

O. F. FORSBERG.
 CALLING DEVICE.
 APPLICATION FILED MAR. 9, 1915.

1,161,854.

Patented Nov. 30, 1915.
 4 SHEETS—SHEET 1.

Fig. 1.

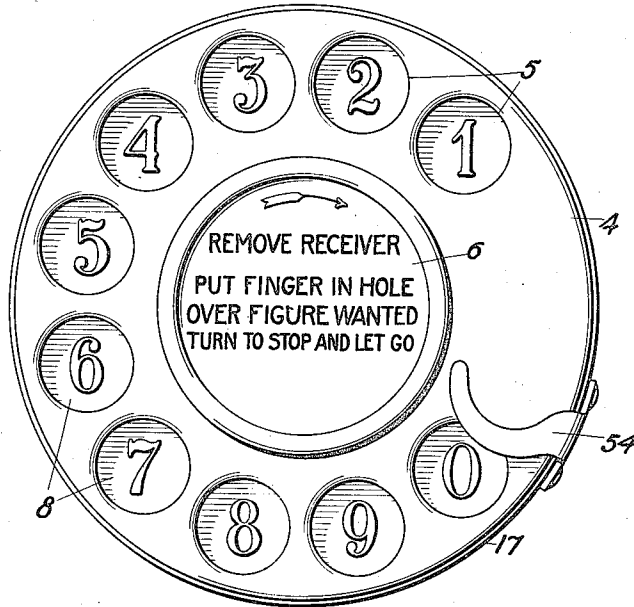
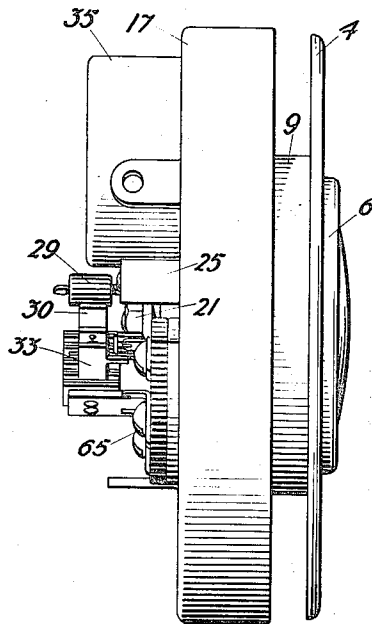


Fig. 2.



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Fig. 3.

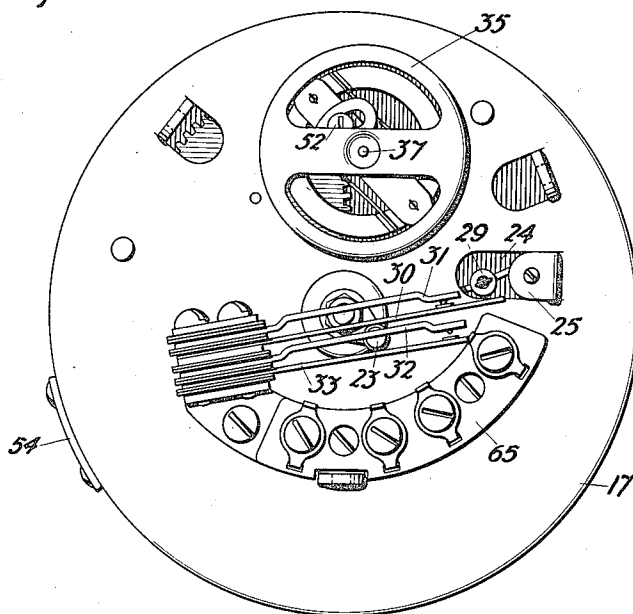
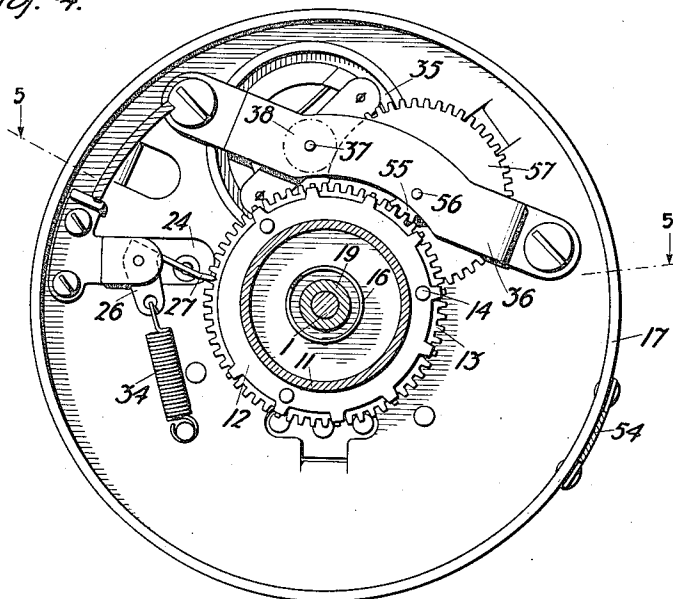


Fig. 4.



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 4 SHEETS—SHEET 3.

Fig. 5.

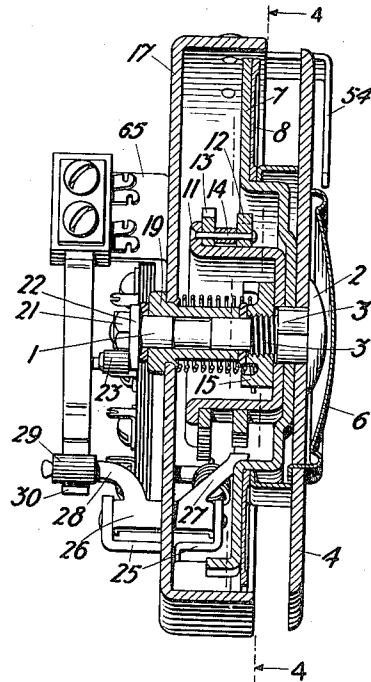
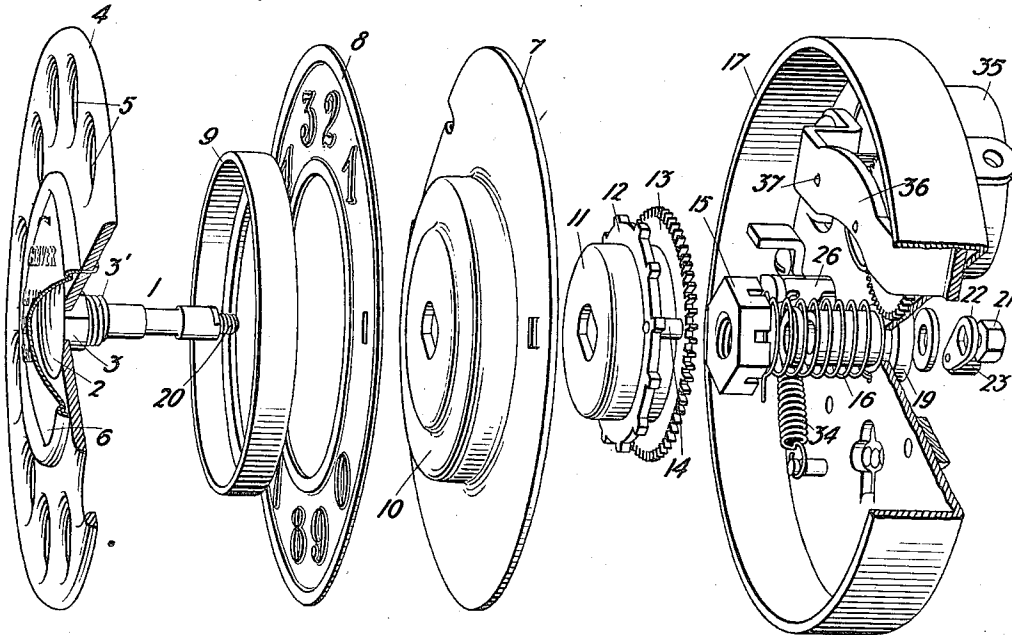


Fig. 6.



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 4 SHEETS—SHEET 4.

Fig. 9.

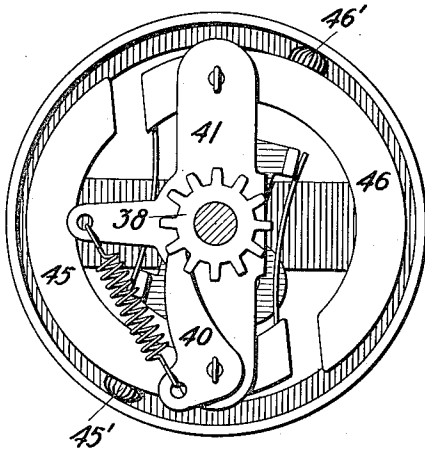


Fig. 7.

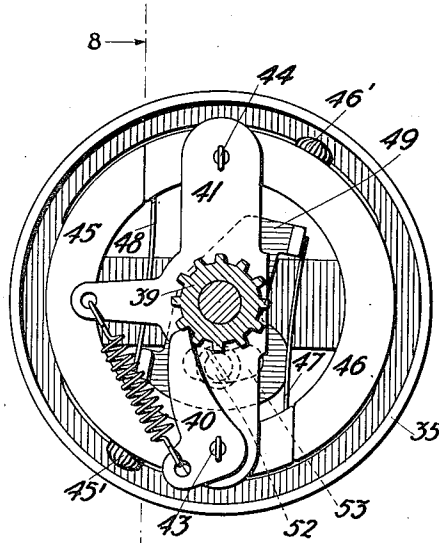
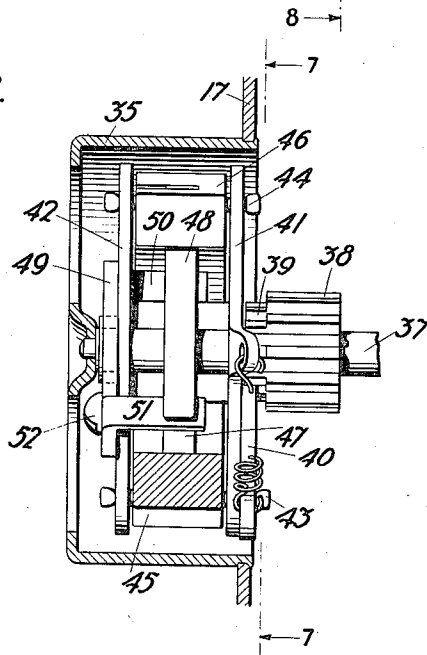


Fig. 8.



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UNITED STATES PATENT OFFICE.

OSCAR F. FORSBERG, OF YONKERS, NEW YORK, ASSIGNOR TO WESTERN ELECTRIC COMPANY, OF NEW YORK, N. Y., A CORPORATION OF ILLINOIS.

CALLING DEVICE.

1,161,854.

Specification of Letters Patent.

Patented Nov. 30, 1915.

Application filed March 9, 1915. Serial No. 13,126.

To all whom it may concern:

Be it known that I, OSCAR F. FORSBERG, a citizen of the United States, residing at Yonkers, 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 the building up of a connection are directly controlled by current impulses sent from a subscriber's station or an operator's position.

The object of this invention is to provide a new and improved calling device which is simple in construction which may be readily assembled, and in which the adjustable parts can be reached without the necessity of dismantling the device.

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 plan view of the calling device; Fig. 2 is a side elevation thereof; Fig. 3 is a bottom view thereof; Fig. 4 is a sectional view on lines 4—4 of Fig. 5; Fig. 5 is a sectional view on lines 5—5 of Fig. 4; Fig. 6 is a perspective view of the different parts of the calling device before assembly; Fig. 7 shows the speed-governing mechanism in its normal position, the view being taken on lines 7—7 of Fig. 8; Fig. 8 is a sectional view of the speed-governing mechanism the view being taken on lines 8—8 of Fig. 7; Fig. 9 is a view corresponding to Fig. 7, showing the speed-governing mechanism in its actuated position.

The different parts of the calling device are held together by means of a shaft 1. At one end shaft 1 has an enlarged portion forming a head 2. A dial 4 is fastened to an enlarged portion 3 of shaft 1. The dial may be actuated by means of finger holds 5 provided around its periphery.

In the center of dial 4 is fastened a plate 6 on which the necessary instructions as to the handling of the device may be engraved or printed. Head 2 of shaft 1 is positioned in the cavity formed between plate 6 and the dial 4, and the user is thus prevented from dismantling the device. Fastened to

a plate 7 is a ring 8 carrying characters, such as numerals 1 to 0, each of said characters corresponding to one finger hold 5. The proper spacing between dial 4 and the ring 8 is insured by a ring 9. The plate 7 has a cup-shaped portion 10 projecting through ring 8 and ring 9, and said plate is carried on and arranged for rotation with portion 3 of shaft 1. Within said cup-shaped portion 10 is a drum 11 also engaging portion 3 of shaft 1 and carrying an impulse wheel 12 and a gear wheel 13 held together by means of a stud 14. Dial 4, plate 7 and drum 11, with the parts carried by them, are clamped between head 2 of shaft 1 and a nut 15 adapted to engage a screw-threaded portion 3' of shaft 1. Below nut 15, motor spring 16 is provided, one end of which is secured to the shaft by engaging one of several slots in nut 15, and the other end to a base 17. Shaft 1 extends through a hub 19 secured to base 17. To screw-threaded end 20 of shaft 1 is fastened, by means of a nut 21, an arm 22 carrying a roller 23 of insulating material. It will be seen, therefore, that all the operating parts of the calling device are held together by a single screw-threaded means, *i. e.* nut 21. By unscrewing nut 21 the device may be taken apart. Since the device is preferably mounted in a telephone desk or wall set, the user does not have access to nut 21 and is unable to tamper with the adjustment of the apparatus.

Extending through an opening 24 of base 17 and pivoted between projections 25 of base 17 is a pawl 26. One arm 27 of said pawl is adapted to be engaged by the teeth of impulse wheel 12, and another arm 28 of pawl 26 extends outside of base 17 and carries a roller 29 of insulating material. Roller 29 is adapted to actuate contact spring 30 coöperating with contact spring 31 suitably mounted on but insulated from the outside of the base 17. Contact springs 32 and 33, which are also mounted on the outside of base 17, are normally maintained open by roller 23 engaging contact spring 33. A coiled spring 34 tends to keep pawl 26 in its normal position, *i. e.* with roller 29 out of engagement with contact spring 30 and with the arm 27 in the path of the teeth of the impulse wheel 12.

Projecting outward from base 17 is a cup 35. Mounted on the inner surface of base

17 over cup 35 is a bridge 36. Between bridge 36 and the bottom of cup 35 is journaled a spindle 37. Carried on spindle 37 is a pinion 38 adapted to be engaged through a train of wheels by gear wheel 13. Spindle 37 carries also a ratchet wheel 39 adapted to be engaged by a spring-pressed pawl 40. Loosely mounted on spindle 37 are a pair of interconnected bridge-pieces 41 and 42. Between these bridge-pieces are provided friction members 45 and 46 pivotally mounted on studs 43 and 44, respectively. Friction member 45 carries a leaf spring 47, and friction member 46 a leaf spring 48. A substantially S-shaped member 49, loosely mounted on spindle 37 beneath bridge-piece 42, engages, by means of its arms 50 and 51, the free ends of leaf springs 47 and 48, respectively. By means of a screw 52 extending from bridge-piece 42 through an opening 53 of the S-shaped member 49, this member may be fixed in various positions so as to adjust the tension of leaf springs 47 and 48. As shown in Fig. 3, openings are provided in the bottom of cup 35, through which free access may be had to screw 52 to permit the governor to be readily adjusted without disturbing the other parts of the calling device. The leaf springs tend to maintain friction members 45 and 46 in the position shown in Fig. 7.

Other details of construction will be understood from the following description of the mode of operation of the device.

If the user desires to send out, for instance, a signal corresponding to the number "3," he engages with his finger the finger hold 5 opposite which numeral 3 appears, and rotates the dial in a clockwise direction until a stationary stop 54 is reached. In response to the actuation of dial 4, shaft 1, plate 7 and the ring 8 carried thereby, drum 11 and the impulse wheel 12 and gear-wheel 13 provided thereon, are rotated in a clockwise direction. Nut 15 is also rotated with shaft 1 and causes the winding up of motor spring 16. Gear-wheel 13 meshing with a pinion 55 causes a spindle 56, journaled between bridge 36 and base 17, to rotate in a counter-clockwise direction. Fastened to spindle 56 is a gear-wheel 57 which transmits the motion of gear-wheel 13 to pinion 38 of the speed-governing mechanism, and rotates spindle 37 of the governor in a clockwise direction. The ratchet wheel 39 slides by the pawl 40 pivoted on stud 43, thereby allowing pinion 38 and spindle 37 to rotate in a clockwise direction, the friction members 45 and 46 remaining in the position shown in Fig. 7. It will be seen therefore that the governor does not operate or exert any speed controlling action while the dial is being set by rotation in a clockwise direction.

During the forward rotation of impulse

wheel 12, arm 27 of pawl 26 is vibrated by the ratchets of the impulse wheel, but arm 28 of pawl 26 is moved from contact spring 30 and therefore does not cause the opening and closing of the contact springs 30 and 31.

When dial 4 was moved out of its normal position, roller 23, which normally keeps contact springs 32 and 33 open, allowed said contact springs to close. Contact springs 32 and 33 may be connected to the operator's telephone set in such a manner as to short-circuit it while signaling impulses are being sent.

When the user releases dial 4, *i. e.* removes his finger from the engaged finger hold, shaft 1 and the elements fastened thereto are rotated in a counter-clockwise direction by the power stored up in motor spring 16. Impulse wheel 12 now vibrates arm 27 of pawl 26 but in a direction to cause arm 28 to engage spring 30, and thereby to open and close the contact between springs 30 and 31. In the device shown, in signaling the number "3," said springs will be opened and closed three times resulting in the sending out of three impulses which may serve to govern a switch in its selective movement in a well-known manner.

Gear-wheel 13, being rotated in a counter-clockwise direction, causes spindle 37 of the speed-governing mechanism to rotate also in a counter-clockwise direction. Spring-pressed pawl 40 now engages ratchet wheel 39, and as this pawl is pivoted at 43 it causes bridge-pieces 41 and 42 to rotate in a counter-clockwise direction. Due to the centrifugal force, friction members 45 and 46, which rotate with said bridge-pieces, fly outwardly against the tension of leaf springs 47 and 48, and press the rubber studs 45' and 46' against the wall of cup 35. Due to the friction between studs 45' and 46' and the wall of cup 35, the return movement of shaft 1, and thereby that of impulse wheel 12, is reduced to a speed predetermined by the adjustment of leaf springs 47 and 48. When shaft 1 and therefore the whole mechanism reach their normal position, roller 23 again engages contact spring 33, thereby opening said contacts and removing the shunt around the user's telephone set.

As shown in Fig. 3, a terminal strip 65, to which the line conductors are connected, is provided on the outside surface of base 17.

Although in the claims the movable setting member of the calling device is referred to as a dial, it will be apparent that this invention is applicable to impulse senders which are set by manually movable members of widely varying character.

What is claimed is:

1. In a calling device, a rotatable shaft, a dial carried thereby and having a plurality of finger holds, a plate carrying digit characters designating said finger holds, an im-

pulse wheel on said shaft, a gear wheel on said shaft coöperative contacts adapted to be actuated by said impulse wheel in accordance with the rotation of the shaft, a governing mechanism driven from said gear wheel, and a single clamping means for maintaining said shaft, dial, plate, and impulse and gear wheels in their normal position in relation to each other.

2. In a calling device, a rotatable shaft, a dial carried thereby and having a plurality of finger holds, a plate carrying digit characters designating said finger holds, an impulse wheel and a gear wheel on said shaft, coöperative contacts adapted to be actuated by said impulse wheel in accordance with the rotation of said shaft, a governing mechanism driven from said gear wheel, and a single screw-threaded means applied to the shaft for maintaining said shaft, dial, plate, and impulse and gear wheels in their normal position in relation to each other.

3. In a calling device, a rotatable shaft, a dial carried thereby and having a plurality of finger holds, a plate carrying digit characters for designating said finger holds, an impulse wheel and a gear wheel on said shaft, a base, a single screw-threaded means for maintaining said shaft, dial, plate, and

impulse and gear wheels in their normal position in relation to each other, a single clamping means for maintaining said shaft and said base in their relative normal position, a governor mounted on said base and driven from said gear wheel, coöperative contacts, and means controlled by said impulse wheel for actuating said contacts in accordance with the rotation of said shaft.

4. In a calling device, a rotatable shaft, a dial carried thereby and having a plurality of finger holds, a member carrying digit characters for the designation of said finger holds, a plate carrying said member, a cup-shaped portion for said plate, an impulse wheel carried within said cup-shaped portion, a single screw-threaded means for maintaining said dial, shaft, plate and impulse wheel in their relative normal position, and contacts actuated by said impulse wheel in accordance with the rotation of said shaft.

In witness whereof, I hereunto subscribe my name this 8th day of March, A. D. 1915.

OSCAR F. FORSBERG.

Witnesses:

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K. L. STAHL.