June 30, 1936. H. B. TAYLOR 2,045,930

EMERGENCY OPERATOR FOR RAILWAY TRAFFIC CONTROLLING DEVICES

Filed Feb. 27, 1931 3 Sheets-Sheet 1

FIG. 1.

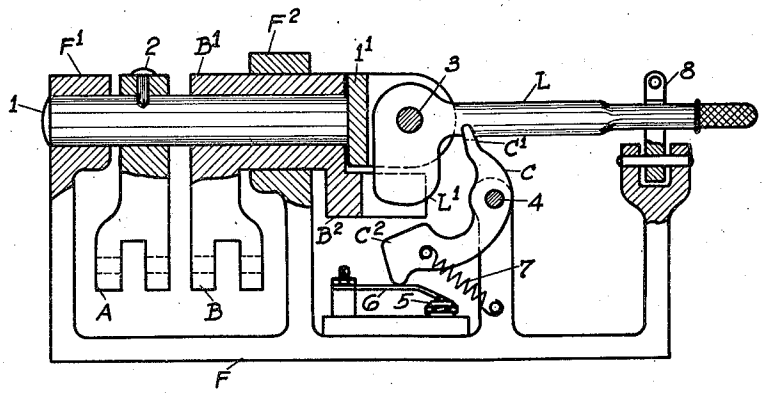
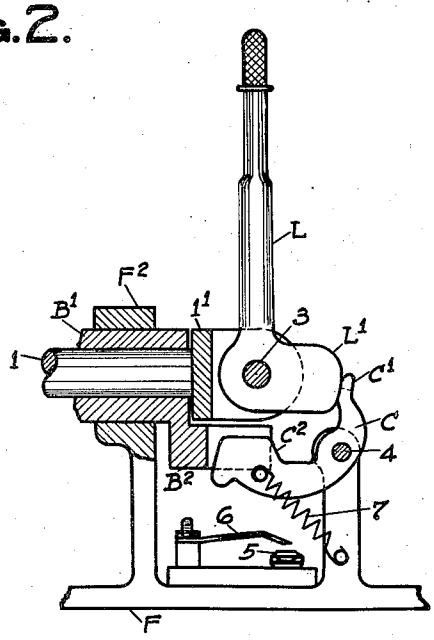


FIG. 2.



INVENTOR
H. B. Taylor.
BY Neil W. Preston,
his ATTORNEY

June 30, 1936. H. B. TAYLOR 2,045,930

EMERGENCY OPERATOR FOR RAILWAY TRAFFIC CONTROLLING DEVICES

Filed Feb. 27, 1931 3 Sheets-Sheet 2

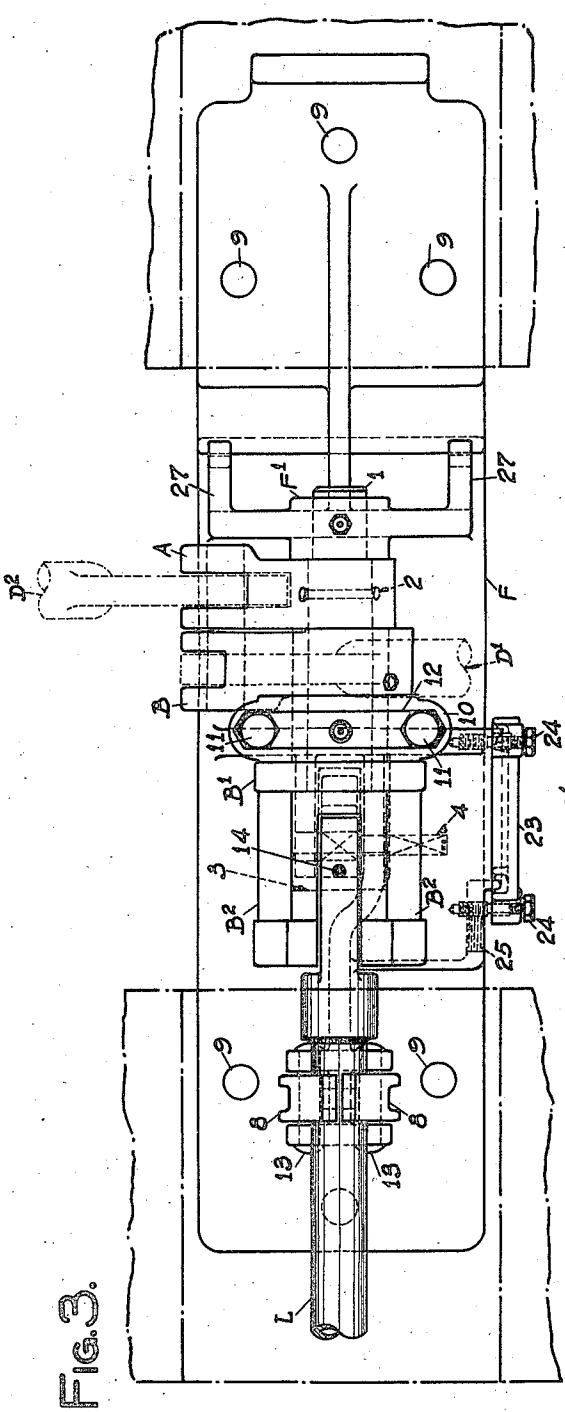


Fig. 3.

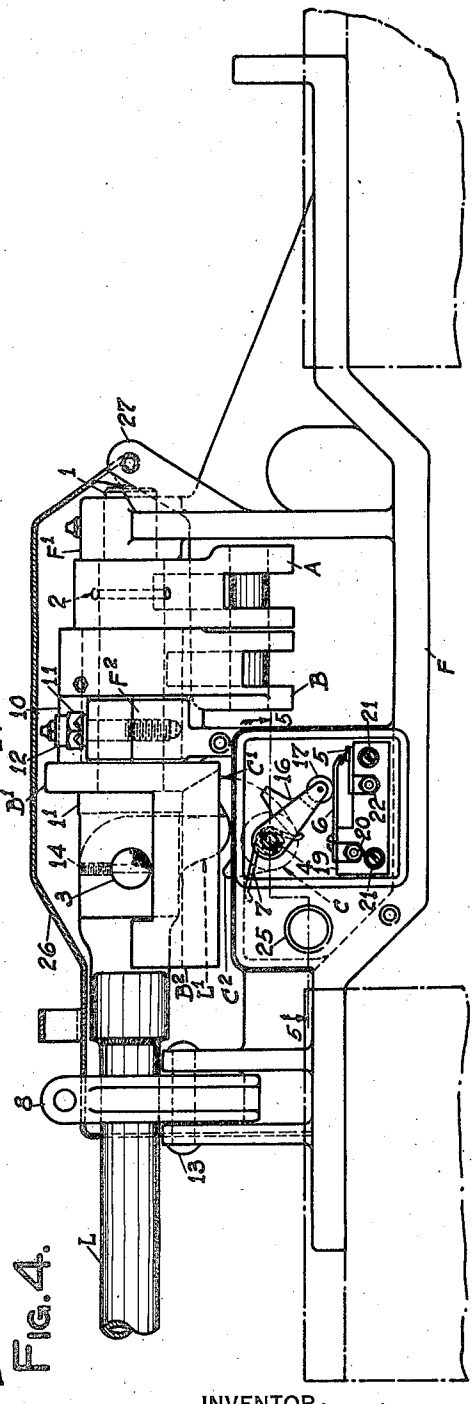


Fig. 4.

INVENTOR
H. B. Taylor.
BY
Neil W. Preston
his ATTORNEY

June 30, 1936. H. B. TAYLOR 2,045,930

EMERGENCY OPERATOR FOR RAILWAY TRAFFIC CONTROLLING DEVICES

Filed Feb. 27, 1931 3 Sheets-Sheet 3

FIG. 5.

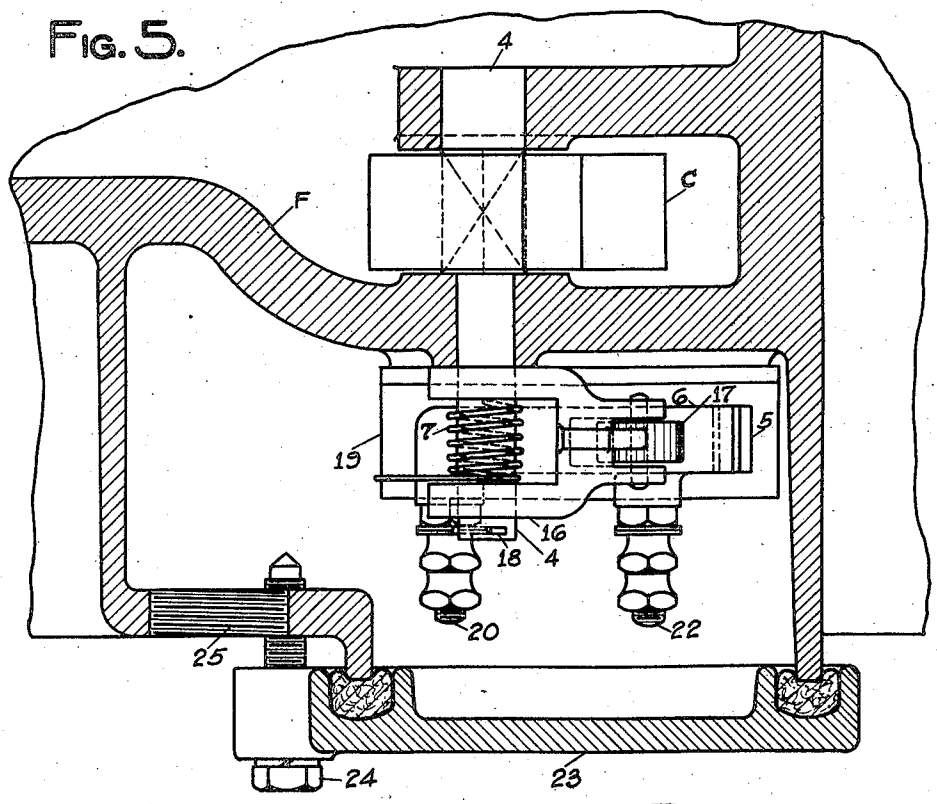


FIG. 6.

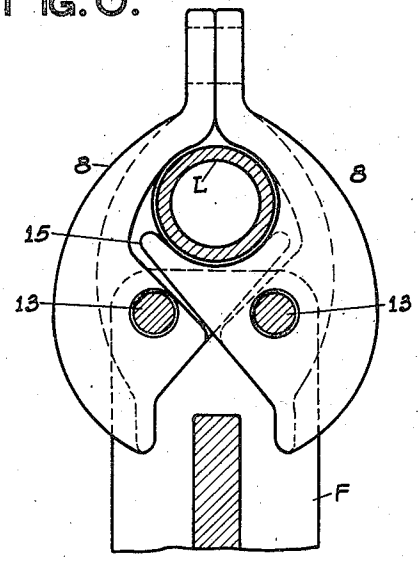
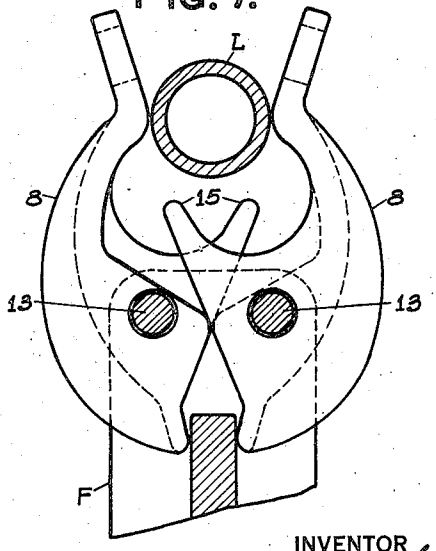


FIG. 7.



INVENTOR
H. B. Taylor,
BY
Neil M. Preston,
his ATTORNEY

Patented June 30, 1936 2,045,930

UNITED STATES PATENT OFFICE

2,045,930

EMERGENCY OPERATOR FOR RAILWAY TRAFFIC CONTROLLING DEVICES

Herbert B. Taylor, Rochester, N. Y., assignor to General Railway Signal Company, Rochester, N. Y.

Application February 27, 1931, Serial No. 518,751

28 Claims. (Cl. 246—393)

This invention relates to dual operation of a railway traffic controlling device and more particularly to a device for locally operating a remotely controlled derail or switch.

It is often necessary to locally operate derails or switches, which are mechanically operated from an interlocking machine or by remotely controlled power, in order to facilitate in local switch movements or due to some abnormal conditions obtaining which prevents normal operation.

In view of this, it is proposed in accordance with this invention, to provide a manually operable device, insertable in the mechanical operating connection, whereby the derail or switch can be disconnected from its operating connection and mechanically operated according to the will of the local operator. It is further proposed to lock the remotely controlled connection to a stationary member during local operation and to actuate circuit changing means in accordance with the method of operation.

Other objects, purposes and characteristic features of the invention will appear as the description thereof progresses, during which references will be made to the accompanying drawings which show the invention in a manner to make it easily understood and also show, solely by the way of example, and in no manner in a limiting sense, one form which the invention can assume, and in which:—

Fig. 1 is a diagrammatic view of the invention shown in its normal operating position.

Fig. 2 is a view of Fig. 1 in its manually operable position.

Fig. 3 is a plan view of an embodiment of the invention.

Fig. 4 is a side elevation view of Fig. 3.

Fig. 5 is a sectional view on line 5—5 of Fig. 4 viewed in the direction of the arrows.

Fig. 6 is an enlarged view of the operating lever latch bearing in its closed position.

Fig. 7 is a view of the same latch bearing in its open position.

A description of the rather simple embodiment of the invention illustrated in Figs. 1 and 2 will be undertaken first to facilitate in disclosing the operation thereof. The apparatus consists essentially of a frame F having two integral bearing portions F^1 and F^2 and rigidly fastened along the railroad trackway in a convenient operating position. A crank A is secured to a shaft 1 by a pin 2 and is connected to the function to be operated which may be a derail, switch or the like. A second crank B is integral with a hollow shaft B^1 which surrounds a portion of the shaft 1 and is supported by the frame bearing portion F^2. The crank B is connected to the normal operating means which may be a switch machine or any remotely controlled mechanical operating connection which the particular application may include.

The shaft 1 is supported at one end by the bearing member F^1 and extends through the hollow shaft B^1 where it terminates in an enlarged shoulder 1^1 which is bifurcated so as to have extending parallel surfaces which shoulder is illustrated in Figs. 1 and 2 with one of the bifurcations removed to disclose the accompanying parts. A pin 3 is placed through holes in the bifurcations of the shoulder 1^1 and aligning with the center of the shaft 1 to pivotally carry an operating lever L.

The hollow shaft B^1 has a downwardly extending bifurcated portion B^2 aligning with the bifurcated end of shaft 1. The operating lever L has a cam portion L^1 which is adapted to enter the aforesaid bifurcated portion B^2 of the hollow shaft B^1 when the operating lever L is in a horizontal position, as shown in Fig. 1. In this way, a horizontal position of the lever L locks the crank A to the crank B to cause the two shafts 1 and B^1 to rotate as a unit in the bearings F^1 and F^2 to thereby permit normal direct operation from crank A to crank B.

A locking crank C is pivotally mounted on the frame F by a bearing pin 4 and includes an arm C^1 extending upwardly into the path of the cam L^1 and a locking portion C^2 which is adapted to enter the bifurcated extension B^2 of the shaft B^1. It is now evident that an operation of the lever L to a vertical position, as shown in Fig. 2, unlocks the two shafts 1 and B^1 by removing its integral cam L^1 from the bifurcated extension B^2 and rotates the locking crank C by engaging the arm C^1 thus operating the locking portion C^2 into the bifurcated extension B^2. The operating lever L is now in a position to have sufficient mechanical advantage to operate the crank A through the shaft 1 which has its bearing in F^1 and the hollow shaft B^2, as the shaft B^2 is now unlocked from the shaft 1 and mechanically locked to the frame F by the locking crank C. The arm C^1 of the locking crank C is so constructed as to be engaged by the cam L^1 throughout the complete operating movement of the lever L.

Suitable contacts may be operated by the movement of the locking crank C, which contacts are indicated in Figs. 1 and 2 by a fixed contact 5 and a movable contact spring 6. The locking crank C may be biased to a normal position, as shown in Fig. 1, by a spring 7 to thereby engage

the aforesaid contact arrangement in such position.

A latch bearing 8 mounted on the frame F is provided to rotatably hold the operating lever L in its normal position. Provision on this latch for locking the lever L in its normal position may be included to prevent its operation by an unauthorized person.

It has now been shown that the device illustrated in Figs. 1 and 2 is capable of selecting the method of operating the switch or derail by a movement of a single lever in one plane and capable of actually operating the switch or derail by a movement of the same lever in a plane substantially at right angles to the aforesaid plane.

The above description of the simple embodiment of the invention shown in Figs. 1 and 2 has been given to disclose the idea underlying the same, and further description will be given to a modified and perhaps more practical form shown in the appended figures of illustration. In describing these figures of illustration, like reference characters are given to parts having the same function as those illustrated in Figs. 1 and 2 although such parts may differ in their construction.

The frame F of the apparatus shown in Figs. 3 and 4 is adapted to be secured to a railway cross tie at each end by suitable lag screws or through bolts in holes 9 included therein. Between these supporting ends, the frame F is depressed and has a raised solid horizontal bearing portion F^1 with a larger half bearing F^2 spaced from F^1 and aligning therewith.

A crank member B which is to be connected to the normal operating means by a drive link D^1, shown in dotted lines in Fig. 3, has a hollow shaft portion B^1 with an annular shoulder spaced from the crank B. This annular shoulder has two lower spaced integral sectors B^2 extending horizontally beneath the center of the hollow shaft B^1.

A shaft 1 having an enlarged end 1^1 is fitted inside the hollow shaft B^1 and a second crank A to be connected to the operated apparatus by a driven link D^2, shown in dotted lines in Fig. 3, is secured thereon adjacent crank A by a pin 2. The enlarged circular end 1^1 of the shaft 1 is bifurcated by a slot receiving an enlarged flat end L^1 of an operating lever L which is so held to move relative thereto thru approximately 90 degrees in a single plane about a pin 3 which is retained by a screw 14.

This unit is rotatably held in the frame F at one end by the solid bearing F^1 receiving the reduced free end of shaft 1 and at the other end by the half bearing F^2 receiving the portion of the hollow shaft B^1 which is between the crank B and the enlarged shoulder. This hollow shaft B^1 is held in the bearing F^2 by a cap 10 retained by two screws 11 which are locked by a strip 12 passing under the heads of the screws 11 with the corners upturned against the sides thereof.

The operating lever L is rotatably held in its normal or horizontal position by two cooperating latches 8 which are each held to upstanding portions of the frame F by a pin 13. An enlarged view of these latches in a position holding the lever L horizontally is shown in Fig. 6, and Fig. 7 shows their position when opened by raising the lever L from its horizontal position. These latches 8 each have half-width extending arms 15 which intermatch when closed to complete the bearing, and when the latches 8 open the arms 15 rise to a position shown in Fig. 7, in which position they are engaged by the lever L when returned to a horizontal position, and automatically close the latches thereabout. The center of gravity of these latches is located so that when not enclosing the lever L they are biased to an open position, which position is centered by their lower ends engaging a web of the frame which connects their two supports.

The flat enlarged end L^1 of the operating lever L, which is pivotally held in the bifurcated enlarged end 1^1 of the shaft 1 by pin 3, has a downwardly extending integral cam L^1 which enters between the spaced sectors B^2 of the hollow shaft B^1 when the lever L is in its horizontal position. This cam L^1 locks the hollow shaft B^1 to the shaft 1 which causes the members to rotate as a unit thereby directly transmitting the motion of the drive link D^1 to the driven link D^2.

A transverse shaft 4 is held beneath the sectors B^2 in bearings of the frame F and holds a locking crank C on a squared portion thereof which is shown in the enlarged sectional view in Fig. 5. This crank C is positioned so that one arm C^1 thereof is capable of entering between the spaced sectors B^2 of the hollow shaft B^1, but it is held therefrom by the cam L^1 when the lever L is in its horizontal position, and is held in the same position by resting on the circular outside of the sectors B^2 when these sectors are rotated during operation.

The reduced end of the transverse shaft 4 has a squared end projecting beyond its bearing and holds in fixed relation a contact operating arm 16 by a through pin 18. This contact operating arm 16 receives the shaft 4 in square holes in a bifurcated end thereof and its free end holds an insulating roller 17 which engages a contact spring 6.

An insulating block 19 is secured to the frame F by two screws, 21 which holds the contact spring 6 by a terminal screw 20 and also holds a fixed contact member 5 by a terminal screw 22. Low resistance contacts are secured to the free end of the contact spring 6 and to the fixed contact member 5, which contacts are forced into engagement by the roller 17 of the contact operating arm 16 when assuming its normal position, as shown. The contact spring 6 is made of suitable flat resilient material, such as phosphor-bronze, and is shaped to have an upturned set which biases the free end to a disengaged position when not forced down by the operating arm 16.

The contact arrangement just described, is accessibly housed in a frame portion, shown in Fig. 5, and the side opening closed by a cover 23 which is held by two screws 24. A threaded opening 25 is included in the side of the housing to receive a wire conduit fitting to carry external wire connections to the contact terminals 20 and 22.

The operating apparatus is also enclosed by a sheet-metal cover 26 which is hinged at one end between two projecting ears 27 of the frame F. This cover has a slot opening arranged to receive the upstanding ends of the latches 8 when in its closed position. The latches 8 have aligning holes in their upstanding ends which project above the cover 26 and may receive a lock which will both prevent the raising of the cover 26 as well as prevent the operation of the lever L.

Manual operation of the apparatus just described may be obtained by raising the cover 26 and lifting the operating lever L from its horizontal position upward to a vertical position. This rotates the cam L^1 out of its position between the

sectors B^2 of the hollow shaft B^1 thereby engaging the arm C^2 of the locking crank C and rotating its opposite arm C^1 into the space between the sectors B^2 which is normally occupied by the cam L^1. The biasing spring 7 holds the locking crank C in this position and in this crank position the contact operating arm 16 is raised from the contact spring 6 which thereby disengages the contact 5.

The operating lever L has now unlocked the shaft 1 from the hollow shaft B^1 and is in a position to operate the crank A by manual operation in a vertical plane thus rotating the shaft 1 in the hollow shaft B^1 and its end bearing F^1. The sectors B^2 of the hollow shaft B^1 extend beyond the bifurcated ends 1^1 of the shaft 1 and have upstanding ends which prevent the returning of the lever L to a position to align with shaft 1 when the lever has been manually operated, as just described, to an extreme position out of correspondence with the shaft B^1.

It will be seen that this apparatus has the same operation and function as the simpler embodiment previously described and illustrated in Figs. 1 and 2, and it will also be seen that a simple and rugged construction has been employed which is to be inserted in series with a mechanical operating connection to normally permit a very low loss direct drive or in emergency to disconnect the normal driving member and to manually operate the driven member. This invention has also provided for the selection of such operating means and for the manual operation of the driven member by a single lever arranged to negotiate these two distinct functions by movements thereof in two different planes.

Proper operation of the apparatus has also been assured by the provision of a locking means arranged to definitely hold the drive member during manual operation of the driven member and thereby permit the locking of the two members only when the driven member has been returned to its original position. Contacts have been included which may be employed to interrupt the electrical operating circuit of the power driving means during manual operation, or to control electrical means for indicating such a condition. Other details of the apparatus have also been provided such as the self-operating latch bearing with means included therein to provide for locking the operating lever and the apparatus cover against unauthorized persons.

The above rather specific description of one form of the present invention has been given solely by way of example, and is not intended, in any manner whatsoever, in a limiting sense. It is also to be understood that various modifications, adaptations and alterations may be applied to meet the requirements of practice, without in any manner departing from the spirit or scope of the present invention, except as limited by the appended claims.

Having thus described my invention, what I claim is:—

1. An operating means for a railway traffic controlling device comprising an operated means, an operating lever arranged to move in a definite plane to disconnect a normal operating member from the means and to move in another plane substantially at right angles to said first plane of motion to manually operate a railway traffic controlling device through said means and means cooperating with said operating lever to prevent motion of said normal operating member when it is disconnected from the operated means by said lever.

2. In an emergency operating means for railway traffic controlling devices, two crank members concentrically pivoted for common or relative rotation, an operating lever secured by a hinged joint to one of said crank members and having a cam portion arranged to interlock said crank members when said lever assumes a position aligning with the pivot of said cranks and to operatively disconnect said cranks when rotated about said hinged joint to a position transverse to said pivot, said operating lever when assuming said transverse position being capable of rotating said crank secured thereto.

3. In an operator for railway traffic controlling devices, a hollow shaft member having a fixed arm and held in a bearing, a shaft rotatably mounted in said hollow shaft and having a fixed arm and a hinged extension, said extension having a cam portion arranged to lock said shaft to said hollow shaft when said extension substantially aligns with said shaft, said extension being movable to a position transverse to said shaft to unlock the two shafts, said transverse position of said extension facilitating rotation of said solid shaft by manual operation thereof.

4. In an emergency operator for railway traffic controlling devices, a crank and operating lever connectible to a traffic controlling device and rockable on an axis, a crank connectible to a normal operating means and rotatable on an axis, a pivoted locking dog operable to lock said normal operating crank, said operating lever being hinged to swing into alignment with said axis, and means on said operating lever operable to interlock said cranks and to disengage said pivoted locking dog from its locking position.

5. In an operator and selector for railway traffic controlling devices, a rotatable shaft, a driven crank fixed to said shaft, an operating lever attached to said shaft by a hinged joint, a hollow shaft having a drive crank thereon and rotatable on said shaft, a locking dog pivoted to a fixed member, a cam on said operating lever, and a recess in said hollow shaft arranged to receive either said locking dog or said cam according to the angular relation of said operating lever to its shaft.

6. In an operator and selector of the character described, the combination of an operating lever hinged to a rotatable shaft so as to be operable as a selector in a quadrant between positions aligning with and transverse to said rotatable shaft, of cooperating latches having inter-matching arms operable by the movement of said operating lever to said aligning position to close said latches thereby rotatably holding said operating lever.

7. An operating means for a railway traffic controlling device comprising an operating lever to disconnect a normal operating member from such device and to manually operate the railway traffic controlling device and means cooperating with said operating lever to lock said normal operating member against motion when disconnected from the controlling device by said lever.

8. In an emergency operating means for railway traffic controlling devices, two crank members concentrically pivoted for common or relative rotation, an operating lever secured by a hinged joint to one of said crank members and having a cam portion arranged to interlock said crank members when said lever assumes a posi-

tion aligning with the pivot of said cranks and to operatively disconnect said cranks when rotated about said hinged joint to a position transverse to said pivot, said operating lever when assuming said transverse position locking the other crank against movement.

9. In controlling devices, in combination, a first rod, a driven member connected to the rod, an operating member movably attached to the rod, a second rod associated with the first rod, a lock dog movably attached to a fixed part, a cam on the operating member, and means in the second rod positioned to receive either the lock dog or the cam, according to the relative position of the operating member and the first rod.

10. In combination, a drive shaft, a fixed clutch member on the drive shaft, a relatively rotatable clutch member carried by the drive shaft, a driven member connected to the rotatable clutch member, and an operating member fastened to the fixed clutch member and movable to operatively interconnect the two clutch members.

11. In an emergency operating means for railway traffic controlling devices, two operating members concentrically pivoted for common or relative rotation, an operating lever secured by a flexible joint to one of said operating members and having a cam portion arranged to allow interlocking of said operating members when said lever assumes a position substantially parallel with the pivot axis of said operating members and to operatively disconnect said operating members when swung about said joint to a position transverse to said pivot axis, said operating lever when assuming said transverse position being capable of rotating said operating member secured thereto.

12. In an emergency operator for railway traffic controlling devices, a crank and operating lever connectible to a traffic controlling device and rockable on an axis, an element connectible to a normal operating means and movable thereby, a locking dog operable to lock said normal element, said operating lever being hinged to swing into substantial parallelism with said axis, and means controlled by said operating lever operable to interlock the crank and element and to disengage said locking dog from its locking position.

13. In an operator and selector of the character described, the combination of an operating lever hinged to a rotatable shaft so as to be operable as a selector in a quadrant between positions substantially parallel to and transverse of said rotatable shaft, of cooperating latches having intermatching arms operable by the movement of said operating lever to said parallel position to close said latches thereby rotatably holding said operating lever.

14. In an emergency operating means for railway traffic controlling devices, two mechanical members concentrically pivoted for common or relative rotation, an operating lever secured by a hinged joint to one of said members and having means arranged to allow interlocking of said mechanical members when said lever assumes a position substantially paralleling a pivotal axis of said mechanical members and to operatively disconnect said members when rotated about said hinged joint to a position transverse to said pivotal axis.

15. Means of the character described, including, a switch actuating member, manual means and power operated means for actuating said member both normally connected with the member, and means for at times disconnecting said power means from said member to permit said member to be operated by said manual means.

16. Means of the character described, including, a switch actuating member, manual means and power operated means for actuating said member both normally connected with the member, and means controlled by said normal means for at times disconnecting said power means from said member to permit operation of said member by said manual means.

17. Means of the character described, including, a switch actuating shaft, manual means and power operated means for actuating said shaft both normally connected with said shaft, and means controlled by said manual means for disconnecting said power means from said shaft before said shaft can be actuated by said manual means.

18. Means of the character described, including, a switch actuating shaft, manually operable means for actuating said shaft constantly connected with the shaft, power operated means for actuating said shaft adapted to be at times connected with the shaft, and means controlled by said manually operable means for at times connecting said power operated means with the shaft.

19. Means of the character described, including, a switch actuating shaft, a crank normally connected with the shaft, power means for operating said crank, and a single lever constantly connected with the shaft for at times disconnecting said crank from said shaft and for rotating said shaft manually.

20. Means of the character described, including, a switch actuating shaft, power operated means for actuating said shaft normally connected with the shaft, and a single lever constantly connected with said shaft for at times disconnecting said power operated means from said shaft and for rotating said shaft manually.

21. Means of the character described, including, a switch actuating shaft, power means for actuating said shaft normally connected with the shaft, a manually operable lever constantly connected with the shaft and rotatable in two planes, and means responsive to rotation of said lever in one plane for disconnecting said power means from said shaft in order to permit operation of said shaft by rotation of said lever in the other plane.

22. In an emergency operating means for railway traffic controlling devices, two operating members concentrically pivoted for common or relative rotation, an operating lever secured by an articulated joint to one of said operating members and having a cam portion arranged to allow interlocking of said operating members when said lever assumes a position substantially parallel with the pivot axis of said operating members and to operatively disconnect said operating members when swung about said joint to a position transverse to said pivot axis, said operating lever when assuming said transverse position being capable of rotating said operating member secured thereto.

23. Railway switch operating apparatus comprising a switch actuating member, manual means and power operated means for actuating said member both normally connected with the member, and means for at times disconnecting said power means from said member to permit said member to be operated by said manual means.

24. Railway switch operating apparatus com-

prising a switch actuating member, manual means and power operated means for actuating said member both normally connected with the member, and means controlled by said manual means for at times disconnecting said power means from said member to permit operation of said member by said manual means.

25. Railway switch operating apparatus comprising a switch actuating shaft, manual means and power operated means for actuating said shaft both normally connected with said shaft, and means controlled by said manual means for disconnecting said power means from said shaft before said shaft can be actuated by said manual means.

26. Railway switch operating apparatus comprising a switch actuating shaft, power means for actuating said shaft normally connected with the shaft, a manually operable lever constantly connected with the shaft and rotatable in two planes and means responsive to rotation of said lever in one plane for disconnecting said power means from said shaft in order to permit operation of said shaft by rotation of said lever in the other plane.

27. In a dual control selector for track switches and the like, a shaft supported in bearings, a crank fixed to the shaft and operably connected to switch points, a power operated drive member loosely mounted on the shaft, a hand operable lever permanently hinged to the shaft, and coupling means for operatively interconnecting the drive member and the shaft, said coupling means being controlled by the hand lever.

28. In a dual control selector for track switches and the like, a shaft supported in bearings, a crank fixed to the shaft and operably connected to switch points, a power operated drive member loosely mounted on the shaft, a hand operable lever permanently hinged to the shaft and movable to be substantially parallel with, or at an angle to, the shaft, coupling means for operatively interconnecting the drive member and the shaft, said coupling means being controlled by the hand lever to be effective when the hand lever is substantially parallel with the shaft, and ineffective when the hand lever is at an angle to the shaft, a receiving means for the hand lever in its parallel position and lock means for positively locking the lever in this position.

HERBERT B. TAYLOR.