No. 731,899. PATENTED JUNE 23, 1903.

R. B. HAZLETT.

ELECTRICAL INDICATOR FOR TELEPHONIC TOLL COLLECTING DEVICES.

APPLICATION FILED JAN. 30, 1902.

NO MODEL.

FIG. 1.

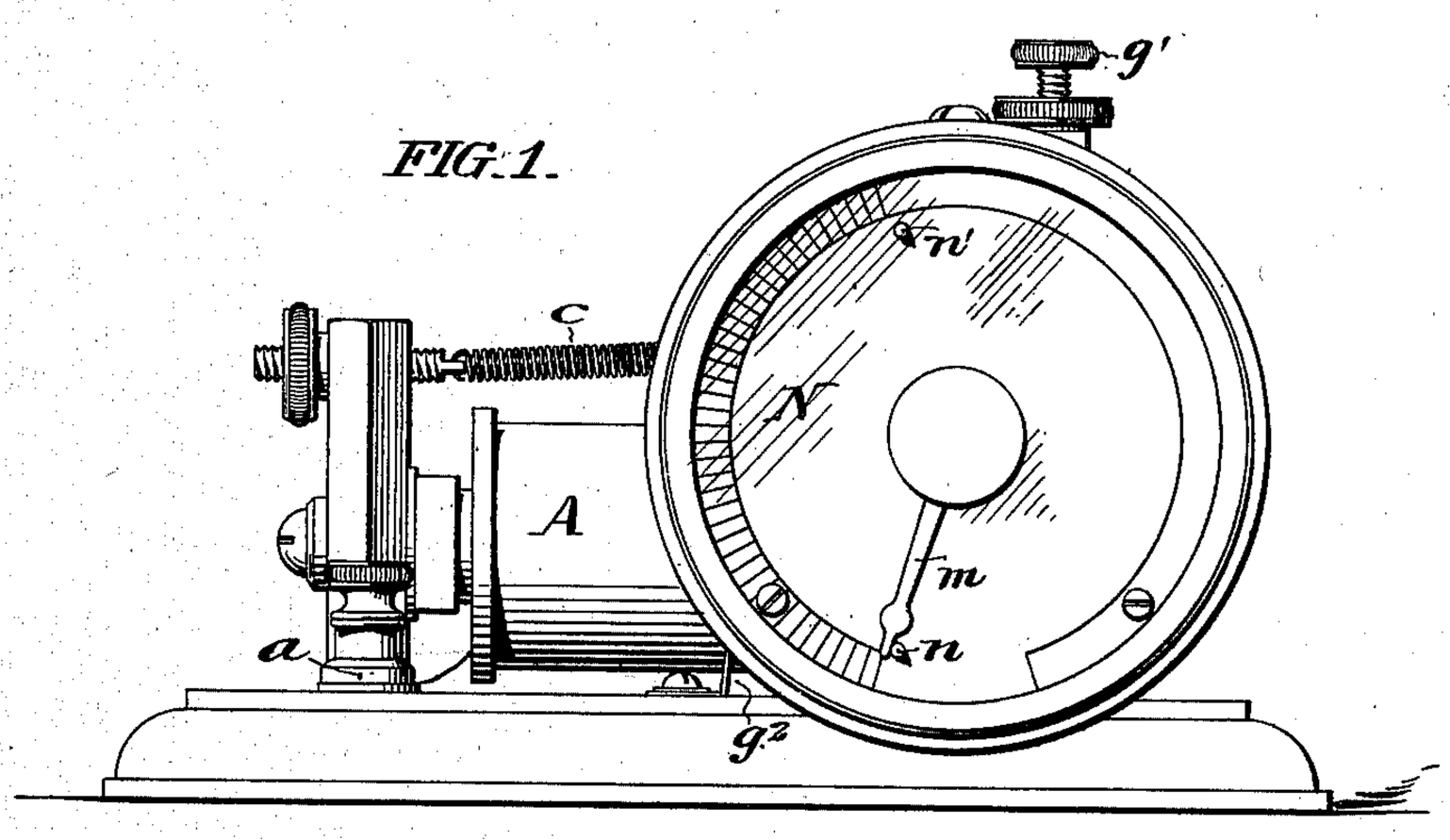


FIG. 2.

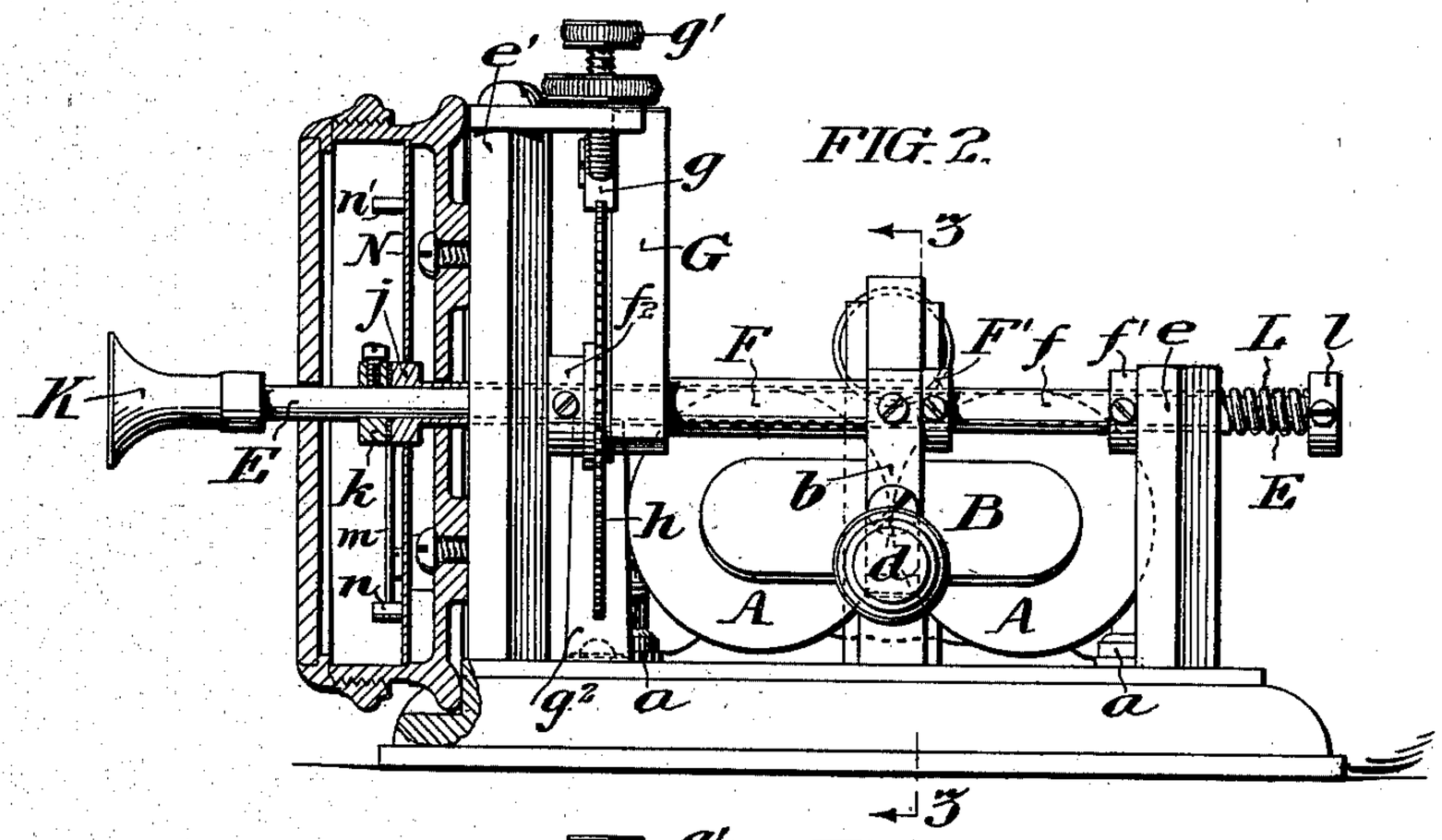
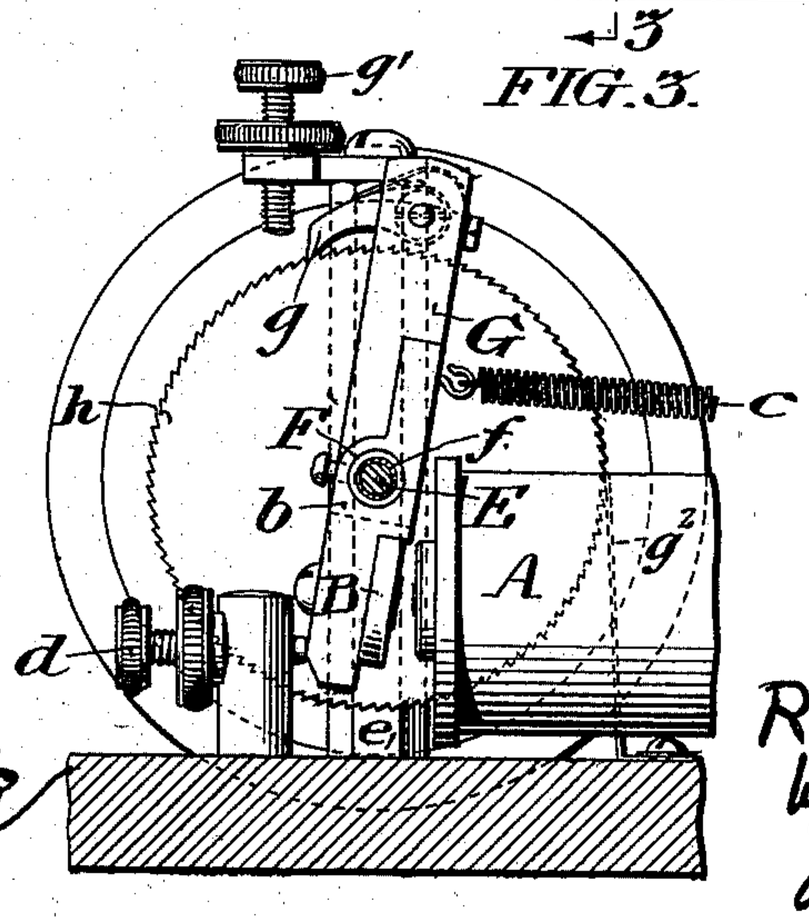


FIG. 3.



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UNITED STATES PATENT OFFICE.

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ELECTRICAL INDICATOR FOR TELEPHONIC TOLL-COLLECTING DEVICES.

SPECIFICATION forming part of Letters Patent No. 731,899, dated June 23, 1903.

Application filed January 30, 1902. Serial No. 91,845. (No model.)

To all whom it may concern:

Be it known that I, ROMEO B. HAZLETT, a citizen of the United States, residing in the city and county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Electrical Indicators for Telephonic Toll-Collecting Devices, whereof the following is a specification, reference being had to the accompanying drawings.

My invention relates to an electrical indicator which is adapted for use in connection with electrical toll-collecting devices used at pay telephone-stations. By such devices the deposit of a coin or coins at the telephone-station causes a corresponding number of successive closures of an electric circuit. I have recently filed three applications covering differing devices of this character in connection with which my present invention is adapted for use. I have further explained in detail in one of these applications a series of wiring connections by means of which such electrical toll-collecting devices may be employed in connection with the ordinary telephone-circuits. My present invention relates to an indicator which may be inserted in such a circuit for the purpose of indicating the deposit of the coin to the operator at the central station.

In the accompanying drawings, Figure 1 is a front elevation of my device. Fig. 2 is a side elevation with the indicator-case shown in section. Fig. 3 is a vertical section taken on the line 3 3, Fig. 2.

Mounted upon the base of the instrument is an ordinary double electromagnet A, the coils of which terminate at the binding-screws *a a*, by means of which the instrument is placed in its proper circuit. The armature B of this electromagnet is fast to a pivoted arm *b*, approach to the pole of the magnet being opposed by the coiled spring *c*. The extent of the retraction of the armature is limited by the set-screw *d*. A slide-rod E is freely mounted in longitudinal relation to the apparatus in the upright posts *e e'*. This rod carries two concentric sleeves—an outer sleeve F and an inner sleeve *f*. The inner sleeve *f* passes through both bearings and is entirely free from the rod itself. Its longitudinal position is maintained by collars f' f^2, set upon the sleeve *f* in proximity to the sides of the posts *e e'*. The outer sleeve F is also free to revolve upon the inner sleeve, its longitudinal position thereon being fixed by a collar F', fast to sleeve *f*. Fast to one end of the outer sleeve F is the arm *b*, of which the inner sleeve forms the pivot. Fast to the other end of the outer sleeve is a pawling-arm G, which carries at its outer extremity the spring-pressed pawl *g*. This pawl plays over the teeth of a ratchet-wheel *h*, which is fast to the inner sleeve *f*. The play of the pawl upon this ratchet-wheel is limited by the set-screw *g'*, the point of the pawl being shaped to pass sufficiently beneath it at each reciprocation to cause the pawl to lock the wheel, thus preventing the momentum of the wheel from carrying the revolution more than the space of a single tooth at a time—a consideration of importance in the operation of my device. The possibility of reverse rotation of the wheel during the retraction of the pawl is prevented by the keeper-pawl g^2. By the operation of the parts thus described each closure of the circuit which includes the electromagnetic coil reciprocates the pawling-lever and advances the ratchet-wheel *h* one tooth, causing a corresponding rotation of the inner sleeve *f*. This motion may be regulated with extreme nicety by adjustment of the set-screws *d* and *g'*.

In front of the post *e'* is mounted a dial-plate N, through which the rod E and the inner sleeve *f* project. The inner sleeve ends the face of the dial-plate in the form of a rounded stud *j*, which is raised a little above the dial-plate. The rod E terminates in a button K, which projects farther through the glass or other casing of the dial. A collar *k* is fast to the rod E in proximity to the stud *j*, and another collar *l* is fast to its rear end. A coiled spring L exerts pressure between the post *e* and the collar *l*, continually forcing collar *k* against stud *j*. Between these two a pivoted pointer *m* freely encircles the rod E. Normally the pressure of spring L by pushing this pointer against the stud *j* causes the pointer to rotate with it; but if this pressure is released by a slight pull given to the rod by means of the button K the pointer imme-

diately falls by gravity. The dial-plate is conveniently graduated, so as to represent portions of arc corresponding to the teeth upon the ratchet-wheel *h*, so that the pointer will be advanced one unit for every tooth of the ratchet-wheel—that is to say, for every reciprocation of the armature. Upon the dial-plate are two fixed pins *n n'*, one near the bottom and the other near the top and both within the play of the pointer and limiting its motion. At the commencement of its operation the pointer rests against the lower pin *n*, as seen in Fig. 1. With the making and breaking of the circuit caused by the operation of the toll-collecting device, which is inserted within it, the pointer is advanced one unit for each electrical impulse. It is convenient to have the toll-collecting device arranged so that the deposit of coins causes impulses in a ratio fixed according to some convenient factor—as, for example, if a five-cent piece occasions one closure of the circuit a ten-cent piece should occasion two and a twenty-five-cent piece five, and so on, and also a combination of two or more coins should occasion a corresponding number of successive impulses. In this way the operator at the central station upon receiving from the pay telephone-station a request for a connection will state to the calling subscriber the amount of coin which must be deposited to pay for the same. When this deposit has been made, the pointer moving over the dial will indicate the fact to the operator by advancing the proper number of units, whereupon the connection will be supplied. The operator will then give the button K a pull, thereby causing the pointer to fall back to the stop-pin *n*, so that the apparatus is in condition to instantly begin to register a similar deposit made at any other pay-station within the circuit. The stop-pin *n'* prevents the pointer from revolving to a position immediately over its axis where it would not fall when the button K is pulled.

The advantage of this form of indicating device is that although a large number of stations may be included in a single circuit the device is always ready to begin at zero to indicate to the operator each deposit as made. It is very convenient to associate with this indicator for the operator another indicator inserted in the same circuit and placed in a superintendent's office, which indicator may be precisely similar to the present form, except that the pointer is allowed to register continuously. For this purpose a larger dial will be required than that shown in the drawings. In this way the superintendent's office will at all times have before it a registration of the total amount of tolls which have been deposited in the various toll-collecting devices, and in this way a check may be kept both upon the operator at the central station and upon the employees whose duty it may be to gather up the coins from the various toll-collecting devices included in the circuit.

Having thus described my invention, I claim—

1. In an electrical indicating device, the combination with a dial-plate and pointer, of means for revolving the pointer relative to the dial-plate, comprising a suitably-supported rod on which the pointer is carried, an inner sleeve concentric with the rod, means for holding the pointer in engagement with the inner sleeve, a ratchet-wheel carried by the inner sleeve, an outer sleeve concentric with the inner sleeve and rod, an arm secured to the outer sleeve carrying a pawl arranged to engage the teeth of the ratchet-wheel, an arm secured to the outer sleeve carrying an armature, and an electromagnet arranged, when energized, to attract the armature to effect the movement of the ratchet-wheel; substantially as described.

2. In an electrical indicating device, the combination with a dial-plate and pointer, of means for revolving the pointer relative to the dial-plate, comprising a suitably-supported rod on which the pointer is carried, an inner sleeve concentric with the rod and having a stud at its end for engaging the pointer, a collar on the rod, means normally pressing the collar toward the stud to hold the pointer in engagement with the stud, a ratchet-wheel carried by the inner sleeve, an outer sleeve concentric with the inner sleeve and rod, an arm secured to the outer sleeve carrying a pawl arranged to engage the teeth of the ratchet-wheel, an arm secured to the outer sleeve carrying an armature and an electromagnet arranged, when energized, to attract the armature to effect the movement of the ratchet-wheel; substantially as described.

3. In an electrical indicating device, the combination with a dial-plate and pointer, of means for revolving the pointer relative to the dial-plate, comprising a suitably-supported sliding rod on which the pointer is carried, an inner sleeve concentric with the rod, means for holding the inner sleeve against longitudinal movement, a stud on the end of the inner sleeve, a collar on the sliding rod, yielding means for pressing the collar toward the stud to hold the pointer in engagement with the stud, a ratchet-wheel secured to the inner sleeve, an outer sleeve concentric with the inner sleeve and rod, an electromagnet arranged to vibrate the outer sleeve and means whereby the vibration of the outer sleeve operates the ratchet-wheel carried by the inner sleeve; substantially as described.

In witness whereof I, the said ROMEO B. HAZLETT, have hereunto signed my name, with the attestation of two witnesses.

ROMEO B. HAZLETT.

Witnesses:
JAMES H. BELL,
C. BRADFORD FRALEY.