(No Model.) 2 Sheets—Sheet 1.

R. H. INNES.

AUTOMATIC REPEATING RAILROAD SIGNAL.

No. 553,733. Patented Jan. 28, 1896.

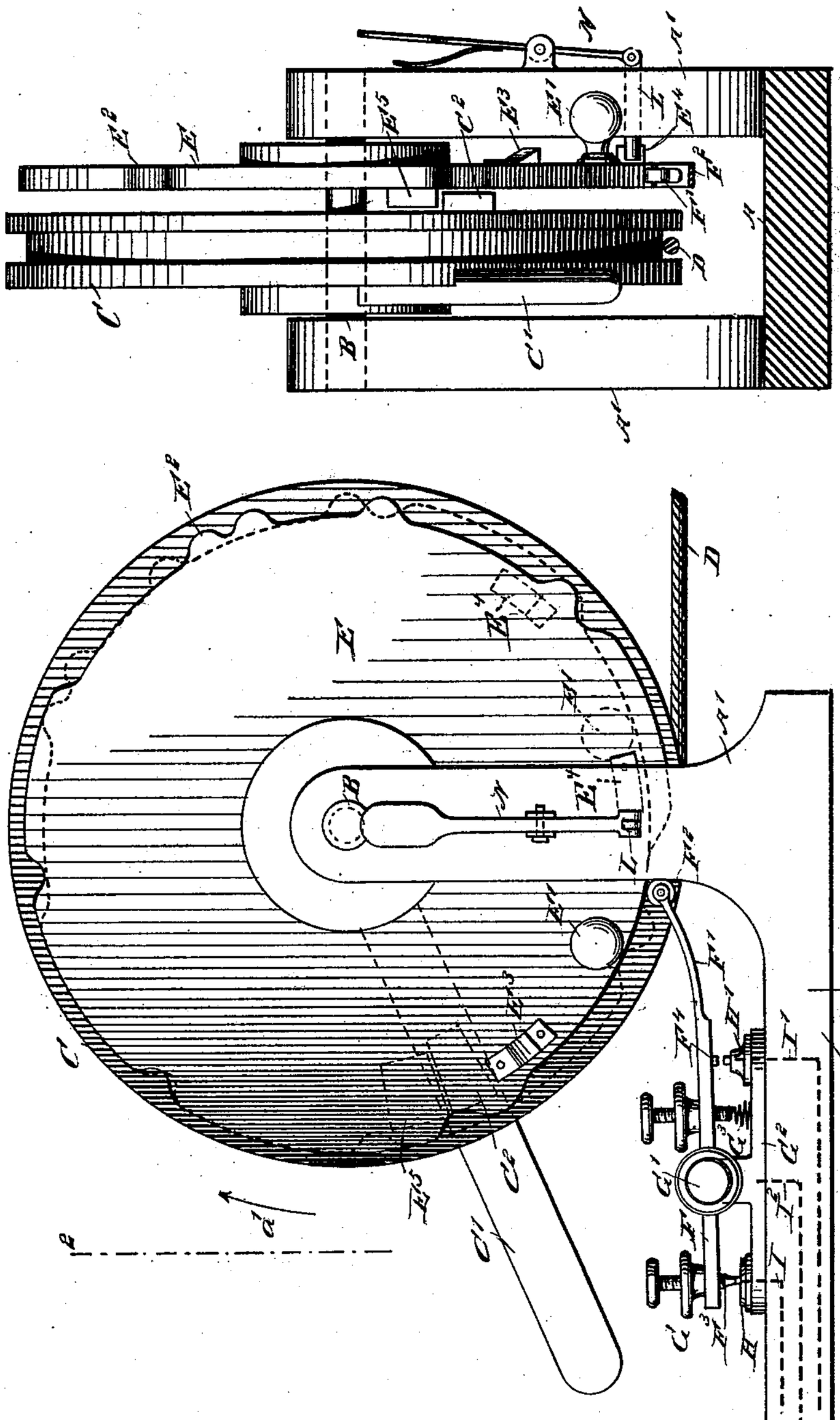

Fig. 2

Fig. 1

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(No Model.) 2 Sheets—Sheet 2.

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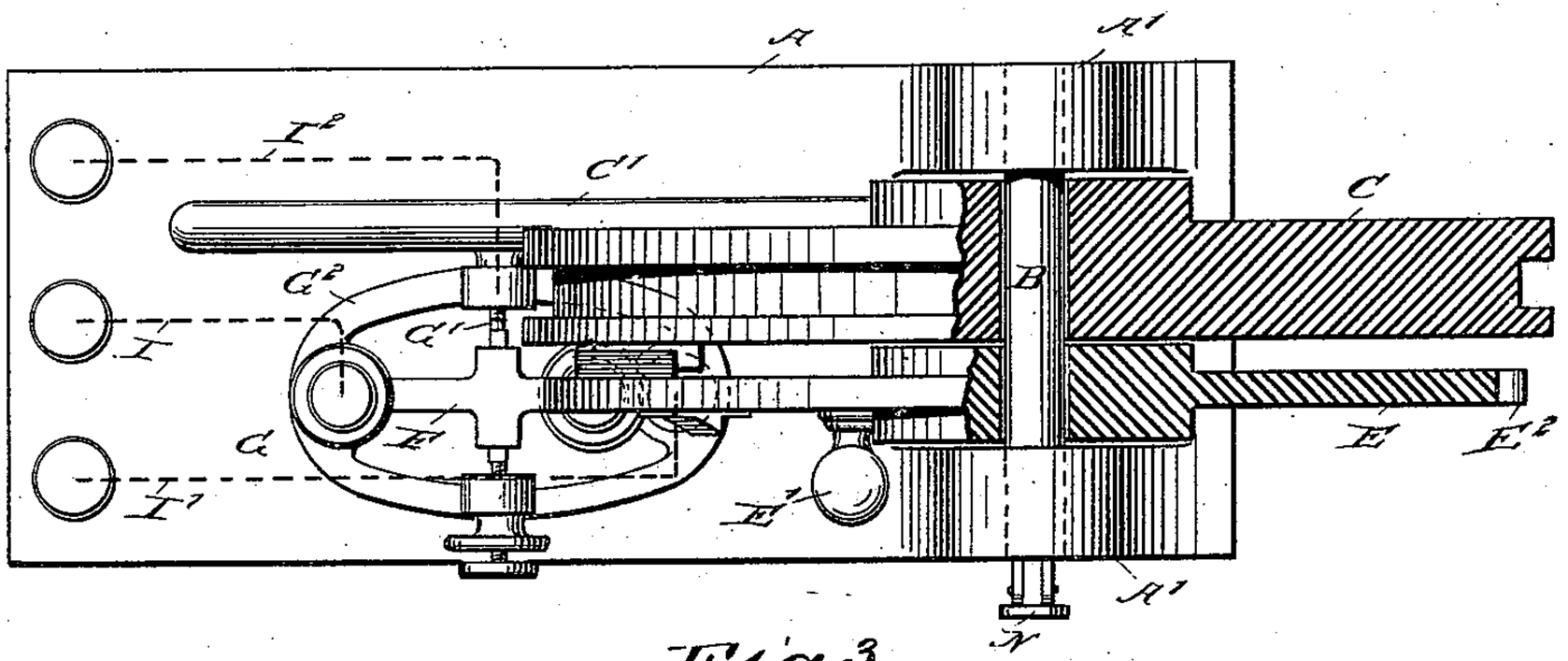


Fig. 3

Fig. 4

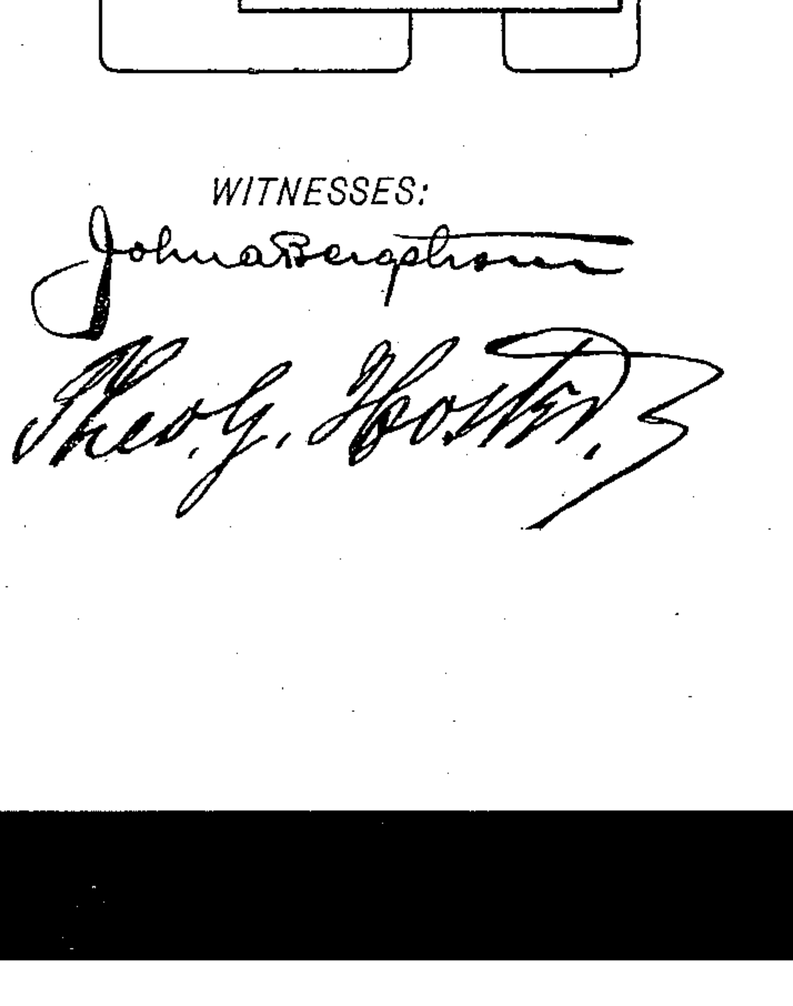
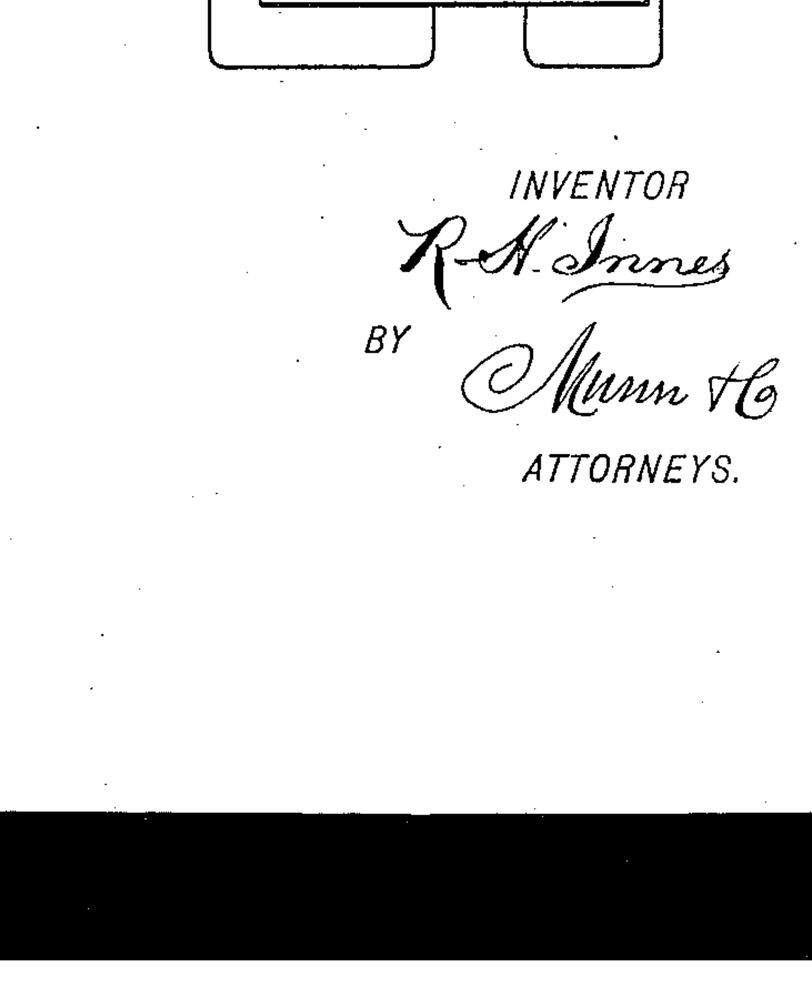


Fig. 5



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UNITED STATES PATENT OFFICE.

ROBERT HAYWARD INNES, OF SAN ANTONIO, TEXAS.

AUTOMATIC REPEATING RAILROAD-SIGNAL.

SPECIFICATION forming part of Letters Patent No. 553,733, dated January 28, 1896.

Application filed March 30, 1895. Serial No. 543,837. (No model.)

To all whom it may concern:

Be it known that I, ROBERT HAYWARD INNES, of San Antonio, in the county of Bexar and State of Texas, have invented a new and Improved Automatic Repeating Railroad-Signal, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved automatic repeating railroad-signal for use in connection with semaphore and other train-signaling apparatus and designed to prevent mistakes in manipulating the signal when notifying the central office and to automatically report any change in the position or color of the signal to a central office over the ordinary telegraph-wire.

The invention consists principally of a wheel for operating a key to send a message to the central station that the signal is changed to a "danger" position, the said wheel when turned being adapted to engage the signal-repeating device, so that when the latter is actuated to clear the signal a second message is sent to the central office to that effect.

The invention also consists of certain parts and details and combinations of the same, as will be fully described hereinafter, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of the improvement. Fig. 2 is a transverse section of the same on the line 2 2 of Fig. 1. Fig. 3 is a plan view of the same with parts in section. Fig. 4 is a diagrammatic view of the circuits, and Fig. 5 is a similar view of a modified arrangement of the circuits.

The improved apparatus is provided with a base A, on which are arranged the standards A′ carrying a shaft B, on which is mounted to rotate loosely a grooved wheel C, on which is fastened one end of a wire D connected with the signal alongside the railroad-track to permit the operator in charge of the station to throw the signal into a "danger" or "safety" position by turning the wheel C in the direction of the arrow *a′* and back.

On the wheel C is secured a handle C′ adapted to be taken hold of by the operator for turning the wheel C, as above described, the said handle C′ normally standing at the position shown in Fig. 1—that is, the position in which the signal stands at "danger." On the shaft B is also mounted to turn a disk E, likewise provided with a handle E′ adapted to be taken hold of by the operator to turn the said disk, for the purpose hereinafter more fully explained. The disk, however, turns independent of the wheel C. On the periphery of the disk E are arranged projections E^2 representing dots and dashes for transmitting a telegraphic message, as hereinafter more fully described, whenever the disk E is turned forward or backward.

In contact with the peripheral surface of the disk E is a wheel F^2, journaled in the free end of a spring F′, attached to and forming part of the lever F of a telegraph key or transmitter G, held on the base A, as is plainly shown in Figs. 1 and 3. The lever F is hung on the usual arbor G′, secured in the key-frame G^2, and one end of the lever F carries a contact-pin F^3, while near the other end is arranged a contact-pin F^4. A spring G^3 presses against the under side of the lever F, so as to hold the latter normally in the position shown in Fig. 1—that is, with the contact-pin F^3 in engagement with the insulated contact-pin H, attached to the frame G^2, while the other contact-pin, F^4, is held out of engagement with the insulated contact-pin H′, likewise attached to the frame G^2.

As shown in the drawings, and more clearly outlined in Fig. 4, a wire I′ leads from the contact-pin H′ through a relay K, a wire I^3 leads from the relay K to a distant receiving-station, and a return-wire I^2 leads from said station to the frame G^2 of the transmitter G. By this arrangement it will be seen that when the projections on the disk E close the circuit through F^4 H′ the impulses will be transmitted through the wire I′, the relay, and the wire I^3, the return-current being through I^2. A shunt-wire I leads from the contact-pin H to a connection with the wire I′, and in this shunt is arranged a transmitter J for sending messages in the ordinary manner. In this example it will be seen that when the disk E is not in operation and the pin F^3 is in engagement with the contact H the circuit will

be closed through the frame G^2, so that a message may be sent by manipulating the key J through the wires I I^3 I^2.

In the example of wiring shown in Fig. 5 the impulses from the disk E are transmitted in the manner before described—that is, through the wires I', I^3, and I^2—but in this example a shunt I^4, having the transmitter J' therein, leads from the wire I' to an engagement with the wire I^2 and not to the frame G^2; but in this example in order to transmit a message by the transmitter J' the parts F^4 H' of the instrument G must be closed, while in the other case it must be open.

On the front face of the disk E and on opposite sides of the handle E' are arranged stops E^3 E^4 adapted to engage a pin L, mounted to slide transversely in one of the standards A', the outer end of the said pin L being connected with a spring-pressed lever N, fulcrumed on the standard and adapted to be pressed at its free end by the operator to withdraw the pin L and move the inner end thereof out of the path of either stop E^3 or E^4 to unlock the disk E. Normally the disk E stands with its handle E' against the right-hand side of the standard A', as shown in dotted lines in Fig. 1, with the stop E^3 against the left or front side of the pin L and the stop E^4 in the position indicated by dotted lines in Fig. 1, so that the operator, after unlocking the disk by pressing the lever N, can turn the disk in the inverse direction of the arrow a' to the position shown in full lines in Fig. 1.

On the inner face of the disk E and approximately opposite the stop E^3 is arranged a projection E^5, the normal position of which is at the left hand of the standard, adapted to move in contact with a projection C^2, secured on the inner face of the wheel C, the said contact taking place at the time the disk E is turned in the inverse direction of the arrow a', as above mentioned, and as shown in Fig. 1.

When the several parts are in the normal position above described, the signal stands at "danger," and when a train approaches the signal—that is, is observed by the operator in charge of this station—then the operator throws the handle C' in the direction of the arrow a' to shift the signal into a clear position to let the train pass. When, however, the operator in charge receives a message to hold the train approaching the station, he presses the lever N to unlock the disk E, and then takes hold of the handle E' and turns the same into the position shown in full lines in Fig. 1. In doing so the projections E^2 of the peripheral surface of the disk E press successively the roller F^2 of the spring F', so that the key F is actuated to make and break the current in the usual manner and sends a message to the central station corresponding to the characters represented by the projections E^2. Thus, for instance, if the station is U 22 these characters are represented by the projections E^2 and this message is sent to the central station. The operator in charge of the central station is thus notified that the signal at station U 22 is at "danger" and the train is held, and as soon as the operator in charge of the station U 22 receives a message to let the train pass he takes hold of the handle C' and turns the latter, whereby the signal is thrown into "safety" position, and at the same time the projection C^2 by being in engagement with the projection C^5 turns the disk E in the direction of the arrow a' and a second message is sent to the station indicating 22 D—that is, the reverse message from the one previously sent—and indicating that the signal stands clear and the train has proceeded on its journey.

It is understood that when the disk E is turned from one position to the other the pin L snaps in behind the corresponding stop E^3 or E^4 to lock the disk in place until it is to be turned, at which time the operator has to press the hand-lever N to withdraw the pin L and permit of turning the disk. Thus when the disk E is turned from its normal position to the one shown in full lines in Fig. 1 then the wheel C is locked in place and cannot be turned without the operator first unlocking the disk E by pressing the lever N, and even after that is done the wheel C cannot be turned without also turning the wheel E, owing to the projection E^5 being on top and in contact with the projection C^2. When, however, the wheel C is turned the disk E moves with it to send the second or reverse message to the central station.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. An automatic repeating railroad-signal, comprising a rotary device for shifting the signal, a disk loosely mounted on the shaft of said shifting device and having means to lock the said shifting device and disk in operative engagement, and a key adapted to be actuated from the said disk, to send messages to the central station, substantially as shown and described.

2. An automatic repeating railroad-signal, comprising a grooved wheel forming part of the signal-repeating device and connected by a rope with the signal proper, a disk mounted to turn loosely on the shaft carrying the wheel, the said disk being adapted to be turned by the operator from a normal position, and back again into this position by the said wheel, and a telegraph-key adapted to be actuated by the said disk, to send two messages to the central station whenever the said disk is turned from and back to its normal position, substantially as shown and described.

3. An automatic repeating railroad-signal, comprising a grooved wheel forming part of the signal-repeating device and connected by a rope with the signal proper, a disk mounted to turn loosely on the shaft carrying the wheel, the said disk being adapted to be turned by the operator from a normal position, and back

again into this position by the said wheel, a telegraph-key adapted to be actuated by the said disk, to send two messages to the central station whenever the said disk is turned from and back to its normal position, and means, substantially as described, for locking the said disk in position, as set forth.

4. An automatic repeating railroad-signal, comprising a grooved wheel forming part of the signal-repeating device and connected by a rope with the signal proper, a disk mounted to turn loosely on the shaft carrying the wheel, the said disk being adapted to be turned by the operator from a normal position, and back again into this position by the said wheel, a telegraph-key adapted to be actuated by the said disk, to send two messages to the central station whenever the said disk is turned from and back to its normal position, and an operator's key connected with the said first-named key and with a relay, and the line leading to the central office, substantially as shown and described.

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