

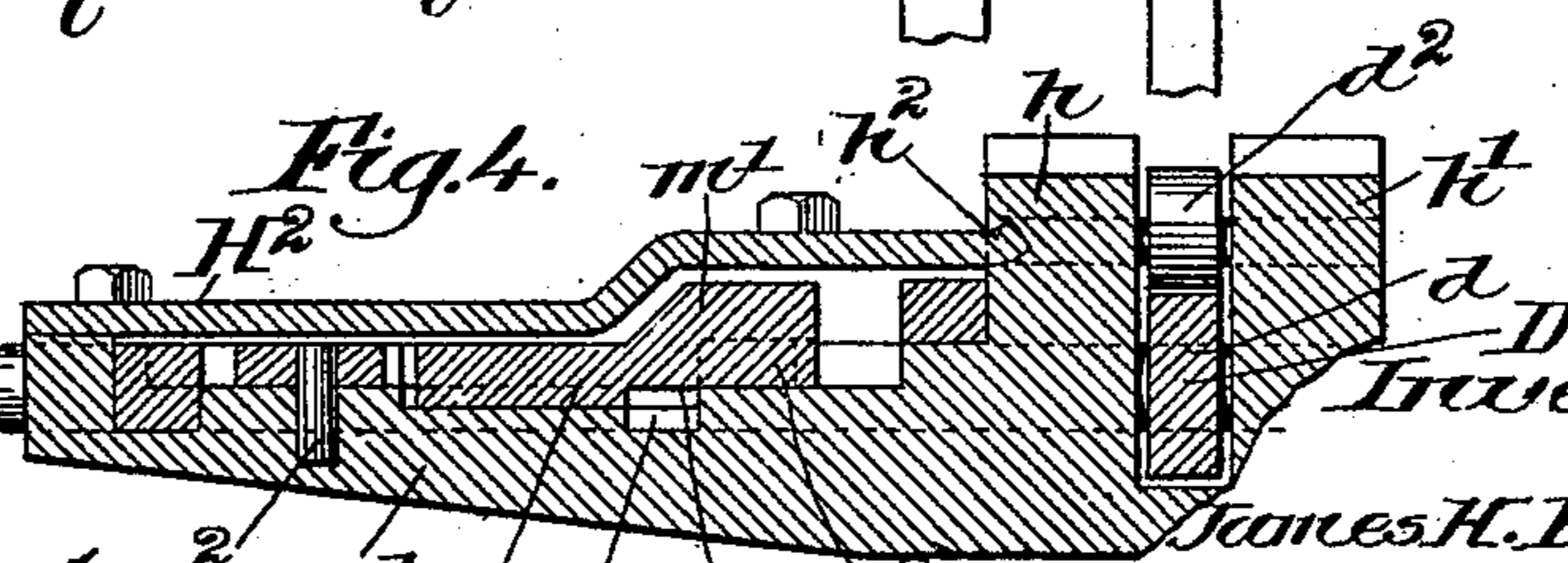
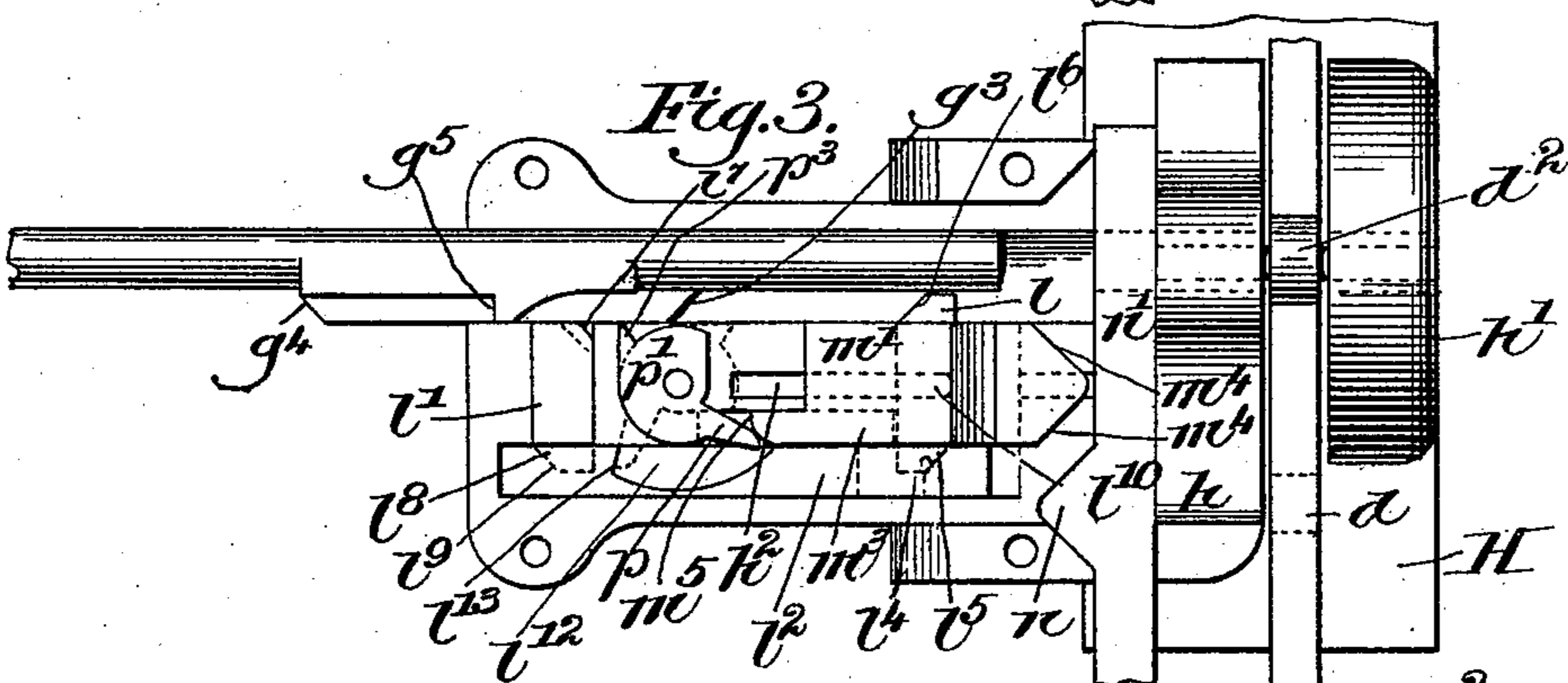
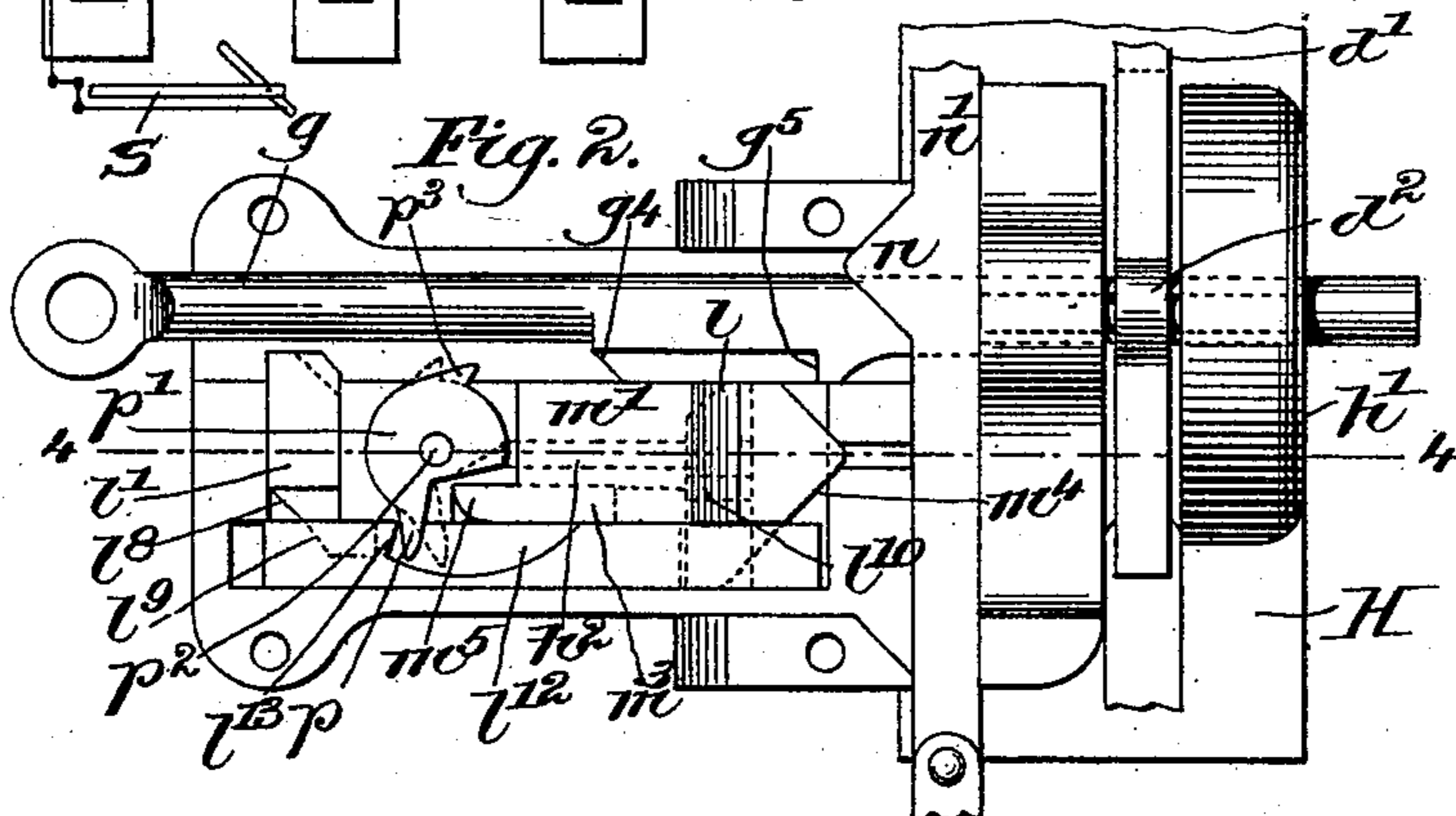
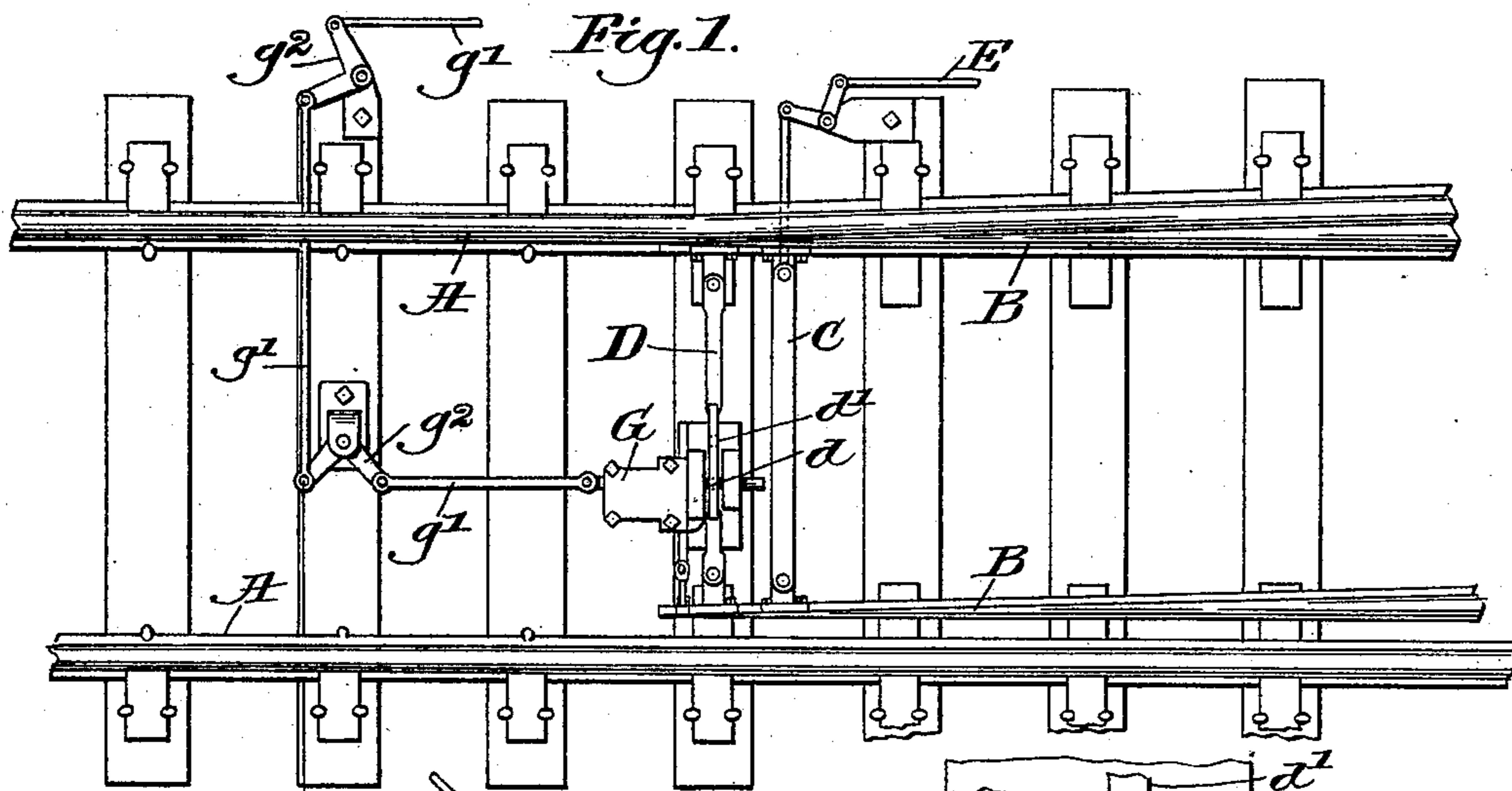
(No Model.)

2 Sheets—Sheet 1.

J. H. BOYLETT.
SWITCH LOCK.

No. 581,100.

Patented Apr. 20, 1897.



Witnesses:

A. C. Harrison.

Thomas J. Drummond.

Inventor:

James H. Boylett.

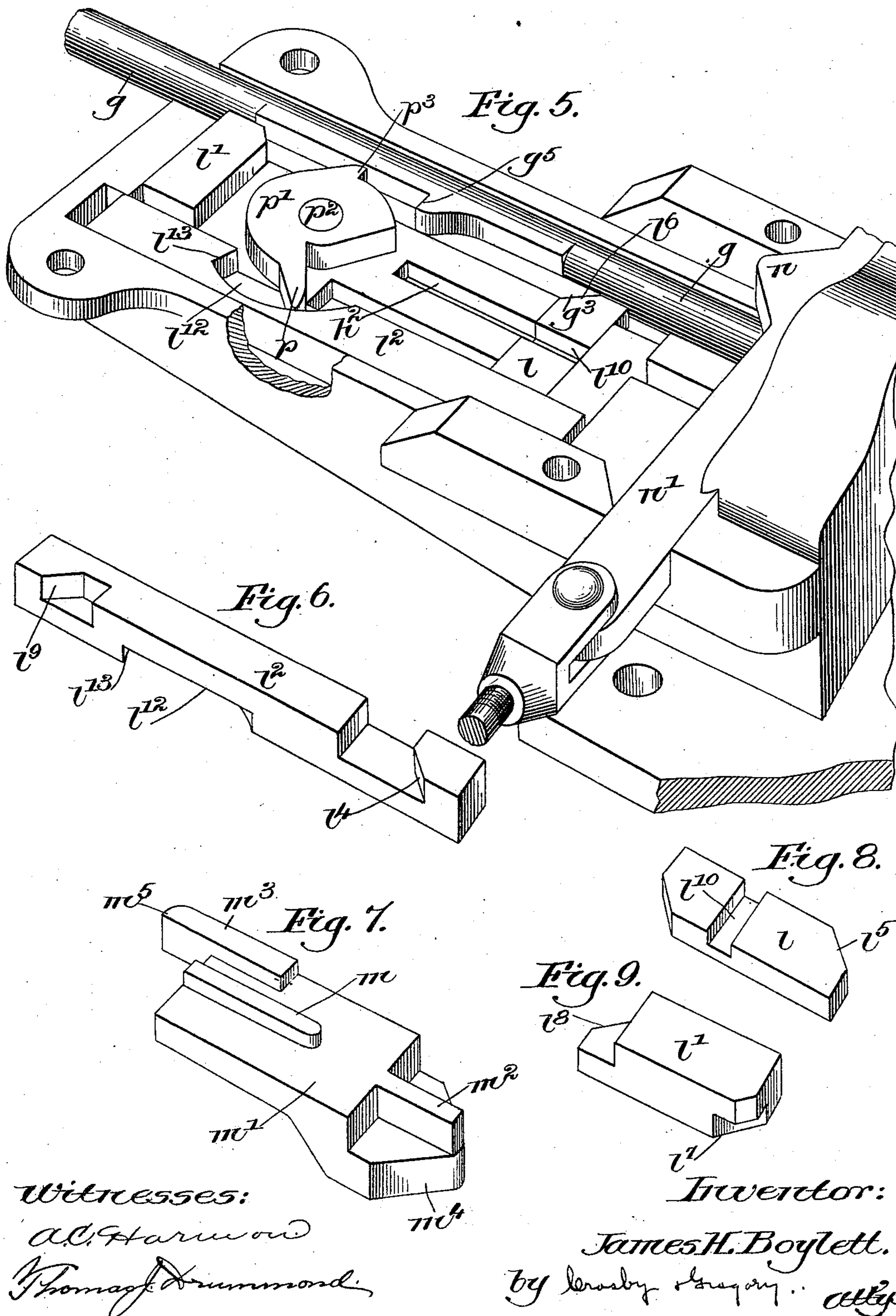
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2 Sheets—Sheet 2.

J. H. BOYLETT.
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UNITED STATES PATENT OFFICE.

JAMES H. BOYLETT, OF BOSTON, MASSACHUSETTS.

SWITCH-LOCK.

SPECIFICATION forming part of Letters Patent No. 581,100, dated April 20, 1897.

Application filed November 14, 1896. Serial No. 612,112. (No model.)

To all whom it may concern:

Be it known that I, JAMES H. BOYLETT, a subject of the Queen of Great Britain, residing at Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Switch-Locks, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

10 Railway-switches, movable frogs, &c., particularly in yards and interlocking systems, are usually provided with positive locks in addition to the switch-operating mechanism, both the operating mechanism and the locking mechanism being operated from a distant tower.

As at present constructed it might happen that the connections between the switch and tower might fail to throw the switch and yet 20 permit the usual movement of the operating mechanism, so that the operator, receiving no indications of such failure from the interlocking mechanism, might perform all the proper movements, supposing that he had moved the switch. For instance, he might pull the tower-lever to throw the switch, and, the switch connections being broken, the switch would not be thrown, although the tower mechanism worked in its proper normal manner. Then, 30 having locked the switch, he might give a "clear" signal to indicate that the switch had been thrown, the switch, however, not having been thrown, but having been simply relocked in its unchanged position. The switch and signal might thus be at variance without any fault on the part of the operator and without any notification to him of the error.

My invention provides means to indicate to the operator whether the switch has been 40 thrown or not, thereby to prevent the giving of an improper display of the signal, and contemplates means to prevent movement of the switch-lock without proper precedent movement of the switch or switch device with which the lock coöperates.

I so construct or arrange the lock that it is prevented from being operated unless the switch device has been properly moved, the movement of the latter coöperating with the 50 lock to permit it to again lock the switch device.

In the accompanying drawings, illustrative

of one embodiment of my invention, Figure 1 shows in plan sufficient portions of a usual split switch and its operating connections 55 provided with my invention to enable those skilled in the art to understand the general arrangement thereof. Fig. 2 is an enlarged top plan view of my invention, the cover being removed to show the details of construction, the parts being shown in the positions 60 assumed when the switch is locked to the main track clear. Fig. 3 is a similar view, the parts being shown in the positions assumed when the switch is unlocked, having 65 been shifted to the siding. Fig. 4 is a vertical longitudinal section taken on line 4 4 of Fig. 2. Fig. 5 is an enlarged detail in perspective of the lock and adjacent parts, the cover being removed. Figs. 6 to 9 are similar views 70 of the moving parts in detail.

The rails A, switch-points B or other switch devices, connecting-bar C, lock-rod D, and connections E, leading to the operating mechanism in the tower, may be and are of usual 75 or preferred construction.

G designates a locking device, which may be of any kind desired, that herein shown for convenience of illustration in connection with the preferred embodiment of my invention 80 being of the ordinary plunger type, in which a plunger or bolt *g* is reciprocated from the tower by means of links *g'* and bell-cranks *g''* to enter one or the other of the holes *d d'*, according as the switch is set for the siding or 85 for the main line. The bolt *g* slides in bearings in the opposite flanges or lugs *h h'* of the plate H, secured to a tie of the road-bed.

The gist of my invention resides in providing means to insure that the switch when 90 once unlocked must be moved before it can be relocked, or, in other words, in providing means to prevent the proper operation of the lock (and, if desired, of the signal and other mechanism connected therewith or dependent 95 thereon) unless the switch has actually moved, as required, said means being herein embodied in the following mechanism, which I will now describe:

A stop *l*, an actuator *l'* therefor, and a slide 100 *l''* are arranged to reciprocate in ways provided in the casting H'. The stop *l* is projected into the path of the plunger *g* by means of a beveled face *l''* of the slide *l''*, engaging

a correspondingly-beveled inner end l^5 of the stop, and is retracted by means of the engagement of similar bevels l^6 g^3 on the outer end thereof and on the plunger g , respectively.

5 Similarly the actuator l' has beveled ends l'^8 , coöperating, respectively, with the beveled lug g^4 of the plunger g and the beveled recess l'^9 of the slide l^2 . As the plunger g is pulled back to unlock the switch its bevel g^4 wedges

10 against l'^8 , thereby pushing the actuator l' inwardly, and this movement brings the bevels l'^8 l'^9 into coöperation and crowds the slide over to the left from the position of Fig. 2 to that of Fig. 3, causing the bevel l'^5 to pull

15 against the bevel l'^4 and project the stop l , as stated, the three parts l l' l^2 thus constituting a train acted upon at its end bevels l^6 l' by the lug-bevels g^3 g^4 of the plunger to be reciprocated one way or the other, according to

20 the movement of the plunger. The stop l has a transverse holding-groove l^{10} cut therein, adapted to receive a holding-rib m , depending from the dog m' and seated in a way

25 preferably, a similar rib m^2 at one end and another rib m^3 at its edge, traveling in ways provided in the casting for the purpose of giving rigidity and strength to the apparatus. The dog m' is reciprocated by engagement

30 with its beveled ends m^4 and m^5 of the lug n on the slide-bar n' and the finger p of the escapement-cam p' . As the dog moves into the position of Fig. 3 in the operation of unlocking the switch the holding-rib m enters the

35 groove l^{10} and holds the stop l against movement, so that it acts as a rigid stop to engage the lug g^3 and prevent the operation of the plunger to lock the switch, and as it is moved into the position of Fig. 2 the rib and groove

40 are disengaged, so that the stop l is no longer held rigidly to act as a stop, but may be shoved aside as the plunger g is operated to lock the switch.

The slide-bar n' is directly connected to one

45 or both of the switch-points, moving, therefore, as the switch is moved, and thus the dog m' is moved back to release the stop l each time the switch is actually moved. If, however, the connections E should be broken,

50 the switch would not be moved, notwithstanding that the operator in the tower properly moved the operating mechanism, and hence, the switch itself not having actually moved, the dog m' is undisturbed and remains holding the stop l in the path of the plunger g ,

55 making it impossible to again lock the switch which had just been unlocked.

I have shown the lug n as on a bar pivotally connected to the switch in order to permit

60 the inevitable movements of the switch, &c., due to creeping, changes in temperature, &c., but the lug n or other equivalent means may be otherwise placed if desired, as, for instance, it may be on the lock-bar D if preferred.

65 A roller d^2 is provided to retain the bar D in position for accurate alinement with the plunger g .

As the dog m' is moved back by the lug n its end m^5 swings the cam p' around on its pivot p^2 into the position shown in dotted

70 lines in Fig. 2, the finger p moving in a pocket l^{13} in the slide l^2 and the shoulder p^3 projecting into the path of movement of a lug g^5 on the plunger. The latter, being moved inwardly to lock the switch, first turns the cam p' into

75 the dotted position, Fig. 3, and then upon engaging the stop l pushes the same in, slides l^2 to the left, and brings the end l^{13} against the finger p , thereby turning the cam p' back into its full-line position, Fig. 2, so that it is

80 in position to be subsequently engaged by the lug g^5 when the plunger g is withdrawn. The withdrawal of the plunger turns the cam p' into the full-line position, Fig. 3, thereby throwing the dog m' forward, as shown in Fig.

85 3, to engage the stop l and render it rigid as a stop to prevent any return of the plunger to relock the switch until the switch has been thrown, as explained above.

The signal S is connected in any usual man-

90 ner, either directly or through the interlocking mechanism of the tower, to lock G, so that by reason of the apparatus already described it is rendered impossible that the signal should be given unless the switch has not

95 merely been supposed to have moved because of the correct working of the tower mechanism, but has actually moved, thereby permitting the lock to be operated.

A cover-plate II^2 , preferably slightly up-

100 turned at its upper edge h^2 to fit into a correspondingly-shaped groove in the flange h , secures the parts in position on the casting II' , as shown in Fig. 4, the bent edge h^2 serving to keep out rain and prevent accidental move-

105 ment of the cover.

The operation of the mechanism described is as follows: When it is desired to shift the switch, the plunger g is retracted from its position Fig. 2 to its position Fig. 3, the bevel

110 g^4 acting on the bevel l'^8 and through the bevels l'^9 l'^5 l'^4 to project stop l , and the lug g^5 engaging the cam p' at p^3 to turn the cam and throw the dog m' forward by means of finger

115 p to hold the stop l rigidly in projected position. No relocking movement of the plunger can now take place for the reason that stop l is in the path of the lug g^3 and serves as a means to indicate the position of the switch to the operator, for even though the tower

120 mechanism should operate correctly the operator finds it impossible to operate the lock unless the switch itself has actually been moved. When the switch moves, the lug n engages a face m^4 and moves the dog m' out

125 of engagement with the stop l , permitting the bevel g^3 of the plunger to shove the stop out of the way and allow the plunger to be moved into its locking position. This movement of the stop l moves slide l^2 to the right, Fig. 2,

130 projecting the actuator l' and turning the cam m' to the full-line position, Fig. 2, to be engaged by the plunger g when it shall be again withdrawn.

I have shown and prefer to employ a train of sliding parts substantially as described for the reason that it cannot easily get out of order. No springs or gearing are necessary.

5 The parts are simple, inexpensive, strong, and will endure a great amount of wear; but I do not restrict my invention to this embodiment, inasmuch as various other means to accomplish the same ends may be substituted
10 either as a part of or separate from the switch and lock.

For convenience I have illustrated and described my invention in connection with an ordinary switch, but I wish it understood that
15 my invention is in no wise restricted in this respect and that by the word "switch" or "switch device" in the claims I mean to include any kind of switch or accessory or other device where my invention may be used to
20 advantage.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination with a switch device
25 and its cooperating lock, of means to prevent movement of said lock without precedent movement of its cooperating switch device, substantially as described.

2. The combination with a switch device,
30 and a lock therefor, of a stop, mechanism to move said stop into the path of said lock when the switch device is unlocked, and means to rigidly hold said stop when so moved, substantially as described.

35 3. The combination with a switch device, and a lock therefor, of a stop, mechanism to move said stop into the path of said lock when the switch device is unlocked, a holding device for said stop, and means operated by the
40 switch device to release said holding device, substantially as described.

4. The combination with a switch device,

and a lock therefor, of a stop, mechanism to move said stop into the path of said lock when the switch device is unlocked, a holding device for said stop, and means operated by the
45 lock in its unlocking movement to engage said holding device with said stop, substantially as described.

5. The combination with a switch device,
50 its lock, and means to prevent locking movement of the latter, of a bar cooperating with said means, said bar being pivotally connected at one end to the switch device and movable therewith, substantially as described. 55

6. The combination with a switch, and its signal, of means to prevent two movements of the signal without intervening movement of the switch, substantially as described.

7. The combination with a switch, and its
60 lock, of means connected to and operated by said switch and lock, to indicate to the operator whether the switch has been operated or not, said means being independent of the switch-signal, substantially as described. 65

8. The combination with the base H', and flange h', of a cover for said base, said cover being provided at one end with an upturned edge adapted to fit a correspondingly-shaped groove provided therefor in said flange, sub-
70 stantially as described.

9. The combination with a switch, its signal and a switch-lock, of means operated by said lock to prevent two movements of the signal without intervening movement of the switch,
75 substantially as described.

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

JAMES H. BOYLETT.

Witnesses:

GEO. H. MAXWELL,
JOHN C. EDWARDS.