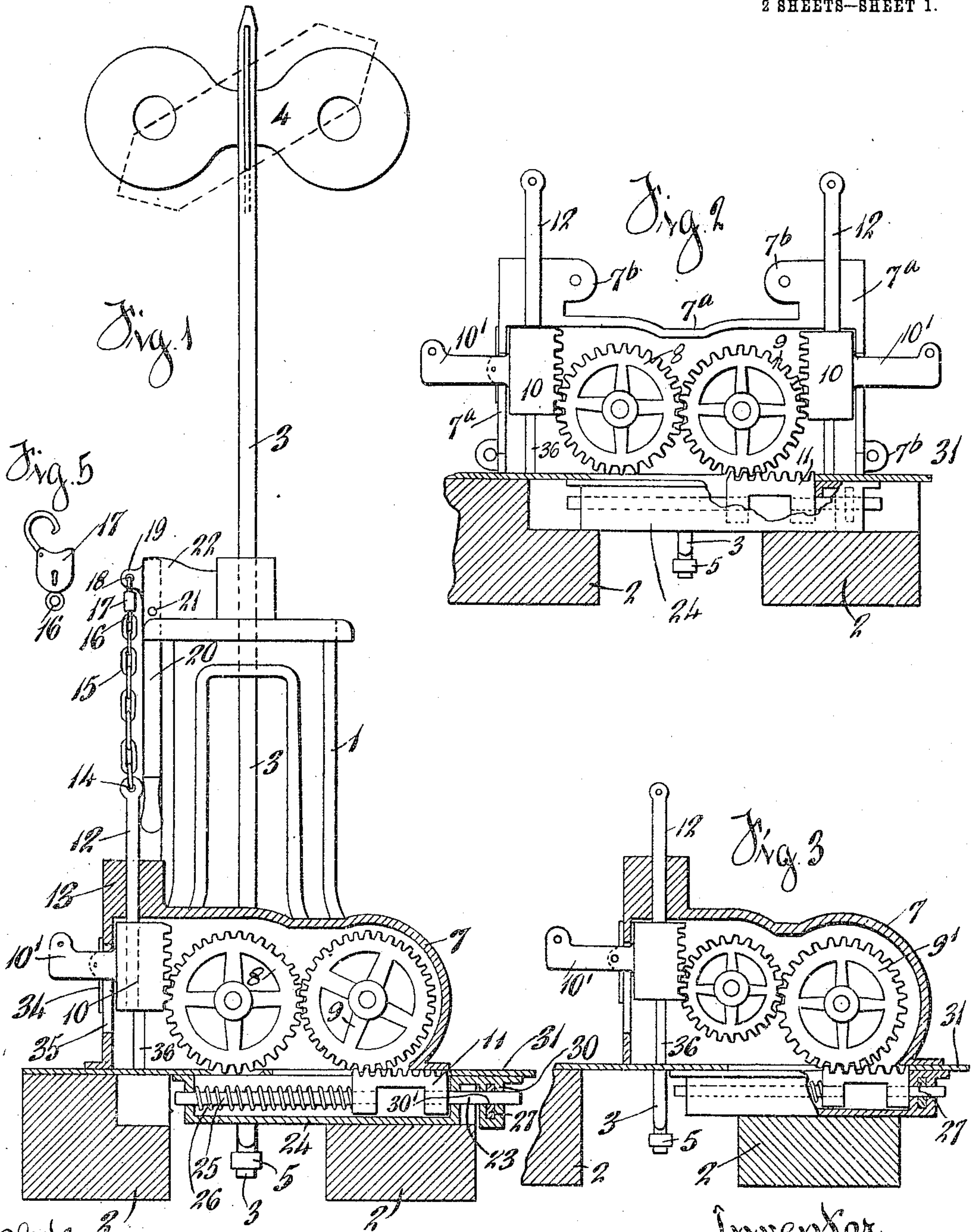


F. C. ANDERSON.  
 SWITCH SAFETY MECHANISM.  
 APPLICATION FILED JAN. 19, 1910.

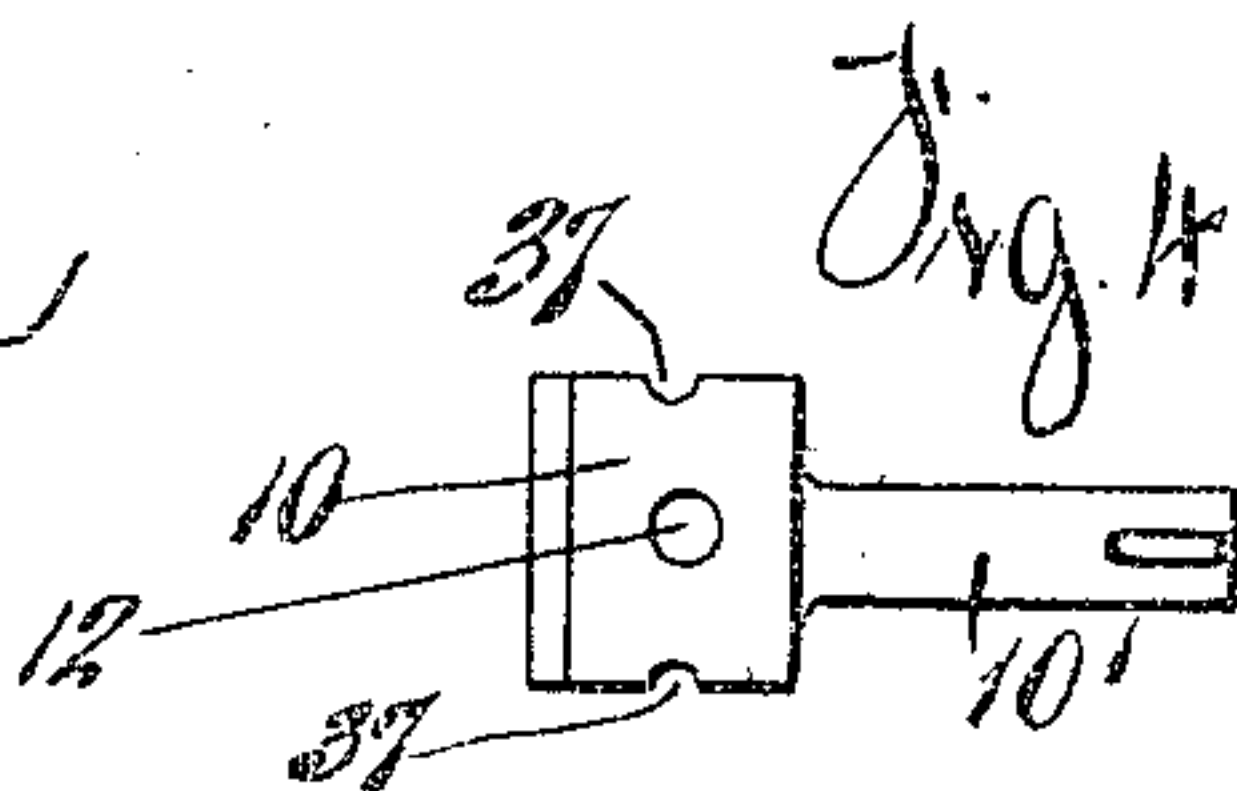
959,691.

Patented May 31, 1910.

2 SHEETS—SHEET 1.



Witnesses  
 Oliver Roman  
 Florence Hammel



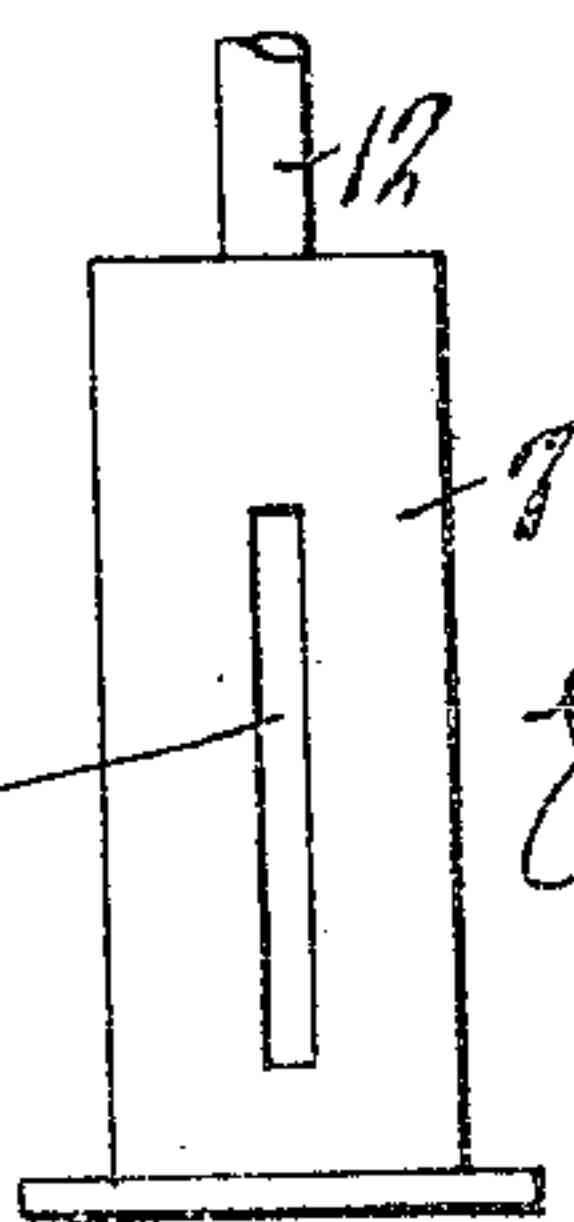
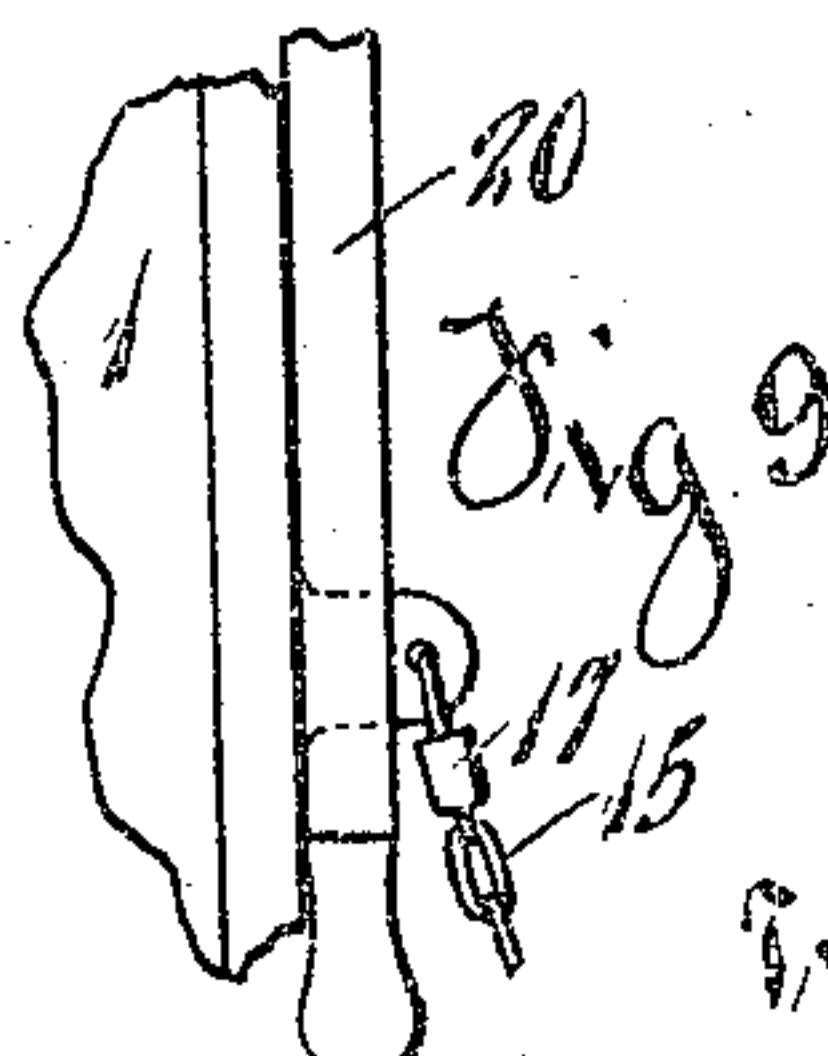
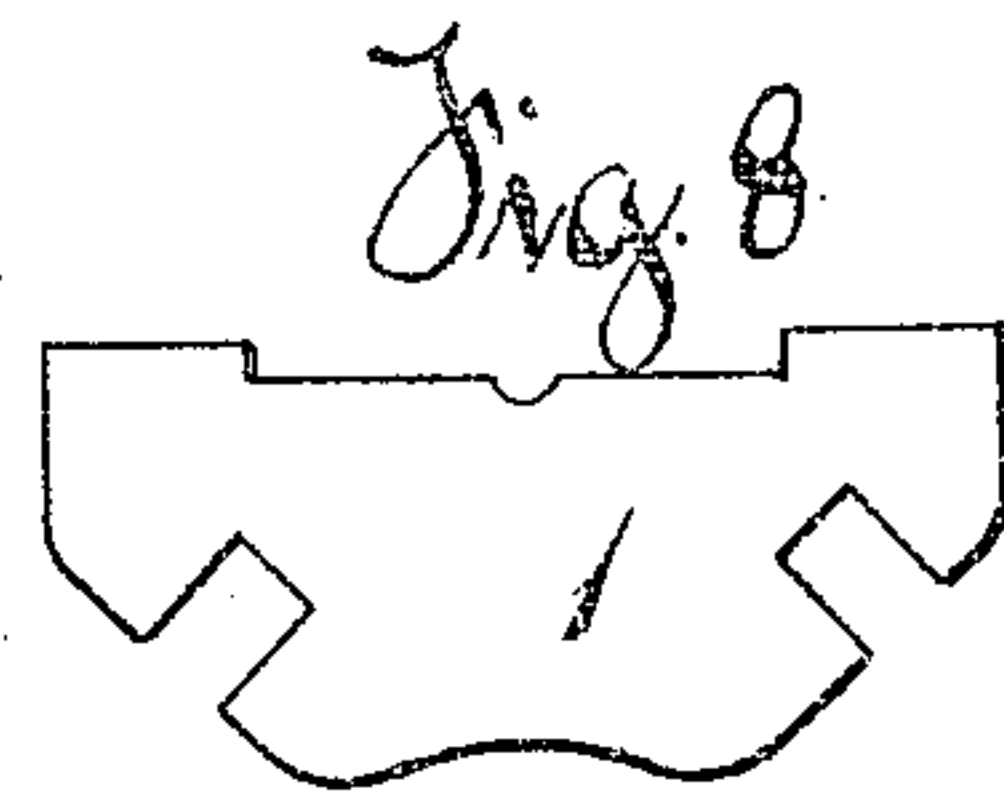
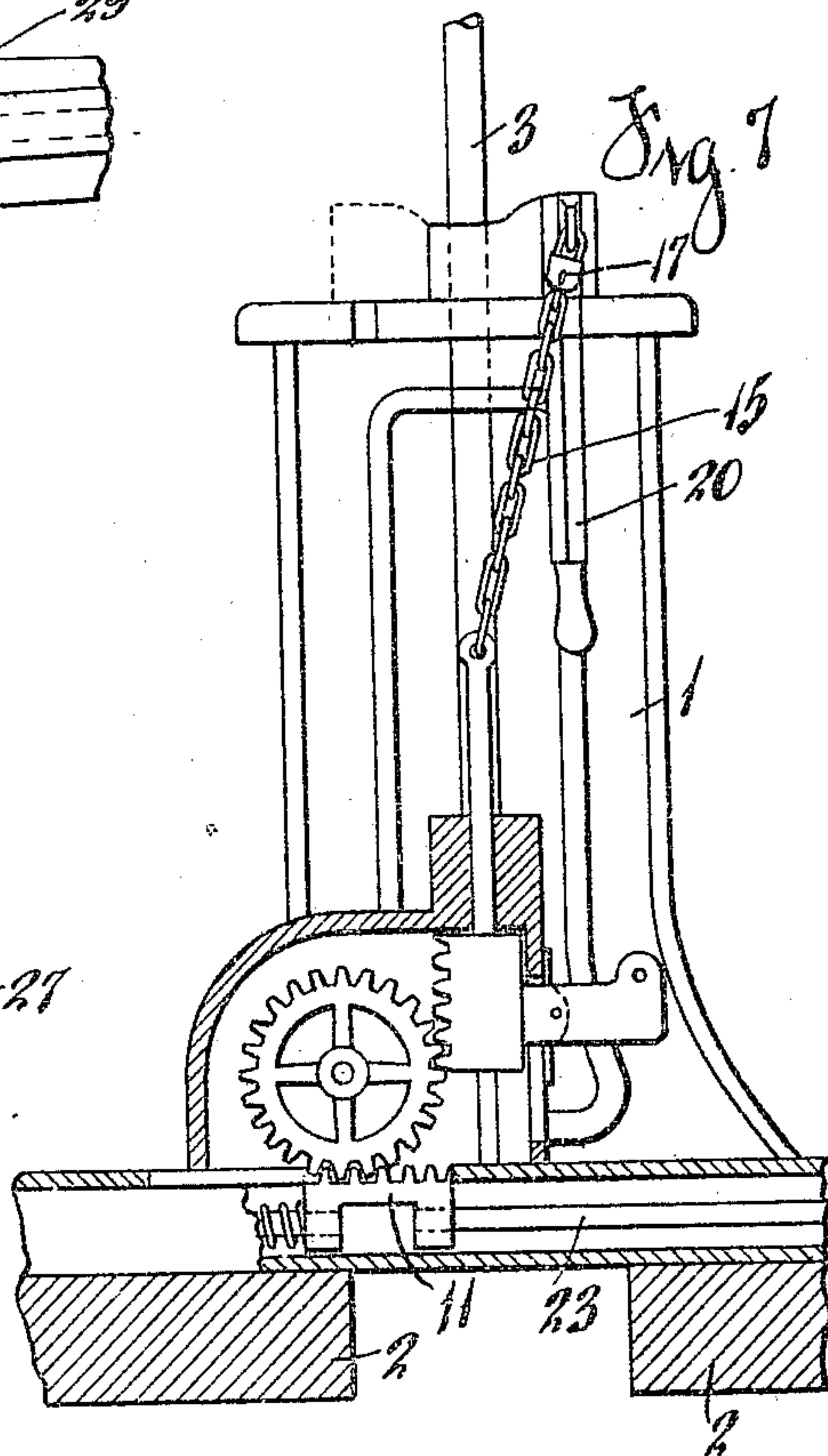
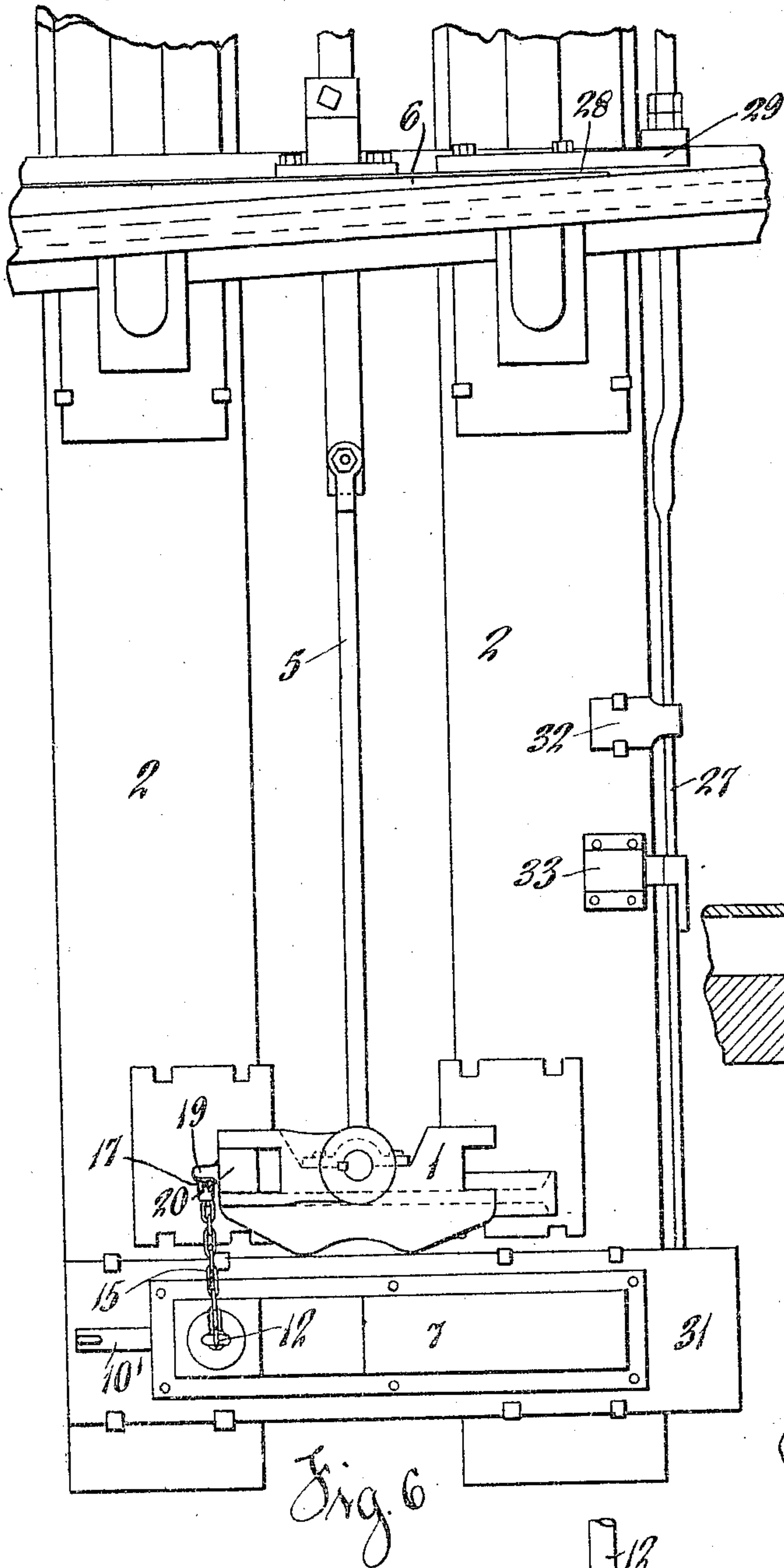
Inventor  
 Frank C. Anderson  
 By James H. Ramsey  
 Attorney

F. C. ANDERSON.  
 SWITCH SAFETY MECHANISM.  
 APPLICATION FILED JAN. 19, 1910.

959,691.

Patented May 31, 1910.

2 SHEETS—SHEET 2.



Witnesses  
 Oliver Harmon  
 Florence Hammel

Inventor  
 Frank C. Anderson  
 By James N. Causey  
 Attorney



# UNITED STATES PATENT OFFICE.

FRANK C. ANDERSON, OF CINCINNATI, OHIO, ASSIGNOR TO THE AMERICAN VALVE & METER COMPANY, OF CINCINNATI, OHIO, A CORPORATION OF OHIO.

## SWITCH SAFETY MECHANISM.

959,691.

Specification of Letters Patent.

Patented May 31, 1910.

Application filed January 19, 1910. Serial No. 538,875.

*To all whom it may concern:*

Be it known that I, FRANK C. ANDERSON, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Switch Safety Mechanism, of which the following is a specification.

My invention relates to means for insuring safety in the use of railroad switches, and more particularly to means for controlling the use of a pad lock for locking a switch stand whereby the switch stand cannot be locked unless the interlocking plunger is engaged in locked position with the interlocking bar.

I have heretofore constructed switch safety mechanism to be used in connection with switch interlocking mechanism to control the locking of a switch stand which required the use of a specially constructed switch stand, as shown by my Patents Nos. 862,044, 839,089, 913,185, and No. 946,952, but none of these switch safety devices are interchangeable or adapted to be used in connection with any of the various styles of switch stands upon the market except those specially designed to be used therewith.

The object of my present invention is to provide switch safety mechanism for engaging, operating and controlling an interlocking plunger adapted to engage an interlocking bar connected to the point rails of a switch, and for engaging and controlling the use of a pad lock for locking the switch stand, whereby the switch stand cannot be locked unless the switch is in proper position for traffic and said interlocking plunger is engaged in locked position with the interlocking bar, my invention being adapted for use in connection with various styles of switch stands of the high or skeleton type now upon the market, no special construction of switch stand being required for use in connection therewith.

My invention consists in means to operate an interlocking plunger and means to control the use of a pad lock for locking a switch stand.

My invention also consists in the parts and combination and arrangement of parts as herein set forth and claimed.

In the drawings which serve to illustrate preferred constructions of my invention and its application and use: Figure 1 is a front

elevation of a switch stand showing my invention partly in vertical section adjacent thereto. Fig. 2 is a view partly in vertical section showing a modification of my invention in which the mechanism is provided with double operating racks and connecting means for the pad lock. Fig. 3 is a view partly in vertical section showing a modification of my invention in which the plunger mechanism operates through one head block and the connecting rod for pad lock is placed central relative to the head blocks and switch stand. Fig. 4 is a top view of the operating rack with foot treadle or trip. Fig. 5 is a front elevation of a pad lock in general use on railroads for locking switch stands. Fig. 6 is a plan view of a switch stand and switch equipped with my invention. Fig. 7 is a view partly in vertical section showing a switch stand having a handle which moves 90° equipped with my invention. Fig. 8 is a plan view of the plate shown in Fig. 7. Fig. 9 is a broken view of a switch stand showing the pad lock engaging the handle near its lower or free end. Fig. 10 is an end view of the housing with the elongated slot through which the foot trip of the operating rack is adapted to extend and limit the movement of the plunger operating mechanism.

In illustrating the construction and use of my invention, I show a switch stand 1 mounted on railroad head blocks 2. The switch stand is provided with the usual vertical operating shaft 3, and has a target 4 mounted thereon. An operating rod 5 connects the operating shaft 3 with the point rails 6.

Mounted in a housing 7, alongside of the switch stand 1, are gear wheels 8 and 9 for engaging the operating rack 10 and the plunger rack 11, respectively. The operating rack 10 is provided with a connecting rod 12 slidably mounted in a boss or guide 13 on the housing 7. The top of the connecting rod 12 is provided with a hole 14 to which is attached one end of a chain 15. The other end of the chain 15 is attached to the eye 16 of a pad lock 17. The operating rack 10 is also provided with a foot trip 10' having a hole therein to which the chain 15 may be directly attached, if desired, thus dispensing with the use of the connecting rod 12 for that purpose.

The hasp of the pad lock 17 is adapted to



enter the opening 18 in the lug 19 on the handle 20. The handle 20 is pivoted at 21 on the fulcrum head 22, said fulcrum head being pinned and keyed to the operating shaft 3.

The plate 31 is secured to the head blocks 2 and supports upper and lower housings 7 and 24, respectively, attached to said plate. The plunger rack 11 is slidably mounted within the lower housing 24 and has attached thereto the interlocking plunger 23 and plunger guide 25. Surrounding the plunger guide 25 is a spring 26 which automatically forces the operating rack 10 to its uppermost position and the interlocking plunger in locked position with the interlocking bar 27 when the switch is properly closed. Thus, the switch safety mechanism acts automatically in locking the switch if the point rails of the switch are properly closed. It also serves to hold the plunger in locked position if the switch stand and plunger operating mechanism should be destroyed under traffic.

The interlocking bar 27 of the usual construction is connected to the switch point 28 by means of a connecting member 29 and is supported in a locking guide 30 secured to the plate 31 of the switch safety mechanism. The interlocking bar 27 also passes through guide 32 secured to the head block 2. A distant signaling device 33 can be attached to the interlocking bar 27 to operate in conjunction therewith, but this forms no part of the present invention. The interlocking bar 27 is also provided near its outer end with an opening 30' to engage the interlocking plunger 23 when the switch is in closed position. If it is desired at any time to interlock the switch both ways, which would be the case at the end of a double track, the interlocking bar would be provided with two openings instead of the one opening 30' to engage the interlocking plunger 23.

When it is desired to open the switch the pad lock 17 must be removed from the operating handle 20, permitting the foot trip 10' to be moved with the foot to its lowermost position, thus withdrawing the interlocking plunger 23 from the interlocking bar 27 to permit the switch to be thrown by the use of the switch stand 1. It will be apparent that the interlocking plunger 23 cannot be operated unless the pad lock 17 is disengaged from the operating handle 20 of the switch stand 1, thus making it impossible to tamper with or disengage the interlocking mechanism when the switch stand is engaged with the pad lock in locked position because the connection between the pad lock and the connecting rod 12 is only long enough to permit the pad lock to engage and lock the switch stand when the switch is in closed position.

If it is desired to close and lock the switch,

the switch stand is thrown in the usual manner, but, if the switch should be disconnected from the stand or if there should be an obstruction between the point rails and main or stock rails, the operator could not use the pad lock for it would be out of position to engage the stand, thus requiring the operator to remove the cause which prevents the locking of the switch in closed position.

The housing 7 is provided with an elongated vertical slot 35 within which the foot trip 10' operates, and it is preferably covered by means of a plate 34 attached to the foot trip 10' to close said slot and protect the interior mechanism. Said slot is of proper length to control the movement of the plunger in either direction, thus avoiding any possibility of the plunger becoming inoperative.

I preferably provide the operating rack 10 with vertical grooves 37 to engage vertical ribs 36 on the interior of the housing 7 for the purpose of guiding and holding said operating rack in operative engagement with the gear wheel 8. Thus, the operating rack 10 is always held in its proper position and is free to slide up and down in the housing.

The construction of my safety mechanism, as illustrated in Fig. 1, in which the stand is adapted to throw 180°, permits of the reversal of the position of the switch safety mechanism with relation to the switch stand and interlocking mechanism to allow the locking of the handle 20 upon either side of the switch stand when necessary. This is accomplished by providing two gears 8 and 9, either of which is adapted to mesh with the plunger rack 11 and operate the plunger, making either right or left mechanism to engage the pad lock with the rod 12 on either side of the stand. The operating handle of the switch stand is shown on the side of the stand opposite to the interlocking bar and the rod 12 in direct line to engage the pad lock of the stand. To reverse the safety mechanism simply detach the housing 7 and reverse its position so that the gear wheel 8 will mesh with the plunger rack 11. It will thus be seen that this construction makes a positively right or left mechanism to engage the pad lock, regardless of the position of either the operating handle or interlocking bar.

In Fig. 2 I show a modification adapted to be used in connection with a switch stand adapted to throw 180° for the purpose of controlling a pad lock on either side of the switch stand to lock the switch stand in either position as may be desired. This construction is especially adapted for use in locking the switch at the end of a double track where stands are locked with switch in either position. It provides for a connecting rod and chain to limit and control



the use of a pad lock on each side of the stand. It is immaterial which head block contains the interlocking plunger because the downward movement of either operating rack will withdraw the interlocking plunger. It will be understood that the interlocking bar 27, when used with this construction, will require two openings to receive the interlocking plunger when the switch is thrown in either position. The housing 7<sup>a</sup> is made in halves, each half having ears 7<sup>b</sup> through which the two halves are bolted together, thus permitting the assembling of the gears and operating racks therein.

In Fig. 3 I show another modification of my invention in which the plunger mechanism operates through one head block and the connecting rod 12 for the pad lock is placed central relative to the head blocks and switch stand, permitting the use of the pad lock for locking on either side of a stand which has a handle adapted to move 90°. If it is desired to interlock both ways, it is only necessary to have the interlocking bar provided with an opening to receive the plunger when the switch is thrown in either position. The large gear 9' will withdraw the plunger from the interlocking mechanism when set in either position by having the rod 12 to operate in the center of the stand and it makes no difference which head block contains the plunger mechanism, thus making it reversible for engaging the interlocking bar on either side of the switch stand.

In Fig. 7 I show a construction in which one of the gear wheels of the switch safety mechanism is dispensed with and the pad lock is adapted to lock the handle of the switch stand in either position where the handle operates 90°. With this type of switch safety mechanism the housing containing the switch interlocking mechanism extends through both head blocks in order that the rod 12 will always operate in the center of the stand. With this construction I am also enabled to interlock the switch both ways by simply providing the interlocking bar with two openings to engage the interlocking plunger. With this construction the interlocking plunger may be mounted through either head block as may be required, thus providing for operating right or left interlocking mechanism. Thus, it is seen, that in Figs. 3 and 7 my invention is adapted to be used with types of switch stands having a throw of 90°, but the plunger mechanism shown in Fig. 3 requires two gears and operates through one head block, while the mechanism shown in Fig. 7 has only one gear and operates through both head blocks.

It will be apparent that my invention is capable of considerable modification in its

application and use without material departure from the scope and spirit thereof, as shown by the several modifications illustrated. It will also be apparent that it is applicable to use with various other styles of switch stands, as, for instance, it is adapted to lock a stand in which the handle is secured thereto near its free end, as shown in Fig. 9.

I claim:

1. In switch safety mechanism, a switch stand connected to the point rails of a switch, a pad lock for locking said switch stand, a flexible connection attached to said pad lock, an interlocking bar connected to said point rails, a plunger adapted to engage said interlocking bar, means to manually disengage the plunger from said interlocking bar and adapted to engage said flexible connection for said pad lock, and means to automatically throw said plunger into engagement with said interlocking bar and permit the use of said pad lock only when the switch is properly closed.

2. In switch safety mechanism having a switch stand and switch interlocking mechanism connected to the point rails of a switch, and a pad lock for locking said switch stand when the switch is properly closed, a gear adapted to engage the switch interlocking mechanism, an operating rack adapted to actuate said gear, and a connection between said rack and said pad lock to limit and control its use for locking said switch stand.

3. In switch safety mechanism having a switch stand and switch interlocking mechanism connected to the point rails of a switch, and a pad lock for locking said switch stand when the switch is properly closed, a gear adapted to engage the switch interlocking mechanism, an operating rack adapted to actuate said gear, a foot trip for said operating rack, and a connection between said operating rack and said pad lock to limit and control its use for locking said switch stand.

4. In switch safety mechanism having a switch stand and switch interlocking mechanism connected to the point rails of a switch, and a pad lock for locking said switch stand when the switch is properly closed, a gear adapted to engage the switch interlocking mechanism, an operating rack adapted to engage said gear, a connecting rod secured to said operating rack, and a chain connecting said connecting rod and pad lock, substantially as set forth.

5. In switch safety mechanism having a switch stand and switch interlocking mechanism connected to the point rails of a switch and a pad lock for locking said switch stand when the switch is properly closed, a gear adapted to engage the switch interlocking mechanism, an operating rack adapted



to actuate said gear, a foot trip on said operating rack, and a housing for said gear and operating rack provided with an elongated slot adapted to limit the movement of said trip whereby movement of the interlocking plunger is limited, substantially as set forth.

6. In switch safety mechanism having a switch stand and switch interlocking mechanism connected to the point rails of a switch and a pad lock for said switch stand, reversible means for engaging said switch interlocking mechanism, and means whereby the pad lock is adapted to engage the operating handle of the switch stand to lock the switch stand on either side thereof.

7. In switch safety mechanism having a switch stand and switch interlocking mechanism connected to the point rails of a switch and a pad lock for said switch stand, means to operate said interlocking mechanism, whereby the operating rack can be placed on either side of a switch stand to operate the interlocking mechanism and automatically permit the use of said pad lock for locking the handle of the switch stand on either side thereof only when the switch is properly closed.

8. In switch safety mechanism having a

switch stand and switch interlocking mechanism connected to the point rails of a switch and a pad lock for locking said switch stand when the switch is properly closed, means adapted to operate said switch interlocking mechanism, a vertical rod engaging said means, and a flexible connection between said vertical rod and said pad lock to automatically permit the engagement of the pad lock with the switch stand only when the switch is properly closed.

9. In switch safety mechanism, a switch stand connected to the point rails of a switch, a pad lock for locking said switch stand, switch interlocking mechanism adapted to rigidly hold the switch only when properly closed, means for connecting said pad lock to said switch interlocking mechanism, means for manually releasing said switch from said switch interlocking mechanism, and means for automatically interlocking said switch and permitting the use of said pad lock only when the switch is properly closed.

FRANK C. ANDERSON.

Witnesses:

JAMES N. RAMSEY,  
FLORENCE HAMMEL.