March 8, 1938. L. A. YOST 2,110,433

TAKE-UP DEVICE FOR TELEPHONE SWITCHBOARD CORDS

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FIG. 2

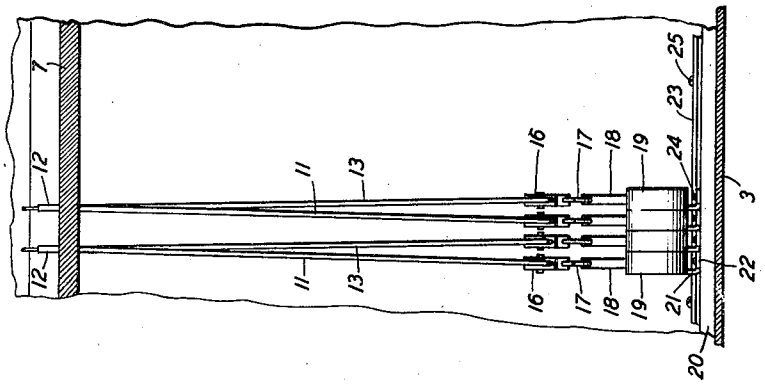
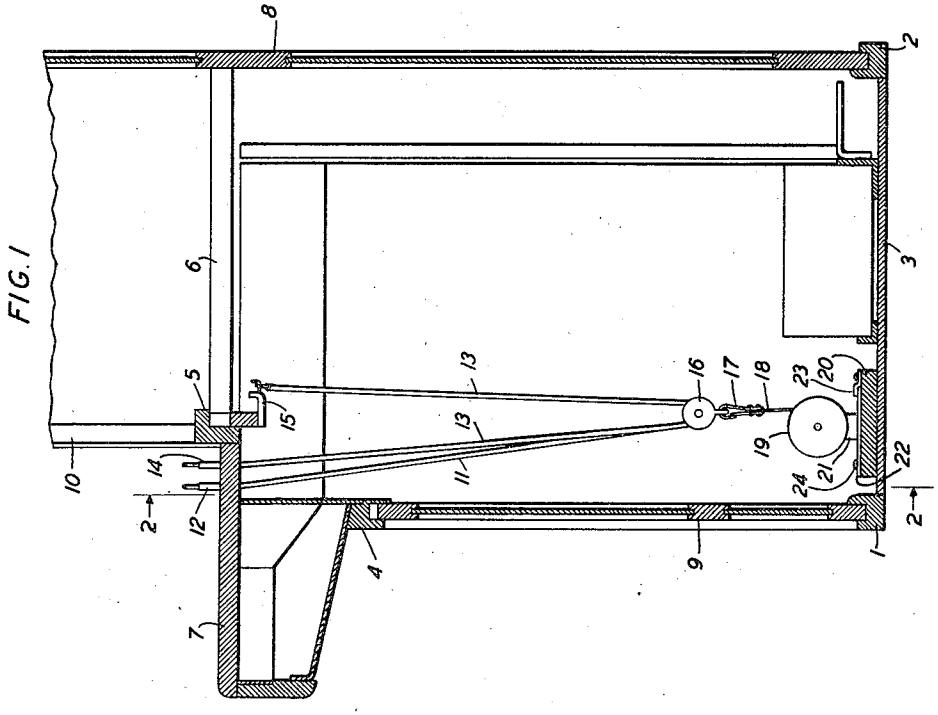


FIG. 1



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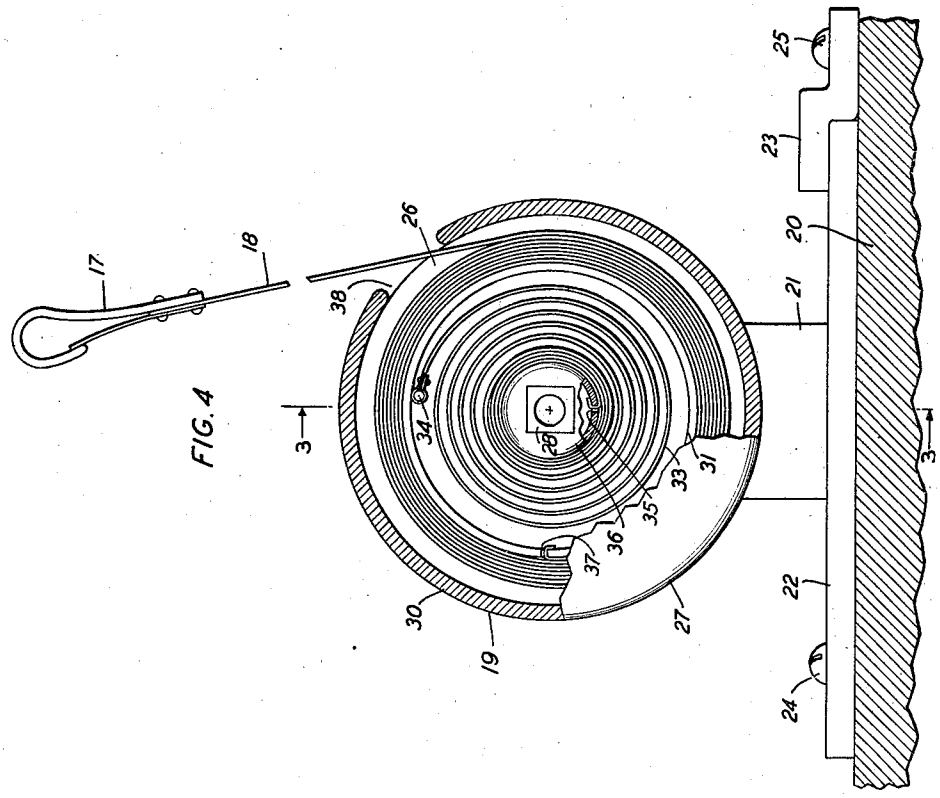

FIG. 4

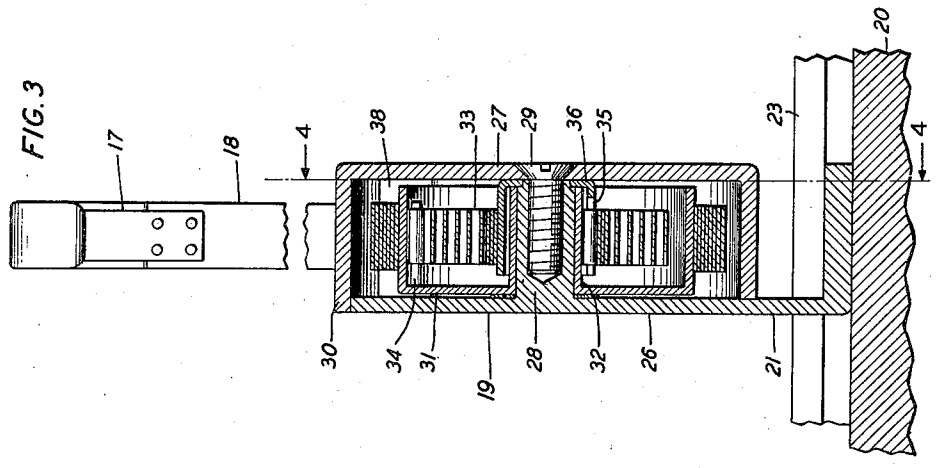

FIG. 3

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TAKE-UP DEVICE FOR TELEPHONE SWITCHBOARD CORDS

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Application January 7, 1937, Serial No. 119,463

2 Claims. (Cl. 179—95)

This invention relates to telephone switchboards and more particularly to take-up devices for returning cord plugs to their seats in the switchboard shelf.

On telephone switihboards, plug ended cords are provided by means of which connections may be made to jacks in which subscribers' lines or trunk lines terminate. Each cord is secured at one end of a hook to a cordshelf mounted on the inside of the switchboard, extends through a plug seat opening in the keyshelf of the switchboard and terminates in a connection plug which is normally seated in the plug seat. Each cord is of sufficient length to enable the plug to be lifted from its seat and to be inserted in any jack within the reach of the operator. To take up the slack in the cord and to return the plug thereof to its seat when the operator removes the plug from a jack, it has been the practice to extend the loop of the cord through a pulley attached to a cord weight, the loops of all of the cords and their associated cord weights being housed in a cord well in the lower portion of the switchboard.

Since it is necesary to supply a large number of such cords for each switchboard position, the cord plug seats are of necessity placed close together on the keyshelf and consequently the cord loops and their associated weights depend in close proximity to each other into the cord well. With this switchboard construction it has been found that there is a tendency for the weights of adjacent cords to peen against each other when one of the cord plugs is lifted from or restored to its seat, or to strike against the front and rear walls of the cord well, and a further tendency for the cord weights to become tangled in adjacent cord loops. These tendencies are more apt to be present in switchboards having both front and rear cords with their plug seats positioned in two parallel rows on the keyshelf.

Some difficulty has also been experienced in properly seating the cord plugs in their seats after the cords have been removed from connection jacks, it being often necessary for the operator to thread the cords back through the plug seats particularly when the cords have been extended to their full lengths and have become somewhat entangled with other extended cords. This difficulty has been obviated to some extent by increasing the mass of the usual cord weights but this remedy of necessity increases the energy required on the part of the operator to pull up cords in establishing connections and also increases the peening effect.

It is therefore the object of the present invention to obviate these difficulties by the elimination of the usual cord weights and by replacing them with take-up devices utilizing retractile springs.

In accordance with the present invention each cord loop is threaded through a pulley as has been the usual practice but the pulley instead of being connected to a free swinging weight is attached to a retracting device mounted on the floor of the cord well. The retracting device comprises a housing having a spindle upon which a drum is mounted for rotation. Inside of the drum is a spiral spring one end of which is connected to the drum and the other end of which is connected to the spindle. Wound on the outside of the drum is a tape, either of steel or textile material, having its inner end connected to the drum and its outer end connected in any desired manner to the cord pulley as for example by a snap fastener. The spring normally tends to wind the tape upon the drum, thus pulling down on the cord pulley to seat the cord plug in the plug seat in the keyshelf and to take up the slack in the cord loop with a pull equivalent to the usual cord weight. Since the cord loops are thereby maintained in approximately fixed planes, they cannot become tangled and with the cord weights eliminated, excessive noise is eliminated and the construction of the cord well is simplified.

For a more complete understanding of the invention, reference may be had to the following detailed description taken in connection with the accompanying drawings, in which:

Fig. 1 shows in cross-section a portion of a switchboard embodying the invention;

Fig. 2 is a detail taken along line 2—2 of Fig. 1;

Fig. 3 is a cross-sectional view of one of the cord retracting devices disclosed in Fig. 1, taken along line 3—3 of Fig. 4; and,

Fig. 4 is a cross-sectional view taken along line 4—4 of Fig. 3.

Referring to the drawings, Figs. 1 and 2 illustrate the application of the invention to a typical telephone switchboard. The switchboard comprises two bottom frame members 1 and 2 jointed by a baseboard 3, frame members 4, 5 and 6, keyshelf 7, rear removable panel 8, front removable panel 9 and jack panel 10. The switchboard is assumed to be of the type having both front and rear cords, the cords 11 terminating in plugs 12 illustrating two of the front cords and cords 13 terminating in plugs 14 illustrating two of the rear cords. The other ends of all of the cords are attached by hooks to the cordshelf 15 secured to the frame member 5.

All of the cord loops depend into the cord well

in the bottom portion of the switchboard enclosed between the front and rear panels 9 and 8 and are readily accessible by the removal of the front panel 9. Each cord loop is threaded through a pulley 16 which is secured by a snap fastener 17 to the tape 18 of the retracting device 19. All of the retracting devices are removably mounted in alignment with each other on a mounting board 20 secured to the baseboard 3 of the switchboard.

Each retracting device 19 comprises a support 21 having a base portion 22 which may be secured to the mounting board 20 by engagement beneath the cleat 23 and by the screw 24. The cleat 23 extends the whole length of the mounting board 20 and is secured thereto by screws 25. Thus to remove any retracting device from the mounting board, it is only necessary to remove the single screw 24 individual thereto and to slip the base portion 22 from under the cleat 23.

The upper portion 26 of the support 21 is circular in shape and with the cup-shaped cover 27 forms a housing for the mechanism of the retracting device. The circular portion 26 is provided with a central spindle 28 internally threaded for the reception of screw 29 which secures the cover 27 to the support with the cylindrical wall 30 of the cover 27 resting upon and embracing the edge of the circular portion 26 of the support.

Within the housing and journaled by a hub 32 on the spindle 28 is a reel or drum 31. A spiral clock spring 33 is positioned within the drum with its outer end attached to the pin 34 secured to the web of the drum and its inner end hooked into a slot 35 of a member 36. The member 36 is cup-shaped with its end wall held between the end of the spindle 28 and the end wall of the cover 27. To prevent the member from rotating, its end wall is provided with a square opening which fits over the squared end of the spindle 28 as most clearly shown in Fig. 4.

Wound upon the outer peripheral surface of the drum 31 is a tape 18 which may be of steel or textile material. The inner end of the tape is secured at 37 to the periphery of the drum and the outer end of the tape extends through a slot 38 in the peripheral wall 30 of the cover portion 27 of the housing and terminates in a snap fastener 17 by means of which the tape may be attached to the eye of a cord pulley 16.

The spiral spring 33 is so tensioned that normally the tape 18 is wound on the drum 31 and a downward pull is exerted on the pulley 16 to which the outer end of the tape is attached whereby the slack in the cord loop is taken up and the cord plug is firmly seated in its plug seat. When the operator lifts the cord plug from its seat and pulls the cord upwardly to insert the plug in a connection jack, the cord pulley 16 is pulled upwardly thereby unwinding the tape from the drum and rotating the drum 31. The rotation of the drum now further tensions the spiral spring 33 since one end thereof is secured to the pin 34 carried by the drum and the other or inner end thereof is secured to the fixed member 36. When thereafter the operator removes the cord plug from the connection jack and thereby releases the pull on the cord, the tensioned spring 33 uncoils, rotating the drum 31 in a reverse direction to rewind the tape 18 thereon and to pull down the cord pulley 16 thereby positively returning the cord plug to its seat and taking up the slack in the cord loop.

The initial tension of the spiral spring 33 may at any time be adjusted by removing the cover 27 and by rotating the cup member 36 to a new position with respect to the spindle 28.

It will be obvious from an inspection of Fig. 2 that by the use of the retracting device 19, each cord loop is held in its own fixed plane and that there is no possibility of adjacent cord loops becoming tangled and that there are no swinging members which might impinge against each other or against the walls of the cord well and further, since there are no swinging members, the cord protection panel usually placed at the rear of the cord loops and the usual linoleum backing for the front cord well panel 9 may be eliminated.

It is to be understood that while one embodiment of a retracting device has been illustrated other details of construction might be employed without departing from the scope of the invention as set forth in the appended claims.

What is claimed is:

1. In a switchboard, a keyshelf, a cordshelf, switchboard cords having their plugs normally seated in said keyshelf and their other ends attached to said cordshelf, and a take-up device for each of said cords, comprising a pulley through which the cord loop passes, a housing attached to the switchboard frame beneath the cord loop comprising a support and a cover member, a spindle integral with said support, a drum within the housing and journaled on said spindle, a tape attached to said pulley and to said drum, a member adjustably supported on said spindle, and a spiral spring within said drum having one of its ends secured to said drum and its other end secured to said member and so tensioned as to wind said tape on said drum thereby moving said pulley to take up the slack in the cord loop.

2. In a switchboard, a keyshelf, a cordshelf, switchboard cords having their plugs normally seated in said keyshelf and their other ends attached to said cordshelf, and a take-up device for each of said cords, comprising a pulley through which the cord loop passes, a housing attached to the switchboard frame beneath the cord loop comprising a support and a cover member, a spindle integral with said support and having a square shouldered end to which said cover member is secured, a drum within the housing journaled on said spindle, a tape attached to said pulley and to said drum, a cup member supported on the squared end of said spindle and clamped between the shoulder of said spindle and said cover, and a spiral spring within said drum having one of its ends secured to said drum and its other end secured to said member and so tensioned as to wind the tape on said drum thereby moving said pulley to take up the slack in said cord loop.

LLOYD A. YOST.