

E. PFISTER.
 INDICATING DEVICE.
 APPLICATION FILED OCT. 5, 1915.

1,324,924.

Patented Dec. 16, 1919.

2 SHEETS—SHEET 1.

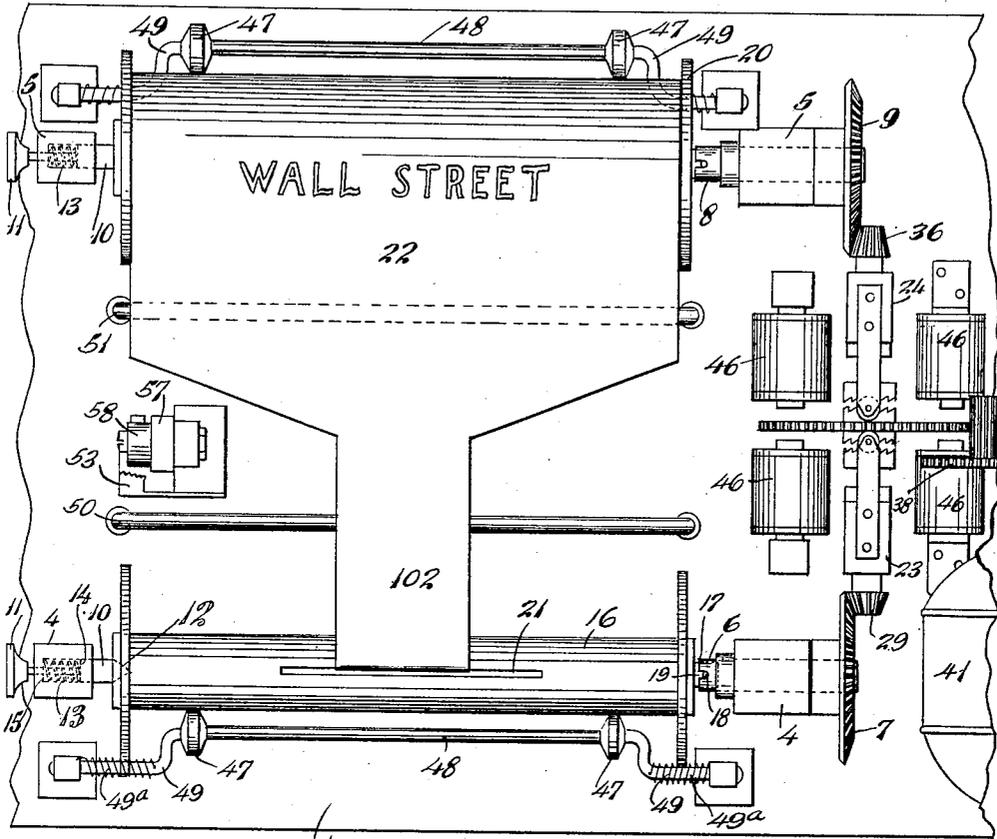


Fig. 1

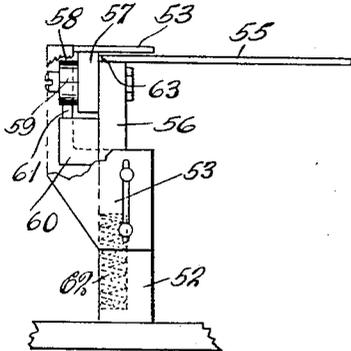


Fig. 3

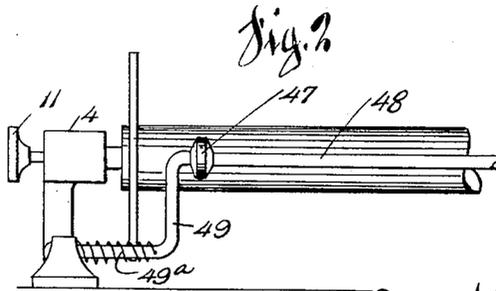


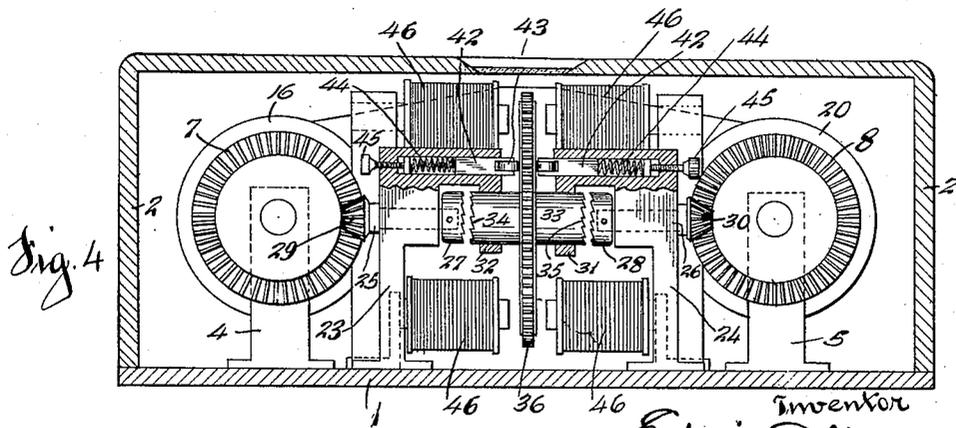
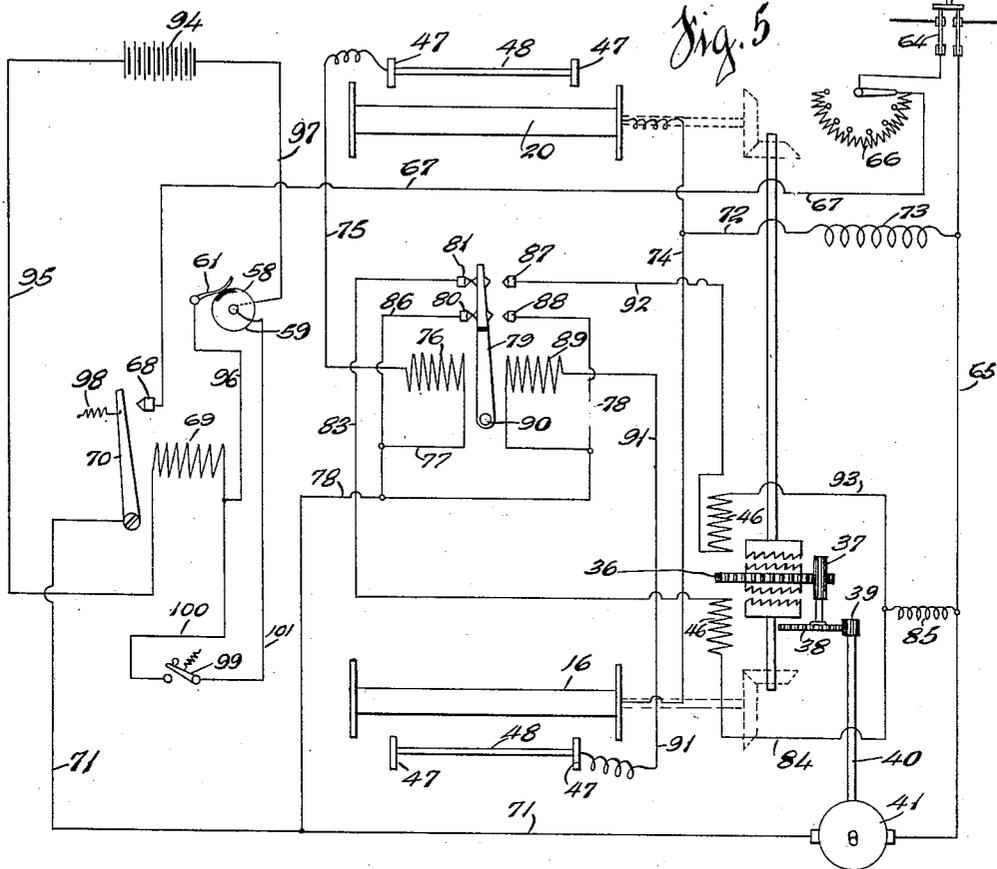
Fig. 2

Inventor
 Edwin Pfister
 By Arthur Oswald,
 Attorney

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Inventor
Edwin Pfister
By Arthur Ewald
Attorney

UNITED STATES PATENT OFFICE.

EDWIN PFISTER, OF CINCINNATI, OHIO.

INDICATING DEVICE.

1,324,924.

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To all whom it may concern:

Be it known that I, EDWIN PFISTER, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented a new and useful Improvement in Indicating Devices, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to automatic indicating devices and particularly to such as are adapted to indicate for the benefit of passengers upon a conveyance, the names of the regular stops to be made by such conveyance as the same are reached.

The object of my invention is to provide a device of the character mentioned having a suitable web on which the regular stops to be made by a street car or other conveyance are printed, or otherwise indicated, in the order in which such stops or stations are to be reached by the conveyance, said web being arranged to be advanced intermittently to disclose to the passengers in the conveyance, the names of the stations or stops to be made by the conveyance in the order in which the same are reached.

In the drawings:

Figure 1 is a plan view of my invention. Fig. 2 is a fragmentary front elevation thereof.

Fig. 3 is an elevation of the web supporting device and commutator.

Fig. 4 is an elevation of the invention, certain parts being shown in section.

Fig. 5 is a diagrammatic illustration of the electric wiring whereby the mechanism of my invention is operated.

Numeral 1 indicates the base on which the several elements of my invention are mounted. Adapted to fit upon the said base and to serve as a covering for the mechanism hereinafter described is the casing 2, said casing being provided on its upper side with a glass panel 3 through which the indicia upon a web are visible, as hereinafter more fully described. The base 1 is preferably of some fibrous or other electrically non-conductive material and the casing 2 is made of wood or other suitable material. Mounted upon the base 1 are standards 4—4 and 5—5. Journaled in one of the standards 4 is a short hollow shaft 6 upon one end of which a bevel gear 7 is rigidly mounted. Journaled in one of the standards 5 is a

short hollow shaft 8 carrying a bevel gear 9, the shaft 8 and gear 9 being similar to shaft 6 and gear 7 and upon the opposite side of the base 1, the gears 7 and 9 being in alinement. Mounted in each of the other standards 4 and 5 is a pin 10 provided on its outer end with a milled nut 11; the said pin is provided with a pointed end 12, which is caused normally to extend inside the standard by means of a coil spring 13 mounted upon said pin and interposed between a shoulder 14 on the pin and a shoulder 15 in the opening in said standard. The short shaft 6 and pin 10 in the opposite standard 4 are adapted to serve as mountings for an electrically conductive roller 16, the said roller being provided with a short axle 17 at one end adapted to fit into the end of the hollow shaft and a pin 18 on said axle to engage a slot 19 in the hollow shaft 6 so that the roller 16 may be caused to rotate with the shaft 6. The opposite end of the roller 16 is provided with an opening in which the pointed end 12 of the pin 10 is adapted to fit to serve as a bearing for the roller. As will be seen, the roller 16 is thus mounted in such a manner that it is automatically adjustable longitudinally, the bearings and uniform position of the roller being maintained by the tension of the spring 13. Between the standards 5—5 a roller 20, similar to the roller 16 is mounted, the mountings being in all respects similar to those described in connection with the roller 16, the roller 20 being arranged to rotate with the rotation of shaft 8. Each of the rollers 16 and 20 is provided with a slot or slots 21 in which the ends of the web 22 are secured so that said web may be wound upon either of said rollers by the suitable rotation thereof.

The driving mechanism for the operation of the rollers 16 and 20 will now be described. Journaled in the standards 23 and 24, which are mounted on the base 1, are short shafts 25 and 26, the inner ends of said shafts being provided with clutch members 27 and 28 rigidly secured to the ends of the shafts as shown in Fig. 4. The outer end of shaft 25 has keyed thereto a bevel pinion 29 which intermeshes with the bevel gear 7; and the outer end of shaft 26 carries a bevel pinion 30 which intermeshes with the bevel gear 9 on shaft 8. The clutch members 27 and 28 are arranged to be in alinement as shown in Fig. 4. Journaled in

hangers 31 and 32 depending from the standards 24 and 23 respectively, is a short shaft 33, the two ends of which are formed to serve as clutch members 34 and 35 to engage the clutch members 27 and 28. The shaft 33 is arranged to slide longitudinally in the hangers 31 and 32 so that either pair of clutch members may be brought into engagement, the opposite pair being released. Secured to the shaft 33 between the clutch members 34 and 35 is a drive gear 36 which intermeshes with a pinion 37, which is mounted with the gear 38. The gear 38 is driven by pinion 39 which is mounted on the armature shaft 40 of the motor 41. By means of the drive mechanism above described, it will be seen that when the clutch member 34 is in engagement with the clutch member 37, the roller 16 will be driven in a direction to wind upon it the web 22; and when the clutch member 35 is in engagement with clutch member 28, the roller 17 will be rotated to wind the web in the opposite direction, that is, upon said roller 17. For the purpose of holding the clutch members in neutral position, there is mounted in each of the standards 23 and 24 a plunger 42 which carries mounted in its outer end a roller 43 the two rollers being arranged to bear against the two sides of the gear wheel 36. Tension springs 44 are seated in the standards and arranged to bear against the inner ends of the plungers to cause the rollers to bear constantly against the gear wheel 36. Thumb screws 45 are provided as shown in Fig. 4 for the adjustment of the springs 44 and set screws as shown may be provided to secure such adjustment.

In order that either pair of clutch members may be brought into engagement, there are mounted on opposite sides of the gear wheel 36, electro-magnets 46, two or more of such magnets being on each side of the gear wheel 36 in order that the pull of the magnets upon said gear wheel which is arranged to be drawn to either side by either set of magnets, may be equal and the engagement positive. As soon as the magnets are demagnetized, by cutting off the current, the clutch is caused to return to a neutral position by the plunger 43 which has been under compression during the engagement of the clutch.

Arranged to bear upon each of the rollers 16 and 20 are electrically conductive roller bearings 47, the said bearings being mounted upon a rod or shaft 48 which is pivotally connected to the base by the arms 49. The shaft 48 and arms 49 are also electrically conductive and in contact with the rollers 47; springs 49^a cause the roller bearings to bear constantly on the rollers 16 and 20. The purpose of the rollers 47 is partly to control the movement of the web 22 and partly to complete electric circuits in con-

junction with the rollers 16 and 20 in the manner and for the purpose hereinafter set forth.

The web 22 in passing between the rollers 16 and 17 is arranged to pass over supports 50 and 51, which are adapted to support the web beneath the transparent panel 3 of the casing 2. Mounted on the base 1 below one edge of the web 22 and between the supports 50 and 51 is a standard 52 upon which is mounted a plate 53 which has a portion arranged to overlap the web 22. Secured to the plate 53 is a plate 55 arranged to extend under the web 22; the plates 53 and 55 cooperating as will be readily understood, to maintain the web 22 between the supports 50 and 51 in flat position. Mounted in the standard 52 is a tension support 56 having a roller 57 which carries a commutator 58; the commutator is provided with a single non-conductive segment 59 and is arranged to conduct a current through the roller 57, support 56 and standard 52. Mounted upon insulation 60 on the support 56 is a brush 61 which bears upon the commutator 58. A spring 62 is arranged to thrust the support 56 upward. The plate 55 is provided with a slot 63 through which the roller 57 is adapted to bear upon the web 22; the passage of the web between the plate 54 and roller 57 thus causes the latter and the armature 58 to rotate.

The actuation and control of the mechanism above described is accomplished by means of the electrical mechanism diagrammatically illustrated in Fig. 5 of the drawings. The electrical current for the actuation of the motor 41 is derived from the main line, the switch 64 being provided to throw in and cut out the current. From the switch 64 a wire 65 leads direct to one pole of the motor 41. The opposite pole of the main line leads through the rheostat 66 through wire 67 to a contact 68 of a relay, the magnet of which is illustrated at 69 and the armature by the arm 70. Leading from the arm 70 is a wire 71 to the opposite pole of the motor 41; the circuit through the motor will thus be completed whenever the armature arm 70 is in contact with the point 68 as will be seen. Suitable resistance to cut down the current for the use of motor 41 if the same be necessary, may be introduced by means of the rheostat 66. A shunt circuit from the main line through a reverse relay is arranged to magnetize the magnets on either side of the clutch gear 36 in order to bring into engagement either pair of clutch members for the driving of either one of the rollers 16 and 20. This shunt circuit is illustrated in Fig. 5 by the wires 72 leading through the resistance 73 from the wire 65 to a wire 74 which contacts with both of the rollers 16 and 20; from the supports 49 of the rollers 47 which

bear on the roller 20 is a wire 75 which leads to a magnet coil 76 of the reverse relay. The opposite pole of said coil is connected by a wire 77 to wire 78 which leads to the wire 71 in the motor circuit. The current for the magnetizing of the magnet 76 passes from the wire 65 when the motor current is made through the arm 70 of the relay, thence through resistance 73, wires 72 and 74 to roller 20, rollers 47, wire 75, coil 76, wires 77, 78 and 71, arm 70, point 68 and out through wire 67. When the magnet 76 is thus magnetized, the armature arm 79 is actuated to make contact between the points 80 and 81 which complete a circuit through one set of the clutch magnets 46 for the actuation of the clutch. The point 81 is connected by means of a wire 83 to one pole of one set of clutch magnets 46; the other pole of said magnets being connected by wire 84 through resistance 85 with the motor circuit lines 65. The contact point 80 is connected by wire 86 to the wire 78. When the armature arm 79 completes contact between the points 80 and 81, the circuit for the magnetizing of one set of clutch magnets is as follows: through the wire 65, resistance 85, wire 84, to coil 46, wire 83, point 81, arm 79, point 80, wires 86, 78 and 71, arm 70, point 68 and out through wire 67. Magnetizing of this set of magnets 46 as will be understood, throws into engagement the appropriate clutch members as above described. In order to throw into connection the opposite clutch members, a circuit is to be completed through the opposite clutch magnets 46 and this is done when the arm 79 is thrown into contact with the points 87 and 88 of the reverse relay by the magnetizing of the electro-magnet 89 of said reverse relay. To accomplish this, the following circuit is made through the magnet 89: through wire 65, resistance 73, wires 72 and 74, roller 16, rollers 47, wire 91, coil 89, wires 90, 78 and 71, arm 70, point 68 and out through wire 67. The magnetizing of electro-magnet 89 draws the armature 79 toward it and makes contact by the contacts on the armature arm between the points 87 and 88 which complete a current through the clutch magnets 46 as follows: through wire 65, resistance 85, wire 93, magnet 46, wire 92, point 87, arm 79, point 88, wires 78 and 71, arm 70, point 68 and wire 67. The relay 69 is operated by a battery current from the battery 94 through wires 95 and 96, brush 61, commutator 58 and wire 97 back to the battery. When the commutator is in position to break the battery current through the magnet 69, the relay armature 70 is caused to break contact at point 68, by means of the spring 98 which normally holds the circuit through motor 41 in open position. In order to manually close the battery circuit

through wire magnet 69, a push button 99 is provided which completes the battery circuit through wires 100 and 101 when the commutator is in open position. Completion of the circuit through magnet 69, closes the motor circuit, thus starting the motor and throwing in the appropriate clutch members in the manner heretofore set forth. This actuates the web which rotates the commutator and completes the circuit through said commutator to the magnet 69 and maintains the motor circuit until the commutator has completed one revolution when it again opens the battery circuit and hence stops the motor.

In order that the reverse relay magnet 76 and 89 may be alternately actuated at the proper intervals to throw the clutch for the purpose of rotating the rollers 16 and 20 at the proper times, the web 22 is so shaped at its ends that it is narrower than the space between the rollers 47 and thus when the end of the web is reached, the rollers 47 are ready to contact with the corresponding rollers 16 and 20, thus completing the circuits as above set forth.

The operation of my indicating device is as follows: The web 22, being provided with suitable indicia to indicate the streets or stations along the route of a railway, for instance, at which stops are to be made, is applied to the rollers 16 and 20, so that in being unwound from one roller and taken up upon the other, the indicia upon the web will be caused to pass under the transparent plate 3 in the order in which the stations or stops are to be reached; the first station upon one end of the web being visible through said transparent plate. The narrow end 102 of the web then lies between the rollers 47 which bear upon the take-up roller as shown in Fig. 1. This closes the circuit through clutch magnets 46 arranged to throw in the clutch for the operation of said take-up roller in the manner above set forth. After the station has been reached and it is desired to cause the web to move forward to disclose the next station or stop, the motorman or conductor presses the button 99 which may be conveniently located for the purpose and thus makes the battery circuit through the relay magnet 69 which completes the motor circuit and actuates the web to cause it to move forward as above set forth. The movement of the web actuates the commutator 58 and holds the relay arm 70 and point 68 in contact until the commutator has made one revolution and the brush is on the non-conductive segment. When the battery circuit is open and the armature arm 70 caused to open the motor circuit by reason of the spring 98, the web is caused to stop, the next station to be reached being under the transparent panel of the cover. This operation is continued from station to station until

the final stop upon the route has been made at which time the narrow portion at the opposite end of the web lies between the rollers 47 bearing upon the roller from which the web has just been unwound. This, as above explained, when the motor circuit is closed, completes a circuit through the opposite clutch magnets and throws the clutch so that said roller becomes the take-up roller and the web is returned intermittently indicating the stations in reverse order as they are reached on the return trip.

For the purpose of the correct operation of the device, it will be understood that the proper relation between the distance of the indicia from each other on the web and the circumference of the commutator must be secured and that the cut-away portions 102 at each end of the web must be suitably related to the final indicia at the ends so that the web will be reversed at exactly the proper times.

It will be understood furthermore that my new indicating device as above described is adapted not only to the purpose of indicating the stations or stops upon the route of a public conveyance, but may also be used for advertising and other similar purposes.

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

1. In a device of the character specified, the combination between a web, a commutator arranged to be actuated by the movement of said web, means whereby, during the completion of an electric circuit through said commutator, said web may be actuated, and means, upon the opening of the circuit through said commutator, to discontinue the actuation of said web.

2. In a device of the character specified, the combination between a web, said web being provided with suitable indicia at intervals throughout its length, a cover for said web, a transparent panel in said cover through which the indicia on said web may be read, a commutator arranged to be actuated by the movement of said web, means whereby, during the completion of an electric circuit through said commutator, said web may be actuated to present said indicia consecutively under said panel, said commutator being provided with a non-conductive segment by means of which the circuit through said commutator is broken when indicia are under said panel to discontinue the actuation of said web.

3. In a device of the character specified, the combination with a web and electrically conductive rollers upon which said web is to be alternately wound and unwound, of a magnetic clutch arranged to transmit power to either of said rollers, electrical contact rollers arranged to bear upon each of said rollers at prearranged points during the movements of said web whereby the engagement of said magnetic clutch and the operation of said rollers are reversed, a commutator arranged to be actuated by the movement of said web, means whereby, during the completion of an electric circuit through said commutator, said web may be actuated, and means, upon the opening of the circuit through said commutator, to discontinue the actuation of said web.

EDWIN PFISTER.

Witnesses:

ALICE WALKER,
OLIVER W. SHARMAN.