

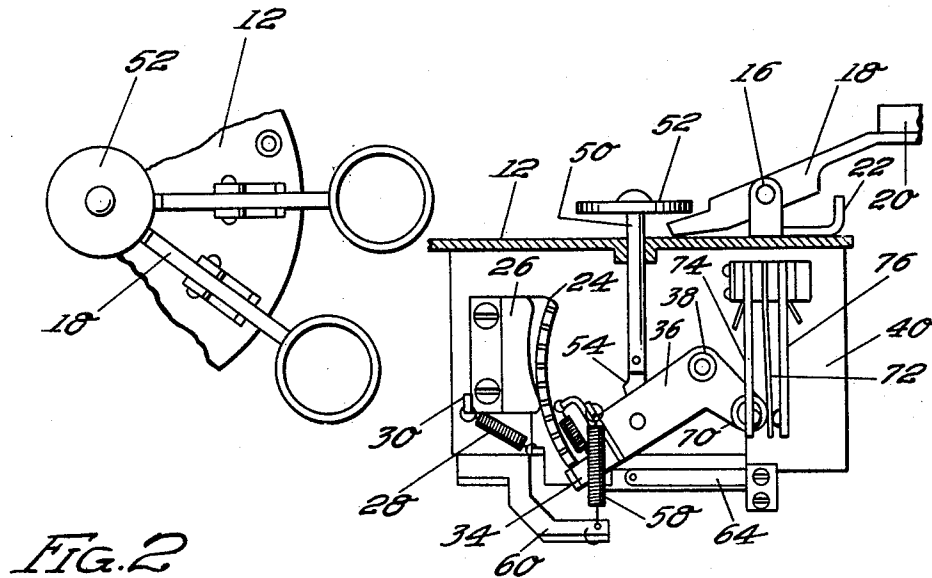
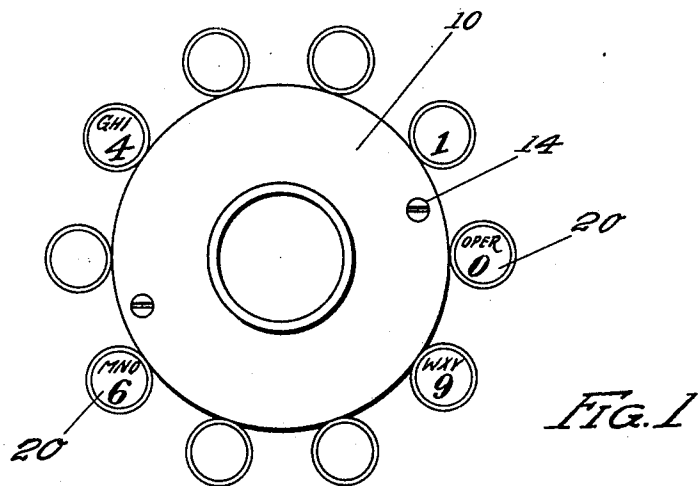
Jan. 31, 1933.

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1,895,552

DIAL TELEPHONE OPERATING MEANS

Filed Aug. 28, 1931 2 Sheets-Sheet 1



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DIAL TELEPHONE OPERATING MEANS

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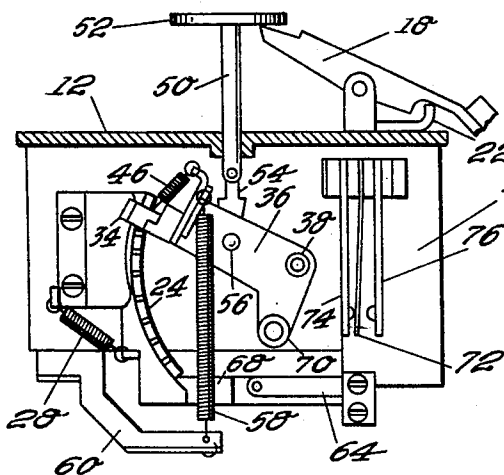


FIG. 4

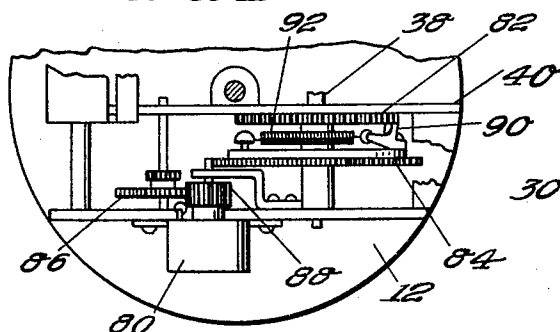


FIG. 5

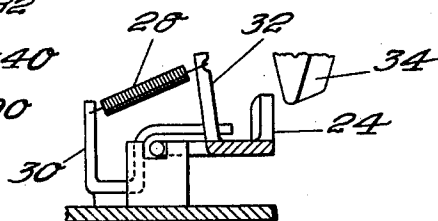


FIG. 6

FIG. 8

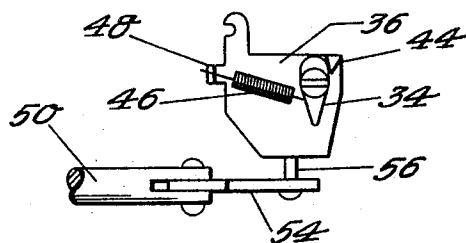
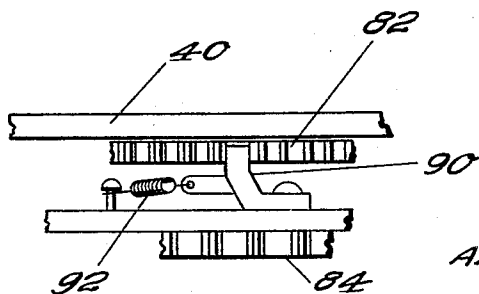


FIG. 7

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FIG. 9

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DIAL TELEPHONE OPERATING MEANS

Application filed August 28, 1931. Serial No. 559,961.

This invention relates to an improved dial telephone operating means, and has for one of its principal objects the provision of means whereby a telephone of the dial type may be more conveniently and readily operated, and with a minimum expenditure of time.

One of the important objects of this invention is to provide an improved novel and useful means for operating telephones of the dial type wherein the necessity of rotating the dial to obtain a certain sequence of desired letters and numbers is eliminated.

Still another important object of the invention is the provision of an improved dialing mechanism for automatic telephones and the like whereby a desired sequence of numbers, letters or other insignia can be conveniently and readily impressed upon the recording mechanism of the device by means of levers or push-buttons.

Another and still further important object of the invention is the provision of a novel means for operating telephones and other instruments of the dial type whereby inaccuracies in operation will be automatically avoided.

Other and further important objects of the invention will be apparent from the disclosures in the accompanying drawings and following specification.

The invention, in a preferred form, is shown in the drawings and hereinafter more fully described.

In the drawings:

Figure 1 is a top plan view of the improved dial telephone operating means of this invention, illustrating particularly the novel levers or push-buttons.

Figure 2 is a portion of a similar top view with the cover of the dialing case removed.

Figure 3 is a side elevation of the improved mechanism, showing one of the levers and the common attachments for operating the current making and breaking means ordinarily used in the automatic telephone.

Figure 4 is a view similar to Figure 3, only showing the operating lever depressed and the related parts in correspondingly shifted position.

Figure 5 is a detail view, showing the es-

sential elements of the make and break system.

Figure 6 is a view somewhat similar to Figure 5, only illustrating in more detail the hinged arrangement of the ratchet which cooperates with a movable pawl for the make and break.

Figure 7 is a detail view, showing the construction of the movable pawl and the stop means allowing the same to operate in one direction only.

Figure 8 is an end view of the train of gears which connect the main operating shaft of the device to a speed governor.

Figure 9 is an enlarged view of certain of the gears shown in Figure 8, illustrating particularly the one way drive for the main governor operating gear.

As shown in the drawings:

The reference numeral 10 indicates generally the cover-plate for the casing of the improved dialing mechanism of this invention, this cover-plate 10 being maintained in position on a base plate 12 by means of screws or the like 14.

Pivotal mounted on supports 16 positioned on the base plate 12 is a series of levers 18, each lever having an operating push-button or the like 20 on its outer end. The push-buttons have indicia thereon showing the desired grouping of letters or numerals as is common in the ordinary automatic telephone dial. Stops 22 are provided, these stops varying in height for each of the levers so that a desired amount of depression of the lever is accomplished, this amount of depression corresponding to a certain resultant desired upward movement whereby a series of electrical contacts are made and broken.

This make and break feature is embodied in a rack or the like 24 which is hinged mounted on a supporting plate 26 and maintained in normal operating position by means of a helical spring 28 which has its ends attached to suitable supports 30 and 32 mounted on the supporting plate 26 and the hinged rack 24 respectively. (Figure 6.)

Adapted to cooperate with the rack 24 is a movable pawl 34 which is supported on the end of an arm 36, the arm itself being shaped

as best shown in Figures 3 and 4, and pivotally mounted on the shaft 38 on a supporting plate 40 which depends from and is fastened to the base plate 12.

5 In order that the pawl 34 may ride freely in one direction over the teeth of the rack 24, it is pivotally mounted on the end of the arm 36 by means of a screw or the like 42, and a stop element 44 is provided whereby rearward motion of the pawl is prevented. (Figure 7.) A helical spring 46 is also attached at one end to the pawl and at the other end to an extension 48 of the arm 36 whereby the pawl is normally maintained with its upper end against the stop 44, but is allowed to move away from said stop upon depression of any of the levers 18, and a consequent circular movement of the arm 36 around the shaft 38, whereupon the pawl slides over the teeth of the rack 24, and the parts assume a position as shown in Figure 4.

The amount of travel of the arm 36 and associated parts depends, of course, upon the distance through which the lever 18 is moved, this being regulated by the stop 22. An operating connection between any one of the levers 18 and the arm 36 is furnished by means of a vertically movable stem 50 mounted in a suitable bearing for the base plate 12 and provided at its top with a disk 52, the peripheral edge of which overlaps the ends of each of the operating levers 18 (Figure 2), and which is adapted to be raised through a certain predetermined distance upon depression of anyone of the levers. At the bottom of the stem 50, a pivotal connection is made with the arm 36 by means of a link 54, thereby preventing any binding of the stem 50 in its bearing upon being moved upwardly while at the same time allowing of an arcuate movement of the point of connection 56 with the link 54.

A helical spring 58 connects one end of the arm 36 to an extension 60 forming part of the supporting plate 40, whereby the arm 36 is normally maintained in its lowermost position as shown in Figure 3, and any operation of the levers 18 and the associated parts is against the tension of this spring 58.

50 Upon the intermittent up and down movement of the rack 24 occasioned by the movement of the pawl 34 thereover, a switch comprising a leaf spring 62 and an associated bar 64 together with cooperating contact points 66 is alternately opened and closed by the action of an insulating plate 68 upon the end of the spring 62 which insulating plate is attached to and forms part of the rack 24. In this way, a desired number of impulses are transmitted to the central telephone office and the automatic instruments there located.

In order that each operation of one of the levers 18 be kept separate and distinct from the subsequent and preceding operation of

the same or an adjacent lever, a break in the main transmitting current must be made, and this is accomplished by means of an insulated switch operating element 70 mounted on the rear end of the arm 36, which element contacts with a leaf-spring 72 forming part of the double switch, which has for its remaining parts bars 74 and 76 respectively as best shown in Figures 3 and 4. This particular switch and its connections to the instrument at the central office are old and well-known in the art, and further detailed description of such connections is not considered necessary here.

In order that the transmitting speed of the apparatus does not exceed the capacity of the receiving instrument at the central office a governor is provided which is of the ordinary centrifugal type and is enclosed in a casing or the like 80 as best shown in Figure 8, and a connection to this governor is made between the main shaft 38 upon which the arm 36 is mounted by means of a train of gears 82, 84, 86 and 88. The gear 82 is fixed on the shaft 38 (Figures 8 and 9) and rotates therewith in two directions upon both the upward and downward movement of the stem 50 and its connected parts.

A cam-faced pawl 90 is pivotally mounted on the face of the gear 84 and held in contact with the teeth of the gear 82 by means of a spring 92. The cam face of the pawl allows the gear wheel 82 to rotate thereunder upon an upward motion of the stem 50 and the arm 36, but the teeth of the wheel 82 contact the forward face of this cammed pawl upon a return movement, carrying the same with it in its rotation, and imparting a corresponding rotation to the gear wheel 84.

This is connected by means of gears 86, 88, etc., to the governor in the case 80, and consequently a too rapid return movement of the arm 36 and the pawl 34 over the rack 24 is prevented. In this manner, the series of make and break operations at the point 66 in the switch element 62-64 are regulated so that a sufficient time elapses between each impulse.

The particular device of this present invention can be made more compact than the ordinary rotatable dial now common on automatic telephones, and on account of the push-button feature is more readily and conveniently operated, and at the same time, the possibility of mistakes owing to undesirable movement of the telephone base itself during the dialing operation is positively avoided. Furthermore, the parts are simple of manufacture and of a minimum number, thereby assuring of a small cost in making and a consequent lesser liability of getting out of order. Additionally, the downward operation of the push-button is inherently more simple than the rotation of a dial for the ordinary person using this type of ap-

paratus, and mistakes are consequently much less liable to occur.

I am aware that many changes may be made and numerous details of construction varied throughout a wide range without departing from the principles of this invention, and I, therefore, do not purpose limiting the patent granted hereon otherwise than as necessitated by the prior art.

I claim as my invention:

1. A means for operating automatic telephones, comprising a series of levers for variable movement, a central operating shaft about which the levers are circularly grouped and an electrical make and break contact element connected to said central operating shaft.

2. A means for operating automatic telephones, comprising a series of levers, a central operating shaft about which the levers are grouped and an electrical make and break contact element connected to said central operating shaft, together with a head on the shaft, the periphery of which extends over the inner ends of the said levers.

3. A means for operating automatic telephones, comprising a series of levers, a central operating slidable shaft about which the levers are grouped and one portion of an electrical make and break contact element connected to said central operating shaft, the other portion of said make and break element comprising a rack hingedly mounted for movement in a plane at right angles to the movement of the operating shaft.

4. A means for operating automatic telephones, comprising a series of levers, a central operating shaft about which the levers are grouped for individual selective contact and one portion of an electrical make and break contact element connected to said central operating shaft, the other portion of said make and break element comprising a rack hingedly mounted for movement in a plane at right angles to the movement of the operating shaft, and a pawl for movement over the rack on the first-named portion of the contact element.

5. A means for operating automatic telephones, comprising a series of levers, a central operating shaft about which the levers are grouped and one portion of an electrical make and break contact element connected to said central operating shaft, the other portion of said make and break element comprising a rack hingedly mounted for movement in a plane at right angles to the movement of the operating shaft, and a pawl for movement over the rack on the first-named portion of the contact element, together with stop and spring means associated with the pawl for allowing free movement thereof over the rack in one direction.

6. A means for operating automatic telephones, comprising a series of levers, a cen-

tral operating shaft about which the levers are grouped and one portion of an electrical make and break contact element connected to said central operating shaft, the other portion of said make and break element comprising a rack hingedly mounted for movement in a plane at right angles to the movement of the operating shaft, and a pawl for movement over the rack on the first-named portion of the contact element, and an electrical switch operatively associated with the end of the rack.

7. A means for operating automatic telephones, comprising a series of levers, a central operating shaft about which the levers are grouped and one portion of an electrical make and break contact element connected to said central operating shaft, the other portion of said make and break element comprising a rack hingedly mounted for movement in a plane at right angles to the movement of the operating shaft, and a pawl for movement over the rack on the first-named portion of the contact element, together with stop and spring means associated with the pawl for allowing free movement thereof over the rack in one direction, an extension on the operating member, and a current carrying switch operatively associated with said extension.

8. A means for operating automatic telephones, comprising a series of levers, a central operating shaft about which the levers are grouped and one portion of an electrical make and break contact element connected to said central operating shaft, the other portion of said make and break element comprising a rack hingedly mounted for movement in a plane at right angles to the movement of the operating shaft, and a pawl for movement over the rack on the first-named portion of the contact element, together with stop and spring means associated with the pawl for allowing free movement thereof over the rack in one direction, an extension on the operating member, a current carrying switch operatively associated with said extension, and contact elements in the switch adapted to be shifted from one current-carrying position to another upon movement of the member and its associated elements over the said rack.

9. A means for operating automatic telephones, comprising a series of levers, a central operating shaft about which the levers are grouped and one portion of an electrical make and break contact element connected to said central operating shaft, the other portion of said make and break element comprising a rack hingedly mounted for movement in a plane at right angles to the movement of the operating shaft, and a pawl for movement over the rack on the first-named portion of the contact element, together with stop and spring means associated with the pawl

for allowing free movement thereof over the rack in one direction, an extension on the operating member, a current carrying switch operatively associated with said extension, and contact elements in the switch adapted to be shifted from one current-carrying position to another upon movement of the member and its associated elements over the said rack, together with a governor to control the speed of said movement.

10. A means for operating automatic telephones, comprising a series of levers, a central operating shaft about which the levers are grouped and one portion of an electrical make and break contact element connected to said central operating shaft, the other portion of said make and break element comprising a rack hingedly mounted for movement in a plane at right angles to the movement of the operating shaft, and a pawl for movement over the rack on the first-named portion of the contact element, together with stop and spring means associated with the pawl for allowing free movement thereof over the rack in one direction, an extension on the operating member, a current-carrying switch operatively associated with said extension, and contact elements in the switch adapted to be shifted from one current-carrying position to another upon movement of the member and its associated elements over the said rack, together with a governor to control the speed of said movement, a shaft upon which said operating member is rotatably mounted, and a train of gears connecting said shaft to the governor.

11. A means for operating automatic telephones, comprising a series of levers, a central operating shaft about which the levers are grouped and one portion of an electrical make and break contact element connected to said central operating shaft, the other portion of said make and break element comprising a rack hingedly mounted for movement in a plane at right angles to the movement of the operating shaft, and a pawl for movement over the rack on the first-named portion of the contact element, together with stop and spring means associated with the pawl for allowing free movement thereof over the rack in one direction, an extension on the operating member, a current carrying switch operatively associated with said extension, and contact elements in the switch adapted to be shifted from one current-carrying position to another upon movement of the member and its associated elements over the said rack, together with a governor to control the speed of said movement, a shaft upon which said operating member is rotatably mounted, and a train of gears connecting said shaft to the governor, together with a one-way drive connection between two adjacent gears of said train.

12. A means for operating automatic tele-

phones, comprising a series of levers, a central operating shaft about which the levers are grouped and one portion of an electrical make and break contact element connected to said central operating shaft, the other portion of said make and break element comprising a rack hingedly mounted for movement in a plane at right angles to the movement of the operating shaft, and a pawl for movement over the rack on the first-named portion of the contact element, together with stop and spring means associated with the pawl for allowing free movement thereof over the rack in one direction, an extension on the operating member, a current-carrying switch operatively associated with said extension, and contact elements in the switch adapted to be shifted from one current-carrying position to another upon movement of the member and its associated elements over the said rack, together with a governor to control the speed of said movement, a shaft upon which said operating member is rotatably mounted, and a train of gears connecting said shaft to the governor, together with a one-way drive connection between two adjacent gears of said train, said one-way drive connection comprising a cammed pawl pivotally mounted on one gear, and with its cammed face in normal contact with the teeth of the adjacent gear.

13. A means for operating automatic telephones, comprising a series of levers, a central operating shaft about which the levers are grouped and one portion of an electrical make and break contact element connected to said central operating shaft, the other portion of said make and break element comprising a rack hingedly mounted for movement in a plane at right angles to the movement of the operating shaft, and a pawl for movement over the rack on the first-named portion of the contact element, together with stop and spring means associated with the pawl for allowing free movement thereof over the rack in one direction, an extension on the operating member, a current carrying switch operatively associated with said extension, and contact elements in the switch adapted to be shifted from one current-carrying position to another upon movement of the member and its associated elements over the said rack, together with a governor to control the speed of said movement, a shaft upon which said operating member is rotatably mounted, and a train of gears connecting said shaft to the governor, together with a one way drive connection between two adjacent gears of said train, said one-way drive connection comprising a cammed pawl pivotally mounted on one gear, and with its cammed face in normal contact with the teeth of the adjacent gear, and spring means for normally maintaining said operating contact.

14. In a mechanism for operating automatic telephones, a hinged rack, a make and

break switch operatively associated with said rack, and means movable over the rack for shifting the same about its hinges to alternately open and close the contacts in said switch.

15. In a mechanism for operating automatic telephones, a hinged rack, a make and break switch operatively associated with said rack, and means movable over the rack for shifting the same about its hinges to alternately open and close the contacts in said switch, the teeth of said rack being cammed in one direction, and a pawl adapted to move freely over the teeth in a reverse direction, and to operate the rack about its hinged point upon moving in the other direction.

16. In a mechanism for operating automatic telephones, a hinged rack, a make and break switch operatively associated with said rack, and means movable over the rack for shifting the same about its hinges to alternately open and close the contacts in said switch, the teeth of said rack being cammed in one direction, and a pawl adapted to move freely over the teeth in a reverse direction, and to operate the rack about its hinged point upon moving in the other direction, and operating means for predetermining the distance of travel of said pawl over the rack.

17. In a mechanism for operating automatic telephones, a hinged rack, a make and break switch operatively associated with said rack, and means movable over the rack for shifting the same about its hinges to alternately open and close the contacts in said switch, the teeth of said rack being cammed in one direction, and a pawl adapted to move freely over the teeth in a reverse direction, and to operate the rack about its hinged point upon moving in the other direction, and operating means for predetermining the distance of travel of said pawl over the rack, said operating means comprising a series of operating levers, and means operatively connecting the individual levers to the pawl.

18. In a mechanism for operating automatic telephones, a hinged rack, a make and break switch operatively associated with said rack, and means movable over the rack for shifting the same about its hinges to alternately open and close the contacts in said switch, the teeth of said rack being cammed in one direction, and a pawl adapted to move freely over the teeth in a reverse direction, and to operate the rack about its hinged point upon moving in the other direction, and operating means for predetermining the distance of travel of said pawl over the rack, said operating means comprising a series of operating levers, and means operatively connecting the individual levers to the pawl, together with graduated stop means for successively limiting the distance of operative movement of said levers.

19. In a mechanism for operating auto-

matic telephones, a hinged rack, a spring for normally holding the rack in one position, a make and break switch operatively associated with said rack, and means movable over the rack for shifting the same about its hinges to alternately open and close the contacts in said switch, the teeth of said rack being cammed in one direction, and a pawl adapted to move freely over the teeth in a reverse direction, and to operate the rack about its hinged point upon moving in the first direction, and means for predetermining the distance of travel of said pawl over the rack, said means comprising a series of levers, and means indirectly connecting the individual levers to the pawl, together with graduated stop means for successively limiting the distance of movement of said levers, and respective indicia at the end of each lever.

In testimony whereof I affix my signature.
ABRAM L. MYERS.

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