(No Model.) 2 Sheets—Sheet 1.

E. R. WILDER.

CALL BOX.

No. 462,785. Patented Nov. 10, 1891.

Fig. 1.

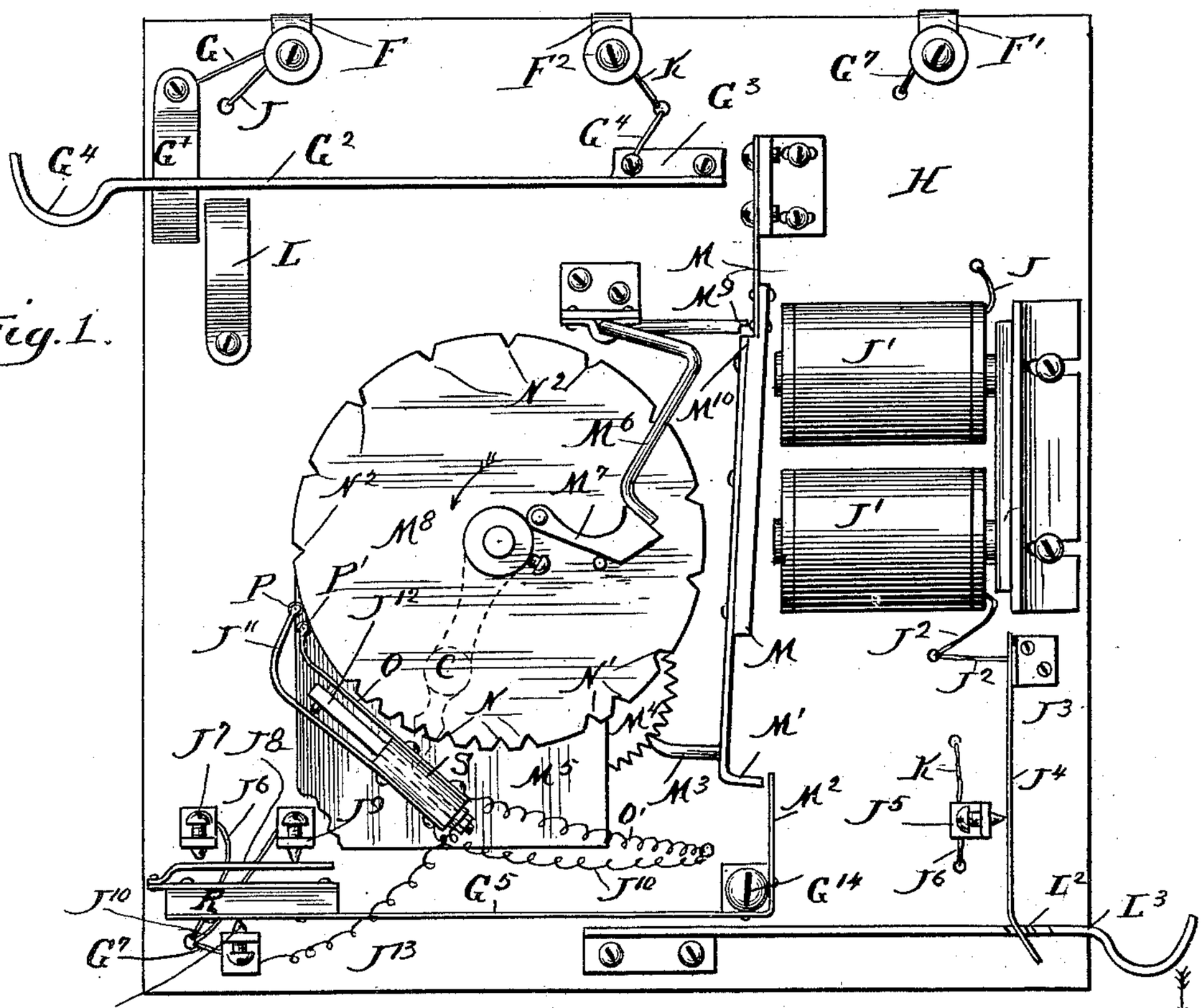
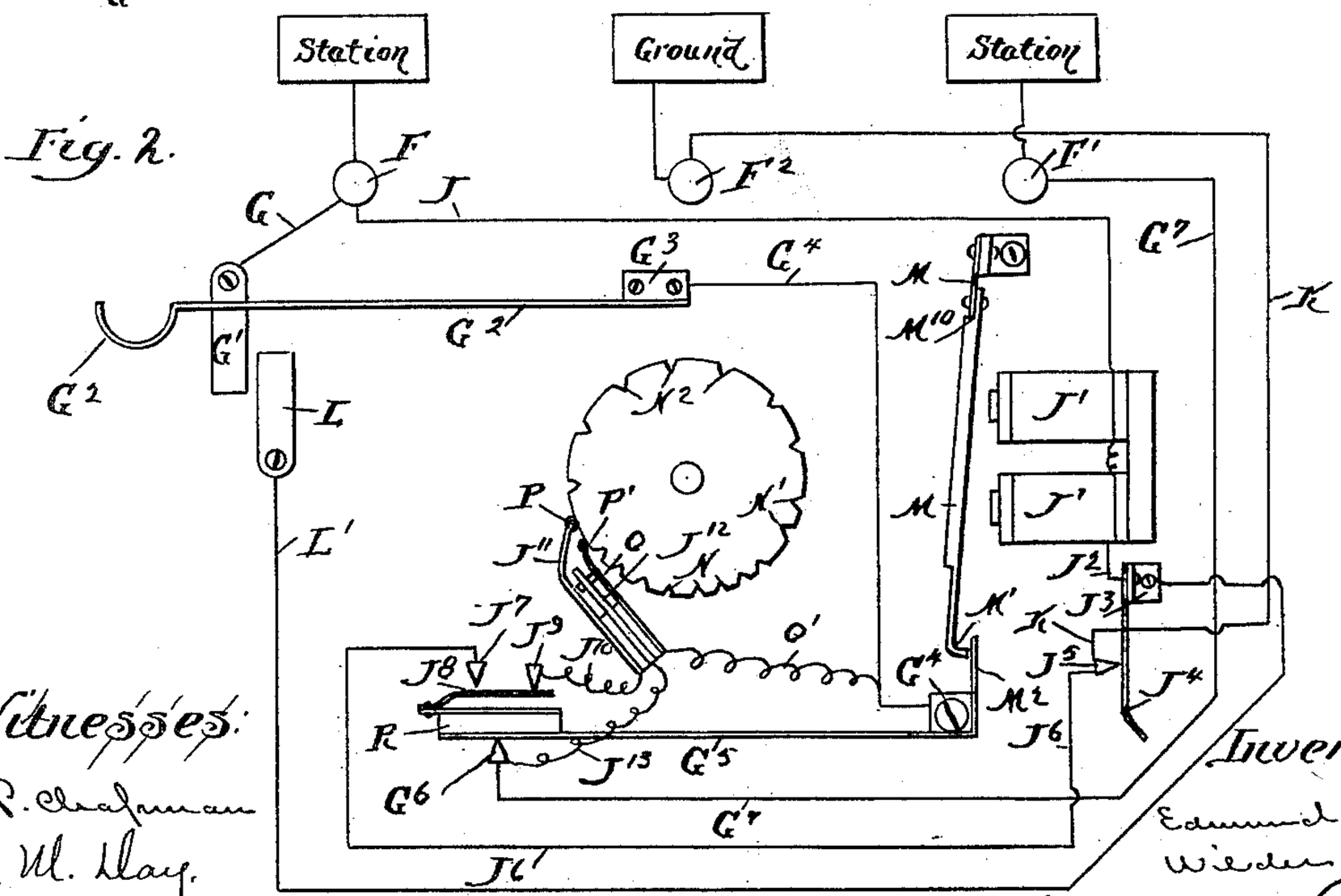


Fig. 2.



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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

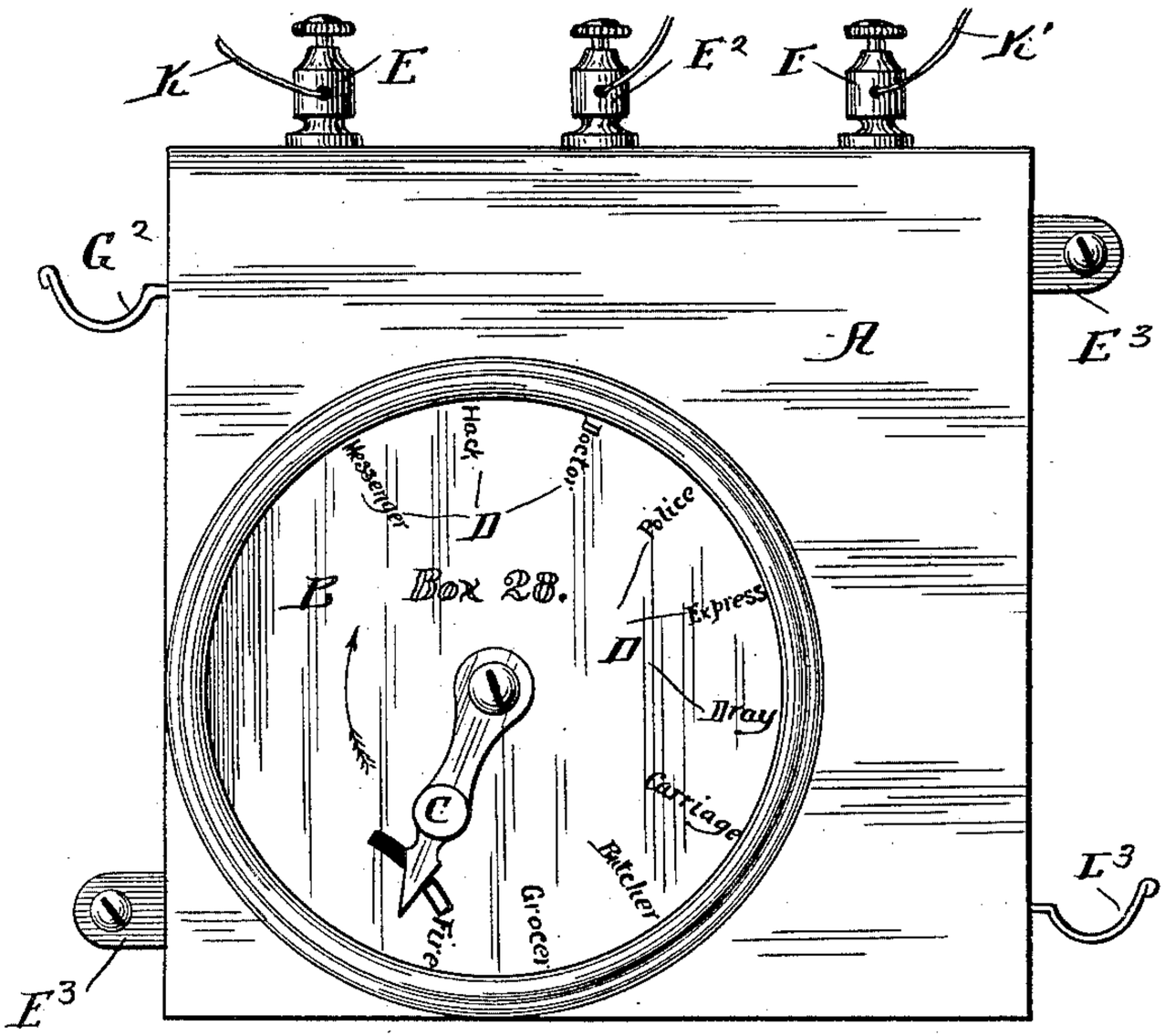


Fig. 4.

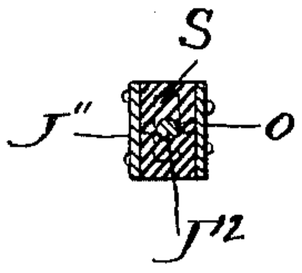
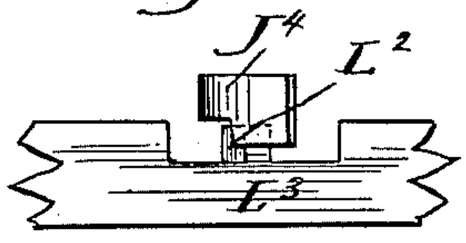


Fig. 5.



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UNITED STATES PATENT OFFICE.

EDMUND R. WILDER, OF KANSAS CITY, MISSOURI, ASSIGNOR TO THE WILDER DUPLEX ELECTRIC BURGLAR ALARM AND MESSENGER COMPANY, OF WEST VIRGINIA.

CALL-BOX.

SPECIFICATION forming part of Letters Patent No. 462,785, dated November 10, 1891.

Application filed December 17, 1890. Serial No. 374,977. (No model.)

To all whom it may concern:

Be it known that I, EDMUND R. WILDER, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented a certain new and useful Improvement in Call-Boxes, of which the following is a full, clear, and exact specification.

My invention relates to call-boxes or messenger-boxes such as are used in ordinary district-messenger systems and the like, and has for its object to provide convenient, cheap, and simple boxes. It is illustrated in the accompanying drawings, wherein—

Figure 1 is a plan view of the interior of the box. Fig. 2 is a partly-diagrammatic view of the circuits. Fig. 3 is a face view of the box. Fig. 4 is a detail of the signal-key. Fig. 5 is a detail.

Like parts are indicated by the same letters in all of the figures.

A is a case, having the dial B with the pointer C thereon and the various calls D D indicated thereon. In the box in question there are ten calls indicated.

E E′ are binding-posts, from which leads conductors to the central station.

E^2 is a binding-post from the conductor to ground.

E^3 E^3 are lugs by which the box is secured in position. The binding-post E is connected with the contact F, and the binding-post E′ with the contact F′, and the binding-post E^2 with the contact F^2. From F a conductor G leads to the curved spring-contact G′, which engages the spring-pull G^2, which is secured at G^3 to the insulating-base H. From the point G^3 the conductor G^4 leads through the base H and under the base to the post G^{14} G^{14}. To this post is secured the strip G^5, which normally makes contact with the pin G^6, from which leads a conductor G^7 through the base and across to the contact F′, and thence to the binding-post E′ and back to the station. Thus a metallic circuit is made through these various parts through the box connecting with the two metallic central-station conductors K K′. On this metallic circuit there is at all times a central-station battery, so that a constant current is passing through the box along the line now traced. From the contact-plate F a second conductor J leads through the insulation-base and thence to the electro-magnets J′ J′. From this magnet J′ leads the conductor J^2 to the post J^3, upon which is the spring J^4, opposed to and normally free from the contact-point J^5. From this contact-point leads a conductor J^6 to the contact-point J^7, normally free from the opposed spring J^8 upon one end of the strip G^5. J^9 is a similar contact-point opposed to the strip J^8, and from which leads the conductor J^{10}, which passes under the insulating-plate and thence connects with the outer pen J^{11}, which is normally free from the double contacting-strip J^{12}, which is connected with the conductor J^{13}, which leads to the contact standard or point G^6. From this the circuit by the conductor G^7 has already been traced to the contact standard or point J^5, opposed to the spring J^4, from which leads the conductor K underneath the insulation-plate to the contact-spring F^2, which leads to the ground.

L is a contact-strip secured upon the insulating-body H and adapted to be engaged by the spring-arm G^2 when desired, from which leads a conductor L′ to the conductor J^2. The spring contacting-plate J^4 engages a projecting pin L^2 on the spring-hook L^3, so that when the spring-hook L^3 is pulled downwardly—the direction indicated by the arrow—this arm J^4 is momentarily thrown in contact with the standard J^5, and when the arm is released this contact is also immediately broken.

M is a spring-armature controlled by the magnets J′ J′ and provided at one end with a point M′ to engage the projecting end M^2 of the pivoted strip G^5, and carrying also at the same end a dog M^3 to engage the wheel M^4, and thus lock the clock mechanism which is contained within the case M^5.

M^6 is a sort of bell-crank lever, one end of which is adapted to be engaged by the dog M^7 on the rotating signaling-disk M^8 and the other end of which is notched at M^9 to engage the shoulder M^{10} on the armature M, and thus hold the same in proximity with the poles of the magnets J J′. The notch M^9 is normally disengaged from the shoulder M^{10}, but falls down by gravity or by a spring, if preferred, to engage the same when the armature is pulled up against the poles of the

electro-magnets. The disk M is provided with the box-number notches N′ N′ and the call-notches N^2 N^2.

O is an interior pen connected with the conductor O′, which leads to the post G^{14}. From the post G^{14} it is connected with the conductor G^4, which leads to the spring-arm G^2.

P P′ are rollers on the ends of the pens.

R is insulation interposed between the spring J^8 and the strip G^5.

S is insulation separating the pens O and J^{11} and the central contact-strip J^{12}.

The use and operation of my invention are as follows: Assuming the box to be in the position shown in Fig. 3, the calls D D are arranged so as to correspond with the signal-notches N^2 N^2, and the hand or pointer C is connected with the clock mechanism, so that when such hand is moved, as indicated by the arrow, and permitted to rest upon any given call the pens will be carried past the corresponding notch and the clock mechanism will be wound up, and here the mechanism rests, neither of the pen-rollers being in a slot. In this situation there is a metallic circuit from the station to contact F along conductor G to spring-contact G′ to the arm G^2, plate G^3, conductor G^4 to post G^{14} along strip G^5, back down G^6, along conductor G^7 to contact F′, and thence back to the station. In this metallic circuit at the station there is placed a battery, so that a current continuously flows over the described circuit. If now we pull down upon the spring-pull L^3, the point or projection L^2 will engage the bent end of the spring-piece J^4 and force the same against the contact or standard J^5. As soon as this circuit is closed by the engagement of these two parts and during their engagement, which is of course very brief, because contact is immediately broken when the pull L^3 is released, a current is established as follows: A circuit is made from the station to contact F, thence along conductor J through magnets J′ J′, conductor J^2, post J^3, spring J^4, contact J^5, conductor K, spring-plate F^2, and thence to ground. There is at the central station a battery connected with the metallic wire which leads to contact-plate F and also connected to ground, so that from this circuit, part metallic and part ground, a current may be passed from the said grounded battery at the central station through the magnets J′ J′ in the box. If now the metallic conductor leading from the central station to the plate F should be disconnected or broken, the circuit from the station would be as follows: over the conductor from the station leading to the contact F′, thence along conductor G^7 to contact G^6, thence back on the spring-plate G^5 to the post G^{14}, thence along conductor G^4 through plate G^3, arm G^2, plate G′, conductor G, plate F, conductor J, magnets J′ J′, conductor J^2, post J^3, spring J^4, contact J^5, conductor K, contact-plate F^2, and thence to ground. From this it will appear that when by drawing down the spring-pull L^3 a contact is momentarily made between the post J^5 and the spring or arm J^4, a circuit is closed through either or both of the metallic wires leading from the station to the contact-plates F and F′ and through the ground from the station to the ground-contact plate F^2 of the box, and also that this circuit, in whichever of these two ways formed, embraces the magnets J′ J′, so as to place them in circuit with a grounded battery at the station. These magnets when thus sufficiently energized draw to them the armature M and thus release the clock mechanism, permitting the elbow-lever M^6 to fall and its notch M^9 to engage the shoulder M^{10}, and thus lock for a limited period the armature near the poles of the magnet, and by the engagement of the projection M′ of the armature with the projection M^2 from the post G^{14} throws the strip G^5 upwardly, so as to disconnect it from the contact-post G^6 and to bring the spring J^8 into contact with the point J^7, it being already in contact with the point J^9. It will be observed, if not from the foregoing at least from the succeeding tracing of the circuits, that this motion of the arm G^5 removes the shunt from the metallic circuit heretofore traced and places the pen O in such circuit so long as the same is in the position indicated in Fig. 1. This circuit will now be traced: Leaving the station on the metallic conductor which leads to the plate F, it would pass to the conductor G, strip G′, arm G^2, plate G^3, conductor G^4, conductor O′, pen O, contact-strip J^{12}, conductor J^{13}, contact-post G^6, conductor G^7, plate F′, and thence back to the station by the other metallic conductor. Thus the pen O, so long as it is retained in contact with the strip J^{12}, is included in a closed metallic circuit from the station and including at the station a battery which furnishes a current for such circuit. The mechanism being released, as above described, the disk moves in the direction of the arrow, (shown in Figs. 1 and 2,) and evidently every time the roller P′ descends into one of the slots or notches this metallic circuit is broken and a suitable signal is given at the central station over the metallic circuit just described. Should either of these metallic conductors from the station to the box be broken or disconnected, so that no call or signal could be given by the pen O, the signal is returned by the pen J^{11} over the ground-circuit. This circuit we will now trace: Beginning with the ground at the station, we pass to the ground at the box, thence to the contact-strip F^2, then along conductor K to the contact-point or standard J^5, thence along conductor J^6 to contact J^7, and since this contact is during the operation of the box in contact with the spring J^8 we pass from contact J^7 to the spring J^8, along the same to contact J^9, thence along conductor J^{10} to pen J^{11}, which, when its roller P drops into any of the notches, makes contact with the central contacting-plate J^{12} and also with the pen O, since such pen O is always in contact with the central strip J^{12}

when this roller is not in a slot. The two rollers are so positioned that they cannot be simultaneously in slots. To trace the circuit we pass, in the first instance, along the strip J^{12}, conductor J^{13}, contact-point G^6, conductor G^7 to contact-plate F′, thence to the station, and thence also to the ground at the station, thus making a complete circuit through the ground and the metallic connections from the station to the plate F′. This is the operation or the circuit used in case the conductor from plate F to the station is disconnected or broken. If now the other conductor, or the one from plate F′ to the station, is disconnected or broken, the circuit is as follows: The circuit is of course in like manner traced from station-ground to the ground at the box, and thence to the pen J^{11}, thence through the contact-strip J^{12} to the pen O, thence to conductor O′, conductor G^4, plate G^3, arm G^2, plate G′, contact G, plate F, and back over that metallic conductor to the station. Thus in the event of either of the metallic conductors from box to station being broken the pen J^{11} will give the signal over a circuit composed of the other metallic conductor and the ground connections, and if both of the metallic conductors are intact the call is made by the pen O over a complete metallic circuit composed of both these metallic conductors from the box to the station. If now one of the metallic conductors between the station and the box should be grounded, so that there would be a short ground-circuit from such grounded point to the ground at the station, it is obvious that no current would flow through the magnets when the ground-circuit to the box is completed, as the current which normally would flow through such magnets is cut off. Now in this case when the person pulls the pull L^3 no result is obtained. Having discovered this, the object of the person at the call-box is to signal the office, so as to secure a sufficient current through the magnets J′ J′ to operate the box. He does this in the following manner: He pulls down the arm G^4 until it engages the plate L, whereupon the magnets J′ J′ are switched into the metallic circuit, so as to add to such circuit a resistance equal to that in the magnets, and the metallic circuit within the central station is provided with a signal-call, which operates the moment such resistance is thrown into the metallic circuit. We will now trace the circuit by which the magnets are thus thrown into the metallic circuit: leaving the station and passing along the metallic conductor to plate F, thence along conductor J, through the magnets J′ J′, thence to conductor J^2, post J^3, conductor L′, plate L, arm G^2, plate G^3, conductor G^4, post G^{14}, strip G^5, contact-point G^6, conductor G^7, plate F′, and back over the other metallic connection to the station. Thus it will be seen that by operating the pull or lever G^2 the magnets J′ J′ are thrown into the metallic circuit, and the call at the central station depends upon the placing of this resistance in the metallic circuit as given. The operator at the central station having received this call switches into the metallic circuit a sufficiently strong electric current and causes the battery J′ J′ to pull up the armature M, whereupon the box mechanism begins to rotate, and if the arm G^2 is released and restored to its normal position the giving in of the calls will proceed, as heretofore described. The calls would of course be given in, even though the arm should be held upon the plate L; but in practice the arm is usually released.

The circuits which I have described I variously identify as follows: The ground-circuit is that circuit which is composed of the ground connection from the box to the station and of either one or both of the metallic conductors from the box to the station, and this ground-circuit is also described as the starting-circuit, as it is this circuit which is normally used to start the box. The metallic circuit composed of the two metallic conductors from the station to the box is also described as the signaling-circuit, for it is over this circuit that the call or signal is normally sent.

I claim—

1. In a call-box, the combination of a signaling mechanism, a starting mechanism in a normally-broken circuit, a hand-switch in the box, a metallic circuit of two conductors connecting the box and station and a battery in such circuit which supplies a continuous normal current, a ground-circuit composed in part of one or both of the conductors of such metallic circuits and containing an independent battery which may supply a current heavier than the normal current, said switch adapted to control the ground-circuit so as to momentarily complete the same over either or both the metallic conductors, and thus by such heavy battery start the box, said starting mechanism in such switch-controlled circuit adapted to release the signaling mechanism and said signaling mechanism adapted to be connected with either the metallic or ground circuit, so that by the action of the switch the heavy battery on the ground-circuit starts the box and the signal is given.

2. In a call-box, the combination of a signaling mechanism, a starting mechanism in a normally-broken circuit, a hand-switch in the box, a metallic circuit of two conductors connecting the box and station, and a battery in such circuit composed in part of one or both of the conductors of such metallic circuits and containing an independent battery which may supply a current heavier than the normal current, said switch adapted to control the ground-circuit so as to momentarily complete the same over either or both the metallic conductors, and thus by such heavy battery start the box, said starting mechanism in such switch-controlled circuit adapted to release the signaling mechanism and said signaling mechanism adapted to be connected with either the metallic or ground circuit, so

that by the action of the switch the heavy battery on the ground-circuit starts the box and the signal is given, said signaling mechanism being duplex with one part in the ground-circuit and another part in the metallic circuit, so that the signal may be given over either or both the said circuits.

3. In a call-box, the combination of a signaling mechanism, a starting mechanism in a normally-broken circuit, two hand-switches in the box, a metallic circuit of two conductors connecting the box with the station, a ground-circuit composed in part of one or both of such metallic circuits, said switches controlling the circuit of the starting mechanism, so that said starting mechanism may be connected with the ground or metallic circuit at will, and thus the starting mechanism be set in operation.

4. In a call-box, the combination of a signaling mechanism with a metallic signaling-circuit connecting the same with the central station, so that a feeble normal current traverses such circuit at all times and traverses the mechanism when the same is released, so as to give the signal, a starting mechanism in the box, a hand-switch constructed to momentarily hold the starting mechanism in the metallic circuit, said starting device adapted to be operated only by a current different from that normally flowing and adapted only to start the box and to be released to then permit the normal circuit to give the signal.

5. In a call-box, the combination of a signaling mechanism with a metallic signaling-circuit connecting the box with the station and normally closed and carrying the normal current, a starting device in the box, a hand-switch whereby the same may be included in the metallic circuit, said starting device containing a certain considerable resistance, so that when the same is included in the metallic circuit the normal current is varied and a signal is given to the central station by such variation in said current, said starting mechanism adapted to be operated only by a current different from that normally flowing and adapted only to start the box and to be then released, so as to restore the normal current and let it give the signal.

6. In a call-box, the combination of a signaling mechanism, a metallic circuit connecting the box and the station, a ground-circuit composed in part of such metallic circuit, connecting the box and the station, a starting mechanism in the box, a switch whereby such starting mechanism may be connected either with the metallic circuit or the ground-circuit and adapted to release the signaling mechanism when energized, and a switch whereby the signaling mechanism may be connected to either the metallic or ground circuit, so as to give the signal over either.

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