Feb. 3, 1942. L. E. LA GUARDIA 2,272,089

DIALING DEVICE FOR TELEPHONES

Filed Aug. 10, 1939

Fig. 1.

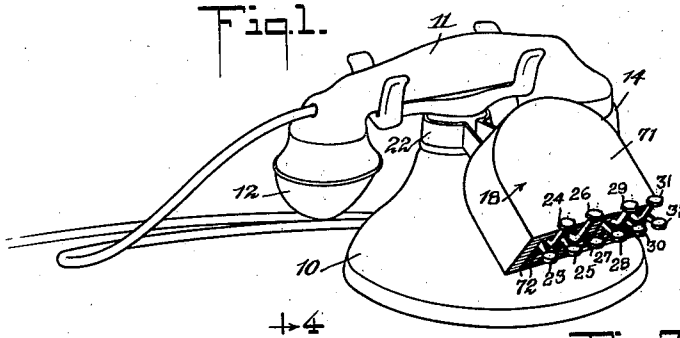


Fig. 6.

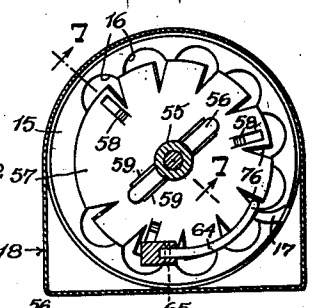


Fig. 2.

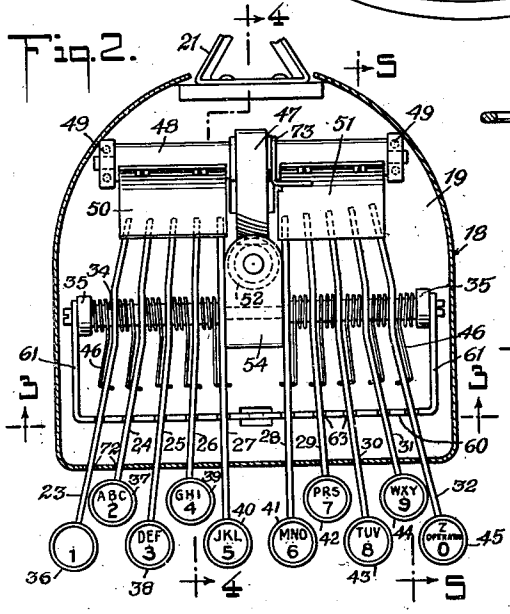


Fig. 7.

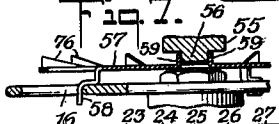


Fig. 3.

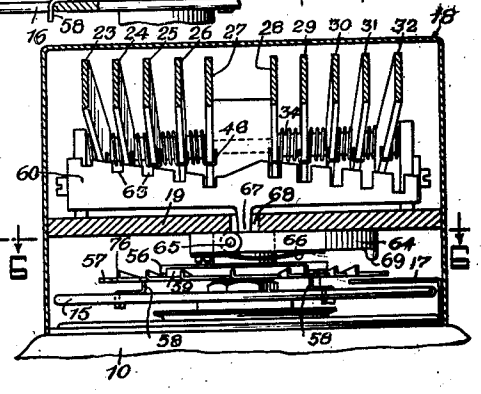


Fig. 5.

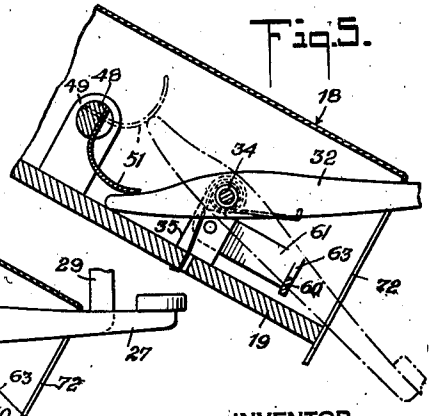
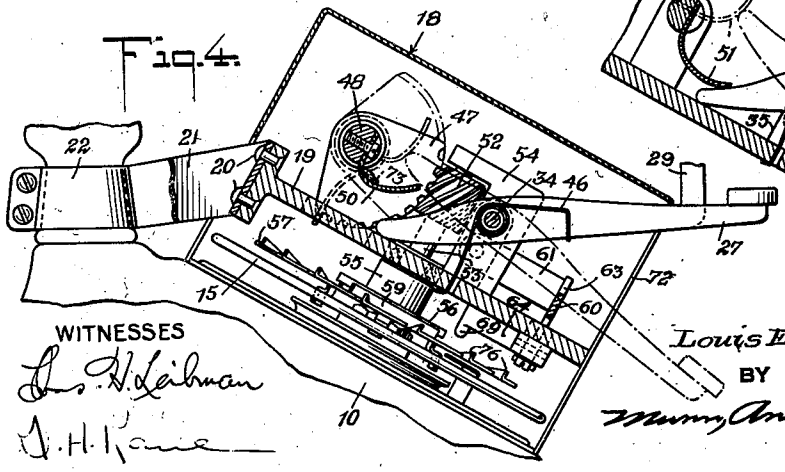


Fig. 4.



WITNESSES

INVENTOR

Louis E. La Guardia

BY

ATTORNEYS

Patented Feb. 3, 1942 2,272,089

# UNITED STATES PATENT OFFICE

2,272,089

## DIALING DEVICE FOR TELEPHONES

Louis E. La Guardia, New York, N. Y.

Application August 10, 1939, Serial No. 289,382

7 Claims. (Cl. 179—90)

This invention relates to an improved dialing device for telephones.

In the conventional type of dial telephone a rotatable dialing disk is provided. Upon the rotation of the disk electrical impulses are set up. By sequentially combining these impulses in various manners connections between different telephone stations can automatically be established. Normally the dials are so arranged that they are rotated in one direction against the tension of a spring and when released will return to the original position. A plurality of separate dial holes are provided in the disk, each representing various numbers of impulses and a stop is provided adjacent the disk at one point. In using the dial the finger of the operator is inserted in the desired dial opening and the disk is rotated until the finger engages the stop. When the finger is removed the dial will then return to its normal position, due to the action of the spring. To establish the desired station connections it is necessary to make a plurality of operations of this character in succession and selecting the proper dial openings in the proper sequence.

Considerable difficulty has frequently arisen in the operation of dials of this character. Thus it is easy to inadvertently select the wrong dial opening and frequently the finger of the operator will slip from one opening to another or else the disk will be released prior to the time that the finger engages the stop. Any of these circumstances results in the dialing of the improper number.

It is a prime object of the present invention to overcome the difficulties encountered in this respect and to provide an improved simplified dialing device whereby the desired sequence of numbers, letters or symbols can readily be selected and wherein the danger of the inadvertent selection of the wrong number, letter or symbol is reduced to a minimum.

A further object is the provision of a device of the above character which may readily be attached to the standard type of dial telephone without injuring the telephone in any respect and without requiring the removal or disturbance of any of the standard parts of the telephone.

Another object is the provision of an improved dialing device of the above character which is of relatively simple and inexpensive construction and which will operate over a long period of time with comparative freedom from wear.

For a fuller understanding of the invention reference should be had to the accompanying drawing, in which

Fig. 1 is a perspective view of a telephone having my improved dialing device attached thereto;

Fig. 2 is a sectional plan view of the device;

Fig. 3 is an elevation in section in the direction of the arrows on the line 3—3 of Fig. 2;

Fig. 4 is a longitudinal sectional view in the direction of the arrows on the line 4—4 of Fig. 2;

Fig. 5 is a longitudinal sectional view in the direction of the arrows on the line 5—5 of Fig. 2;

Fig. 6 is a plan view of the coupling disk and dial plate taken on the line 6—6 of Fig. 3; and

Fig. 7 is a detailed view in section in the direction of the arrows on the line 7—7 of Fig. 6.

In the accompanying drawing my device is illustrated as applied to a standard type of dial telephone comprising a base 10 and a hand set 11 formed with a mouthpiece 12 at one end and an earphone 14 at the other end. On the base is mounted in the usual manner for rotary movement the circular dial disk or plate 15 provided with a plurality of openings, usually 10 in number, as shown most clearly at 16 in Fig. 6. Adjacent and overlapping the dial plate is the stop 17 adapted to engage the finger of the operator when it is inserted in one of the dial openings and rotated to a point adjacent the stop.

As shown in Fig. 6 the dial plate is partially rotated from normal position. Each dial opening usually represents certain numbers and symbols. One of the standard arrangements is to number the dial openings from 1 to 10 and to also cause each of the dial openings with the exception of the first to represent certain letters of the alphabet. This arrangement of course is subject to variation and is merely described herein as an illustration of a standard type of dialing arrangement.

The telephone dial plate and associated mechanism just described forms no part of the present invention. Their construction is well understood by those skilled in the art and is merely illustrated and described herein as the type of mechanism to which my dialing device may be attached.

My improved dialing device is indicated generally by the numeral 18 and comprises a supporting plate 19 suitably attached as by means of rivets 20 to an arm 21 projecting from the circular clamp 22 which is adapted to be attached around the standard of the telephone base in the manner shown most clearly in Figs. 1 and 4.

In my device I provide suitable mechanism for converting the rotary movement of dial 15 into

substantially vertical movement and this mechanism preferably comprises a plurality of levers corresponding in number to the number of dial openings, which, in this instance is 10. The levers are indicated by the numerals 23 to 32 and they are pivotally mounted on a fulcrum comprising a shaft 34 supported on standards 35 which in turn are mounted on the plate 19. The ends of the levers 23 and 32 are in staggered relationship, alternate levers being somewhat shorter than the remaining levers and at the end of each lever is provided a disk shaped head indicated by the numerals 36 to 45.

Each of the levers represent one of the dial openings and is marked with the number and letters of the dial opening which it represents, as shown in Fig. 2. The levers are normally held in elevated position by means of the springs 46 disposed around shaft 34 and engaging the undersurface of the several levers. The levers in turn are operatively connected to the dial plate 15 so that the depression of a lever causes the dial plate to rotate through an arc of the proper length in accordance with the dial opening represented by the lever. Thus, when lever No. 23 is depressed it causes the dial plate 15 to rotate the proper amount for the operation of dial opening No. 1. The mechanism whereby this is accomplished comprises spiral gear segment 47 keyed to shaft 48, which in turn is pivotally mounted as by means of ball bearings in the uprights 49 which extend upwardly from plate 19. The segmental gear 47 is disposed substantially at the center of shaft 48 and at the two sides thereof are the curved actuating plates 50 and 51 which are rigidly secured to shaft 48 and which extend outwardly into the path of movement of the ends of the levers 23 to 32. Plate 51 is preferably radially offset with respect to plate 50 in a clockwise direction as viewed from the left hand side of Fig. 2. This is clearly illustrated in Figs. 4 and 5.

Fig. 4 shows in full lines the normal position of plate 50 and of lever 27 and in dotted lines the depressed position of the lever and the corresponding actuated position of the plate. Fig. 5 in full lines shows the normal position of plate 51 and of lever 32 and in dotted lines the depressed position of the lever and the corresponding actuated position of the plate. It will be seen that the plate 51 in its normal position extends to a substantially lower point than the plate 50 with the result that it is immediately actuated upon the operation of one of the levers 28 to 32, whereas on the other hand the levers 23 to 27 are depressed a predetermined amount before they cause the actuation of plate 50. The reason for this arrangement is that the levers 28 through 32 represent dial openings which require a greater amount of rotation of plate 15 for their operation.

Spiral gear 47 meshes with spiral gear 52 keyed to a shaft 53 which in turn is journaled in plate 19 and in bracket 54. Shaft 53 extends beneath plate 19 and a collar 55 having a transverse arm 56 connected to or formed integral therewith is fixedly attached to the lower end of the shaft. This arrangement forms a convenient mechanism for coupling the shaft 52 to dial plate 15 so that the rotation of the shaft will cause a corresponding rotation of the dial plate. The coupling is completed through means of a coupling disk 57 which may be connected to the dial plate so as to rotate therewith as by means of the arms 58 extending downwardly into the dial opening while it is keyed to shaft 53 by means of the parallel upstanding flanges 59 which form a channel to accommodate the arm 56. The arm 56 is of substantially the same width as the channel and the two sides thereof are engaged by the flanges 59. Due to this coupling arrangement it will accordingly be seen that when one of the levers 23 to 32 is depressed so as to cause rotation of shaft 48 spiral gear segment 47, spiral gear 52 and shaft 53 it will also cause the dial plate 15 to rotate.

Since each of the levers 23 to 32 represents one of the dial openings it is important that the depression of the lever causes the dial plate to rotate the proper amount for the opening represented by the lever. So as to automatically accomplish this result I provide a stop plate 60 in the form of a U-shaped strip having arms 61 pivotally mounted on shaft 34 and extending forwardly substantially parallel to plate 19 towards the heads of the levers. The guide plate 60 is provided with a graduated upper surface in the manner most clearly shown in Fig. 3 and with a plurality of downwardly extending guide slots 63 positioned beneath and adapted to accommodate the levers 23 to 32. When the levers are depressed they move downwardly into their respective slot 63 until they reach the bottoms thereof which serve as stops. It should be appreciated that the arrangement of the upper surface of plate 60 and of the slots 63 should be such that the movement of each of the levers is resisted and stopped when it has caused the proper amount of rotation of plate 15.

So as to insure the positive stopping of plate 15 at the proper point I also provide mechanism for engaging the coupling plate 57 at the proper time and for resisting further rotation thereof. This mechanism preferably comprises a lever 64 pivotally mounted at 65 to the undersurface of plate 19 and normally held in elevated position in engagement with the plate by means of spring 66. As previously pointed out plate 60 is pivotally supported on shaft 34. Depending downwardly from the center of plate 60 is a tab 67 which projects through an orifice 68 formed through plate 19 so that the tab rests on the top of lever 64. When any one of the levers 23 to 32 is depressed so as to engage the bottom of its slot 63 it causes plate 60 and tab 67 to shift downwardly with the result that lever 64 pivots downwardly against the tension of spring 66. The end of lever 64 is provided with a stop lug 69 which, when it is thus depressed, is adapted to engage one of the upstanding flanges 76 formed on coupling disk 57 thereby arresting further rotation of the disk. It will thus be seen that in addition to providing for the interengagement between the stop plate 60 and any one of the levers 23 to 32 when they are depressed, I have provided additional mechanism for stopping rotation of the dial plate in a positive and effective manner.

My improved dialing device is preferably enclosed in a casing 71 which is provided with a plurality of slots 72 in its forward wall through which the ends of the levers 23 to 32 and their respective heads project.

It will be appreciated that my device may be attached to a standard type of dial telephone by coupling the coupling plate 57 to the dial plate in the manner shown and described and by attaching the clamp 22 to the standard of the telephone base. In using the device it is merely necessary to depress the keys having the desired letters and numbers thereon in the proper sequence. The keys are depressed much in the manner of type-

writer keys and accordingly are easy to operate and reduce the danger of mistake to a minimum.

If desired, spiral spring **73** may be provided in association with the shaft **48** as shown most clearly in Fig. 2, the spiral spring serving to return the shaft to its normal position after one of the levers has been depressed and then released.

It will thus be appreciated that I have provided an improved dialing device for telephones which is of relatively simple construction, which may be readily attached to a standard type of dial telephone without injuring the telephone, and without the necessity of removing any of the parts thereof, and which operates in a simple and effective manner so as to avoid confusion and the danger of mistakes. It should be understood of course that modifications may be made in the illustrated and described embodiment of my invention without departing from the invention as set forth in the accompanying claims.

I claim—

1. A dialing device for use with a dial telephone having a rotary dial plate and a plurality of dial openings therein which comprises a supporting member, a plurality of levers representing the respective dial openings mounted on the supporting member, a coupling disk having means for engaging the dial openings in the dial plate so that the rotation of the coupling disk causes rotation of the dial plate, means mechanically connecting the levers with the coupling disk so that movement of the levers causes the coupling disk and dial plate to rotate and a stop plate having a plurality of abutment portions in the path of movement of the respective levers, the abutment portions being located in relatively different planes so that the movement of the different levers is limited to different predetermined amounts whereby the operation of the levers causes the dial plate to rotate through an arm corresponding to the position of the dial opening represented by the lever.

2. A dialing device for use with a dial telephone having a rotary dial plate and a plurality of dial openings as set forth in claim 1 in which the coupling disk has a plurality of upstanding flanges and which engages a member pivotally mounted on the supporting member and operatively connected to the stop plate, said member being shiftable into the path of movement of the upstanding flanges on the coupling plate so that when an abutment portion of the stop plate is engaged by one of the levers, said member arrests further rotation of the coupling plate.

3. A dialing device for use with a dial telephone having a rotary dial plate which comprises a supporting member, a plurality of levers mounted on the supporting member and shiftable through paths of different predetermined lengths, and means for operatively connecting the levers to the dial plate so that movement of the levers causes the dial plate to rotate, said means comprising a shaft journaled on the supporting member, a plurality of actuating plates mounted on the shaft and disposed in the path of movement of the levers, said plates being mounted at different points around the periphery of the shaft so as to be radially offset with respect to each other, a spiral gear segment mounted on the shaft, a spiral gear engageable with the spiral gear segment, and means operatively connecting the spiral gear with the dial plate.

4. The combination with a dial telehpone having a base and a rotary dial plate mounted thereon and formed with dial openings therein, of a dialing attachment which comprises a supporting member, means for attaching the supporting member on the base so as to retain it against rotation with respect thereto, a plurality of levers mounted on the supporting member representing the respective dial openings and means forming a positive mechanical connection between the levers and dial plate so that movement of the levers causes positive rotation of the dial plate through an arc corresponding to the position of the dial opening represented by the lever.

5. The combination with a dial telephone having a base and a rotary dial plate mounted thereon and formed with dial openings therein, of a dialing attachment which comprises a supporting member, a plurality of levers representing the respective dial openings mounted on the supporting member, a coupling member having engagement with the dial plate so that rotation of the coupling member causes rotation of the dial plate, and means forming a positive mechanical connection between the levers and coupling member whereby movement of the lever causes rotation of the coupling member and dial plate through an arc corresponding to the position of the dial opening represented by the lever.

6. The combination with a dial telephone having a base and a rotary dial plate mounted thereon and formed with dial openings therein, of a dialing attachment which comprises a supporting member, a plurality of levers representing the respective dial openings mounted on the supporting member, a coupling member having means for engaging a dial opening in the dial plate so that rotation of the coupling member causes rotation of the dial plate, and means forming a positive mechanical connection between the levers and coupling member whereby movement of the lever causes rotation of the coupling member and dial plate through an arc corresponding to the position of the dial opening represented by the lever.

7. The combination with a dial telephone having a base and a rotary dial plate mounted thereon and formed with dial openings therein, of a dialing attachment which comprises a supporting member, a plurality of levers representing the respective dial openings mounted on the supporting member, a coupling member having means for engaging a dial opening in the dial plate so that rotation of the coupling member causes rotation of the dial plate, means forming a positive mechanical connection between the levers and coupling member so that movement of the levers causes the coupling member and dial plate to rotate, and a stop plate having a plurality of abutment portions in the path of movement of the respective levers, the abutment portions being located in relatively different planes so that the movement of the different levers is limited to different predetermined amounts whereby the operation of the levers causes the dial plate to rotate through an arc corresponding to the position of the dial opening represented by the lever.

LOUIS E. LA GUARDIA.