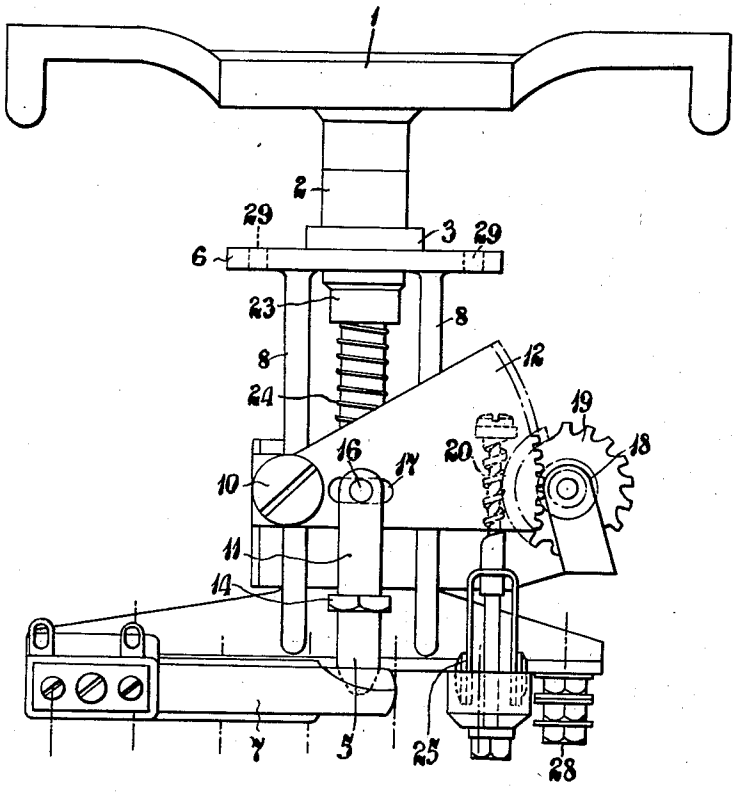
June 25, 1940. C. C. PUCKETTE ET AL 2,205,491

SWITCHING DEVICE FOR USE IN TELEPHONE SYSTEMS

Filed June 11, 1937



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Patented June 25, 1940 2,205,491

UNITED STATES PATENT OFFICE

2,205,491

SWITCHING DEVICE FOR USE IN TELEPHONE SYSTEMS

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Application June 11, 1937, Serial No. 147,666
In Great Britain June 19, 1936

2 Claims. (Cl. 179—164)

The present invention relates to switching devices for use in telephone systems and more especially to that type of device operated by the weight of a receiver or hand microtelephone combination.

Switches of this nature are well known, and their primary purpose is to close a line loop for signalling when the subscriber removes the receiver or the like. These switches suffer from certain disadvantages. For instance, it is possible during removal of the receiver from the switch to cause an impulse to be sent accidentally over the line wires, this impulse positioning a selector if the exchange to which the subscriber is connected is automatic. In addition, it may be possible by rapid manipulation of the switch to impulse automatic selectors at the exchange without using the automatic dial provided for this purpose. This must be prevented, in the case of coin box telephones, for example, as otherwise a connection may be established without payment of the usual fee.

According, therefore, to the invention, a switch for use in a telephone instrument, operated by the weight of the receiver or the like, is controlled by means of a governor mechanism in such manner as to retard the rate of movement of the switch, preferably in one direction of motion only.

In an embodiment of our invention, a cradle switch the plunger of which is operated by the weight of a hand microtelephone combination, is provided with a toothed sector which is rotated by the movement of the cradle. The sector engages with a pinion which is coupled by means of a spring to a spur wheel in such a manner that rotation of the pinion in one direction drives the wheel and rotation in the other direction does not.

The said wheel engages with a worm, the latter bearing two governor weights each located at the end of a flexible spring. The weights rotate inside a cup, and when a predetermined speed is exceeded, the friction of the weights against the inside of the cup prevents any appreciable further rise in speed.

When the telephone is on the plunger of the cradle switch, certain contacts inside the instrument are broken. Removal of the telephone causes the plunger to rise under the action of a spring, the sector driving the pinion in such a direction as to bring the governor mechanism into operation. Thus the said contacts are closed slowly. Replacement of the telephone on the cradle switch causes a rapid depression of the latter, the pinion revolving freely. Thus it is impossible for the contacts to be opened and closed sufficiently rapidly to enable impulses to be sent, so that false impulses due to deliberate or unintentional movement of the cradle switch cannot be sent over the line wires to position selectors at the exchange.

The mechanism, comprising the plunger on which the telephone lines when not in use, the sector, the governor, the contact springs and certain terminals, is preferably made in the form of a single unit which is easily attached to or detached from the telephone instrument as a whole.

In order that the nature of the invention may now be better understood, reference should be made to the accompanying drawing which shows an embodiment of the invention.

In the drawing it will be seen that a plunger 1 of known form is provided on which the hand microtelephone rests when not in use. This plunger is provided with a stem 2 which passes through a collar 3 provided on a frame 6. The stem normally slides vertically in the collar and carries at its lower end an insulating tip 5 which opens and closes the contacts of a spring set 7. This spring set is supported on a portion of the frame 6 and connected to the top part thereof by the pillars 8.

One of the pillars 8 also bears a screw 10 on which is pivoted a toothed sector 12 which is moved by an L-shaped member 11 fixed to the stem of the plunger by the nut 14. This member 11 carries a pin 16 which engages with a slot 17 on the sector and rotates the latter when the plunger 1 is raised or depressed.

The teeth of this sector engage with a small pinion wheel 18 fixed to a shaft which also carries a spur wheel 19, the coupling between the wheels 18 and 19 being by means of a spiral spring clutch of known type which permits the wheel 19 to be driven by the sector only when the latter is moving upwards. Under this condition, the wheel 19, engaging with a worm 20, drives the centrifugal governor 25, thus limiting the speed of rotation of the wheel 19 and hence the rate at which the plunger 1 is enabled to rise on removal of the hand microtelephone.

The plunger is shown in the position which it occupies when the receiver of the telephone instrument is in use. It is depressed by replacement of the receiver, and removal of the latter causes the plunger to rise under the influence of the spring 24 which presses at its lower end against a part of the frame 6 and with its upper end against the collar 23 which is in engagement with a part of the stem. Connection to the

device as a whole is effected by means of the terminals 28, several of these being provided along the centre lines shown. The assembly is fixed to the inside of the base of a telephone instrument by screws passing through the holes 29, arrangements being such that removal of the two screws and also of the nut 14 and insulating tip 5 enables the plunger to be withdrawn upwards from the assembly and the assembly to be withdrawn downwards from the inside of the instrument.

By the means above described, the contacts 7 are operated by the slow rise of the plunger 1 a short time after the receiver is removed therefrom. On replacement of the receiver, however, the spring coupling between the wheels 18 and 19 allows the plunger 1 to return to a normal position without any appreciable delay so that no opposition is offered by it to the weight of the receiver. By these means the shortest impulse that can be given by depressing the plunger 1 and allowing it to rise, is approximately ½ to 1 second, this being far too long to permit impulsing of switches at an exchange to which the instrument is connected.

We claim:

1. In a cradle telephone having a removable handset, a plunger pushed downward by the weight of the handset when it is placed on the cradle and moved upward by spring tension when the handset is removed from the cradle, a gear segment pivoted adjacent the plunger, a link connecting the plunger with the segment so that the segment is moved about its pivot with each movement of the plunger, a governor, and means for linking the governor with the gear segment to move therewith and retard its action only when the handset is removed from the cradle.

2. In a cradle telephone having a removable handset, a plunger operated up and down vertically whenever the handset of the telephone is removed or replaced on the cardle, a gear sector pivoted adjacent the plunger, a link pin linking the plunger with the sector and causing corresponding movement thereof whenever the plunger is moved up or down, a gear rotated back and forth by each movement of the sector, a centrifugal governor, and means for linking the governor to the gear only upon rotation of the gear in one direction.

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