

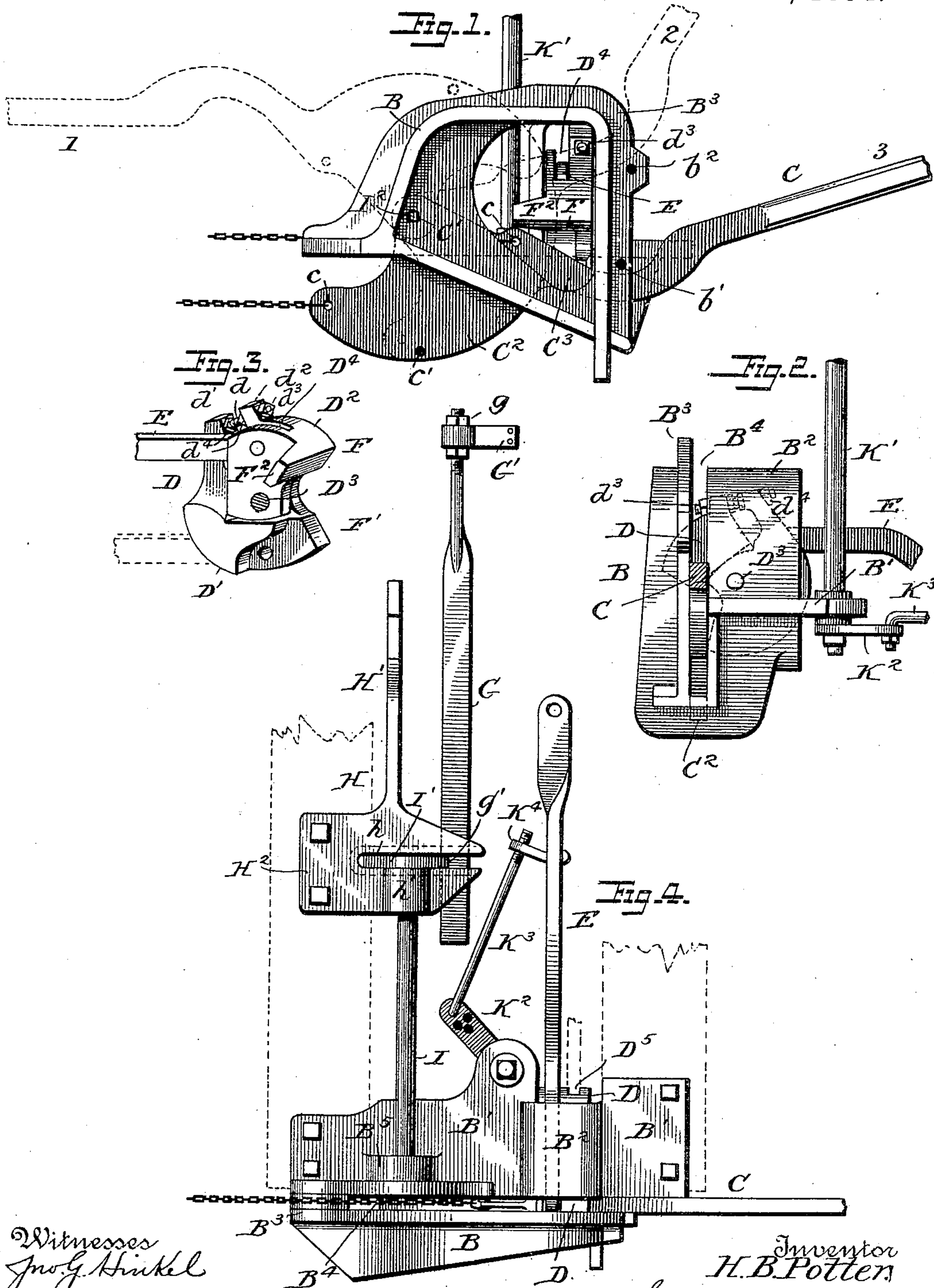
(No Model.)

2 Sheets—Sheet 1.

H. B. POTTER.  
SWITCH AND SIGNAL LEVER.

No. 529,407.

Patented Nov. 20, 1894.



Witnesses  
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A. H. Dobson

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Attorneys

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Fig. 5.

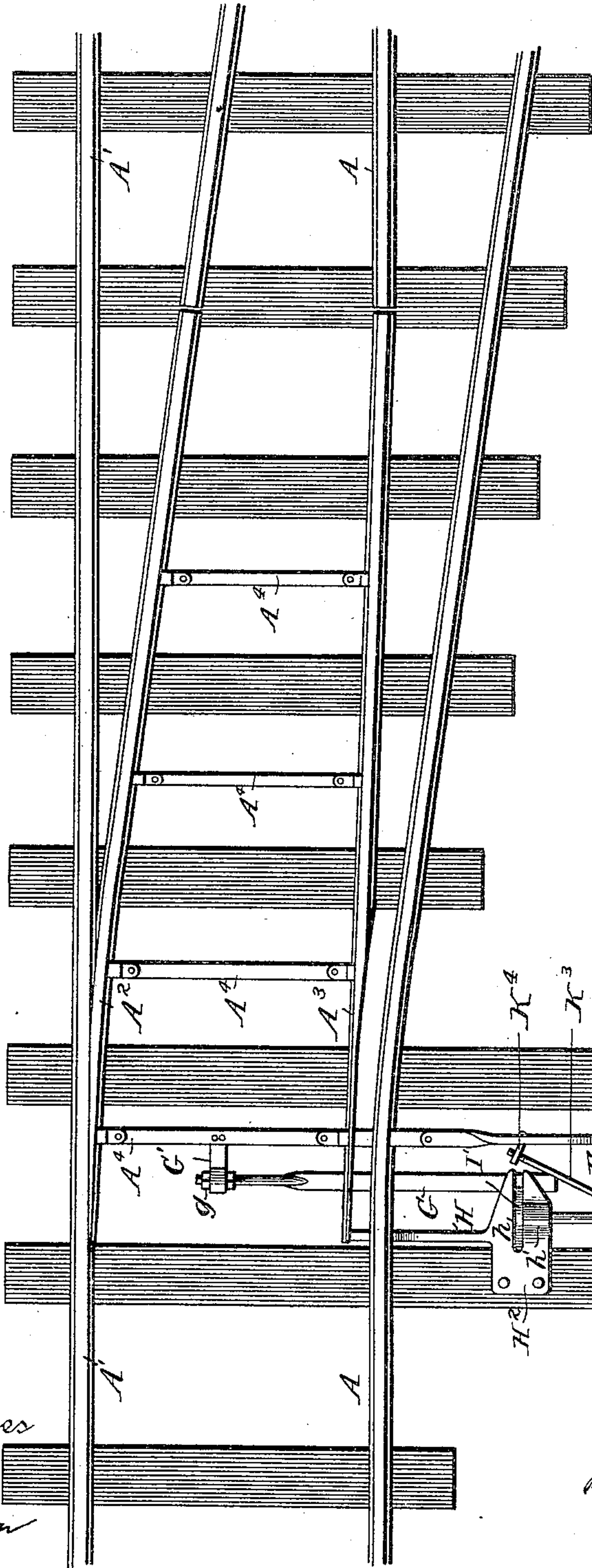
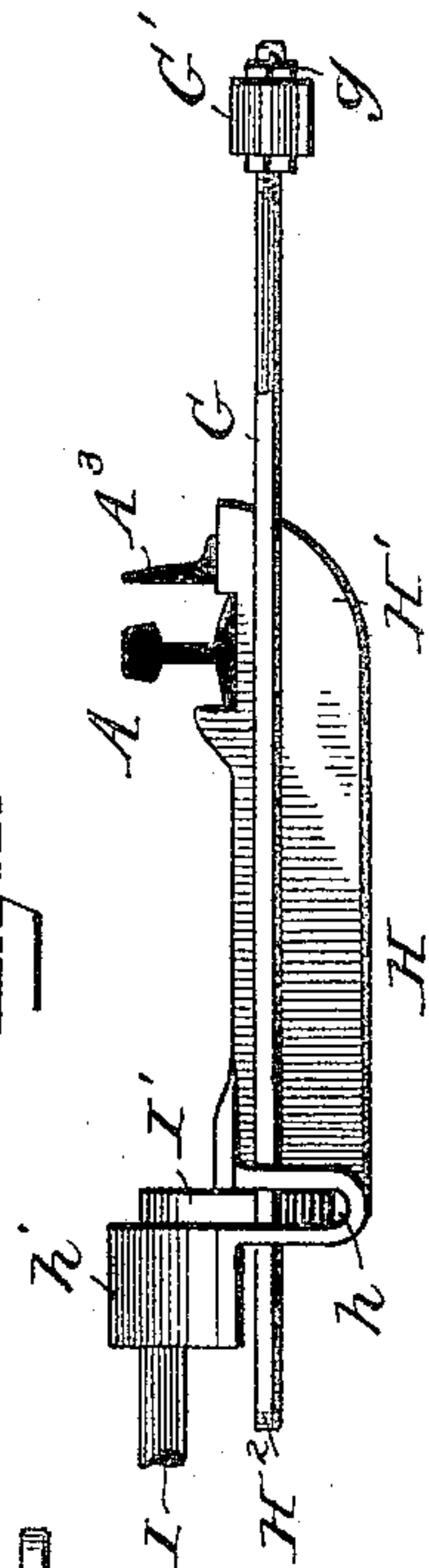


Fig. 6.



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# UNITED STATES PATENT OFFICE.

HOBERT B. POTTER, OF HILLBURN, NEW YORK.

## SWITCH AND SIGNAL LEVER.

SPECIFICATION forming part of Letters Patent No. 529,407, dated November 20, 1894.

Application filed October 24, 1893. Serial No. 489,031. (No model.)

*To all whom it may concern:*

Be it known that I, HOBERT B. POTTER, a citizen of the United States, residing at Hillburn, in the county of Rockland and State of New York, have invented certain new and useful Improvements in Switch and Signal Levers, of which the following is a specification.

My invention relates to switch and signal operating devices, and it has for its object to provide a device embodying an operating lever for a railroad switch and signals, a facing-point lock, and attachments, which shall be simple in construction, positive in its operation and not liable to get out of order, and to these ends my invention consists in the various features of construction and arrangement of parts substantially as hereinafter more particularly pointed out.

Referring to the accompanying drawings, Figure 1, is an end view of the device, showing the switch and signal-lever in different positions. Fig. 2, is a side view of the same. Fig. 3, is a detached perspective view, showing the cam. Fig. 4, is a plan view. Fig. 5, is a plan view showing the switch in place in connection with the tracks of the railway; and Fig. 6, is an enlarged detail of the chair for the locking-rod and dog.

In the embodiment of my invention shown and described herein, the device is applied to a switch where the traffic is shown as approaching the switch-points, and a signal is arranged at a proper distance in front of the points to give warning to an approaching train as to the condition of the switch. The points are moved by a lever to open and close the same, a signal on the switch may also be operated, the parts are locked in position, and the signal operated, and the arrangement of the parts is such that the signal cannot be set to "safety" until the switch is set to the main track and locked, although the switch can be opened and closed to permit the passage of the train, while the distant danger signal remains unaffected, and all these are accomplished by a single lever, and the operations of the parts are all positive and arranged in accordance with correct interlocking, signaling and switching, as commonly used at the present day.

In the drawings, A, A', represent the rails of the main track, while A<sup>2</sup>, A<sup>3</sup>, represent the points of the siding, and these are connected together by the ordinary tie-bars A<sup>4</sup>.

The switch device is shown as arranged to one side of the track and mounted on the extended sleepers, in the usual way, to which the switch operating device and connections are secured.

The device embraces a suitable frame or casing B, having in the present instance the flanges B' projecting laterally from the main body of the frame, by means of which it may be secured in place, and a housing B<sup>2</sup>, in which is mounted the cam, and the main portion B of the frame is provided with a flange B<sup>3</sup>, extending in a vertical plane, leaving a slot or opening B<sup>4</sup> between said flange and the housing, in which slot moves the switch and signal-operating lever C. This lever C is pivoted at the point C' (preferably in the manner hereinafter described), and has an extension C<sup>2</sup>, which serves the double purpose of holding the cam in position, as hereinafter set forth, and providing convenient means for locking the lever and for operating the distant signal, and for this purpose the signal wires or connections may be attached to the extension C<sup>2</sup>, at the points c, c, while the opening c' may receive the padlock or other securing device for holding the switch closed. The lever also has a bearing portion C<sup>3</sup> for engaging and operating the cam, as hereinafter set forth.

The cam D may be made in a single piece, but I preferably form it in two parts, D', D<sup>2</sup>, which are both pivoted upon a shaft D<sup>3</sup>, mounted in bearings in the housing B<sup>2</sup>, and these two parts are adjustably connected together by means of a rod d, passing through projections d', d<sup>2</sup>, on the parts D', D<sup>2</sup>, and having suitable nuts d<sup>3</sup>, d<sup>4</sup>, by means of which the relations of the two parts of the cam to each other can be adjusted and fixed for the purpose of taking up wear, or otherwise. The cam is provided with suitable means by which the moving rod E, may be attached thereto, and I have shown this rod (in Fig. 3) as pivotally mounted in a recess D<sup>4</sup> in the upper portion of the cam, while there is a similar recess D<sup>5</sup> (shown in dotted lines) at the lower



portion of the cam, in which the moving rod may be connected, and in this way it will be seen that the same lever may be used to open or close the points in either direction, and the switch device can be interchangeably used to operate points for a right- or left-hand siding. The cam is provided with two bearing surfaces  $F$ ,  $F'$ , against which the bearing edges  $C^3$  of the lever operate to move the cam, while it is also provided with an extension  $F^2$ , to bear against the side of the extension  $C^2$  of the operating lever, to prevent the cam moving as the lever is swung to its final or normal position.

The switch-moving rod  $E$  is shown as connected to one of the tie-bars  $A^4$  of the points, in the usual way, and also connected to the tie-bar is a locking-bar  $G$ , it being adjustably connected therewith by means of nuts  $g$ , and a clip  $G'$  secured to the tie-bar, and this locking-bar is provided with a notch  $g'$  to receive the locking-dog, and its free end passes through and is supported in an opening in the chair  $H$ . This chair is shown on an enlarged scale in Fig. 6, and consists of an extension  $H'$ , which supports or is connected to the rail  $A$ , on which the point  $A^3$  preferably slides, and the chair is further provided with a base  $H^2$ , by means of which it can be spiked or otherwise secured to one of the sleepers, and it has further a slot  $h$ , in which moves the locking-dog, and a bearing  $h'$  for the locking-dog-rod  $I$ . The locking-dog-rod  $I$  carries the locking-dog  $I'$  on its end, and this dog is moved in the slot  $h$  of the chair  $H$ , and at the proper time engages the notch  $g'$  of the locking-bar, and it is arranged to be operated by the lever  $C$ . While the locking-dog-rod may be connected in different ways to the lever  $C$ , I preferably form the end  $I^2$  thereof square, as shown in Fig. 1, and mount the lever thereon, while the portion between the squared end and the locking-dog is rounded and extending through the journal  $B^5$  on the frame  $B$ , forms a bearing for the switch lever, and owing to its squared end, moves in accordance therewith, so as to bring the locking-dog in operative position at the proper time to secure the locking-bar and hold the points in position.

One special advantage of this construction resides in the fact that the locking-dog prevents the complete movement of the lever unless it fits into the notch in the locking-bar, and this it cannot do unless the points have been moved to their fullest extent to properly close the points and complete the main track. Thus, if any obstruction prevents the complete movement of the points, the operator will be instantly aware of the fact in that he cannot throw the lever to its complete locking position, but when the points are clear and move in proper place, the lever can be thrown, operating the locking-dog and securing the locking-bar, and at the same time moving the distant signal to "safety."

It is sometimes desirable to have a signal

or target on the switch to show its condition, in addition to the distant signal, and I have shown a signal target  $K$ , mounted on the base of the switch-frame and connected to be moved by the switch-moving rod, and while various mechanisms may be used, I have shown the signal-rod or support  $K'$  as provided with an operating arm  $K^2$  which is connected by a target-rod  $K^3$ , to a lug  $K^4$  secured to the switch-moving rod  $E$ , and it will be seen that as the switch-rod is operated, the target is moved in accordance therewith, and I preferably provide the operating arm with a series of openings, as shown in Fig. 4, so that the target-rod may be adjustably connected thereto to move the target as desired to indicate the position of the switch.

Such being the general construction of the device, I will now describe its mode of operation.

The parts are shown in Fig. 1 in their normal position, by the dotted lines, showing the lever  $C$  extended to the left and secured by a padlock or other suitable means, passing the hole  $c'$ , and bearing on the top of the flange  $B^3$ , and it will be understood that the parts are locked in the manner hereinafter described. In order to open the points, the lever  $C$  is moved from its extreme position "1," shown in dotted lines, to the position "3" shown in full lines in Fig. 1, and in doing this it will be understood that the distant signal is set to danger by the use of the usual lines connected to the extension  $C^2$ , and the bearing portion  $C^3$  of the lever impinges upon the bearing surface  $F'$  of the cam, rotating it through a partial revolution, moving the switch-rod and the connected points, and at the same time setting the target  $K$  to danger. As the lever has moved from one position to the other, the locking-dog  $I'$  has been rotated by its rod  $I$  so as to release the locking-bar  $G$ , and this is accomplished just before the cam is moved and before the lever reaches the position "2," shown in dotted lines in Fig. 1. When the lever is in its position "3," it can be locked by the padlock passing through the opening  $b'$ , and it will be noticed that the bearing surface  $F'$  of the cam impinges upon the side of the bearing portion  $C^3$  of the lever, and is securely held in position against movement. If now, it is desired to close the points temporarily, as in making up a train, or otherwise, without setting the distant signal to safety, the lever  $C$  can be moved to position "2" and its bearing surface  $C^3$  impinges upon the bearing face  $F$  of the cam, moving the points to open them, and the parts can be locked temporarily by placing the padlock in the opening  $b^2$ , but this opening is preferably so formed that it will not permit the padlock to be locked, as it is only a temporary locking, while the distant signal still remains to danger. Furthermore, the locking-dog is so shaped that it is not moved with this movement of the lever sufficiently to engage the notch in the lock-



ing-bar, and thus it will be seen that the points may be opened and closed as often as desired, without disturbing the distant danger signal. When, however, it is desired to restore the track to its normal position, the lever C is thrown to its position "1," and it will be observed that the extension F<sup>2</sup> of the cam bears on the face of the extension C<sup>2</sup> of the lever, and the cam is held in position while the locking-dog is turned so as to engage the notch in the locking-bar, and as before intimated, this cannot be accomplished unless the points have been moved to the proper position in relation to the main line, and the distant signal will not be set to safety until the lever has been moved its full extent and the parts properly locked.

It will be seen that all the parts of the device are simple of structure, can be easily made and adjusted, and the switch can be used for any and all purposes desired, either with or without the signal devices, and all the movements are accomplished by a single lever. It is evident that the lever and cam may be used without the other connecting mechanism when desired to simply throw the points, and the locking-bar and dog can be used without the signal devices, or these and other parts of the device may be used together in combination, or in combination with other equivalent devices, but when the complete organization is used, the points are moved, they are locked in position, a target is operated at the stand, and the distant signal set, all their work being done by a single stroke of the operating lever. It will further be observed that the cam is provided with means for taking up wear or adjusting the parts, so that they can move accurately, that the cam is arranged at right-angles to the lever, and the locking-dog is also arranged at right-angles to the lever, so that the lever can be arranged longitudinally of the track, thereby taking up very little space. It is only necessary to so form the cam that the lever will strike it and throw it when passing through a portion of its movement, and so that it will hold the cam in position throughout its entire stroke, and in the present instance the cam is provided with a projection which bears against the side of the lever.

It is evident that the details of construction of the parts may be varied by those skilled in the art without departing from the principles thereof, and I do not, therefore, limit myself to the precise construction shown.

What I claim is—

1. In a switch-operating device, the combination with the frame, of a cam mounted to swing in a vertical plane therein, connections between the cam and the switch rails, and a lever mounted in the frame and arranged to impinge upon the cam to move the rails and to hold the cam in position, substantially as described.

2. In a switch-operating device, the combi-

nation with the frame, of a cam mounted to swing in a vertical plane therein, connections between the cam and the switch rails, and a lever pivotally mounted in the frame parallel to the track and arranged to impinge upon the cam and lock it in position, substantially as described.

3. In a switch-operating device, the combination with the frame, of a cam mounted therein, connections between the cam and switch rails, and a lever impinging upon the cam, the lever being provided with an extension for holding the cam, substantially as described.

4. In a switch-operating device, the combination with the frame, of a cam mounted therein, connections between the cam and switch rails, and a lever mounted in the frame, the lever being provided with a bearing surface to impinge upon the cam and with an extension for holding the cam in position, substantially as described.

5. In a switch-operating device, the combination with the frame, of a cam made in two parts adjustable with relation to each other, connections between the cam and the rails, and a lever for operating the cam, substantially as described.

6. In a switch-operating device, the combination with the frame, of a housing, a cam mounted to swing in a vertical frame in the housing, connections between the cam and switch rails, and a lever arranged at right-angles to the cam impinging upon and controlling the same, substantially as described.

7. In a switch-operating device, the combination with the frame, of a cam mounted therein, connections between the cam and switch rails, a lever mounted in the frame at right-angles to the cam and arranged to directly engage and hold the same, and means for locking the lever in its various positions, substantially as described.

8. In a switch-operating device, the combination with the frame, of a housing, a cam mounted in the housing, the frame having an opening, a lever mounted in the opening for operating the cam, and a flange on the frame adjacent to the opening for securing the lever substantially as described.

9. In a switch-operating device, the combination with the frame, of a cam, mounted to, swing in a vertical plane in the frame a moving rod connected to the cam, a lever for operating the cam, a target on the frame, and connections between the moving rod and target, substantially as described.

10. In a switch-operating and locking device, the combination with the frame, of a cam, connections between the cam and rails, a locking bar, a locking rod and dog for said bar, and a lever arranged to operate the locking rod and dog and the cam, substantially as described.

11. In a switch-operating and locking device, the combination with the frame, of a cam mounted thereon, connections between the



cam and rails, a locking bar adjustably connected to the rails, a locking rod and dog, and a lever mounted on the locking rod and arranged to operate said rod, and the cam, substantially as described.

12. In a switch-operating and locking device, the combination with the frame, of a cam mounted thereon, connections between the cam and rails, a locking bar adjustably connected to the rails, a chair supporting said locking bar, a locking rod and dog mounted in the chair and connected to the frame, and a lever mounted on the locking rod and arranged to operate the same and the cam, substantially as described.

13. In a switch-operating and locking device, the combination with the frame, of a cam mounted thereon, connections between the cam and rails, a target mounted on the frame and connected to be operated from the cam, a locking bar connected to the rails, a locking rod and dog, and a lever connected to the locking rod and arranged to operate the same and the cam and target at a single movement, substantially as described.

14. In a switch-and signal-operating device, the combination with the frame, of a cam and connections between the cam and rails, a lever mounted in the frame for operating the cam, the lever being provided with an extension, and the signal chains connected to said extension, substantially as described.

15. In a switch-and signal-operating device, the combination with the frame, of a cam mounted thereon and connected to the rails, a lever for operating the cam and provided with an extension to which the signal chains are connected, and means for locking the lever in different positions, the arrangement being such that the cam may be operated to open and close the switch by a partial movement of the lever, while the cam is locked and the signal operated on a complete movement of the lever, substantially as described.

16. In a switch-and signal-operating device, the combination with the frame, of a cam and connections with the rails, a locking bar, a

locking rod and dog for the bar, and a lever connected with the locking rod, the said lever having an extension to which the chains of the signal are attached, the arrangement being such that the cam may be operated to open and close the switch by a partial movement of the lever and the switch will be locked and the signal operated with a complete movement of the lever, substantially as described.

17. In a switch-and signal-operating device, the combination with the frame, of a switch-operating device, a switch-locking device, and a lever, said lever being arranged to operate the switch to open and close the same by a partial movement, and to operate the switch, lock the same and operate the signal with a complete movement, substantially as described.

18. In a switch-operating and locking device, the combination with the frame, of a cam and connections to operate the switch, a chair, a locking bar connected to the switch and mounted in the chair, a locking rod and dog also mounted in the chair and arranged to engage the locking bar, and a lever connected to the locking rod to operate the locking dog and having a bearing surface for operating the cam, the arrangement being such that the dog engages the locking bar only when the switch has been completely moved, substantially as described.

19. In a switch-operating and locking device, a chair having an extension supporting the main rail, a locking bar connected to the switch and mounted in the chair, a locking rod and dog also mounted in the chair, and means for operating the dog, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HOBERT B. POTTER. [L. S.]

Witnesses:

THEO. WEYGANT,  
W. STUART ROE.