

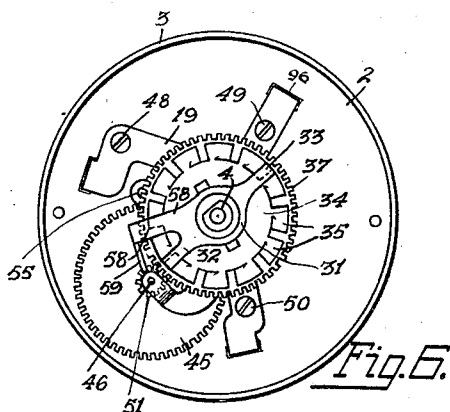
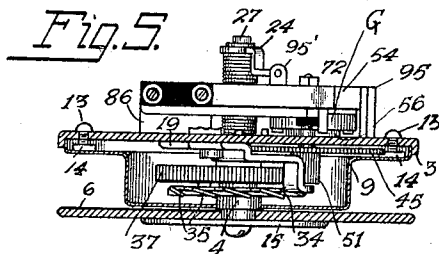
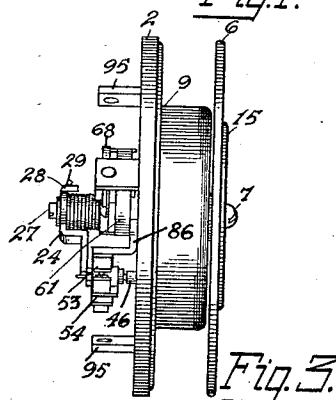
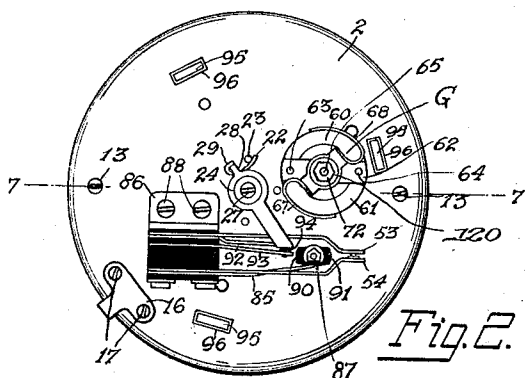
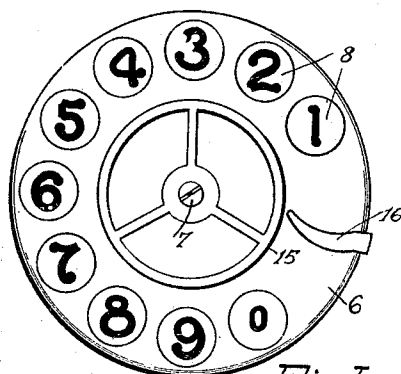
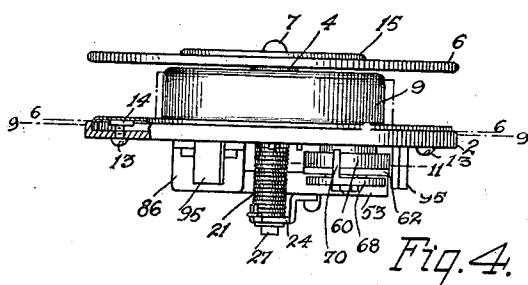
July 15, 1924.

H. H. IDE

1,501,281

AUTOMATIC CALLING DEVICE

Original Filed April 9, 1920 2 Sheets-Sheet 1



Inventor:
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July 15, 1924.

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1,501,281

AUTOMATIC CALLING DEVICE

Original Filed April 9, 1920 2 Sheets-Sheet 2

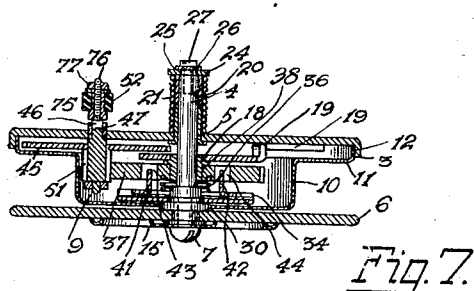


Fig. 7.

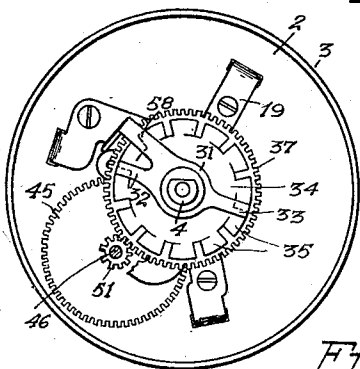


Fig. 8.

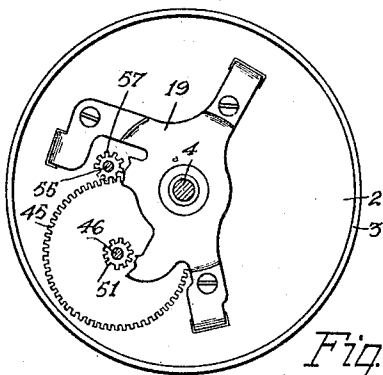


Fig. 9.

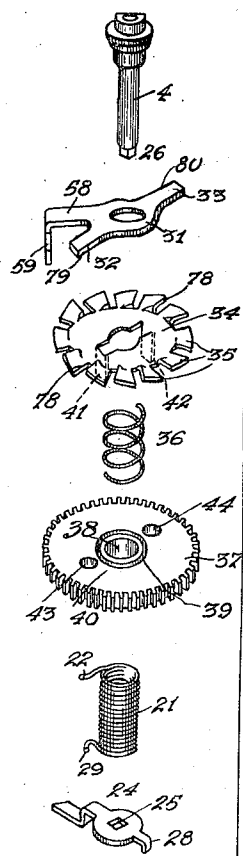


Fig. 10.

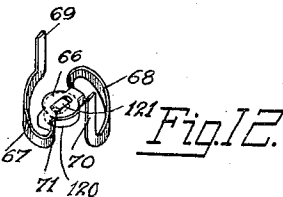


Fig. 12.

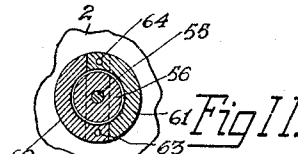


Fig. 11.

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Patented July 15, 1924.

1,501,281

UNITED STATES PATENT OFFICE.

HARRY H. IDE, OF LA GRANGE, ILLINOIS, ASSIGNOR TO KELLOGG SWITCHBOARD AND SUPPLY COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

AUTOMATIC CALLING DEVICE.

Application filed April 9, 1920, Serial No. 372,525. Renewed March 5, 1923.

To all whom it may concern:

Be it known that I, HARRY H. IDE, a citizen of the United States of America, residing in La Grange, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Automatic Calling Devices, of which the following is a specification.

My invention relates to calling devices and has to do more particularly with calling devices such as are commonly used in telephone systems for controlling automatic switches which are located at the central office by directive impulses to extend a connection from a calling substation to a called substation through the agency of the said switches.

My invention is particularly adapted to operate in conjunction with the so-called metallic or two-wire type of automatic circuits in which the circuit of the line is interrupted a number of times, determined by the adjustment of the setting member of the calling device. The principal object of my invention is to provide a device of the character described which will be certain and efficient in operation, simple in construction and economical to manufacture.

A feature of my invention is the provision of means whereby, upon the advance movement of the setting member or dial, the cam or wing member which interrupts the impulse springs is prevented from rotating backward and separating the said impulse springs. Another feature of my invention relates to the governor mechanism which permits the restoration of the setting member or dial from an advanced position at a predetermined speed. Still another feature of my invention relates to a floating ratchet mechanism which connects the setting member or dial to the impulse controlling means. A still further feature of my invention resides in the manner I arrange the gears of the speed-up gear train and in the manner I enclose said gears in a dust-proof casing to protect them against foreign matter.

The above features, as well as others, and advantages herein described will be better understood upon reference to the following specification, taken in connection with the accompanying drawings, and the scope of the invention will be particularly pointed out in the appended claims.

Referring now more particularly to the accompanying drawings, in which I illustrate the calling device in the several views and in which views like reference characters indicate like parts, and in which

Fig. 1 is a face view of the calling device of my invention;

Fig. 2 is a rear view of Fig. 1;

Fig. 3 is a right side view of Fig. 2;

Fig. 4 is a top view of Fig. 2;

Fig. 5 is a bottom view of Fig. 2 with certain parts broken away;

Fig. 6 is a sectional view along the line 6—6 of Fig. 4;

Fig. 7 is a sectional view along the line 7—7 of Fig. 2;

Fig. 8 is a view similar to Fig. 6 but showing the mechanism in an advanced position;

Fig. 9 is a sectional view along the line 9—9 of Fig. 4;

Fig. 10 is a disassembled perspective view of the main shaft and parts which are mounted thereon;

Fig. 11 is a sectional view of the governor along the line 11—11 of Fig. 4;

Fig. 12 is a perspective view of the tension spring of the governor.

Referring now more in detail to my invention as illustrated in the accompanying drawings, it comprises a main mounting plate 2 provided with a forwardly extending rim 3 for purposes as will be more fully hereinafter described. A main shaft 4 extends through a bearing 5 which is secured to the mounting plate 2 in any suitable manner. A finger hold actuating member 6 is secured to the forward end of the main shaft 4 by means of a screw 7, which screw has screw-threaded engagement with a suitable tapped orifice in the main shaft 4. The forward end of the shaft 4 is cut away to form a squared portion, and the finger hold actuating member 6 is provided with an opening shaped to receive the forward end of the shaft 4. The squared portion of the shaft 4 secures the finger hold actuating member 6 against rotation on the shaft 4 when it is being advanced from its normal position.

The finger hold actuating member 6 is provided with a plurality of openings or finger holds 8, preferably ten in number. A member 9 for enclosing the mechanism is provided with a forwardly extending cup portion 10 and a flanged portion 11 which is provided with a backwardly extending

Referring now more particularly to the

rim portion 12. The diameter of the rim portion 12 of the member 9 is of a size so as to set within the rim portion 3 of the mounting plate 2 and, when in this position, is secured to the mounting plate 2 by means of screws 13 which pass through suitable openings in the plate 2 and have screw-threaded engagement with suitable tapped orifices in the lugs 14 which are secured to the flanged portion 11 of the member 9 in any suitable manner.

Indicating numerals are placed upon the flanged portion 11 of the member 9 in any suitable manner and the number of said numerals corresponding with the number of finger holds 8. The ten openings 8 which form the finger holds are numbered 1, 2, 3, etc., to 0, and the calling device is adapted to send from one to ten impulses. The finger hold actuating member 6 is provided with a card holder in the form of a clamping ring 15, and the card held in place by the ring 15 may bear any legend. The screws 7 which secure the member 6 upon the shaft 4 also holds the clamping ring 15 and card against displacement. A stationary finger stop 16 is secured to the mounting plate 2 by means of screws 17, so that when the finger hold actuating member 6 is advanced in a clockwise direction, the advancing finger of the operator engages the stationary finger stop 16, and arrests further movement of the actuating member.

Referring now more particularly to the operating mechanism, the main shaft 4 extends through a suitable bearing sleeve 5 secured to the mounting plate 2 and a bearing sleeve 18 which is secured to the bridge plate 19 in any suitable manner, the said shaft 4 rotating in the said bearings 5 and 18. A sleeve 20 is provided, which is of a size to receive the shaft 4, the said sleeve 20 when in place resting against the bearing 5. A spiral motor spring 21 is coiled around the bearing 5 and the sleeve 20 and the end 22 of the spring 21 engages one of a plurality of lugs 23, which lugs 23 are preferably integrally formed with the mounting plate 2 by means of a shearing and forming operation. An arm 24 is provided which has a square orifice 25 of a size to receive the square portion 26 of the shaft 4 and is held in place by means of a screw 27, which has screw-threaded engagement with a suitable tapped opening in the end of the shaft 4. The arm 24 is provided with an angular extension 28, which extension 28 forms a securing means for the end 29 of the motor spring 21, the said end 29 being hook-shaped so as to permit it being hooked over the said extension 28. The spring 21 restores the finger hold actuating member 6 to its normal position after the same has been ad-

vanced, and then released, and the arm 24 operates the shunt springs and also serves to retain the motor spring 21 in place about the bearing 5 and sleeve 18. To secure the proper tension of the motor spring 21, the end 22 of the spring 21 is moved in a clockwise direction over the lugs 23 until the proper tension or adjustment is secured. The end 22 of the spring 21 is then placed so that it engages one of the plurality of lugs 23, to thus hold the spring 21 under its normal tension and also hold the finger hold actuating member 6 in its normal position.

The member 9 is provided with a centrally located orifice 30 in the cup portion 10 and is of a size to permit the passage of the main shaft 4. Positioned directly beneath the cup portion 10 of the member 9 on the main shaft 4 is a combined stop and dog 31 which is secured to the said shaft 4 in any suitable manner as by means of a staking operation. The dog 31 is provided with two arms 32 and 33, diametrically opposite each other, and co-operates with a floating ratchet 34 loosely mounted upon the main shaft 4 and positioned directly beneath the said dog 31. The floating ratchet 34 is provided with a plurality of teeth or wings 35 and is spring-pressed into engagement with the dog 31 by means of a spiral spring 36. Positioned directly beneath the ratchet 34 is a gear wheel 37 provided with a central orifice 38 of a size to permit it being slipped over the sleeve 18 secured to the bridge plate 19, the said gear wheel 37 being loosely supported upon the said sleeve 18. An annular groove 39 is cut in the face 40 of the gear wheel 37 and is of a size to receive a portion of the spiral spring 36. The said spring 36 surrounds the shaft 4 and when it is in position with a portion resting in the annular groove 39, it is thus positioned against displacement. When the ratchet 34 and gear wheel 37 are positioned as just described, the tension of the coil spring 36 is such that the ratchet 34 is spring-pressed in an upward direction into engagement with the dog 31 so that arms 32 and 33 of the dog 31 each engage a tooth or wing 35 of the said ratchet 34. The ratchet 34 is provided with depending lugs or arms 41 and 42, preferably integrally formed therewith, the said arms 41 and 42 extending down into orifices 43 and 44, in the gear wheel 37. The function of the dog 31 and ratchet 34 and arms 41 and 42 co-operating with the gear wheel 37 will be more fully hereinafter described.

A gear wheel 45 is also provided and is suitably secured to a shaft 46, which shaft 46 is journaled between the bridge plate 19 and a bearing 47 which is secured to the plate 2, the said bridge plate 19 be-

ing secured to the mounting plate 2 by means of screws 48, 49 and 50, which screws pass through suitable openings in the bridge plate 19 and have screw-threaded engagement with suitable tapped orifices in the mounting plate 2. A pinion 51, formed integrally with the shaft 46, meshes with the gear wheel 37, the said shaft 46 also carrying the interrupter cam 52 which operates with the impulse springs 53 and 54, as will be more fully hereinafter described. A shaft 55 is provided and is journaled between the bridge plate 19 and a bearing 56 secured to the mounting plate 2. The shaft 55 is provided with a pinion 57 integrally formed with the shaft 55 and which meshes with the gear wheel 45. The shaft 55 is associated with the governor mechanism G, which is adapted to retard the return movement of the finger hold actuating member 6 at a predetermined speed, as will be more fully hereinafter described.

To retain the finger hold actuating member 6 in its normal position against the tension of the motor spring 21, I provide an arm 58 integrally formed with the dog 31, which is permanently secured to the shaft 4, the said arm 58 being provided with an angular extension 59 which is normally in engagement with the pinion 51 of shaft 46. Should the finger hold actuating member 6 be advanced in a clockwise direction, the nose of the angular extension 59 disengages the pinion 51 due to the fact that the dog 31 is rotated with the shaft 4 when the member 6 is rotated in a clockwise direction. When the finger hold actuating member 6 is released and restored in a counter-clockwise direction by the motor spring 21, upon restoration to normal the nose of the extension 59 is again brought into engagement with the pinion 51. This engagement with the pinion 51 by the nose of the extension 59 also prevents an overrun operation of the impulse mechanism.

The governor mechanism comprises the shaft 55 which has a pinion 57 formed integrally with it, as hereinbefore mentioned, the said pinion meshing with the gear wheel 45 upon the shaft 46. The shaft 46 has a pinion 51 integrally formed with it, which pinion 51 meshes with the gear wheel 37 upon the shaft 4. The train of gearing thus outlined connects the governor mechanism G with the main shaft 4. A member 56 is staked to the mounting plate 2 and serves as a bearing for the shaft 55, and also serves as a braking surface for the weighted members 60 and 61. The weighted members 60 and 61 of the governor are pivotally supported on the bridge plate 62 by means of the pivot pins 63 and 64. The end 65 of the shaft 55 is threaded to receive the bridge plate 62 which is provided with a suitable tapped orifice which has screw-threaded en-

gagement with the said threaded end 65 of the shaft 55, thus rotatably securing the governor mechanism as a whole to the mounting plate.

A plate 66 of comparatively thin metal is provided, and formed integrally with the plate 66 are a pair of looped spring members 67 and 68 provided with depending spring arms 69 and 70 diametrically opposite each other. The plate 66 is provided with a slot 71 of a size to permit its being slipped over the shaft 55. The depending arms 69 and 70 engage, respectively, weighted members 60 and 61, and the said plate 66 is held in place by means of the nut 72, which has screw-threaded engagement with the threaded end 65 of the shaft 55. The action of the tension of spring members 67 and 68 upon weighted members 60 and 61 may be lessened or increased, thereby decreasing or increasing the speed of the governor mechanism. The slot 71 in the plate 66 permits lateral movement of said plate 66 when adjusting the governor to balance up the spring tension on the weighted members 60 and 61.

The governor mechanism G is operatively associated with the train of gearing before mentioned, and when the finger hold actuating member 6 is rotated in a clockwise direction to set the calling device to transmit a certain number of impulses, the gear 37 and floating ratchet 34 which are loosely mounted upon the shaft 4 remain stationary while the shaft 4 and dog 31 are operated in a clockwise direction so that the arms 32, 33 and 58 ride over the teeth or wings 35 of the floating ratchet 34 until the arms 32 and 33 rest in the desired teeth of the floating ratchet 34. Upon the return movement of the finger hold actuating member 6 and the shaft 4, the dog 31 also returns therewith, due to its being secured to the shaft 4, and as the arms 32 and 33 of the dog 31 now engage the desired tooth 35 of the ratchet 34, the said ratchet 34 is rotated in a counter-clockwise direction, and due to the depending arms 41 and 42 of ratchet 34 extending into orifices 43 and 44 in the gear wheel 37, the said gear 37 is rotated therewith, and through the medium of the train of gearing the motion is transmitted to the governor mechanism G. The shaft 55 is now rotated, as is also the bridge plate 62, which is secured to the shaft 55, and due to the fact that the weighted members 60 and 61 are pivotally secured to the bridge plate 62, they are forced out by centrifugal force against the tension of the spring members 67 and 68. The forcing out of the free ends of the weighted members 60 and 61 cause the pivoted ends of the members 60 and 61 to be forced against the member 56 and, due to the engaging surfaces of the weighted members 60 and 61 being in close proximity to the fulcrum of the weighted members 60

and 61, the weight of the said members is multiplied in forcing the engaging surfaces of the said weighted members 60 and 61 against the periphery of the member 56. A member 120 is provided with a central orifice for receiving the shaft 55 and also provided with a shoulder portion 121 which fits down into slot 71 of plate 66 and secured in place by means of the nut 72 having screw-threaded engagement with the threaded end portion of shaft 55. The shoulder portion 121 is such as not to permit rotation of plate 66 relative to member 120, but to permit only lateral movement of plate 66 relative to member 120. The shoulder portion 121 is slightly greater in thickness than the plate 66 so that when nut 72 is tightened, the plate 66 is held against rotation but not against lateral movement. The slot 71 in the plate 66, as before mentioned, permits lateral movement of the said plate member 66 so that, should there be a slight difference of tension between the spring members 67 and 68, it is overcome by permitting the plate 66 to move slightly either way, depending upon the tension of the said members 67 and 68, thus equalizing the tension of the spring members 67 and 68. To increase or decrease the speed of rotation of the calling device, the nut 72 is loosened and the member 120 and plate 66 rotated in one direction or the other to increase the action of the spring tension or to decrease the action of the spring tension, whichever the case may demand, upon the weighted members 60 and 61.

In order to operate the impulse springs 53 and 54 of the calling device, I preferably provide an interrupter cam member 52 of insulation material, mounted upon a sleeve 75. The sleeve 75 is provided with a tapped opening extending therethrough, the said sleeve 75 having screw-threaded engagement with the threaded end 76 of the shaft 46. A nut 77 is provided which has screw-threaded engagement with the threaded end 76 of the shaft 46 and secures the said cam 52 in place upon the shaft 46.

The floating ratchet 34, hereinbefore described, has a plurality of teeth or wings 35, twelve in number, but I only use ten of these wings 35, as I only have the finger holds 8 numbered from 1 to 9, having a space equal to two finger holds 8 upon the member 6. When the member 6 is at normal, the arms 32 and 33 of the dog 31 each engage a wing 35 of the ratchet 34, and as the arms 32 and 33 are diametrically opposite each arm, they engage wings 35 diametrically opposite each other. A portion of each wing 35 of the ratchet 34 is angularly displaced in relation to the plane face of the ratchet 34, and the edge 78 of the wings 35 engages, respectively, the edge 79 of the arm 32 and the edge 80 of the arm

33 of dog 31. Now when the member 6 is rotated in a clockwise direction, the arms 32 and 33 ride over the successive wings 35 of the ratchet 34 in its advance movement, and as the arms 32 and 33 pass over the successive wings 35 of the ratchet 34, the said ratchet 34 is forced down against the normal tension of the spiral spring 36, which spring 36 holds the ratchet in its floating position in engagement to the arms 32 and 33 of the said ratchet 34. Upon this advance movement of the member 6, the arm 58 also rides over the wings 35 of the ratchet 34, and the nose of the angular extension 59 of arm 58 also disengages pinion 51. When the finger hold actuating member 6 is moved in a clockwise direction, the tension of the coil spring 36, which holds the ratchet 34 in its floating position, is such that it tends to hold the ratchet 34 in engagement with the arms 32 and 33 of the dog 31, thus tending to carry the loosely mounted gear 37 (if the spring tension is sufficient) with the ratchet 34 and thereby rotate the train of gearing and cam member 52. This backward movement of the gear train is prevented by a latch spring 85 secured to the impulse spring support 86. The cam member 52 is provided with notches 87 diametrically opposite each other, and the nose of the latch spring 85 engages a notch 87 of the cam 52, thus preventing this preliminary movement. A slightly greater movement than that required to operate the impulse springs 53 and 54 a number of times, dependent upon the number of impulses to be sent, is given member 6, due to the position of the finger stop 36, and this slightly greater movement just described is given so that, upon the return movement of the device, the arms 32 and 33 will engage the proper wing 35 of the ratchet 34. This is so arranged that a positive action is obtained and so that the desired impulses are always transmitted.

A pair of normally closed impulse springs 53 and 54 are provided, which are interrupted according to the number of impulses to be transmitted by the interrupter or cam member 52. The impulse springs 53 and 54 are so spaced that the cam member 52 rests between the springs 53 and 54 toward their extremities, the free ends of the said springs 53 and 54 being formed, as illustrated in Fig. 2, to form a pair of normally closed impulse springs. The springs 53 and 54 are insulatingly mounted upon the support 86, which is secured to the mounting plate 2 by means of the screws 88.

Now, if the actuating member 6 is rotated in a clockwise direction, the dog 31 moves with the shaft 4 and the arms 32 and 33 ride over the wings 35 of the ratchet 34 due to being loosely mounted upon the shaft 4. Upon the return movement of the shaft 4 and dog

31, the arms 32 and 33 engage wings 35, diametrically opposite each other, corresponding to the number of impulses to be sent. The movement of ratchet 34 is transmitted to the gear wheel 37 by means of the connection between the arms 41 and 42 of ratchet 34 and gear wheel 37, and the said gear wheel 37 is then rotated in a counter-clockwise direction, due to the motor spring 21, thereby transmitting power to the pinion 51 which meshes with the gear 37, thus rotating the shaft 46 upon which the cam member 52 is secured, bringing about the opening and closing of the impulse contacts 53 and 54 a number of times, according to the number of impulses to be sent.

The gearing ratio is such that for every thirty degrees that the gear wheel 37 is rotated, the shaft 46 is rotated one hundred and eighty degrees so that, if eight impulses are to be sent and the dial set, upon the return movement of the shaft 4 and member 6 the gear wheel 37 will travel through two hundred and forty degrees of rotation, thus causing four complete revolutions of the shaft 46, and as the cam member 52 is provided with wings 90 and 91, diametrically opposite, the four revolutions of the shaft 46 cause the wing member 90 to engage each spring 53 and 54 four times and wing member 91 to engage each spring 53 and 54 four times, thus bringing about the opening and closing of impulse springs 53 and 54 eight times.

I also provide shunt springs by which the subscriber's apparatus may be short-circuited while the impulses are being transmitted.

The shunt springs comprise a pair of normally open contact springs 92 and 93, the spring 92 being conductively connected with the impulse spring 53, the said springs 92 and 93 being also mounted upon the support 86. When the calling device is at normal, the arm 24 secured to the shaft 4 engages an insulation buffer 94 mounted upon the extension 95' of the spring 92 and holds the shunt springs 92 and 93 normally disengaged. When the member 6 is moved off normal, the shaft 4 is rotated and the arm 24 moves therewith, disengaging the buffer 94, allowing the shunt springs 92 and 93 to close and remain in such position until the arm 24 again engages buffer 94 upon the completion of the return movement of the setting member.

I provide angular extensions 95, which are integrally formed with the bridge plate 19, the said angular extensions 95 extending through suitable openings 96 in the plate 2 and serve as means for fastening the dial to the instrument.

I will now describe briefly the operation of the device. Let us assume that the subscriber wishes to effect four operations of

the impulse contacts 53 and 54, that is, to transmit four impulses, the finger of the subscriber will be inserted into a finger hold 8 before the member 4 and the member 6 is rotated in a clockwise direction until the finger of the subscriber engages the stationary stop 16. The rotation of the member 6 also causes the rotation of the shaft 4 and dog 31 and the nose of the angular extension 59 of arm 58 of dog 31 to disengage the pinion 51. A slight movement, as already described, of the mechanism is brought about, but is arrested when the nose of the latch spring 85 engages a notch 87 of the cam member 52. The floating ratchet 34 and gear 37 are loosely mounted upon the shaft 4, and therefore upon this forward movement the arms 32 and 33 of the dog 31 ride over the wings 35 of the ratchet 34, thus allowing the ratchet 34 and gear 37 to remain normal. As the shaft 4 leaves normal upon its forward rotation, the arm 24 carried thereby disengages the rubber buffer 94 of the shunt spring 92, allowing the shunt springs 92 and 93 to close their contacts to short-circuit the substation apparatus. The adjustment of the member 6 winds up the motor spring 21 so that when the finger of the subscriber is removed from the finger hold 8 of the actuating member 6, the spring 21 restores the shaft 4 and dog 31 to normal. The arms 32 and 33 of the dog 31 engage edges 78 of wings 35 and, due to the connection between the ratchet 34 and gear 37 by arms 41 and 42, the gear 37 is rotated with the said ratchet 31. This motion of the gear 37 is transmitted to the governor mechanism G through the agency of the train of gearing, thus permitting the restoration of the calling device at a predetermined speed. Motion is also transmitted to the shaft 46 to bring about the rotation of the cam member 52, causing impulse contacts 53 and 54 to be interrupted four times to transmit four impulses of current to the central office to operate the central office switch apparatus. Upon the return to normal of the device, the nose of the extension 59 of arm 58 of dog 31 again engages a tooth of the pinion 51, thereby immediately arresting further rotation of the cam member 52. The arm 24 again engages the rubber buffer 94 mounted upon the spring 92, thus interrupting the shunt springs 92 and 93. The device is now at normal and is again ready to be adjusted to effect the transmission of another set of impulses.

In illustrating my invention, I have shown a specific form of apparatus, but I do not wish to be limited to the exact structure as shown, as many modifications and changes may readily suggest themselves to those skilled in the art, and, therefore, I aim to cover all such changes and modifi-

cations as come within the spirit and scope of the appended claims.

Having described my invention what I claim as new and desire to secure by United States Letters Patent is:

1. A calling device including a mounting plate, a pinion shaft carried by said mounting plate, an interrupter secured to said pinion shaft, a setting member for controlling said interrupter, driving mechanism including a floating ratchet member supported by said mounting plate connecting said setting member to said interrupter via the said pinion shaft, a dustproof cover-cap for enclosing said mechanism, and a number plate carried by said cover cap.

2. A calling device comprising a circular mounting plate having a peripheral flange, interrupter contacts secured to the rear face of said plate, an interrupter for operating said contacts, a setting member, mechanism including a speed-up train of gearing secured to said mounting plate and adapted for connecting said setting member to said interrupter, and a circular dustproof cover provided with a downwardly extending peripheral flange adapted to fit within the peripheral flange of said mounting member for enclosing said mechanism.

3. A calling device including a mounting plate, a pinion shaft carried by said mounting plate, an interrupter secured to said pinion shaft, a disk like setting member provided with a plurality of orifices for controlling said interrupter, mechanism supported by said mounting plate connecting said setting member to said interrupter via said pinion shaft, a dustproof cover-cap for enclosing said mechanism, and a number plate carried by said dustproof cover beneath said setting member.

4. A device of the character described including a mounting plate, interrupter springs secured to said mounting plate, an interrupter extending through the mounting plate for operating said interrupter springs, a governor secured to the rear of said mounting plate, a number plate, a setting member, mechanism connecting the setting member to said governor and said interrupter, and a cover for enclosing all of said mechanism and for carrying said number plate.

5. A calling device including a mounting plate, a mounting member, a main shaft and an interrupter shaft having bearings in said mounting plate and said mounting member, and lugs formed integrally with said mounting member adapted for use in securing the calling device in position.

6. A calling device including a mounting plate, a supporting member connected to said mounting plate, a main shaft and an interrupter shaft having bearings in said mounting plate and in said supporting member, and lugs formed integrally with said sup-

porting member extending through orifices in said mounting plate for securing said calling device in position.

7. A calling device including a mounting plate, a supporting member connected to said mounting plate, a main shaft and a governor shaft having bearings in said mounting plate and in said supporting member, lugs formed integrally with said supporting member extending through orifices in said mounting plate for securing said calling device in position, and a setting member connected to said main shaft for controlling the operation of said calling device.

8. A calling device of the character described provided with a mounting plate having a circular peripheral flange, impulse springs, a pinion, an interrupter secured to said pinion for operating said springs, a setting member, a speed-up train of gearing mounted upon said mounting plate and connecting said setting member to said interrupter via said interrupter pinion, and a cover-cap provided with a circular peripheral flange adapted to fit within the flange of said mounting plate enclosing said speed-up train of gearing.

9. A calling device including a mounting plate, a supporting tripod secured to said mounting plate, a main shaft and a governor shaft both having bearings in said mounting plate and said supporting tripod, and a dustproof cover enclosing said supporting tripod.

10. A calling device including a mounting plate, a supporting member secured to said mounting plate, a main shaft having bearings in said mounting plate and said supporting member, a pawl firmly secured to said shaft, a loosely connected gear supported by said shaft, a ratchet loosely connected to said shaft, and a spring member for yieldingly holding said ratchet in contact with said pawl.

11. A calling device including a mounting plate, a supporting member secured to said mounting plate, a main shaft having bearings in said mounting plate and said supporting member, a pawl firmly secured to said shaft, a loosely connected gear supported by said shaft, a ratchet loosely connected to said shaft, a spring member for yieldingly holding said ratchet in contact with said pawl, and a setting member for rotating said main shaft and pawl whereby said pawl ineffectively passes over the teeth of said ratchet.

12. A calling device including a mounting plate, a supporting tripod secured to said mounting plate, a main shaft having bearings in said mounting plate and said supporting tripod, a pawl firmly secured to said shaft, a loosely connected gear supported by said shaft, a ratchet loosely connected to said shaft, a spring member for

yieldingly holding said ratchet in contact with said pawl, and a setting member for rotating said main shaft and pawl whereby said pawl ineffectively passes over the teeth of said ratchet so that when the setting member is released said pawl engages the teeth of said ratchet and transmits motion to said gear.

13. A device of the character described including a mounting plate, a main shaft supported by said mounting plate, a pawl secured to said main shaft and having oppositely extending arms, a gear loosely supported upon said main shaft, a ratchet loosely connected to said main shaft and provided with peripherally formed teeth, and a spring member for yieldingly holding said ratchet in engagement with said pawl.

14. A device of the character described including a mounting plate, a main shaft supported by said mounting plate, a pawl secured to said main shaft and having oppositely extending arms, a main gear loosely supported upon said main shaft, a ratchet loosely supported upon said main shaft and provided with peripherally formed teeth, a setting member for moving said pawl in a clockwise direction whereby its oppositely extending arms ineffectively pass over the peripherally formed teeth of said ratchet and a spring member for yieldingly holding said ratchet in engagement with said pawl, whereby when the setting member is released the oppositely extending arms of said pawl engage teeth of the ratchet and rotate the said gear.

15. A device of the character described including a mounting plate, a main shaft supported by said mounting plate, a pawl secured to said main shaft and having oppositely extending arms, a gear loosely supported upon said main shaft, a ratchet loosely connected to said main shaft and provided with peripherally formed teeth, a spring member for yieldingly holding said ratchet in engagement with said pawl, a setting member for moving said pawl in a clockwise direction whereby its oppositely extending arms ineffectively pass over the peripherally formed teeth of said ratchet, an interrupter contact geared to said gear whereby when the setting member is released the oppositely extending arms of said pawl engage teeth of the ratchet and rotate the said gear, thereby operating said interrupter, a governor for regulating the return movement of said setting member, and a motor spring for returning said setting member to normal.

16. A calling device of the character described including a mounting plate, a supporting tripod secured to said mounting plate and having integrally formed ears extending through the mounting plate, a gear

shaft, and an integrally formed arm for said tripod forming a bearing for said gear shaft.

17. A calling device of the character described including a mounting plate, a supporting member connected to said mounting plate, a main shaft having bearings in said supporting member and said mounting plate, an interrupter and a pinion mounted upon a shaft having bearings in said mounting plate and said supporting member, a shaft having bearings in said mounting plate and said supporting member, a governor and a pinion secured to said second shaft, a gear supported on said main shaft in mesh with said pinion on the interrupter shaft, and a driving gear on the interrupter shaft in mesh with said pinion on the governor shaft.

18. A calling device of the character described including a mounting plate, a supporting member connected to said mounting plate, a main shaft having bearings in said supporting member and said mounting plate, a shaft having bearings in said mounting plate and said supporting member, an interrupter and a pinion secured to said second shaft, a governor and a pinion secured to a shaft having bearings in said mounting plate and said supporting member, a gear supported on said main shaft in mesh with said pinion on the interrupter shaft, a driving gear on the interrupter shaft in mesh with said pinion on the governor shaft, a setting member secured to said main shaft, and ratchet and pawl mechanism connecting said main shaft to the gear supported on the main shaft.

19. A calling device of the character described including a mounting plate, a supporting member connected to said mounting plate, a main shaft having bearings in said supporting member and said mounting plate, a shaft having bearings in said mounting plate and said supporting member, an interrupter and a pinion secured to said second shaft, a governor and a pinion secured to a shaft having bearings in said mounting plate and said supporting member, a gear supported on said main shaft in mesh with said pinion on the interrupter shaft, a driving gear on the interrupter shaft in mesh with said pinion on the governor shaft, a pawl firmly secured to said main driving shaft, a ratchet loosely secured to said main shaft for cooperation with said pawl, and a cover for enclosing said gears and pinions.

20. A calling device of the character described including a mounting plate, a supporting member connected to said mounting plate, a main shaft having bearings in said supporting member and said mounting plate, a shaft having bearings in said mounting plate and said supporting member, an

interrupter and a pinion secured to said second shaft, a governor and a pinion secured to a shaft having bearings in said mounting plate and said supporting member, a gear supported on said main shaft in mesh with said pinion on the interrupter shaft, a driving gear on the interrupter shaft in mesh with said pinion on the governor shaft, a pawl firmly secured to said main driving shaft, a ratchet loosely secured to said main shaft for cooperation with said pawl, and integrally formed members for said ratchet connecting said ratchet to said main driving gear.

21. A calling device provided with a mounting plate, a supporting member secured to the face of said mounting plate, a main shaft having bearings in said mounting plate and supporting member and extending through said mounting plate, a motor spring connected to said main shaft, a main driving gear loosely connected to said main shaft, ratchet and pawl mechanism connecting said main shaft to said main driving gear, an interrupter shaft having bearings in said mounting plate and said supporting member and extending through said mounting plate, a pinion on said interrupter shaft in mesh with said main driving gear, a driving gear connected to said interrupter shaft, a governor shaft having bearings in said mounting plate and said supporting member and extending through said mounting plate, a pinion for said governor shaft in mesh with the driving gear on the interrupter shaft, and a dustproof cover for enclosing said gears and pinions.

22. A calling device provided with a mounting plate, a supporting member secured to the face of said mounting plate, a main shaft having bearings in said mounting plate and supporting member and extending through said mounting plate, a motor spring connected to said main shaft, a main driving gear loosely connected to said main shaft, ratchet and pawl mechanism connecting said main shaft to said main driving gear, an interrupter shaft having bearings in said mounting plate and said supporting member and extending through said mounting plate, a pinion on said interrupter shaft in mesh with said main driving gear, a driving gear connected to said interrupter shaft, a governor shaft having bearings in said mounting plate and said supporting member and extending through said mounting plate, a pinion for said governor shaft in mesh with the driving gear on the interrupter shaft, a dustproof cover for enclosing said gears and pinions, and integrally formed lugs for said supporting member extending through orifices in said mounting plate adapted to be used to secure the calling device in position.

23. A calling device including a mounting

plate, a supporting member secured to said mounting plate, a main shaft having bearings in said mounting plate and said supporting member, a pawl connected to said main shaft having oppositely extending arms, a driving gear loosely connected to said main shaft, a ratchet loosely connected to said main shaft and having dependent members extending into orifices in said driving gear, and a spring partially supported in an annular groove in said driving gear for maintaining said ratchet in engagement with said pawl.

24. A calling device including a mounting plate, a supporting member secured to said mounting plate, a main shaft having bearings in said mounting plate and said supporting member, a pawl connected to said main shaft having oppositely extending arms, a driving gear loosely connected to said main shaft, a ratchet loosely connected to said main shaft and having dependent members extending into orifices in said driving gear, a spring partially supported in an annular groove in said driving gear for maintaining said ratchet in engagement with said pawl, and a member formed integrally with said pawl for preventing an overrun operation of said driving gear.

25. A calling device including a mounting plate, a supporting member secured to said mounting plate, a main shaft having bearings in said mounting plate and said supporting member, a pawl connected to said main shaft having oppositely extending arms, a driving gear loosely connected to said main shaft, a ratchet loosely connected to said main shaft and having dependent members extending into orifices in said driving gear, a spring partially supported in an annular groove in said driving gear for maintaining said ratchet in engagement with said pawl, a member formed integrally with said pawl for preventing an overrun operation of said driving gear, a dustproof cover for enclosing said mechanism and provided with a numerical disc, and a setting member for controlling said main shaft.

26. A calling device including a mounting plate, impulse mechanism including an accelerating gear train supported by said mounting plate, a dustproof cover-cap adapted to be secured to said mounting plate for enclosing said accelerating gear train, a setting member for operating said gear train and impulse mechanism, and a supporting member having bearings for said impulse mechanism and gear train and adapted to secure said devices in position.

27. A calling device including a mounting plate, an interrupter and a shaft for the same secured to said mounting plate, a disk-like setting member provided with a plurality of orifices for setting said interrupter to produce a certain number of interruptions,

a dust-proof casing secured to said mounting plate, and gear mechanism positioned between said casing and mounting plate for operatively connecting said interrupter and
5 said setting member to effect operation of said interrupter when said setting member is operating.

28. A calling device including a mounting plate, a shaft secured in said mounting
10 plate, an interrupter secured to said shaft, a setting member, impulse springs controlled by said interrupter, gear mechanism including a floating ratchet for operatively associating said setting member and interrupter
15 via said shaft, whereby said setting member is operable to cause said interrupter to interrupt said impulse springs a predetermined number of times, and a dust-proof casing for enclosing said gear mechanism.

20 29. A calling device including a mounting plate, impulse springs, interrupter mechanism for controlling said impulse springs, a setting member, gear mechanism including a floating ratchet for operatively associating
25 said interrupter mechanism with said setting member whereby said setting member is adapted to control the operation of said

interrupter mechanism to interrupt said impulse springs a certain number of times, governor means for causing said impulse
30 springs to be interrupted at constant intervals, and a casing secured to one side of said mounting plate to enclose the parts of said device on that side of the mounting plate.

30. A calling device including a mounting
35 plate, impulse springs, an interrupter for interrupting said impulse springs, a shaft for said interrupter, a setting member, gear mechanism including a floating ratchet for operatively associating said setting member
40 and said interrupter via said shaft, said setting member operable in one direction to determine the number of times said impulse springs are to be interrupted by said interrupter, and operable in the opposite direction
45 to permit the interruption of said impulse springs the predetermined number of times, and a dust-proof casing for enclosing said gear mechanism.

Signed by me at Chicago, in the county of
Cook and State of Illinois, this 7th day of
April, 1920.

HARRY H. IDE.