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TELEPHONE SUBSTATION APPARATUS

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2 Sheets-Sheet 1

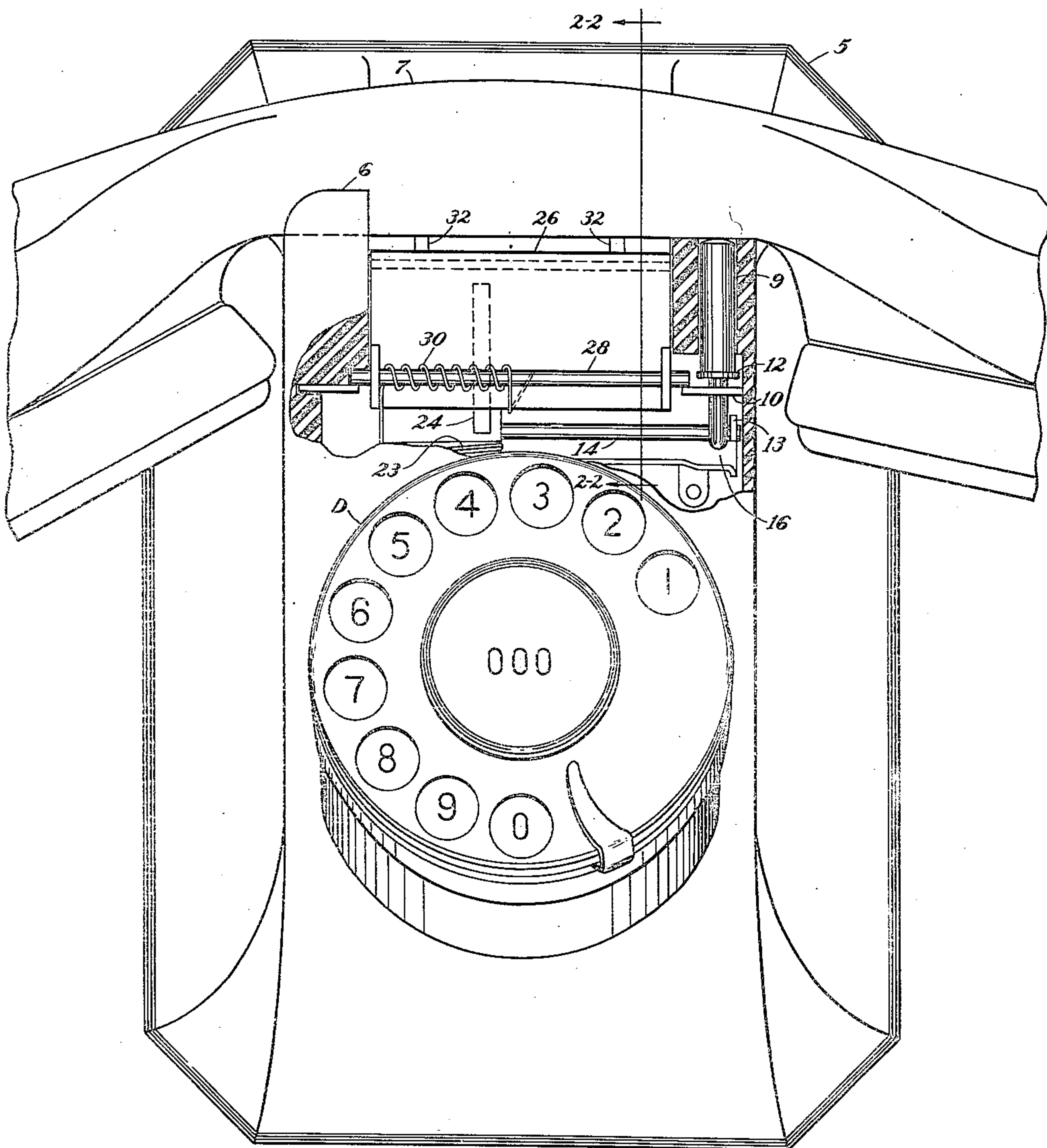


Fig. 1

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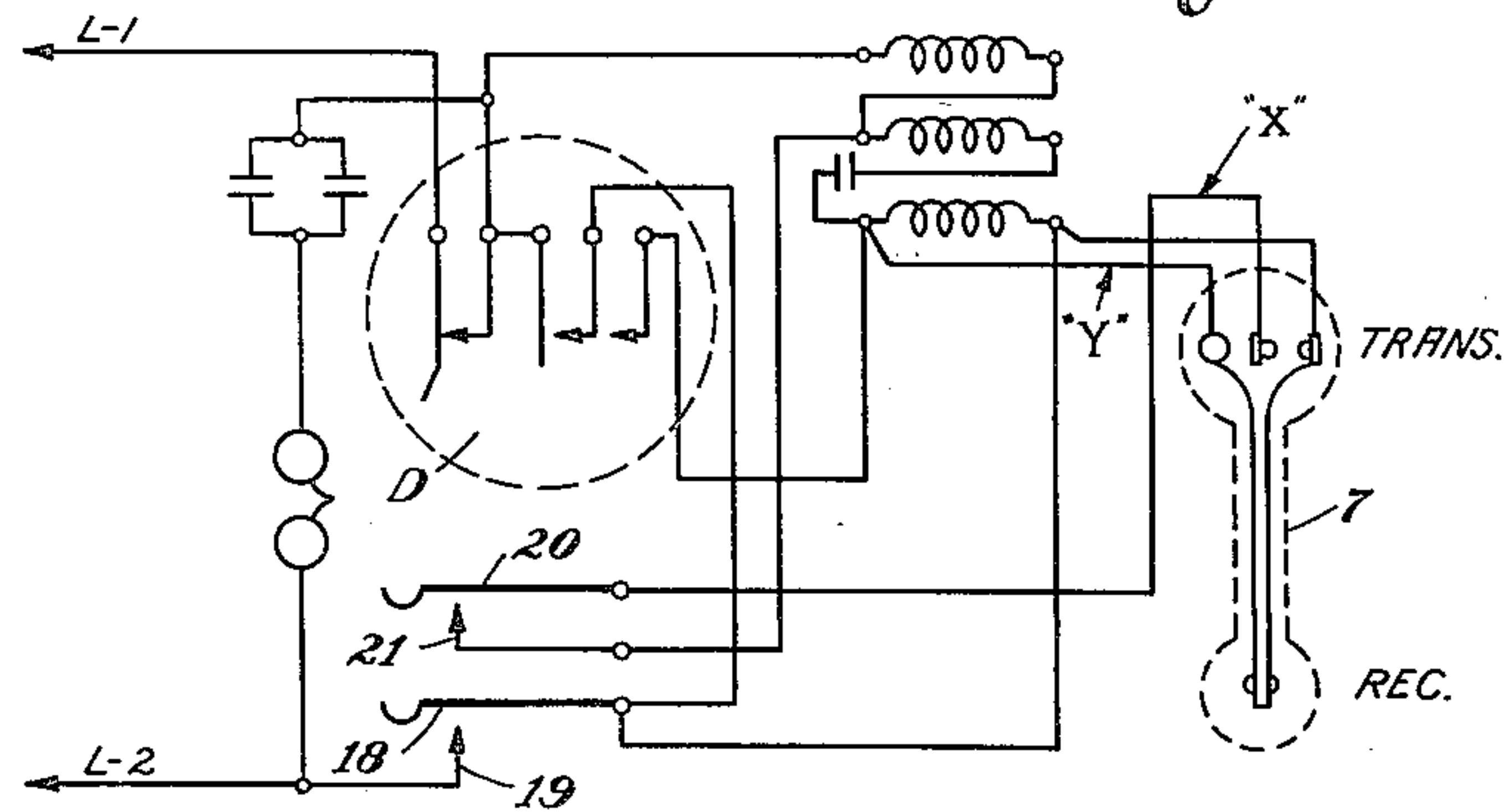
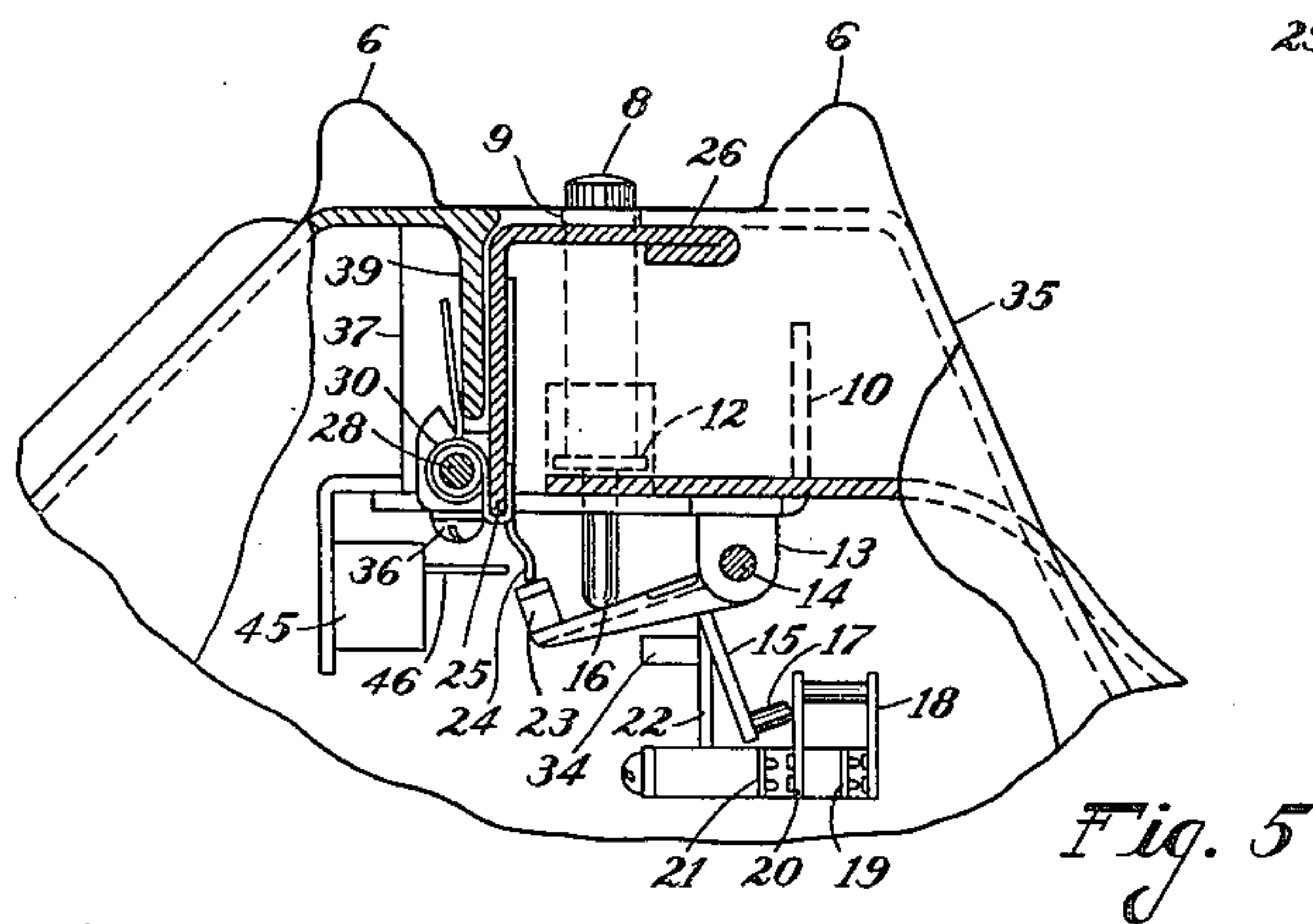
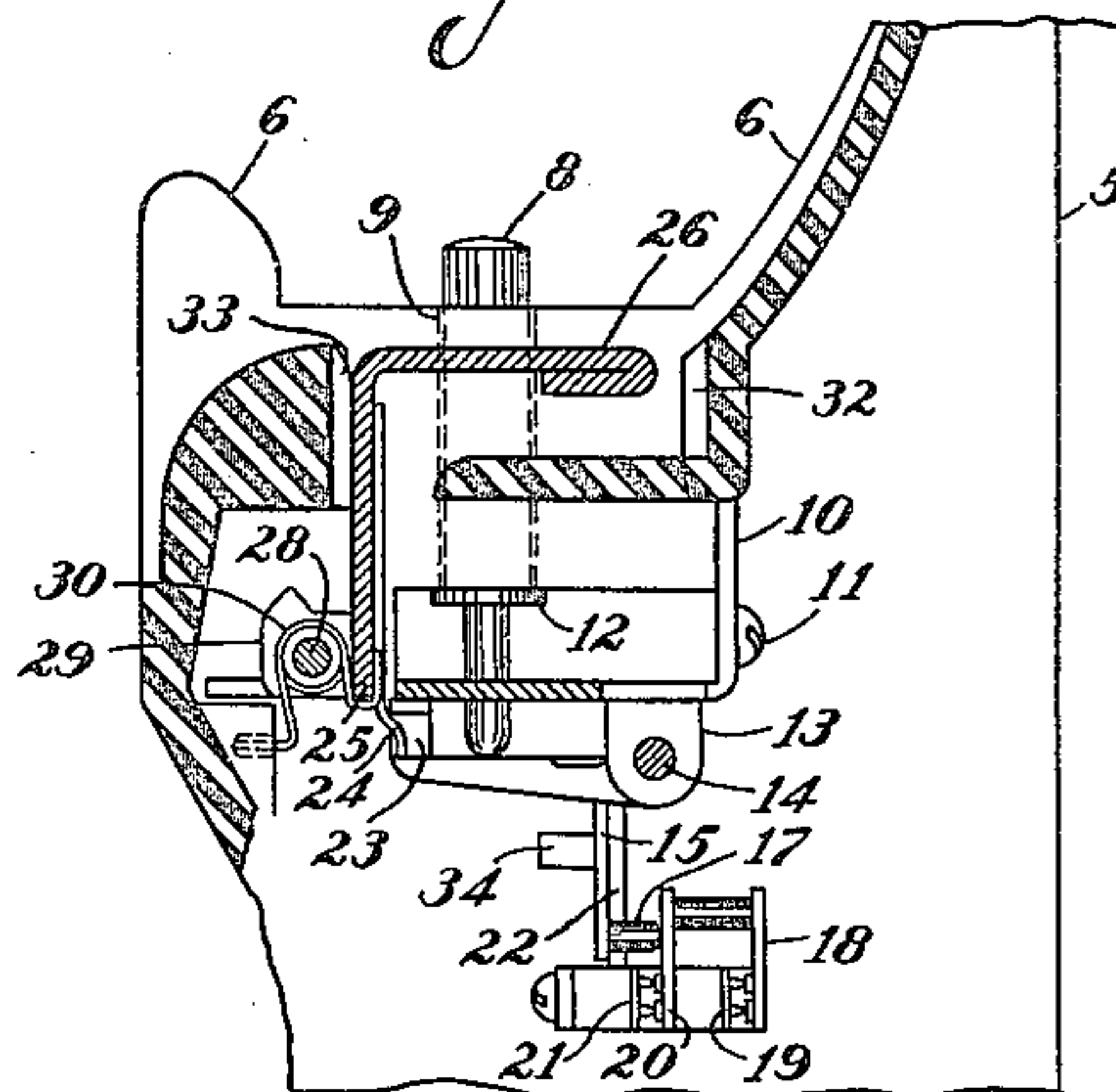
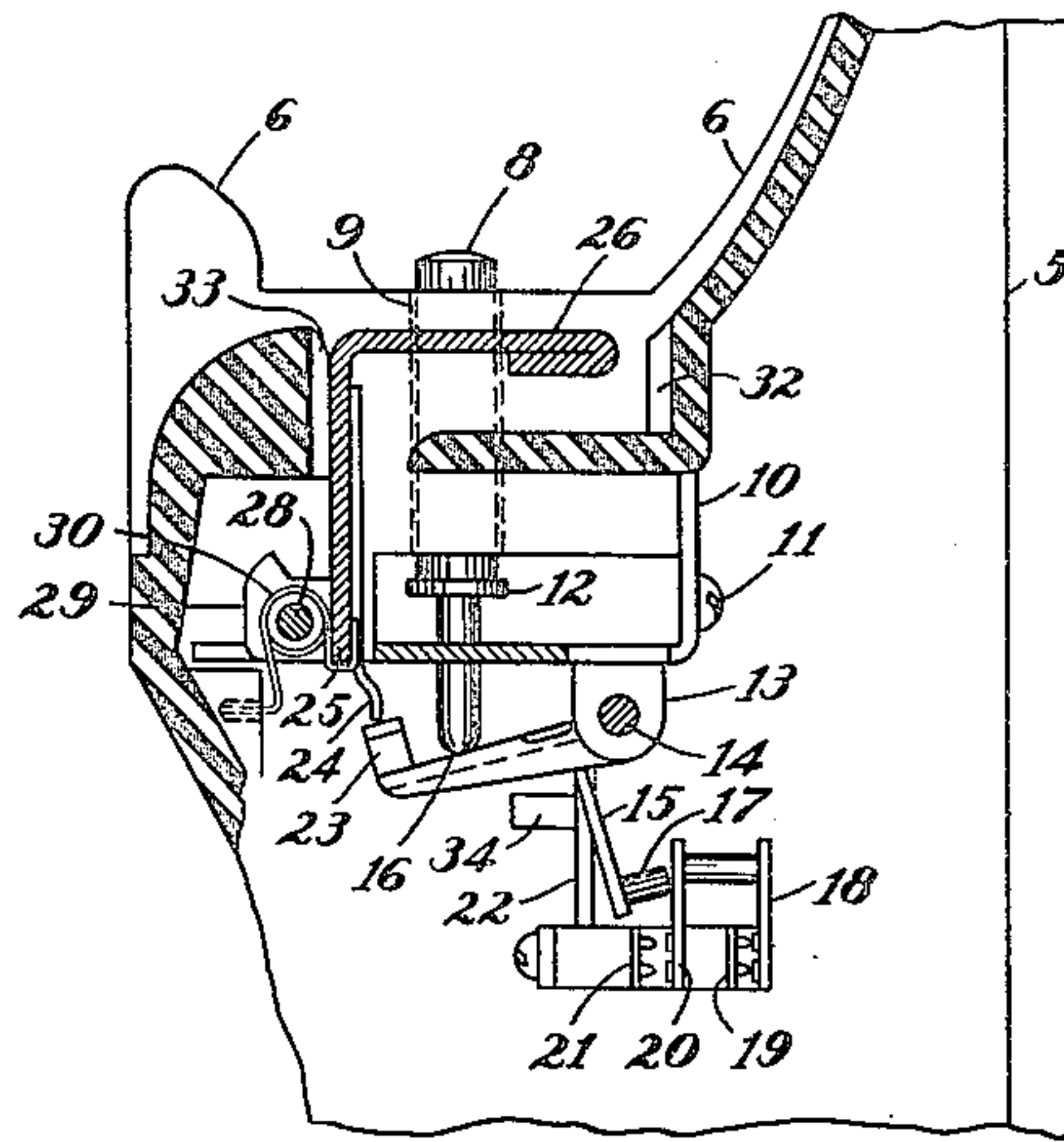
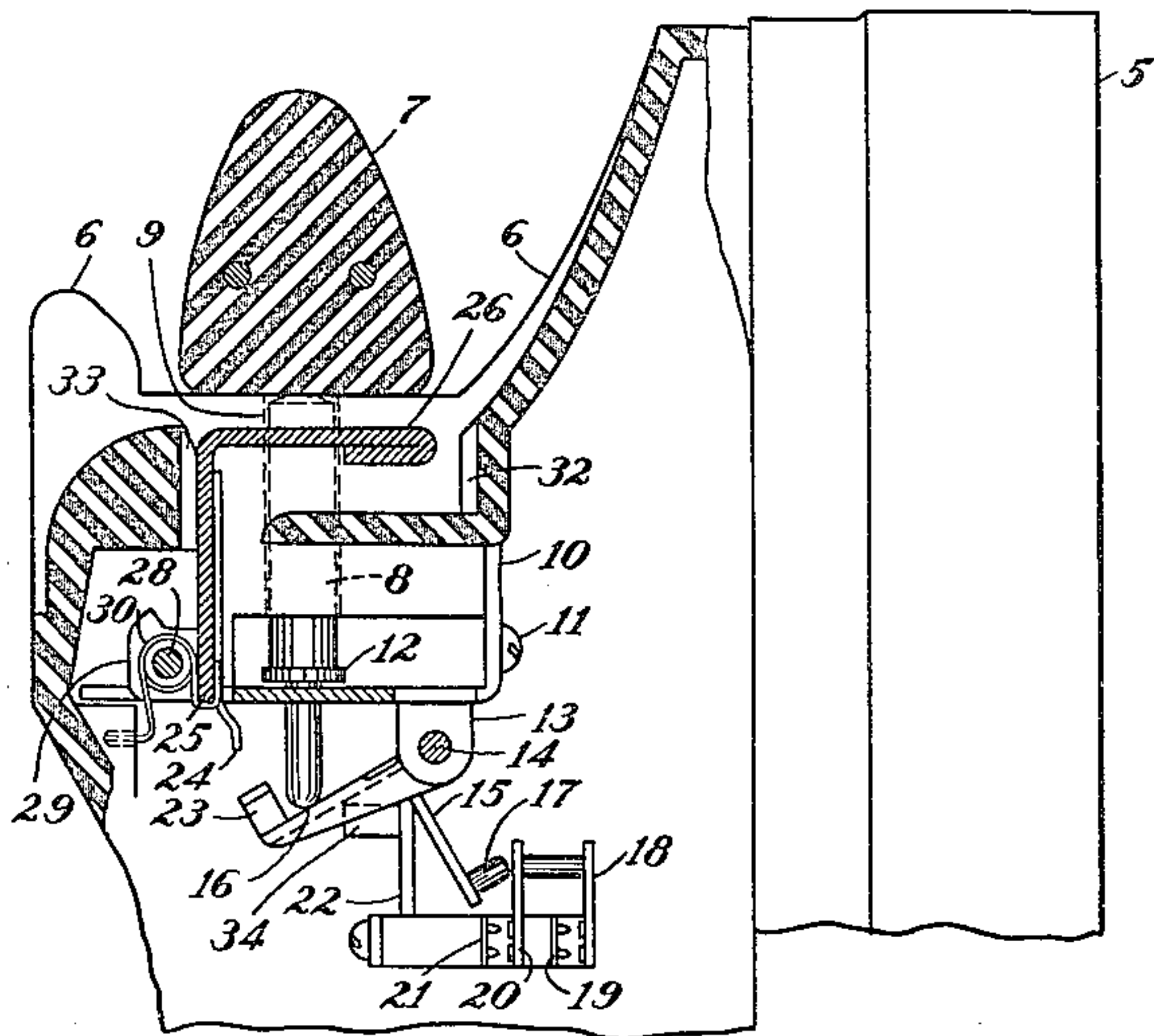
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2 Sheets-Sheet 2



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TELEPHONE SUBSTATION APPARATUS

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6 Claims. (Cl. 179—81)

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This invention relates to telephone substation apparatus and more particularly to switching means for selectively operating the receiver contacts and the transmitter contacts of a substation telephone.

Where telephone substation apparatus is used on a party telephone line of an automatic telephone system, it sometimes happens that a subscriber at a second substation on that line closes the hook-switch of his substation apparatus while a subscriber at a first substation on this party line is already engaged in transmitting dial impulses corresponding to a wanted telephone line. The actuation of the hook-switch at the second substation on the party telephone line will, under these conditions, mutilate the series of impulses then being transmitted from the first substation. In accordance with one feature of the present invention, there is provided an arrangement whereby the removal of the telephone hand set from the telephone support serves to move the hook-switch to a position wherein only the telephone receiver of the substation is effectively connected to the party telephone line, the transmitter circuit thereof being held open at this time. This affords the subscriber an opportunity to listen for a series of dial impulses being sent over his party line from another substation thereon and this can be done without mutilating the series of impulses. In the event that no such impulses are being sent at this time, this subscriber can manually operate the hook-switch further which will be effective to connect the telephone transmitter in circuit with the telephone line so that this subscriber can proceed to complete his call.

Telephone substations are sometimes located in noisy locations, as a result of which it is frequently desirable to short-circuit the transmitter at this station, during such intervals as the subscriber located thereat, is not talking. In accordance with another feature of the present invention, a novel arrangement is provided for manually short-circuiting the transmitter at the substation during such periods as the subscriber thereat is not talking.

The invention will best be understood by reference to the description, when taken with the drawings, in which:

Fig. 1 is a front view of a wall type telephone substation having the present invention incorporated therein;

Figs. 2, 3 and 4 are fragmentary sectional views taken substantially on the line 2—2 of Fig. 1; Fig. 2 showing the position of the mechanism

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when the hook-switch contact springs are open due to the presence of the hand set on the cradle support; Fig. 3 is a similar view of the contact springs of the hook-switch in their second or intermediate position which prevails after the hand set has been removed from the support but before the mechanism is further actuated manually to advance the contact springs of the hook switch to their fully closed position, as illustrated in Fig. 4;

Fig. 5 is a fragmentary view showing the invention applied to a cradle type desk stand and also illustrating how the mechanism can be further modified to short-circuit the transmitter at noisy locations during such intervals as the subscriber thereat is not talking; and

Fig. 6 is a diagrammatic showing of the substation circuits utilized with this mechanism and particularly indicating how the hook-switch contacts control these substation circuits.

In Fig. 1 the invention is illustrated in connection with a wall type telephone including a housing 5 which is adapted to be attached to the side wall of a room, a desk or other vertical support. This housing, which carries a dial D, is provided with a cradle type support including spaced pairs of integral upright portions 6, 6 between which the handle 7 of a combined transmitter and receiver or French type hand set is adapted to rest when not in use. Between each pair 6, 6 of uprights of the support there is mounted a plunger 8 for movement through a guide passage 9 in the housing and through an opening in the L-shaped bracket 10. This bracket is secured at each end thereof to the inner wall of the housing as indicated at 11. Each of the plungers 8 has a shoulder 12 near its lower end. These shoulders engage the bracket 10 (Fig. 2) as a stop when the plungers have been forced to their lowermost position by the handle 7 of the handset while on its cradle support. The bracket is provided near the bend therein, with downwardly spaced ears 13 to receive a pin 14 on which an angular hook-switch spring actuator 15 is mounted. This actuator has an armature portion 16 normally contacting the lower ends of the plungers 8. The actuator 15 also has a lower portion 17 adapted to operate the motor spring 18 of a pair of receiver contact springs comprising the motor spring 18 and the stationary spring 19 and also to actuate the motor spring 20 of a pair of transmitter springs comprising motor spring 20 and stationary spring 21. The several springs are support-

ed on a downwardly extending arm 22 integral with the bracket 10.

It should be pointed out that in accordance with the present invention the transmitter springs 20 and 21 remain open but the receiver springs 18 and 19 are closed when the handle 7 of the hand set is removed from its cradle. The plungers 8 will tend to move upward due to the tension of the mentioned receiver and transmitter motor springs applied through the actuator 15 to the lower ends of these plungers 8. However, the armature portion 16 of the actuator is provided with a catch 23 which will now engage a latch 24 to limit further clockwise movement of the actuator. The latch 24 is carried at the lower end of the vertical portion 25 of an inverted L-shaped member having a horizontal portion 26. The L-shaped member, including the horizontal portion 26, is adapted to extend across the space between the pair of uprights 6 on the cradle support. The vertical portion 25 of this member is pivoted on a horizontal pintle 28 supported in suitable upright ears 29 located on each side of the bracket 10. A coil spring 30 encircling the pintle 28, has one end embracing the housing and has its other end engaging the lower edge of the vertical portion 25 of the L-shaped member. The spring tends to rotate a part of this member against a suitable stop 33. With catch 23 on the actuator held by the latch 24, the actuator moves only to the position wherein the receiver contact springs 18 and 19 are closed (Fig. 3). At this time the transmitter springs 20 and 21 are open so that the transmitting portion of the substation circuit (Fig. 6) is ineffective and consequently the dial impulses on a simultaneous call from another substation of the same party line, will not be mutilated.

When the subscriber at this substation has ascertained that no other substation on his party line is engaged in completing a call, he will press down on the horizontal portion 26 of the L-shaped member as far as stop 32. This will rock the latch 24 out of the path of the catch 23 on the actuator. Thus the actuator 15 can rock clockwise so that not only the receiver contact springs 18 and 19 but also the transmitter contact springs 20 and 21 will be closed, as illustrated in Fig. 4. It will be understood, of course, that the handle 7, when the hand set is replaced on its cradle, will push down the plungers 8 to rock the actuator in a counterclockwise direction until the actuator strikes the stop 34. This in turn opens both the receiver contact springs and the transmitter contact springs as shown in Fig. 2. The mechanism of the present invention can also be mounted in the housing 35 of a cradle type desk stand, as illustrated in Fig. 5. When used in a desk stand housing, the L-shaped bracket 10 is fastened by one or more screws 36 to a rib 37 of the housing. Here also the coil spring 30 encircles the pintle 28 and one end of the spring engages the lower edge of the vertical part 25 of the L-shaped member but the other end of the coil spring engages one side of a lug 39 integral with the housing. This spring tends to rotate the L-shaped member counterclockwise against the other side of the lug. This mechanism operates in the manner already described. However, in the arrangement shown in Fig. 5, provision has also been made whereby the telephone transmitter of this substation can be short-circuited at will, when used in a noisy location. To effect this result, there is mounted within the housing a so-called microswitch 45, which maintains its contacts (not shown) nor-

mally open except when its button 46 is depressed. In this arrangement, the button 46 is in the path of the latch 24 so that while the subscriber presses down on the horizontal portion 26 of the L-shaped member, the latch 24 actuates the button 46. Button 46 closes the microswitch 45 so that its contacts short-circuit the transmitter. It should be mentioned that when the microswitch is used it will be connected in the substation circuits of Fig. 6 at the points indicated at X and Y.

What I claim is:

1. In combination, a telephone housing, a transmitter and a telephone receiver associated with said housing, at least said receiver being movable with respect to said housing, a set of receiver spring contacts and a set of transmitter spring contacts mounted within said housing, an actuator movable to a primary position in which it opens both of said sets of contacts and to an intermediate position in which it maintains said transmitter contacts open while permitting said receiver contacts to close and to a secondary position in which it permits both sets of contacts to close, an element extending from the outside of said housing into the interior thereof, said element being effective under the weight of said receiver to advance said actuator to its primary position, a latch within said housing and effective on the lifting of said receiver to retain said actuator in its intermediate position, and a member actuated from the outside of said housing for releasing said latch from said actuator.

2. In combination, a telephone housing, a transmitter and a telephone receiver associated with said housing, at least said receiver being movable with respect to said housing, a set of receiver spring contacts and a set of transmitter spring contacts mounted within said housing, an actuator movable to a primary position in which it opens both of said sets of contacts and to an intermediate position in which it maintains said transmitter contacts open while permitting said receiver contacts to close and to a secondary position in which it permits both sets of contacts to close, an element extending from the outside of said housing into the interior thereof, said element being effective under the weight of said receiver to advance said actuator to its primary position, a latch within said housing and effective on the lifting of said receiver to retain said actuator in its intermediate position, a member actuated from the outside of said housing for releasing said latch from said actuator, and a switch under the control of said member for short-circuiting said transmitter at will.

3. In combination, a telephone housing, a transmitter and a telephone receiver associated with said housing, at least said receiver being movable with respect to said housing, a set of receiver spring contacts and a set of transmitter spring contacts mounted within said housing, an actuator movable to a primary position in which it opens both of said sets of contacts and to an intermediate position in which it maintains said transmitter contacts open while permitting said receiver contacts to close and to a secondary position in which it permits both sets of contacts to close, a vertically movable plunger extending from the outside of said housing into the interior thereof, said plunger being effective under the weight of said receiver to advance said actuator to its primary position, a latch within said housing and effective on the lifting of said receiver to retain said actuator in its intermediate position, and an element actuated from the outside

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of said housing for releasing said latch from said actuator.

4. In combination, a telephone housing, a handset including a transmitter and a receiver joined by a handle, a cradle support on said housing comprising two pairs of spaced uprights, the uprights of a pair being separated a distance apart sufficient to receive the handle of the handset therebetween, a generally horizontal pivotally mounted member between said uprights and adapted to be rocked a limited amount, a latch within said housing controlled by said member, a set of receiver contact springs and a set of transmitter contact springs mounted within said housing, an actuator movable to a primary position in which it opens both of said sets of springs and to an intermediate position in which it maintains said transmitter springs open while permitting said receiver springs to close and a secondary position in which it permits both sets of springs to close, and an element extending from the outside of said housing into the interior thereof, said element being effective under the weight of said handle to advance said actuator to its primary position, said latch being effective on the lifting of said handle to retain said actuator in its intermediate position, said member being movable at will for disengaging said latch from said actuator.

5. In combination, a telephone housing, a handset including a transmitter and a receiver joined by a handle, a cradle support on said housing comprising two pairs of spaced uprights, the uprights of a pair being separated a distance apart sufficient to receive the handle of the handset therebetween, a generally horizontal pivotally mounted member between said uprights and adapted to be rocked a limited amount, a latch within said housing controlled by said member, a set of receiver contact springs and a set of transmitter contact springs mounted within said housing, an actuator movable to a primary position in which it opens both of said sets of springs and to an intermediate position in which it maintains said transmitter springs open while per-

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mitting said receiver springs to close and a secondary position in which it permits both sets of springs to close, an element extending from the outside of said housing into the interior thereof, said element being effective under the weight of said handle to advance said actuator to its primary position, said latch being effective on the lifting of said handle to retain said actuator in its intermediate position, said member being movable at will for disengaging said latch from said actuator, and a switch under the control of said member for short-circuiting said transmitter.

6. In combination, a telephone housing, a handset including a transmitter and a receiver joined by a handle, a cradle support on said housing comprising two pairs of spaced uprights, the uprights of a pair being separated a distance apart sufficient to receive the handle of the handset therebetween, an inverted L-shaped member pivoted for rocking movement about a horizontal axis, said member having a generally horizontal portion extending between said pairs of uprights, said member having a substantially vertical portion provided at its lower end with a latch extending into said housing, a set of receiver contact springs and a set of transmitter contact springs mounted within said housing, an actuator movable to a primary position in which it opens both of said sets of springs and to an intermediate position in which it maintains said transmitter springs open while permitting said receiver springs to close and to a second position in which it permits both sets of springs to close, and a pair of plungers each extending from between a pair of uprights at the outside of the housing to the interior of said housing, said plungers being effective under the weight of said handle to advance said actuator to its primary position, said latch being effective on the lifting of said handle to retain said actuator in its intermediate position, said member being movable at will for disengaging said latch from said actuator.

DONALD B. MILLER.