P. FERRARI.

TRAIN INDICATOR.

APPLICATION FILED FEB. 18, 1907.

918,028.

Patented Apr. 13, 1909.

3 SHEETS—SHEET 1

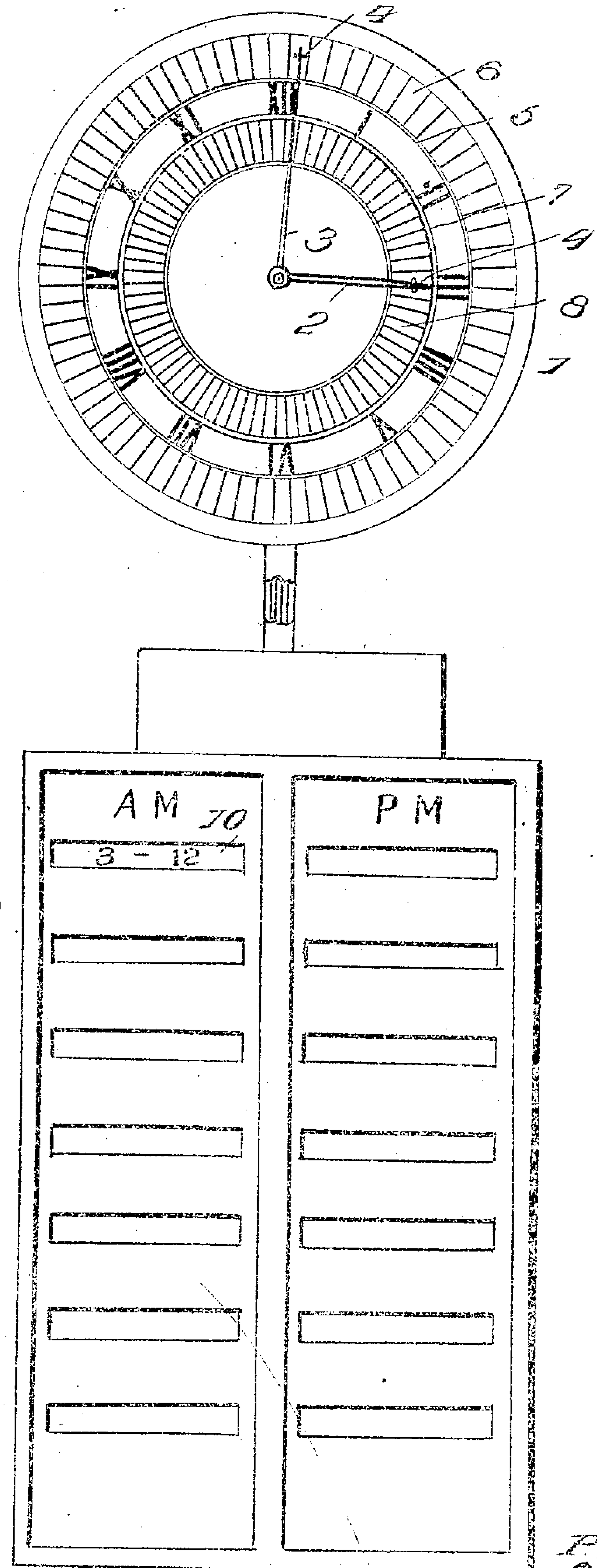

Fig. 1.

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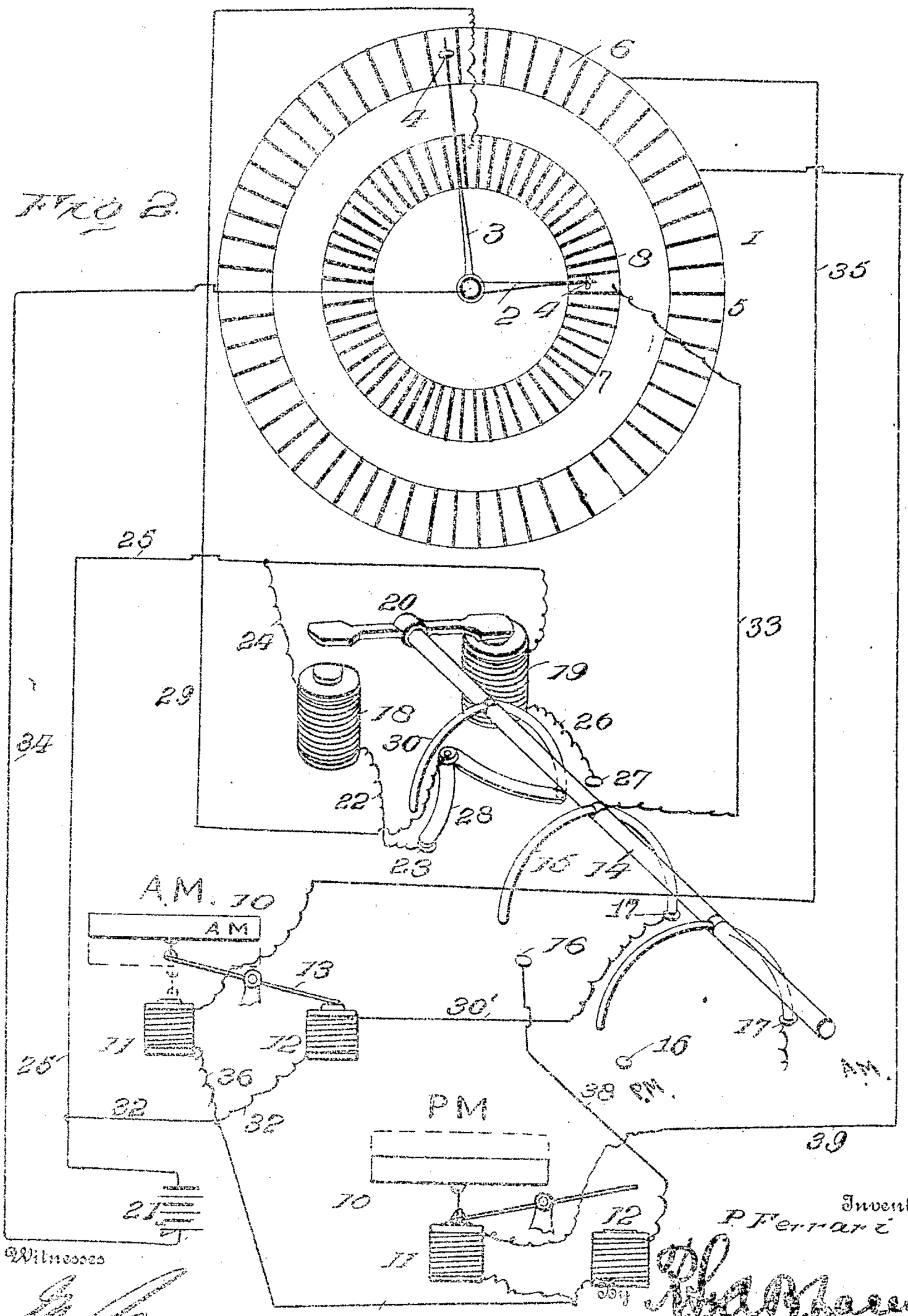
3 SHEETS—SHEET 2.

FIG. 2.



Witnesses

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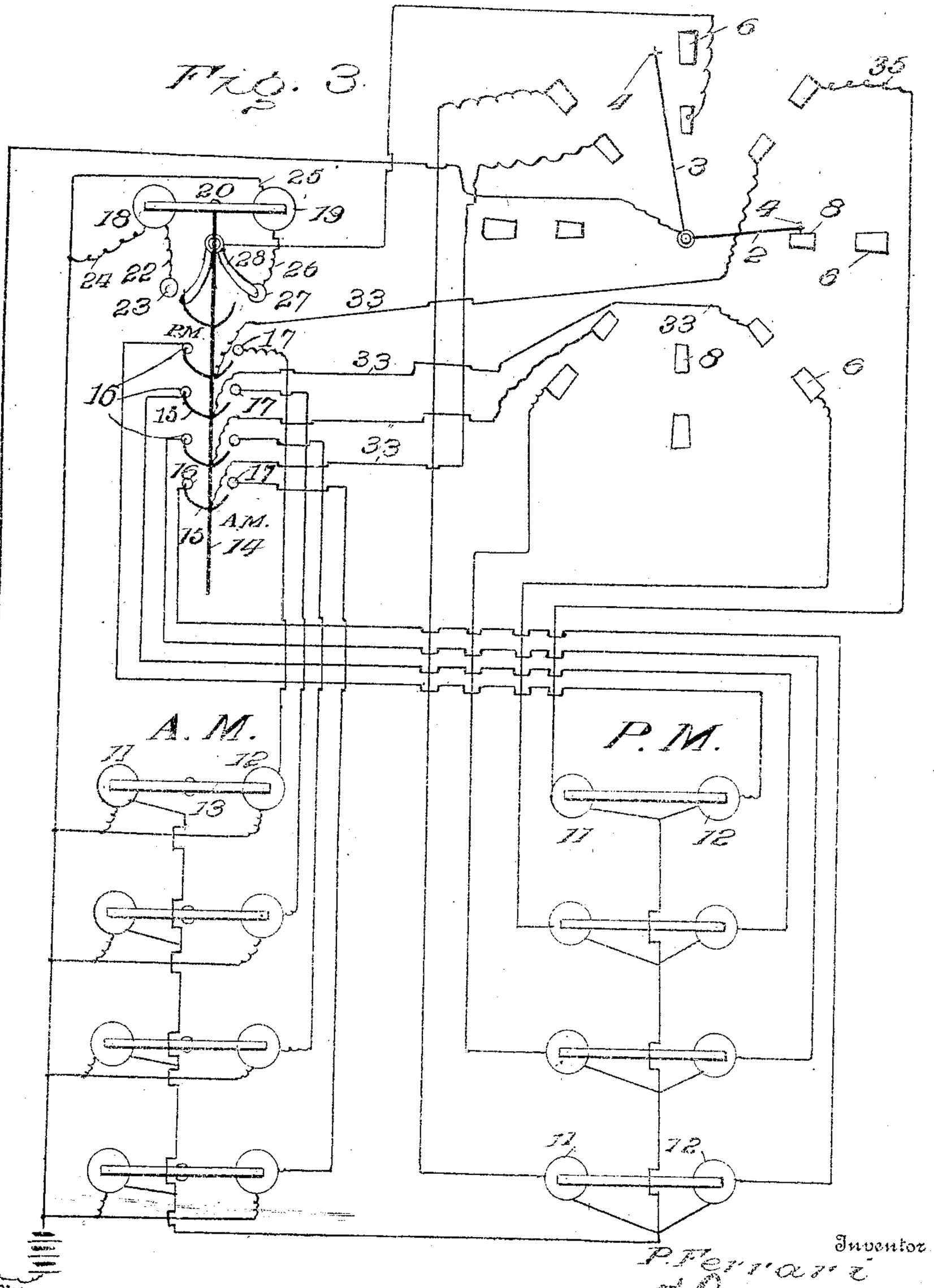
Fig. 3.



Witnesses

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UNITED STATES PATENT OFFICE.

PASQUINO FERRARI, OF FALL RIVER, MASSACHUSETTS, ASSIGNOR OF ONE-TENTH TO SEVERINO TOLETTI AND ONE-TENTH TO FRANCESCO PAOLO GIZZI, BOTH OF FALL RIVER, MASSACHUSETTS.

TRAIN-INDICATOR.

No. 918,028. Specification of Letters Patent. Patented April 13, 1909.

Application filed February 18, 1907. Serial No. 357,998.

To all whom it may concern:

Be it known that I, PASQUINO FERRARI, subject of the King of Italy, residing at Fall River, in the county of Bristol and State of Massachusetts, have invented certain new and useful Improvements in Train-Indicators, of which the following is a specification.

This invention relates to means for automatically indicating either the departure or the arrival of trains or public carriers operating on a fixed schedule. A clock movement is the controlling means and is adapted to open and close certain electric circuits, whereby indicator mechanisms are actuated either to expose or withdraw from observation placards or other schedule indicating matter. Electricity is the controlling medium and energizes certain electro-magnets with the result that the matter to be displayed is either brought to view or hidden in successive order as the time passes. Included in the mechanism as a part thereof is an automatic switch for throwing one series of electro-magnets out of circuit and bringing another set of electro-magnets into circuit, corresponding to the time from midnight to noon and from noon to midnight.

In carrying out the invention, a clock movement of any make, design or pattern may be employed and the hour and minute hands are utilized as circuit closing means to cause the indicator cards either to appear or disappear as may be determined upon.

For a full description of the invention and the merits thereof and also to acquire a knowledge of the details of construction and the means for effecting the result, reference is to be had to the following description and accompanying drawings.

While the invention may be adapted to different forms and conditions by changes in the structure and minor details without departing from the spirit or essential features thereof, still the preferred embodiment is shown in the accompanying drawings, in which:

Figure 1 is a front view of an indicator embodying the invention. Fig. 2 is a diagram showing the circuits, the ante-meridian indicators being in established circuits to be operated upon closing and breaking the said circuits, and the appearing circuit being closed. Fig. 3 is a diagram showing the post meridian indicators in established circuits to be operated upon by closing and breaking said circuits by the time actuated circuit closing means.

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.

The clock movement is indicated at 1 and the hour and minute hands are designated respectively by the numerals 2 and 3, the same being electrically connected with one pole of a battery or current generator 21. Each hand is provided at its outer end with a small wheel 4, which travels over a series of electrically insulated contacts which are electrically connected with the opposite pole of the battery or generator, thereby enabling the several circuits to be successively opened and closed. A ring 5 is secured to the front or dial of the clock movement and is provided with a series of electric contacts 6 electrically insulated from one another. The contacts 6 make electric connection with the minute hand 3 through the wheel or rotary contact 4. The circuits established through the minute hand and the contacts 6 effect disappearing of the indicator cards. A second ring 7 concentric with the ring 5 is likewise attached to the front or dial of the clock movement and is provided with a series of electric contacts 8 dielectrically separated. The several circuits established through the hour hand 2 and electric contacts 8 effect appearance of the indicator cards so as to display either the departure or the arrival of trains or other public carriers.

In a conspicuous position is placed the schedule, the same consisting of a suitable frame-work or case 9 and a series of indicators 10 which may consist of slats, cards, or the like, bearing time or other matter to be exposed so as to indicate to the public either the time of departure or arrival of trains or the like. These indicators are electrically controlled being exposed at proper intervals and withdrawn from view at such other times as may be determined upon to avoid confusion. Two electro-magnets 11 and 12 are provided for each indicator and other armatures are connected to opposite ends of a rocking bar 13 with which the indicator 10 is connected. When the minute hand reaches the required point in its travel it makes electric connection with a contact 6 and closes the circuit through the electro-magnet 11 which becoming energized attracts its arma-

ture and rocks the bar 13 to effect withdrawal of the indicator. When the hour hand reaches a given point in its travel it closes a circuit through one of the contacts 8 and an electro magnet 12 which being vitalized attracts its armature and causes the bar 13 to rock with the result that an indicator 10 is brought in position to expose the matter imprinted or otherwise inscribed thereon. It is to be understood that the coöperating electro-magnets 11 and 12 of each indicator are included in circuits whose contacts appear upon the concentric series of electric contacts 6 and 8. All of the circuits include the hour and minute hands 2 and 3 of the clock movement. The dials of clock movements usually represent characters from 1 to 12 corresponding with the twelve hours from midnight to noon and from noon to midnight. It will thus be understood that in each day the hour hand makes two complete revolutions and passes twice over each character.

To designate the ante-meridian schedules from the post-meridian schedules, it is necessary to interpose a switch in the series of circuits and which switch is automatically actuated at noon and midnight of each day to throw the ante-meridian schedules out of circuit and the post-meridian schedules into circuit, and vice versa, as the time passes and the days are born and die. The switch devised for the purpose consists of a rock shaft 14 provided with a series of circuit closers 15 and a series of contacts 16 and 17. The circuit closers 15 consist of spaced members and while they are attached to the shaft 14 so as to rock therewith, they are electrically insulated from one another. Upon rocking the shaft 14 in one direction, one member of the circuit closers 15 will engage with the contacts 17 and close the circuits through the ante-meridian indicators and break the circuits through the post meridian indicators. When the shaft 14 is rocked in the opposite direction, the reverse takes place, *i. e.*, the circuits through the ante-meridian indicators are broken and the circuits through the post-meridian indicators established. It is to be understood that the operation of the switch in one direction or the other closes the circuits in a sense to place either the ante-meridian or the post-meridian indicators in condition for operation as the respective circuits are closed by the hour and the minute hands. The switch simply throws one set or the other of the indicators into or out of operative position. When the hour and minute hands close the circuits upon the contacts of the circular series 6 and 8 of the clock movement, the electro-magnets corresponding to such circuits as are closed by the hour and minute hands are alone energized.

The switch is electrically controlled by means of the clock movement, electro-magnets 18 and 19 being provided and having their armatures connected to a rocking bar 20 made fast to the rock shaft 14, whereby the latter moves in one direction or the other according to which of the electro-magnets 18 or 19 is energized. It is to be understood that the switch and the operating parts generally are suitably housed or incased. The helix of the electrc magnet 18 has one end connected by a wire 22 to a contact 23, the opposite end of said helix being connected by a wire 24 to a wire 25 which is electrically connected with one pole of battery or generator 21 and which wire also connects with one end of the helix of the electro-magnet 19. A wire 26 connects the opposite end of the helix of the electro-magnet 19 with an electric contact 27. A circuit closing switch 28 is mounted so as to make electric connection with either one or the other of the contacts 23 or 27 and is connected by means of a wire 29 with a contact 8 opposite to the twelfth hour of the clock movement. A trip 30 of yoke form is fast to the shaft 14 and rocks therewith and is adapted to engage the switch 28 to throw the same to make electric connection with either one or the other of the contacts 23 and 27. When the hour hand 2 reaches the noon or midnight hour and makes momentary electric connection with the contact 8 the circuit is closed through one or the other of the electro-magnets 18 and 19, thereby causing the bar 20 to rock and the shaft 14 to rock therewith with the result that the switch 28 is moved by the trip 30 to break the circuit through the electro-magnet energized an instant before and to establish the circuit through the other electro magnet, whereby said circuit may be closed upon the next revolution of the hour hand when it reaches the contact 8 corresponding to the twelfth hour of the dial. The circuit established through one or the other of the electro-magnets 18 and 19 is of momentary duration sufficient to effect a rocking of the shaft 14 to break the circuit through the electro magnet energized and to establish the circuit through the other electro magnet, whereby said circuit may be closed at the next revolution of the hour hand with the result that the post meridian indicators are thrown out of operation and the ante-meridian indicators brought into operation and vice versa. In this connection it is to be understood that the clock movement is of the kind in which the hour hand works intermittently, and that the contact piece is located between two successive positions of the hour hand, so that the contact is made while the hour hand is moving from its last position on the left of the contact, to the first position on the right of the contact.

The circuits through the electro-magnets 11 and 12 are the same both for the ante-meridian and the post-meridian indicators. One end of the helix of the electro-magnet 12 is connected by a wire 30^1 with a contact 17 and the other end of said helix is connected by wire 32 with the wire 25 which as heretofore described is in electric connection with one pole of the battery or current generator 21. The circuit closer switch 15 is connected by wire 33 with a contact 8. The minute hand 3 is connected by wire 34 with one pole of the battery or generator 21. A wire 35 connects one of the contacts 6 with one end of the helix of the electro magnet 11, the other end of said helix being connected by wire 36 with the wire 32; hence with one pole of the battery or generator 21 through the wire 25, when the minute hand makes electric connection with the contact from which the wire 35 leads, the circuit is as follows: from the minute hand through wire 35 to electro-magnet 11, thence through wire 36 to wire 32, wire 25, battery 21 and wire 34 back to the minute hand. The electro-magnet 11 becoming energized, causes the bar 13 to rock, thereby withdrawing the indicator so that it may not be read through the observation opening of the cabinet 9.

It is to be understood that the circuit through the electro-magnet 12 is broken some time prior to the closing of the circuit through the electro magnet 11 of the same pair. The electro magnets of the post-meridian indicators have one end of their helixes connected by wire 37 with the wire 32 and to one pole of the battery 21 through wire 25. One end of the helix of the electro-magnet 12 is connected by wire 38 to a contact 16. The other end of the helix of the electro-magnet 11 is connected by wire 39 with a contact 6. When the switch is thrown to establish the circuits of the post meridian indicators, the appearing circuit is as follows: starting at the hour hand 2, through contact 8, wire 33, switch 15, contact 16, wire 38, electro-magnet 12, wires 37, 32 and 25, battery 21 and wire 34, back to hour hand 2. The disappearing circuit is as follows: starting at the minute hand through contact 6, wire 39, electro-magnet 11, wires 37, 32 and 25, battery 21 and wire 34 back to minute hand 3.

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

1. In an indicator for trains or other schedules, the combination of a series of indicators, a clock movement, a pair of electro-magnets for each indicator and electric circuits for the electro-magnets, and adapted to be opened and closed by the clock movement, whereby one or the other of the electro-magnets of each pair is energized to throw the indicator either into or out of view.

2. In an indicator for trains or like schedules, the combination of two series of indicators, a clock movement, electric apparatus for the indicators of each of the two series, electric circuits adapted to be opened and closed by the said clock movement and a switch for throwing one set of electric apparatus out of action and the other set into action according as the clock movement is registering the hours before or after meridian time.

3. In an indicator for trains or like schedules the combination of two series of indicators, a clock movement, electric apparatus for the indicators of the two series, electric circuits adapted to be opened and closed by the said clock movement and a switch for throwing one set of electric apparatus out of action and the other set into action according as the clock movement is registering the hours before or after meridian time, and means for automatically operating said switch and likewise controlled by the said clock movement.

In testimony whereof I affix my signature in presence of two witnesses.

PASQUINO FERRARI. [L. S.]

Witnesses:

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