F. H. KITTREDGE.

INTERLOCKING SAFETY MECHANISM FOR CONTROLLING DEVICES.

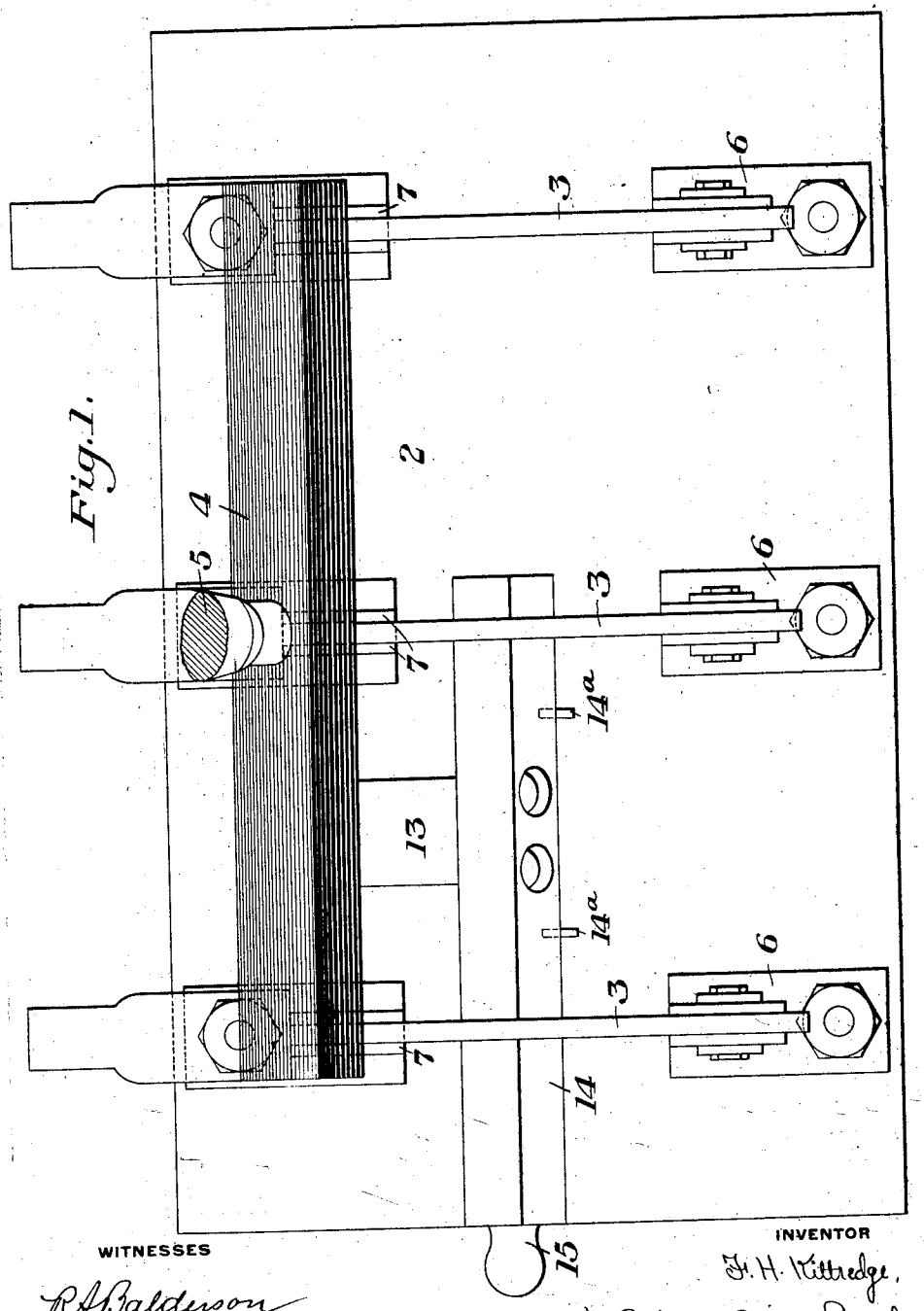
APPLICATION FILED MAY 17, 1909.

964,654.

Patented July 19, 1910.

2 SHEETS—SHEET 1.

Fig. 1.



WITNESSES

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2 SHEETS—SHEET 2.

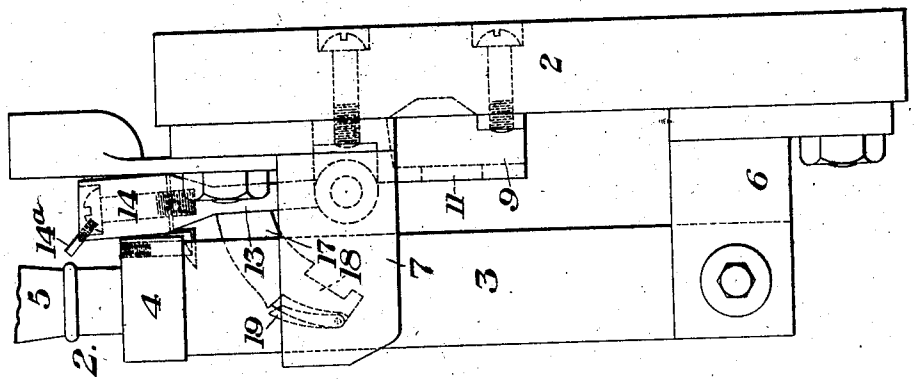

Fig. 2.

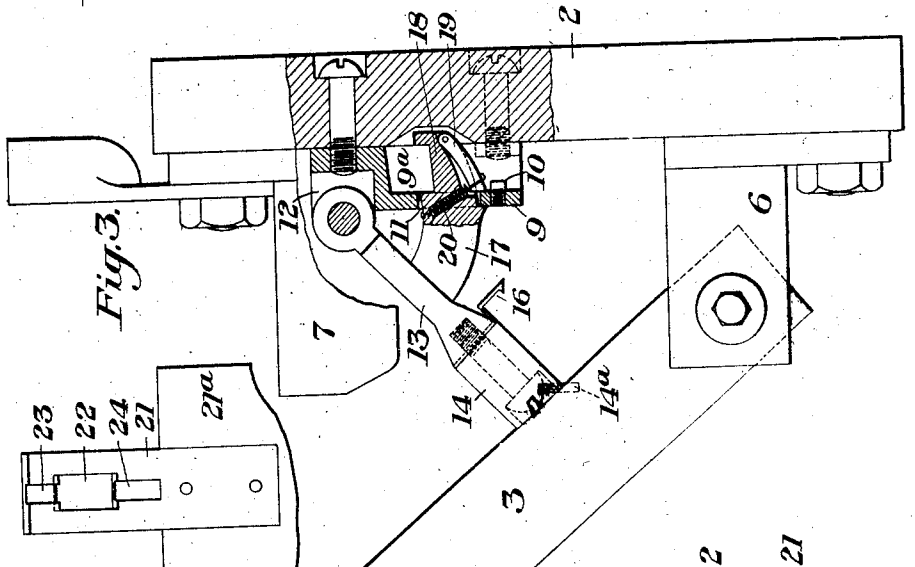

Fig. 3.

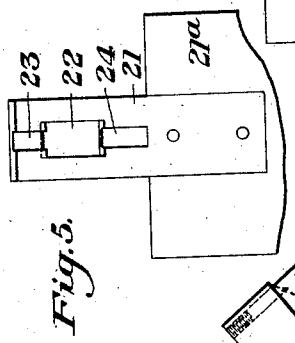

Fig. 5.

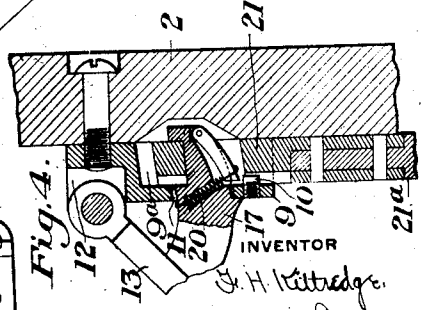

Fig. 4.

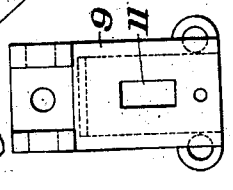

Fig. 6.

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UNITED STATES PATENT OFFICE.

FRANK H. KITTREDGE, OF JOLIET, ILLINOIS.

INTERLOCKING SAFETY MECHANISM FOR CONTROLLING DEVICES.

964,654. Specification of Letters Patent. Patented July 19, 1910.

Application filed May 17, 1909. Serial No. 496,441.

To all whom it may concern:

Be it known that I, FRANK H. KITTREDGE, of Joliet, Illinois, have invented a new and useful Interlocking Safety Mechanism for Controlling Devices, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a front elevation of an electric switch showing one form of my automatic locking mechanism, for the switch blades; Fig. 2 is a side elevation of the same showing the switch in its closed position; Fig. 3 is a similar view showing the switch levers in their open position and a portion of the switch base and locking mechanism in section; Fig. 4 is a detail sectional view similar to Fig. 3 with the key in position; Fig. 5 is a face view of the key; and Fig. 6 is a face view of the lock plate.

This invention relates to an improvement in automatic locking mechanism for controlling devices, such as valves, electric controllers, operating levers or electric switches which control the flow of motive power.

The object of my invention is to provide a novel, simple and effective device which is of cheap construction and which will automatically lock the movable member of the controlling device in a position which will stop the flow of the motive power, and will prevent the said device from being again moved except by an authorized person having a releasing or interlocking key, thereby preventing injury to life, limb or machinery by the device being thrown at an improper time.

The precise nature of my invention will be best understood by reference to the accompanying drawings, which will now be described, it being premised, however, that various changes in the arrangement and details of construction may be made without departing from the spirit and scope of my invention as defined in the claims.

In the drawings, the numeral 2 designates the base of a well known type of switch for closing and opening the circuit of an electric current. This switch comprises the three blades, 3, 3, which are connected together at their upper ends by means of the cross-bar 4 made of any well known insulating material, and provided with a handle 5. Each of these blades is pivotally connected to one of the terminals 6, which are in turn connected to the base 2. Connected to the base 2 above each of the terminals 6, and in alinement with the blades 3 are the spring contacts 7, which form the other terminal for each of the blades 3.

Projecting from the under face of the cross-bar 4 is a projection 8, which is provided for the purpose hereinafter described. Secured to the base between the terminals 6 and 7 is a lock case 9 provided with a recess 9^a, the lower end of which is open for the insertion of a key. Projecting into this recess 9^a from the face of the lock case 9 is a pin or projection 10, and extending through the face of this lock case 9 is an opening 11. Pivotally mounted upon lugs or projections 12 on the lock case 9 is a blocking lever 13, provided with the bar 14, which is secured to the end thereof, in any well known manner. This bar 14, as shown in the drawings, extends across the under face of at least two of the blades 3 and projects sufficiently to the side of the end blade to form a handle 15 at the end thereof, and it is also provided with one or more pins 14^a for the purpose hereinafter described. Secured to the outer end of this lever 13 is a spring catch 16, which engages the projection 8 on the cross-bar 4 when the switch is closed as shown in Fig. 2, and connected to the lower face of this lever 13 is an arm 17 whose outer end is provided with a member 18 which is recessed transversely on its upper face and longitudinally on its lower face. Pivotally mounted in the longitudinal recess in the lower face of this projection 18, is a latch 19, which is normally held in the position shown in Figs. 3 and 4, by means of a compression spring 20.

21 is a key which is used for engaging the pivoted latch 19 to release the same from the lock case, and is provided with a depending check 21^a which may be marked or numbered so as to identify the key. This key 21 is provided with an orifice 22, and is also provided with two recesses 23 and 24 on the face thereof. The recess 23 extends from the opening 22 to the end of the key, and the recess 24 extends from the opening 22 to a point considerably below the opening.

The operation is as follows: When the switch is in its closed position, as shown in Fig. 2, the spring catch 16 engages the projection 8 when the blades are in their closed position. When the switch is opened the

engagement of the projection on the switch with the catch on the locking lever will draw the blocking lever from a vertical to an angular position, and as soon as the engagement between this blocking lever and the switch is broken, the blocking lever will fall by gravity and if the switch lever has not been moved far enough to allow the blocking lever to fall into the position shown in Fig. 3, the return of the switch lever is prevented by the engagement of the bar 4 with the pins 14^a on the blocking lever. However if the switch lever has been drawn out far enough so as to allow the blocking lever to assume the position shown in Fig. 3, the blocking lever is locked in this position by means of the engagement of the spring latch 19 with the face of the lock-case 8 and cannot be raised until after the spring latch 19 has been disengaged from the face of this lock-case. The projection 10 acts as a stop for the spring lever 19, and also assists in partially closing the lower end of the recess 9, to prevent the insertion of a stick or similar object to unlock the lever. If the proper key is inserted into the open end of the recess 9^a, the recess 23 on the key 21 will pass over the projection 10 and the end of the key will engage the latch lever 19 and release it from engagement with the face of the lock-case, after which the lever can be raised into the position shown in Fig. 2 and allow the switch blades 3 to be closed. If this switch is open and a lineman desires to work on the line he will insert the key and release the blocking lever, and after he has released this lever he will advance the key into the recess 9^a. after which he will drop the locking lever and allow the projection 18 thereof to pass through the hole 22 in the key. The key may then be dropped into the transverse recess along the upper face of the projection. This will notify the switchman that some one is working on the line, and that the same is not to be closed until after the lineman's key has been removed from the lock. This will overcome a great many accidents which are caused by the switchman going to the board and opening the switch for some cause or other, and after the same has been opened, a lineman may come to open the switch preparatory to working on that line. Seeing that the switch is open, he may assume that the line will be safe until after he has made the necessary repairs, but as the switchman has not been notified that a lineman is working on this particular line, he may close the switch and pass current through the line while the lineman is working thereon. The insertion of the key by the lineman notifies the switchman that a lineman is working on the line, and the number on the check attached to the key informs the switchman as to the identity of the lineman. After the lineman has repaired the line he will push the key into the lock a distance sufficiently to release the spring latch 19 from engagement with the face of the lock case, raise the blocking lever and remove the key. He can then either close the switch or throw the locking lever into the position shown in Fig. 3. The switchman in passing the switch will be able to see that the key has been removed and that no one is working on the line, and when he so desires, he can use his own key to unlock the blocking lever and close the switch.

It will be readily understood by those familiar with the art that various changes can be made in the details of construction, so that this blocking mechanism may be applied to electrical switches of various types, as well as levers, or movable members for controlling valves in steam or water lines.

I claim:

1. A controlling device for power lines comprising a movable circuit closing member, a blocking member and a connection between said members arranged to move the blocking member into blocking engagement with the circuit closing member and hold the movable circuit closing member in its opened position after said member is moved to open the circuit; substantially as described.

2. A controlling device for power lines comprising a movable circuit closing member, a blocking member adapted to engage with and hold the controlling member in its opened position, means controlled by the movement of said controlling member for moving the blocking member into its blocking position and means for locking the blocking member in its blocking position; substantially as described.

3. A controlling device for power lines, comprising a pivoted controlling lever, a blocking member, a connection between the controlling lever and the blocking member to move the blocking member to prevent the return of the controlling lever when said lever is moved to shut off the power, and means to lock the blocking member in its thrown position; substantially as described.

4. A controlling device for power lines, comprising a pivoted controlling lever, a pivoted blocking member, a connection between the controlling lever and the blocking member to move the blocking member to prevent the return of the controlling lever when said controlling lever is moved to shut off the power, and means to lock the blocking member in its thrown position; substantially as described.

5. A switch for electric circuits comprising a pivoted switch lever, a contact in the line of movement of said lever, a blocking lever and a connection between the levers

adapted to move the blocking lever into locking engagement with the switch lever and retain said switch lever in its open position when moved out of engagement with the switch contact; substantially as described.

6. A switch for electric circuits, comprising a pivoted switch lever, a contact in line of movement of the switch lever, a lock case, a blocking lever pivoted to the lock case, a pivoted spring latch connected to the blocking lever, means to move the blocking lever when the switch lever is moved away from said contact, and a recess in said lock case to receive the spring latch; substantially as described.

7. A switch for electric circuits, comprising a pivoted switch lever, a contact in the line of movement of the switch lever, a lock case having a recess therein, a blocking lever pivoted to the lock case, a spring latch pivoted to the blocking lever and arranged to enter the recess and engage the lock case to lock the blocking lever to the lock case; substantially as described.

8. A switch for electric circuits, comprising a pivoted switch lever, a contact in line of movement of the switch lever, a lock case having a key slot therein, an opening extending through the lock case into the recess, a blocking lever pivoted to the lock case having a projection provided with a pivoted spring latch to enter the opening through the lock case, the pivoted latch engaging the inner face of the lock case, a projection on the inner face of the lock case within the key slot and a key having a recess to pass over the projection in the key slot to engage and release the spring catch; substantially as described.

9. A switch for electric circuits, comprising a pivoted switch lever, a contact in line of movement of the switch lever, a lock case having a key slot therein, an opening extending through the lock case into the recess, a blocking lever pivoted to the lock case having a projection provided with a pivoted spring latch to enter the opening through the lock case, the pivoted latch engaging the inner face of the lock case, a projection on the inner face of the lock case within the key slot and a key to be inserted in the key slot having an opening in the line of movement of the projection on the blocking lever to lock the key to the lock case; substantially as described.

10. A switch for electric circuits comprising a pivoted switch lever, a pivoted blocking lever arranged to contact with and hold the switch lever in its open position, mechanism controlled by the opening of said switch lever in opening the circuit arranged to move the blocking lever into operative engagement with the switch lever, and means for locking the blocking lever in its blocking engagement with the switch lever; substantially as described

In testimony whereof I have hereunto set my hand.

FRANK H. KITTREDGE.

Witnesses:
R. W. CAMPBELL,
RUTH G. HURD.