Nov. 4, 1930. W. KRUSE 1,780,754

COIN OPERATED TELEPHONE APPARATUS FOR AUTOMATIC TELEPHONE EXCHANGES

Filed Dec. 20, 1928

Fig. 1

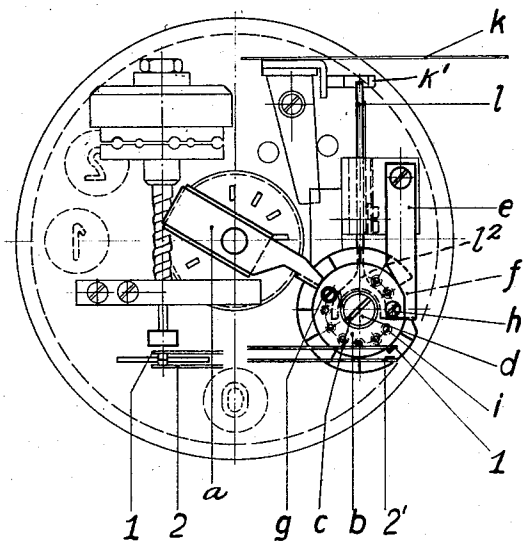


Fig. 2

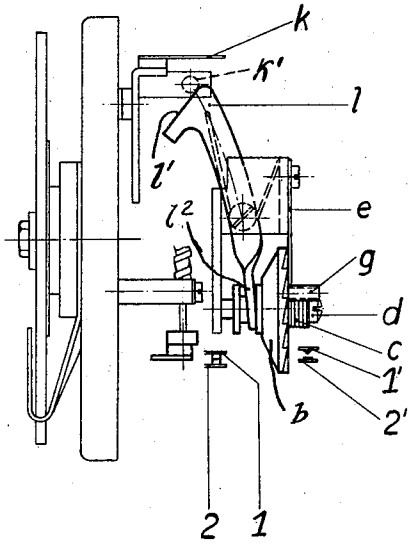
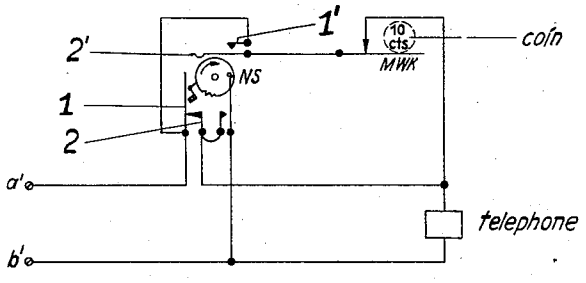


Fig. 3



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Patented Nov. 4, 1930 1,780,754

UNITED STATES PATENT OFFICE

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COIN-OPERATED TELEPHONE APPARATUS FOR AUTOMATIC TELEPHONE EXCHANGES

Application filed December 20, 1928, Serial No. 327,233, and in Germany December 23, 1927.

In my prior Patent No. 1,691,575, coin-operated telephone apparatus for automatic telephone exchanges has been described, possessing a mechanical connecting system, which after a certain number of series of impulses will block further selection. Said device is intended to allow for the free selection at one exchange of a definite number of figures of the calling numbers only. If the last place of the free range of calling numbers has been selected, the next series of impulses is rendered ineffective by means of a short circuiting. For the selection of the remaining numerical values the impulse contact is only released, after the introduction of a corresponding coin into the said apparatus. The progressive switching of the switching or connecting device is effected in the arrangement described in the patent referred to during the winding up of the selecting dial, that is prior to the delivery of the series of impulses. This construction, as shown in the patent, has the defect that it is possible for a person operating the device to use the apparatus without paying the charge. If, for example, after winding up of the number disk, a person keeps the latter stationary in this position and presses the fork-carrier, he will, by so doing, force the ratchet-wheel, which has been moved forward by one of its teeth, back into its original position. When further rows of impulses are sent out the ratchet wheel will be moved forward by that number of its teeth which corresponds to the selected rows of impulses. And there would be no short circuit of the impulse contact owing to the fact that on winding up the number disk the ratchet wheel would be returned back to its position of rest.

To overcome this defect, the arrangement according to the present invention is such that the switching device is progressively switched only during or at the end of the series of impulses. To overcome this defect the ratchet wheel, in the present invention, is moved forward either simultaneously with or subsequently to the sending out of the impulses. According to the present invention there is also provided an adjustable stop by means of which the impulse contact is short circuited after a predetermined number of feeding steps.

In the drawing one mode of execution of the device is illustrated.

Figure 1 is a front elevation,

Figure 2 a side elevation of the device, and

Figure 3 a diagram of the connections.

At each turning of the dial disc the lever *a* mounted at the opposite end of the same axis is simultaneously turned to the top. During this winding up of the dial disk the switching device in the form of a ratchet wheel *b* is held locked by engagement of a spring pawl *e* with a notch *f* of said wheel. After the release of the finger dial disc, which is returned to its position of rest by means of a spring in known manner, the lever *a* will engage a tooth of the wheel *b* and move the wheel *b*, by one step independently of the selected number and the impulses given by it. At the same time, the helical spring *c* connected on the one part with the toothed wheel or gear *b* and with its stationary spindle on the other part, will be tensioned. During the step-by-step rotation the toothed wheel will be held secure in its position each time by means of the pawl-spring *e*. After a certain number of steps of rotation the contacts 1′, 2′ will be closed by means of the insulated pin *g* mounted on the toothed wheel *b*, thereby short-circuiting the impulse contacts 1, 2 of the dial. Thus an additional delivery of selecting impulses is prevented.

On the toothed wheel *b* there is mounted a stop pin *h* which can be screwed at will into any one of a series of threaded holes *i*. The said stop pin *h* is screwed into a certain threaded hole according to the number of steps of rotation to be made which it is desired to permit before causing short circuiting of the impulse contact.

The release of the device is effected in the following manner. By pressure of the forked carrier upon the lever *k* the upper portion of said lever is moved toward the right hand owing to the inclined sliding surface *l′* of the lever *l* (Figure 2) with a pin *k′* on lever *k*. The lower forked portion l^2 of the lever *l* will thus displace the toothed wheel *b* connected with the former in axial

direction to the left hand (Figure 2) to such an extent, until the locking of the ratchet or pawl spring *e* is released. The helical spring *c* will then return the toothed wheel *b* into its position of rest.

If for instance, in an exchange selecting by six places of numbers the switching device arranged within a coin-operated telephone apparatus, is actuated by the selection of a subscriber, the impulse contacts 1, 2 (Figure 3) of the selecting disc will short-circuit after the selection of the fifth place of figures and the desired subscriber will not be called when the sixth place of figures is selected. If however, a coin was duly placed into the coin-operated telephone apparatus, the said coin will actuate the contact M W K and the short circuit of the impulse contact of the number disc is again finished, and the call of the desired subscriber will be effected without restraint.

I claim:

1. An impulse dial apparatus for telephone systems of the character described comprising, in combination, a dial mechanism adapted to send out a consecutive number of sets of impulses according to special indications for calling a particular subscriber, a step-by-step mechanism associated with said dial mechanism and operated thereby, and means operated by said step-by-step mechanism for short circuiting the impulse contacts of the dial mechanism after a distinct number of sets of impulses has been sent out, said means being adjustable to vary said number.

2. An impulse dial apparatus for telephone systems of the character described comprising, in combination, a dial mechanism adapted to send out a consecutive number of sets of impulses according to special indications for calling a particular subscriber, a step-by-step mechanism associated with said dial mechanism and operated thereby, means for short circuiting the impulse contacts of the dial mechanism and operated by said step-by-step mechanism after a selected number of sets of impulses has been sent out, and means operable or not at the will of the operator and actuated by said step-by-step mechanism for short circuiting the impulses of the dial mechanism independently of the first-named means upon the sending out of sets of impulses less than the selected number.

3. An impulse dial apparatus for telephone systems of the character described comprising, in combination, a dial mechanism adapted to send out a consecutive number of sets of impulses according to special indications for calling a particular subscriber, a step-by-step mechanism including a ratchet wheel associated with said dial mechanism and operated thereby, a contact carried by the ratchet wheel for short circuiting the impulse contacts of the dial mechanism after a selected number of sets of impulses has been sent out, and a second contact adjustably connected with the rachet wheel and selectively applicable thereto for short circuiting the impulse contacts of the dial mechanism after a number of sets of impulses has been sent out less by one or more sets than the selected number.

4. An impulse dial apparatus for telephone systems of the character described comprising, in combination, an impulse dial mechanism adapted to send into the line a consecutive number of sets of impulses to operate the switching apparatus in the exchange according to special indications marked on the dial for calling a particular subscriber, a ratchet wheel, a pawl and ratchet mechanism associated with said impulse dial mechanism for moving said ratchet wheel by one tooth after the sending out of a set of impulses, a projection upon said wheel, a contact operated by said projection after a distinct number of sets of impulses of the ratchet wheel has been carried out to short circuit the impulse contacts of the dial mechanism, and an auxiliary contact adjustably connected with the ratchet wheel for short circuiting said impulse contacts selectively according to adjustment position relatively to the first-named contact to short circuit the impulse contacts after a plurality of sets of impulses less than the selected number has been sent out.

5. An apparatus of the character described in accordance with claim 2 wherein the ratchet wheel is provided with a series of spaced sockets to receive the auxiliary contact, whereby the latter is adapted to operate a desired number of impulse steps ahead of the main contact.

In testimony whereof I have affixed my signature.

WILHELM KRUSE.