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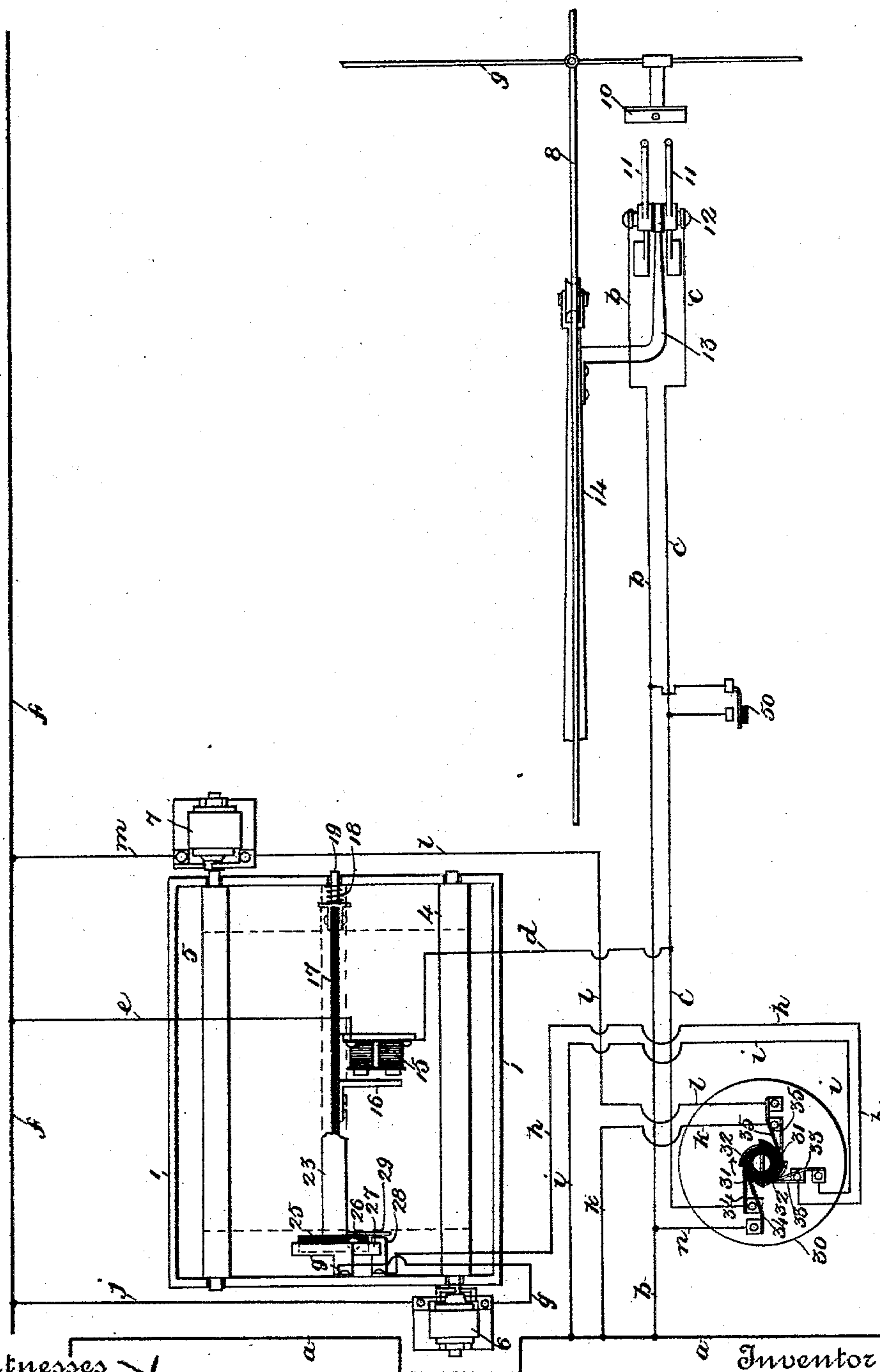
3 Sheets—Sheet 1.

H. ALWIES.  
ELECTRIC STREET OR STATION INDICATOR.

No. 571,738.

Patented Nov. 24, 1896.

Fig. 1.



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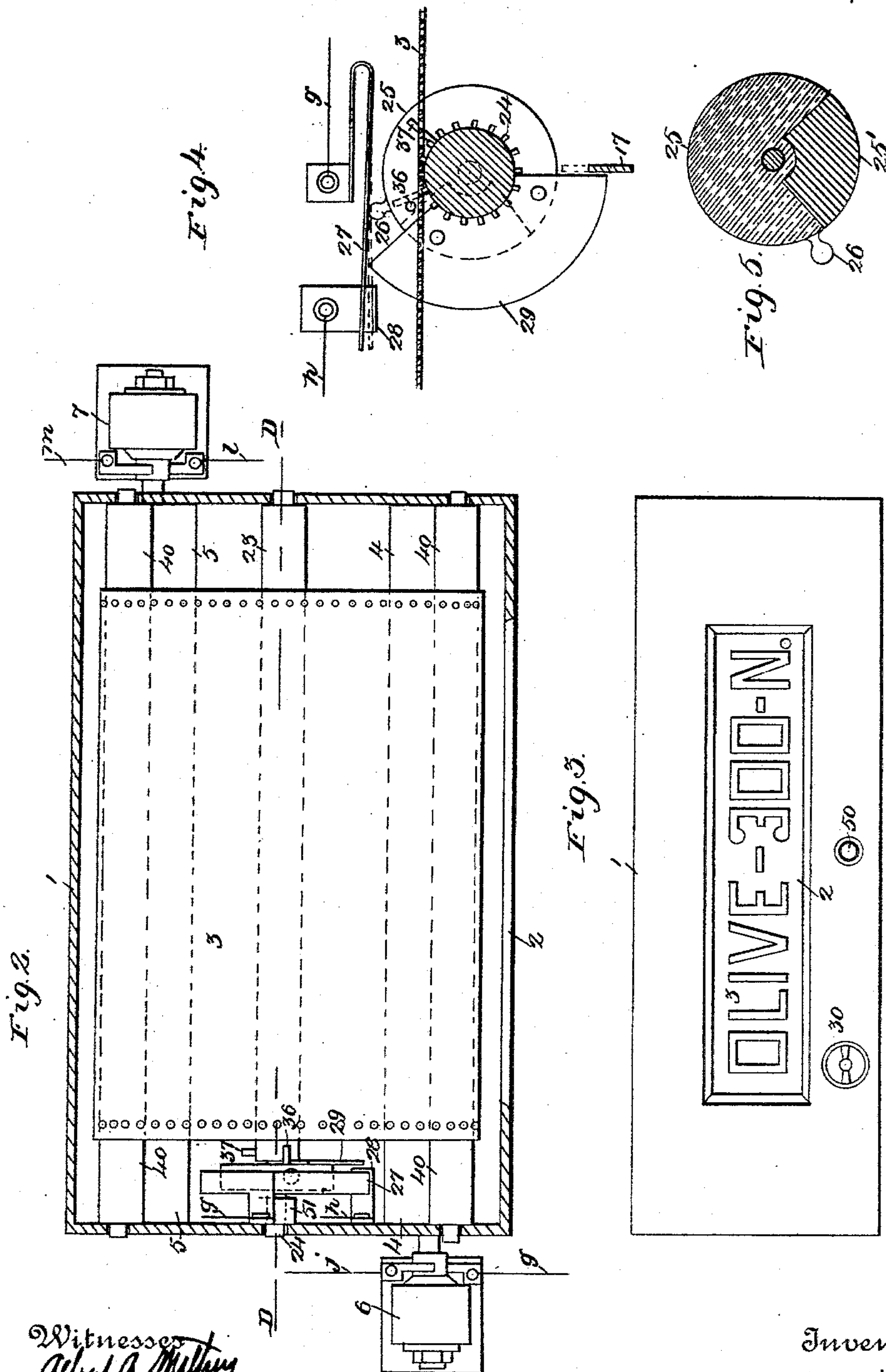
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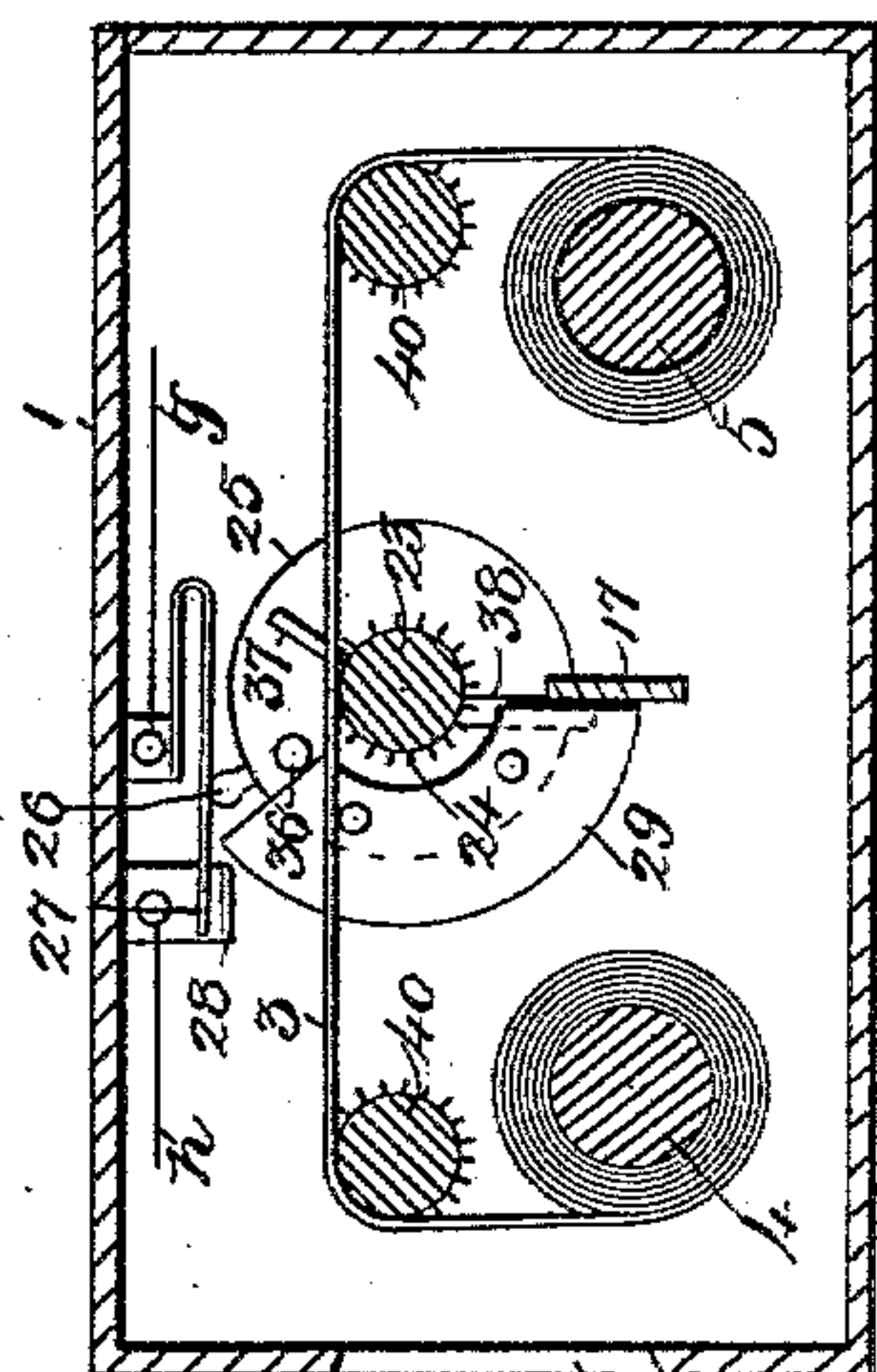
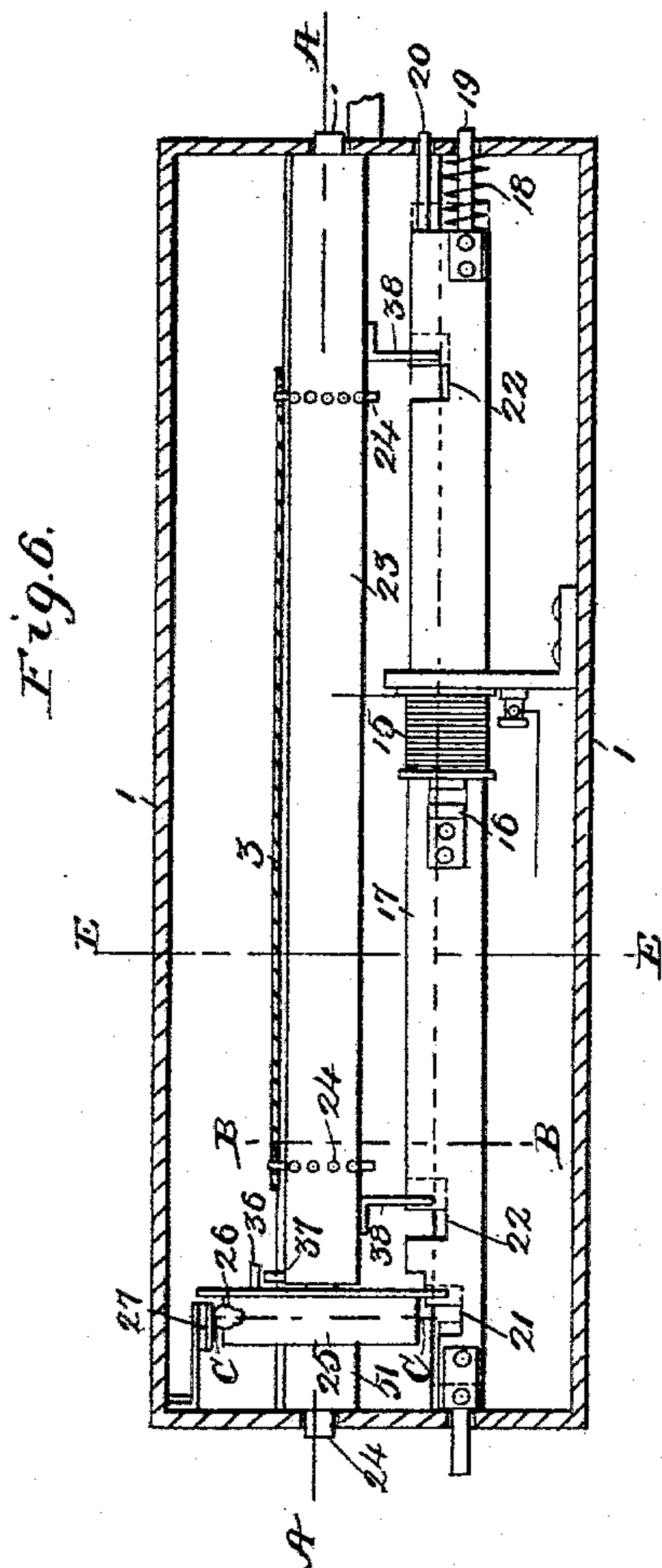
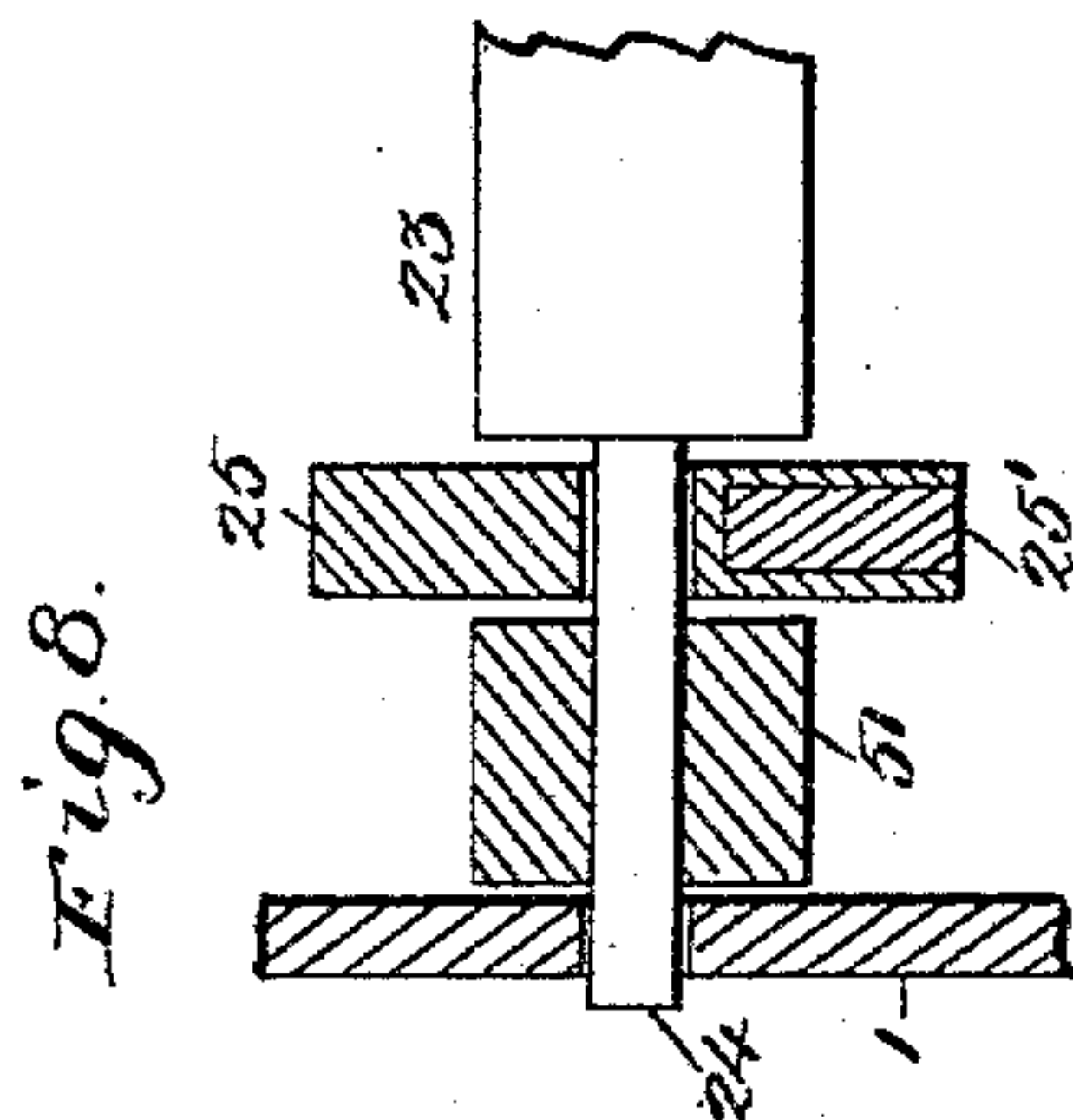
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3 Sheets—Sheet 3.

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# UNITED STATES PATENT OFFICE.

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## ELECTRIC STREET OR STATION INDICATOR.

SPECIFICATION forming part of Letters Patent No. 571,738, dated November 24, 1896.

Application filed August 10, 1896. Serial No. 602,354. (No model.)

*To all whom it may concern:*

Be it known that I, HERMAN ALWIES, a citizen of the United States, residing at St. Louis, in the State of Missouri, have invented certain new and useful Improvements in Automatic Electric Street or Station Indicators, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention has relation to improvements in electric street or station indicators; and it consists in the novel arrangement and combination of parts more fully set forth in the specification and pointed out in the claims.

In the drawings, Figure 1 is a diagrammatic view of the street-indicator and the wiring by which the operative parts of the same are controlled. Fig. 2 is a horizontal section of the casing on the line A A of Fig. 6, the web being shown in plan. Fig. 3 is a front elevation of the casing. Fig. 4 is an enlarged sectional detail on the line B B of Fig. 6. Fig. 5 is a section on C C of Fig. 6, taken through the rotating disk carried by the current making and breaking roller. Fig. 6 is a section on D D of Fig. 2, taken through the casing, but showing the interior in elevation. Fig. 7 is a section on E E of Fig. 6, and Fig. 8 is an enlarged section of one end of the current making and breaking roller or the end which carries the revolving disk.

The object of my invention is to construct a street or station indicator, which is carried on the car and which is automatically and electrically operated from the current of the main or line wire, or the light-wire forming a continuation thereof, the mechanism of such indicator being set in motion at stated points along the route and indicate the next succeeding station or street after a previous one has been passed.

The improvement consists in the several new combinations of mechanical elements to be more particularly referred to in the specification and pointed out in the claims.

In detail the device may be described as follows:

With the exception of the wiring the operating parts of the present indicator are confined in a suitable box or casing 1, the front of which has an opening 2, through which the stations or streets can be read on the web 3,

passing over the front and rear rollers 4 5, respectively, the roller 4 being operated in one direction by an electric motor 6 and the roller 5 being operated in the reverse direction by a motor 7, only one motor of course being operated at a time, as will more fully subsequently herein appear. The line-wire is represented by 8, the same being supported at intervals by the guy wires or ropes 9. Disposed adjacent to the line-wire and carried by the guy-wires at stated intervals along the line are a series of circuit-closing plates 10, which are adapted to be struck by the upper ends of the weighted arms 11, insulated from one another and loosely pivoted on a pin 12, carried at the free end of a laterally-projecting bracket 13, carried at the upper end of the trolley-pole 14. As the car is advancing along the route the arms 11 simultaneously ride over the arms of the plate 10, thereby closing an electric circuit coming from the main light-wire *a*, said current passing through the wires *b*, returning through the arms 11 and plate 10 along the wires *c*, passing thence along wire *d*, through an energizing-magnet 15, thence through the wire *e* to the ground-wire *f*. The current thus energizes the magnet 15, causing the latter to momentarily attract the armature 16, which latter forms an arm projecting laterally from a reciprocating intercepting-bar 17, mounted between the end walls of the casing intermediate of the winding-rollers 4 5, the said bar being shifted in its bearings in one direction by the energizing action of the magnet under circumstances when the arms 11 strike the circuit-closing plates 10 and being returned or shifted to its original position by the resilient action of a coiled spring 18, interposed between one of the end walls of the casing and the adjacent end of the bar, said spring encircling the pin or stem 19, by which the bar is supported at that end.

To prevent the turning of the bar in its bearings, an additional guide-pin 20 is provided therefor, which passes through a suitable opening in the wall of the casing. Formed along the bar 17 are a series of notches 21 22, for a purpose to be presently explained. Mounted above the reciprocating bar 17 is a guide-roller 23, having peripheral radially-disposed pins 24 projecting therefrom, the lat-



ter meshing with suitable holes punched in the web 3 along the longitudinal edges thereof, the object of said pins being to prevent any slipping of the web consequent upon the momentum which the rollers 4 5 may acquire under the action of the motor by which they are driven after the current by which the motor is driven has been cut off. Loosely mounted over the cylindrical spindle 24, by which the roller 23 is supported at one end, is a circuit making and breaking disk 25, the latter being made of insulated or non-conducting material and having a weighted segment 25', forming a part thereof, by which the disk has a tendency to always revolve around the spindle 24 to a point to bring the weighted segment 25' to the lowest position, as indicated in Fig. 5. Carried by the periphery of the disk adjacent to one end of the peripheral surface of the weighted segment is a contact-knob 26, which normally bears against the under surface of the long arm of a flexed contact spring-plate 27, the short arm of said plate being secured to the side wall of the casing and being adapted to connect electrically with a wire *g*, whose function will presently be described. When the free end of the long arm of the flexed plate 27 is released by the knob 26, the said arm makes electric contact with a conducting-plate 28, with which communicates one end of a wire *h*, whose function will presently be described.

It was stated above that the knob 26 normally bears against the under surface of the long arm of the spring-plate 27, and it remains to be explained how the disk 25, by which said knob is carried, is retained in said normal position. Carried by the inner face of the disk is a segmental wing or extension 29, the lower radial edge of which normally bears against the shifting bar 17 adjacent to the notch 21 thereof. Under these circumstances the segmental weighted portion 25' of the disk is held above the center of gravity of the disk or above the lowest point which the weighted portion 25' would assume if the disk were left free to revolve about the spindle by which it is carried. Now the moment the magnet 15 is energized as the trolley-pole effects contact between the arms 11 and plate 10, the bar 17, as before stated, is shifted against the tension of the spring 18, causing the wing 29 to come in line with the notch 21, thus permitting the weighted disk 25, of which said wing forms a part, to swing or turn about the spindle 24, bringing its weighted section 25' to its lowest position and bringing the knob 26, located adjacent thereto, out of contact with the long arm of the flexed spring 27 and permitting the free end of the latter to make contact with the plate 28, to which the wire *h* connects. (See dotted position of the arm 27 in Fig. 4.) It is therefore obvious that the instant the magnet 15 is energized the circuit between the wire *g* and *h* is completed. This circuit thus completed acts as follows:

Located at any convenient part of the car is a switch 30, having a rotatable cylindrical stem provided with two insulated peripheral sections or wings 31 and two conducting sections or wings 32 32, against each of which are respectively adapted to bear the pairs of spring contacting arms 33 34 35, the stem of the switch being normally turned to a position where only the pair of arms 33 will contact with one of the conducting segments or sections 32. The circuit which has been closed between the wires *g* and *h*, as above indicated, will travel from the light-wire *a* along the wire *i* through the switch, thence along the wire *h*, plate 28, arm 27, wire *g*, through the motor 6, thence through the wire *j* into the ground-wire *f*. The motor 6 being thus set in motion will drive the roller 4 forward, winding the web over the same and at the same time unwinding it from the roller 5, the web passing over the roller 23. The motor 6 will continue to operate and the web 3 will continue to be advanced until the current which drives the said motor 6 is again intercepted or broken. This must be done, of course, immediately after the web has been advanced sufficiently to present to view one station or street marked thereon, and is accomplished as follows: Projecting at right angles from the inner face of the disk 25, in proximity to the periphery thereof, is a pin 36, which is adapted to be seized or engaged by a radially-projecting arm 37, carried by the revolving roller 23. The disk 25 is thus brought back to its normal position, causing the knob 26 to again raise the arm 27 off the plate 28, thus breaking the current and stopping the motor 6. By and prior to this time, however, the bar 17 has been shifted to its normal position under the action of the spring 18, (the action of which is instantaneous the moment the trolley-pole has passed over any plate 10,) whereupon the momentum acquired by the disk will be arrested by the radial bearing edge of the wing 29 thereof striking the bar 17, the said wing striking the bar adjacent to one edge of the notch 21. (See Fig. 6.) The momentum of the roller 23, too, is simultaneously arrested by the arms 38 striking the bar adjacent to the notches 22, the latter, of course, permitting the free rotation of the roller 23 when it is temporarily shifted under the action of the magnet 15 to bring the notches 22 in alinement with the arms 38. Thus it is that as the trolley-pole, or rather the arms 11 thereof, close the circuit from the light-wire with each contact with the plates 10, disposed along the line, the magnet 15 becomes energized, shifting the bar 17 out of the way for the free rotation and release of the disk 25, the latter closing the circuit by which the motor 6 is operated for the necessary advance of the web on which the names of the streets or stations are marked. The latter current is subsequently broken the moment the knob 26 of the disk is raised to its normal position under the spring-arm 27.



The web 3 is long enough for a continuous round trip, which the car may make. At the end of the round trip it becomes necessary to wind the web back from the roller 4 onto the roller 5, whereupon it is necessary to set in motion the motor 7, by which the latter roller 5 is positively rotated in said reverse direction. This is accomplished as follows: The stem of the switch 30 is turned in the direction indicated by the arrow in Fig. 1 until the pairs of contact-arms 34 35 come into contact with the conducting-sections 32 32 of said stem, thus bringing the pair of arms 33 out of electrical connection, that is to say, bringing them against one of the insulated sections 31 of said stem. Under these circumstances there are formed two distinct closed circuits from the light-wire passing through the switch, one current following the wire *k*, passing through the switch, thence along the wire *l* into the motor 7, thence through the wire *m*, and finally into the ground-wire *f*. The other current passes through the wires *b n* through the switch, thence through wires *c d* into the magnet 15. The motor 7 is run long enough to unwind the full length of the web from the roller 4 onto the roller 5, and the bar 17 will be held in its shifted position (that is, to bring its several notches in alinement with the wing 29 of the disk and the arms 38 of the roller 23) under the energizing action of the magnet 15, thereby allowing the roller 23 and disk 25, carried by it, to revolve freely until the winding operation is complete. When the web has been wound back to its original position on the rollers, the switch is turned back to its normal position, as indicated in Fig. 1, and the car is ready to make a new trip. To keep the web 3 taut and cause the same to wind readily on the rollers, I mount over each roller 4 5 the idle-roller 40, also provided with pins engaging the holes punched along the edges of the web, as best seen in Fig. 7.

Should any of the circuit-closing plates 10, disposed along the line, become broken and thus fail to energize the magnet 15 and run the motor 6 at the proper moment, the conductor can close the circuit by pressing the contacting push-button 50, disposed along the wire *c*, until the indicator shall display the necessary sign of the street which the car is approaching. A suitable washer 51 is interposed between the disk 25 and the wall of the casing to keep the former in its place on the spindle 24.

I do not limit myself to the precise wiring herein shown and described, nor to the energizing-magnet here shown. In the place of the electromagnet here illustrated I may substitute a hollow cylindrical coil with a movable core passed through the same, said core being connected to the shifting bar and moving the latter with each shifting of the core, due to the induction of the current passing through the coil.

The device is entirely automatic, and, as is

obvious, may be materially modified in details without departing from the spirit of my invention.

Having described my invention, what I claim is—

1. In an electric indicator, a line-wire, a suitable web on which the names of the stations are disposed, rollers for said web, a series of circuit-closing devices disposed in proximity to the line-wire along the length thereof, a motor for advancing the web or turning the rollers on which the same winds, suitable mechanism actuated by the closing of the circuit under the action of the circuit-closing devices, for arresting the momentum of the web and rollers carrying the same acquired during the advancing movement of the web, and intermediate connections between the momentum-arresting device and the motor for alternately closing and breaking the circuit by which the motor is actuated, substantially as set forth.

2. In an electric indicator, a line-wire and a light-wire, suitable revolving rollers, a web adapted to wind on and unwind from said rollers, a series of circuit-closing devices or plates disposed along the line-wire in proximity thereto, a spring-actuated shifting bar carried by the casing of the indicator, an energizing-magnet having one end leading to the light-wire and the opposite end to the ground-wire, contacting arms carried by the car adapted to contact with the circuit-closing plates and complete the circuit of the magnet, an arm serving as an armature for the magnet carried by the shifting bar whereby the bar is shifted against the tension of the spring in one direction, a motor for one of the rollers of the web, a circuit closing and breaking roller over which the web passes, and suitable means carried by the last-named roller for closing the circuit by which the motor is driven and subsequently breaking said circuit after the web has been sufficiently advanced to indicate the next succeeding station, substantially as set forth.

3. In an electric indicator, a suitable line-wire, a casing, rollers mounted in the casing for receiving the opposite ends of the web on which the names of the stations are indicated, a circuit closing and breaking roller also mounted in the casing over which the medial portion of the web passes, a shifting bar actuated in one direction by the closing of a circuit mounted in proximity to the last-named roller, said shifting bar adapted to permit the last-named roller to revolve freely and advance the web for one position of the bar, and to intercept and arrest the momentum of the rollers and web for another position of said shifting bar, a motor adapted to advance the web the necessary distance for one position of the shifting bar and to cease operating for another position of said bar, and suitable means for reversing the motion of the web and permanently hold the shifting bar in position to allow for the reverse rota-



tion of the rollers on which the web winds and the simultaneous free rotation of the circuit closing and breaking roller over which the medial portion of the web passes, substantially as set forth.

4. In an electric indicator, a suitable casing, web-winding rollers mounted therein, a circuit closing and breaking roller over which the medial portion of the web is adapted to travel, a weighted disk loosely and revolubly mounted at one end of the said roller, an extended wing carried by one of the faces of the disk, a knob projecting from the periphery of the disk adjacent to the weighted side thereof, a spring-arm against which the said knob is adapted to bear in one position of the disk and break the circuit leading to the motor by which the web is driven in one direction, a pin projecting from one face of the disk, an arm projecting radially from the periphery of the circuit closing and breaking roller for seizing the pin projecting from the disk and turn the latter with the roller during the rotation of said roller for the time the web is being advanced, a reciprocating or shifting intercepting-bar mounted in proximity to the circuit closing and breaking roller, a series of notches formed along the length of the bar, a series of arms projecting radially from the periphery of the circuit closing and breaking roller and adapted to normally bear against the shifting bar for arresting the momentum of the roller to which they are secured, the said wing carried by the disk having a bearing edge adapted to come also normally in contact with the shifting bar in one position of the latter, the said circuit closing and breaking roller and disk carried by it being adapted to freely rotate in another position of said shifting bar, whereby the circuit normally broken by the knob carried by the disk is closed and the motor actuating the web may be set in motion, substantially as set forth.

5. In an electric indicator, a revolving cir-

cuit closing and breaking roller, a suitable shifting bar, an energizing-magnet adapted to shift the bar in one direction upon the passage of the car along successive stations along the route of the main line and permit the free rotation of the said circuit closing and breaking roller, the said bar being adapted to assume its normal position after the passage of the car beyond the station at which it was operated electrically in one direction and thereby arrest the movement of the roller, substantially as set forth.

6. In an electric indicator, a line-wire, a light-wire, a car, a casing for the indicator, motors adapted to drive the indicator in opposite directions, a switch having two electrical conducting-sections and two insulated sections, an energizing-magnet, circuit-closing devices disposed in proximity to the line-wire, contacting arms carried by the trolley-pole for riding over said circuit-closing devices, the current from the light-wire adapted in one position of the switch to actuate one of the motors, and in another position of the switch to actuate the other motor, and permanently control the energizing-magnet, substantially as set forth.

7. In an electric indicator, a suitable traveling web, winding-rollers for the same, an intermediate circuit closing and breaking roller over which the web passes, means for periodically intercepting the free rotation of said roller, a series of holes disposed along the opposite longitudinal edges of the web, and a series of radially-projecting pins carried by the intermediate roller cooperating with the holes in the web, substantially as set forth.

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

HERMAN ALWIES.

Witnesses:

EMIL STAREK,  
ALFRED A. MATHEY.