

July 11, 1933.

C. S. HADDLESAY
SWITCH OPERATING MEANS

1,917,837

Filed April 6, 1931

2 Sheets-Sheet 1

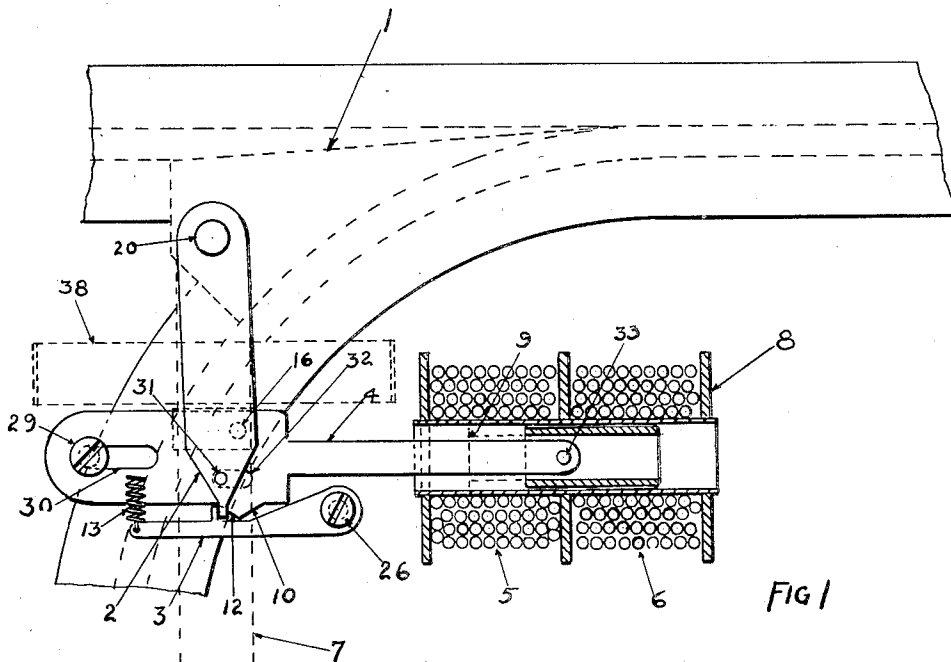


FIG 1

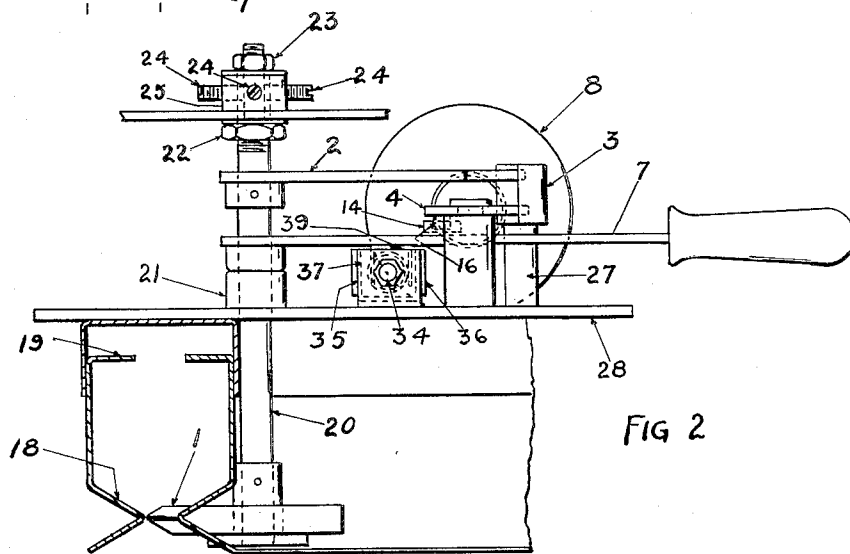


FIG 2

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2 Sheets-Sheet 2

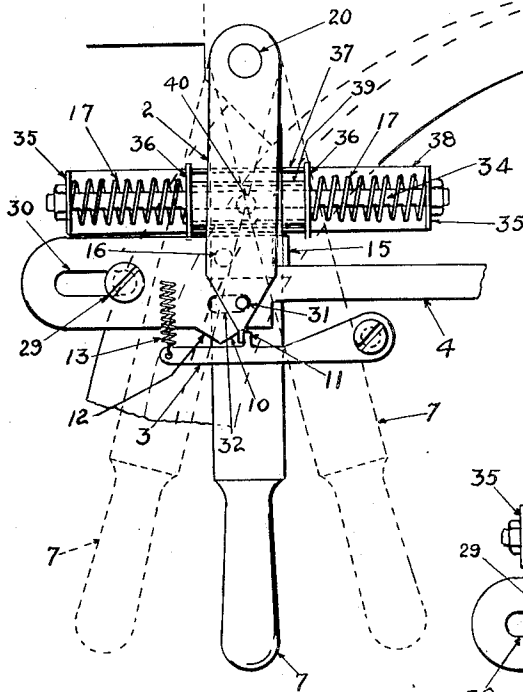


FIG 3

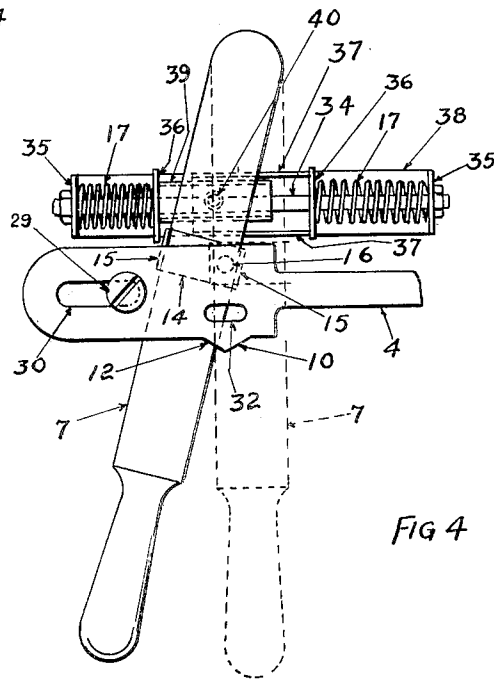


FIG 4

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UNITED STATES PATENT OFFICE

CHARLES S. HADDLESAY, OF ELMHURST, ILLINOIS

SWITCH OPERATING MEANS

Application filed April 6, 1931. Serial No. 527,918.

This invention relates to switch operating mechanism.

One of the objects of this invention is to provide a means for actuating track switches electrically and manually, the two controls being capable of conjoint or separate use.

A further object is to automatically lock the switch in both of its positions.

A further object is to provide a means for operating the switch manually when the source of power, electric or otherwise, fails.

Further objects will appear from the description and claims.

In the drawings,

Figure 1 is a plan view of the operating mechanism with the switch in position to direct the cars or trolleys into the side track;

Fig. 2 is an elevation, from the left in Fig. 1, showing the operating mechanism;

Fig. 3 is a bottom floor view of the operating mechanism with the switch thrown in straight-line position; and

Fig. 4 is a plan view of the hand operating mechanism with the handle thrown to one side.

Referring to the drawings in detail, these show a switch construction for an overhead, suspended load, monorail conveyor system comprising an oscillatable car-deflecting switch member 1, a rock arm 2 for operating said switch member 1, locking means 3 for locking the rock arm in two different positions to hold the switch member 1 in two different positions, a plunger 4 movable back and forth for operating said rock arm 2, said plunger having provisions for releasing said locking means from both locking positions (and having a lost-motion connection with said rock arm enabling the lock-releasing movement to be effected without moving the rock arm), a solenoid construction for operating said plunger 4 comprising a coil 5 for moving the plunger in one direction and another coil 6 for moving the plunger in the opposite direction, and a manually-operable lever 7 for operating said plunger to cause the operation of the rock arm having a lost-motion connection with respect to said plunger to enable the plunger to be actuated by the

solenoid without actuating the manually-operable lever 7.

Before describing in further detail the various parts of the apparatus, I will briefly outline the operation.

I will first describe the operation by means of the solenoid 8. The circuits for the two coils of the solenoid may be controlled in any suitable manner, one manner of control being disclosed in my co-pending application, Serial No. 526,962, filed April 1, 1931. Assuming that a car is approaching the switch from the right (Fig. 1) and that the armature 9 of the solenoid is in the dotted-line, left-hand position of Fig. 1 (in which case the car-deflecting switch member 1 would be set for the straight-away track), the right-hand switch-throwing coil 6 will be energized, causing the armature 9 to move from the dotted-line to the full-line position.

During the first part of this movement, the rock arm 2 will not be moved because of the lost-motion connection between the plunger 4 and rock arm. The latch or lock 3, however, will be moved to unlocking position by means of the sloping cam surface 10 engaging the projection 11 on the pivoted lock member. Soon after the lock 3 has been moved to an unlocking position, the lost motion between the plunger 4 and rock arm 2 will be taken up and thereafter a continued movement of the plunger will cause movement of the rock arm, thus throwing the car-deflecting switch member 1 to a position which will cause the car to move off along the branch track. This continued movement of the plunger 4 also permits the latch or lock member 3 to drop in behind the end of the rock arm 2, thus locking the rock arm and switch member in their positions.

After the car has passed the switch, the left-hand switch-restoring coil 5 may be energized (the right-hand coil having previously been deenergized). This causes the plunger member 4 to move to the left, restoring the parts to their original position. During the first part of the left-hand movement of the plunger, there will be no movement of the rock arm 2 because of the lost-motion connection between the plunger and

rock arm. During this operation, the lock 3 will be moved to releasing position by the sloping face 12 of the cam. Soon after the lock 3 is moved to releasing position, the lost motion between the plunger and rock arm will be taken up so that a continued movement of the plunger will cause movement of the rock arm, thus throwing the switch member 1 back to the straightaway position. During this final movement of the plunger 4, the cam face 12 will permit the lock 3 to move again to locking position under the action of the coil tension spring 13.

I will now describe the manual operation of the switch, which may be desirable under certain circumstances. This is effected by means of the hand lever 7 which has a lost-motion connection with the plunger 4. This lost-motion connection is effected by means of a U-shaped member 14 secured to the handle 7, having a pair of upwardly-extending flanges 15 embracing between them a pin 16 extending downwardly from the plunger 4. The spacing of the flanges 15 on the U-shaped member 14 is such that the plunger 4 can have its full movement under the action of the solenoid 8 without moving the manually-operable handle 7 from its mid-position in which it is normally held by means of a pair of coil compression springs 17. However, if it is desired to operate the plunger manually, it is necessary only to move the handle 7 from its mid-position to one or the other of the two dotted-line positions shown in Fig. 3. This movement of the handle will, of course, move the plunger 4 and cause the movement of the car-deflecting switch member 1 in the same manner in which its operation is effected by means of the solenoid. After the plunger and switch member have been shifted, as described above, the handle 7 may be released, permitting it to be restored to the mid-position shown in dotted lines in Fig. 4 under the action of one or the other of the coil compression spring 17. This restoring movement of the handle, however, will not release the switch lock or cause any movement of the plunger and switch member because of the lost motion permitted between the handle and the plunger.

I will now describe in more detail certain features. The track construction for the cars may be of the section shown in Fig. 2, comprising the lower passage 18 in which the wheels of the cars travel and the upper passage 19 provided for the conveyor chain, this construction being described in more detail in my co-pending application, Serial No. 521,494, filed March 10, 1931.

The oscillatable switch member 1 may be secured to oscillate with a vertical rock shaft 20, to the upper end of which the oscillatable rock arm 2 is secured. This rock shaft 20 may be mounted in a suitable bearing 21 and may be vertically adjustable by means of the

adjusting nuts 22 and 23 and may be tiltably adjustable in any direction by means of the four radial adjustable screws 24 threaded in the fixed bushing or sleeve 25. The points of these screws have a bearing engagement with the upper end of the rock shaft, permitting the slight oscillatory movement required, and being cooperatively adjustable to effect any slight tilting adjustment which may be necessary in order to bring the switch member 1 into proper cooperative relation with the track.

The locking or latching member 3 may be pivotally mounted at 26 on a post 27 secured to a supporting plate 28.

The plunger member 4 may be guided by means of a pin 29 extending through a slot 30 in the outer end of the plunger.

The lost motion connection between the plunger 4 and rock arm 2 is effected by means of a pin 31 secured to the rock arm and extending into a slot 32 in the plunger. If desired, the plunger may have a pivotal connection 33 with the armature 9 of the solenoid to enable the parts to operate freely without undue friction.

The coil compression springs 17 for restoring the manually operable lever 7 may be mounted on a rod or bolt 34 extending through the springs and having its ends secured to the upwardly-extending lugs 35 of an elongated bracket mounted on the supporting plate 28. Each of these springs is confined between one of the upwardly-extending lugs 35 and a rectangular bearing washer 36, which is slidably mounted on the spring-supporting rod 34. The expanding movement of each spring 17 is limited by the engagement of its washer 36 with the wings 37 of a channel member secured to the central portion of the elongated bracket 38. The coil compression springs 17 exert their effect on the manually-operable handle 7 through the intermediary of an inverted channel member 39 pivotally secured at 40 to the underside of the handle 7 and having downwardly extending flanges which straddle the spring-supporting rod 34. The ends of this inverted channel member 39 are engageable by the spring-pressed rectangular washers 36 for the returning movement of the handle. The handle 7 is mounted to rock freely on the shaft 20 to which the rock arm 2 is secured.

It will be seen that the construction above described provides means whereby the switch may be operated either by power or by hand without interference between the two controls. It will also be seen that both with the power operation and the manual operation, the switch is securely locked in both of its adjusted positions.

Further modifications will be apparent to those skilled in the art and it is desired, therefore, that my invention be limited only by

the prior art and the scope of the appended claims.

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

1. A switch construction for an overhead, suspended load, monorail conveyor system comprising an oscillatable car deflecting switch member, a rock arm for operating said switch member, locking means for locking the rock arm in two different positions to hold the switch member in two different positions, a plunger movable back and forth for operating said rock arm, said plunger having provisions for releasing said locking means from both locking positions and having a lost-motion connection with said rock arm enabling the lock-releasing movement to be effected without moving the rock arm, a solenoid construction for operating said plunger comprising a coil for moving the plunger in one direction and another coil for moving the plunger in the opposite direction, and a manually-operable lever for operating said plunger to cause the operation of the rock arm having a lost-motion connection with respect to said plunger to enable the plunger to be actuated by the solenoid without actuating the manually-operable lever.

2. A switch construction for an overhead, suspended load, monorail conveyor system comprising an oscillatable car-deflecting switch member, a solenoid construction for operating said switch member comprising a

coil for moving the switch member in one direction and another coil for moving the switch member in the opposite direction, and a manually-operable lever for operating said switch member to cause the operation of the rock arm having a lost-motion connection with respect to said switch member to enable the switch member to be actuated by the solenoid without actuating the manually-operable lever.

3. A switch construction for an overhead, suspended load, monorail conveyor system comprising an oscillatable car-deflecting switch member, locking means for holding the switch member in two different positions, a plunger movable back and forth for operating said switch member, said plunger having provisions for releasing said locking means from both locking positions and having a lost-motion provision enabling the lock-releasing movement to be effected without moving the switch member, a solenoid construction for operating said plunger comprising a coil for moving the plunger in one direction and another coil for moving the plunger in the opposite direction, and a manually-operable lever for operating said plunger to cause the operation of the rock arm having a lost-motion connection with respect to said plunger to enable the plunger to be actuated by the solenoid without actuating the manually-operable lever.

In witness whereof, I have hereunto subscribed my name.

CHARLES S. HADDLESAY.

40	105
45	110
50	115
55	120
60	125
65	130