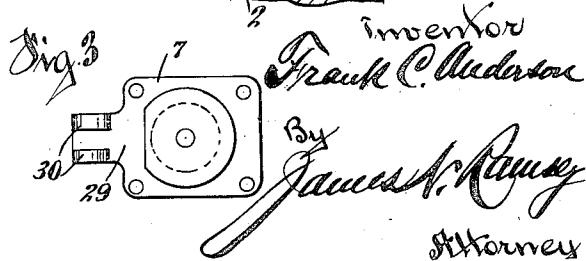


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UNITED STATES PATENT OFFICE.

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AUTOMATIC SAFETY SWITCH-LOCK.

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Specification of Letters Patent.

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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 Automatic Safety Switch-Locks, of which the following is a specification.

My invention relates to means to be used in connection with a switch stand for automatically locking the switch points of a railway independently of the switch stand.

The objects of my invention are to provide simple, economical, convenient and inexpensive means for automatically locking railway switch points in closed position when operated by a switch stand of the weighted ground lever automatic type, and to prevent the locking of said switch stand unless the switch is properly closed, as well as to provide easy and convenient means to unlock the same to open the switch; to provide such a device for automatically locking the switch and which will always hold the switch points in locked position even though the switch stand should become disconnected, damaged or destroyed by accident under traffic; to provide means in connection with certain forms of switch stands to insure the proper closing of the switch points against the stock rails before the switch can be locked in closed position; and to provide such a device for automatically locking the switch points of a switch in locked position which can be readily applied, which interlocks with the interlocking bar and which has a dog adapted to lock said interlocking bar by resting thereon, gravity maintaining its engagement therewith.

My invention comprises the combination of a point rail, a recessed interlocking bar attached thereto, a slotted dog adapted to rest upon said interlocking bar and to engage the same by gravity, a lifting arm fastened at the top of said dog, a foot bearing trip adapted to engage said lifting arm and thereby operate said dog, and a pair of housings in which said dog is mounted and protected.

My invention consists more specifically in an interlocking bar having a recess therein, a dog adapted to rest therein and engage said recess by gravity, a plate through which said dog is adapted to operate, a housing mounted on the top of said plate and surrounding the stem of said dog, said stem

having a reduced portion to permit it to break under unusual strains, a spring adapted to force said latch downwardly to insure quicker engagement with said interlocking bar, a housing underneath said plate and surrounding the lower portion of said dog and interlocking bar, an angular lifting arm mounted on the top of said dog and outside of the upper housing, a pocket therein, a foot bearing trip lever pivotally mounted on the base of said upper housing and adapted to engage the angular lifting arm at one end, and at the other end adapted to engage the foot trip of the latch of the switch stand whereby the foot trip operates the dog and latch simultaneously to throw the latch out of the path of the operating lever and the dog out of engagement with the interlocking bar to permit the switch to be thrown to open position, as shown by dotted lines in Fig. 9, and whereby said latch is prevented from engaging the switch operating lever or from being locked until the switch is properly closed.

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

In the accompanying drawing, which serves to illustrate the construction, application and use of my invention: Figure 1 is an isometric view of an ordinary ground weighted lever switch stand of the automatic type showing my invention applied thereto, the switch points being held in closed position by means of the switch stand connecting rod and the interlocking bar of my automatic safety switch lock; Fig. 2 is a transverse vertical section taken through my safety locking device; Fig. 3 is a plan view of the upper housing on a smaller scale; Fig. 4 is an isometric view of the lower housing; Fig. 5 is an elevation view of the lifting arm; Fig. 6 is a plan view of the foot bearing trip lever; Fig. 7 is an isometric view of the dog; Fig. 8 is a fragmentary view of the interlocking bar showing the recess in same; and, Fig. 9 is a side elevation of an ordinary switch stand latch as shown in Fig. 1 with the throwing lever shown in cross-section.

Constructed as illustrated, 1 represents a switch stand of the ground weighted lever type suitably mounted upon head blocks or ties 2 and secured to the switch points 3 by means of a connecting rod 4. The operat-

ing lever 5 engages the latch 6' in the usual manner when the switch is in closed position.

My automatic safety switch lock which is used in connection with the switch stand 1 is mounted in an upper housing 7 and a lower housing 8 each secured to a plate 9 which is rigidly mounted upon one of the head blocks 2. The lower housing 8 is provided with a transverse slot 10 which receives the interlocking bar 11, said interlocking bar 11 being suitably connected to the switch point rail 3 at 11'. The lower housing 8 is also provided with a vertical slot 12 which receives the dog 13, said dog having a slot 14 therethrough near its lower end to receive the interlocking bar 11. The interlocking bar 11 is provided with a recess 15 on its upper edge which is adapted to receive the upper wall 14' of the slot 14 in the dog 13, the dog 13 resting therein when the point rails of the switch are closed.

The dog 13 is preferably provided with flanges or beads 16 around its enlarged end 17 to give it strength at that point. The dog 13 extends upwardly through the opening 18 in the plate 9 and just above said opening 18 it is provided with a shoulder 19 from which a stem 20 extends upwardly. I preferably form a groove 36 in the stem 20 of the dog 13 just above the shoulder 19 and above the plate 9 so that should the portion of my automatic safety switch lock above said plate 9 become damaged or destroyed under traffic said stem will break at the reduced or weakened portion 36 and leave the lower portion of the dog undisturbed and in engagement with the recess 15 of the interlocking bar thereby eliminating the liability of the lower engaging portion 17 of the dog from coming out of engagement with the interlocking bar. The stem 20 of the dog 13 extends up through the top of the housing 7 where it is provided with another shoulder 21 upon which rests the angular lifting arm 22. The stem 20 is screw threaded and a nut 23 is provided to fasten said lifting arm to said dog. A flanged washer 24 is provided on the stem 20 of the dog 13 and is adapted to rest upon the shoulder 19 of the dog. Bearing against the top of said washer 24 I provide a compression spring 25 which bears against another washer 26 at the other end which is adapted to bear against the inner wall of the top of the housing 7 as shown in Fig. 2. It is the purpose of this spring to assist gravity in causing the enlarged end 17 of the dog to engage the interlocking bar 11 more quickly. The lifting arm 22 is preferably angular in shape having a downwardly extending side 27 in which is provided a pocket recess or opening 28.

The housing 7 is provided with an extension 29 at one side thereof and under the

downwardly extending portion 27 of the lifting arm and is provided with a pair of lugs 30 in which is pivotally mounted a foot bearing trip lever 31. The foot bearing trip lever 31 has an engaging extension 32 at one end which is adapted to enter the recess or pocket 28 in the lifting arm and is provided with a cap screw 33 which is adjusted to the proper position before the lever is placed in the lifting arm and which forms a convenient adjustment for the foot bearing trip lever to operate the dog. The foot bearing trip lever is provided with a foot treadle 34 at the other end thereof which extends equal distances on each side of the center line of said foot bearing trip lever in order that it may engage the tripping lever 35 of the latch 6 on either side to form a right and left hand interlocking mechanism, thereby rendering it reversible, and it may be provided with reinforcing ribs on the under side if desired.

When it is desired to operate the point rails of the switch, the operator places his foot upon the foot bearing trip lever 31 and presses downwardly until the latch 6 is thrown out of engagement with the switch stand lever 5 and the dog 13 is raised sufficiently to allow free movement of the interlocking bar therethrough and to disengage the dog from said recess 15 in the interlocking bar 11. The operating lever 5 of the switch stand is then manipulated to throw the switch to open position. In closing the switch the operating lever 5 of the switch stand is manipulated in the opposite direction, thereby closing the point rails and at the same time operating the interlocking bar 11. The recess 15 of the interlocking bar 11 will be automatically engaged by the dog 13 when the switch is properly closed.

It is apparent that my device is extremely simple and economical to construct and can readily be installed with switch stands which have no interlocking mechanism, at comparatively small expense and without the necessity of providing an entirely new switch stand interlocking mechanism especially designed for use in connection therewith. It is readily seen also that with my invention a switch stand cannot be locked with an obstruction between the main point rail and stock rail, nor when the switch stand becomes disconnected when closing the switch and that the switch will not open if the switch stand should become disconnected or damaged or destroyed by accident under traffic.

Modifications of my invention may be made without departing from its spirit or scope and I do not, therefore, wish to be confined to the exact details shown, but

What I claim as new and desire to secure by Letters Patent is:

1. An automatic safety switch lock com-

prising an interlocking bar, a slotted dog adapted to engage and lock said interlocking bar from endwise movement, a housing in which said dog is mounted to prevent said interlocking bar from movement, a lifting arm mounted on the stem of said dog, and a pivoted foot bearing trip lever adapted to operate said lifting arm at one end and to operate and control the keeper of a switch stand latch with its foot bearing portion at its other end.

2. In combination with a switch stand connected to a switch, an operating lever for said switch stand, a latch for said operating lever, an interlocking bar connected to said switch, a dog adapted to engage and lock said interlocking bar, a lifting arm mounted on said dog and having a pocket at its lower end, and a pivoted foot bearing trip lever adapted to engage said pocket at one end and engage said latch with its foot bearing portion at the other end whereby said dog and latch are operated simultaneously to permit the switch to be thrown to open position and whereby said latch and said dog are held out of locking position with said operating lever and interlocking bar until the switch is properly closed.

3. An automatic safety switch lock comprising an interlocking bar, a dog adapted to engage said interlocking bar and lock the same from movement, a plate through which said dog is adapted to operate, a housing above said plate surrounding said dog, a lifting arm mounted on said dog and a pivoted bearing trip lever adapted to operate said lifting arm.

4. An automatic safety switch lock comprising an interlocking bar, a dog adapted to engage and lock said interlocking bar and having a reduced portion between its ends for the purposes set forth, and means for operating said dog.

5. An automatic safety switch lock comprising an interlocking bar, a dog adapted to engage the top of said interlocking bar, a plate through which said dog operates, a housing above said plate and surrounding said dog, a housing below said plate and surrounding said dog and interlocking bar, a pivoted foot bearing trip lever, a lifting arm mounted on said dog above said housing on the top of said plate and having a downwardly extending portion adapted to be engaged and operated by said pivoted foot bearing trip lever.

6. An automatic safety switch lock comprising an interlocking bar having a slot in the top thereof, a dog adapted to rest in said slot and thereby lock said interlocking bar from movement, a plate through which said dog operates and placed above said interlocking bar, said dog being constructed smaller in diameter above said plate thereby

rendering it weaker from that point upwardly, a lifting arm mounted on the top of said dog, and a pivoted foot bearing trip lever adapted to operate said lifting arm.

7. An automatic safety switch lock comprising an interlocking bar, a dog adapted to engage the top side of said interlocking bar, a plate through which said dog operates, a housing on top of said plate and surrounding said dog, a spring in said housing tending to force said dog downwardly and thereby give quicker engagement with said interlocking bar, a lifting arm mounted on the dog outside of said housing above said plate, and a pivoted foot bearing trip lever adapted to operate said lifting arm.

8. In combination with a switch stand, a switch, point rails for said switch, a connecting rod connecting said point rails with said switch stand, an interlocking bar connected to the point rails and having a recess in the top thereof, an operating lever for said switch stand, a latch for said operating lever, a foot treadle for said latch, of an automatic safety switch lock comprising a dog adapted to rest in said recess, a plate through which said dog is adapted to operate, a housing on the top of said plate and surrounding said dog, a spring in said housing forcing said dog downwardly, said dog having a weak portion above said plate, a housing below said plate surrounding said dog and interlocking bar, an angular lifting arm mounted on the top of said dog outside of said housing above said plate, and a pivoted foot trip lever adapted to engage and operate said lifting arm by engagement at one end, and adapted to operate the said foot treadle of said latch at the other end thereof to release the operating lever of said switch stand and the dog simultaneously, substantially as and for the purposes set forth.

9. In combination with a switch stand, a switch, point rails for said switch, a connecting rod connecting said point rails with said switch stand, an operating lever and a latch for said switch stand, an interlocking bar connected to the point rails of said switch and having a recess in its upper edge, of an automatic safety switch lock comprising a dog adapted to rest in said recess, a plate through which said dog is adapted to operate, a housing on the top of said plate and surrounding said dog, a spring in said housing forcing said dog downwardly, a housing below said plate surrounding said dog and said interlocking bar, an angular lifting arm mounted on the stem of said dog outside of said housing above said plate, and a pivoted foot trip lever adapted to engage and operate said lifting arm at one end and adapted to operate the foot treadle of said latch at the other end thereof thereby releasing the operating lever of said

switch stand and the dog simultaneously, and holding the latch out of engagement with the switch stand lever until the switch is properly closed, substantially as and for the purposes set forth.

10. A safety switch lock comprising an interlocking bar, a dog adapted to engage the top of said interlocking bar, a plate through which said dog operates, a housing 10 above said plate and surrounding said dog, a housing below said plate and surrounding said dog, a lifting arm mounted on the stem of said dog above said housing on the top of said plate, said stem having a reduced portion above the plate whereby when 15 an unusual strain is put upon said dog the stem will break at said reduced portion and leave the lower portion of the dog within the recess of the interlocking bar and prevent the releasing of the interlocking bar. 20

11. An automatic safety switch lock comprising an interlocking bar, a dog adapted

to engage and lock said interlocking bar, a lifting arm mounted on said dog, a pivoted foot bearing trip lever adapted to operate 25 said lifting arm and dog, and adjustable means between the foot bearing trip lever and lifting arm for the purpose of adjusting the movement of said dog.

12. An automatic safety switch lock comprising an interlocking bar, a dog adapted to engage and lock said interlocking bar, a lifting arm mounted on said dog, a pivoted foot bearing trip lever adapted to operate 30 said lifting arm and dog and a cap screw mounted in one end of said foot bearing trip lever to engage the lifting arm for the purpose of regulating the movement of said dog, substantially as set forth and for the 35 purposes specified.

FRANK C. ANDERSON.

Witnesses:

JAMES N. RAMSEY,
GOLDIE GORDON.