

No. 776,120.

PATENTED NOV. 29, 1904.

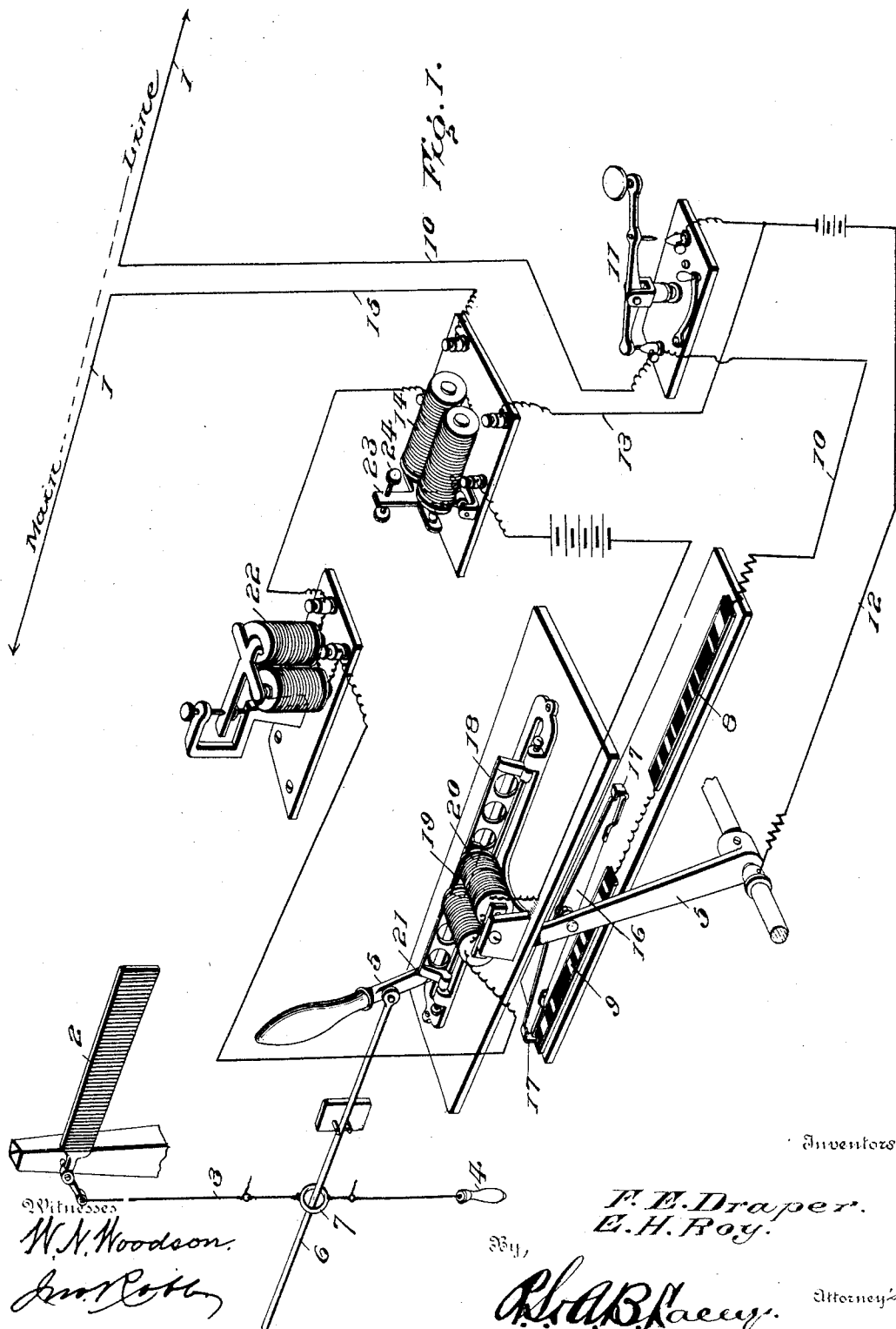
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TRAIN ORDER PROTECTOR AND SIGNAL LOCK.

APPLICATION FILED JAN. 5, 1904.

NO MODEL.

2 SHEETS—SHEET 1.



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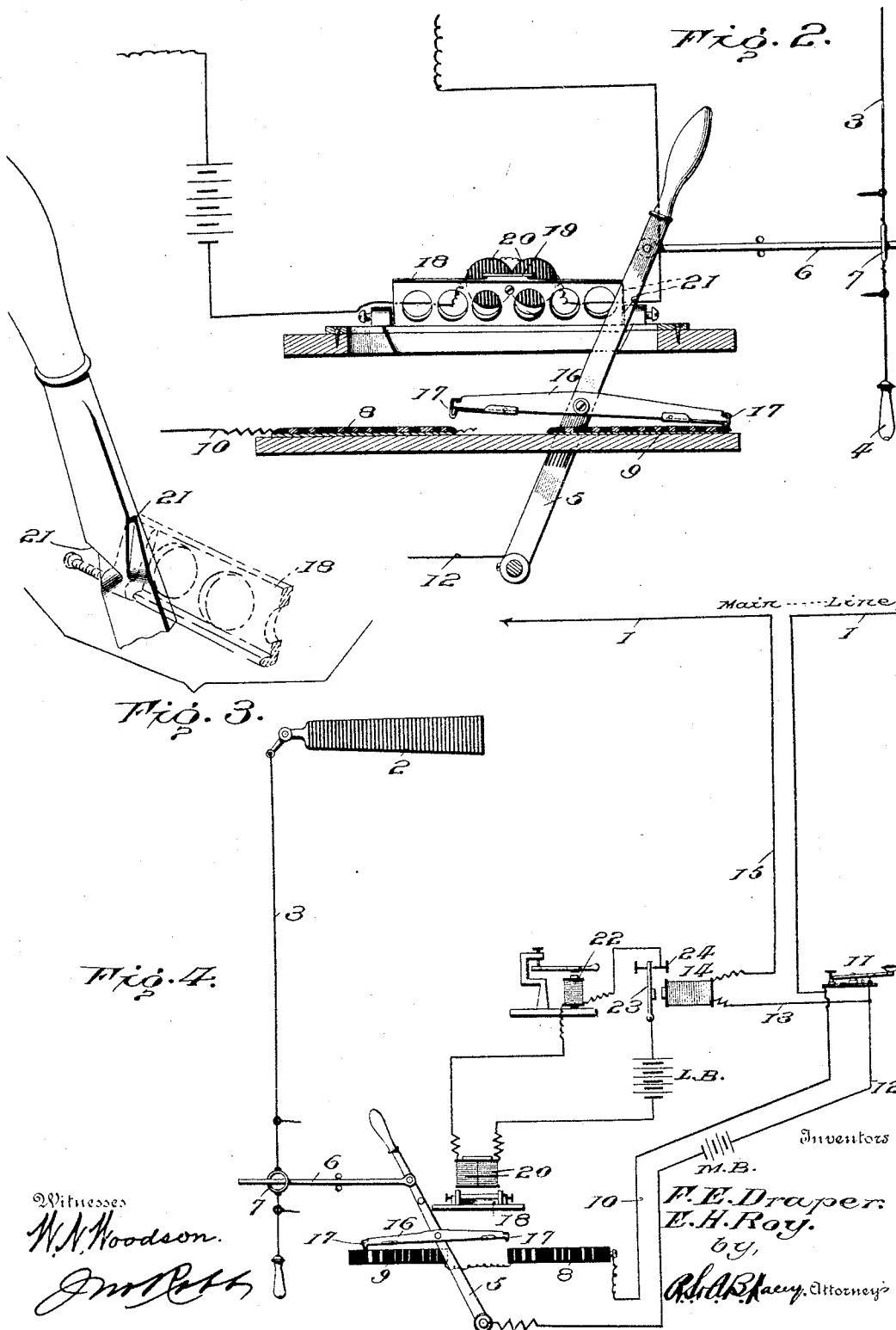
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UNITED STATES PATENT OFFICE.

FRYAR E. DRAPER AND EDWARD H. ROY, OF NASHVILLE, TENNESSEE,
ASSIGNORS OF ONE-TENTH TO THEODORE J. ZOELLER, OF NASHVILLE,
TENNESSEE.

TRAIN-ORDER PROTECTOR AND SIGNAL-LOCK.

SPECIFICATION forming part of Letters Patent No. 776,120, dated November 29, 1904.

Application filed January 5, 1904. Serial No. 187,772. (No model.)

To all whom it may concern:

Be it known that we, FRYAR E. DRAPER and EDWARD H. ROY, citizens of the United States, residing at Nashville, in the county of Davidson and State of Tennessee, have invented certain new and useful Improvements in Train-Order Protectors and Signal-Locks, of which the following is a specification.

In railroading many casualties are attributable to the forgetfulness of operators at the various stations, who upon receipt of orders for a certain train overlook the same either through attention to other matters or inadvertence or other cause.

This invention has for its object to place a check upon the operator and remind him of an order to be delivered and at the same time to notify the despatcher of the condition of the signal, whereby in the event of the operator failing to repeat the signatures of the conductor and engineer the despatcher knows that the order has not been delivered and can apprise the operator of the fact before the train departs.

The invention consists of two locks in combination with the signal-operating lever, one to secure the signal and the other to hold the lever against movement.

The invention comprises an electric signaling mechanism controlled by the signal-operating lever to inform the despatcher by a prearranged code when the signal at the station is locked and released, thereby automatically informing the despatcher as to the condition of the signal at the station in receipt of orders to deliver to a particular train.

The invention also consists of an electric-controlled release for the lock of the signal-operating lever, the same being included in a local circuit and brought into action when the switch of the telegraph-key is operated to open the line and the key is closed.

The invention further consists of the novel features, details of construction, and combinations of parts which hereinafter will be more particularly described, illustrated, and finally claimed.

In the drawings hereto attached and form-

ing a part of the specification, Figure 1 is a perspective view of the instrumentalities for effecting the objects of this invention. Fig. 2 is a detail view of the signal-operating lever, the signal mechanism, and the lock devices for said lever and the train-signal. Fig. 3 is a detail perspective view of an end portion of the signal-operating lever and the lock cooperating therewith. Fig. 4 is a diagrammatical view showing more clearly the circuits and the relative arrangement of the correlative elements.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

Each station along the line having the invention installed is similarly equipped, and the train-signal may be of the semaphore type or of any approved variety. The main line is indicated at 1 and connects all the stations with the central or despatcher's office to admit of intercommunication between the despatcher and operators and between the latter.

The train-signal illustrated is of the semaphore type and consists of the arm 2, mounted in the accustomed manner and adapted to be operated in any determinate way, as by means of the connection 3, provided with the pull 4. The signal-operating lever is indicated at 5, and a lock 6 is connected therewith for securing the train-signal when displayed. The lock 6 for convenience is illustrated as a rod or bar and is adapted to engage a ring 7 of the connection 3 when the signal-operating lever is actuated to indicate to the despatcher that the signal corresponding with the order has been displayed. A series of electric contacts 8 and 9 are disposed in two groups and according to a prearranged code, so as to convey to the despatcher information indicating whether the signal at the station is locked or unlocked. The group of contacts 8 and 9 are in electrical connection; but the individual elements are insulated, so as to transmit electric impulses corresponding to the characters of the Morse alphabet or other system. A wire 10 connects the electric contacts with the

telegraph-key 11, which is of usual construction. A wire 12 connects the signal-operating lever 5 with the fixed contact or bed piece of the telegraph-key 11, and a wire 13 connects the wire 12 with the electromagnet 14 of the relay, said electromagnet having its helix connected by wire 15 with the main line. A contact-arm 16 is pivoted intermediate of its ends to the signal-operating lever 5 and is provided at its extremities with shoes 17 to make electrical connection with the contacts of the groups 8 and 9. The pivotal connection between the arm 16 and the lever 5 is disposed in such a manner as to prevent the arm making electrical connection with both sets of contacts 8 and 9 at the same time. When the free end of the lever 5 is moved in one direction, the shoe at one end of the arm 16 glides over the contacts of one group, and when moved in the opposite direction the shoe at the opposite end of the arm sweeps over the contacts of the other group, thereby transmitting the predetermined message to the despatcher, so that he may be informed as to the condition of the signal, whether locked or released. The relay 14 and the signaling mechanism, including the parts 5, 8, 9, and 16, are arranged in the main line.

The lock for the signal-operating lever 5 is indicated at 18 and consists of a plate or bar pivotally mounted and adapted to engage with and hold the signal-operating lever 5 in either one of its extreme positions. For convenience the length of the plate or bar 18 corresponds to the amplitude of movement of the lever 5, and the latter is engaged by the extremity of said bar or plate in each of its extreme positions. The plate or bar 18 is provided with a magnetizable piece 19, constituting the armature of the electromagnet 20, which is included in a local circuit adapted to be closed when the telegraph-key 11 is closed after the switch forming a part of said telegraph-key has been opened. The signal-operating lever 5 is provided with shoulders 21 oppositely inclined and formed by cutting away a portion of the lever, and these shoulders 21 are adapted to abut against the extremities of the lock bar or plate 18, as indicated most clearly in Fig. 3. The sounder 22 is located in the local circuit. The pivoted arm 23 is in electrical connection with one pole of the local battery, and the contact 24 is in electrical connection with the other pole of the local battery through the helices of the electromagnets of the sounder 22 and the part 20. When the telegraph-key 11 is depressed to close the circuit of the main line, the electromagnet of the relay 14 is energized and affects the arm 23, carrying its armature, and closes the local circuit through the contact 24, and the electromagnet 20 being energized attracts the armature 19 and moves the lock 18, so as to release the signal-operating lever 5 and admit of its operation, which when moved au-

tomatically and simultaneously transmits a signal to the despatcher to advise him of either the locking or the releasing of the train-signal, as the case may be.

There will be provided at each station a signal-operating lever 5 for each direction of trains scheduled to pass by the station—one for trains going north, one for southbound trains, one for east, and one for west going trains. One group of signals, as 9, indicates to the despatcher that the signal-operating lever 5 has been moved in accordance with an order so as to lock the train-signal. The other set of signals 8 is to advise the despatcher that the train-signal has been unlocked. Hence a movement of the signal-operating lever in each direction automatically conveys information to the despatcher as to the condition of the train-signal at any station along the line of railway.

When an operator receives an order, he sets the train-signal and moves the signal-operating lever, thereby locking the train-signal, and in the event of the order being for a northbound train the despatcher will be informed that the signal has been locked through the instrumentality of the arm 16 passing over the contacts 9, which may designate "R. N." When the operator has delivered the order to the conductor and engineer of the indicated train and has repeated their signatures to the despatcher and returns the signal-operating lever 5 to its normal position, thereby releasing the train-signal, the despatcher is advised of the release of the signal by the arm 16 traveling over the contacts 8, which designate "W. N." The letters "R.," "N.," and "W." stand for, respectively, red, north, and white to indicate "danger," "direction," and "safety." Obviously the contacts 8 and 9 may be grouped and arranged to transmit any pre-arranged matter.

Having thus described the invention, what is claimed as new is—

1. In a system of railroad signaling, the combination of the train-signal, an electric circuit including line-signals, a signal-operating lever for actuating the line-signal, and a lock for the train-signal connected with said signal-operating lever to be simultaneously and automatically actuated therewith, substantially as set forth.

2. In a system of railroad signaling, the combination of the train-signal, an electric circuit including line-signals, a signal-operating lever for actuating the line-signal, a lock for the train-signal connected with said signal-operating lever to be simultaneously and automatically actuated therewith, a second lock for said signal-operating lever, and an electric release therefor controlled by the telegraph-key, substantially as described.

3. In a system of railroad signaling, the combination of the train-signal, a lock therefor, line-signals, and a lever under control of

the operator for simultaneously actuating the lock for the train-signal and the line-signals, whereby the despatcher may be notified when the train-signal is locked and released, substantially as specified.

4. In a system of railroad signaling, the combination of the train-signal, a line-signal, a lock for the train-signal, a lever for simultaneously operating said lock and the line-signal, a second lock for said lever for holding the same in either of its extreme positions, and an electric release for the lock of the lever included in a local circuit adapted to be closed by the telegraph-key, substantially as set forth.

5. In a system of railroad signaling, the combination of independent signaling contacts arranged in the main line, a signal-operating lever, and an arm pivoted to the lever intermediate of its ends and adapted to move with said lever over the respective groups of signaling-contacts to automatically inform the despatcher of the position of said lever when operated, substantially as set forth.

6. In a system of railroad signaling, the combination of a train-signal, a line-signal, a lock for the train-signal, an operating-lever

for the line-signal, a lock for said lever, a local circuit including an electric release for the lock of the operating-lever, a sounder and circuit-closer in the local circuit, and means in the main line for closing the local circuit to effect a release of the operating-lever, substantially as described.

7. In a system of railroad signaling, the combination of a series of contacts in the main line, an operating-lever carrying a contact to sweep over the series of contacts to transmit a series of electric impulses over the main line, a lock for the operating-lever of a length corresponding to the amplitude of movement of said lever and adapted to engage at its ends therewith to hold the same in either of its extreme positions, and an electric release for said lock adapted to be controlled by the telegraph-key, substantially as and for the purpose set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

FRYAR E. DRAPER. [L. S.]

EDWARD H. ROY. [L. S.]

Witnesses:

JNO. ROBB,

GEORGE G. WATT.