

No. 682,428.

Patented Sept. 10, 1901.

E. A. RUSSELL.
STATION INDICATOR.

(Application filed Aug. 16, 1900.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 2.

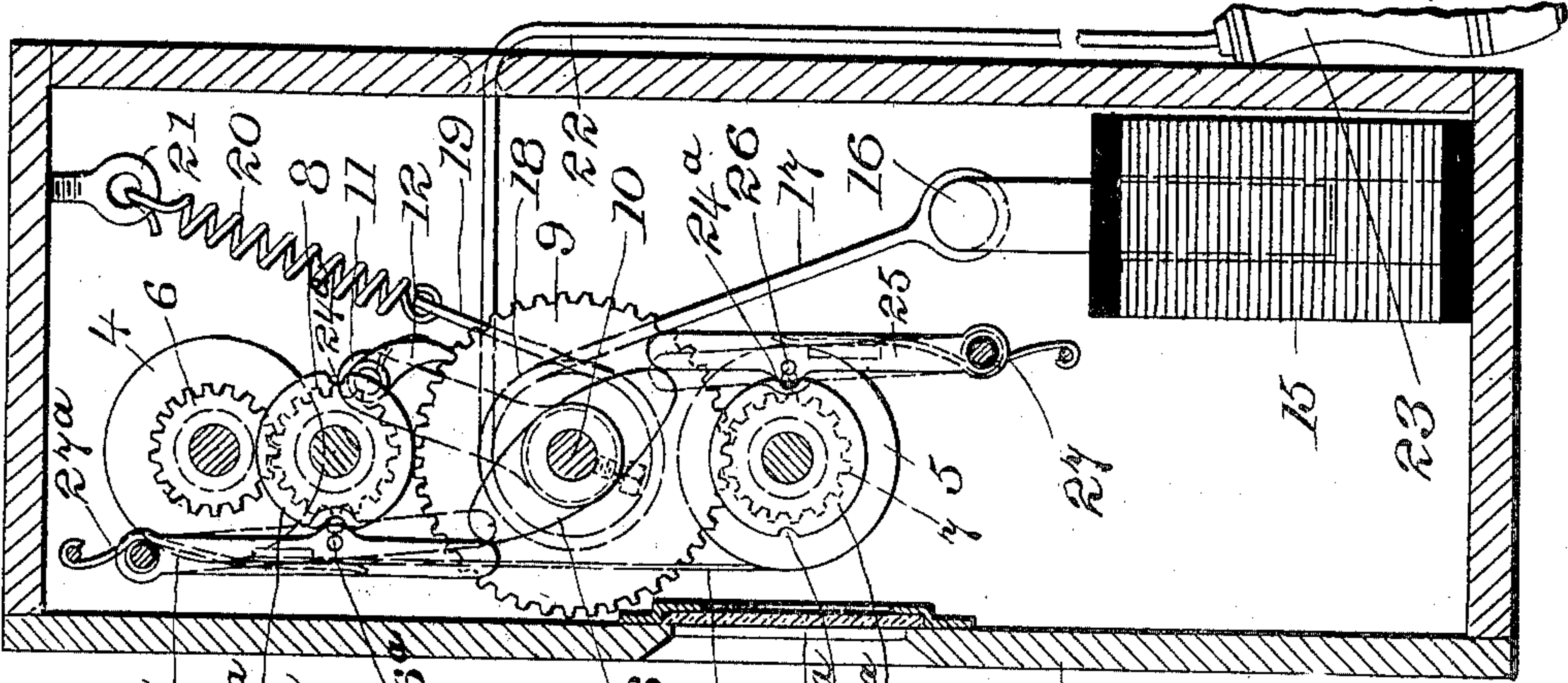
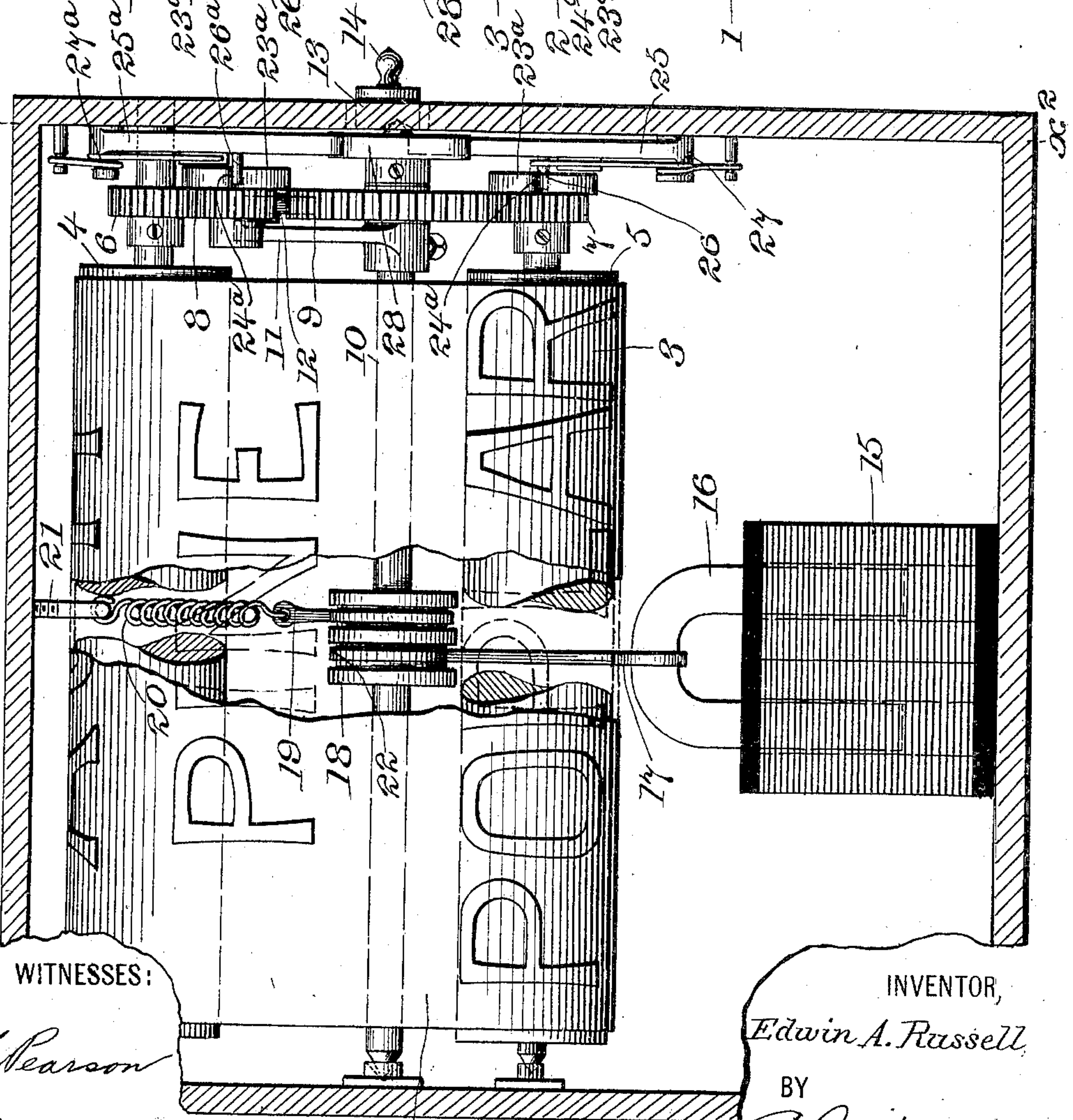


Fig. 1.



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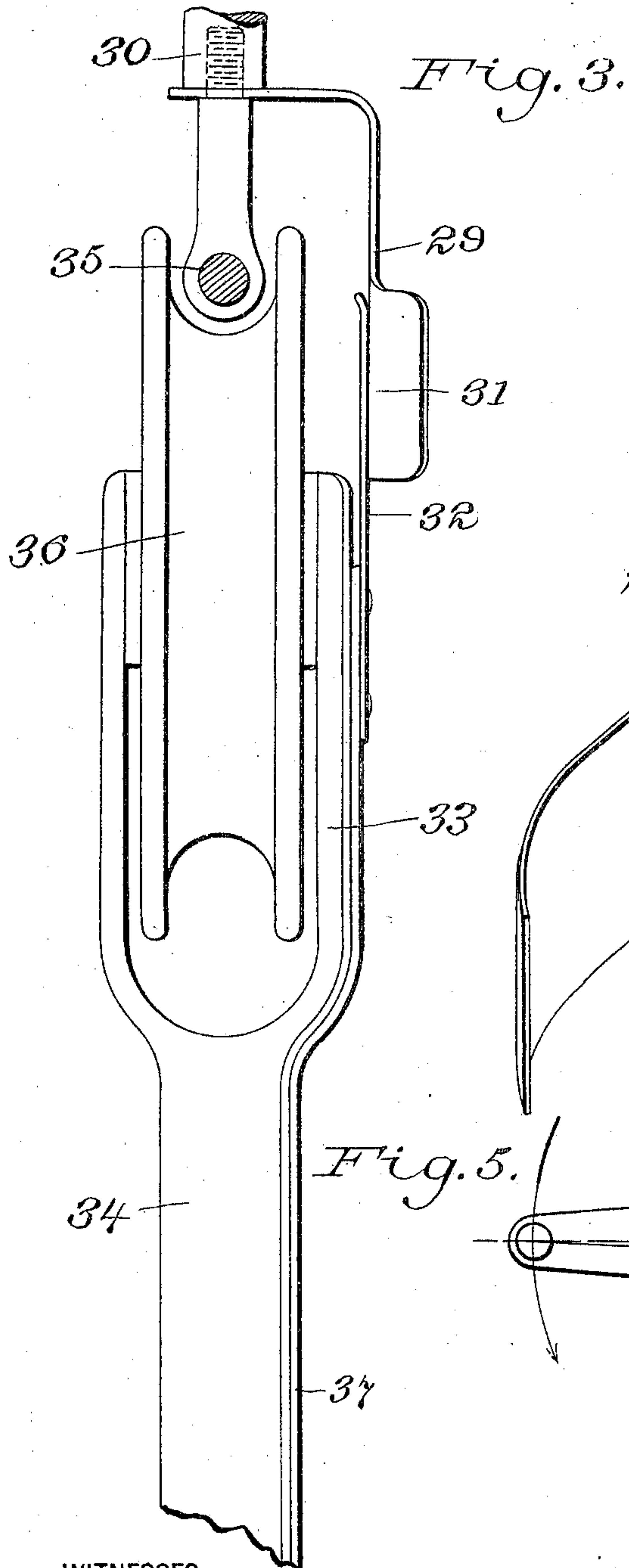


Fig. 4.

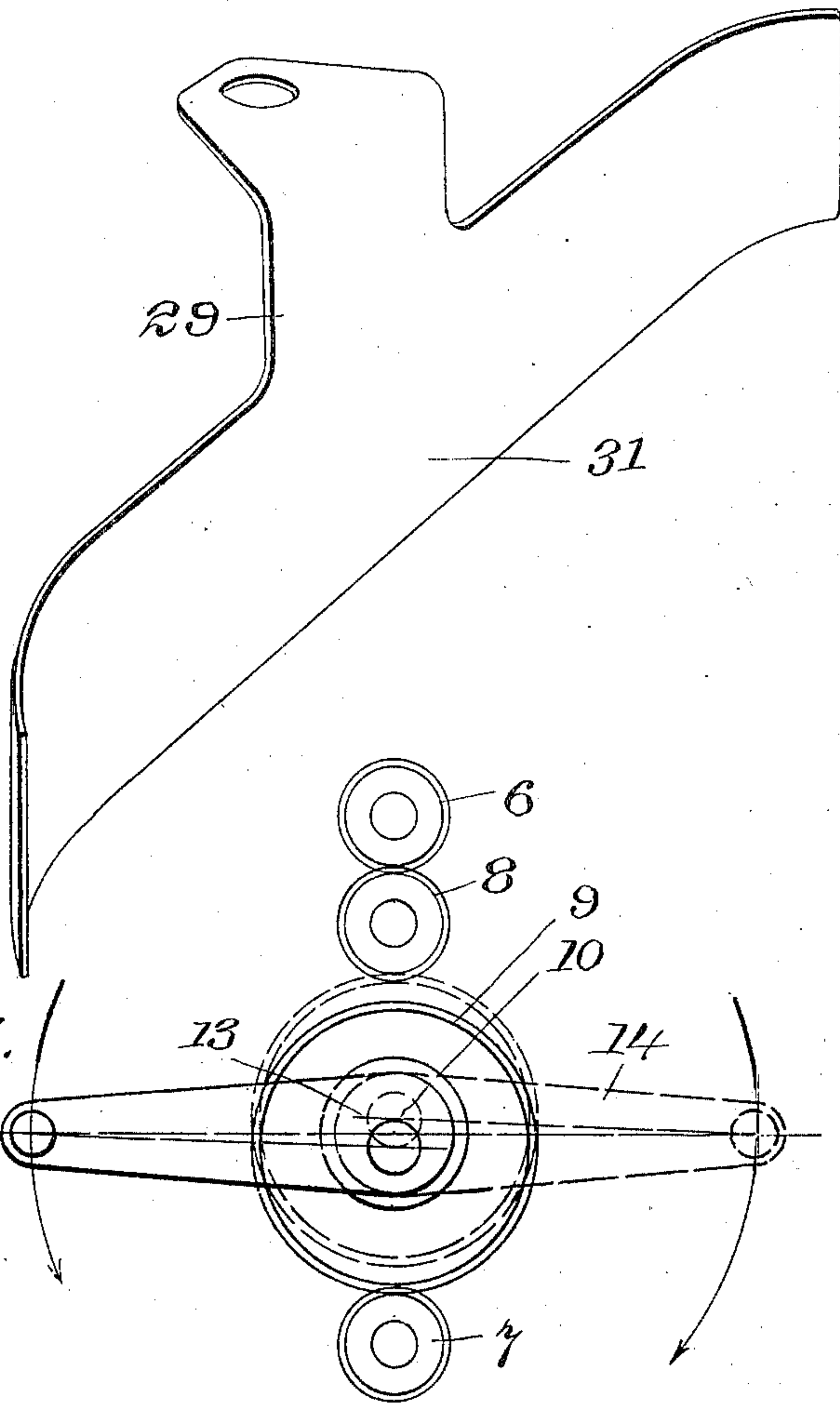
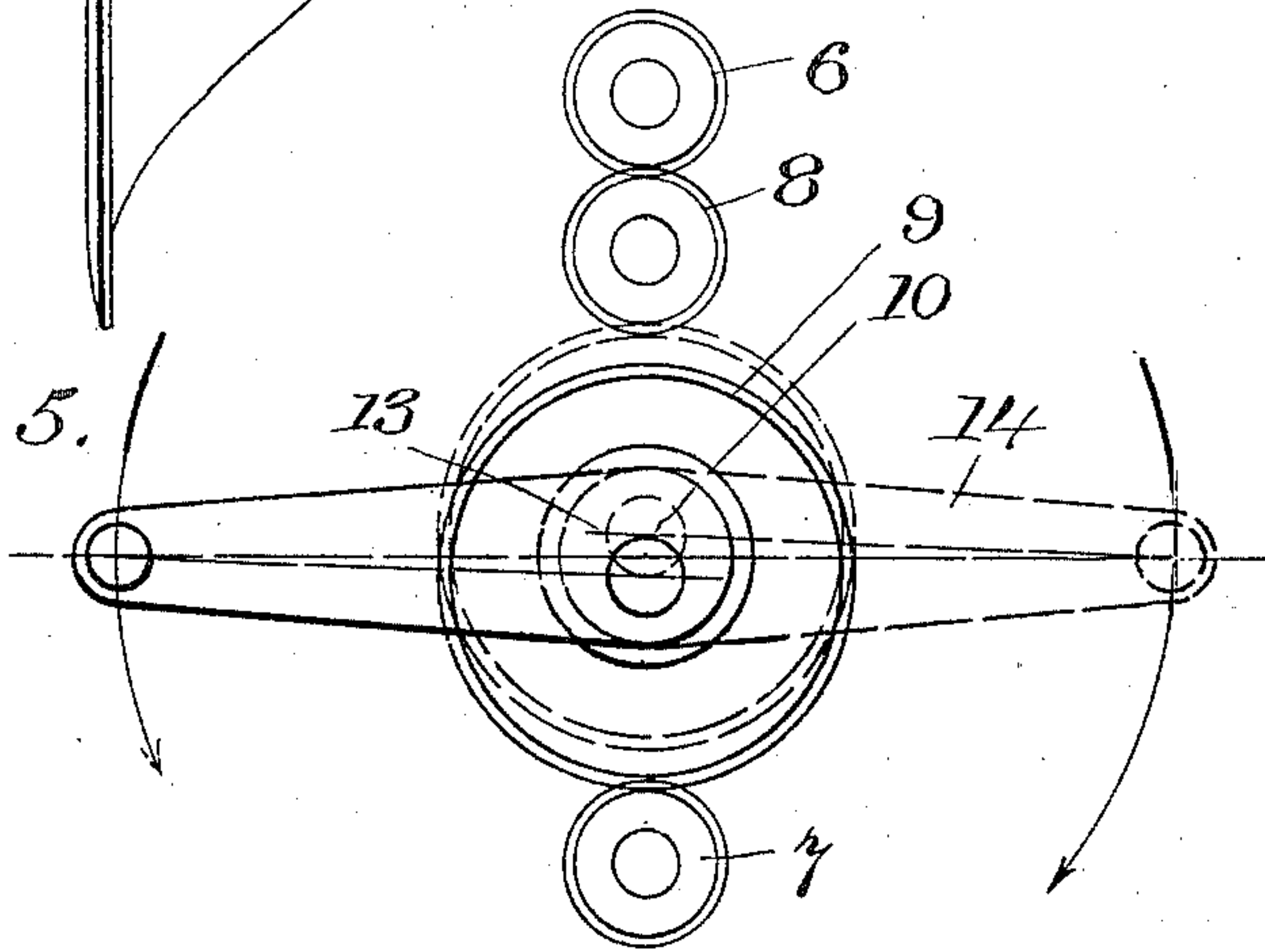


Fig. 5.



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UNITED STATES PATENT OFFICE.

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STATION-INDICATOR.

SPECIFICATION forming part of Letters Patent No. 682,428, dated September 10, 1901.

Application filed August 16, 1900. Serial No. 27,025. (No model.)

To all whom it may concern:

Be it known that I, EDWIN ALBERTUS RUSSELL, a citizen of the United States of America, and a resident of Newark, county of Licking, State of Ohio, have invented certain new and useful Improvements in Station-Indicators, of which the following is a specification.

My invention relates to apparatus for automatically indicating the street or station at which a passenger-car will next arrive, and is more specifically designed to produce a simple and positively-operated form of mechanism for producing this result on cars operated by electricity.

My invention further presents certain points of advantage which will be more fully described hereinafter.

The preferred form of apparatus embodying my invention is illustrated in the accompanying two sheets of drawings, in which—

Figure 1 is a front view of the apparatus, the front of the containing-case being cut away and parts of the apparatus broken out to show other parts more clearly. Fig. 2 is a vertical section on line $x^2 x^2$ of Fig. 1. Fig. 3 is a detail view of the upper end of the trolley-pole with a portion of the trolley wire and hanger, showing the preferred form of apparatus for producing the electrical contact to operate my apparatus. Fig. 4 is an enlarged perspective view of the preferred form of contact-shoe used by me, and Fig. 5 is a diagrammatical illustration of the reversing mechanism.

Throughout the drawings like reference-figures indicate like parts.

The apparatus is inclosed in a casing 1, having a sight-opening 2, which may be protected by a pane of glass, as shown in Fig. 2. The names of the streets or stations are printed upon a belt 3, which winds on and off of two rollers 4 and 5, journaled in the casing. The rollers are so located that one of the names appearing on the belt will come opposite the sight-opening 2 at each position of rest of the mechanism. The rollers 4 and 5 are alternately rotated, so as to wind the belt 3 off of one and onto the other and then in the opposite direction by means of gearing (best shown in Figs. 1 and 2) comprising the pinion 6 on the roller 4 and pinion 7 on the roller 5, the reversing-pinion 8, and the driv-

ing-gear 9, which is carried on a driving-shaft 10, but is loosely mounted thereon, its motion being given to it by means of the ratchet-crank 11, carried by said shaft 10, and the pawl 12, carried by said crank. The driving-shaft 10 and the gear 9 are capable of being so shifted that the gear will engage with the pinion 7 or the reversing-pinion 8, and this is preferably accomplished by journaling the cone-shaped end of the shaft 10 in an eccentric journal-bearing 13, controlled by the lever 14. (See Fig. 5.)

Intermittent motion may be given to the driving-shaft 10 in any one of a number of ways; but I preferably employ an electric-motor apparatus, which may be of the construction shown, in which a double solenoid 15 has a double core or armature 16 coöperating therewith, to which armature a flexible cord or band 17 is connected, the other end thereof being wound upon and fastened to a drum 18 on the driving-shaft 10. A second cord or band 19 is fastened to said drum 18, being wound thereon in an opposite direction to that in which the cord 17 is wound, and the other end of the second cord 19 is connected to any suitable spring 20, which is supported from the casing, as by the screw-eye 21. A third cord 22 is wound upon and fastened to the drum 18, being wound thereon in the same direction as is the motor-cord 17. This third cord 22 preferably extends through an opening in the casing at the back and has a handle 23 attached to its free end in a position to be conveniently grasped by the conductor or other operator.

I preferably employ a system of brakes for the rollers 4 and 5 which will limit their revolution to a definite amount on each pull of the motor-cord. One form of such brake (illustrated in the drawings) consists of the brake-wheels 23^a 23^a, attached to the pinion 7 and the reversing-pinion 8, respectively. Each of these brake-wheels has a series of recesses or notches 24^a 24^a spaced at regular intervals about the periphery. Brake-levers 25 25^a are pivoted to the main frame or casing and have projections 26 26^a, adapted to engage with the recesses 24^a 24^a. These brake-levers are spring-pressed by the springs 27 27^a in a direction to produce such engagement. Normally, however, these levers are

held out of engagement by a double cam 28 on the driving-shaft. When said driving-shaft turns, the cams allow the brake-levers to press against the brake-wheels under the action of the springs 27 27^a, and when the pinions have turned far enough the projections 26 26^a will drop into one of the notches 24^a 24^a and prevent further rotation of the rollers and further movement of the belt 3.

The current for intermittently exciting the solenoid 15 may be derived from the motor-current of the car in any one of a number of manners; but I preferably employ a contact-shoe 29, supported from the trolley wire and hanger 30 and having a vertical portion 31 bent outwardly at the ends, as shown in Figs. 3 and 4. This shoe coöperates with a spring contact-piece 32, carried by one fork 33 of the trolley-pole 34. 35 represents the trolley-wire in cross-section, and 36 is the usual trolley-wheel coöperating therewith.

The method of operation of my invention is as follows: One of the contact-shoes 29 is placed on a hanger 30 near each of the streets or stations whose names are printed on the belt 3, said shoe being in electric connection with the trolley-wire 35. As the car comes along the spring contact-piece 32 rubs against the inner face 31 of the shoe 29 and the current is carried down through a conductor 37 and through the solenoid 15 to the ground connection in any convenient manner. The solenoid 15 being excited pulls upon the core 16, which causes the motor-cord 17 to unwind from the drum 18, giving the driving-shaft 10 a partial rotation. This rotation is transmitted to the gear 9 through the pawl 12 and with the parts arranged in the position shown in Fig. 2 is transmitted from said gear to the pinion 7 and the roller 5, causing a given length of the belt 3 to be wound onto the roller 5 and off of the roller 4, thus causing the name of one street or station to disappear and that of the next one to appear.

After the contact-strip 32 passes the shoe 29 the solenoid 15 becomes dead and the spring 20 reacts, pulling the shaft 10 back into its original position, the pawl 12 running idly over the teeth of the gear 9 and transmitting no motion thereto. When in this position of rest, the cam 28 holds the brake-levers in the position shown in full lines in Fig. 2, out of engagement with the brake-wheels. After the solenoid has pulled the shaft 10 around a little way, however, the cam releases the brake-levers and the projections 26 26^a bear down upon the peripheries of the brake-wheels 23^a 23^a. Accordingly when the rotation of the parts has proceeded far enough to allow the said projections to drop into the next set of notches 24^a, which is the desired distance to cause a second street-name to appear, said projections on the brake-levers drop into said notches and check further movement of the belt. When the solenoid becomes dead, the spring 20 acts to pull the shaft back to its original position, the cam 28

again holds the brake-levers out of engagement, and leaves the parts of the apparatus free to move under the motor impulse at the next engagement of a contact-shoe. In setting the apparatus or otherwise manipulating it by hand the above motion can be given by grasping the handle 23 and pulling on the cord 22. At the end of the route the apparatus is reversed by throwing the eccentric lever 14 around from the position shown in full lines to that shown in broken lines. This lifts the gear 9 out of engagement with the pinion 7 and throws it into engagement with the reversing-pinion 8, which is in engagement with the pinion 6 on the roller 4. Accordingly every motor impulse, whether from the cord 17 or from the cord 22, will cause the roller 4 to wind the belt 3 up onto it and off from the other roller 5.

The advantages of my invention comprise its simplicity in reversing action, arising from the fact that the mechanism can be reversed by merely shifting the motor-shaft 10, as described, and this shifting action is rendered possible without disengaging the connections by the use of the flexible motor-cords shown; also, the certainty of action arising from the brake system, which insures the exactly correct length of belt being moved at each operation and keeps the portion of the belt between two rollers taut. Furthermore, the possibility of setting the indicator by hand or advancing it a sufficient distance to have it catch up in case one or more of the contact-shoes fails to act prevents the entire disarrangement of the apparatus by any such accident. The contact arrangement shown, by which the contact-strip is carried by one fork of the trolley-pole, is also particularly compact and does not add any unsightly attachment to the present trolley apparatus.

Of course various changes could be made in the details of construction shown in the drawings without departing from the spirit and scope of my invention so long as the underlying principles above described are preserved in the modified construction. The current might be taken from other forms of electric apparatus, the reversing-gear might be modified, and other motor apparatus substituted for that shown. The brake mechanism might be altered and other details of mechanism substituted. It may also at times be desirable to employ a bell as a means of attracting attention to the indicator at the moment the name of the street is changed; but as the construction and arrangement of such an addition are obvious and would not involve any change in either the mechanism or the relation of parts I do not deem it necessary to illustrate or further describe the same.

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

1. The combination of the station-indicator for electric cars consisting of a belt with

names printed thereon, and two rollers from one to the other of which the belt may be wound, means by which said rollers may be automatically rotated at intervals by a shunt-
 5 current from the motor-circuit of the car, and means whereby the said rollers may be operated by hand, said first-mentioned means consisting of an electromagnet and armature, a shaft, apparatus by which the rectilinear
 10 motion of the armature is converted into a rotary movement of the shaft, and a ratchet-wheel and pawl connection from the shaft to one of the rollers, while said last-mentioned means consists of a cord wound around the
 15 shaft and having a free end adapted to be grasped by the operator.

2. The combination of the belt and roller, a pinion on said roller, a brake-wheel having recesses cut in its periphery at equal dis-
 20 tances, a brake-lever having a projection adapted to engage any one of said recesses, and spring-pressed in the direction to produce such engagement, a driving-shaft, a loose gear on said shaft meshing with the
 25 pinion, a crank and pawl carried by the shaft and adapted to rotate the gear-wheel in one direction, a cam on the driving-shaft which holds the brake-lever out of engagement while the parts are at rest, but which allows
 30 the projection on the brake-lever to press against the periphery of the brake-wheel as soon as the parts have moved a short distance, and means for giving the driving-shaft a fraction of a rotation and then returning it to its
 35 original position of rest.

3. The combination of the two rollers and the belt wound in opposite directions thereon, the pinion on each roller, the reversing-pin-

ion meshing with the pinion on one roller, the driving-shaft having one end journaled 40 in a shifting bearing, the gear-wheel carried by and rotated from the driving-shaft and adapted to mesh with the pinion on one roller or the reversing-pinion geared to the other roller according as the shaft-bearing is shift- 45 ed, the drum on the shaft, the motor apparatus, the cord wound on the drum and connected to the motor apparatus, and the second cord wound in the opposite direction on the drum and having its other end connected 50 to a spring.

4. The combination of the two rollers and the belt wound in opposite directions thereon, the pinion on each roller, the reversing-pin- 55 ion meshing with the pinion on one roller, the driving-shaft having one end journaled in a shifting bearing, the gear-wheel carried by and rotated from the driving-shaft and adapted to mesh with the pinion on one roller or the reversing-pinion geared to the other 60 roller according as the shaft-bearing is shifted, the drum on the shaft, the motor apparatus, the cord wound on the drum and connected to the motor apparatus, and the second cord wound in the opposite direction on 65 the drum and having its other end connected to a spring, together with the third cord wound on the drum in the same direction as the motor-cord and having a free end adapted to be grasped by the operator. 70

Signed at Newark this 27th day of July, 1900.

EDWIN ALBERTUS RUSSELL.

Witnesses:

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