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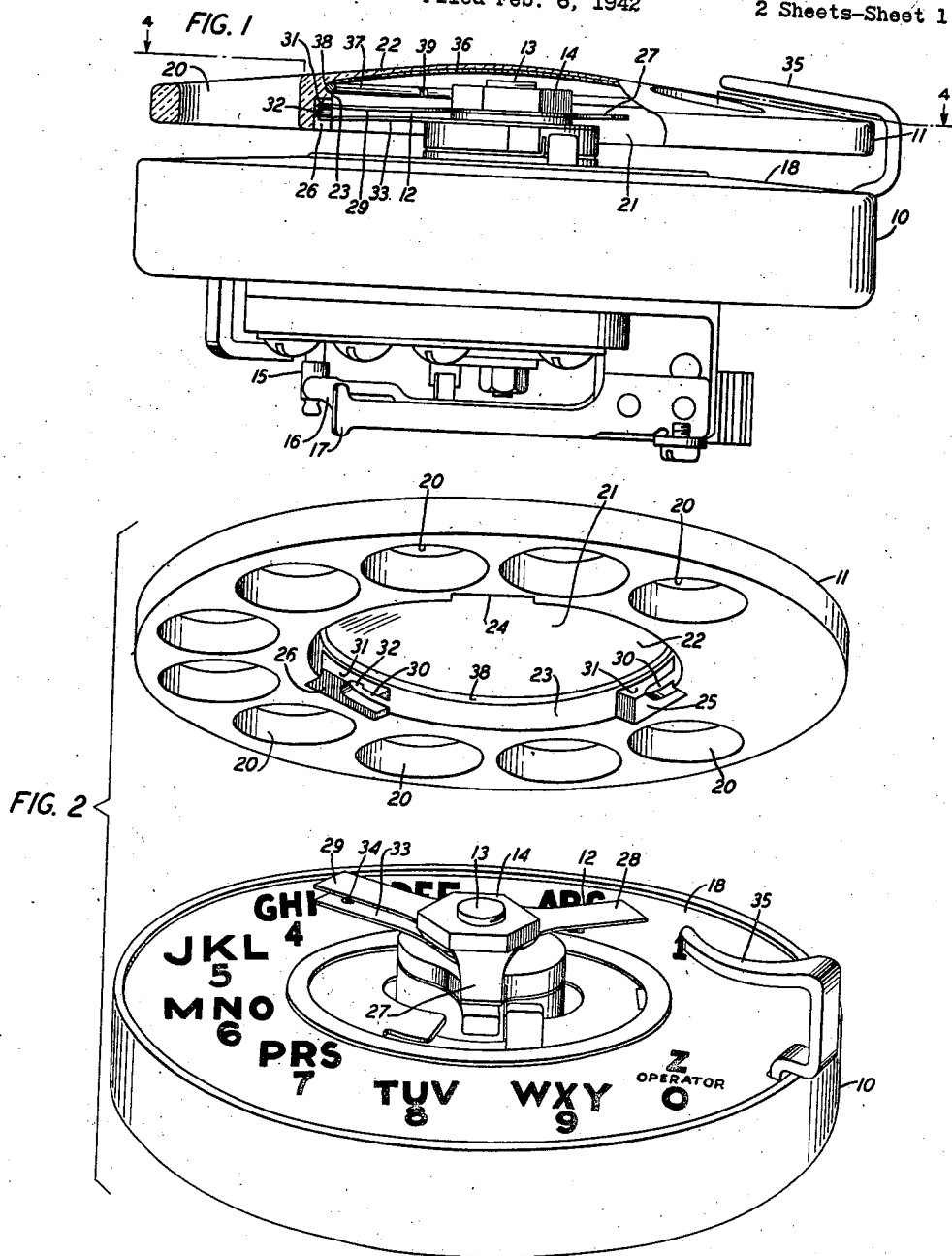
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TELEPHONE CALLING DIAL DEVICE

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TELEPHONE CALLING DIAL DEVICE

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5 Claims. (Cl. 179-90)

This invention relates to telephone calling dial devices and more particularly to telephone calling dial devices in which a finger wheel is supported on the rotatable shaft of the device.

An object of the invention is to provide an improved structure and arrangement for flexibly supporting the finger wheel and which permits ready application of the finger wheel to the device and removal therefrom.

A feature of the invention resides in a spider type flexible support for the finger wheel.

Another feature resides in the structure of the finger wheel.

In the drawings,

Fig. 1 is a side elevational view, partly in section, of the calling dial device embodying the invention.

Fig. 2 shows, in exploded arrangement, the dial device and the finger wheel.

Fig. 3 corresponds to Fig. 1 but shows a modification of the finger wheel.

Fig. 4 is a top plan view, partly in section, of the finger wheel and the flexible support therefor, and is drawn in reduced scale relative to Figs. 1, 2 and 3.

Fig. 5 is a view in perspective of a fragmentary portion of the finger wheel and is somewhat enlarged relative to Fig. 4.

Fig. 6 corresponds to Fig. 5 but shows in addition a fragmentary portion of the flexible support; and,

Fig. 7 is a sectional view of the parts shown in Fig. 6 and taken on the line 7-7 in Fig. 4.

It has been common practice to make finger wheels, for telephone calling dial devices, of metal and to directly mount the finger wheel on the rotatable shaft of the device, the finger wheel being held in place by means of a nut, screw threaded on the shaft.

It is also common practice to provide an apertured hub portion on the finger wheel and to mount in the hub portion a card and a transparent cover for the card, the card having the telephone substation name and number thereon and the card and the transparent cover being removable through the top of the hub portion to permit access to the nut on the rotatable shaft.

The trend is now, however, to make the finger wheel of some molded plastic material. In some cases it is desirable to make the finger wheel of transparent molded plastic material to enhance the appearance of the device and in order that light may pass through the finger wheel to letter and number characters on the calling device. Finger wheels of molded plastic material are not

as strong as the metal finger wheels and it is found advantageous to provide a flexible support for the finger wheel instead of mounting the finger wheel directly on the rotatable shaft of the calling device.

In this invention, the flexible spider type support for the finger wheel is mounted on the rotatable shaft of the device and the finger wheel is mounted on the spider type support, the finger wheel being formed to receive outer end portions of the spider type support. Means are provided in the finger wheel and the support to latch the wheel in required position on the support. The finger wheel may be readily applied to or removed from the spider type support without requiring any access through the top of the finger wheel. The finger wheel is arranged so that the station number card is inserted only from the underside or the finger wheel and the hub portion of the wheel may have an integral window in place of the transparent cover for the card.

The telephone calling dial device as shown in Fig. 1 comprises a casing 10, and a finger wheel 11, the finger wheel 11 being supported above the casing 10. The finger wheel 11 is supported by the flexible spider type support 12, the structure of which will be subsequently described. The support 12 is supported on a rotatable operating shaft 13 of the device and is held in position on the shaft 13 by means of a nut 14. The shaft 13 extends downward through the casing 10 and may be manually operated by means of the finger wheel 11 to wind up a spring (not shown) but which, as well-known in the art, is part of a spring motor which serves to return the finger wheel to normal position and as a driving means for a contact controlling device 15 which operates spring contacts 16 and 17 to control the sending of signal pulses over a line system to obtain a desired call connection. A ring-shaped dial 18 bearing groups of letters and numerals on its upper face is supported in the top of the casing 10, the groups being arranged in positions to be separately observed through the finger holes 20 provided in the finger wheel 11, all of which is well understood in the art. The finger wheel 11 is made of material suitable for molding to required form in a die and may be made for instance of a synthetic resin. The finger wheel 11 in Figs. 1 and 2 is provided with the usual finger holes 20 to facilitate manual rotation of the finger wheel in dialing a telephone call. The central portion of the finger wheel 11 is hollowed out from the under surface to provide a circular indentation 21 and to leave across

the top of the central portion a window 22 which is an integral part of the finger wheel. The indentation 21 is defined by the circular side wall 23 and the under surface of the window 22. The side wall 23 of the indentation 21 is recessed at spaced points to provide the recesses 24, 25 and 26 to receive respectively the outer end portions of the arms 27, 28 and 29 of the spider type support 12. The recesses 24, 25 and 26 are open at the bottom and closed at the top so that when the finger wheel 11 is suitably placed on the spider type support 12, the arms 27, 28 and 29 will pass upwardly in the respective recesses 24, 25 and 26. The width of the outer end portion of each arm of the spider type support 12 is slightly less than half the length of its receiving recess in the finger wheel 11. A projection 30 as shown in Fig. 2 is provided in each recess to serve as a shelf for the outer end portion of the arm of the spider type support 12 disposed in the recess. The projections 30 are integral with the circular side wall 23 of the indentation 21 and extend longitudinally of the recesses. Each projection 30 is slightly less than half the length of the recess and is spaced a sufficient distance from the upper wall 31 to permit the arm of the spider type supports 12 to pass over the upper surface of the projection 30. One at least of the projections 30 as shown in Figs. 2, 5, 6 and 7 is abruptly thickened on the outer end to form a latch 32 for the spider type support 12. The latch 32 may be seen in the recess 26 in Fig. 2.

The spider type support 12 may be made of sheet metal or any other material suitable for the purpose and provides a flexible support for the finger wheel 11. It is illustrated as having three arms 27, 28 and 29 but may have a greater number if desired, the finger wheel 11 having a suitable number of recesses formed therein to accommodate the arms of the spider type support 12.

Located directly below and in parallel spaced relation with one of the arms of the spider type support 12, and in this case the arm 29, is a bar 33 equipped with an upwardly extending embossing 34. The bar 33 may be made of stiffer material than the spider type support 12 and is apertured on its inner end to accommodate the shaft 13. The bar 33 is slipped over the shaft 13 before the spider type support 12 is applied. The spider type support 12 is centrally apertured to receive the shaft 13. The spider type support 12 and the bar 33 are formed and arranged to rotate with the shaft 13 and are clamped in position on the shaft 13 by means of the nut 14.

The finger wheel 11 may be latched to the spider type support 12 by placing the finger wheel 11 on the spider type support 12 and so that the outer ends of the arms 27, 28 and 29 pass upwardly within the respective recesses 24, 25 and 26 and above the projections 30 and into engagement with the upper wall 31 and by rotating the finger wheel 11 counter-clockwise relative to the spider type support 12. This will bring the arms of the spider type support 12 directly over the projections 30 and the arm 29 past the latch 32 in the recess 26. The bar 33 will bear against the lower surface of the projection 30 in the recess 26. The spacing of the bar 33 from the arm 29 and the thickness of the latch 32 are such that the arm 29 is flexed slightly upward in passing over the latch 32. When the arm 29 passes to the right of and beyond the latch 32, the spring pressure developed in the arm 29 will cause it to snap down against the upper surface of the projection 30 in the recess 26 as shown in

Fig. 6. The bar 33 in engagement with the under surface of the projection 30 will prevent any normal bearing down force applied to the finger wheel 12 from causing release of the arm 29 from the latch 32. When the finger wheel 11 is mounted on the spider type support 12 and is rotated in a clockwise direction, the latch 32 forms a driving edge for the spider type support 12 and transmits the manual rotation of the wheel 11 to the spider type support 12 so that the spring motor in the calling device is wound up to develop enough spring pressure therein to return the finger wheel 11 to normal starting position, when the finger wheel 11 is released. In the return movement of the finger wheel 11 and the spider type support 12, the contact controlling device 15 is operated in the well-known manner to operate the contacts 16 and 17 so that the signal pulses are sent over the line system to control the operation of switches at the telephone central station in setting up the desired telephone call connection. When the finger wheel 11 has been manually rotated to bring a desired finger hole 20 around to the stop 35, and is released from further manual rotation, the spring motor of the telephone calling device rotates the spider type support 12 back to normal position and the finger wheel is carried back by the spider type support to starting position by reason of the arm 29 bearing against the latch 32.

The finger wheel 11 may be released from the spider type support 12 by placing a screw driver or other suitable tool between the bar 33 and the arm 29 and preferably over the embossing 34, and then tilting the tool to flex the arm 29 above the latch 32. When the arm 29 is flexed above the latch 32 the finger wheel may be manually rotated in a clockwise direction and relative to the spider type support 12 to bring the arms 27, 28, and 29 clear of the projections 30 and into the portions of the recesses 24, 25 and 26 not occupied by the projections 30. The finger wheel 11 may then be lifted off the spider type support 12.

The integral window 22 in the finger wheel 11 serves as a cover for the telephone substation number card 36 which is placed against the under surface of the window 22 and held in position by some suitable means, the means for holding the number card 36 in position as shown in Fig. 1 may comprise a spring ring 37 located in an annular groove 38 formed in the finger wheel 11. The ring 37 is of slightly incomplete circular form as shown at 39 and is snapped into the groove 38 against the under surface of the outer edge portion of the card 36.

Fig. 3 shows a modification of the finger wheel construction above-described. In this case the finger wheel 40 is provided with a centrally apertured hub portion 41, the internal diameter of which is somewhat less than the diameter of the station number card 36 and an overlying transparent cover disc 42. The card 36 and the disc 42 are placed in laminated form against an overhang 43 in the hub portion 41 and are held in place by means of the spring ring 37 which is snapped into the annular groove 38 in the same manner as in Fig. 1. The finger wheel 40 in all other respects is constructed like the finger wheel 11 above described and is mounted on the flexible support 12.

Since the finger wheel in both constructions above described is supported on the flexible spider type support 12, considerable bearing down pressure may be applied to the finger wheel by the

operator of the device without causing fracture of the finger wheel. When an undue downward pressure is applied to the finger wheel, the flexible spider type support 12 will flex downwardly in the region of the point of pressure and relieve the finger wheel of much of the strain it would otherwise be subjected to.

The finger wheel may be readily detached from the flexible spider type support 12 for replacement by another finger wheel or for changing the substitution number card.

What is claimed is:

1. In a telephone calling dial device, in combination, a finger wheel recessed at a plurality of spaced points, projections extending into the recesses formed in said finger wheel, a flexible spider type support for said finger wheel having arms extending into said recesses, and overlying said projections, means underlying said spider type support and engaging the under surface of at least one of said projections and an enlarged end portion on at least one of said projections and in engagement with one of the arms of said spider type support.

2. In a telephone calling dial device, in combination, a finger wheel, spaced recesses formed in the under surface of said finger wheel, a projection extending into each of said recesses, a flexible spider type support extending into said recesses and having arms engaging the upper surfaces of said projections, means extending in parallel spaced relation with at least one of the arms of said spider type support and engaging the under surface of at least one of said projections, and an abruptly enlarged end portion on at least one of said projections and bearing against one of the arms of said spider type support.

3. In a telephone calling dial device, in combination, a finger wheel having a circular indentation in its under surface, a plurality of spaced recesses formed in the circular wall of said indentation, projections integral with said wheel and extending into said recesses, a spider type supporting member of flexible material supporting said finger wheel, the arms of said spider type supporting member extending into said recesses and resting on said projections, an enlarged end portion on at least one of said projections and extending above the plane of the lower surface of said spider type supporting member and engaging one of the arms of said spider type supporting member, a bar extending in parallel spaced relation with at least one of

the arms of said spider type supporting member and bearing against the under surface of at least one of said projections, and said bar and said enlarged end portion cooperating to latch said spider type supporting member to said finger wheel.

4. In a telephone calling dial device, in combination, a finger wheel having a central indentation formed in its lower face, an integral window in said finger wheel and closing the upper end of said indentation, spaced recesses formed in the side wall of said indentation, a projection extending into each of said recesses, a spider type supporting member of flexible material serving as a support for said finger wheel, arms on said spider type supporting member extending into said recesses and resting on said projections, a bar extending beneath said spider type supporting member and in spaced relation with at least one of the arms of said spider type supporting member, said bar engaging the under surface of at least one of said projections, an embossing on said bar extending into the space between said bar and said spider type supporting member, an abruptly enlarged end portion on at least one of said projections and engaging one of the arms of said spider type supporting member, and said bar and said abruptly enlarged end portion cooperating to form a latch to hold said finger wheel secured to said spider type supporting member.

5. In a telephone calling dial device, comprising a rotatable shaft and means controlled by operation of said shaft to send signal pulses, in combination, a spider type support of flexible material mounted on said shaft and having arm members extending radially of said shaft, a finger wheel having a circular opening adapted to receive said spider type support, spaced recesses formed in said finger wheel and arranged to receive the outer ends of said arms of said spider type support, projections extending longitudinally into the recesses and arranged to form rests for the outer ends of said arms, a bar mounted on said shaft and extending below and in spaced relation with at least one of said arm members, and engaging the lower surface of at least one of said projections, an abrupt enlargement on the end of at least one of said projections and said bar and said enlargement serving in cooperation to latch said finger wheel to said spider type support.

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