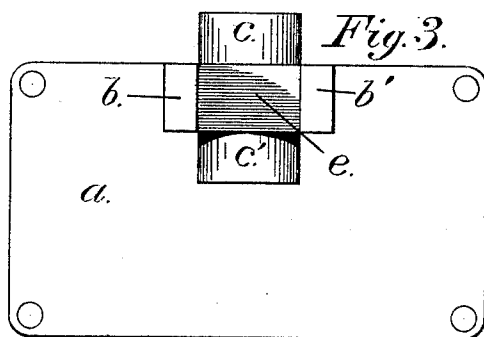
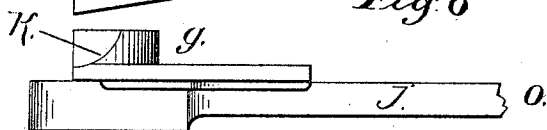
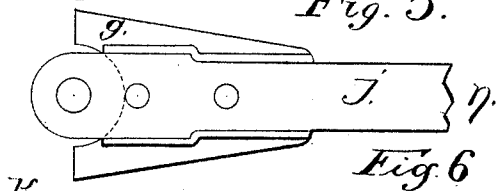
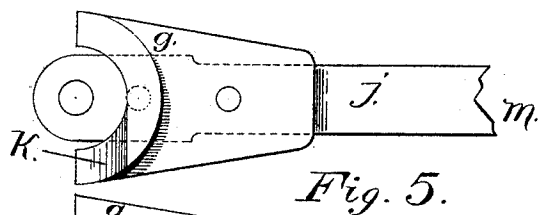
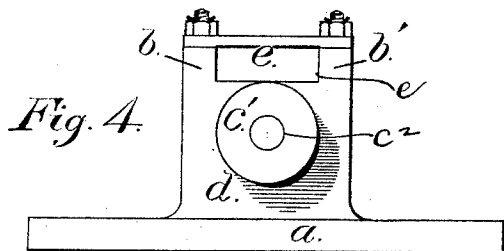
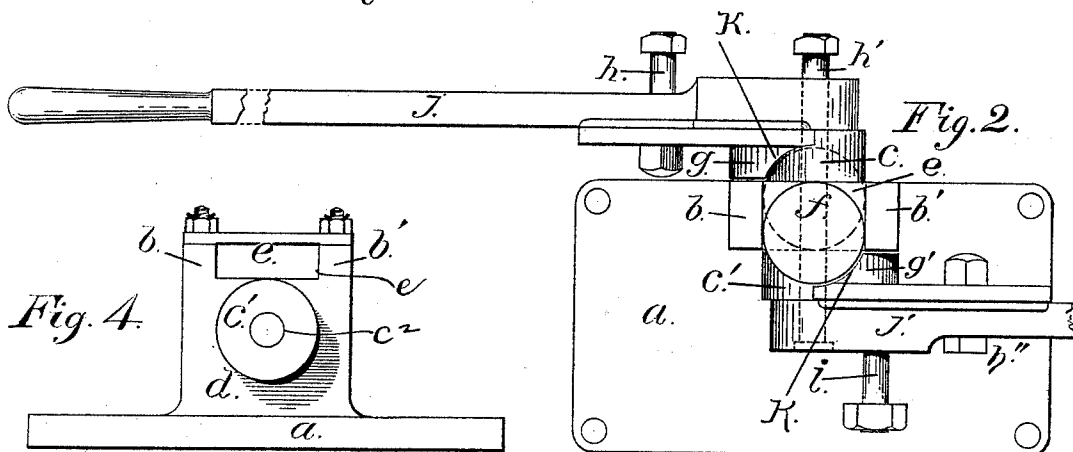
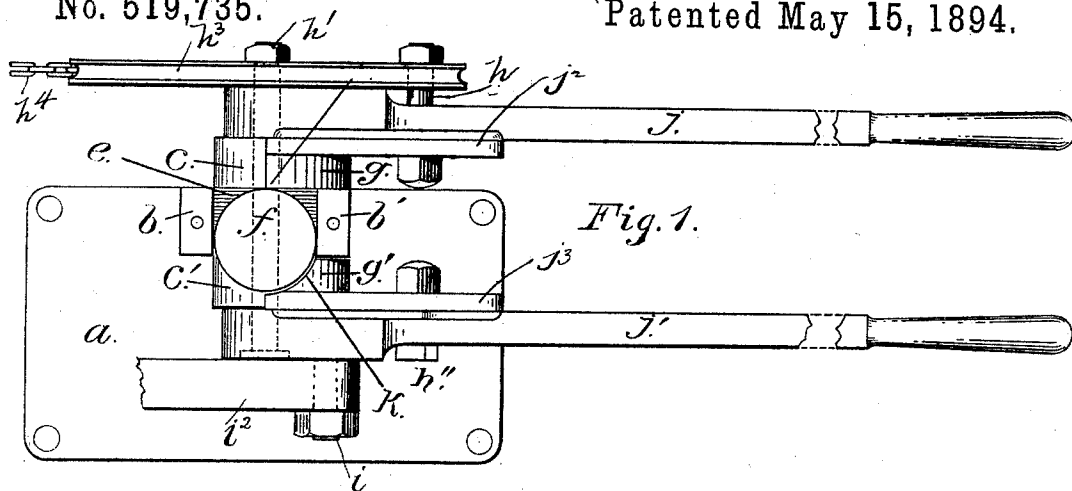


N. RATCHFORD.

SWITCH AND SIGNAL OPERATING MECHANISM.

No. 519,735.

Patented May 15, 1894.



Witnesses,
J. C. Bradshaw
A. L. Phelps

Inventor,
Nicholas Ratchford
By Staley and Stephens atty

(No Model.)

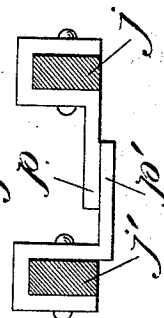
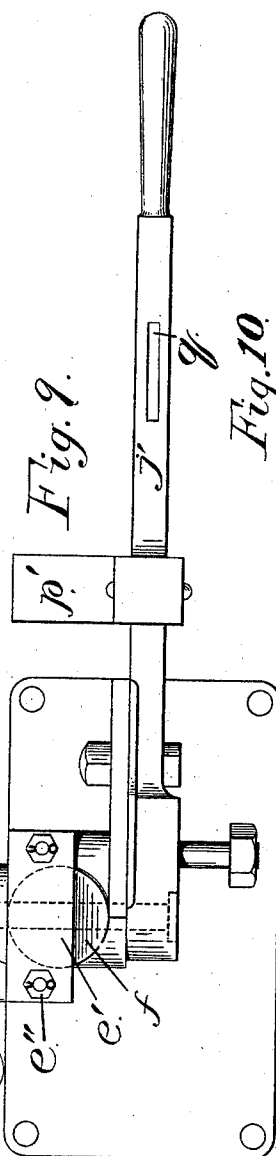
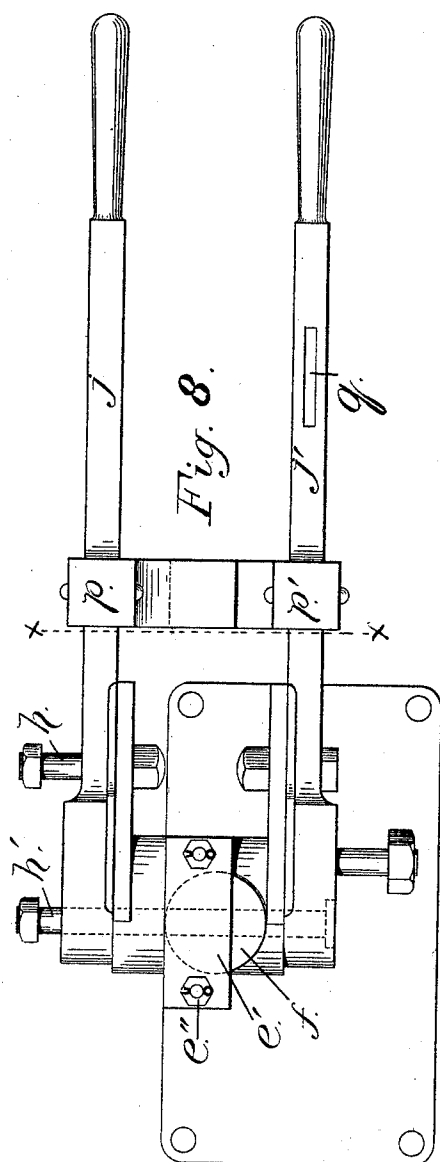
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Attys.

UNITED STATES PATENT OFFICE.

NICHOLAS RATCHFORD, OF COVINGTON, OHIO.

SWITCH AND SIGNAL OPERATING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 519,735, dated May 15, 1894.

Application filed August 11, 1893. Serial No. 482,917. (No model.)

To all whom it may concern:

Be it known that I, NICHOLAS RATCHFORD, a citizen of the United States, residing at Covington, in the county of Miami and State of Ohio, have invented a certain new and useful Improvement in a Combined Switch and Signal Operating Mechanism, of which the following is a specification.

My invention relates to the improvement of railway switch and signal operating mechanisms, and has particular relation to that class of mechanism wherein a signal and switch are connected through the medium of chains and wires with operating levers.

The objects of my invention are to provide a simple and reliable mechanism of this class of such construction and operation as to prevent the switch being thrown from a main track movement to a side track movement without first operating a signal; to admit of its operation in a safe and effective manner; to construct the device in a durable and inexpensive form and to produce other improvements which will be more specifically pointed out hereinafter. These objects I accomplish in the manner illustrated in the accompanying drawings, in which—

Figure 1 is a plan view of my improved switch and signal operating device, showing the position of the levers when the main track is cleared. Fig. 2 is a similar view showing the position of one of the levers when the signal has been operated thereby. Fig. 3 is a plan view with the levers, stand top plate and operating disk removed. Fig. 4 is a side elevation of the stand showing the levers and operating disk removed. Fig. 5 is a detail inner side view of one of the operating levers. Fig. 6 is an outer side view of the same. Fig. 7 is a plan view of said lever. Figs. 8 and 9 are respectively views corresponding to Figs. 1 and 2, showing the addition thereto of overlapping lever arms and Fig. 10 is a transverse section on line *x x* of Fig. 8.

Similar letters refer to similar parts throughout the several views.

a represents a suitable base plate which is adapted to be rigidly secured upon the extensions of the railway ties or otherwise supported adjacent to a railway track. From this base *a* rises a suitable stand or lever block *d*, which on its upper side is provided

adjoining its forward and rear side with vertical extensions *b b'*, thus forming between the latter in the top of said stand, a transverse way or channel *e*. This channel portion *e* is normally covered by a plate *e'*. On opposite sides of the stand *d* are provided projecting rounded bosses or hubs *c, c'*, through which pass centrally a pin or shaft opening *c²*, the latter being continued through the body of the stand. Within the channel or seat *e* between the stand projections *b b'* and beneath the plate *e'* is loosely seated a locking disk *f*, said disk being of such circumference that when centrally seated in the channel *e* it will project over the inner end portions of the hubs or bosses *c'*.

j j' represent the operating levers of my device, the bodies of which consist of suitable elongated bars provided at their outer ends with desirable handle portions as indicated. The inner ends of these levers *j j'* are fulcrumed at the centers of the bosses *c c'* by means of a suitable pin or bolt *h'* which passes through the pin hole *c²*. Near the inner end of each of the levers *j j'* is secured on the inner side thereof a cam plate, the latter being indicated at *j² j³*. The forward and enlarged end portions of each of these cam plates is provided on its inner side with an inwardly projecting semi-circular cam lug, which are indicated at *g g'*. These semi-circular cam lugs together with the correspondingly shaped and flush ends of the plates *j² j³* are adapted to bear as shown, on the peripheries of the stand hubs *c c'*. As indicated in the drawings, one end of each of the lugs *g* is squared, while the remaining end is inclined or beveled from its outer side or face, said incline or bevel extending downward to meet the inner face of the plate *j²*. These beveled end portions of the lugs are so arranged with relation to each other that when said lever arms are opposite each other and lying on the same side of the stand, the beveled end of one of said lugs is at the lower end thereof, while the corresponding end of the remaining lug is at the upper end thereof. Projecting laterally from the lever arm *j* opposite the rear portion of the plate *j²* is a bolt or pin *h*. Upon the outer projecting end portion of the pin *h'* is mounted a grooved wheel *h³* about which passes and to which is secured the usual sig-

nal operating chain h^4 said wheel being also connected with the lever bolt h . Projecting laterally from the inner end portion of the lever j' , is a pin i with which is connected the usual switch tongue operating arm i^2 .

As indicated in Figs. 8, 9 and 10 of the drawings, I may provide each of the lever arms j j' with an inwardly extending plate or arm, which are indicated at p p' , which projects at right angles with said lever arms and on such plane as to cause one of said arms p p' to overlap the other when the lever arms are opposite each other. Any suitable and well known means may be provided for locking the lever arm j' in a horizontal position through the usual slotted opening q in said arm.

In order to illustrate the operation and use of my device I will assume that the usual signal controlled by the chain h^4 indicates that the way is clear for cars to run upon the main track, that the lever arms j j' are down in the horizontal positions shown in Fig. 1 and that the beveled end of the cam lug g' is uppermost. The operation of throwing the switch in order to direct cars from the main to the side track consists in reversing the lever j' and as will readily be seen when the parts are in the position above specified, the bearing of the locking disk f against the inner side or surface of the lug g will so support said disk as to bring the opposite side of the latter into contact with the beveled end portion of the lug g' when the latter is turned upward and thus prevent the movement of the switch operating lever. In order, however, to accomplish the throwing of said switch lever, it will be seen that the signal lever must first be reversed, thus bringing the beveled end portion of the lug g opposite the disk f or a portion thereof, and allowing the latter to be moved laterally by frictional contact of the lug g' when the switch lever is reversed. From this operation it will readily be seen that the switch lever cannot be thrown and the switch cannot therefore be operated or changed without first operating the signal controlled by the lever j , in as much as the reversal of the signal lever serves in the manner above described to unlock the switch lever. It will thus be seen that any danger of accidents occurring through carelessness of an employé in changing the course of travel from the main to the side track without first displaying a signal to that effect, is entirely obviated.

In again clearing the main track and returning the switch tongue to its former position, it will be seen that the switch operating lever must be utilized first, in as much as the signal lever is locked from movement on account of the contact of the locking disk with the inner side of the squared end of the lug g' . In case, however, that the operator should forget to follow the operation of the switch lever with the operation of the signal lever, it will be seen that the signal will be retained at a danger position, thus indicating to the

engineer of an approaching train that he must approach with caution.

It is obvious that in the operation of my device the contact of the lever lugs with the periphery of the locking disk will result not only in the above mentioned lateral movement of said disk, but in a partial rotation of the latter at each contact of a lever lug therewith. The progressive rotary motion thus imparted to the disk must result, as will readily be seen, in distributing the wear of the disk over its entire periphery, thereby so equalizing the wear as to prolong the life of the stand and retain said disk in operative condition.

It is evident from the construction which I have herein shown and described that a simple, reliable and effective means is provided for preventing the opening of the main track without first operating the signal.

As a further indication to the operator of the lever to be first operated, I may provide the arms p p' , the uppermost arm of the latter always indicating the lever which may be thrown first. It is obvious that a switch mechanism constructed as herein described may be produced at a reasonable cost of manufacture and that the parts of the same are so arranged as to obviate any tendency of the same getting out of order.

Having now fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a railway switch and signal operating mechanism, the combination with a stand d and a transverse way or channel in the upper end thereof and a disk loosely seated in said way, of levers j j' fulcrumed on opposite sides of said stand and cam lugs on the inner faces of said levers, said lugs being of such form as to prevent the movement of the lug of one of said levers past the periphery of the locking disk without first reversing the remaining lever when said levers are thrown to the same side of the stand substantially as and for the purpose specified.

2. In a combined switch and signal operating mechanism, the combination with a stand, and a transverse seat in the upper side thereof and a locking disk loosely supported in said way, of levers j j' fulcrumed on opposite sides of said stand, semi-circular cam projections on the inner sides of said lever arms, said cam projections being provided with alternately arranged beveled ends as described, a switch connection with the lever j' and a signal operating connection with the lever j , substantially as described.

3. In a combined signal and switch operating mechanism, the combination with a stand having an upper end channel or way e , and a locking disk supported loosely in said way, of levers j j' fulcrumed on opposite sides of said stand, plates j^2 j^3 on the inner sides of said lever end portions, semi-circular cam lugs on the inner faces of said plates, each of said cam lugs having a beveled end

portion, said beveled end portions being located, one at the upper end of one of said lugs and the other at the lower end of the other when said arms are on the same side of the stand, a signal operating connection with said lever *j*, and a switch operating connection with said lever *j'*, and inwardly extend-

ing and overlapping arms *p p'* on said levers, substantially as and for the purpose specified.

NICHOLAS RATCHFORD.

In presence of—

C. W. VOORHEES,
C. C. SHEPHERD.