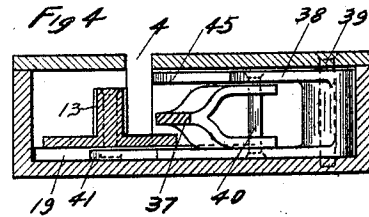
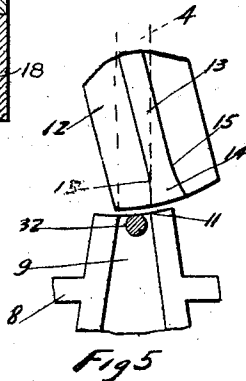
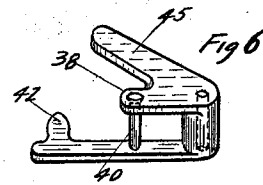
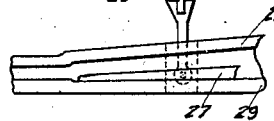
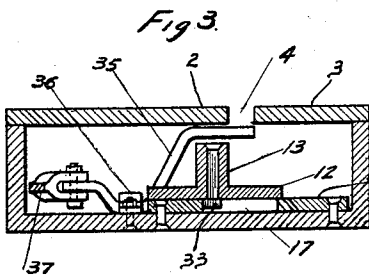
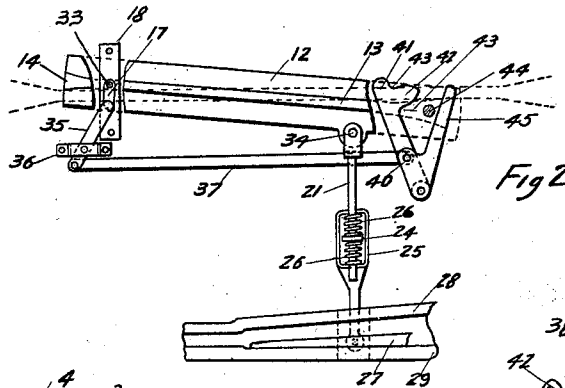
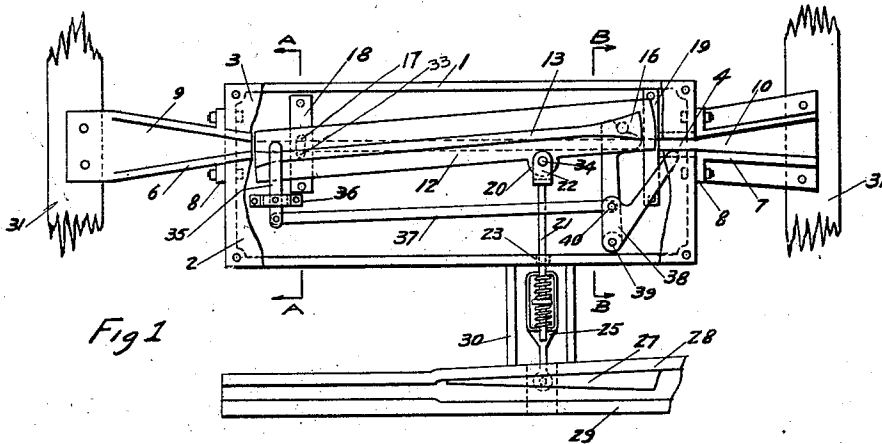


R. D. JOHNSTON, JR.
AUTOMATIC SWITCH MECHANISM.
APPLICATION FILED APR. 20, 1911.

1,000,917.

Patented Aug. 15, 1911.



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AUTOMATIC SWITCH MECHANISM.

1,000,917.

Specification of Letters Patent. Patented Aug. 15, 1911.

Application filed April 20, 1911. Serial No. 622,193.

To all whom it may concern:

Be it known that I, ROBERT D. JOHNSTON, Jr., citizen of the United States, residing at Birmingham, in the county of Jefferson and State of Alabama, have invented certain new and useful Improvements in Automatic Switch Mechanism, of which the following is a specification.

My invention relates to improvements in the track equipment of car actuated switch mechanisms, of the type which comprise an elongated shifting lever which is connected to the switch point and disposed in a slotted box, the lever being so held in the box that a car trip each time it passes through the slot alternately sets it in reverse diagonal positions therein.

The object of my invention primarily is to perfect the locking mechanism for the shifting lever and switch point, adapting it not only to lock the switch point but also to set and lock the shifting lever in either of its diagonal operating positions.

A further object is to utilize the car trip to first reverse the operating position of the lever and then engage and force a setting and locking member against the lever to adjust and lock it and thereby the switch point.

A further object is to reduce the number of working parts to a minimum to give the desired operation and also to reduce the shock of impact of the trip against the lever by giving the latter a peculiarly curved forward end.

I obtain these and other objects by my invention which in its preferred embodiment comprises the details of construction and arrangement of parts hereinafter more particularly described and claimed, reference being had to the accompanying drawings, in which:—

Figure 1 is a plan view of my track mechanism with the cover plates broken away, showing the switch shifting lever in one operating position. Fig. 2 is a detail view showing the shifting lever in its other operating position, the lever being broken away to show the device for both setting and locking the shifting lever in its open position assumed while the lever is being shifted. Figs. 3 and 4 are detail cross sectional views taken along the lines A—A and B—B of Fig. 1. Fig. 5 is a detail view showing the construction of the curved forward end of the shift-

ing lever. Fig. 6 is a detail view of the locking and setting member for the shifting lever and switch point.

Similar reference numerals refer to similar parts throughout the drawings.

In the illustrated embodiment of my invention I show the switch mechanism inclosed in a box 1 having two cover plates 2 and 3, which are suitably bolted to the top and leave between them a longitudinal slot 4 which extends in a straight line from end to end of the casing and is of uniform width. The end walls of the casing are slotted to receive castings 6 and 7 which have flanges 8 and are suitably bolted to the end walls of the casing, and which respectively have downwardly inclined converging guide slots 9 and 10 formed therein which converge to the width of and aline with the slot 4. The bottom walls of the guide surface 9 projects into the casing, as seen in Fig. 5, and its inner end is struck on a curve at 11. Within the casing 1 is an elongated shifting lever for throwing the switch point, which lever comprises a base plate 12 having a rib 13 attached to or formed integrally therewith and disposed along its longitudinal center line, the rib being symmetrical with respect to said center line and having its forward end 14 widened to give the curve surfaces 15 on each side thereof which merge into the straight side walls of the rib, which walls continue to the rear end and there spread slightly apart to form the rear wedge 16. The forward end of the plate and rib are struck on a curve to correspond with the curve 11 of the entrance guide slot 9 and also the rear end of the plate 12 is similarly curved to correspond to the curve of the adjacent end of the guide slot 10. Near its forward end the plate 12 has a pin which projects below the bottom thereof midway from its side edges, which pin is adapted to work in a curved slot 17 formed in a bearing plate 18 upon which the shifting lever slides and which is suitably bolted or connected to the bottom of the casing. The rear end of the lever rests on a similar bearing plate 19, also attached to the bottom of the box, which two plates support the shifting lever out of contact with the bottom of the box. At a point to the rear of the middle of the shifting lever the plate 12 is provided with a lug 20 to which the switch throw rod 21 is connected, the rod having

its bifurcated end 22 arranged to straddle the lug 20 and be pivotally connected thereto by a pin. This throw rod passes through a suitable opening 23 in the side wall of the box and carries on its outer end a fixed collar 24 which slides back and forth in a cage 25 being interposed between two coil springs 26 within the cage, which latter is connected to the underside of the switch point 27 which works between the rails 28 and 29. The cage 25 is disposed in a casing 30 leading from the side of the box 1 to the rail 28. The guides 9 and 10 are bolted at their ends to cross ties 31, the upper ends of these guides standing flush with the pavement with which the cover plates 2 and 3 are also flush. The guide 9, which directs the car trip 32 into the slot 4, flares more widely than the outlet guide 10.

In operation, as the trip member 32 rides down the guide 9 and enters the slot 4, it passes onto the portion 12 of the shifting lever which is on a level with the bottom of the guide 9, and strikes the central rib 13 on the curve 15 thereof. This curve is designed to avoid shock and to give a gradual application of lateral shifting motion to the rib and lever. When the lateral thrust is applied to the shifting lever in the position shown in Fig. 1, the pin 33 will bear against one end wall of the slot 17 and will swing about it as a fulcrum point while the rear portion of the lever is gradually shifted laterally, carrying with it the switch point 27 to throw the latter in the desired direction. The throwing movement of the point 27 is completed when the trip arrives opposite the lug 20, after which, in order to set the lever in reversed diagonal position for the next operation and swing its forward end to the position shown in Fig. 2, the rib 13 is slightly widened at 16 so that, as the trip pin rides past the wedge surface, it will rock the shifting lever about its intermediate axis or the pivot pin 34 which connects it to the throw rod 21, as a fulcrum, and swing its forward end 14 about said fulcrum to a position at the other end of slot 17, see Fig. 2, after which the trip rides up the surface 10 and the shifting operation is completed.

In order to lock the switch point in either of its shifted positions, and also to insure the shifting lever reaching its correct position with its forward end 14 on one or the other side of the slot and to hold it in that position against being moved by the jarring of the passing train or car, I provide the mechanism which will now be described.

Above the forward end of the shifting lever I provide a pivoted arm 35 which has its free end bent parallel with the top of the box and so arranged that it stands above the shifting lever and normally across the slot 4. The arm is bent down and under a

clip 36 to which it is pivotally connected and beyond which it is extended to pivotally connect with a rod 37. The clip 36 is suitably attached rigidly to the bottom of the casing 1. The rod 37 extends lengthwise of the casing passing above rod 21 and at its rear end is pivotally connected to the lock member 38. This lock member is pivoted to swing horizontally around a vertical pin 39 which passes down through the cover plate 2 and is screwed or fastened into the bottom of the box, as seen in Fig. 4. The member is provided with a thick end portion through which the opening for pin 39 passes and which carries a pin 40 to which the rod 37 is pivotally connected. This lock member 38 comprises a bottom member or lock arm 41 which extends under the plate 12 and is provided with a tapered locking projection 42 which is curved to provide sockets 43 on each side thereof. This projection, when moved rearwardly, is adapted to engage a portion of the shifting lever preferably a pin 44 fastened in the bottom of the shifting lever near its rear end, and force the pin into one or the other of the sockets 43. This rearward motion is imparted to the lock arm by the engagement of the trip member 32 with the angularly disposed top member or arm 45 to the said lock member 38. When the trip member strikes the arm 35 and swings it to the position shown in Fig. 2, lock member 38 will be pulled forward by the rod 37 which releases the projection 42 from the pin 44 and moves it out of the path of the pin, thereby unlocking the shifting lever and leaving it free for its operating movement. This forward movement of lock member 38 brings its arm 45 to a position across the slot 4. The locking mechanism remains in this position while the shifting lever is being moved to throw the switch and when that operation is completed and the switch point and shifting lever are ready to be locked in the position to which they have been respectively adjusted, this will be effected by the trip member striking the arm 45, which will cause the lock arm 41 to be positively thrown rearwardly, its tapering projection 42 engaging the pin 44 and forcing it into the proper socket 43 which insures the proper and exact position for the end 14 of the shifting lever. This movement also, through the rod 37, shifts the arm 35 back to the position across the slot as shown in Fig. 1.

As a preferred construction the forward fulcrum pin 43 and the rear locking pin 44 are preferably formed by the heads or rivets which have passed up through the plate 12 and rib 13, and which may accordingly be used to fasten the rib and plate together when the latter are made separately.

It will be noted that the end 22 of the

throw rod is sufficiently spaced from the rib 13 to permit the free passage by it of the trip 32. This trip is carried by the car or train and can be lowered in any suitable manner to engage in and ride down the guide 9 to operate in the manner described.

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

1. The combination with a car trip and a slotted guide therefor, of a lever mounted for bodily shifting movements beneath said guide, means to connect said lever at an intermediate point to a switch point, said lever being adapted to rock about said connection, means coöperating with the car trip to rock said lever to a diagonal position under the slot during the switch shifting movement, forward bearing points on each side of said slot against one or the other of which the forward end of the lever rests and about which it rocks when first engaged by said trip, a device also operable by the trip which engages the rear portion of the lever and coöperates with said switch point connection and forward bearing point to lock the latter against movement, said device having a tapering portion which when moved by the trip adjusts the lever before locking it, and means to unlock the lever for operation by the trip, substantially as described.

2. In a mechanism of the character described, the combination of a car trip; a slotted guide therefor; a bodily shifting lever normally disposed diagonally beneath the guide; means to connect said lever to a switch point; means to reverse the diagonal position of the lever across said slot after each operation thereof by said trip comprising a pivotal connection between the lever and the means connecting it to the switch point, an enlarged rear portion of the lever beyond said point of connection, and stop means on each side of the slot to arrest the swing of the forward end of the lever after it moves to diagonal position across the slot in either direction; locking means actuated by the trip to rock the lever about its pivotal connection into position for the next operation before locking it in position, said means being operable by the car trip after the switch shifting movement, and means operable by the car trip before the switch shifting movement to unlock said locking means, substantially as described.

3. A switch operating mechanism comprising in combination, a slotted guide for the car trip; a lever adapted to be moved bodily first on one side and then on the other of said slot, said lever being pivotally connected at an intermediate point to a connecting rod which in turn connects to a switch point, and stops for the forward end of the lever which serve as fulcrums about which the lever is moved by the trip to shift the

switch point, said lever having its rear end enlarged and adapted to coöperate with the car trip and rock the lever about its pivotal connection to the switch point causing it to assume reverse oblique positions under said slot, substantially as described.

4. A switch operating mechanism comprising, in combination, a slotted guide for the car trip, a lever adapted to be moved bodily by the trip first on one side and then on the other of said slot, said lever being pivotally connected at an intermediate point to a connecting rod which in turn connects to a switch point, stops for the forward end of the lever which serve as fulcrums about which the lever moves in shifting the point, an enlarged rear end to said lever which coöperates with the trip to rock the lever about its pivotal connection causing it to assume alternate reverse oblique positions across said slot, in combination with locking means adapted to engage the rear end of the lever in either of its operating positions and lock it against movement, and means to unlock said lever, substantially as described.

5. A switch mechanism comprising a casing having a slotted top, a symmetrical lever therein having its forward end enlarged with side walls that curve inwardly toward the longitudinal center line of the lever and its rear end enlarged with side walls that flare outwardly from said center line, a connecting rod pivoted to said lever near the point where the rear enlargement begins, a switch point to which said rod is attached, and stops on each side of the slot, one or the other of which engage the forward end of the lever and arrest it in position to present a curved side wall in predetermined relationship to said slot, substantially as described.

6. A switch mechanism comprising a casing having a slotted top, a symmetrical lever therein having its forward end enlarged with reversely curved side walls and outwardly flaring side walls at its rear end, a connecting rod pivoted to said lever at an intermediate point, a switch point to which said connecting rod is attached, stops on each side of said slot against one or the other of which the forward end of the lever bears with one of its curved end faces in predetermined relationship with the slot, in combination with a car trip which is adapted to traverse said slot and engage one or the other side walls of said lever, and means actuated by said trip to first unlock and after shifting to then relock said lever, substantially as described.

7. In a mechanism of the character described, a casing having a slotted top, means to guide a car trip into said slot, a lever therein comprising a rib centrally disposed on a base plate, said rib being symmetrical

and having its front and rear side walls divergent from a longitudinal center line, a connecting rod pivotally connected to said base plate at a point near the rear, a switch point connected to said rod, an unlocking lever pivotally mounted in the casing above the forward end of the lever, a relocking member pivotally mounted in the casing and adapted to project over the rear end of the lever, means to connect said levers so that as each is actuated by a car trip it swings the other in a reverse direction to a position to be engaged by the trip, a locking device operably connected to both levers and having a tapered point, and a pin at the rear end of the shifting lever which is adapted to engage on one or the other side of said tapered projection and to be adjusted and held against movement thereby to lock the lever, substantially as and for the purposes described.

8. In a switch operating mechanism, a guide for a car trip and track devices operable by said trip comprising a laterally adjustable lever adapted to be engaged first on one side and then on the other by said trip and shifted bodily, a switch operating rod pivotally connected to said lever at an intermediate point, means cooperating with the trip to rock the lever angularly about said connecting rod as a fulcrum to swing its forward end diagonally with respect to said guide, stops to limit the transverse movements of the forward end of the lever,

trip actuated means adapted to engage the rear end of the lever and adjust it, said latter means cooperating with a stop and said connecting rod to lock the lever and switch point, and means to unlock the lever, substantially as described.

9. In a switch operating mechanism, a guide for a car trip and track devices operable by said trip comprising a laterally adjustable lever adapted to be engaged first on one side and then on the other by said trip and shifted bodily, a switch operating rod pivotally connected to said lever at an intermediate point, means cooperating with the trip to rock the lever angularly about said connecting rod as a fulcrum to swing its forward end diagonally with respect to said guide, stops to limit the transverse movements of the forward end of the lever, a tapered locking device adapted to engage a pin at the rear end of the lever and rock it about its pivotal connection until its forward end engages one of said stops, said device cooperating with said stop and the connection to the switch point to lock the lever and point, and means operable by the trip to unlock said parts, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

ROBERT D. JOHNSTON, Jr.

Witnesses:

NOMIE WELSH,

R. D. JOHNSTON.