

(No Model.)

2 Sheets—Sheet 1.

S. J. SWAYZE & J. C. LANE.

ELECTRIC BLOCK SIGNAL FOR RAILWAYS.

No. 298,913.

Patented May 20, 1884.

Fig. 1.

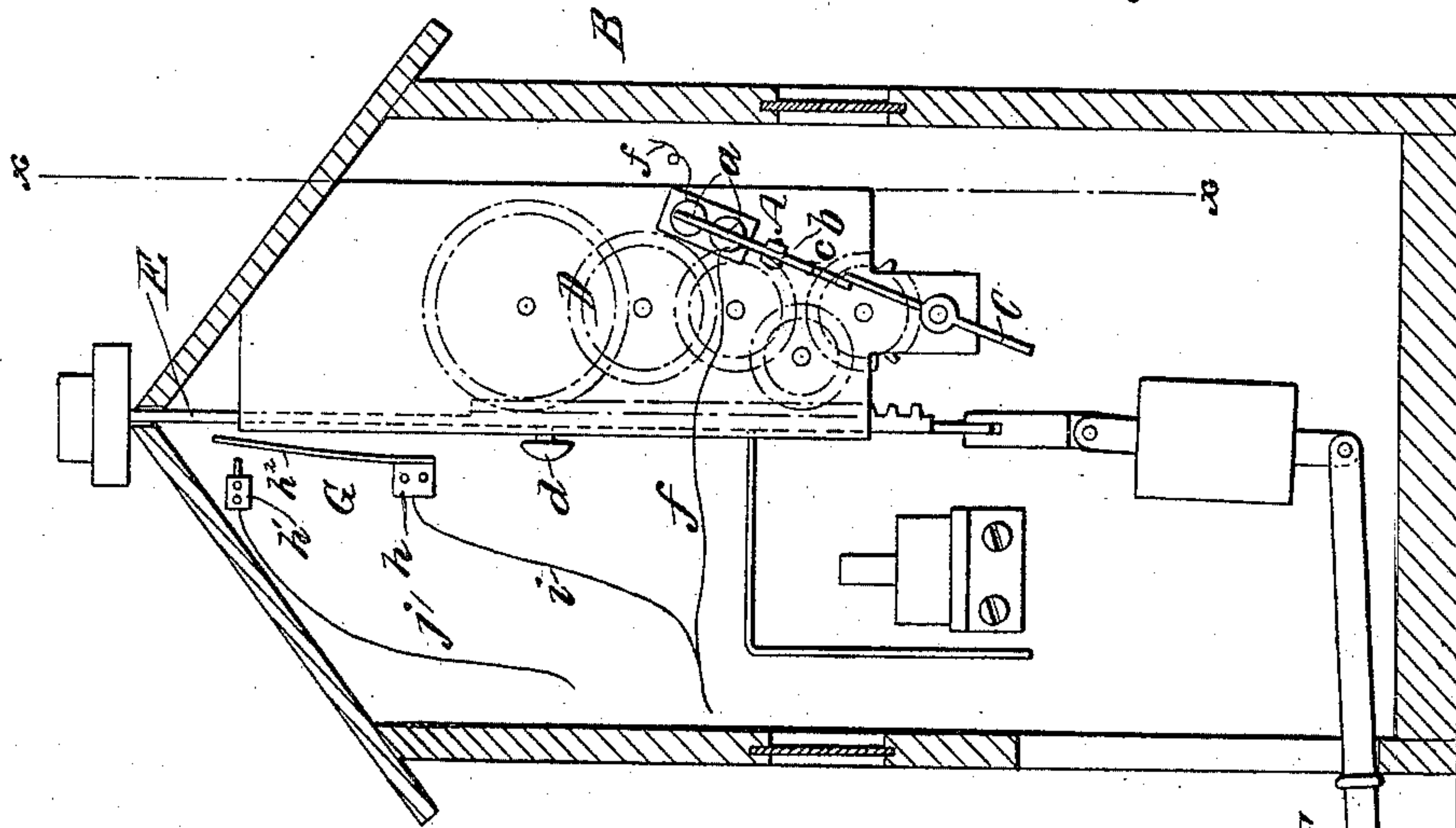
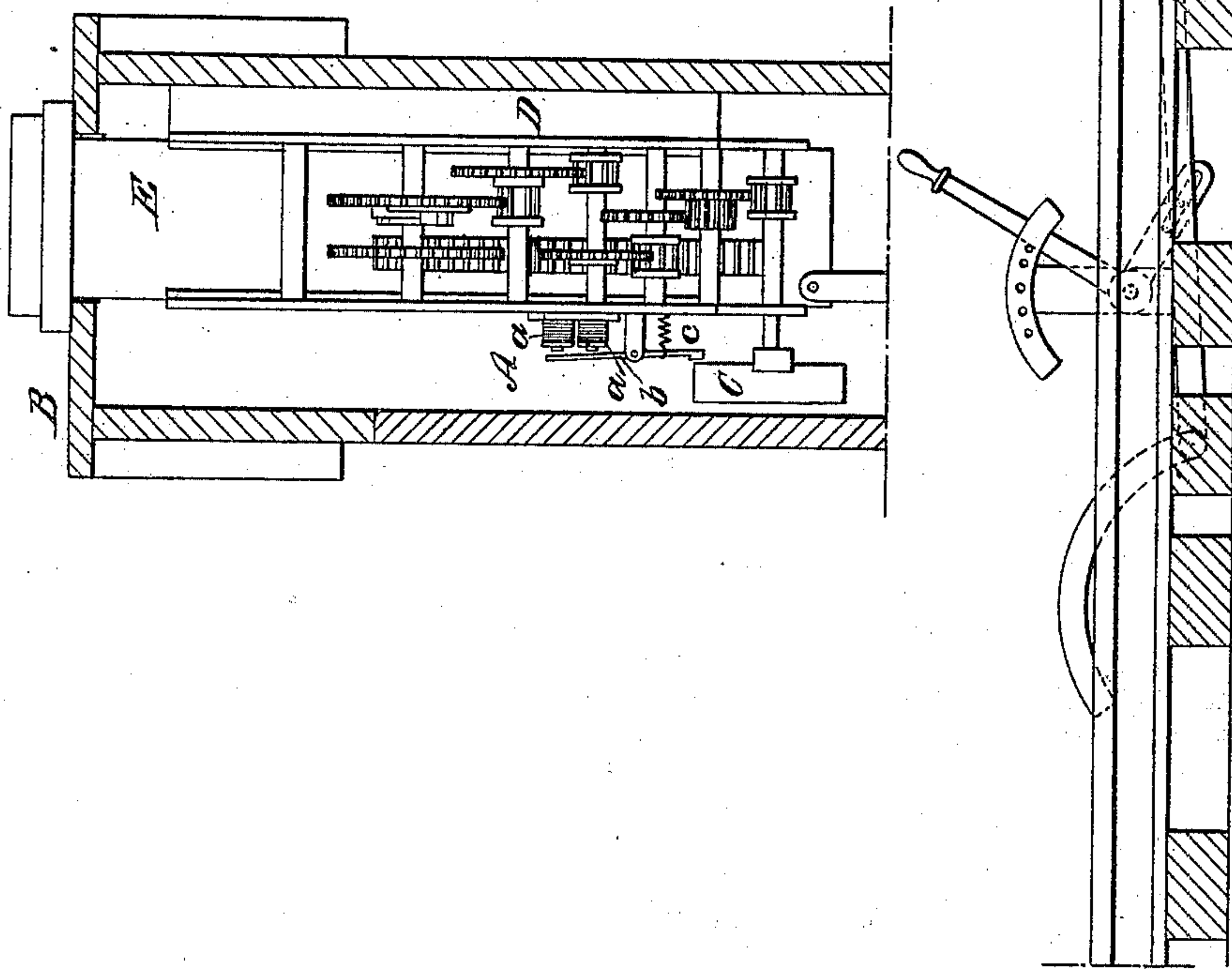


Fig. 2.



WITNESSES:

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(No Model.)

2 Sheets—Sheet 2.

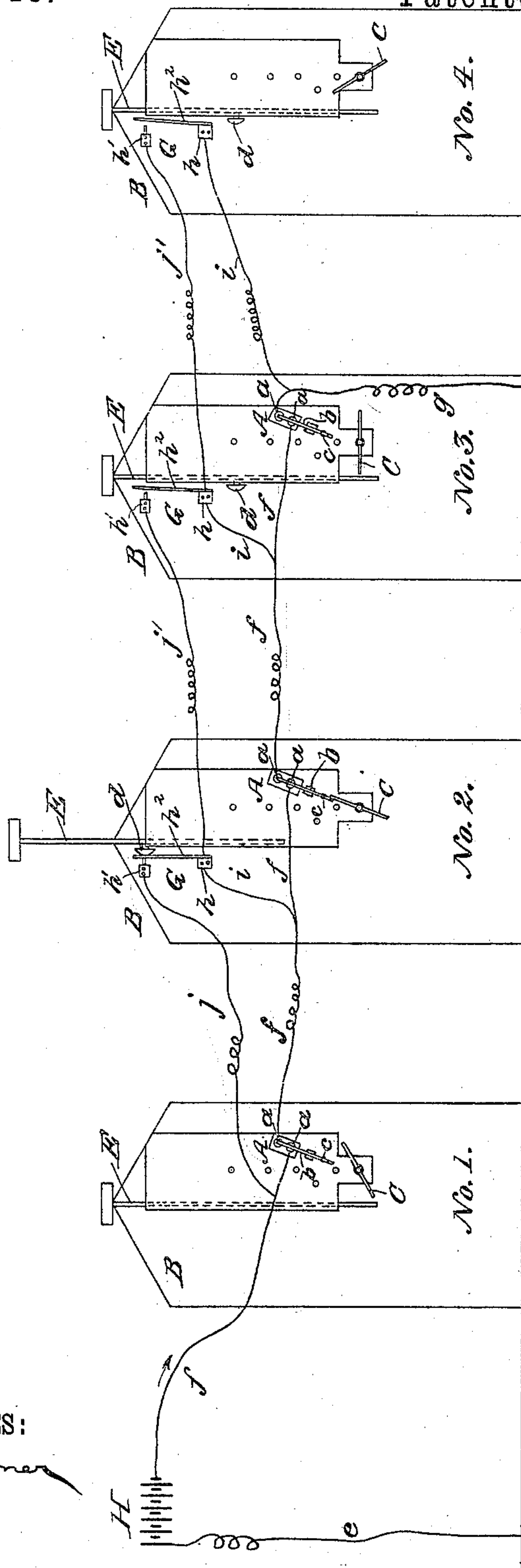
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Fig. 3.



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# UNITED STATES PATENT OFFICE.

STEPHEN JAMES SWAYZE AND JOHN CLARENCE LANE, OF SAG HARBOR, N. Y.

## ELECTRIC BLOCK-SIGNAL FOR RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 298,913, dated May 20, 1884.

Application filed November 13, 1883. (No model.)

*To all whom it may concern:*

Be it known that we, STEPHEN J. SWAYZE and JOHN C. LANE, of Sag Harbor, in the county of Suffolk and State of New York, have invented a new and Improved Electric Block-Signal for Railways, of which the following is a full, clear, and exact description.

This invention relates to a block system of railway-signaling wherein our new time-signal, shown and described in Letters Patent No. 286,156, dated October 2, 1883, or other automatic signal adapted to be set by the passage of the train, is employed; and the invention consists of an electric locking arrangement adapted for locking the signal-board in displayed position until the train that set it reaches the next signal-station, whereupon the signal-board of the signal next in rear will be released, indicating to the oncoming train that the track between it and the first signal ahead is clear.

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

Figure 1 shows in sectional elevation our automatic time-signal covered by our above-mentioned patent, the signal having our new electric locking attachment applied thereto. Fig. 2 is a sectional elevation of the same, taken on the line *x x* of Fig. 1; and Fig. 3 is a diagram view illustrating the electric connections for several signals arranged in accordance with our invention, the signals being numbered.

In the present arrangement shown in the drawings, the electric locking appliance A is attached in the signal-housing B, so as to act in conjunction with the fan C, acting as a lever to the retarding mechanism D, which mechanism is adapted to clutch and retard the signal-board E when raised by a train of cars passing over the curved end of the bent lever F, as fully described in our said patent, the fan C revolving only when the board E descends.

The electric locking appliance A consists of the electro-magnets *a*, lever *b*, and spring *c*, attached to the lever *b*, the said lever being so arranged as to intercept the revolution of the fan C only when the rear end of the lever is attracted by the passage of a current of elec-

tricity through the magnets *a*, the spring *c* serving to withdraw the lever from in front of the fan C when the electric current ceases to flow through the magnets.

G is an electric switch or cut-off arranged to be opened and closed by the stud *d*, attached to the signal-board E when it is raised and lowered.

H represents the battery, one element of which is grounded by the wire *e*. The other element is connected with all of the electro-magnets *a* in the signal system by the wire *f*, which is grounded at next to the last signal on the line, as shown at *g*, thus making a closed circuit running through the electro-magnets *a*, which constantly hold the levers *b* in position for locking the fans C when the signals are at rest. The lower metallic post, *h*, of each switch G is connected by wire *i* to the main wire *f*. The upper metallic post, *h'*, in signal No. 2 is connected by wire *j* to main wire *f* in rear of the electro-magnets in signal No. 1. Each upper post, *h'*, in all of the other signals throughout the system is connected by a wire, *j'*, to the lower post, *h*, of the signal next in rear, so that when the spring *h<sup>2</sup>* of the switch is forced against the upper post, *h'*, by the button *d* the electric current will be switched off from the electro-magnets of the signal next in rear, thus permitting spring *c* to withdraw the forward end of the lever *b* of such signal away from fan C, and thus permit the signal-board E of such signal to drop within its housing B. When all of the signal-boards in the system are down, the electric current, as above intimated, will pass along the main wire *f* and through all of the magnets in the system. When one of the signal-boards is raised—say that of signal No. 2—the current will pass through wire *j*, upper post, *h'*, spring *h<sup>2</sup>*, lower post, *h*, and wire *i*, again into main wire *f*, thus cutting out of the circuit the magnets *a* in signal No. 1. When the signal-board in signal No. 2 drops into its inclosure, the switch G being thus opened, the current will follow its original course through the main wire *f*, except as next described.

Now, the action of our system is as follows: It will be understood that the signals will be placed at suitable intervals along the line of



the railroad. All of the signal-boards along the line being down within their inclosures, a train starting upon the track, in passing signal No. 1 will elevate and display the signal-board E thereof, which will be locked in elevated position by the retarding mechanism D, lever *b*, and fan C, and held until the train reaches signal No. 2. In passing signal No. 2 the train will elevate the signal-board E of such signal, which in like manner will be locked and held in displayed position, and the raising of this signal-board E in signal No. 2 will also close the switch G, which will take the electric current from the magnets *a* of signal No. 1, which will cause lever *b* to release fan C, thus permitting the signal-board in signal No. 1 to recede into its inclosure, indicating to the next oncoming train that the preceding train has passed signal No. 2. The first train, in passing signal No. 3, will in like manner display its signal-board and close its switch G, which will cause the electric current to pass from the switch G in signal No. 2 over wire *j'*, thence through the switch G of signal No. 3 and wire *i* again into the main wire *f*. This will cut the current from the magnets in signal No. 2, and thus cause its signal-board to recede into its inclosure, which will open the switch G of such signal No. 2, and thus cause the current to again pass through its magnet *a*, and the magnet of signal No. 1 putting these signals in readiness for subsequent action. As soon as the recession of the signal-board of signal No. 2 opens the switch G thereof, the current will pass directly over the main wire *f*, as in starting, until the signal-board of signal No. 4 is set, which will switch the current from the magnets in signal No. 3 and release its signal-board, and the whole operation just described will be repeated with every set of

four or any number of signals throughout the line. In this manner it will be seen that the system is perfectly automatic and that the system is a perfect block-signal system.

In case the electric system should get out of order, the time-signal remains, which in itself is a good safeguard against collision, and which may be regulated as to time by the interchangeable fans. It will be understood, however, that we do not confine ourselves to the use of our time-signal in connection with the electric system, as any other suitable automatic signal might be used; but we prefer to use our time-signal, since, because of the retarding mechanism D, only a slight force applied to the fan C is required to effectively lock the signal-board in displayed position.

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

1. The signal-board E, adapted to be automatically elevated by the passage of a train, the clutching and retarding mechanism D, and the fan C, or its equivalent, in combination with the magnets *a*, lever *b*, spring *c*, and switch G, connected as described, and adapted to be opened and closed by the signal-board E, substantially as specified.

2. In a signaling system, the switches G, connected to the main wire *f* by wires *j'* and *i*, and adapted to be opened and closed by the signal-board E, in combination with the magnets *a* and the locking mechanism, whereby the setting of one signal will release the other, substantially as described.

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JOHN CLARENCE LANE.

Witnesses:

HIRAM L. TOPPING,  
JOHN L. SHERWOOD.