

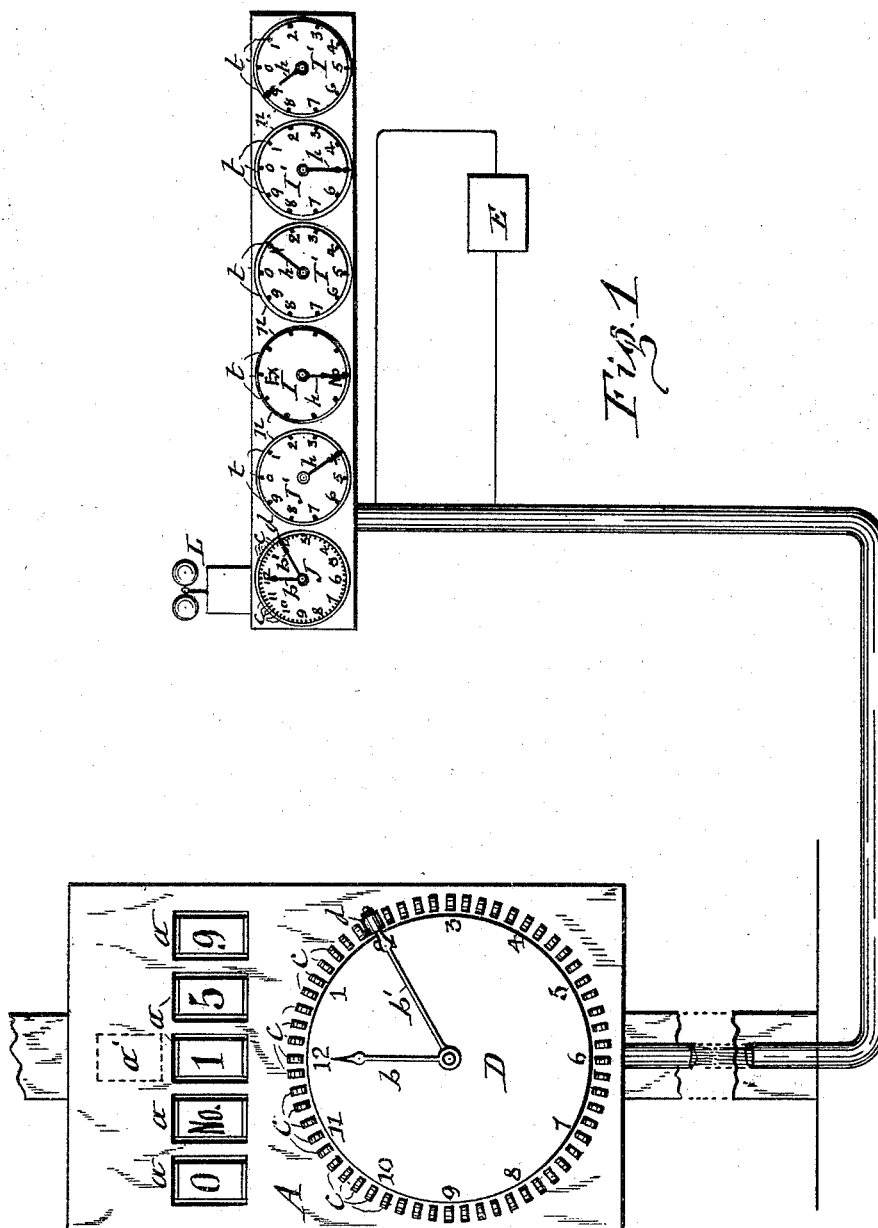
(No Model.)

3 Sheets—Sheet 1.

J. E. GEARY.
RAILWAY SIGNAL.

No. 489,736.

Patented Jan. 10, 1893.



WITNESSES:

C. L. Bendixon
Mark W. Dewey

INVENTOR:

John E. Geary
By Small, Lacey & Small
his ATTORNEYS.

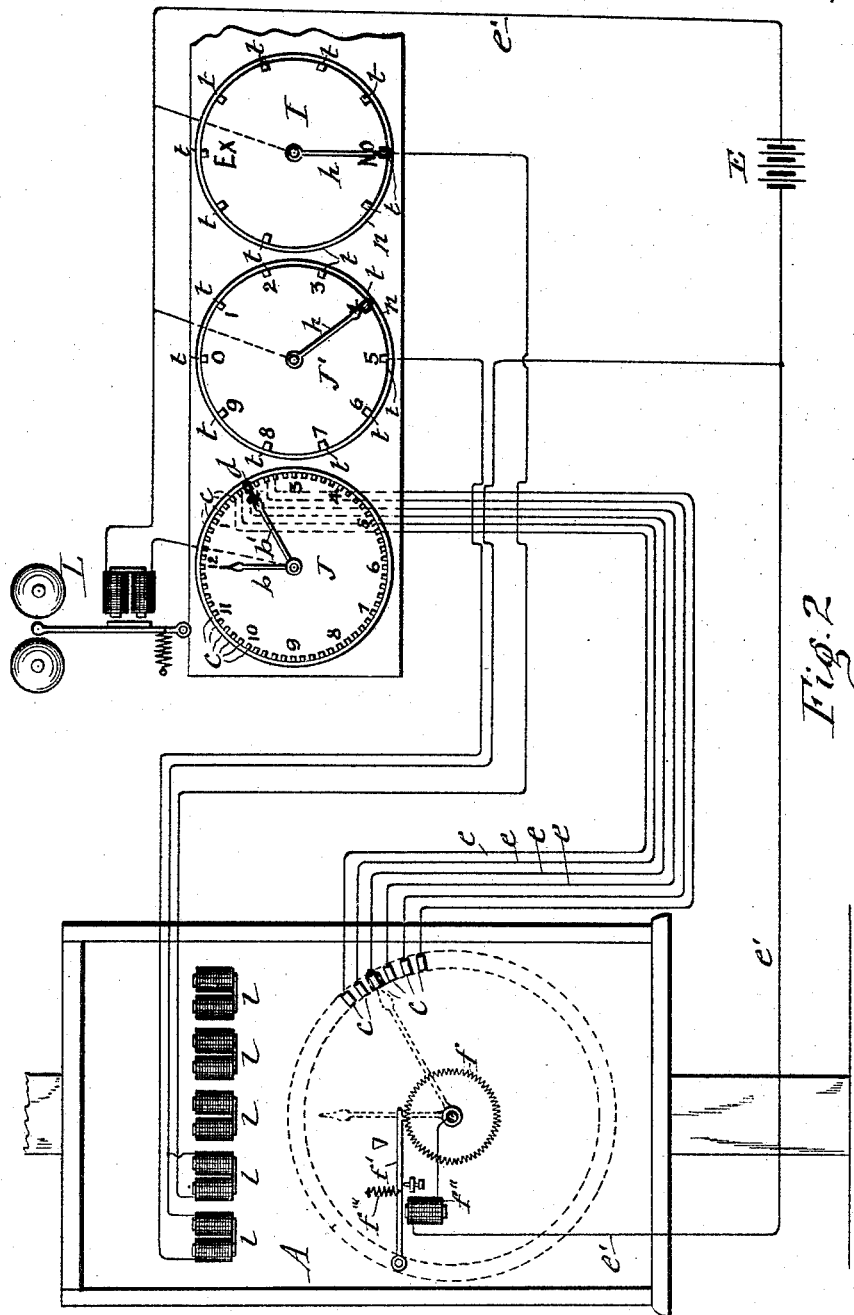
(No Model.)

3 Sheets—Sheet 2.

J. E. GEARY.
RAILWAY SIGNAL.

No. 489,736.

Patented Jan. 10, 1893.



WITNESSES:

C. L. Bendixon
Mark W. Dewey

INVENTOR:

John E. Geary
By Bull, Laess & Bull
his ATTORNEYS.

(No Model.)

3 Sheets—Sheet 3.

J. E. GEARY.
RAILWAY SIGNAL.

No. 489,736.

Patented Jan. 10, 1893.

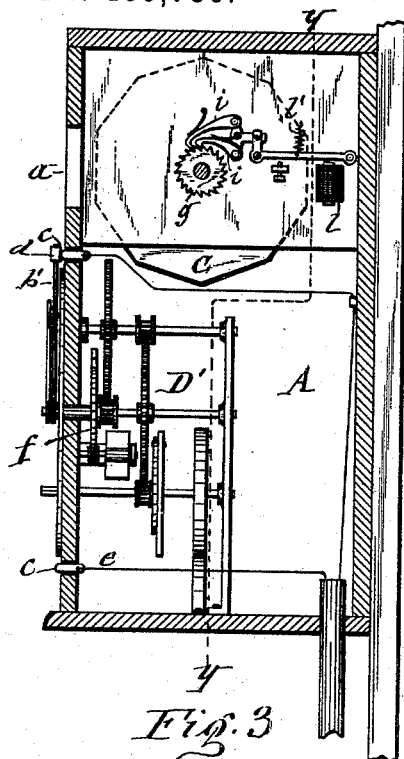


Fig. 3

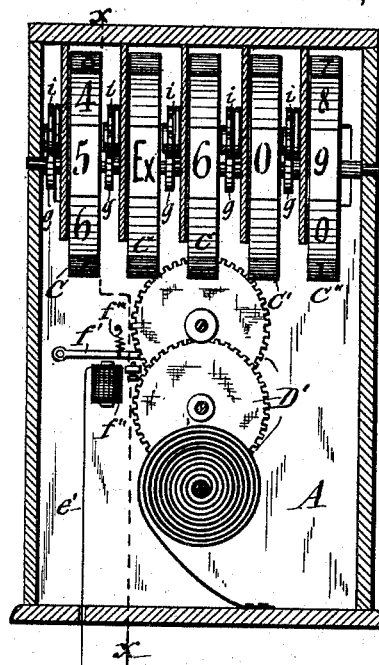


Fig. 4

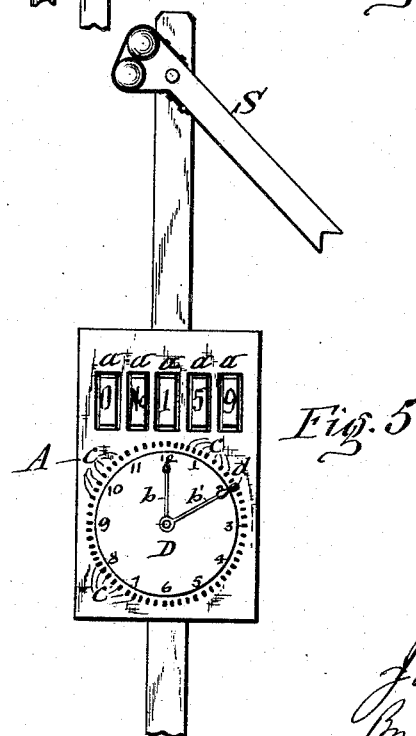


Fig. 5

WITNESSES:

E. L. Bendixon
Mark W. Dewey

INVENTOR:

John E. Geary
By Shull, Laas & Smith
his ATTORNEYS.

UNITED STATES PATENT OFFICE.

JOHN E. GEARY, OF SYRACUSE, NEW YORK.

RAILWAY-SIGNAL.

SPECIFICATION forming part of Letters Patent No. 489,736, dated January 10, 1893.

Application filed December 29, 1891. Serial No. 416,440. (No model.)

To all whom it may concern:

Be it known that I, JOHN E. GEARY, of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Railway-Signals, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to the class of apparatus employed at railway stations for warning the engineer and conductor of an approaching train from following too closely a preceding train. And the object of the invention is to provide more convenient and more efficient means for attaining the aforesaid effect. And to that end the invention consists in the novel construction and combination of parts hereinafter fully described and set forth in the claims.

In the annexed drawings Figure 1 is an elevation of a railway train indicator embodying my invention, Fig. 2 is a diagrammatic view of the electric apparatus for operating the indicator, Fig. 3 is a vertical transverse section on line *x, x*, in Fig. 4, Fig. 4 is a vertical transverse section on line *y, y*, in Fig. 3, and Fig. 5 is an elevation of the train indicator and semaphore used in connection therewith.

Similar letters of reference indicate corresponding parts.

Inasmuch as the train-indicators must face the railway in opposite directions from the station there must be two independently operating indicators employed at each station, and as they are alike in construction and operation, I will describe only one of them.

D— represents the dial of a clock by which to indicate the time at which the last train departed from the station. The clock work —D'— is arranged in a protecting case —A— and may be of any suitable construction. The case is preferably attached to the post of the semaphore —S— and set in such a position as to present the dial toward the railway. The same side of the case which is provided with the aforesaid dial has also a horizontal row of ports —a—a—a— through which to exhibit the number of a section of the train which has last departed from the station, also announce whether it was a scheduled or extra train, and the number of the train. For

this purpose I pivot inside of the case wheels or rollers —C—C—C—C'—C''— preferably disposed with their axes horizontal and in the same horizontal plane with the row of ports. 55

The devices thus far described are an important improvement of the train-indicators hitherto in use, and may be operated by hand. However the chief object of my invention is to operate said indicator electrically 60 by means of controlling instruments in the office or apartment of the operator.

It is obvious that the detail construction of the controlling instrument and its electric connection with the indicators admits of many 65 modifications and I therefore do not limit myself specifically to the arrangement shown in the annexed drawings in which —J—J'—I—I'—I'— represent the controlling instruments arranged in the apartment of the operator. The dial of the instrument —J— is 70 similar to the dial —D— of the time indicator, each being provided with an annular series of sixty electric contact points —c—c—c— &c., arranged concentric to the shaft of the clock-hands —b—b'— and in radial lines 75 passing from said shaft through the minute points of the dial. To the minute hand —b'— is attached an electric terminal —d— which traverses the contact points during the motion of said hand. To obviate friction I employ for said terminal a metallic roller pivoted to the minute hand. 80

The minute hands of the time indicating clock and of the dial —J— constitute electric 85 conductors, and each of the contact points —c— of the former is connected with a corresponding contact point of the latter by a wire —e— and a wire —e'— running from the hub of the minute hand of the clock to that of the dial —J— completes the circuit in which —E— denotes the battery. 90

To set the time on the dial —D— the operator turns the minute hand —b'— of the dial —J— to the time to be indicated. The hour-hand of said dial is geared with the minute-hand so as to cause the two hands to move together at the same rate of speed as the hands of an ordinary clock, but in this case neither spring nor weight is used for moving the 100 gears. In moving the minute hand of the dial —J— the circuit is successively made and

broken by the terminal —*d*— traversing the contact-points —*c-c-c*— and intervening spaces. The first break of the circuit allows the clock-work —*D'*— to move the hands on the dial —*D*— and, although said clock-work is geared to move the hands much faster than those of an ordinary clock, yet the clock-work in this case prevents the hands from moving as rapidly as those moved by the hands of the operator, and consequently the minute hand of the clock moves freely over the contact-points —*c-c-c*— until it arrives at the one corresponding to that over which the minute hand of the dial —*J*— is set. The circuit being closed at this point causes the hand of the clock to be arrested from farther movement and thus the time is set on the clock corresponding to the adjustment of the hands of the dial —*J*.

In order to insure a positive stop of the hands of the clock I employ a suitable detent connected to the clock work. Said detent being represented in the form of a spur-wheel or star-wheel —*f*— fixed to the hub of the minute hand, and a lever —*f'*— pivoted at one end to the case —*A*— and provided at the opposite end with a tooth by which it engages the wheel —*f*— as shown in Fig. 2 of the drawings. Said lever is drawn into engagement with the wheel by an electro magnet —*f''*— which is in the circuit hereinbefore described, and a spring —*f'''*— draws the lever out of engagement when the circuit is broken.

Each of the three indicating wheels —*C*— has the numbers from 0 to 9 marked or otherwise suitably applied to its peripheral face and distributed equidistantly around the same. The first wheel —*C''*— has on its peripheral face a series of numerals beginning with 1 and is used to indicate the number of the section, if any, of a train leaving the station. The second wheel —*C'*— has marked on two different portions of its face the letters "Ex." and "No." and is used to indicate whether the train is an extra or a scheduled train, and the other wheels —*C-C-C*— are marked with numerals from 0 to 9 and are used to indicate the number of the train.

One or more indicating wheels may be added if desired, as for instance a wheel to indicate how many trains are in the block. Said wheel being also electrically connected with a controlling instrument arranged as the others. The additional port in the case —*A*— for exposing the said wheel is indicated by dotted line —*a'*— in Fig. 1 of the drawings. All of the aforesaid indicating wheels are operated electrically and independently of each other by the separate controlling instruments —*J'-I'-I'-I'*— located in the office or apartment of the operator. Each of said instruments consists of a dial to which are attached the electric contact points —*t-t*— &c., distributed in a circle concentric to the dial.

To the center of each dial is pivoted a hand

—*h*— which traverses the aforesaid contact-points and constitutes an electric conductor. To the side of each wheel *C''*, *C'*, *C*, &c., is affixed a ratchet-wheel —*g*— with which engages a pawl or pawls —*i*— actuated by an electro magnet —*l*— and spring —*l'*— as shown in Fig. 3 of the drawings. Said magnet being in circuit with the hand —*h*—, and an electric conducting ring —*n*—, which latter encircles the series of contact points —*t-t*— and is in contact therewith.

By turning the hand —*h*— of the controlling instrument the circuit is broken and made as the hand passes from one contact point —*t*— to the next, and by the electric impulse transmitted to the magnet —*l*—, the pawl or pawls —*i*— are actuated to move the indicating wheel by means of its ratchet-wheel —*g*—, and said movement is continued until the hand —*h*— of the controlling instrument is set upon the contact point —*t*— coinciding with the number or letters to be presented by the indicating wheel in the case —*A*—.

In setting the described train-indicator the operator moves the hands of the instrument —*J*— until they represent the time the last train has left the station. The hands of the clock-dial —*D*— become thus set correspondingly in the manner hereinbefore described. If the train which is leaving the station is a scheduled train the operator turns the hand of the third dial —*I*— to the contact point —*t*— directly opposite the letters "No." on the dial which causes the second wheel —*C'*— to turn into a position to expose "No." through the port —*a*—. And if said train is extra—the operator sets the hands of the dial —*I*— to point to Ex. and the wheel —*C'*— turns correspondingly. If the aforesaid train is a section of a preceding train the operator turns the hand of the second dial —*I'*— to the number corresponding with the number of the section, and the first wheel —*C''*— is thereby caused to turn so as to expose a corresponding number through the port —*a*—. The other three wheels —*C-C-C*— are made to present the number of the train by the operator turning the hands of the three dials —*I-I-I*— to corresponding numbers on the dials. A suitable bell or alarm —*L*— may be connected to the controlling instrument to sound the alarm at the initial break and final closure of the circuit through the indicator and controlling instrument.

In connection with the described train-indicator I prefer to employ a suitable semaphore —*S*— for signaling the condition of the track, as represented in Fig. 5 of the drawings.

Having described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. In a railway train indicator, the combination with a controlling instrument having a dial provided with a series of radial contact points, and an hour and minute hand geared to move relatively in the same ratio as an ordi-

nary clock, of a clock indicator having a series of similarly arranged radial contact points electrically connected with the respective contact points of the controlling instrument, an hour and minute hand, the latter electrically connected with the minute hand of said controlling instrument, a battery and electro magnet in circuit with said hands, a spur wheel on the minute hand shaft and an armature detent, adapted to be operated when the circuit is closed, to hold the clock hands in position corresponding to the position of the hands of the controlling instrument when set, substantially as specified.

2. The combination of a clock presenting its dial toward the railway, an annular series of electric contact points arranged concentric to the shaft of the clock-hands, an electric terminal carried by one of said hands and traversing said contact points, a similar dial with correspondingly arranged contact points in the apartment of the operator, separate electric connections between each of the latter contact points with those of the clock, a hand pivoted to the dial, an electric terminal on said hand traversing the contact-points of said dial and electric connections between the terminals of the two hands as set forth.

3. In a railway train indicator, the combination of a case having a dial and a horizontal row of ports facing the railway, clock-work in the case having hour and minute hands in front of the dial, sixty electric contact points respectively in radial lines passing from the

center of the dial through the minute points of the dial and concentric thereto, an electric terminal on the hand traversing said contact points, a detent adapted to engage and release the clock-work, a magnet actuating the detent, indicating wheels pivoted to the interior of the case and presenting their indicating faces through the ports, ratchet-wheels attached to the sides of the indicating wheels, pawls engaging the ratchet-wheels, magnets actuating the pawls, and controlling instruments one for each of the aforesaid indicating wheels and clock and located in the apartment of the operator and electrically connected with the magnets, contact-points and terminals of the aforesaid clock and indicating wheels, substantially as shown and described.

4. In an electric railway indicator the combination with the controlling instrument, its radial contact points and hands, with the clock indicator its radial points and hands electrically connected as described, of an electro magnet in circuit with the instruments and an armature and alarm adapted to be sounded thereby at the initial break and final closure of the circuit through the clock indicator and controlling instrument, substantially as specified.

In testimony whereof I have hereunto signed my name this 24th day of December, 1891.

JOHN E. GEARY. [L. S.]

Witnesses:

MARK W. DEWEY,
H. M. SEAMANS.