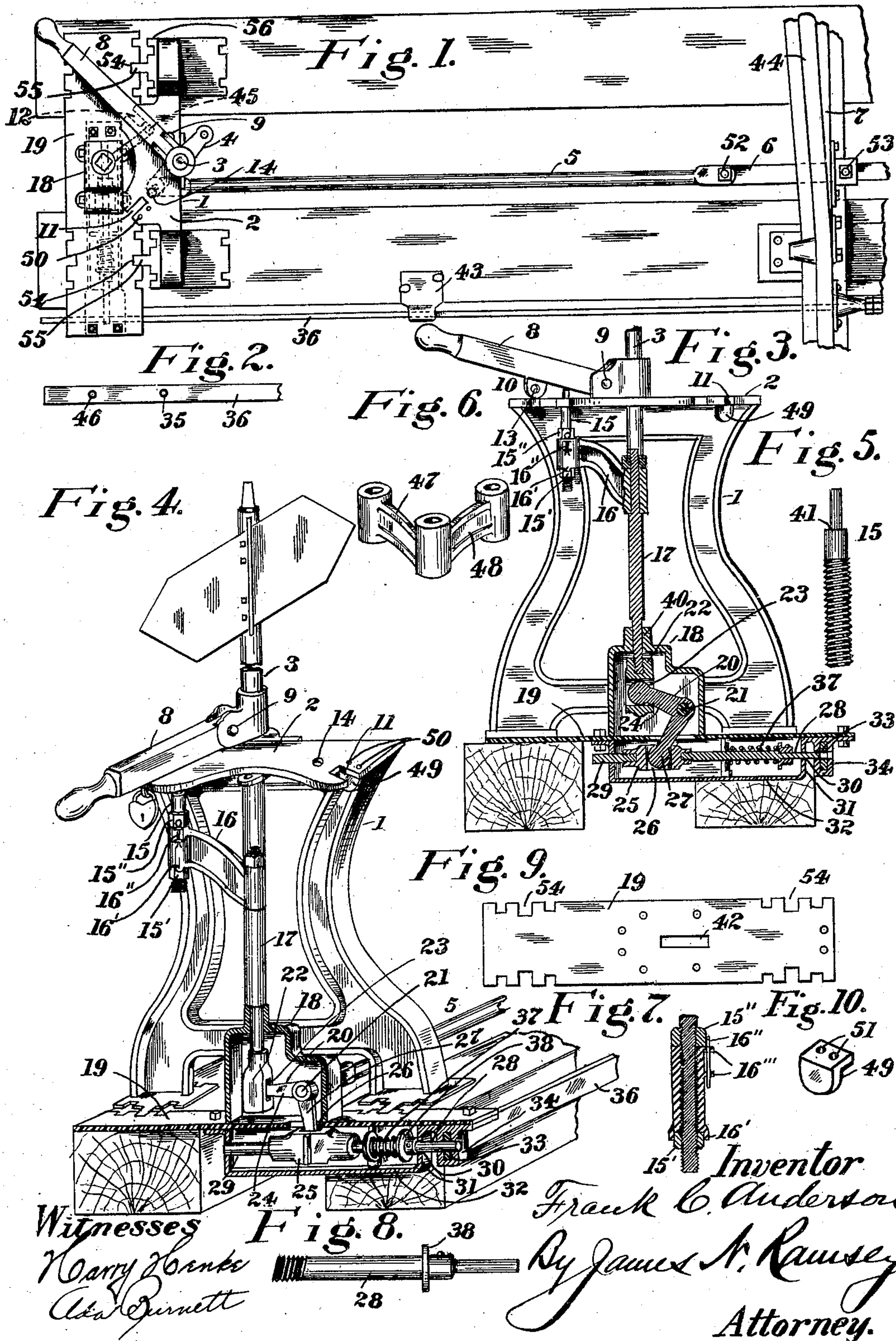


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F. C. ANDERSON.
SWITCH INTERLOCKING MECHANISM
APPLICATION FILED NOV. 14, 1906.



UNITED STATES PATENT OFFICE.

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SWITCH-INTERLOCKING MECHANISM.

No. 862,044.

Specification of Letters Patent.

Patented July 30, 1907.

Application filed November 14, 1906. Serial No. 343,364.

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-Interlocking Mechanism, of which the following is a specification.

My invention relates to means for insuring safety in the use of railroad switches, the object being to render it impossible to lock a switch until the point rail has been brought against the stock rail and to automatically interlock the point rail of a switch in such a way that if the operating mechanism of the switch is destroyed under traffic the switch will remain in locked position.

My invention consists in automatic interlocking mechanism by gravity and spring pressure in combination with a switch stand, and in the parts and combination and arrangement of parts as herein set forth and claimed.

In the drawings which serve to illustrate my invention: Figure 1 is a plan view of my automatic interlocking mechanism connected to a switch stand and to a point rail in locked position. Fig. 2 is a side view of one end of the interlocking bar. Fig. 3 is a side elevation of a switch stand with the interlocking mechanism partly in section showing the device in unlocked position. Fig. 4 is a perspective view of a switch stand, showing my interlocking mechanism connected thereto, in locked position. Fig. 5 is a side view of the vertical plunger. Fig. 6 is a perspective view of a modification showing double plunger arms. Fig. 7 is a longitudinal section through the vertical plunger and hub of the arm which supports it, showing the same secured together by lock nuts. Fig. 8 is a perspective view of the horizontal plunger. Fig. 9 is a top view of the supporting plate for the interlocking mechanism. Fig. 10 is a perspective view of the shield.

I prefer to construct my automatic interlocking mechanism for switches substantially as follows:

A switch stand 1 is provided with top plate 2 and has vertical shaft 3 which is connected by means of crank 4 and bars 5 and 6 to point rail 7 of the switch. The shaft 3 is rotated to throw the switch by means of handle 8 which is pivoted to collar 9 and has lug 10 adapted to engage within the slots 11 and 12 respectively to hold the switch open and closed respectively. The lug 10 has a hole 13 to engage a pad-lock to secure it in the desired position.

Contiguous to the slot 11 is an opening 14 through which the vertical plunger 15 may extend upwardly and engage the handle 8. This plunger 15 is supported by arm 16 to which it is adjustably connected, the arm

16 being rigidly supported on the upper end of connecting rod 17. The vertical plunger 15 is secured in adjusted position in the hub of arm 16 by means of nut 15' engaging lug 16' and nut 15'' engaging cotter 16'' supported by lugs 16'''.

A housing 18 of suitable form is mounted upon supporting plate 19 and a bell crank 20 is journaled horizontally therein on the pin 21. A coupling 22 is rigidly secured on the lower end of connecting rod 17 and provided with slot 23 which receives arm 24 of bell crank 20, said arm being loosely mounted therein. A coupling 25 having slot 26 adapted to receive arm 27 of bell crank 20 which is loosely mounted therein is rigidly connected to horizontal plunger 28 and guide 29. The horizontal plunger extends through an opening 30 in the end wall 31 of housing 32 and is adapted to enter opening 33 in extension 34 and opening 35 in interlocking bar 36. A spring 37 is mounted upon horizontal plunger 28 and engages collar 38 on said plunger at one end and washer 39 which bears against flanges within said housing 32 at the other end to exert pressure upon said horizontal plunger whereby said plunger is operated automatically to engage interlocking bar 36 when opening 35 therein is opposite the end of said plunger. Guide 29 serves to hold horizontal plunger 28 in line with the openings in the end of housing 32 and extension 34 and it also maintains a proper relation between coupling 25 and arm 27 of the bell crank 20.

Connecting rod 17 has a sliding bearing 40 in the top of housing 18 and horizontal plunger 28 has a similar sliding bearing in opening 30 in the end wall 31 of housing 32. The movement of the mechanism is limited in one direction by the shoulder 41 on the vertical plunger 15 engaging the lower side of the top plate 2 and in the other direction by the collar 38 on horizontal plunger 28 engaging the end wall 31 of housing 32.

Supporting plate 19 is provided with a slot 42 through which arm 27 of bell crank 20 extends into engagement with coupling 25.

Interlocking bar 36 is slidably mounted in extension 34 and brace 43 and suitably connected to point rail 7. This interlocking bar 36 has opening 35 at such point and of such shape that horizontal plunger 28 can enter it only when point rail 7 has been drawn closely against stock rail 44.

Since it is necessary for horizontal plunger 28 to enter opening 35 before handle 8 can be locked down as shown in Fig. 4 it is obviously impossible to lock the switch stand until point rail 7 has been brought closely against stock rail 44 thus effectually closing the switch.

In opening the switch the operator releases handle 8

and raises it as shown in Fig. 3, permitting the interlocking mechanism to be operated to withdraw plunger 28 from engagement with interlocking bar 36.

In order to allow my invention to be used in connection with the switch stand in either right or left position a second opening 45 is provided contiguous to the slot 12 in the top plate 2. The arm 16 may be swung around on the connecting rod 17 so that the vertical plunger 15 may enter the opening 45.

10 The end of the interlocking bar that connects with the point rail is provided with a suitable adjustment to permit the opening 35 to be adjusted to engage the plunger in locked position.

Where it is desirable that the switch may be interlocked in either open or closed position as is the case at the end of a double track double arms 47 and 48 may be used, each of which would carry a plunger like plunger 15 extending into both openings 14 and 45. When the above modification is used the openings 35 and 46 in the interlocking bar 36 are placed a distance apart equal to the throw of the switch thus allowing the horizontal plunger 28 to enter one of them when the switch is in either open or closed position. In order to prevent the locking of the switch in wrong position shield 49 is secured adjacent to one of the slots 11 and 12 by means of bolts passing through holes 50 in top plate 2 and holes 51 in shield 49 closing hole 13 in lug 10 of handle 8 to prevent inserting a padlock or other means. In that case the interlocking bar 36 has but one opening 35 to engage the plunger 28 to secure the switch in closed position.

My invention is equally valuable for insuring the proper closing of the switch whether the danger consists in an obstruction between point rail 7 and stock rail 44 or whether it be a disconnection, such for instance as the falling out or intentional removal of bolts 52 or 53 of the bars 5 and 6. In either case the interlocking bar would not be moved into a position allowing the plunger 28 to enter the opening 35 and permit the operator to lock the switch, thus informing him at once that the switch was out of order.

Supporting plate 19 is provided with notches 54 adapted to receive lugs 55 on the base 56 of the switch stand to serve as gages in order that the interlocking mechanism may be placed and held in correct position with relation to the switch stand so that it may be operated with the stand either right or left when placed in service.

An important feature of my invention consists in the construction and mounting of the switch stand and interlocking mechanism substantially independent of each other in order to protect the switch from any possible chance of coming open accidentally under traffic if the switch stand or interlocking mechanism above the plate should in any way be knocked down destroyed and disconnected from the switch under traffic.

My interlocking mechanism is automatic by gravity and spring pressure. The weight of the bell crank, coupling, connecting rod, arm and vertical plunger forms an automatic interlock by gravity and the horizontal plunger being held under spring pressure in connection with the gravity lock makes it impossible for said plunger to release the interlocking bar if the switch stand and operating mechanism of the inter-

lock above the supporting plate should be destroyed under traffic or otherwise.

I claim:

1. In switch interlocking mechanism, an interlocking bar connected to the point rail of a switch and having an opening in said bar, a horizontal plunger adapted to enter said opening, a bell crank adapted to engage said plunger, a connecting rod adapted to engage said bell crank, an arm on said connecting rod, a vertical plunger on said arm, an operating handle adapted to engage said vertical plunger and a spring adapted to automatically throw said horizontal plunger into engagement with said interlocking bar.

2. In switch interlocking mechanism, an interlocking bar, a horizontal plunger adapted to engage and hold said interlocking bar from longitudinal movement, a coupling adapted to secure said horizontal plunger and having a slot therein, a guide rigidly secured to said coupling, a bell crank having one arm adapted to engage in the slot of said coupling, a connecting rod, a coupling having a slot therein and adapted to receive one arm of said bell crank, an arm on said connecting rod, a vertical plunger, a handle adapted to engage said vertical plunger and a spring adapted to automatically throw said horizontal plunger into locked position.

3. In switch interlocking mechanism, an interlocking bar, a vertical plunger, a horizontal plunger, means connecting said plungers whereby they are adapted to move in unison and a spring adapted to engage said horizontal plunger to automatically throw it into engagement with the interlocking bar and hold said interlocking bar and plunger from longitudinal movement.

4. In switch interlocking mechanism, an interlocking bar, a horizontal plunger adapted to engage said interlocking bar, a collar on said plunger, a spring adapted to bear against said collar, a housing, lugs on said housing adapted to form a bearing for said spring, a coupling fixed to said plunger, a guide fixed to said coupling, a bell crank having an arm adapted to engage within a slot in said coupling, a connecting rod, a coupling fixed thereon and having a slot adapted to receive one arm of said bell crank, a supporting arm on said connecting rod, a vertical plunger and an operating handle adapted to engage said vertical plunger.

5. In switch interlocking mechanism, an interlocking bar, a plunger adapted to engage and hold said interlocking bar from endwise movement, a spring and gravity mechanism connected to said plunger whereby said plunger is automatically thrown into engagement with said interlocking bar and means to lock said plunger in position to prevent its disengagement from the interlocking bar.

6. In switch interlocking mechanism, an interlocking bar, a horizontal plunger, a slotted coupling connected to said plunger and to a suitable guide, a connecting rod, a slotted coupling fixed thereon, a bell crank having its arms engaging the slots of said couplings respectively, a supporting arm on said connecting rod, a vertical plunger, and a handle adapted to engage and hold said vertical plunger in locked position.

7. In switch interlocking mechanism, a supporting plate, a housing above and below said plate, said plate having a slot therethrough, a horizontal plunger, coupling and guide in one of said housings, a spring adapted to automatically actuate said plunger, a vertical plunger adapted to engage an operating handle and a bell crank adapted to draw said vertical plunger downwardly as the gravity of the mechanism and spring pressure force the horizontal plunger into engagement with the interlocking bar to hold it from longitudinal movement.

8. In switch interlocking mechanism, a supporting plate having a slot, means for securing said plate in fixed position, notches upon opposite sides of said plate and lugs upon the base of switch stand adapted to register with said notches to insure the relative operative positions of the interlocking mechanism and switch stand.

9. In switch interlocking mechanism, an interlocking bar, a horizontal plunger adapted to engage and hold said interlocking bar in fixed position, a housing adapted to support said plunger, a coupling fixed to said plunger, a guide fixed to said coupling and supported in said housing, a connecting rod, a coupling fixed thereon, a bell crank

5 adapted to engage within the slot in each coupling, an arm upon said connecting rod, a vertical plunger supported by said arm and an operating handle adapted to engage said vertical plunger and hold said horizontal plunger in said interlocking bar.

10 10. In switch interlocking mechanism, an interlocking bar, a plunger adapted to engage said bar, a vertical plunger, mechanism adapted to connect said plungers whereby they may be operated in unison, means for adjusting said vertical plunger and means for holding said vertical plunger in adjusted position.

11. In switch interlocking mechanism, an interlocking bar, a horizontal plunger, a vertical plunger, means connecting said plungers and an arm having lugs adapted to engage and hold a nut from turning and having lugs 15 adapted to receive a spring cotter to engage a nut and hold it from turning.

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Witnesses:

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