

Jan. 26, 1943

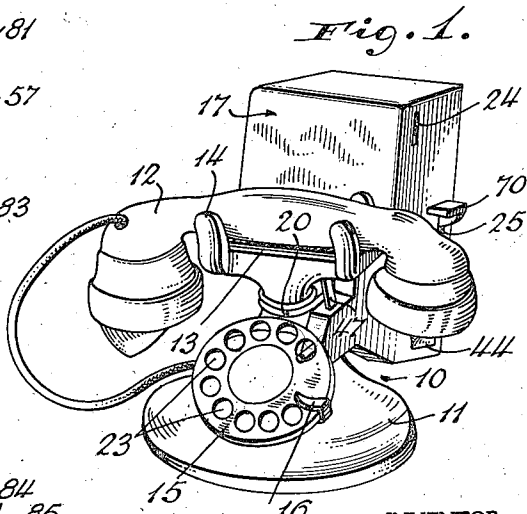
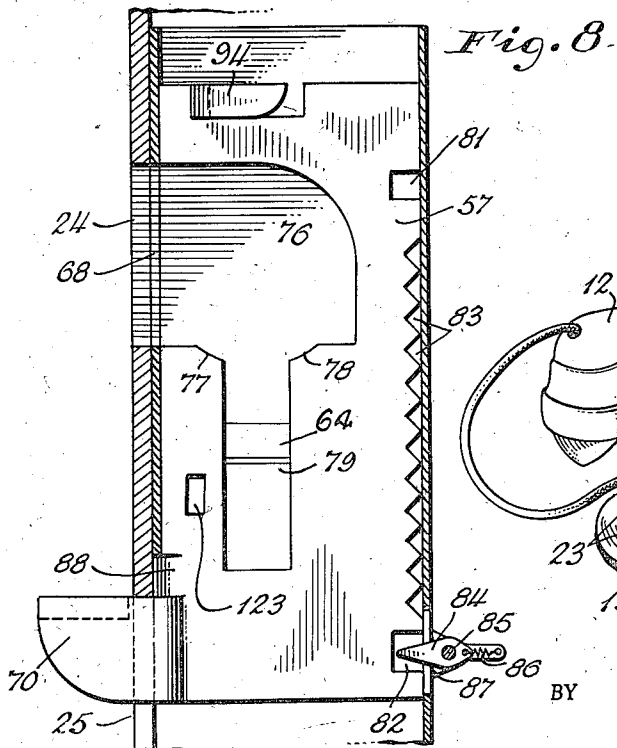
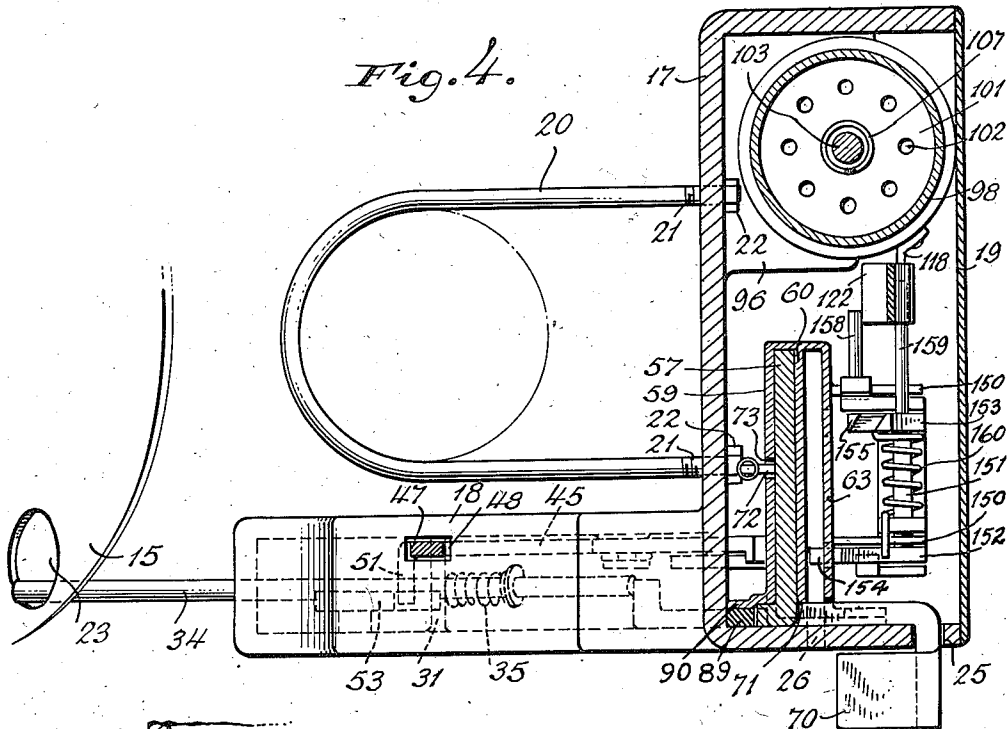
M. BRUCK

2,309,572

COIN-CONTROLLED LOCK FOR DIAL TELEPHONES

Filed Jan. 20, 1940

4 Sheets-Sheet 1



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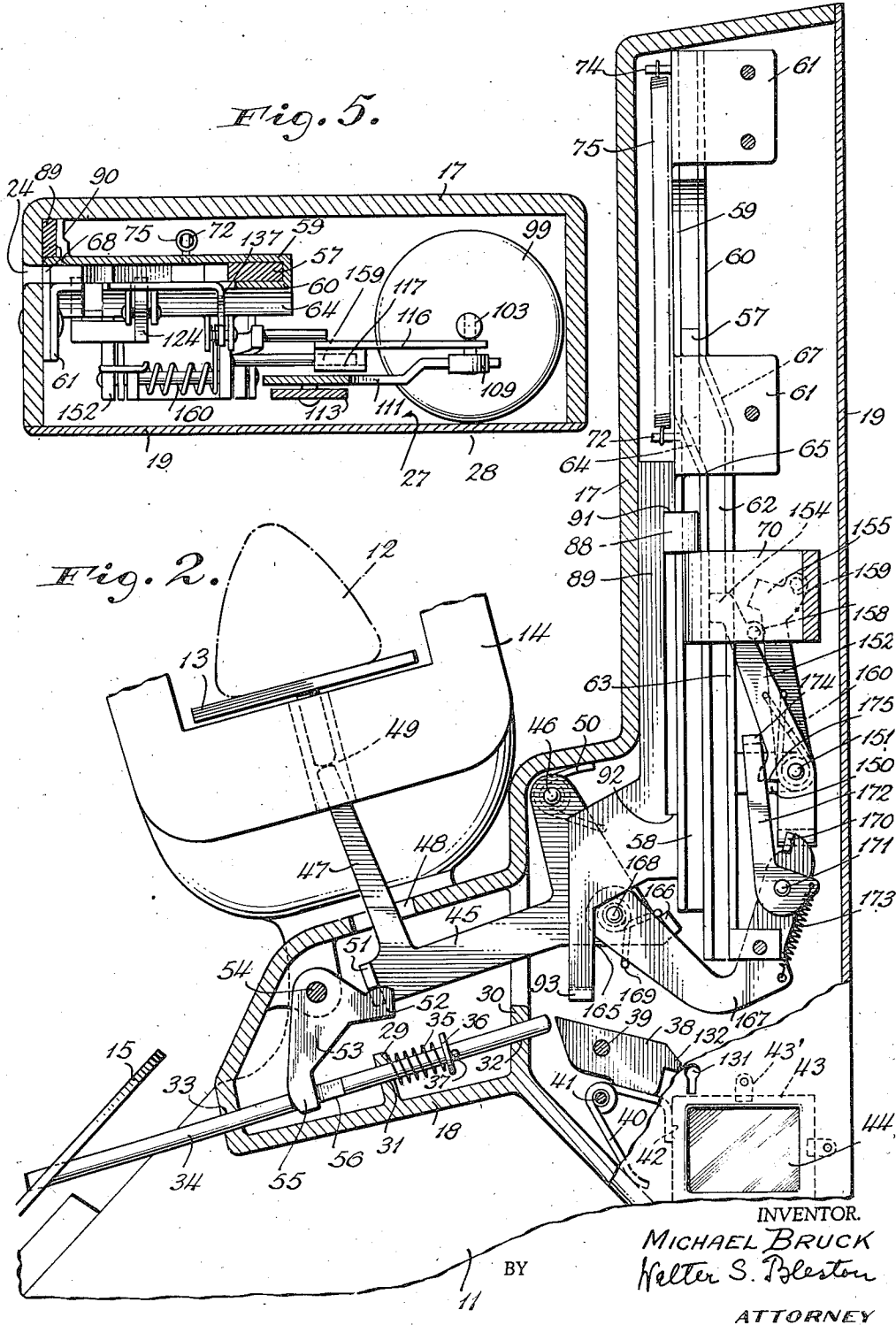
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COIN-CONTROLLED LOCK FOR DIAL TELEPHONES

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Fig. 6.

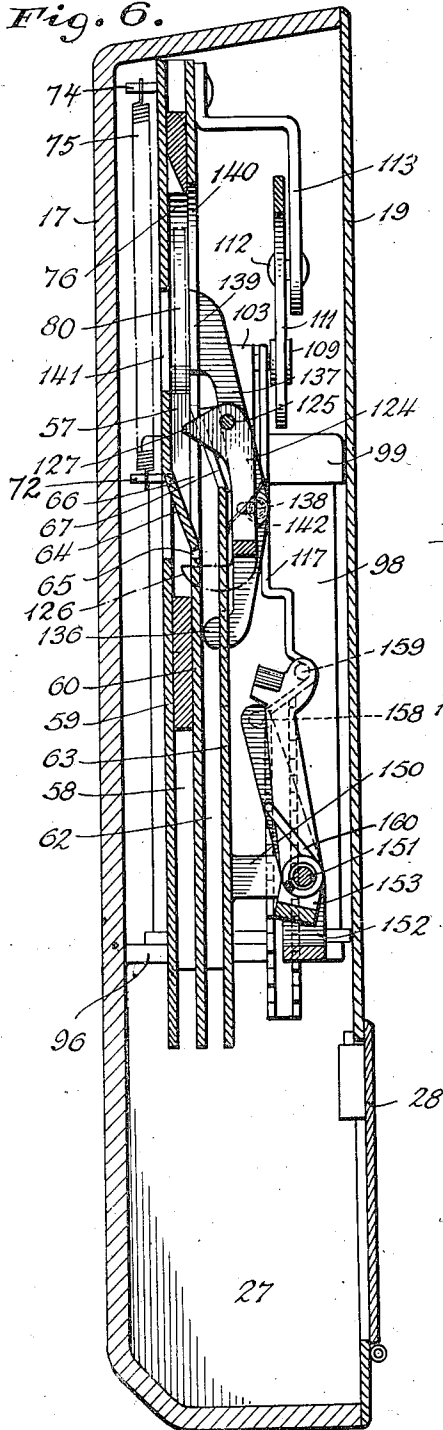


Fig. 7.

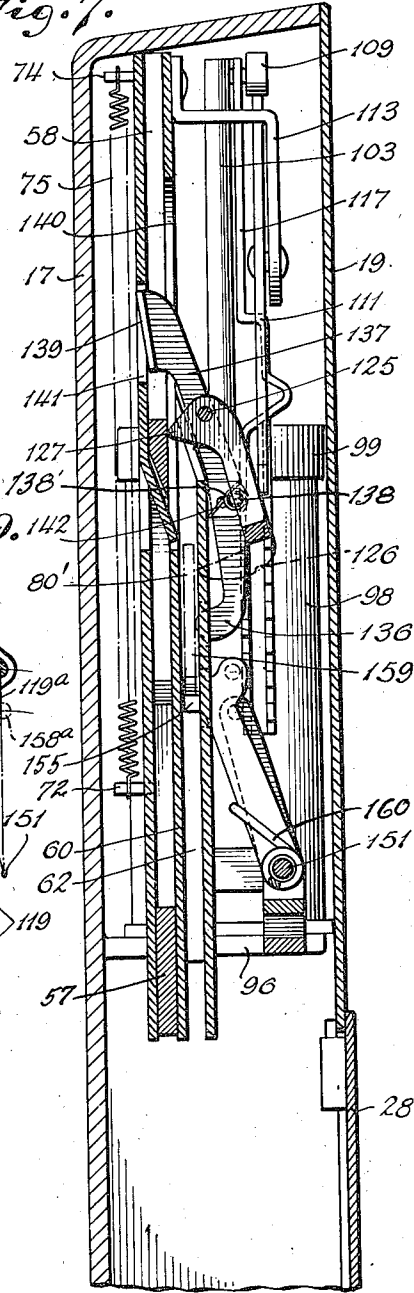
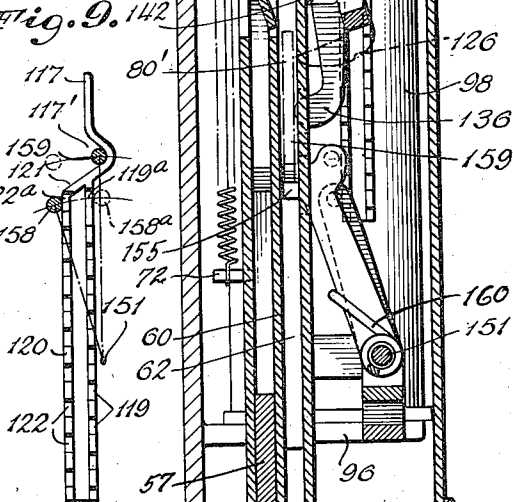


Fig. 9.



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UNITED STATES PATENT OFFICE

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COIN-CONTROLLED LOCK FOR DIAL
TELEPHONES

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7 Claims. (Cl. 194—55)

The invention relates to an attachment for a dial telephone, and contemplates the provision of a dial lock which may be released with the aid of either a coin or a key, or, in case of an emergency, by breaking an exchangeable member.

Another object of the invention is the provision of means whereby an inserted coin may be either deposited into a till or returned to the user of the telephone, depending on whether the telephone receiver is returned to its rest after or before the end of a predetermined time.

A further object of the invention is the provision of means for preventing a coin from being returned when the receiver is only momentarily put on its rest and lifted therefrom immediately thereafter.

A further object is the provision of a timing device controlling the depositing of a coin into the till, and also of means for starting the timing device after the dialing of a connection has been completed.

A further object is the provision of means for returning the coin, independently of the time element if certain connections are established.

Further objects and details of my invention will be apparent from the description hereafter and the accompanying drawings illustrating an embodiment thereof by way of example. In the drawings:

Fig. 1 is a perspective view of a device according to my invention attached to a dial telephone;

Fig. 2 is a longitudinal section of the device;

Fig. 3 is a rear elevation, the back cover being removed;

Fig. 4 is a cross-section along line 4—4 in Fig. 3;

Fig. 5 is a cross-section along line 5—5 in Fig. 3;

Fig. 6 is a section along line 6—6 in Fig. 3;

Fig. 7 is a similar section with a coin inserted into the device;

Fig. 8 is an elevation of a slide constituting the main actuating member of the device;

Fig. 9 is an elevation of a portion of the timing mechanism.

Referring now to the drawings, and more particularly to the embodiment of Figs. 1 to 9, 10 is a conventional dial telephone comprising a standard 11, a receiver 12, a movable receiver rest 13, a receiver fork 14, a rotatable dial disc 15, and a finger stop 16. The operative parts of my device, are disposed in a housing 17 having a projection 18 on the one side of its front face. The housing is open in its rear, so that the various parts can be inserted, and a cover plate

19 may be secured to the housing so as to close the latter. The housing is attached to the standard 11 of the telephone by suitable means, e. g., a substantially U-shaped member 20 having threaded ends 21 which may be passed through suitable holes in the front-wall of the housing 17 and secured thereto by means of nuts 22. It will be noticed that in the illustrated embodiment the attached housing is slightly inclined with respect to the vertical. This is the preferred arrangement in the case of a so-called French type telephone such as shown. However, the arrangement may be different particularly in another kind of dial telephone, it being material only that a locking bar projecting from the housing, can engage one of the holes 23 in the dial disc, as will be more fully described hereinafter. One of the side walls of the housing is provided with a coin slot 24, another slot 25 for an actuating means, and a third slot 26 (Fig. 3) for the passage of returned coins. The lower portion of the housing, serving as a till 27, is accessible through a door 28, as clearly shown in Figs. 6 and 7.

Means are provided for preventing unauthorized manipulation of the dial disc 15 in order to establish a connection with an outside party whereas incoming calls may be answered at any time. For this purpose, there are two ribs 29 and 30 (Fig. 2) interiorly of the housing portion 18 and having holes 31 and 32 respectively, in line with a hole 33 in the front wall thereof, in which holes a locking bar or bolt 34 is longitudinally movable, so as to enter into one of the dial disc holes 23 when projected. A spring 35 bears with its one end against rib 29 and with its other end against a washer 36 which in turn bears against a pin 37 passed through bolt 34 so that spring 35 tends to withdraw bolt 34 from locking position. A movable detent or latch 38 is provided in the path of the bolt 34 to hold the latter in locking engagement with the dial disc when other means hereinafter described release their hold on the bolt 34. Latch 38 is pivoted at 39 and so weighted that it tends to turn in a clockwise direction in Fig. 2, whereby the rear end of bolt 34 can engage the front end of the latch 38 when the latter rests with its lower rear portion on a suitable stop. Emergency means are provided which are operative to release the latch when neither a coin nor a key is available for operating the latch in the normal manner described hereinafter. In the illustrated embodiment said stop is so constructed as to serve as such emergency means. It consists of a spring

40 wound about a fixed pin 41 and bearing with one of its ends against the wall of the housing and with its other end against the edge 42 of a glass plate 43 which is held by suitable means 43' in the rear of a window opening 44 in the wall of the housing 17. Now, it will be apparent that spring 40 will be freed when the glass plate 43 is broken in a case of emergency, and will swing latch 23 in an anti-clockwise direction so as to move out of the path of bolt 34 which, then, may be withdrawn from its locking position, by spring 35. By insertion of another glass plate 43, the normal condition shown in Fig. 2 can be re-established. In a similar manner, latch 38 may be turned by means of a suitable key (not shown) inserted through key hole 131 and engaging projection 132 of latch 33.

Means are provided for shifting bolt 34 into locking position in response to a downward movement of the receiver rest 13, which occurs when the receiver lifted from its rest is returned thereto. Such means comprises a member which, in any suitable manner, is operatively connected to the receiver rest so as to follow its movement. In the illustrated embodiment there is a lever 45 pivoted at 46 and having an upwardly bent arm 47 which projects through a hole 48 in the top of the housing portion 18 and also through a hole 49 that is generally provided in the bottom of the receiver fork 14 and laterally of the vertical axis of the movable receiver rest 13. A spring 50 is so arranged on the pivot pin 46 as to urge the free end of lever arm 47 against the lower side of the receiver rest 13. Near the other end of arm 47, lever 45 has a lateral projection 51 bearing on the one arm 52 of a bell crank lever 53 which is pivoted at 54. The other arm 55 of bell crank lever 53 engages in a lateral recess 56 of bolt 34, the recess being long enough to allow for a lost motion of arm 55 relatively to bolt 34. Now, it will be apparent that the weight of the receiver 12 placed on the rest 13 urges arm 47 downward against the restraint of spring 50, thereby causing bell crank lever 53 to push bolt 34 into locking position and to hold it in such position, against the restraint of spring 35. When the receiver 12 is lifted from its rest the connection of the parts may be interrupted either by disengagement of arm 52 from projection 51 or of arm 55 from the front wall of recess 56 so that spring 35 will withdraw bolt 34 to bear against latch 33. However, this movement of bolt 34 is insufficient to release the dial disc 15.

Actuating means operative with the aid of an inserted coin are provided to disengage latch 38, to set a timing device, to deposit the coin on supports so that the coin may be selectively dropped in the till or returned to the user of the apparatus, and for other purposes to be described hereinafter. In the illustrated form the actuating member consists of a slide 57 shown in detail in Fig. 8. Slide 57 is movable up- and downward, in a channel 58 which comprises parallel walls 59 and 60 secured to the housing 17 by means of flanges 61 (Fig. 5). Intermediate the ends of channel 58, a chute 62 is branched off which is formed by walls 60 and 63. A tongue-like portion 64 is bent off the wall 59 so that the lower edge of tongue 64 is close to the lower edge 65 of a recess 66 in wall 60 as clearly shown in Fig. 6. Similarly, an inclined wall portion 67 extends from the upper edge of recess 66 to the upper end of wall 63. The side wall of channel 58 is provided with

a slot 68 (see Figs. 5 and 8) in registry with the slot 24 of the housing 17. Slide 57 is preferably made of a piece of sheet metal having a thickness similar to that of the type of coin to be used in the apparatus. A lower corner of slide 57 is bent off so as to form a grip 70 projecting through slot 71 between the walls 69 and 63 and through slot 25 in the wall of the housing 17 as shown in Figs. 3 and 4. A pin 72 is secured to slide 57 and projects through a vertical slot 73 in the wall 59. Another pin 74 (Fig. 7) is secured to the top end of wall 59, and a tension spring 75 is attached to both said pins 72 and 74 so as to pull the slide 57 into its topmost position. The slide 57 is provided with a main recess 76 so shaped as to receive therein a coin inserted through the slots 24 and 68 when the recess 76 is in registry with these slots as it is the case in the topmost position of the slide, shown in Fig. 8. A so inserted coin will come to rest mainly on the edge portions 77 and 78 of the recess 76. The latter is further provided with a lower extension 79 to receive therein the tongue 64 of the channel wall 59 so that the slide may travel within the channel 58 without being hampered by said tongue. If, now, slide 57 with a coin 80 is pulled downward with the aid of grip 70, the coin will engage tongue 64 and will be removed by the latter from the slide to be dropped into the chute 62.

For the reasons to be explained hereinafter, it is desirable that the slide cannot return to its topmost position under the action of spring 75 unless it has previously reached its lowermost position. In order to insure such operation, the rim of the slide, opposite the grip 70 is provided with two substantially square recesses 81 and 82 spaced from each other the length of the desired stroke of the slide. Intermediate these square recesses, there are triangular recesses 83 of smaller depth. A detent 84 is pivoted at 85 and provided with a spring 86 which is so arranged as to hold the detent projecting through an opening 87 in the chute wall, and in engagement with the recessed slide rim.

Now, it will be apparent that the slide 57 can reverse its direction only when the detent 84 projects into one of the deeper square recesses whereas the detent will be directed either upward or downward in one of the shallower recesses 83, thus preventing the slide from reversing its movement which caused the detent to enter such shallower recess.

Above grip 70, another portion of the slide is bent in the opposite direction to form a projection 88 adapted to engage a member 89 slidably arranged between the wall of the housing 17 and a bent portion 90 of the chute wall 59, as clearly shown in Fig. 2, and to raise or lower it when projection 88 engages abutment 91 of member 89 on the upward stroke of slide 57, or abutment 92 on the downward stroke. The abutments are so spaced from each other that member 89 will be shifted only when the slide is approaching its end positions. Member 89 has a lower extension 93 so arranged that it will bear on the top of the forward end of latch 38 and swing it into released position when the member 89 is pushed downward, whereas extension 93 is above the path of the rear end of bolt 34 when member 89 is in its topmost position. If, now, the receiver 12 is lifted from its rest in Fig. 2 so that bolt 34 bears against latch 38, and if, then, member 89 is pushed downward by slide 57, the extension

93 will turn latch 35 in an anti-clockwise direction so as to release the bolt 34. Thereupon, the spring 35 will pull the bolt back until its rear end sliding on top of the front part of latch 33 abuts against the extension 93. In this position the bolt 34 is still in engagement with the dial disc 15. However, as soon as slide 57 on its upwards stroke has lifted member 89 with extension 93 sufficiently to clear the bolt, the latter will slide completely backward into its inoperative position while the forward end of the latch 33 is held down by the lower side of the bolt 34.

Another projection 94 at the top of slide 57 serves to set a timing device in general denoted by 95 which now will be described with reference to Fig. 3. A cylinder 98 is mounted on a ledge 96 of the housing 17 and secured thereto by screws 97. A cover 99 is attached to the cylinder, e. g., by a pin and slot connection as indicated at 100 in Fig. 3. A piston 101 provided with a number of relatively large holes 102 is secured to a piston rod 103 and movable within cylinder 98. Below piston 101, piston rod 103 has an extension 104 which carries a valve disc 105 provided with narrow holes 106 in registry with holes 102 of the piston. Disc 105 is adapted to seat against the lower face of piston 101, and on the other hand, to move a short distance in axial direction away from the piston. A spring 107 is so arranged as to urge the piston downward. Thus, in raising the piston, only a very small resistance will be experienced owing to the liquid passing through the holes 102 and, then, around the periphery of the valve disc 105, whereas, when the piston is forced downward, the liquid has to pass through the small holes 106 of the valve disc. By suitably selecting the dimensions of the spring 107 and of the holes 106 the time can be predetermined which will be required for the complete downward stroke of the piston. A roller 109 is secured to the top end of rod 103 by suitable means, e. g., pin 108, and bears on the end 110 of a lever 111 pivoted at 112 on bracket 113, the latter being secured to a stationary part of the device, e. g., the chute wall 60. The other end 114 of lever 111 is so arranged as to bear against the lower face of the projection 94 of slide 57. A slot 115 in the chute walls 60 and 63 permits the projection 94 to pass as far downward as required in view of the length of the stroke of slide 57. Now, it will be apparent that piston 101 will be raised to its topmost position, when the slide 57 is pulled downward, and that, upon release of the slide 57 for its return movement, the piston 101 will be lowered under the action of spring 107 and that it will reach its lowermost position within a predetermined time after separation of the lever arm 114 from projection 94 at the beginning of the upward movement of slide 57.

For a purpose to be explained hereinafter, a retarding device is provided in connection with the timing device 95. In the illustrated embodiment, the retarding device comprises an angular member 116 having a leg 117 which extends substantially parallel to the axis of cylinder 98. Member 116 is secured to the top end of the piston rod 103 and leg 117 is guided by suitable means as indicated at 118. As clearly shown in Figs. 3 and 9, leg 117 is provided with an indentation 117', and below this indentation, with recesses 119, thus having a comb-like shape. The recessed portion is doubled by another comb-like piece 120 as shown in Fig. 9 and which is spaced from the leg 117 a distance approximately

equal to the width of the recesses 119. The top end 121 of piece 120 is slantingly bent towards the lower end of the indentation 117' and secured to leg 117, e. g., by welding, and the recesses 122 of piece 120 are provided in staggered relation to the recesses 119. Piece 120 may be L-shaped in cross-section in order to be welded to leg 117 along its entire length.

Slide 57 is provided also with a recess 123 (Fig. 3) for a coin-released detent 124. A pivot pin 125 for the detent is secured to the rear side of the inclined wall portion 67. The lower end of detent 124 is hook-shaped at 126 and the upper end has the shape of a projecting tongue 127 (Fig. 6). The hook 126 is arranged opposite a recess 128 in the wall 63 which recess is shorter than the recess 123 in the slide as clearly shown in Fig. 3. The upper portion of detent 124 is operative in a recess 129 in the wall portion 67 opposite the recess 79 of the slide. A spring 130 is so arranged as to urge the hook 126 into engagement with the slide recess 123 should the weight distribution of the detent be not sufficient to cause the required tendency of the detent to fall into locking position. Now, it will be apparent that the detent 124 projecting through recess 128 in wall 63 and engaging recess 123 in slide 57 will permit only a very short downward movement of the slide 57 owing to the limited length of recess 123. If, however, as indicated in Fig. 6, a coin 80 is inserted, the lower edge of such coin will engage tongue 127 when the slide 57 is pulled downward as far as recess 123 permits such movement. Thereby, detent 124 will be swung in anti-clockwise direction in Fig. 6 so that the hook 126 leaves both the recesses 128 and 123, and the slide can continue its downward movement. The detent will fall back to lock the slide when recess 123 comes into registry with recess 128 on the return stroke of the slide.

It has been shown how a coin inserted into the apparatus will be transferred into chute 62. In this chute the coin will be temporarily held in a position 80' in Figs. 3 and 7 by means hereinafter described. Opposite the chute space occupied by the coin in position 80', there is a recess 135 through which the lower end 136 of a lever 137 may project into the chute 62. Lever 137 is pivoted at 138 on the rear side of wall 63. Its upper end 139 is formed as a plate or the like, which, in the position of Fig. 6 prevents a coin 80 inserted into the apparatus from passing through an upper recess 140 of chute wall 60, whereas the plate 139 in the position of Fig. 7 will direct an inserted coin through the recess 140 into the space in the rear of wall 63 as will be more fully described hereinafter. Recess 140 is in registry with recess 76 of the slide when the latter is in its topmost position. Opposite recess 140, there is another recess 141 in the wall 59 of smaller size but sufficiently wide to receive therein the plate 139. The arrangement is such that plate 139 is flush with the inner side of wall 60, and that the lower end projects into chute 62 when no coin is in the position 80'. This is shown in Fig. 6, where a coin at 80 will be correctly guided by plate 139 on its downward movement with slide 57. If, however, a coin is in the position 80' in Fig. 7, it urges the lower lever end 136 towards the right with the result that plate 139 takes an inclined position in recess 141. Thus, any coin subsequently inserted in case the toll is more than one coin will be diverted to leave the chute 58 and slide 57

through recess 140 of wall 60, and to drop into the till 27. The pivot hole 142 in the lever 137 is elongated so that the lever may be swung out of the way of the upper rim of slide 57 when the latter returns to its topmost position. A spring 138' is so arranged as to exert a torque on the lever in a clockwise direction in Fig. 7 and co-incidentally to urge the lever to bear against pivot 138 with the right hand end of its elongated hole 142. In connection with lever 137 and its operation, it should be noted that the apparatus, according to my invention, is not in general intended for public use. For this reason, it is sufficient to provide locking means which respond to the insertion of only one coin corresponding to the local call toll, and, in addition thereto, means as hereinabove described to prevent disturbance of the normal operation of the apparatus if other coins are subsequently inserted in payment for the higher charge in the case of a long distance call.

The means will now be described for temporarily supporting a coin in the chute 62 and for selectively returning it or depositing it in the till according to whether the receiver is restored to its rest before or after the end of a predetermined time. Two brackets 150 (Fig. 3) are secured to the rear chute wall 63, for instance, by welding. The brackets carry an axle 151. Two substantially U-shaped members 152 and 153 are rotatably mounted on axle 151, and adapted to project with their heads 154 and 155 respectively of one of their legs through recesses 156 and 157 in the wall 63 into the interior of chute 62. The other leg of member 152 carries a pin 158 adapted to bear against the comb-like leg 117 on that side to which the piece 120 is attached as shown in Fig. 9. The length and thickness of the pin 158 are such that the pin may pass through the recesses 122, and 119 and also through the space between the piece 120 and leg 117. Member 153 carries a pin 159 secured to the rear portion of its head 155, which pin is adapted to bear against the piece 120 or, on top of the latter, against leg 117. The length of pin 159, however, is larger than the depth of the recesses 122, and 119. Thus, pin 159 cannot pass from the one side of the comb-like member to the other one. A spring 160 is so wound on axle 151 and attached to members 152 and 153, that it tends to urge head 154 into the chute 62. This movement is limited when member 152 abuts against the lower rim of recess 156. Co-incidentally, spring 160 tends to urge head 155 of member 153 rearward, i. e., out of chute 62, the movement of member 153 being limited by pin 159 bearing against the bottom of the indentation 117' of the comb-like member. The heads 154 and 155, when projecting into chute 62 serve to support temporarily a coin dropped into said chute. For this reason the heads 154 and 155 will be termed hereinafter as supports. As will be apparent from Fig. 3, the chute 62 is wider than the coin diameter, and in fact so much wider, that a coin may roll down towards the left (in Fig. 3) from the support 155 when the support 154 is withdrawn from the chute 62, and that the coin may roll down on the right-hand side when support 155 is withdrawn. Withdrawal of support 154 will result in that the coin dropping on the left side will strike the inclined bottom wall 161' of the chute and roll through slot 26 into the holder 162 at the outside of the apparatus. If, on the other hand, support 155 will be withdrawn while support 154 is in opera-

tive position, the coin rolling off support 154 towards the right hand side will drop into the till 27 through the lower chute opening which extends from the side wall edge 163 to the edge 161 of the short bottom wall 161'. Even if the coin rolling off support 154 when support 155 is withdrawn hits the edge 161, it will receive an impetus towards the right side rather than towards the passage for the coin return owing to the arrangement of the edge 161 on the left-hand side of the vertical center line of the chute. Fig. 9 shows pin 159 when the piston 101 of the timing device is in its lowest position. In this position, which corresponds to that of Fig. 6, support 155 is withdrawn from chute 62. If, however, the piston is caused to start its upward movement, the inclined portion 121 of leg 117 immediately forces pin 159 towards the left-hand side in Fig. 9 against the restraint of spring 160 with the result that support 155 enters the chute 62 as shown in Fig. 7. From there on until the piston has completed its upward as well as its downward stroke, the support 155 is held within the chute by pin 159 bearing against the side of the comb piece 120. Only at the end of the downward stroke when pin 159 returns to its original position, by sliding along the inclined face 121 of leg 117 into the latter's indentation 117', will spring 160 withdraw support 155 from its operative position. Consequently, a coin temporarily supported by supports 154 and 155 will be deposited into the till 27 only after the timing device 95 has run down.

Means are provided in connection with the other support 154 to withdraw it so as to return the temporarily supported coin when the receiver is put back on its rest prior to the end of the operation of the timing device, and to retard the withdrawal of the support 154 sufficiently long to insure disconnection of the telephone apparatus. The object of the mentioned means is to prevent the coin from being returned through an only momentary replacement of the receiver, while the connection with the called party is still established, in other words, to prevent the return of a coin which should be correctly deposited in the till for an established and consummated telephone connection. In the illustrated embodiment, the mechanism (Fig. 2) for tripping the support 154 is connected with the lever 45 which responds to the movement of the receiver rest 13, and which, for the indicated purpose, has an arm 165 with an abutment 166. A link 167 is pivoted to arm 165 at 168, and a spring 169 is so arranged as to urge link 167 against the abutment 166. The free end of link 167 is provided with an abutment 170 and a pivot pin 171 to which a pawl 172 is attached. A spring 173 connected to pawl 172 and link 167 tends to turn the pawl 172 so as to engage the abutment 170. The free end 174 of the pawl is adapted to engage a shoulder 175 of member 152 from below and, when moving upward, to tilt member 152 sufficiently to permit the pawl to slip off shoulder 175 and to pass it so as to reach the position shown in Fig. 2. When the pawl 172 moves downward the projection of member 152 which forms the shoulder 175 will urge the pawl to swing about pin 171 against the restraint of spring 172 until its end 174 is free to take its lower end position underneath the shoulder 175. Now, it will be apparent from Fig. 2 that, upon lifting of the receiver 12, receiver rest 13 will move upward owing to the action of the conventional telephone mechanism (not shown) and le-

ver 45 following such movement owing to the action of spring 50 will turn in a clockwise direction. Consequently, link 167 abutting against abutment 166, and pawl 172 will be moved downward. In the course of this movement, the end 174 of the pawl 172 will slide over the projection which forms the shoulder 175 of member 152. When arm 47 of lever 45 has reached its topmost position, the pawl end 174 will be located below shoulder 175 and will be pulled against abutment 170 by spring 173, while member 152, owing to the restraint of spring 160, remains in its position in which the support 154 projects into the chute 62. If, now, the receiver is restored to its rest 13, and, at that time, pin 158 is opposite a tooth between two subsequent recesses 122 of the comb-like piece 120, then lever 45 will be turned in anti-clockwise direction, thereby lifting link 167 and tending to tilt the member 152 with the aid of pawl 172 which engages shoulder 175. Member 152 being prevented from turning, owing to the position of pin 158 in relation to the comb, link 167 and pawl 172 will be disengaged from their respective abutments 166 and 170 thereby tensioning springs 169 and 173. If, however, at the time when the receiver is restored to its rest 13, the comb-like member 117 is moving downward, owing to the operation of the timing device 95, then the tensions of the springs 169 and 173 will overcome the restraint of spring 160 as soon as pin 158 is in registry with one of the recesses 122 of comb-like piece 120, with the result that member 152 can be turned until pin 158 abuts against the tooth of member 117, opposite the recess 122 through which the pin has slipped. This movement, however, is insufficient to withdraw support 154 completely from chute 62. The position in which pin 158 abuts against a tooth between two recesses 119 of member 117 may be directly reached when at the time the receiver is restored, pin 158 is just opposite a recess 122 rather than opposite a tooth between two recesses 122 as hereinbefore assumed. In that event, the pin 158 will immediately pass through the pertaining recess 122 to engage the tooth which is in registry with said recess 122 and between two recesses 119. Complete withdrawal of support 154 occurs when upon further downward movement of the comb-like member 117, pin 158 is in registry with a subsequent recess 119 of member 117, so that it may pass therethrough. Now, the member 152 will be turned far enough to be withdrawn completely from chute 62, and, furthermore, to permit pawl end 174 to slip upwards from underneath shoulder 175 into its inoperative position as shown in Fig. 2. Thereafter, spring 160 will tend to return member 152 into its supporting position in the chute 62. In order to do so, pin 158 has to pass the comb-like member in a manner similar to that described, but in the opposite direction. Since it may happen, that this takes place when the timing device and the retarding device constituted by the comb-like member have reached or are approaching the lowermost position, or that the receiver has been taken from its rest and returned thereto before the timing device is set for operation by manipulation of the slide 57, the topmost recesses 119a and 122a are arranged on a circle with a radius equal to the distance of the axle 151 from pin 158 rather than in staggered relation as the recesses 119 and 122. Consequently, pin 158 can freely move from the position at the left side of the comb in Fig. 9 to

the position 158a and back again whenever the timing and retarding device is in its lowermost position. Now, it will be apparent that a coin supported on supports 154 and 155 will be deposited in the till when the timing device has run off prior to the receiver being returned to its rest, so that pin 159 has settled in the indentation 117'. If, however, the receiver is returned to its rest before support 155 has been withdrawn from the chute, the coin will be returned as hereinbefore described. In connection with the dimensioning of the retarding device, the following points should be noted: The spacing of the two comb parts 117 and 120 plus the thickness of the member 120 should be less than the distance pin 158 has to travel in order to cause the complete withdrawal of support 154. With a view to attaining proper relations the thickness of the pin and its distance from pivot 151 should be correctly chosen. Furthermore, the relative location of indentation 117' and the topmost recess 122a of member 120 should be such that pin 159 reaches the position in which support 155 is completely withdrawn from the chute 62, very shortly before the end of the downward stroke of the timing device, whereas recess 122a reaches pin 158 coincidentally with the end of said stroke.

From the foregoing description, it will be clear that only one of the supports 154 and 155 can be withdrawn from the chute at a time, because withdrawal of support 155 occurs only when the timer piston 101 is in its lowermost position whereas withdrawal of the support 154 can practically occur only while the piston is moving during its downward stroke. Furthermore, it will be noticed that spring 160 tends to urge support 154 into and support 155 out of the chute and that mechanical means are provided to counteract such tendency, namely, the inclined surface 121 and side wall of comb 117 in cooperation with pin 159 to urge the support 155 into the chute during the operation of the timing device, and the pawl 172 and accessorial parts to swing support 154 out of engagement with the chute during the time pawl end 174 exercises a lifting force on the shoulder 175 of member 152.

The described apparatus operates as follows:

Before the apparatus is used, the parts are in the position shown in Figs. 2, 3, 6, and 9, that is to say: the receiver 12 is on its rest 13, bolt 34 engages disc 15, slide 57 is in topmost position, the timing device 95 and the comb 117 are in their lowermost position, plate 139 is flush with chute wall 60, support 154 projects into chute 62 from which support 155 is withdrawn, and hook 126 projects into recesses 128 and 123, preventing unauthorized operation of slide 57. Now, the user may first take the receiver 12 from its rest 13. In consequence thereof, the lever 45 will swing in clockwise direction in Fig. 2, thereby releasing its pressure on the arm 52 of bell crank lever 53 and pulling pawl 172 downward into a position underneath shoulder 175, of member 152. Thereupon, the user will insert a suitable coin through slot 24. The coin will be seated on the rim portions 77 and 78 of slide 57 and will be held in upright position by chute wall 59 and plate 139. Then, the user will take hold of grip 70 and pull slide 57 downward. When, shortly after the beginning of such movement, the coin engages tongue 127 thereby withdrawing the hook 126 from recess 123, slide 57 can continue its downward stroke. When the lower rim of the coin reaches the inclined tongue 64, it is deflected into chute 62. However, before

this happens, the slide projection 94 bearing on the arm 114 of lever 111 will have raised the timing and retarding device sufficiently far to urge member 153 with support 155 into supporting position in chute 62 owing to pin 159 being urged by the inclined portion 121 toward the left-hand side of the comb member in Fig. 9. Thus, the coin comes to rest on both supports 154 and 155 in the position 80' in Fig. 3, in which it has turned lever 137, by engaging projection 136, in anti-clockwise direction so that plate 139 is in the position of Fig. 7 to deflect any subsequently inserted coins through recess 140 into the till 27. Completing its downward movement, slide 57 with projection 88 will engage the projecting shoulder 92 of member 89 which will be taken along so as to engage and turn latch 38 in anti-clockwise direction in Fig. 2 whereupon bolt 34 will slide backward owing to the action of spring 35 to bear against the lower end 93 of member 89 without, however, releasing its hold on the dial disc 15. Coincidentally, the upward movement of the timing and retarding device has been completed so that the pins 158 and 159, one above the other, bear against the lower end of the comb-like member 120. Thereafter, the user will release slide 57, so that the latter can be pulled upward by spring 75. At once, projection 114 of lever 111 will be disengaged from slide projection 94, and piston 101 of the timing device will independently start its own movement under the action of spring 107 and according to the cross-section of the valving apertures 106 which are dimensioned for a predetermined length of time of the downward stroke, say 35 seconds. This length of time is considered sufficient to dial a party's number, and to restore the receiver to its rest for the return of the coin if either the busy signal is given or the called party does not answer. In the course of its upward movement, projection 88 engaging shoulder 91 will raise member 89 whereupon bolt 34 will slide backward as far as the bell crank lever 53 permits, thereby releasing dial disc 15. When the upper portion of slide 57 passes the lower edge of plate 139, it forces lever 137 backward against the restraint of spring 138' until plate 139 can fall back into the position of Fig. 7 owing to the recess 76 in slide 57. Approximately at the same time, recess 123 will be in registry with recess 128 so that hook 126 will return to its locking position with respect to slide 57. During the downward as well as during the upward stroke, slide 57 is prevented from reversing its movement by virtue of the mechanism 81 to 87, hereinbefore described, so that the completion of the required operations is safeguarded. As soon as the bolt has been withdrawn from locking position, the user may dial the desired number. If the receiver is restored to its rest before the end of the running time of the timing device, the coin will be returned in the manner hereinbefore described by an oscillatory movement of the member 152, caused by lever 45 with link 167, and pawl 172 in the one direction, and spring 169 in the other direction. This movement is retarded by the interaction of pin 158 and the comb-like members 117, 120. Simultaneously, however, with the returning of the receiver, bolt 34 is pushed into locking position by lever 45 acting on bell crank lever 53. At the end of the running period of the timing device, the member 153 with support 155 will be withdrawn from chute 62 when pin 159 enters the indenta-

tion 117'. If the receiver has not been returned before the end of said period, the coin will be dropped into the till. As soon as the coin has left its temporary position on the supports in chute 62, lever 137 will be swung back into the position of Fig. 6, whereupon the slide 57 is ready to receive another coin.

Hitherto, it has been assumed that the user will first take up the receiver and, then, insert a coin and manipulate the slide 57. If the reversed sequence is chosen, the slide 57 will cause the same operations as hereinbefore described. However, the subsequent lifting of the receiver off its rest will not cause the withdrawal of bolt 34, because latch 38 removed from operative position on the downward stroke of the slide will have returned to its locking position on the return stroke of the slide. Consequently, the user will be compelled to put the receiver back on its rest with the result that support 154 will be operated and the coin returned. Furthermore, it will be noticed that incoming calls may be answered at any time, because on the one hand, they do not require manipulation of the dial, and on the other hand, the mere lifting and returning of the receiver will cause only an oscillating movement of the support 154. Additional means have been described to accomplish outgoing calls either with the aid of a key or by breaking a readily replaceable part if no coin is available.

It will be understood by those skilled in the art that various changes in the specific form of my novel apparatus, particularly in the arrangement and configuration of the several parts thereof, may be made without departing from my invention. I desire it to be understood that my invention is limited, not by the particular disclosure of the specific embodiment thereof illustrated and described hereinabove, but by the scope of the appended claims, it being recognized by me that various changes in addition to those hereinabove suggested and indicated, may be made in the construction and operation of my apparatus.

I claim:

1. In a coin-controlled locking attachment for a dial telephone including a receiver, a receiver rest, and a dial disc, the combination of a locking member to lock said disc against rotation, a till, a coin passage having a first and a second opening towards the outside of said attachment for insertion and return respectively of a coin and a third one towards said till, a timing device, a mechanism including a movable and manually actuated member to cause withdrawal of said locking member from locking position, said manually actuated member being operatively connected with said timing device so as to set the latter for operation, a detent for holding said movable member in inoperative position, said detent projecting into said passage so as to be removed from its holding position by a coin passing through said passage, movable supporting means adapted to project into said passage so as to receive a coin having passed said detent, means under the control of said timing device for moving a portion of said supporting means in one manner out of its supporting position so as to constitute a coin guide towards said till, a second mechanism operable by said receiver rest upon the receiver being placed thereon for moving said locking member into locking position and for moving another portion of said supporting means in another manner out of its support-

ing position so as to constitute a coin guide towards said second opening of the passage, and a retarding device for retarding the movement of said supporting means when it is moved in said other manner.

2. In a coin-controlled locking attachment for a dial telephone including a receiver, a receiver rest, and a dial disc, the combination of a locking member to lock said disc against rotation, a till, a coin passage having a first and a second opening towards the outside of said attachment for insertion and return respectively of a coin and a third one towards said till, a timing device, a mechanism including a movable and manually actuated member to cause withdrawal of said locking member, a lost motion connection of said movable member with said timing device whereby said movable member is adapted to set said timing device for operation during the forward stroke of said movable member and to permit said timing device to start running on the return stroke of said movable member, a detent for holding said movable member in inoperative position, said detent projecting into said passage so as to be removed from its holding position by a coin passing through said passage, movable supporting means adapted to project into said passage so as to receive a coin having passed said detent, means under the control of said timing device for moving a portion of said supporting means in one manner out of its supporting position so as to constitute a coin guide towards said till, a second mechanism operable by said receiver rest upon the receiver being placed thereon for moving said locking member into locking position and for moving another portion of said supporting means in another manner out of its supporting position so as to constitute a coin guide towards said second opening of the passage, and a retarding device in operative connection with said other portion of said supporting means for retarding its movement in said other manner.

3. In a coin-controlled locking attachment for a dial telephone including a receiver, a receiver rest, and a dial disc, the combination of a locking member to lock said disc against rotation, a spring in engagement with said locking member and tending to withdraw the latter from locking position, a latch adapted to hold said locking member in locking position, a till, a coin passage having a first and a second opening towards the outside of said attachment for insertion and return respectively of a coin and a third one towards said till, a timing device, a movable and manually actuated member, lost motion connections of said movable member with said latch and with said timing device whereby said movable member is adapted to set said timing device for operation during the forward stroke of said movable member and to release said locking member and to start running of said timing device on the return stroke of said movable member, a detent for holding said movable member in inoperative position, said detent projecting into said passage so as to be removed from its holding position by a coin passing through said passage, first and second individually movable supporting members, said supporting members having a position in which they project into said coin passage so as to co-operate in forming a support for a coin having passed said detent, said first supporting member when in operative position obstructing said third opening, said second supporting member when in operative position ob-

structing said second opening, means operable by said timing device to remove said first supporting member from its operative position, and means operable by said receiver rest upon the receiver being placed thereon for removing said second supporting means from its supporting position and for returning said locking member into its locking position.

4. In a coin-controlled locking attachment for a dial telephone including a receiver, a movable receiver rest, and a dial disc, the combination of a locking member to lock said disc against rotation, a spring in engagement with said locking member and tending to withdraw the latter from locking position, a till, a coin passage having a first and a second opening towards the outside of said attachment for insertion and return respectively of a coin and a third one towards said till, a timing device, a movable and manually actuated member projecting into said passage so as to receive an inserted coin, a detent means to hold said movable member in its inoperative position, said detent means projecting into said passage so as to be engaged and removed from holding position by said coin received by said movable member when the latter is actuated, said movable member being operatively connected with said timing device so as to set and to start the latter, first and second individually movable supporting members, said supporting members having a position in which they project into said passage so as to receive and co-operatively support said coin released from said movable member, said first supporting member when in operative position, obstructing said third opening, said second supporting member when in operative position obstructing said second opening, means in connection with and operable by said timing device to remove said first supporting member from its operative position, means operatively connected to said second supporting means and said locking member and in engagement with said receiver rest to remove said second supporting means from its supporting position and to return said locking member into its locking position when the receiver is placed on said rest, and a retarding device in engagement with said second supporting member, said retarding device having shorter delaying action than the running time of said timing device for the first supporting member for retarding the removal of said second supporting member.

5. An apparatus as claimed in claim 4 in which said retarding device comprises a member including two spaced sets of teeth in parallel planes the teeth of the one set being arranged opposite the intervals between the teeth of the other set, said second support including a pin, and said means for moving said second support out of its operative position being adapted to urge said pin resiliently against said toothed member, whereby said pin can pass through an interval between two teeth of the first set when the pin is opposite such interval, and through the consecutive interval between the teeth of the second set when the toothed member has been sufficiently advanced to bring said consecutive interval opposite said pin.

6. An apparatus as claimed in claim 1 further comprising a spring adapted to urge said other portion of said supporting means into its operative position, said means for removing said other portion of said supporting means out of its operative position including a resiliently movable member and a pawl resiliently connected to said mem-

ber, and said other portion of said supporting means including an abutment, said pawl being adapted to engage said abutment when said other portion of said supporting means is in its operative position, and to pass beyond said abutment when said other portion of said supporting means has reached its inoperative position, whereby said spring will return said other portion of said supporting means into operative position.

7. In an apparatus of the type described the combination of a member for locking a telephone dial disc against rotation, a spring tending to withdraw said member from its locking position,

5 a latch for holding said member in locking position and removable from operative position by a coin controlled mechanism, said latch including means tending to move said latch into operative position, a breakable fixed part accessible from the outside of the apparatus, a second tensioned spring bearing against said breakable part so as to constitute an abutment for said latch in operative position of the latter, whereby said spring 10 when released from restraint owing to a destruction of said breakable member will urge said latch into inoperative position.

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