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2 SHEETS-SHEET 1.



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J. S. HOBSON.
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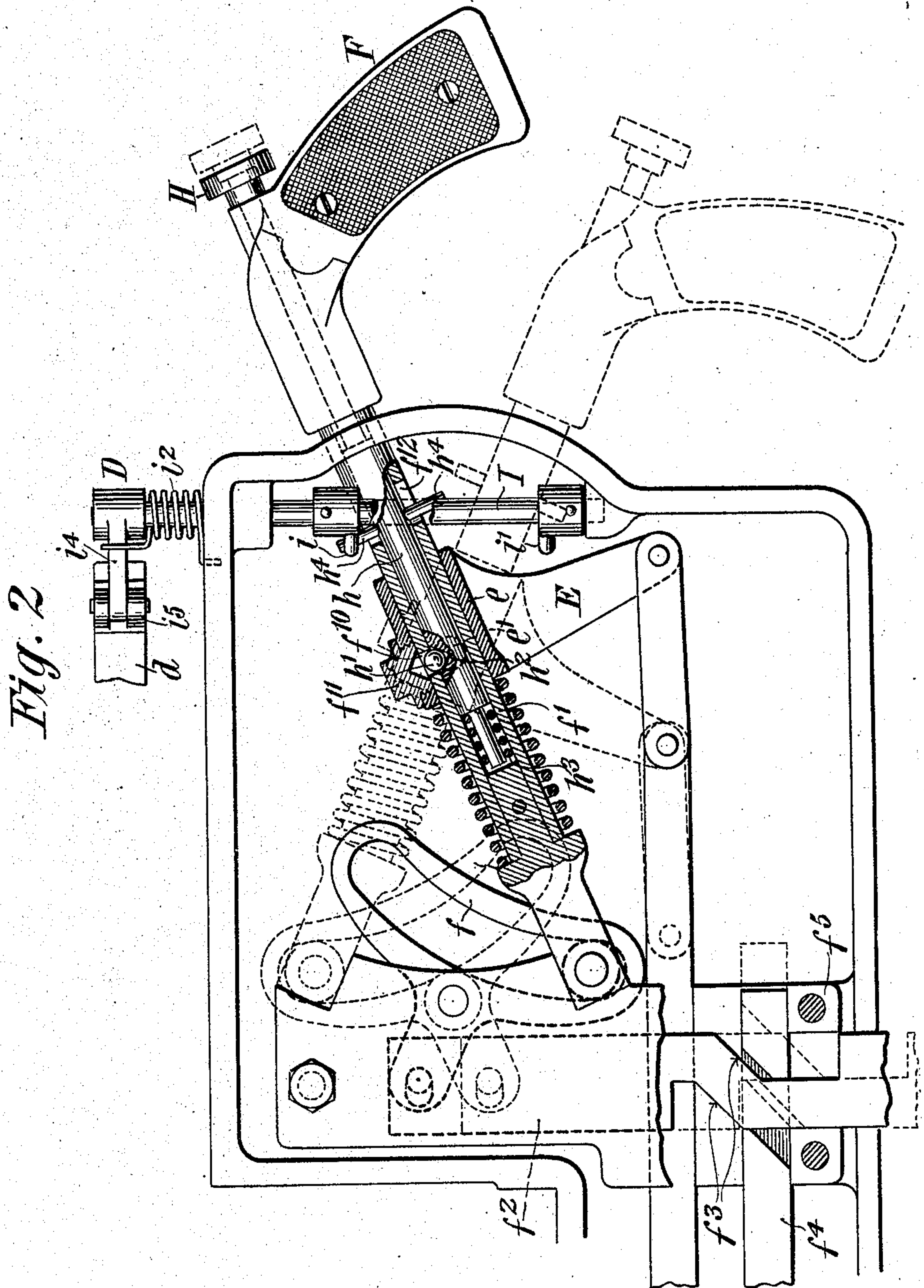


Fig. 2

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UNITED STATES PATENT OFFICE.

JOHN S. HOBSON, OF EDGEWOOD PARK, PENNSYLVANIA, ASSIGNOR TO THE UNION SWITCH & SIGNAL COMPANY, OF SWISSVALE, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

INTERLOCKING MACHINE.

No. 911,723.

Specification of Letters Patent.

Patented Feb. 9, 1909.

Application filed September 14, 1908. Serial No. 452,805.

To all whom it may concern:

Be it known that I, JOHN S. HOBSON, a citizen of the United States, residing at Edgewood Park, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Interlocking Machines, of which the following is a specification.

My invention relates to interlocking machines.

Interlocking machines, as is well known in the signaling and switching art, comprise a number of levers for moving or controlling the movement of switches and signals and mechanical interlocking which latter insures an operation of certain levers in a prearranged sequence as well as to prevent the operation of levers which move or control switches or signals to set up conflicting routes for cars or trains. In interlocking machines used for controlling the operation of motors comprised in switch and signal mechanisms, "indicating mechanisms" are employed in connection with the levers, each of which "indicating mechanism" comprises an electrically operated lock. The functions of these "indicating mechanisms" is well understood in the art and need not be described. In some installation of switches it is usual to employ what is known as "electric detector circuits" instead of the usual detector bar, and when such "electric detector circuits" are used, it is necessary to provide the levers operating or controlling the operation of switches employing the "electric detector circuit" with electric locks which are controlled by the said "electric detector circuit." Usually the circuit for this lock is open so that the lock is effective to hold the lever against a preliminary movement preventing a switch being thrown under a car. It will be seen, therefore, that before the lever can be moved it is necessary to operate the electric locks. If an attempt is made to move the lever without doing this the parts may be injured or otherwise affected to prevent a proper and easy operation of the lever.

It is an object of my invention to insure the operator closing the open circuit on the electric lock (and thus operating it to release the lever provided all other conditions are right to operate said lever) before he attempts to move his lever, thus avoiding binding the latch of the said electric lock.

I will describe an interlocking machine embodying my invention and then point out the novel features thereof in claims.

In the accompanying drawings, Figure 1 is a view in side elevation of a part of an interlocking machine showing a controlling lever, the "indicating mechanism" and electric lock therefor, an electric detector circuit therefor and embodying my invention. Fig. 2 is a detail view of the controlling lever several of its associated parts being in section. Fig. 3 is a detail view.

Similar letters of reference designate corresponding parts in all of the figures.

Referring to Fig. 1, A designates a portion of a railway track, and A¹ a switch by which trains may be deflected from and onto the track A. I have not illustrated any form of motor mechanism for shifting the switch back and forth in the usual way, and any of the well known forms of such mechanisms may be used together with the proper controlling and indication circuits therefor. An indication mechanism is conventionally shown and designated B, and it operates in a usual and well known way as regards the limiting of the movement of the lever.

F designates a lever for controlling the operation of the switch moving mechanism. The lever F is connected with a slotted quadrant *f* by a hollow rod *f*¹ which extends through a cylindrical portion *e* of an arm E, which is also provided with trunnions *e*¹ suitably journaled in the framework of the machine. The lever F and rod *f*¹ when moved longitudinally, rocks the quadrant *f* on its pivot, and the quadrant in turn moves a bar *f*² having cam surfaces *f*³, to operate that part of the mechanical interlocking G which is associated with it. The cam surfaces *f*³ move a rod or bar *f*⁴ supported in guides *f*⁵ and having two notches *f*⁶, *f*⁷ with which a latch *c*¹ of a lock C is adapted to coact as will be hereinafter described. It will be seen that until the latch *c*¹ is disengaged from either of the notches *f*⁶, *f*⁷ the lever F cannot be moved longitudinally. After the longitudinal movement the lever may be given an oscillatory movement from the position shown in full lines to the position shown in dotted lines (see Fig. 2). These longitudinal and oscillatory movements perform functions well known in the art and are set forth in U. S. Patent No. 887,287 granted May 12, 1908, for an inven-

tion of John D. Taylor. The latch c^1 is moved by an electro-magnetic device c the circuit for which is controlled at one point by a circuit controller D which is operated from a push button mechanism comprised in the lever F and the rod f^1 . The push button mechanism comprises a push button H, a rod h extending therefrom and through the hollow rod f^1 and a ball or other device h^1 located in an opening f^{10} provided for it in the rod f^1 (see Fig. 1). A notch or cutout portion h^2 is provided in the rod h and when moved under the ball h^1 by the push-button H receives the ball from the opening f^{10} (see Fig. 2). The notch h^2 is held out of position under the ball h^1 by means of a spring h^3 . In the usual position of the parts (see Fig. 1) the ball h^1 is held in the opening f^{10} by the plug f^{11} which is notched to receive a portion of the ball h^1 , and in this position it will be seen that the lever F and hollow rod f^1 cannot be moved longitudinally on account of the ball being partly in the opening f^{10} and partly in the notch in the plug f^{11} . When however the push-button H is moved to bring the notch h^2 into position under the ball h^1 , the ball will fall into it and completely out of the opening f^{10} thus leaving the lever F and hollow rod f^1 free to be moved longitudinally (see full lines Fig. 2). In moving the push-button H to accomplish this, the circuit controller D is first operated to close the circuit on the electro-magnetic device c , and this may be accomplished by the following parts: A pin h^4 is carried by the rod h and its ends extend through oppositely arranged slots f^{12} in the hollow rod, f^1 . One end of the pin h^4 , when the rod h is moved by the push-button H engages an arm i on a vertically mounted shaft I to move the shaft and thus operate the circuit controller D. This operation of the shaft I occurs when the lever F is in the position shown, and when the lever is in its lower position, the other end of the pin h^4 , upon a movement of the push-button H, engages an arm i^1 also on the shaft I to operate the circuit controller D. These operations of the shaft I are against the action of a spring i^2 which when the engagement of the pin h^4 with either of the arms i or i^1 ceases, moves the shaft I to open the circuit controller.

The circuit controller D comprises a stationary contact d and a movable contact d^1 , the latter being suitably connected with the shaft I as for example by an arm i^4 and block i^5 . The electro-magnetic device c of the lock C is included in an open circuit controlled at one point by the armature r of a relay R which is included in an "electric detector circuit" and by the circuit controller D. The "electric detector circuit" comprises a source of current T. B. the track rails and the relay R. The length of track rails included in this circuit is defined by

insulated joints J which are placed in the track A adjacent the switch A, and the branch track, and portions of rails of the track A and the branch between the insulations are bonded together in any of the well known ways. The function of this circuit however arranged, to control the relay R and its armature r . That is to say, with no pair of wheels and axle of a car or train within the insulations J, current from the battery T. B. flows through the relay to energize it and attract its armature r to close the circuit of the electric lock C, but with a pair of wheels and axle within the insulations, they act as a shunt path for the battery thus depriving the relay of sufficient energizing current causing it to drop its armature and thus open the circuit of the electric lock C at that point. The circuit for the electric lock C starting from battery X is, wire 1, armature r and its contact, wire 2, electro-magnetic device c wire 3, movable contact d^1 of circuit controller D, stationary contact d and wire 4 to battery.

The lever F is shown in what is technically known as its "normal" position, and when in this position the switch A¹ is set so that cars or trains pass back and forth on the track A. If now it is desired to move the switch A the lever F is moved to the position shown in dotted line (see Fig. 2), which is technically known as its "reverse position", but before it is moved to this position the push-button H must be moved, and the switch apparatus must have moved the switch and the "indicating mechanism" responded in the manner well known in the art. In moving the switch A¹ back again the lever F is returned to its "normal" or full line position, but before it is moved to this position, the push-button H must be moved and the "indicating mechanism" respond in the manner well known in the art. It will be seen therefore that in either position of the lever the push-button H must first be moved to relieve the lever F and rod f^2 of the lock afforded by the ball H and to operate the circuit closer D to release the latch c^1 from either of the notches f^6 , f^7 (depending upon which position the lever F is in). Of course, should a train or any of its wheels or axles be within the confines of the "electric detector circuit" the relay R will be deenergized and its armature r released so that the circuit of the electro-magnetic device c will be open at that point. Consequently, under this condition, the electric lock C cannot be operated to release the lever F.

Having thus described my invention, what I claim as new is:

1. In combination with a railway switch; an electric detector circuit associated with said switch comprising a relay and armature; a lever for controlling the operation

of said switch; an electric lock for said lever; a circuit for said electric lock comprising the armature of said relay; a circuit controller for opening and closing said circuit; and means associated with the lever for operating said circuit controller to close the circuit on the electric lock to release the lever.

2. In combination with a railway switch; an electric detector circuit associated therewith comprising a relay and armature; a lever for controlling the movements of said switch; a mechanical latch for said lever; an electric lock for said lever which includes the said armature; a circuit controller for opening and closing said circuit; and means associated with said lever for operating said latch to cause it to first close the circuit controller to give battery to the electric lock circuit thereby energizing the electric lock magnet and releasing the lever at this point and secondly to mechanically release the latch and permit the lever to be operated.

3. In combination with a railway switch; an electric detector circuit associated therewith which comprises a relay and armature; a lever for controlling the movements of said switch comprising a hollow rod which is provided with an opening; a mechanical latch for said lever, comprising a ball located in said opening, a rod having a notch which when moved under the ball receives it from said opening, and means for moving

the rod to bring the notch under the ball; an electric lock for said lever which includes the said armature; and a circuit controller for opening and closing said circuit; said circuit controller being operated to close the circuit before the mechanical lock is released by said means for moving the rod comprised in the said mechanical latch.

4. In combination with a railway switch; an electrical detector circuit associated therewith comprising a relay and armature; a lever for controlling the movements of said switch and mechanical latch for said lever; an electric lock for said lever which includes said armature; a circuit controller for opening and closing said circuit, and means associated with said lever for operating said latch to have it release the lever and the circuit controller to close the circuit on the electric lock and also that to release the lever, said means comprising a rod movable longitudinally, a pin carried by said rod, a shaft, and a plurality of arms carried by said shaft with which the pin engages to operate the shaft.

In testimony whereof I have signed my name to this specification in the presence of two subscribed witnesses.

JOHN S. HOBSON.

Witnesses:

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C. C. WHITE.