

(No Model.)

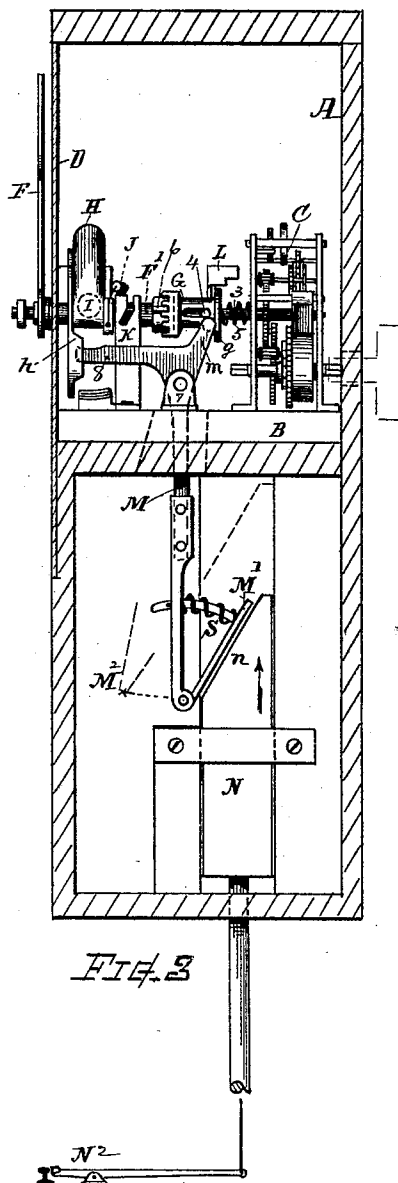
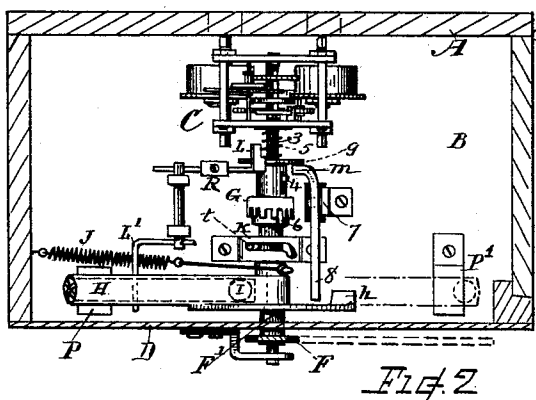
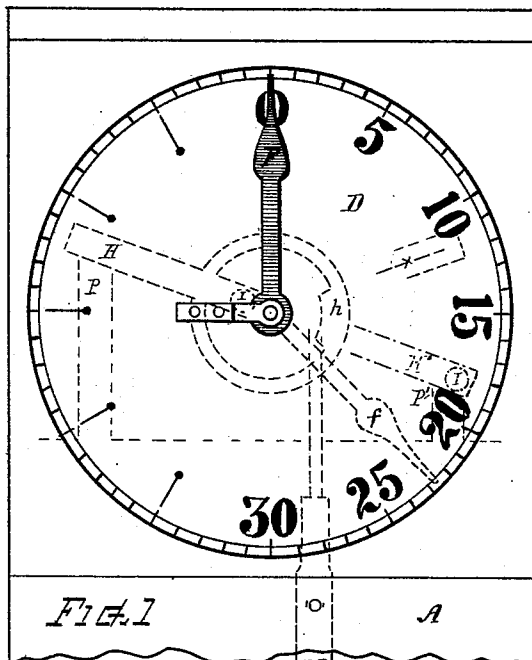
2 Sheets—Sheet 1.

D. W. & E. L. MITCHELL.

RAILWAY TIME SIGNAL.

No. 481,581.

Patented Aug. 30, 1892.



Witnesses.

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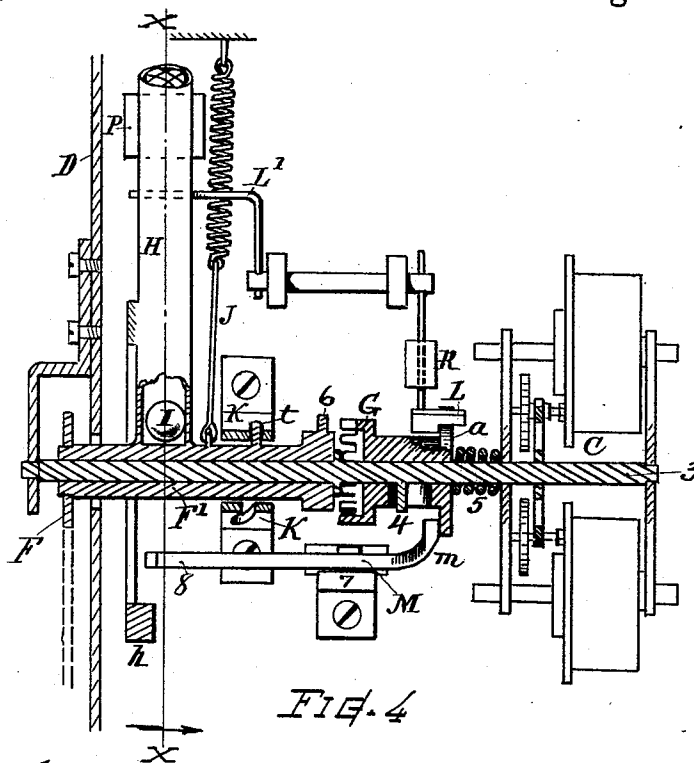


Fig. 4

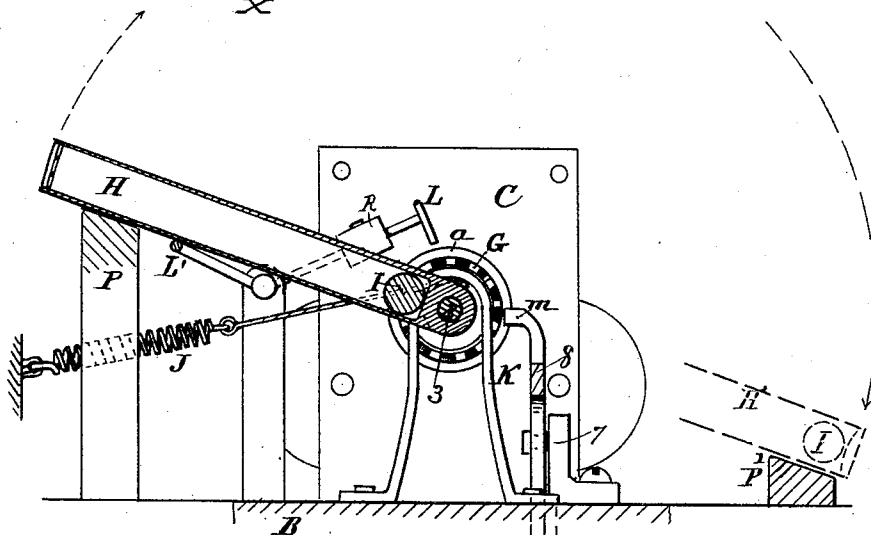


Fig. 5

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UNITED STATES PATENT OFFICE.

DANIEL W. MITCHELL AND ELMER L. MITCHELL, OF SOUTHBOROUGH,
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RAILWAY TIME-SIGNAL.

SPECIFICATION forming part of Letters Patent No. 481,581, dated August 30, 1892.

Application filed March 12, 1892. Serial No. 424,678. (No model.)

To all whom it may concern:

Be it known that we, DANIEL W. MITCHELL and ELMER L. MITCHELL, citizens of the United States, residing at Southborough, in the county of Worcester and State of Massachusetts, have
5 invented a new and useful Railway Time-Signal, of which the following, together with the accompanying drawings, is a specification sufficiently full, clear, and exact to enable
10 persons skilled in the art to which this invention appertains to make and use the same.

The object of our present invention is to provide an automatic dial or time-signal for railway service for indicating the amount of
15 time elapsed after a preceding train has passed any given point or station on a railroad-line within a limit of one to thirty minutes, thus presenting to view for the engineer of a following moving train the exact number of minutes,
20 if within the thirty-minutes limit, since the previous train passed such station.

Another object of our invention is the combination, with a clock-action and figure-dial, of means for automatically returning an index-hand to its position of zero by the passage
25 of a locomotive or railway-train or at the time of the passage of such train, and means for automatically reconnecting the said index with the clock mechanism for its advancement in regular time order subsequently
30 thereto until reasonable interval for safety has intervened. These objects we attain by the mechanism illustrated and described, the particular subject-matter claimed being hereinafter definitely specified.

In the drawings, Figure 1 is a front view of our dial or time-signal. Fig 2 is a plan view of the operating mechanism. Fig. 3 is a side
40 view of the same, the case being shown in section. Fig. 4 is a horizontal section through the shaft and clutches on a somewhat larger scale, showing the clutch-sleeve thrown back out of engagement with the index-arbor. Fig. 5 is a
45 transverse vertical section at the position of line $x x$, Fig. 4.

Referring to parts, A denotes the case, which may be of any suitable size, form, or material.

B is the bed or shelf for supporting the mechanism within the case.

50 C indicates a clock-train or chronometrically-controlled motor impelled by spring (or

weight) power and constantly running, so that its time-shaft 3 makes one revolution per hour. Suitable means are provided for winding
up the motor, the same as an ordinary 55 clock.

D is the dial, made of suitable size to be distinguished at reasonable distance by a person on a passing train. The circle of the dial is graduated or divided into minutes, and one-
60 half (or more) is numbered in convenient spaces from zero to thirty, or, if preferred, from zero to any other specified number of minutes.

F is an index or hand, the point of which traverses a part of the circle of the dial. Said
65 index is mounted upon a shaft or hollow arbor F', axially coincident with the time-shaft 3 of the clock. The shaft 3 preferably passes through the arbor and forms the bearing about
70 which the arbor revolves.

G indicates a toothed clutch or connecting-sleeve longitudinally movable on the shaft 3,
but confined to rotate therewith by a slot and pin 4. A spring 5 presses forward the clutch-sleeve for normally engaging its teeth with
75 the tooth or part of the clutch G, fixed on the index-arbor F'.

H indicates a radially-disposed tube rigidly attached to the index-arbor and containing within it a loose weight or ball I, which is free
80 to shift position from one end of said radial tube to the other, accordingly as the outer end of said tube is above or below the level of the axis. Said tube is also counterbalanced
85 by a ring fixed thereto and having a weight h thereon at the opposite side of the axis.

J indicates a spring or suitable device connected with the index-arbor and adapted for exerting force for returning the arbor and index
90 to the normal position of zero. Said spring can be of any suitable form.

K indicates a throw-off guide, which engages with a pin t , fixed in the arbor, and acts as a cam for disengaging the clutch when the arbor
95 has reached its established limit of rotative movement or has carried the index F to the thirty-minute mark of the dial.

L indicates a dog or device for holding the clutch-sleeve when out of engagement. Said dog is provided with a spring or weight R,
100 which causes it to automatically drop into engagement with the flange g when the sleeve

is moved back. Its lever is fulcrumed in suitable bearings and is provided with an arm L' , that extends under the radial tube, whereby the dog is lifted for releasing the clutch G when said tube swings back to its normal position.

M indicates a lever, pivoted at 7 and having an arm m arranged for moving back the clutch-sleeve and a forwardly-projecting arm 8 for lifting the radial tube H if at its limit of action when the lower end of said lever is swung forward.

N indicates a slide or operator working in guides in the lower part of the case and having a beveled surface n , that engages with the lower arm of the lever M and when the slide N is raised swings it forward. The lower end of the lever is best provided with a relief mechanism consisting of a hinged plate M' , a guiding-arm, and a spring S for holding the plate at an outwardly-inclined position, as indicated in Fig. 3, so that the shock occasioned by a quick movement of the slide N will be reduced by the spring S and not transmitted with undue force to the mechanism above. The slide N can be connected in any manner and worked by any suitable operating means—as, for instance, the well-known style of lever having a pallet adjacent to the track for depression by the wheel of the locomotive, as indicated at N^2 , or, if preferred, by a pull-cord or any other means for effecting the operation, whereby the slide is thrown up and the lever M moved.

The tube H and index F are preferably made of aluminum, so as to be as light as possible, and thus develop but little momentum when thrown back. Suitable stops or cushions $P P'$ are provided for arresting the movement of the arm or tube H and receiving the concussion thereof at its limit of action in either direction.

The operation is as follows: The slide N being thrown up by the locomotive-wheel striking the lever N^2 , its beveled end n swings the lever M to the position M^2 . The lever-arm m disengages the clutch G and slides its sleeve on shaft 3, so that the dog L drops behind the flange, thus freeing the arbor F . At the same time the lever-arm 8 throws up the tube H and the force of the spring J causes the arbor to turn backward, carrying the index to its normal position at zero. The tube strikes the arm of the dog as the index reaches the zero-point and lifts the dog from the clutch, and the spring 5 forces the clutch-sleeve forward into engagement with the tooth on the hub of the arbor. The slide N , having immediately dropped after it was thrown up, the lever M is of course out of the way, so as to allow the clutch to re-engage. The engagement of the clutch G puts the arbor and index in operative connection with the clock mechanism, so that the index is then carried forward over the dial in the same manner as a clock-hand, thus at any time until again returned indicating the

number of minutes (if not exceeding thirty) since the passage of the train. The index moving down the dial—as, for instance, to the position indicated by dotted lines f —would denote that the preceding train had passed the station or position of the dial-signal twenty-two and one-half minutes previous, thus indicating to the engineer of the succeeding train the amount of time elapsed since the preceding train has passed the signal-station. The succeeding train as it passed the signal would in turn cause the operation, as above described, and the return of the index to the zero-point, thus automatically adjusting the signal to the conditions of the passing trains without other attention than the winding of the clock. When the index is carried down to the thirty-minute point, the tube swings over to the point indicated by dotted lines H' , Fig. 1, and the ball I rolls down to the outer end of the tube, overcoming the action of the spring J , so that said spring cannot return the hand to zero as the clutch is disengaged by the guide K or until the tube is thrown up by the arm 8 of the lever M . Thus the weighted tube affords a means for holding the index at the thirty-minutes point after the clutch is disengaged while the clock mechanism proceeds. This is an important feature in the operation of our apparatus.

This signal apparatus can be supported upon a post or upon the front of a station building or in any convenient position to be observed by the engineers or conductors of passing trains, and the dial can be illuminated at night in any suitable or efficient manner.

We claim as our invention herein, to be secured by Letters Patent—

1. The combination, with the graduated dial, index-hand, index-arbor, and return-spring, of the radial arm or tube H , fixed at one end to said arbor, and the self-shifting-weight ball carried by said arm and movable from one end to the other thereof, substantially as and for the purposes set forth.

2. The combination of the graduated dial, the index and index-arbor, the radial tube fixed to said arbor and carrying the self-shifting weight, the clock or motor train, its time-shaft, a clutch connecting said index-arbor and time-shaft, the return-spring, and means for disengaging said clutch to effect the return of the index to zero, substantially as set forth.

3. The combination of the dial, the clock-operated time-shaft, the index and index-arbor, the sliding spring-pressed clutch connecting said arbor and time-shaft, the radial tube carrying the shifting-weight, the return-spring, the throw-off guide, the clutch-holding dog, the tripping-lever having the arms that engage said clutch and tube, and the operating-slide having an incline for working said lever, all substantially as and for the purpose set forth.

4. A time-signal apparatus comprising, in

combination, a graduated figured dial, an index or hand, a clock-train or time-regulated motor, clutch mechanism connecting the motor and index-arbors to advance the index
5 over the dial, and a lever that disengages said clutch, having connections for its actuation by the passing of a railway-train, and means, substantially as described, that automatically return said index to normal or zero
10 position, for the purpose set forth.

5. In a time-signal apparatus having an index and index-operating mechanism, the combination, with the operating slides and the lever whereby the index-arbor clutch is

disengaged, of the yielding relief-plate connected by a hinge to said lever and extending upward along the incline of said operating-slide, the curved arm fixed to said plate and passing through the lever, and an expanding-spring between said plate and said lever, substantially as and for the purpose set forth.

Witness our hands this 9th day of March, A. D. 1892.

DANIEL W. MITCHELL.
ELMER L. MITCHELL.

Witnesses:

MAURICE W. PERRY,
ANNA S. MITCHELL.