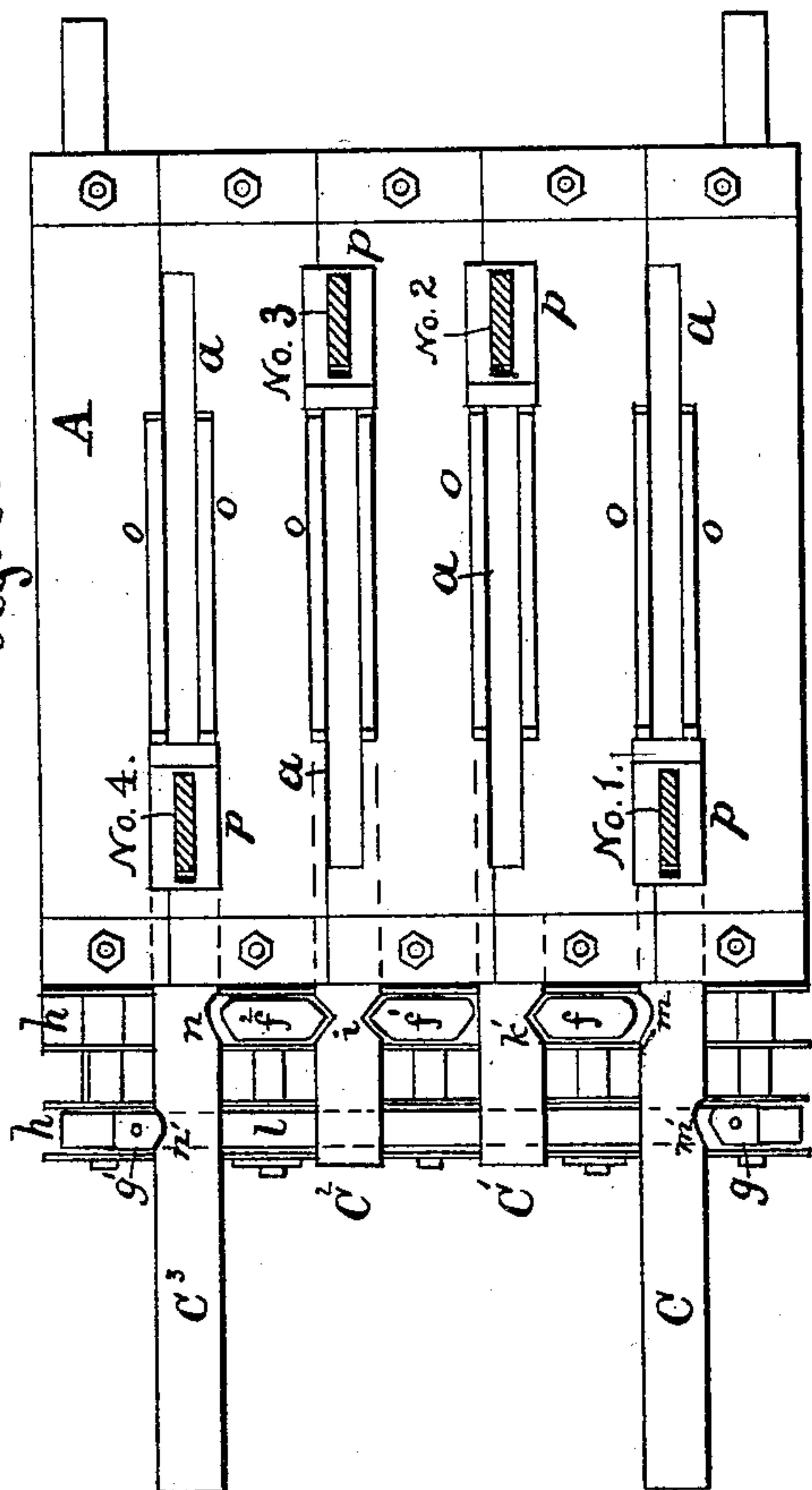


Fig. 6.

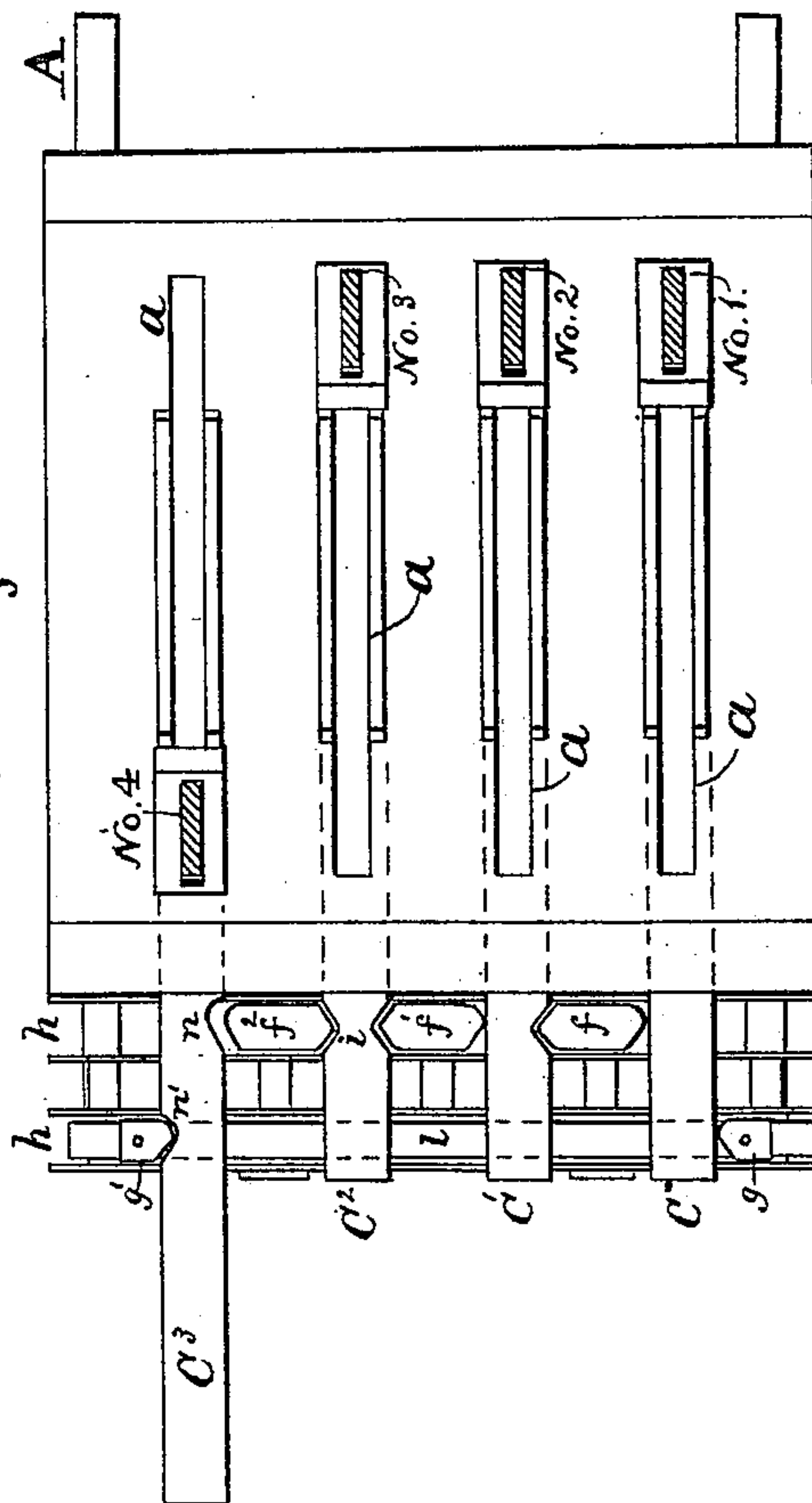
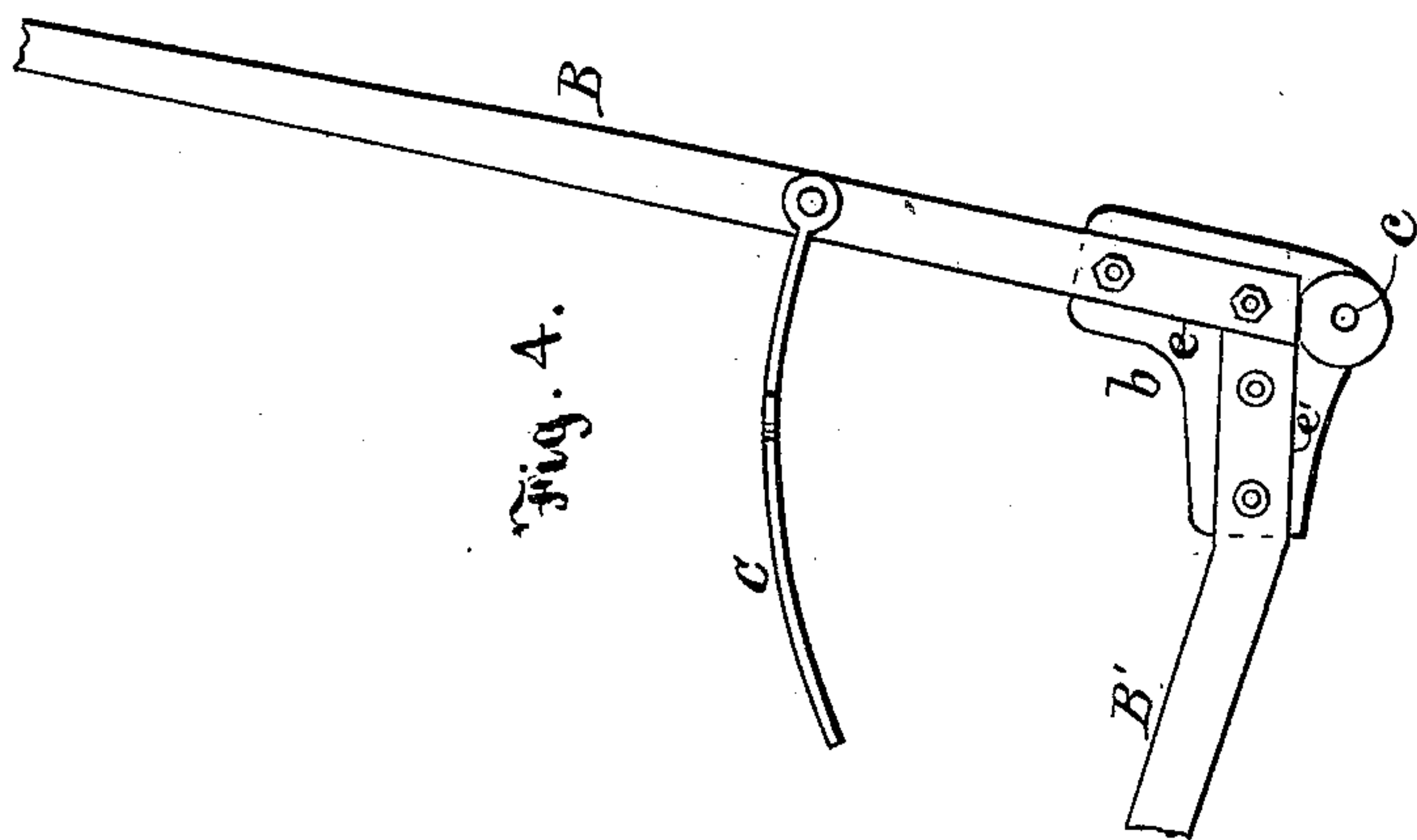


Fig. 4.



Witnesses:
Arthur L. Morrell.
W. M. Dimmick

Inventor:
John W. Harper
By *[Signature]*
Attorneys.

UNITED STATES PATENT OFFICE.

JOHN W. HARPER, OF JERSEY CITY, NEW JERSEY, ASSIGNOR OF ONE-HALF
TO JAMES B. GRAHAM, OF SAME PLACE.

INTERLOCKING APPARATUS FOR RAILWAY SWITCHES AND SIGNALS.

SPECIFICATION forming part of Letters Patent No. 273,681, dated March 6, 1883.

Application filed June 15, 1882. (No model.)

To all whom it may concern:

Be it known that I, JOHN W. HARPER, a citizen of the United States of America, residing at Jersey City, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Interlocking Apparatus for Railway Switches and Signals, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to the interlocking of railroad switches and signals; and it consists in certain improvements in apparatus for such purpose having the object in view to prevent collisions and accidents resulting from a switch-operator signaling by conflicting signals at the same time.

In the accompanying drawings, Figure 1 is a rear view of an interlocking apparatus having my improvements. Fig. 2 is a side view of the same. Fig. 3 is a plan of the same. Fig. 4 is a detached view of bell-crank lever. Figs. 5 and 6 are plans illustrating the operation of the locking parts.

In the drawings, A designates the frame or stand of the apparatus, having the top in the form of a segment, with the slots *a* therein, through which pass the hand-levers B, respectively numbered 1, 2, 3, and 4, as shown. Each of the said levers is removably fastened below in a shoe, *b*, which is pivoted at *c*, the pivotal pin forming the fulcrum of the lever. The lever numbered 3, being the switch-lever, has a downward extension, *d*, for connection with the switch. Each of the levers 1, 2, and 4 is provided with a bell-crank in the following manner: The lower extremity of each lever is removably fastened in a vertical groove, *e*, of its shoe *b*. Another lever, B', for connection with a signal, extends forward at an angle from the lower extremity of the vertical lever, and is fastened in a corresponding groove, *e'*, in the shoe, as shown.

To each of the hand-levers B is coupled a plunger which is operated by means of the lever, the plungers being preferably made in the form shown, but being round or of any suitable form in section. These plungers (indicated by C, C', C², and C³) operate in connection with a series of blocks, *f*, *f'*, and *f*²

and *g* and *g'*, placed in ways or guides *h*, fixed to the front of the stand A, said parts forming the locking devices of the apparatus. The movable blocks in the guides *h* are beveled, as shown, to form points to enter notches made in the plungers, and thus retain the hand-levers in certain relative positions and insure a certain order of movement in moving said levers.

The switch-lever No. 3, marked "Point" on its number-plate, has attached to it the plunger C², which has the opposite notches, *i*, so located that when the lever is drawn back the notches are on a line with the blocks *f'* and *f*² to receive a point from either of said blocks, thus enabling the locking or unlocking in both directions from the switch-lever to be effected simultaneously. The signal-lever No. 2, marked "Home Sig." on its number-plate, has the plunger C', which has the notches *k* and *k'* on opposite sides thereof, so located that when the lever is in its forward position the notch *k* receives block *f'*, and when the lever is drawn back the notch *k'* is in position to receive block *f*. The signal-lever No. 1, having "Start Sig." marked on its number-plate, has the plunger C, with notches *m* and *m'*, to receive blocks *f* and *g* when the lever is in its forward position, and in like manner the signal-lever No. 4, having "Dist. Sig." on its number-plate, has the plunger C³, with the notches *n* and *n'*, to receive blocks *f*² and *g'* when said lever is in a forward position. The blocks *g* and *g'* are connected by a bar, *l*, so that when either of the levers 1 or 4 is drawn back the other lever is locked by one of said blocks closing against it.

By reference to the plan shown in Fig. 3, with all the levers B in a forward position, it will be seen that the switch-lever No. 3 must be first drawn back before any of the other levers can be moved. So the switch must be first operated before any signal is changed. The switch-lever being drawn back, the switch is set for the siding for a train, and then a like movement of the lever No. 2 gives the signal that the switch is so set open. Now, when the said two levers are thus drawn back, as will be seen by reference to Fig. 5, it is impossible to change the switch or move the lever No. 3 as long as

the signal-lever No. 2 remains in its backward position. To change the switch for main line, the lever No. 2 must be first returned to its forward position, and the switch-lever may
5 then be moved forward and the switch reset.

The levers numbered 1 and 4 are adapted for use at tunnels and bridges, and their operation is as follows: The switch-lever No. 3 and also lever No. 2 are moved back. The lever
10 No. 1 is then drawn back, and its connecting-signal gives notice that the train can safely enter the tunnel. After the train has entered the tunnel and passed the signal connecting with lever No. 1 the said lever is returned to its
15 forward position. The lever No. 4 is then drawn back, its connecting-signal at the other end of the tunnel giving notice that the train is coming. After the train has gone through the tunnel and has passed the signal connected with lever
20 No. 4 the said lever is returned to its forward position, and the lever No. 1 can then, but not until then, be drawn back, if desired. The two signal-levers 1 and 4 severally lock one another, as will be seen by reference to Fig. 6,
25 by means of the blocks *g* and *g'*, fastened to the movable bar *l*, and severally closing in notches *m'* and *n'*, so that neither of said levers can be drawn back when the other is already in a backward position. Thus perfect safety from
30 erroneous signaling is insured by the use of these levers.

By the use of the shoe *b*, each lever being removably secured therein, as shown, either of the levers may be detached, for any purpose
35 as desired, without interfering with the others. The drop-box *p*, one of these being placed loosely on each hand-lever, serves an important purpose in connection with the ridges *o*

on either side of a slot, *a*. This box sets against one end of the ridges or flanges *o* and
40 surely prevents the movement of the lever from any accident. It is raised for moving the lever by means of a hand-piece, *q*, pivoted near the upper end of the lever and connected with
45 drop-box by rod *r*, and readily falls in place when the hand-piece is released.

In my construction, as herein described, my improvements are shown as applied to four levers; but these and the locking devices may be multiplied, if desired, the number of levers
50 that may be operated being unlimited.

I claim—

1. In a switch and signal interlocking apparatus, a lever provided with a plunger, *C*², having opposite notches, *i*, to receive the points
55 of beveled movable blocks from opposite directions at the same time, substantially as and for the purposes described.

2. In a switch and signal interlocking apparatus, a switch-lever provided with a plunger
60 having opposite notches, *i*, in combination with one or more other levers, having notched plungers, and a series of beveled blocks in suitable guides, substantially as shown and described.

3. In a signal-interlocking apparatus, two
65 levers having plungers, with notches *m'* and *n'*, in combination with blocks *g* and *g'*, fastened to moving bar *l*, and suitable guides, substantially as shown and described.

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

JOHN W. HARPER.

Witnesses:

HENRY D. GARRETT,
HERMAN WALKER.