March 7, 1944. E. BERTALAN ET AL 2,343,442

TELEPHONE SUBSTATION APPARATUS

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FIG. 1

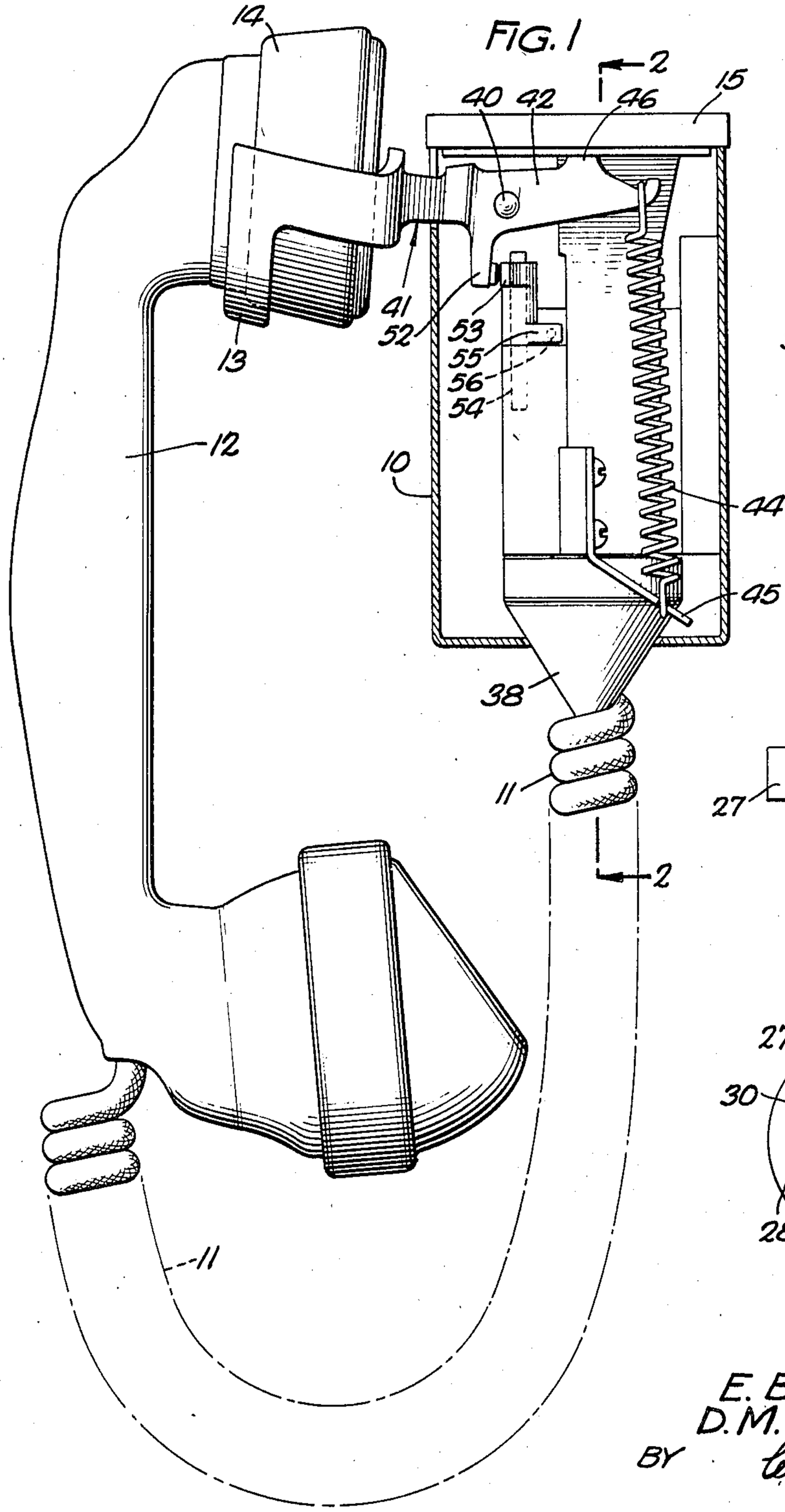


FIG. 5

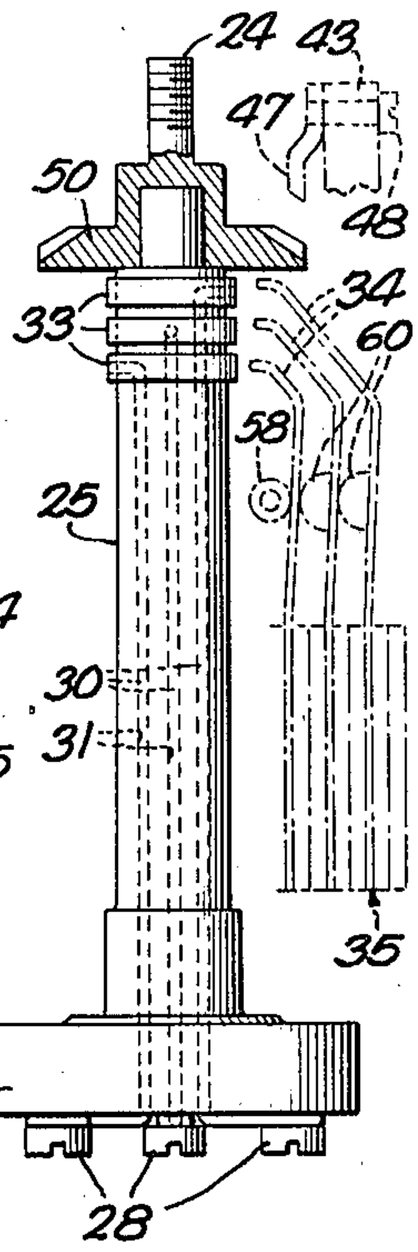
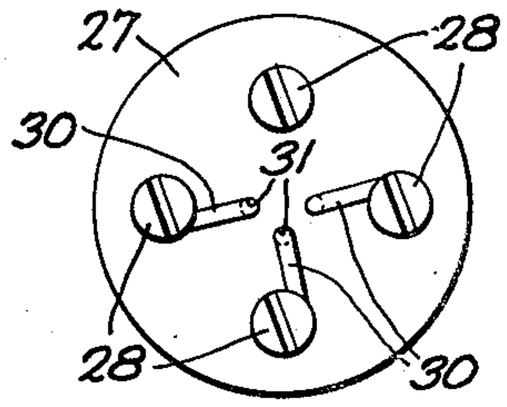


FIG. 6



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TELEPHONE SUBSTATION APPARATUS

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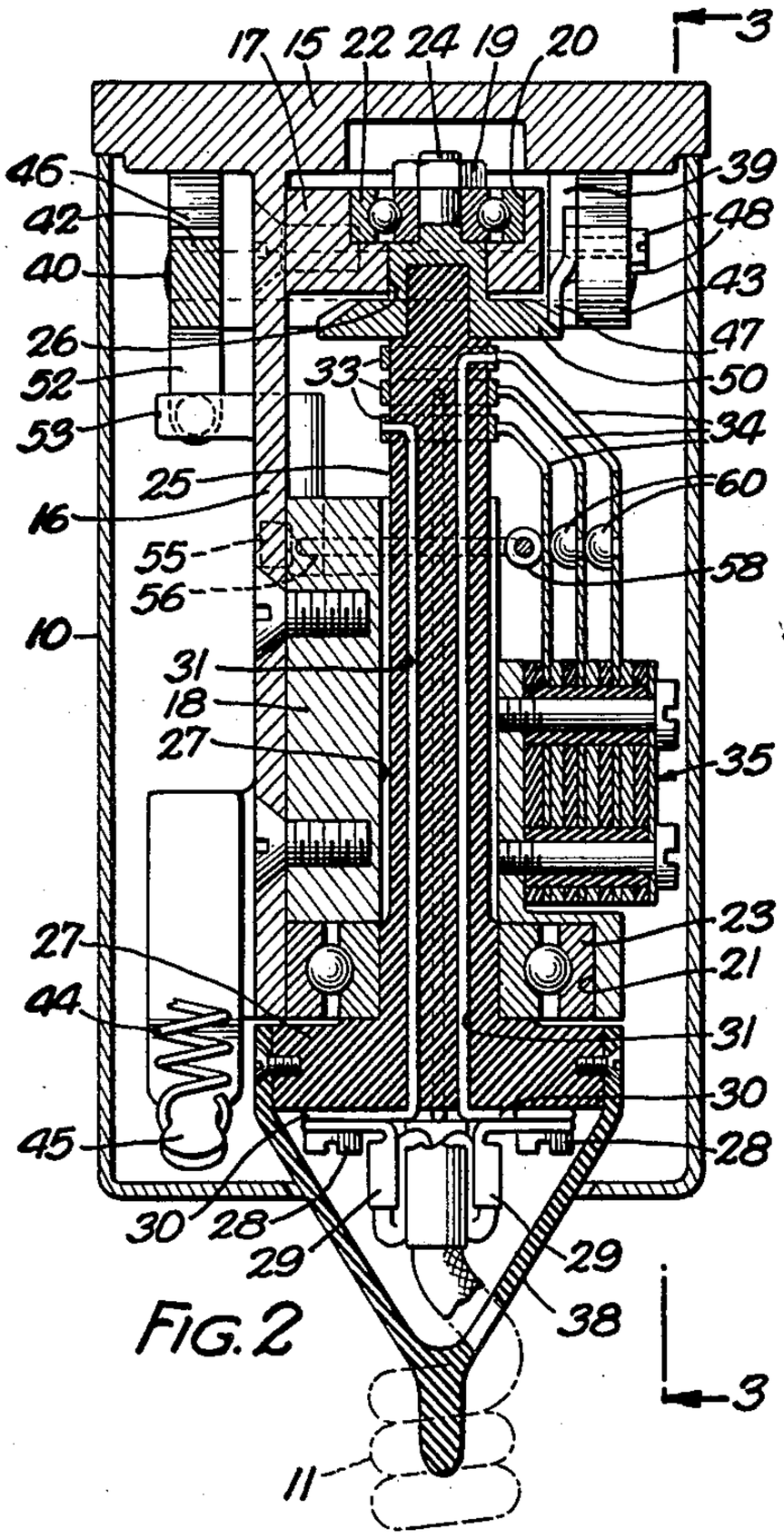

FIG. 2

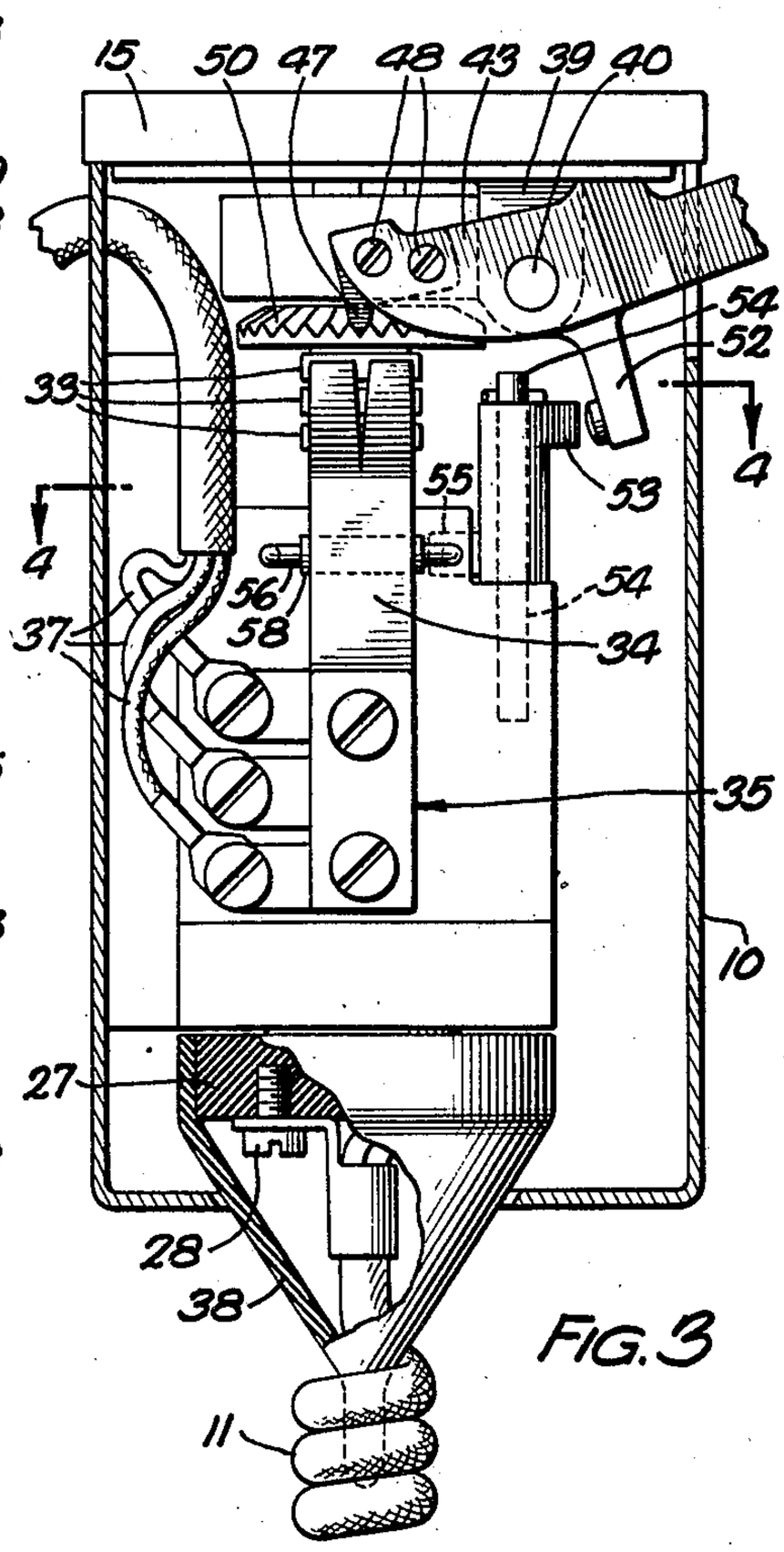

FIG. 3

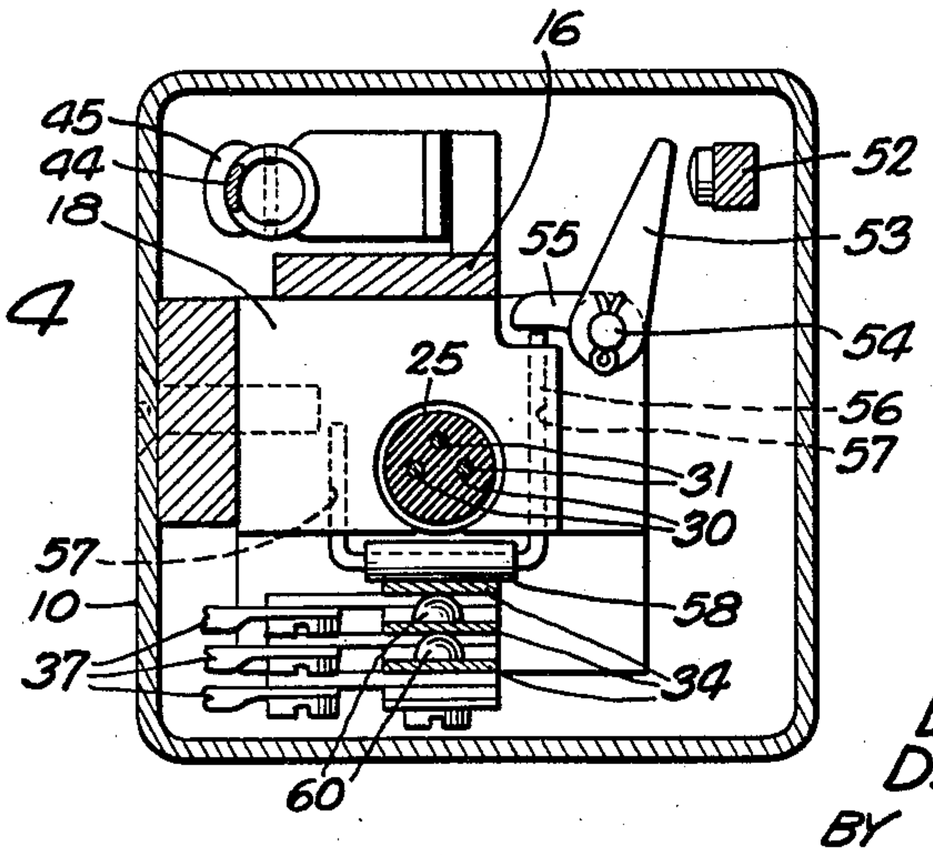

FIG. 4

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TELEPHONE SUBSTATION APPARATUS

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Application January 7, 1943, Serial No. 471,550

10 Claims. (Cl. 179—100)

This invention relates to telephone substation apparatus, and more particularly to hand telephone mountings.

Hand telephone substations usually comprise a casing containing the necessary switching elements, a hand telephone removably supported in some manner on the casing, and a cord connecting the hand telephone and switching elements. A retractile type cord is often used, which is made in the form of a helix. It has been found that if proper care is not taken the cord will twist or kink and satisfactory swivel elements have been designed to overcome this kinking and to allow free rotation of the cord. However, in overcoming this problem there sometimes has resulted undue wear on the contact elements and conversational disturbances occur occasionally due to the movement of the contact elements while a phone call is being made.

The object of this invention is to produce new and improved hand telephone mountings in which undue wear and conversational disturbances are eliminated.

In one embodiment of this invention a hand telephone substation mounting is provided which comprises a casing, a rotatable contact element within the casing, a pivoted switch assembly coacting therewith, a hand telephone resting upon a switching lever which is pivotally secured within said casing, a cord connecting the hand telephone and the rotatable element, and a detent to prevent free rotation of the rotatable contact element at predetermined intervals.

This invention will be understood clearly from the following detailed description and the accompanying drawings, in which

Fig. 1 is a front view, partly in section, of a device embodying the invention;

Fig. 2 is an enlarged vertical sectional view taken on line 2—2 of Fig. 1;

Fig. 3 is a vertical sectional view taken on line 3—3 of Fig. 2;

Fig. 4 is a horizontal sectional view taken on line 4—4 of Fig. 3;

Fig. 5 is a detail view, showing certain contact elements and a locking device forming part of the apparatus, and

Fig. 6 is a bottom plan view of the structure shown in Fig. 5.

Referring now to the drawings, the telephone substation mounting shown in Fig. 1 comprises a casing 10 in which is housed a substation switching mechanism connected by a cord 11 to a hand telephone 12, which is supported by a receiver portion 14 thereof on a receiver hook 13.

The substation switching mechanism, as shown in Fig. 2, comprises a top plate 15 having a vertical side plate 16 made integral therewith. Secured to the plate 16 are blocks 17 and 18, which have bores 20 and 21 therein to seat bearings 22 and 23, respectively. A shaft 25 extends through the blocks 17 and 18 in bores 26 and 27, respectively, and may rotate within the bearings 22 and 23. A nut 19, on a threaded portion 24 of the shaft 25, correctly positions the shaft within the blocks and the bearings, and holds it therein.

As shown in Fig. 5, the shaft 25 comprises a base portion 27, having screws 28—28 threaded therein. The screws 28—28 connect terminals 29—29 (Fig. 2) fastened on the ends of the individual wires of which the cord 11 is constructed, to wires 30—30 which are positioned within bores 31—31 (Fig. 2) formed in the shaft 25. Contact rings 33—33, secured to the shaft 25, are connected to the opposite ends of the wires 30—30. A switch assembly 35 (Fig. 2), secured to the block 18, has elongated spring contacts 34—34 protruding therefrom. The resiliency of the spring contacts 34—34 tends to cause them to engage the contact rings 33—33. Wires 37—37 (Fig. 3) leading to an outside electrical circuit (not shown) are secured to the switch assembly 35. Thus, an electrical circuit may be completed through the wires 37—37, the spring contacts 34—34, the contact rings 33—33, the wires 30—30, and through the cord 11 to the hand telephone 12. A cover 38 (Fig. 2) is fastened to the base 27 to protect the parts associated therewith.

Extending from the top plate 15 is a depending lug 39 (Fig. 3) made integral with the plate and a rod 40 is mounted in the lug 39 and the vertical plate 16, about which a switching lever 41 pivots (Fig. 1). The switching lever 41 comprises the receiver hook 13 formed at one end and two arms 42 and 43 (Fig. 2) formed at the other end. One end of a spring 44 is fastened to the arm 42 and the other end of the spring engages the head of a lug 45 secured to the plate 18. The spring 44 causes the switching lever 41 to rotate in a clockwise direction (as seen in Fig. 1) when the hand telephone 12 is not suspended from the receiver hook 13. The weight of the hand telephone is sufficient to overcome the tension of the spring 44 and when the hand telephone is placed upon the receiver hook the switching lever is rotated in a counterclockwise

direction until a stop 46 formed on the arm 42 engages the top plate 15.

The arm 43, forming part of the switching lever 41, has a detent 47 secured thereon by screws 48—48 (Fig. 3). When the arm 43 is lowered the detent 47 engages a toothed wheel 50, which is secured on the shaft 25 and rotates therewith.

An arm 52 (Fig. 1) depends from the arm 42 in proximity to a lever 53 (Fig. 4) rotatably mounted on a rod 54 secured within the block 18. When the receiver 14 is in place on the hook 13, the arm 52 exerts pressure on the lever 53. A lug 55, forming part of the lever 53, actuates a U-shaped rod 56, which extends into bores 57—57 formed within the block 18. An insulating sleeve 58, positioned on the U-shaped rod 56, pushes the contact springs 34—34 from their position against the contact rings 33—33, as seen in Fig. 2, to the position seen in dotted lines in Fig. 5, thus breaking the electrical circuit. Non-conducting spacers 60—60 prevent the contact springs 34—34 from engaging each other, and so prevent short circuiting.

The operation of the device is as follows: When the receiver 14 is placed on the receiver hook 13, the weight of the hand telephone 12 overcomes the tension of the spring 44, and the switching lever 41 pivots in a counterclockwise direction, as seen in Fig. 1. The depending arm 52, on the arm 42 of the switching lever 41, exerts pressure against the lever 53, as seen in Fig. 4, rotating the lever in a counterclockwise direction. The lug 55 moves in a counterclockwise direction, causing the U-shaped rod 56 and the insulated sleeve 58 thereon to move forward and overcome the resiliency of the spring contacts 34—34. The spring contacts 34—34 are thus forced from their position of establishing contact with the rings 33—33, and the electrical contact is broken.

The arm 43 of the switching lever 41 pivots on the rod 40 in a clockwise direction, as seen in Fig. 3, raising the detent 47 with it. The detent 47 is thus disengaged from the teeth of the wheel 50, allowing free rotation of the shaft 25 and the members thereon. The cord 11 is, therefore, free to turn and to unkink itself.

When the hand telephone 12 is removed from the hook 13 the switching lever 41 will pivot in a clockwise direction, as seen in Fig. 1, under the tension of the spring 44, and the depending arm 52 of the arm 42 will no longer exert any pressure on the lever 53 (Fig. 4). The resiliency of the spring contacts 34—34 will move them into contact with the contact rings 33—33, since there is no pressure exerted on the U-shaped rod 56 by the lug 55. The spring contacts 34—34 push against the insulating sleeve 58, forcing the U-shaped rod 56 toward the block 18, whereupon one end of the U-shaped rod 56 pushes against the lug 55, rotating the lug and the lever 53.

At the same time the switching arm 41 will move in a counterclockwise direction, as seen in Fig. 3, carrying the detent 47 downwardly into engagement with the teeth of the wheel 50. As a result the wheel 50 will be locked in place, and any rotation of the shaft 25 which might otherwise occur because of kinks in the cord 11 is prevented. This prevents undue wear of the contacts and eliminates any conversational disturbances caused by moving electrical contacts while the hand telephone is in use.

Although a specific embodiment of the invention has been shown and described, it will be understood that this embodiment is but illustrative and that various modifications may be made therein without departing from the scope and spirit of this invention. Obviously, devices embodying this invention could be used in conjunction with any telephone handset mounting which contains a rotatable element.

What is claimed is:

1. In a telephone substation apparatus including a hand telephone, a telephone mounting including a receiver hook and a cord to connect said hand telephone with said telephone mounting, means to allow unkinking of said cord comprising a freely rotatable member, and means to hold said freely rotatable member stationary when said receiver hook is elevated.

2. In a telephone substation apparatus including a hand telephone, a telephone mounting including a receiver hook and a cord to connect said hand telephone with said telephone mounting, means to allow unkinking of said cord comprising a freely rotatable member and means to hold said freely rotatable member stationary at predetermined intervals through a change of elevation of said receiver hook.

3. In a telephone substation apparatus including a hand telephone, a telephone mounting including a receiver hook and a cord to connect said hand telephone with said telephone mounting, means to allow unkinking of said cord comprising a member freely rotatable when said hand telephone is in place in said receiver hook, and means to hold said freely rotatable member stationary when said hand telephone is removed from said receiver hook.

4. In a telephone substation apparatus including a hand telephone, a telephone mounting including a receiver hook and a cord to connect said hand telephone with said telephone mounting, means to allow unkinking of said cord comprising a freely rotatable member having a toothed wheel thereon, and means to engage said toothed wheel to hold said freely rotatable member stationary when said receiver hook is elevated.

5. In a telephone substation apparatus including a hand telephone, a telephone mounting, and a cord to connect said hand telephone to said telephone mounting, means to allow unkinking of said cord comprising a freely rotatable member having a toothed wheel thereon, and a detent to engage said toothed wheel to hold said freely rotatable member stationary at predetermined intervals.

6. In a telephone substation apparatus including a hand telephone, a telephone mounting including a receiver hook, and a cord to connect said hand telephone to said telephone mounting, means to allow unkinking of said cord comprising a member having a toothed wheel thereon which member is freely rotatable when said hand telephone is in place on said receiver hook, and a detent to engage said toothed wheel to hold said rotatable member stationary when said hand telephone is removed from said receiver hook.

7. In a telephone substation apparatus including a hand telephone, a telephone mounting including a switching lever formed with a receiver hook at one end thereof and having a spring connected to the opposite end thereof, the tension of which spring holds said receiver hook in an elevated position when said hand telephone is off said receiver hook, and a cord to connect said hand telephone with said telephone mounting, means to allow unkinking of said cord comprising a rotatable member having a toothed wheel thereon, and a detent associated with said switching lever to engage with said toothed wheel at pre-

determined intervals to hold said rotatable member stationary.

8. In a telephone substation apparatus including a hand telephone, a telephone mounting including a switching lever formed with a receiver hook at one end thereof and having a spring connected to the opposite end thereof, the tension of which spring holds said receiver hook in an elevated position when said hand telephone is off said receiver hook, and a cord to connect said hand telephone with said telephone mounting, means to allow unkinking of said cord comprising a rotatable member having a toothed wheel thereon, and means associated with said switching lever to engage said toothed wheel at predetermined intervals to hold said rotatable member stationary.

9. In a telephone apparatus including a hand telephone, a telephone mounting including a switching lever formed with a receiver hook at one end thereof and having a spring connected to the opposite end thereof, the tension of which spring holds said receiver hook in an elevated position when said hand telephone is off said receiver hook, and a cord to connect said hand telephone with said telephone mounting, means to allow unkinking of said cord comprising a rotatable member, and means associated with said switching lever to hold said rotatable member stationary at predetermined intervals.

10. In a telephone apparatus including a hand telephone, a telephone mounting including a pivoted switching lever formed with a receiver hook at one end thereof and having a spring connected to the opposite end thereof, the tension of which spring holds said receiver hook in an elevated position when said hand telephone is off said receiver hook, and a cord to connect said hand telephone with said telephone mounting, means to allow unkinking of said cord comprising a member positioned within said telephone mounting and having a toothed wheel rigidly mounted thereon adjacent to said switching lever, which member is freely rotatable when said hand telephone is in place on said receiver hook, and a detent carried by said switching lever adapted to engage said toothed wheel to hold said rotatable member stationary when said hand telephone is removed from said receiver hook.

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