April 24, 1928. 1,667,473

W. K. HOWE

RAILWAY SWITCH SELECTOR OPERATING MEANS

Filed Dec. 17, 1926 3 Sheets-Sheet 1

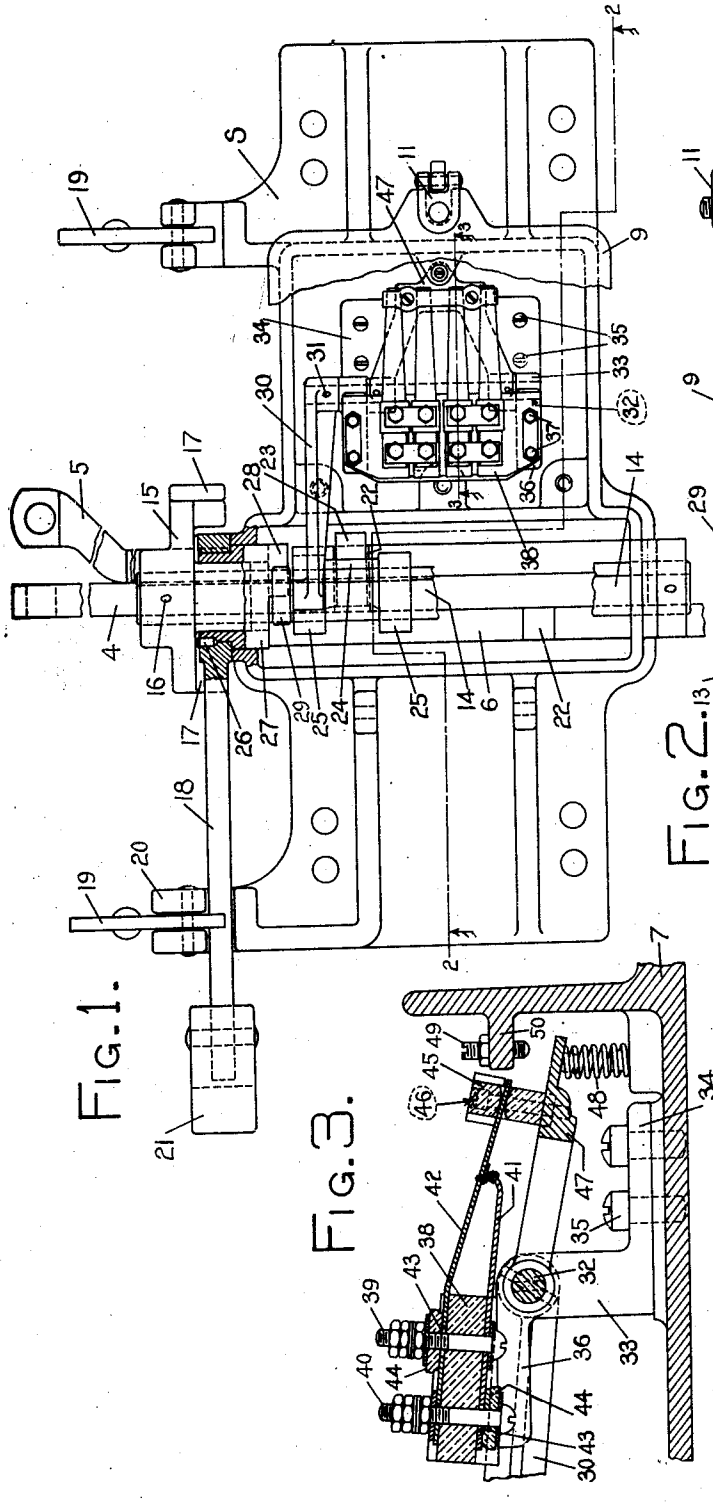


FIG. 1.

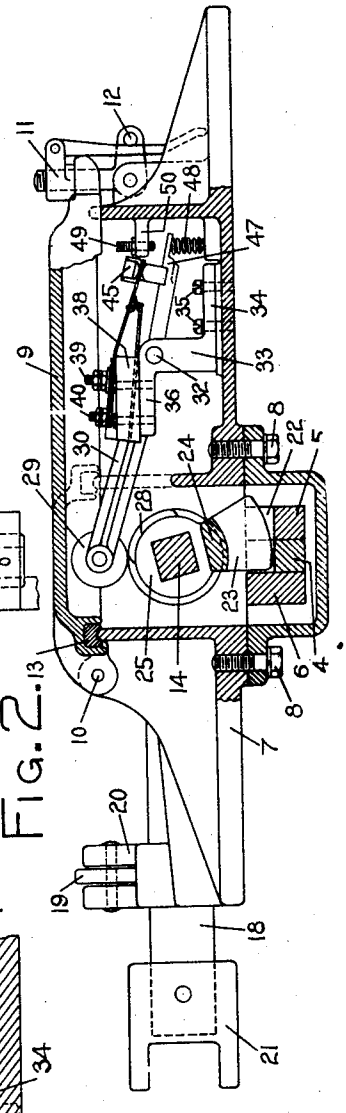


FIG. 2.

FIG. 3.

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RAILWAY SWITCH SELECTOR OPERATING MEANS

Filed Dec. 17, 1926 3 Sheets-Sheet 2

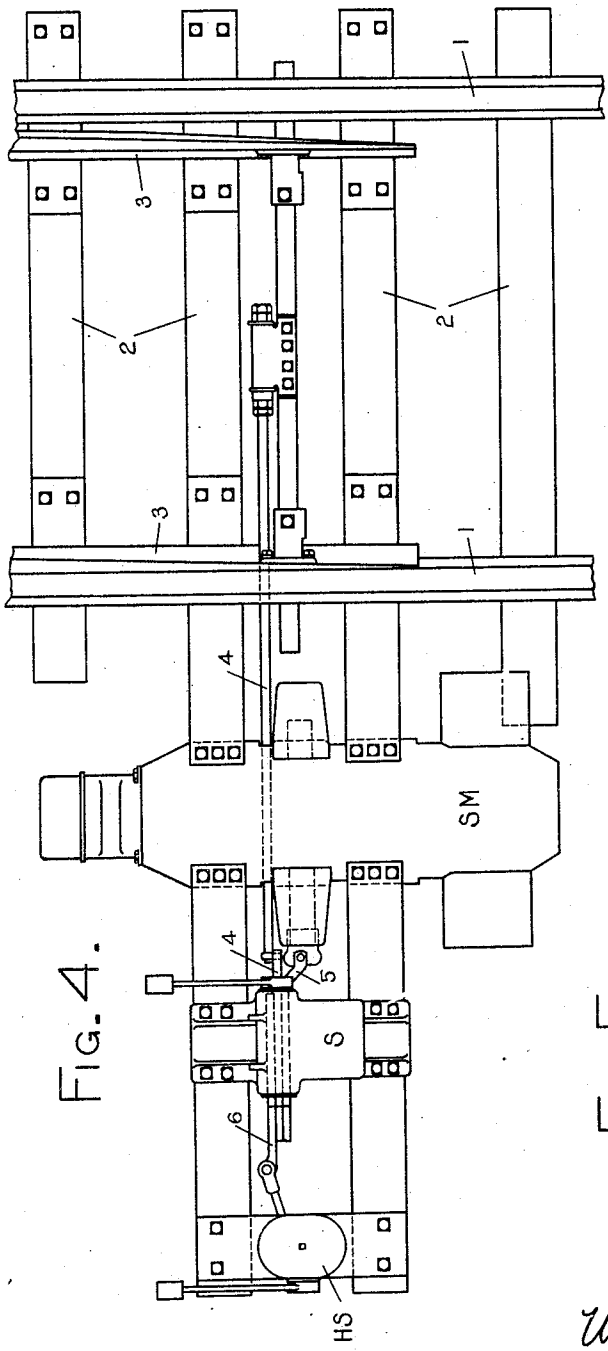


FIG. 4.

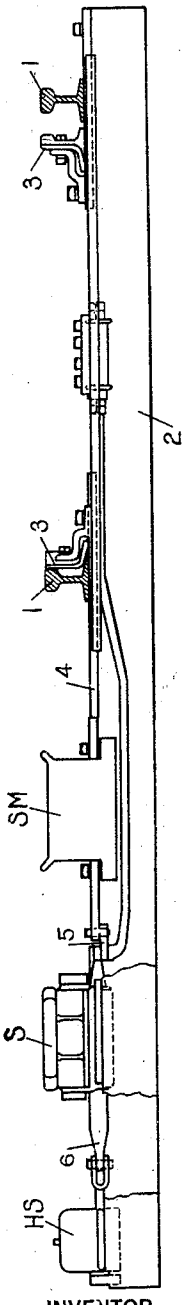


FIG. 5.

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RAILWAY SWITCH SELECTOR OPERATING MEANS

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FIG. 6.

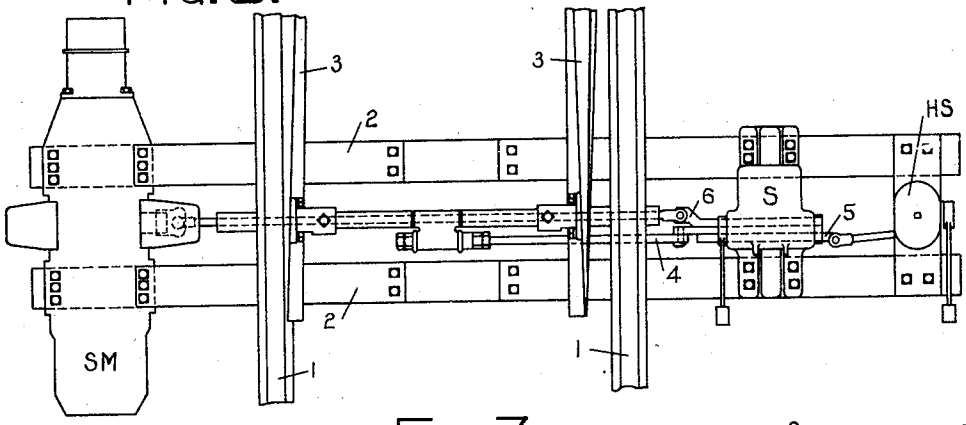


FIG. 7.

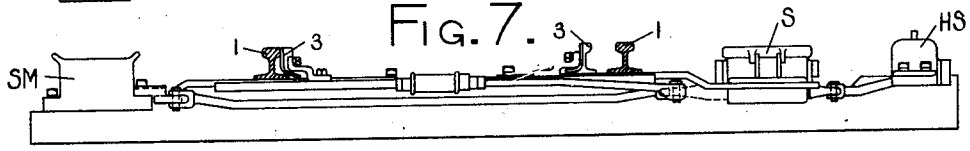


FIG. 8.

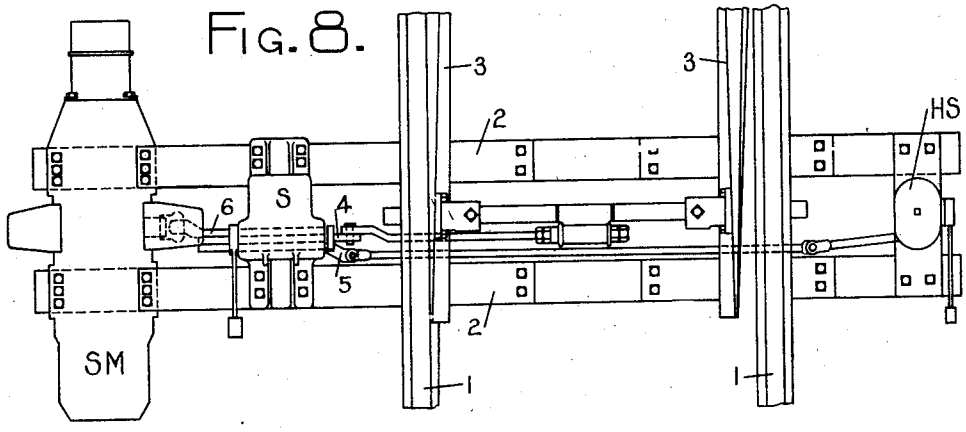
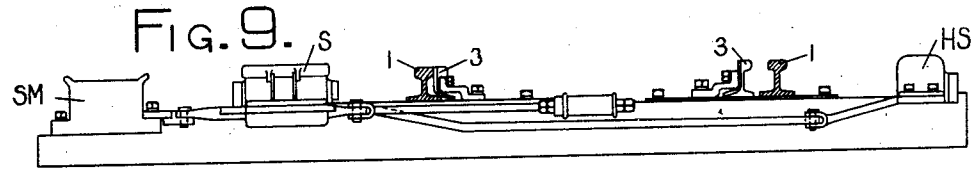


FIG. 9.



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Patented Apr. 24, 1928. 1,667,473

UNITED STATES PATENT OFFICE.

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RAILWAY-SWITCH-SELECTOR-OPERATING MEANS.

Application filed December 17, 1926. Serial No. 155,484.

This invention relates in general to the operation of railway switches, and has more particular reference to means for selectively permitting the switch to be operated either by a usual power operated switch machine or by a usual hand operated switch stand.

It is usual practice at present to operate railroad switches by means of remote controlled power operated switch machines and to provide means whereby the switch machine mechanism can be operated by hand, by means of a crank, in case the power supply fails, the switch machine becomes inoperative, or other emergency arises. In case of such operation by hand the track switch is, of course, operated through the various switch machine gears and levers, the actuating force merely being different.

In the case of operating railroad switches by a hand crank in a switch machine, it often happens that the operator is content with noticing that the switch points have closed, and hence fails to continue the cranking long enough to lock up the switch points. This results in the points being held insecurely, and derailments have occurred due to the jarring of the switch machine in connection with the spring in the switch points, caused by passing train. This is all the more likely to happen since it is usual to have the current automatically cut off the switch machine when a train approaches, thus leaving the motor free to be operated backwards by the spring of the switch points combined with the jarring of a passing train.

A further defect in the present practice of hand operating a switch machine mechanism, is due to the fact that too long a time is required to throw the switch, for permitting taking of flying switches, and the like. That is, whether hand power or other power be used, if the track switch be operated through the mechanism of a switch machine, a considerably longer time is required for throwing the switch than is the case with the usual hand operated switch stand.

In order to completely take care of the various defects of the present practice as outlined above, so as to avoid the difficulties arising through hand cranking of the switch machine mechanism, to allow flying switches to be made, to permit ordinary switching to be done with facility, and to permit the operation of the track switch by hand in the well known manner in case of failure of the power operated mechanism or jamming of the various parts of the mechanism; it is proposed, in accordance with this invention, to provide a mechanical selector for coupling the switch points either to a usual hand operated switch stand or to a power operated switch machine. This is to be accomplished by moving an operating lever from one extreme position to another and thereafter operating the switch points either by hand or by machine, in the usual manner in each case.

When means are provided for operating the switch points by hand, by means of the usual hand operated switch stand, the operator being thoroughly familiar with such switch stand, will be very unlikely indeed to fail to lock the switch points in thrown position, as is so apt to occur, as set forth above, when the hand operation is accomplished by hand cranking a switch machine.

Further objects, purposes, and characteristic features of the present invention will appear as the description progresses, reference being had to the accompanying drawings, showing solely by way of illustration, several physical embodiments which the invention may assume. In the drawings:—

Fig. 1 is a plan view, with parts broken away, of a selector and associated parts, constructed in accordance with this invention:

Fig. 2 is a sectional view on line 2—2 of Fig. 1 viewed in the direction of the arrows;

Fig. 3 is a sectional view, to a larger scale, on line 3—3 of Fig. 1:

Fig. 4 is a plan view, of an entire assembly, according to this invention:

Fig. 5 is a side elevation of the assembly of Fig. 4:

Figs. 6 and 7 are, respectively, plan and side elevational views of a first modified arrangement of parts, corresponding generally to Figs. 4 and 5: and

Figs. 8 and 9 are, respectively, plan and side elevational views of a second modified arrangement of parts, corresponding generally to Figs. 4 and 5.

Referring first to Figs. 4 and 5 of the drawings, track rails 1 supported on ties 2, are furnished with a usual track switch 3 to which is connected a throw rod 4.

Mounted on special, extra long ties, is

a switch machine SM, a switch operator selector S, and a hand operated switch stand HS. The switch machine can be of any usual or desired type, but is preferably such as shown and described in the patent to Howe, No. 1,466,903, Sept. 4, 1923, while the switch stand HS is of any usual or desired construction.

Switch operating rods 5 and 6 are controlled respectively by the switch machine and the hand operated stand, and pass into the selector S, to lie on either side of the switch throw rod 4 which also passes into the selector.

With the arrangement just described, it is obvious that a means for coupling the throw rod 4, to either the rod 5 or the rod 6, will permit operation of the switch points 3, in the usual manner, either by the switch machine, or the hand operated switch stand. Both of these last two instrumentalities have been shown only conventionally since they are contemplated as functioning in the usual manner, when coupled up to control the switch points.

The means for effecting the desired coupling of the parts, will be described with particular reference to Figs. 1–3 of the drawing.

The selector S comprises a two part casing 7, connected together at 8 and having an open top normally closed by a cover 9, hinged to the casing at 10 and held in closed position by a hasp fastener 11, lockable by means of a padlock passing through aperture 12, there being suitable packing means 13 between the casing and cover, to make a weather tight joint.

The rods 4, 5, and 6, are positioned parallel with one another, and are slidably carried in the lower part of the casing 7.

Mounted for rocking in the casing, directly above the said rods, is a square shaft 14, extending beyond the casing 7, and carrying an operating collar 15 pinned thereto at 16, the collar having operating lugs 17, spaced somewhat less than 180° from each other. A selector lever 18 is pivoted to the selector and can be thrown to either one of two extreme positions at approximately 180° from each other, there being detents 19 on the casing 7 for holding the lever in such extreme positions, one of the detents, that at the left in Fig. 1, having locking arms 20. A weight 21 on the free end of the lever 18 biases it to its extreme positions. As shown in Fig. 1, the operating shoulders 17 are in the path of motion of the lever 18, so that such lever, a short distance in front of its final position, will contact with one of the shoulders 17, and rock the collar 15 and the square shaft 14.

Each of the rods 4, 5, and 6 has a transverse notch 22 in its upper face to accommodate a coupling sector 23 depending from, and preferably integral with, a U-shaped hanger 24 slidably, but non-rotatably, mounted on the square shaft 14 by square perforated looped ends 25.

Keyed to the hub of lever 18, at 26, is a collar 27, having a projecting cam 28 operable to raise a roller 29 fastened to an electric switch operating crank 30. The crank 30 is pinned at 31 to a spindle 32 pivoted on upstanding arms 33 of a Z shaped bracket 34 fastened to the bottom of casing 7 by screws 35.

Connected across horizontal arms 36 of the bracket 34, by screws 37, is a terminal block 38 which carries, in the particular form shown in the drawing, two rows 39 and 40, of four binding posts each, although any desired number can be used. To each post of row 39 is electrically connected a back contact finger 41, and to each post of row 40 is electrically connected a front contact finger 42, (Fig. 3) while such fingers are insulated from the other row, in each case, by means of enlarged holes 43 and insulating washers 44. The front contact fingers 42 are all securely held at their outer ends in an insulating block 45 fastened by screws 46 to a horse shoe shaped plate 47 pinned to the spindle 32. This plate 47 is biased upwardly by a spring 48 and is restricted in its upward movement by an adjustable screw stop 49 carried in an integral ear 50 on the casing 7, as clearly shown in Fig. 3.

In the position shown in Figs. 4 and 5, the sector 23 engages in the notches 22 of rods 4 and 5 to couple up the switch machine with the switch points, while the cam 28 is in engagement with the roller 29, to prevent spring 48 from raising the plate 47 and with it the block 45 to thereby separate the front contact fingers 42 from the back contact fingers 41, the resiliency of the contact fingers normally positioning them to make contact with each other. Thus, as shown in Figs. 1–5, the switch points are coupled for operation by the switch machine, and the contact fingers 41, 42 are in contact.

The contact fingers 41, 42 are connected up to control the supply of energy to the switch machine, and to the wayside signals governing traffic on trackway affected by the track switch 3, and for any other desired control, it having been thought unnecessary to show the various circuits on the drawing, as these could be supplied by anyone skilled in this particular art.

In operation, the above decribed selector functions as follows. Let us assume that it is desired to throw the switch points by hand. The lever 18 of the selector is thrown over to its right hand position, as viewed in Fig. 1, to thus rock the segment 23 to the

left and cause it to enter the slot 22 in rod 6, or else to bear against the side of this rod until the slot is brought into registry with the sector by hand operation of the rod 6, at which time the weight 21 will force the sector into position to couple rods 4 and 6, so that the usual hand operation of the switch points is permitted.

During this movement of lever 18, cam 28 will move out from under roller 29, and allow spring 48 to raise the contact fingers 42 out of engagement with fingers 41, to thereby place all wayside signals controlled by these fingers, to stop, and to also cut power off from the switch machine. Thus the switch points are coupled up mechanically for hand operation, and energy to the switch machine is cut off and its rod 5 is uncoupled from the switch point rod 4.

Under certain conditions, it may be expedient to arrange the switch machine, the hand stand, and the selector, in a different order relative to the track and each other, than that shown in Figs. 4 and 5 and it is only in this respect that the modified forms shown in Figs. 6 and 7, and 8 and 9, differ from that of Figs. 4 and 5.

In Figs. 6 and 7, the switch machine is positioned at one side of the track, with the selector and hand stand at the other, the selector, being between the switch machine and hand stand.

In Figs. 8 and 9 the switch machine and selector are positioned at one side of the track, and the hand stand at the other, with the selector, as before, between the other two devices.

The above rather specific description of several forms of this invention has been given solely by way of illustration, and is not intended, in any manner whatsoever, in a limiting sense. Obviously the invention can assume many different forms, and is susceptible of various modifications, and all such forms and modifications are intended to be covered by the present invention, as come within the scope of the appended claims.

Having described my invention, I now claim:—

1. In combination, a track switch and operating rod, a power operated switch machine and operated rod, and a hand operated switch stand and operated rod, a casing slidably receiving the three said rods, and means for coupling the operating rod to either of the operated rods at will and for controlling the power supply to the switch machine and wayside traffic signals.

2. In combination, a track switch and operating rod, a power operated switch machine and operated rod, and a hand operated switch stand and operated rod, a casing slidably receiving the three said rods, a shaft in the casing, a sector slidable but non-rotatable on the shaft, and registerable notches in the said rods receivable by the sector for coupling up the rods in pairs.

3. In combination, a track switch and operating rod, a power operated switch machine and operated rod, and a hand switch stand and operated rod, a casing slidably receiving the three said rods, a shaft in the casing, a sector slidable but non-rotatable on the shaft, registerable notches in the said rods receivable by the sector for coupling up the rods in pairs, circuit controlling switches for the switch machine, and means on the shaft for operating the switches.

4. In combination, a track switch and operating rod, a power operated switch machine and operated rod, and a hand switch stand and operated rod, a casing slidably receiving the three said rods, a shaft in the casing, a sector slidable but non-rotatable on the shaft, registerable notches in the said rods receivable by the sector for coupling up the rods in pairs, a collar pinned to the shaft, spaced operating shoulders on the collar, and a rockable, weighted lever movable against the shoulders to cause rocking of the shaft.

5. In a switch operator selector, a casing, a plurality of rods movable in the casing, a shaft journalled in the casing, a sector slidably and non-rotatably carried by the shaft, an actuating lever for the shaft, a lost motion connection between the lever and shaft, and registerable notches in the rods for receiving the sector to thereby selectively couple up the rods in pairs.

6. In a switch operator selector, a casing, a track switch operating rod, a hand operated rod, and a power operated rod, all slidably reecived in the casing; and means for coupling the switch rod to either of the other two rods and for controlling the supply of power for operation of the power operated rod.

7. In a switch operator selector, a casing, a track switch operating rod, a hand operated rod, and a power operated rod, all slidably received in the casing; registerable notches in the rods, and an oscillable sector receivable in the notches to couple up the rods in pairs.

8. In a switch operator selector, a casing, a track switch operating rod, a hand operated rod, and a power operated rod, all slidably received in the casing, registerable notches in the rods, an oscillable sector receivable in the notches to couple up the rods in pairs, means controlling the power supply for operation of the power operated rod, and a shaft in the casing for actuating the controlling means and the sector.

9. In a switch operator selector, a casing, a track switch operating rod, a hand operated rod, and a power operated rod, all slidably received in the casing, registerable

notches in the rods, an oscillable sector receivable in the notches to couple up the rods in pairs, a shaft carrying the sector, a lever biased to either of two extreme positions, and a lost motion operating connector between the lever and shaft.

10. In a switch operator selector, a casing, a track switch operating rod, a hand operated rod, and a power operated rod, all slidably received in the casing, an operating shaft in the casing, means on the shaft for coupling up the switch rod with either of the other rods, an electric switch for controlling power supply for operation of the power operated rod, means biasing the switch to one position, and means on the shaft making the biasing means ineffective for certain positions of the shaft.

11. In a switch operator selector, a track switch operating rod, a hand operated rod, and a power operated rod, an operating shaft, means on the shaft for coupling up the switch rod with either of the other rods, an electric switch for controlling power supply for operation of the power operated rod, means biasing the switch to one position, a crank connected to the switch, and cam means controlled by the shaft for operating the crank to a position to make the biasing means ineffective.

12. In combination, a track switch and operating rod, a power operated switch machine and operating rod, and a hand operated switch stand and operated rod, a casing slidably receiving the three said rods, and means for coupling the operating rod to either of the operated rods at will.

In testimony whereof I affix my signature.

WINTHROP K. HOWE