

(No Model.)

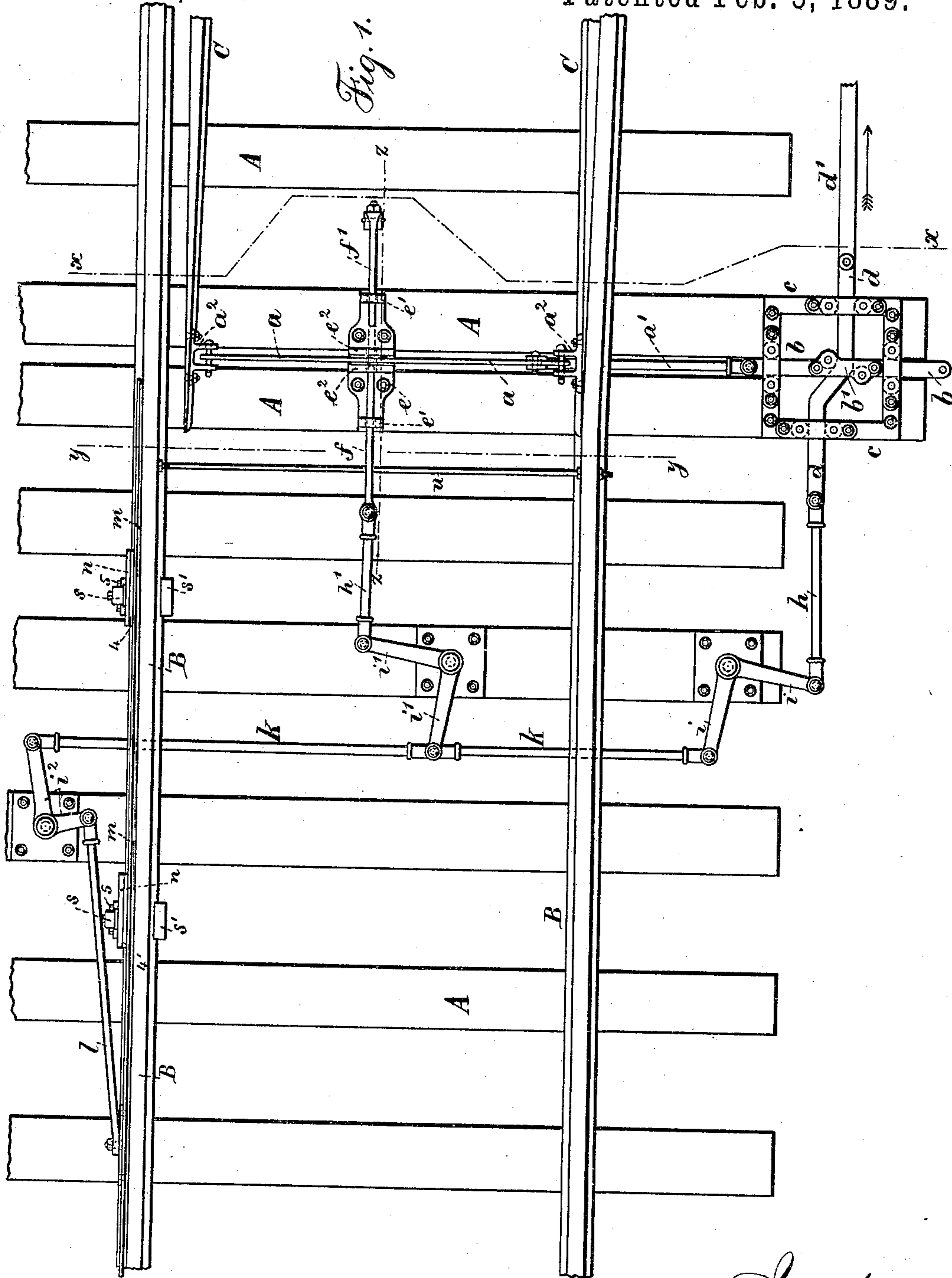
2 Sheets—Sheet 1.

T. W. BURLEY.

DEVICE FOR OPERATING AND LOCKING SWITCHES.

No. 397,414.

Patented Feb. 5, 1889.



Witnesses:
J. Stait
Chas. H. Smith

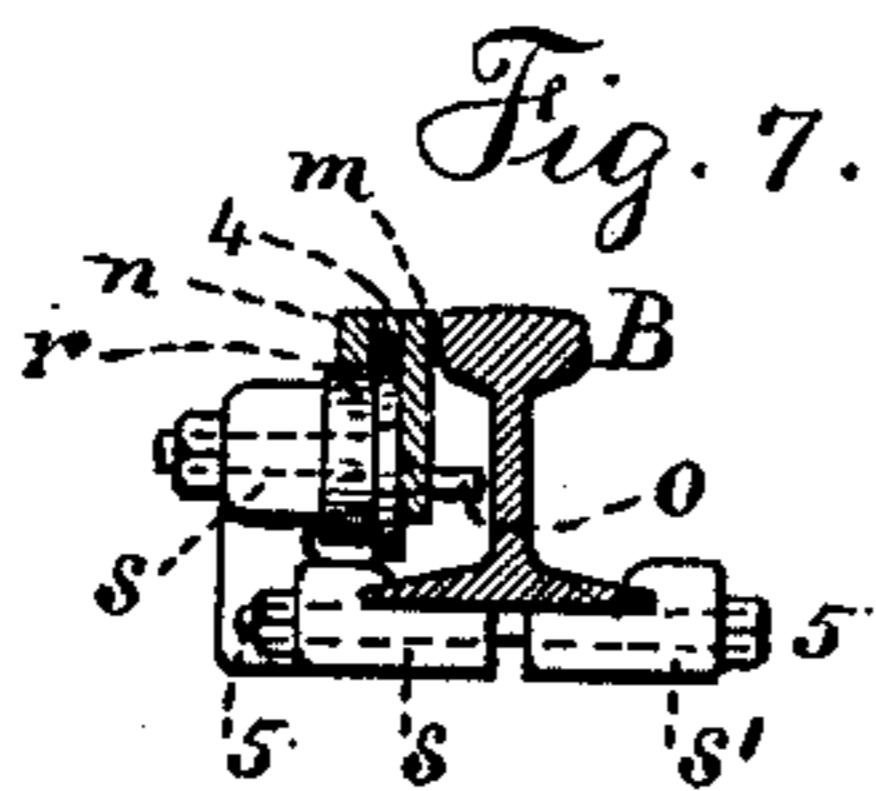
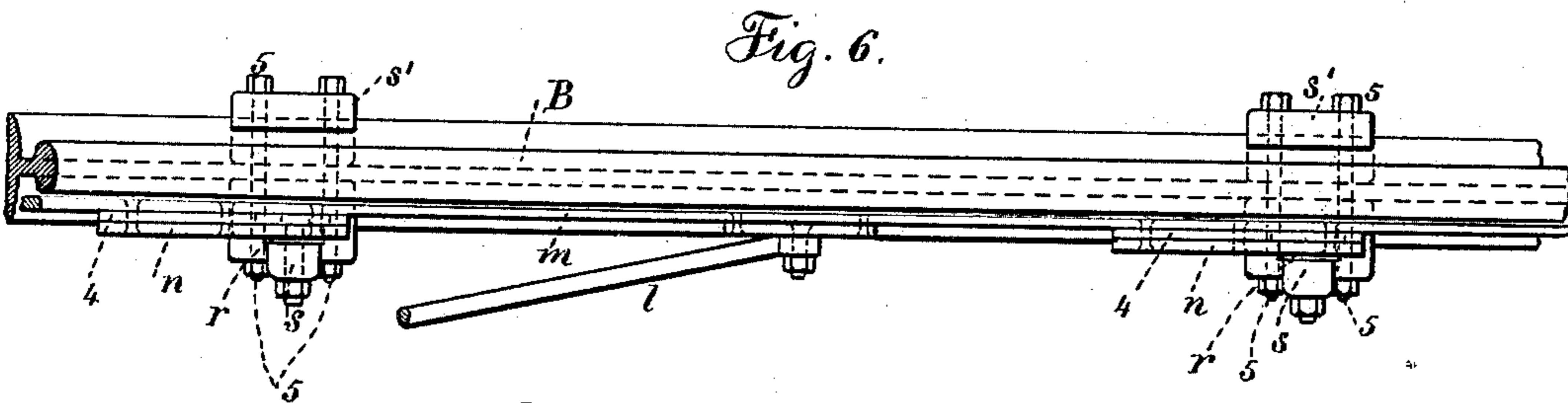
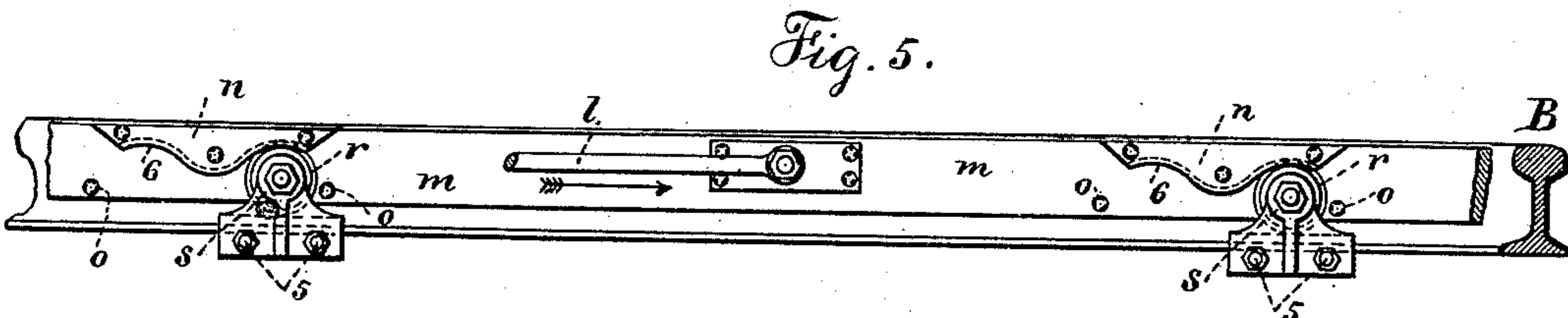
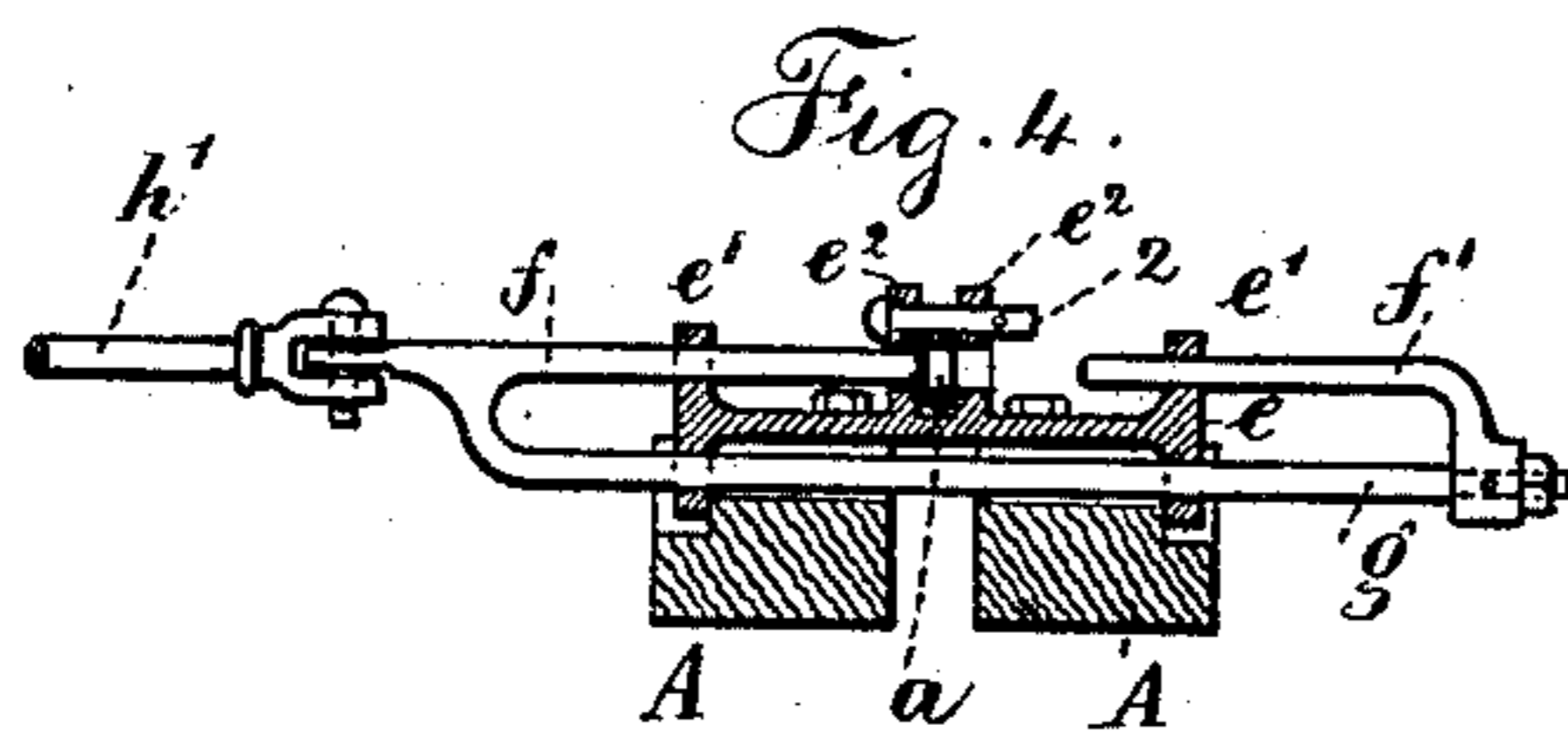
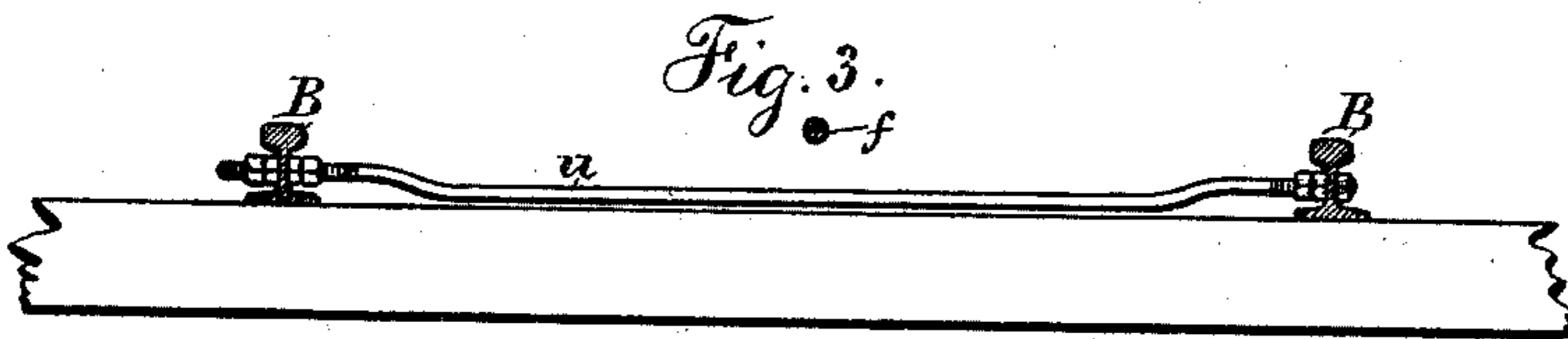
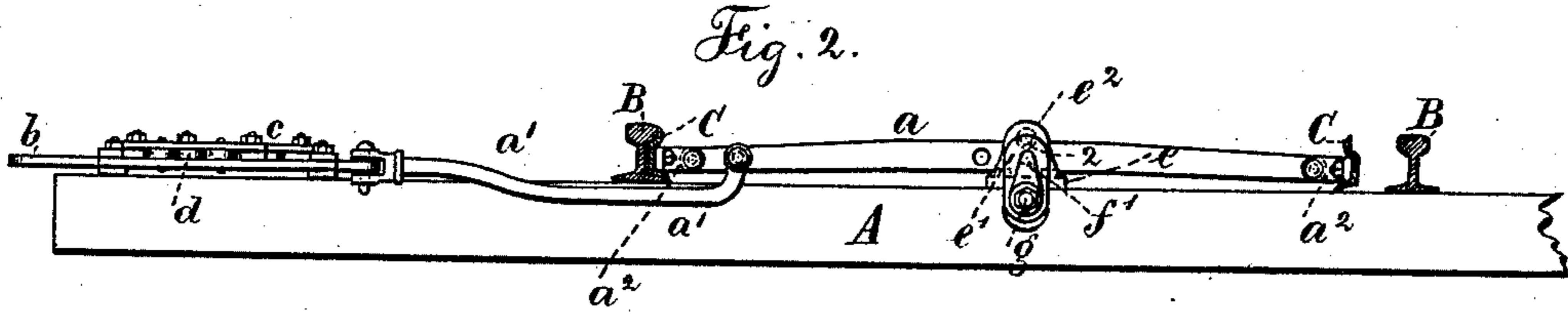
Inventor:
Thomas W. Burley
per *Lemuel W. Serrell* atty.

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UNITED STATES PATENT OFFICE.

THOMAS W. BURLEY, OF LONG ISLAND CITY, NEW YORK.

DEVICE FOR OPERATING AND LOCKING SWITCHES.

SPECIFICATION forming part of Letters Patent No. 397,414, dated February 5, 1889.

Application filed July 16, 1888. Serial No. 280,065. (No model.)

To all whom it may concern:

Be it known that I, THOMAS WILLIAM BURLEY, of Long Island City, in the county of Queens and State of New York, have invented an Improvement in Devices for Operating and Locking Switches; and the following is declared to be a description of the same.

Heretofore in railroad-train-signal systems in the operation of switches and visual signals from signal-towers it has been usual to employ separate operating-levers, through the medium of which and the bars connected therewith the switches and the locking-bars and detection-bars have been worked, it being usual to employ separate levers for operating each of these devices, or else one lever for operating the switch and another lever for operating the locking device and detection-bar.

My present invention relates to devices by which I am enabled by the use of one lever to operate from the signal-tower a switch, a device for locking said switch, and a detection-bar accompanying the same, and in carrying out my invention I employ a bent sliding bar working between rollers in a frame, which bar is operated by a bar passing to the lever of the signal-tower, and the operation of this bent slide-bar moves an arm connected to the switch, which arm also passes through the same frame that supports the bent slide-bar, and connected to this bar are other bars and bell-crank levers by which, simultaneously with the moving of the switch, the locking device is operated and the detection-bar is moved; and my invention further relates to peculiarities in the construction of the detection-bar and the means by which the same is retained in place, the said bar being moved with greater ease and more precision than heretofore.

In the drawings, Figure 1 is a plan of the track, switch, and my improved device for operating and locking the switch and detection-bar. Fig. 2 is an elevation and section at the line $x x$ of Fig. 1. Fig. 3 is a section at $y y$ of Fig. 1. Fig. 4 is a sectional elevation at $z z$ of Fig. 1. Fig. 5 is an elevation of the detection-bar. Fig. 6 is a plan of the same; and Fig. 7 is a cross-section through the bar and rail, showing the means of attaching the same to the rail.

A represents the cross-ties; B, the rails of the main track; C, the rails of the switch. The bar a is connected at its opposite ends by frames or brackets a^2 (which are sufficiently wide to allow for expansion and contraction of the rails) to the tapering ends of the switch-rails, and the arm a' , which passes under the rails between the cross-ties, is pivoted to the bar a , and the bar b is pivoted to one end of the arm a' , and said bar b passes through the frame c , and this frame c is represented in Fig. 1 as secured to two cross-ties and square in shape, and having between its upper and lower plates pairs of rollers, between which pass the bars b and d .

The plates composing the frames c are riveted together in any desired manner, and the arm b is made with a top plate, b' , and with rollers between the top plate and the bar b , between which the inclined or bent portion of the slide-bar d passes. One end of the bent slide-bar d is connected to a bar, d' , which passes in the usual manner to the tower from which the signals are set; and there is a bar, h , connected to the other end of the bar d , which in turn is connected to a bell-crank lever, i ; and there is a cross-bar, k , passing between the cross-ties and beneath the main rails B; and there are bell-crank levers i' and i^2 pivoted to place securely upon the cross-ties, the bell-crank lever i' being connected to the bar k near its central point, and the bell-crank lever i^2 connected to the bar k at one end; and there is an arm, h' , connected to the bell-crank lever i' , which passes to the locking device.

The locking device consists of a plate or frame, e , secured to the cross-ties A; and said frame e has perforated uprights e' e^2 , and between the uprights e^2 passes the perforated rod a , which is connected to the moving rails; and there is a central pin, 2, which keeps the rod a down to place, and the locking-bars $f f'$ pass through the perforated uprights e' , and one of said locking-bars at a time passes through the perforated uprights e^2 and through the rod a to lock the switch, the rod g , connected to the locking mechanism, acting as a guide-rod and passing through the lower part of the frame e .

The detection-bar is connected to the bell-crank lever i^2 by the bar l , which is bolted at

one end to the detection-bar *m* in any desired manner. I have, however, shown a small plate or stiffening-piece at the end of the bar *l* riveted to the detection-bar *m*.

5 The detection-bar *m* consists of a long bar of metal set edgewise, and at regular intervals upon the side thereof there are compound curved inclines or plates *n*, secured a short distance away from the bar *m* by bolts passing through the plates *n* and the detection-
10 bar *m* and an intervening strip of metal, 4; and there are pins *o* upon the lower portion of the detection-bar projecting from the surface next to the rail, which pins *o* prevent the
15 detection-bar being removed, because of their coming in contact with the under side of the top flange of the rail.

The rollers *r*, for supporting the detection-bar, are made with flanges, which flanges pass
20 beneath or within the lower edge of the plates *n*, the lower curved edge of the plates resting upon the surfaces of the roller proper, and said rollers *r* are pivotally supported upon frames *s*; and there is a frame, *s'*, and sup-
25 port, similar in shape to the lower portion of the frame *s*, each of which frames *s s'* is adapted to pass beneath the rail B, and has edges or lips that project over the edge of the base of the rail; and there are bolts 5, that
30 pass across through the frames *s s'* and beneath the rail, clamping the same securely to the rail, thus causing the rail itself to support and carry the rollers *r* and the detection-bar *m*.

35 The normal position of the detection-bar *m* is shown in Fig. 5, wherein its upper edge is parallel with and at about the same height as the upper edge of the rail B; and it will be apparent that should a train be occupying
40 the track B some of the wheels of its cars would come over the detection-bar, and should an attempt be made to move the switch when the train is on the track the detection-bar would prevent such attempt, because the de-
45 vice that would act to operate the switch would also act to raise the detection-bar, and a wheel over the bar, that would prevent it being raised, would, through the device con-
50 nected therewith, also prevent the switch being moved. The detection-bar in Fig. 5 is shown in the position it would occupy with one extreme movement of the switch in one direction, the extreme movement of the switch
55 in the other direction causing the detection-bar to be moved parallel with the rail through the medium of the bar *l* and bell-crank lever *i²*, the bar in said movement rising by the curved plates *n* and falling again, so that the depression at 6 will rest upon the top of the
60 rollers *r*.

In the position of the parts shown in Figs. 1, 2, and 4 the bar *d'* has just commenced to move the bar *d* in the direction of the arrow, and through the arms *h h'*, bar *k*, and bell-
65 crank levers *i i'* the locking-bar *f* has been withdrawn from the opening in the rod *a*, so that the switch-track is free to be moved by

the further movement of the bent slide-bar *d*, acting by its inclined edge upon the rollers of the arm *b* to shift the same and the arms *a'* and
70 *a* and the switch-rails to their opposite position, and after this is done, by the inclined portion of the bar *d* the further movement of such bar *d* and the arms *h h'*, rod *k*, and bell-crank
75 levers *i i'* will draw the locking-bar *f'* through another opening in the plate *a* and lock the switch in its opposite position, and simultaneously with these movements the bell-crank
80 lever *i²* and the bar *l* will move the detection-bar from the position shown in Fig. 5, so that its curved portion 6 will rest upon the rollers
85 *r*. The reverse movement of the rod *d'* will bring the parts back to their normal position.

There is a bar, *u*, having threaded ends
85 passing through the opposite track-rails and having clamping-nuts upon the same, which bear upon opposite sides of each rail, the object of this bar being to keep the track-rails at
90 the right distance apart near the moving ends of the switch and to hold said rails more firmly in such position, especially where it is not possible to employ the usual spikes se-
95 curing the rails to the cross-ties.

I claim as my invention—

1. The combination, with a switch and a
95 locking device and a detection-bar, of a frame composed of a top and bottom plate, and pairs of rollers between the plates at the central portion of each side, the bar *b* from
100 the switch passing through the frame and between two pairs of its rollers, and having a top plate, *b'*, and rollers, the bar *d*, having bends or inclines and passing through said
105 frame and between the other two pairs of its rollers and at right angles to the bar *d* and beneath the top plate, *b'*, and between the rollers on said bar *b*, and adapted to operate
110 said bar *b* by its movement, the arms *h, h'*, and *l*, the bell-crank levers *i, i'*, and *i²*, and the cross-bar *k*, passing beneath the rails of the track and connecting the bell-crank levers,
115 substantially as set forth.

2. The combination, with the switch, of the
115 detection-bar *m*, compound curved inclines or plates *n*, secured to the same, flanged rollers *r*, and supporting-frames *s s'* for the same, and devices, substantially as set forth, for moving the same, substantially as specified.

3. The combination, with the switch, of the
120 detection-bar *m*, compound curved inclines or plates *n*, secured to the same, flanged rollers *r*, and supporting-frames *s s'* for the same, the pins *o* upon the inner surface of the de-
125 tection-bar, to prevent its being raised off of the rollers, the frames *s s'* having projecting edges adapted to grasp the lower edges of the rail, and bolts 5, which pass through the parts
130 *s s'*, to clamp the same to the rail, and devices, substantially as set forth, for moving the de-
135 tection-bar, substantially as specified.

4. The combination, with the switch-rails and the bar *a*, connecting the same, of the locking device having perforated uprights be-

tween which the rod *a* passes, the locking-bars passing through the frame of the locking device at right angles to the bar *a*, and mechanism, substantially as specified, for operating the locking-bars to lock the switch, substantially as set forth.

5 5. The combination, with the switch-rails and the bar *a*, connecting the same, of the frame *e*, having perforated uprights *e'* *e''*, a
10 central pin, 2, the locking-bars *f* *f'*, passing through said frame, the rod *g*, formed with

and connected to the locking-bars *f* *f'*, and mechanism, substantially as specified, for operating the locking-bars *f* *f'* so that they alternately lock the switch in its various positions, substantially as set forth. 15

Signed by me this 9th day of July, 1888.

T. W. BURLEY.

Witnesses:

GEO. T. PINCKNEY,
WILLIAM G. MOTT.