July 13, 1926. 1,591,998

J. S. POPPER

DIAL OPERATING DEVICE

Filed Dec. 28, 1921

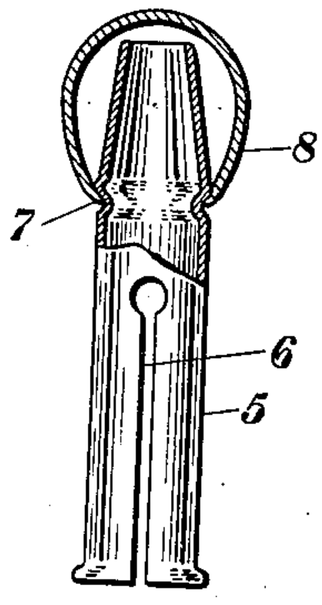

Fig. 1

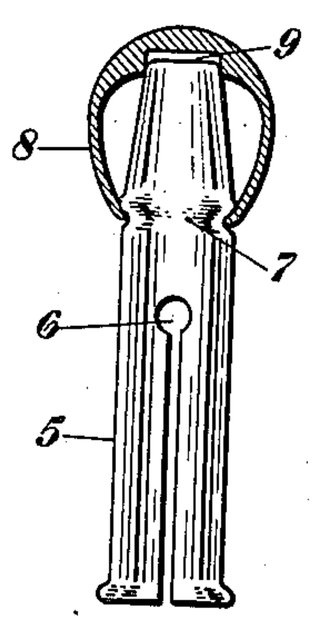

Fig. 2

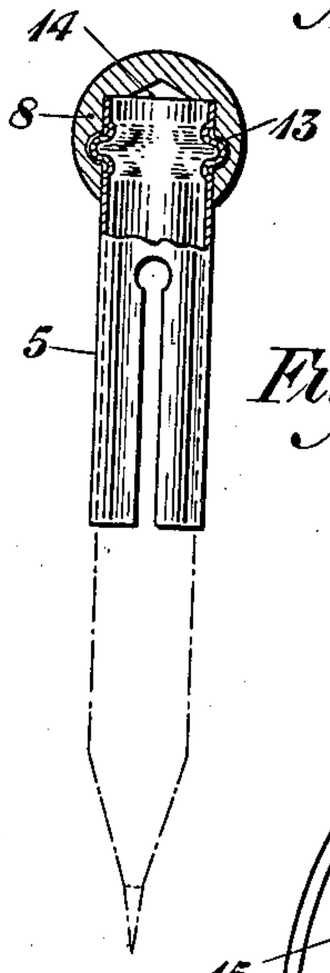

Fig. 3

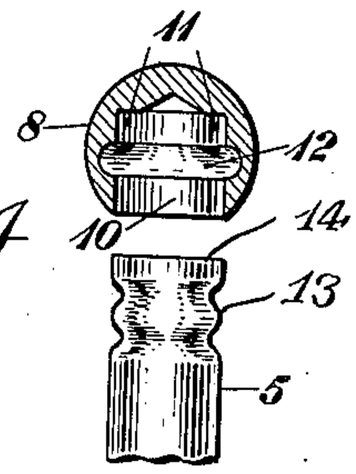

Fig. 4

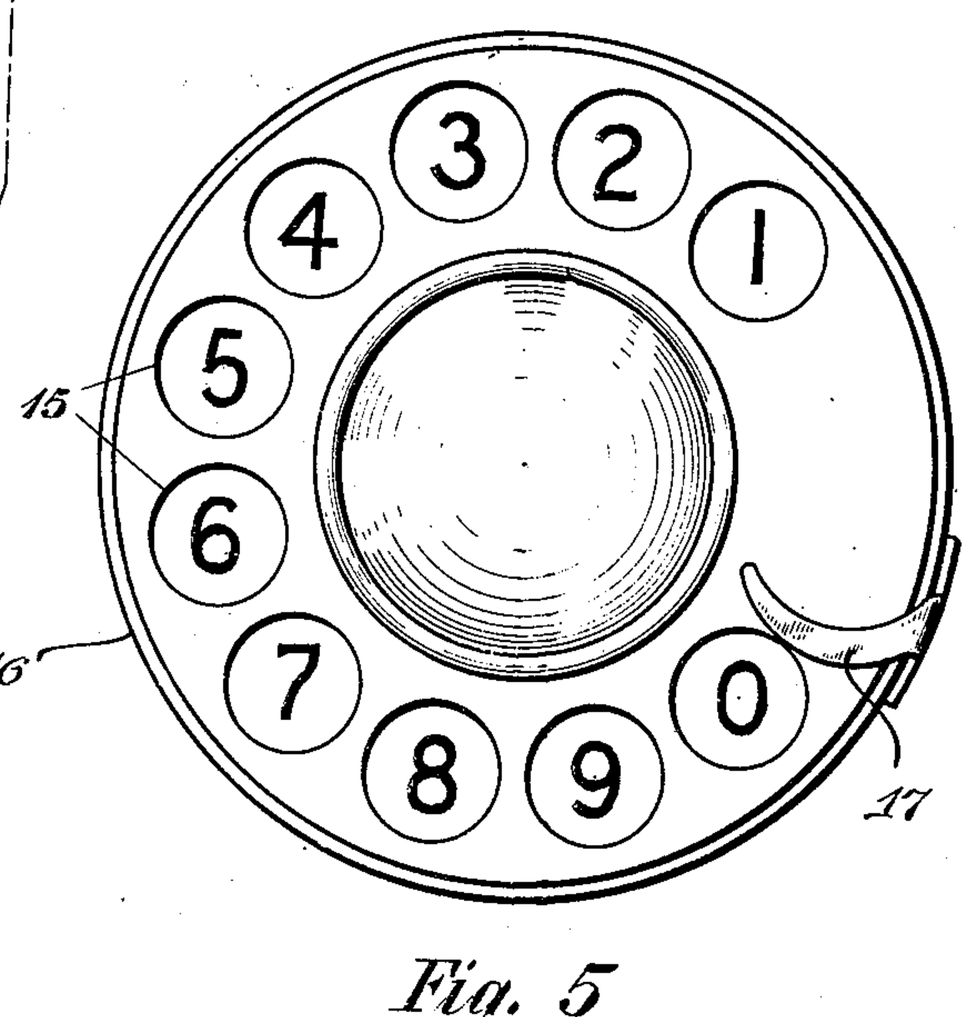

Fig. 5

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UNITED STATES PATENT OFFICE.

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DIAL-OPERATING DEVICE.

Application filed December 28, 1921. Serial No. 525,495.

This invention relates to dial operating devices, and more particularly to devices of this character which are adapted to be used in combination with pencils or the like in the operation of dials of automatic telephone instruments.

In automatic telephone practice, dialing devices are used with other instrumentalities at operators' stations and subscribers' stations for the purpose of establishing connections with other stations. A dialing device is provided with an inner circular plate, and an outer parallel circular plate, which is adapted to rotate. Arranged on the face and near the edge of the inner plate appear numerals 1 to 0 and in some cases other characters, and near the periphery of the face of the outer plate is disposed a series of circular openings. Each numeral has a corresponding opening in alinement therewith through which it may be readily discerned.

In the operation of the dial, the opening in the movable plate corresponding to the first digit of the number of the station with which it is desired to establish a connection is selected, and by a movement imparted thereto the plate is rotated in a clockwise direction until the lower edge of the opening is in alinement with a stop positioned on the device. The movable plate is then released and is returned to normal by means of a retractile spring attached to the shaft on which said plate is mounted. A corresponding operation is followed for each digit in the number of the called station, after which connection may be established through automatic apparatus at a central office.

The operator or subscriber in operating the movable plate ordinarily inserts the forefinger in the opening of said plate and continues to apply pressure to the edge thereof until contact is made with the stop. It will be obvious that as a result of frequent dialing operations the fingers of an operator or subscriber may become injured by contact with the edges of said openings during the rotation of the movable plate, and should the edges of the openings be sharp and rough, because of the unauthorized use of metallic objects in connection with the dialing operations, the chance of such injury will be greatly increased. Accordingly, it is an obect of this inventon to provide a device which will perform these dialing operations in an efficient manner and eliminate any chance of injury to the fingers.

Other and further objects of the invention will be apparent from the following description when read in connection with the accompanying drawing, in which like numerals of reference designate like parts throughout.

Referring to the drawing, Figure 1 is a side elevation partly in section of one embodiment of the invention; Figs. 2 and 3 are views showing modifications of Fig. 1; Fig. 4 is an exploded view of Fig. 3, showing detached elevations of the spherical head and associated casing, and Fig. 5 is a front elevation of a telephone dialing device, with which the improved arrangement is particularly adapted to be used.

In the drawing, 5 designates a casing or tubing having a vertical slot 6 provided in the circular side wall thereof. The casing 5 is adapted to fit over the top of some such object as a pencil or the like, as indicated in dotted lines in Fig. 3. The casing 5 is provided near its upper end with an annular bearing-surface 7, in which the edge of the lower or open end of a spherical knob or ball 8 is seated or journaled in such manner as to swivel freely thereon, as shown in Figs. 1 and 2. In the latter figure, a recess 9 is formed within the upper surface of the knob 8, which is of comparatively greater thickness at that point, and the end of the casing is adapted to register in said recess, and cooperate with the bearing surface 7 in providing a more substantial surface upon which the knob 8 may rotate. In Figs. 1 and 2 the knob is shown as of shell-like formation, while in Figs. 3 and 4 it is shown as of thicker construction.

In Figs. 1 and 2 the device may be assembled by forcing the end of the knob 8 over the head formed on the top of the bearing surface 7, while in Figs. 3 and 4 the upset spun part of the casing is forced into the offset or groove in the knob 8 by a blow on the opposite end of the casing.

In the detached spherical head or knob 8, as more clearly indicated in Fig. 4, there is provided a cylindrical chamber 10, terminating in a round flat portion 11, and having an annular groove 12 formed in the side wall thereof. The upper end of the casing 5 is adapted to fit within the chamber 10 as shown in Fig. 3, and an annular flange

13 provided thereon is adapted to register with the annular groove 12 so that the knob 8 is adapted to swivel freely on said flange, while the end 14 of the casing 5 upon which the knob also rotates, affords a cooperative bearing therefor.

The openings or holes 15 formed in the outer movable plate 16 of the dialing device are of a diameter slightly smaller than the diameter of the knob 8, so that in the operation of the device, said knob extends only partly through the openings 15. Thus, by applying the knob 8 to any of the openings in the movable plate and imparting a circular movement thereto, the plate may be rotated until the knob contacts with the stop plate 17, at which time the knob may be removed, whereupon the movable plate is returned to normal by means of a retractile spring. This operation of rotating the movable plate is continued until the swiveled head has been applied to each of the openings corresponding to each of the digits in the number of the called station.

The improved device may be attached to a pencil and used in combination therewith.

While the arrangements of this invention have been illustrated as embodied in certain specific forms which have been deemed desirable it will be understood that they are capable of embodiment in many and widely varied forms without departing from the spirit of the invention as defined in the appended claims.

What is claimed is:

1. A device for operating a dial of an automatic telephone instrument comprising a rod-like member, a bearing in said member, and a knob freely journaled on said bearing, said knob being of larger diameter than the holes of the dial so that it will firmly engage the periphery of a hole in the dial and when applied thereto will freely rotate upon said bearing as the dial rotates.

2. A device for operating an automatic telephone instrument having a dial including a movable circular plate with apertures provided about its surface, said device comprising a rod-like member, and a rounded knob mounted to freely swivel on one end of the member, said knob being of larger diameter than the holes of the dial so that but part of its surface will engage the periphery of an aperture in the dial and when said knob is applied thereto will freely rotate upon said bearing as the dial rotates.

3. A device for operating an automatic telephone instrument having a dial including a movable circular plate with apertures provided about its surface, said device comprising a rod-like member, and a rounded knob mounted to freely swivel on one end of the member, said knob being of larger diameter than the holes of the dial so as to be seated on the periphery of an aperture in the dial and limited in its extension therethrough by said periphery, and when applied thereto will freely rotate upon said bearing as the movable plate of the dial rotates.

4. A device for operating an automatic telephone instrument provided with the usual dial including its stationary circular plate bearing legends, its stop member, and its rotatable plate positioned above said stationary plate and having apertures provided about its surface through which said legends may be observed; said device comprising a rod-like member, a rounded knob mounted to freely swivel on one end thereof, the knob being of larger diameter than the apertures of the dial so that it may be seated on the periphery of an aperture in the rotatable plate and limited in its extension therethrough by said periphery to prevent contact with said legends and eliminate damage thereof, said knob when applied to the peripheries of the apertures to revolve said rotatable plate swivelling freely upon said rod-like member as said rotatable plate revolves, and the shape of said knob being of like contour to the convex surface of the stop member, so that it registers therewith at the termination of each complete dialing operation in such manner that movement of the rotatable plate is prevented beyond exactly the point where the arc of the periphery of an aperture with which the knob is engaged and the arc of the stop member become in alignment and thereby prevent false dialing operation.

In testimony whereof, I have signed my name to this specification this 27th day of December, 1921.

JULIUS S. POPPER.