H. P. CLAUSEN.

CALLING DEVICE.

APPLICATION FILED JULY 12, 1917

1,337,198.

Patented Apr. 20, 1920.

Fig. 1.

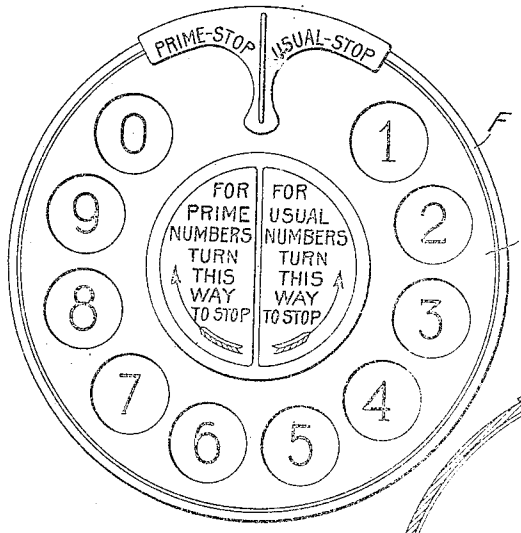


Fig. 2.

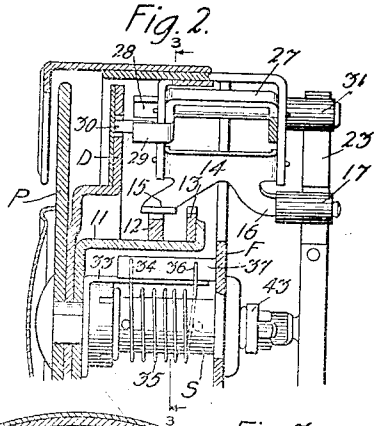


Fig. 3.

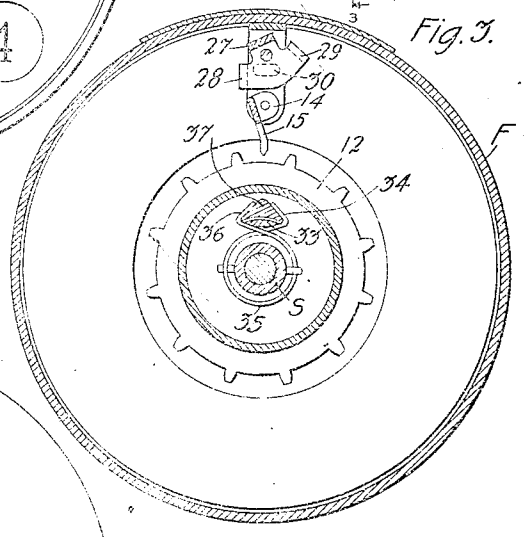
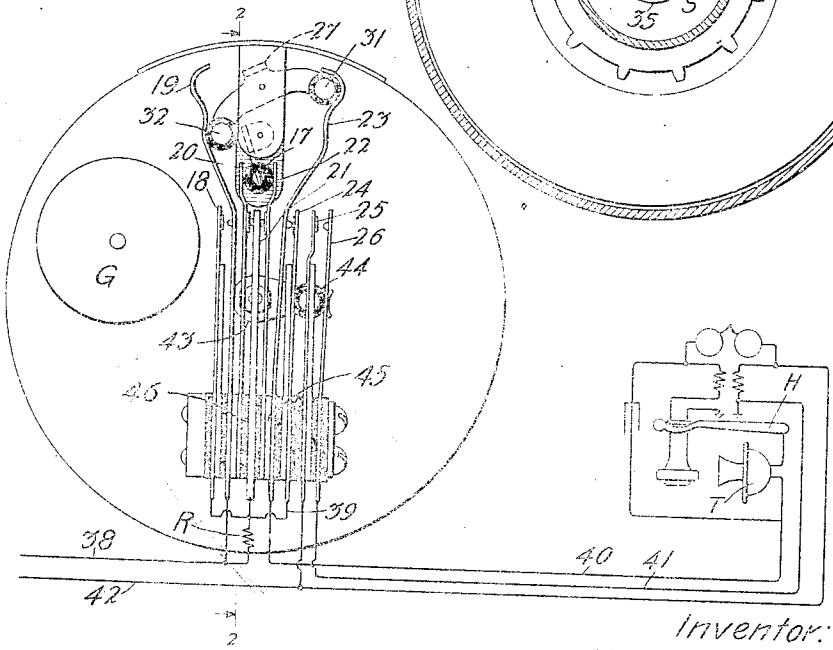


Fig. 4.



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UNITED STATES PATENT OFFICE.

HENRY P. CLAUSEN, OF MOUNT VERNON, NEW YORK, ASSIGNOR TO WESTERN ELECTRIC COMPANY, INCORPORATED, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

CALLING DEVICE.

1,337,198. Specification of Letters Patent. Patented Apr. 20, 1920.

Application filed July 12, 1917. Serial No. 180,122.

To all whom it may concern:

Be it known that I, HENRY P. CLAUSEN, a citizen of the United States, residing at Mount Vernon, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Calling Devices, of which the following is a full, clear, concise, and exact description.

This invention relates to calling devices, and more particularly to impulse senders for automatic or semi-automatic telephone systems in which the selector switches used for building up a connection are directively controlled by current impulses sent from a subscriber's station or an operator's position.

The object of the invention is to provide a new and improved calling device of simple construction by means of which a greater number of different trains of impulses may be sent than is possible with those provided in the commercial systems of the present time. It is an object to provide a device similar in manipulation to the ordinary type for use in systems of increased capacity.

The principal feature of the present invention is the provision of means through which the dial may be rotated in both a clockwise and a counter-clockwise direction, sending impulses when returning from a position in which it has been set by rotation in either direction. Through such means two sets of trains of impulses may be sent, one set being made different from the other by resistance bridged around the break-points actuated by rotation of the dial in a predetermined direction.

Other new and useful features of this invention will appear from the following detailed description and the appended claims.

In the drawings, Figure 1 is a front view of the face of the dial switch; Fig. 2 is a partial section on lines 2—2 of Fig. 4; Fig. 3 is a full sectional view of the calling device, taken on the line 3—3 of Fig. 2, illustrating the action of the cam which operates the break-point, the device for controlling the spring combination for rotation of the dial in opposite directions, and the action of the spring which returns the dial to a normal position after it has been actuated; and Fig. 4 is a back view of the calling device illustrating the spring combinations with a diagrammatic representation of their connection in a sub-station telephone circuit.

The calling device is built upon a frame F, to which is pivotally secured a shaft S. A face plate P, provided with finger holds designated by the numerals 1 to 0, inclusive, is secured to the shaft S, and is the means by which the shaft may be rotated. A cup-shaped member 11, also secured to the shaft S, is the means for securing the impulse wheel 12 and a gear wheel 13.

Pivotally secured to the frame F is a member 14 with a projection 15 which coöperates with the teeth of the impulse wheel 12. Member 14 also carries a projection 16 provided with an insulated bushing 17 which coöperates with impulse springs 20 and 22, supported in a spring pile-up secured to the frame F. Also pivotally secured to the frame is a member 27 with two projections 28 and 29 which coöperate with the projection 30 from a plate D, on which the digits are engraved and which revolves with the face plate P.

Suppose the shaft and impulse wheel 12, as shown in Fig. 3, are rotated in a clockwise direction. The projection 30 will have a clear path for its movement, and the member 27 will remain in the position shown, with the two insulated projections 31 and 32 of the member 27 coöperating respectively with contact springs 23 and 19 in the manner shown in Fig. 4. During the movement of the impulse wheel toward the right, the members 15 and 17 will be driven in a counter-clockwise direction and the spring 22 will be moved in accordance, thereby breaking the connection with contact spring 21. However, due to the position of spring 23 a contact is made between springs 23 and 24, which short-circuits the contact between springs 22 and 21, and thereby renders ineffective the movement of spring 22. The circuit through which the short circuit is made effective may be traced from spring 21 to spring 24, through the contact points of spring 23, thence through the conducting bushing 45 in the spring pile-up, to the spring 22.

As the impulse wheel 12, as shown in Fig. 3 of the drawing, is moved in a clockwise direction, a member 33 secured to the shaft S moves with it and carries the end 34 of the coiled spring 35 in the direction of the

movement. The other end 36 of the spring remains in contact with the member 37 secured to the frame F. In this manner the spring 35 is wound up and stores energy for returning the movable parts of the dial switch back to normal position.

After the dial has been set in a predetermined position and the finger plate P released, then, under the control of the spring 35, the movable parts are caused to return. During this movement, the projections 15 and 16 are rocked in a clockwise direction, thus actuating the spring 20, and intermittently opening the contact between the springs 20 and 21. Thus a circuit, which extends from the line 38, the spring 19, the conducting bushing 46 in the spring pile-up to spring 20, through the contact to spring 21, thence through the conductor 39 to spring 24, spring 23, conductor 40, through the transmitter T, switchhook H (the receiver being off the hook while the impulses are being sent), the conductor 41, the off-normal contacts 26, 25, to the conductor 42, is broken at the contact between the springs 20 and 21, and a resistance R introduced into this circuit in the following manner: from conductor 38, resistance R, the conductor 39, to spring 24, spring 23 to conductor 40, and thence through the circuit, as previously traced. It should be noted that an arm 43 is secured to the shaft and carries an insulating bushing 44 which cooperates with the spring 26 in such a manner that only when the face-plate is in its normal position is the spring 26 forced out of contact with the spring 25.

If the next movement of the impulse wheel 12 is made in a counter-clockwise direction, then the member 30 coming into physical contact with the projection 28 of the member 27 causes this member to rock in a clockwise direction, whereby the insulated projections 31 and 32 will assume correspondingly opposed positions to those in which they are shown. The contact between springs 18 and 19 will be made and the contact between springs 23 and 24 will be broken. During the counter-clockwise movement of the impulse wheel 12, the members 15 and 17 will be rocked in a clockwise direction, and the contact between the springs 20 and 21 will be intermittently broken. However, the contact between the springs 15 and 19 insures the closure of the circuit through springs 20 and 21.

In a manner similar to that hereinbefore described, the member 33, moving in a counter-clockwise direction, will carry the end 36 of the spring 25 with it, leaving the end 34 in connection with the member 37, and thus winding up the spring 35 in such a manner as to return the movable parts back to normal.

During the return movement, the members 15 and 17 are rocked in a counter-clockwise direction and the contact between the springs 21 and 22 is intermittently broken. The circuit now extending from conductor 38, spring 19, the conducting segment 46 between springs 19 and 20, spring 20, spring 21, spring 22, the conducting segment 45 between springs 22 and 23, conductor 40, transmitter T, hookswitch H, conductor 41, and off-normal contacts 26 and 25 to the conductor 42, is entirely opened by the movement of the spring 22. Upon the return to normal, member 44 coming in contact with the spring 26 opens the off-normal contact of this switch and places the subscriber's set in normal condition.

The character G within Fig. 4 represents a well-known type of governing mechanism and is designed to be driven through the use of the gear wheel 13. This and other details of the construction of such a dial may be found in United States Patent 1,161,854, to Forsberg, Nov. 30, 1915, the actual mechanical construction not being of primary importance in the present invention.

What is claimed is:

1. In a calling device, a rotatable shaft, an impulse wheel on said shaft, and sets of coöperative contacts arranged to be actuated by said impulse wheel in accordance with the rotation of said shaft, one set being actuated by the clockwise rotation only of said shaft and another set being actuated by the counter-clockwise rotation only of said shaft.

2. In a calling device, a rotatable shaft, an impulse wheel on said shaft, a set of coöperative contacts arranged to be actuated in accordance with the clockwise rotation only of said shaft, and a set of coöperative contacts arranged to be actuated in accordance with the counter-clockwise rotation only of said shaft.

3. In a calling device, a rotatable shaft, an impulse wheel on said shaft, a set of coöperative contacts arranged to be actuated during the return to normal position of said shaft after being rotated in a clockwise direction, a set of coöperative contacts arranged to be actuated during the return to normal position of said shaft after being rotated in a counter-clockwise direction, and means for returning said shaft and said impulse wheel to normal after being rotated in either direction.

4. In a calling device, a rotatable impulse wheel, a set of coöperative contacts arranged to be actuated during the return movement of said impulse wheel and in accordance with the rotation of said impulse wheel in a clockwise direction, a set of coöperative contacts arranged to be actuated during the return movement of said impulse wheel and in accordance with the rotation of said impulse wheel in a counter-clockwise direc-

tion, and means for returning said impulse wheel to normal position after it has been rotated in either direction.

5. In a calling device, a rotatable impulse wheel, a set of coöperative contacts responsive only to a clockwise rotation of said impulse wheel, and a set of coöperative contacts responsive to counter-clockwise rotation only of said impulse wheel.

6. In a calling device, a movable element having a normal position, a set of coöperative contacts for creating impulses responsive to a movement of said element in one direction and in accordance with the extent of rotation thereof, a set of coöperative contacts for creating impulses responsive to a movement of said element in a different direction and in accordance with the extent of rotation thereof, and means for returning said element to a normal position.

In witness whereof I hereunto subscribe my name this 6th day of July, A. D. 1917.

HENRY P. CLAUSEN.