May 16, 1944. M. SAMBURG ET AL 2,348,758

AUTOMATIC TELEPHONE CALLING SYSTEM

Filed Nov. 15, 1939 3 Sheets-Sheet 1

Fig. 1.

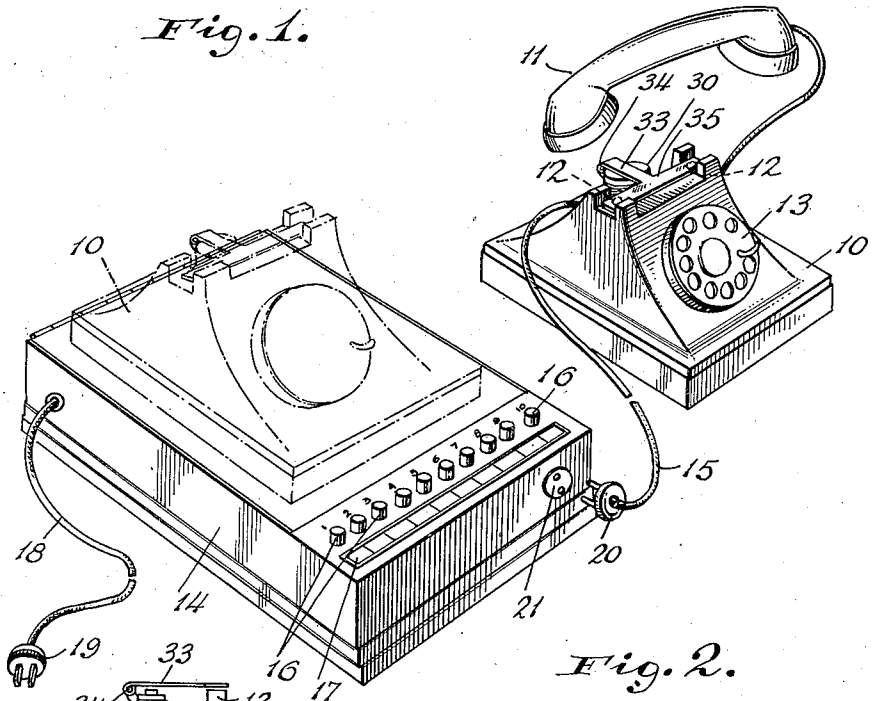
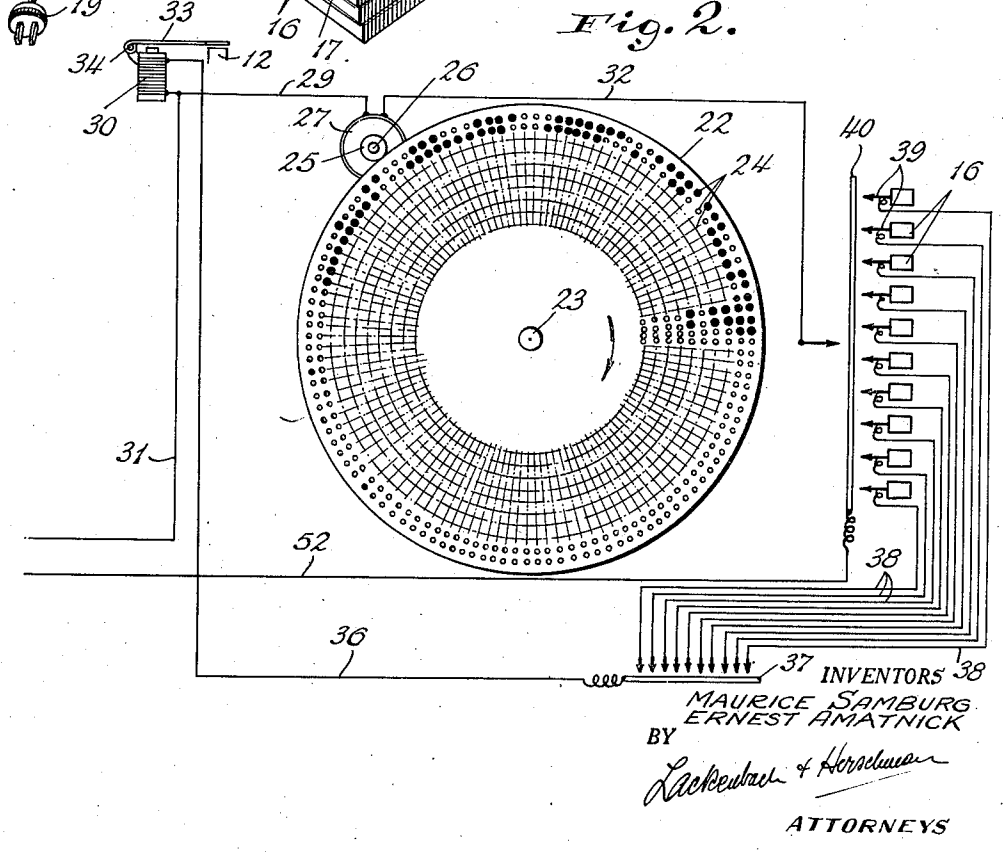


Fig. 2.



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AUTOMATIC TELEPHONE CALLING SYSTEM

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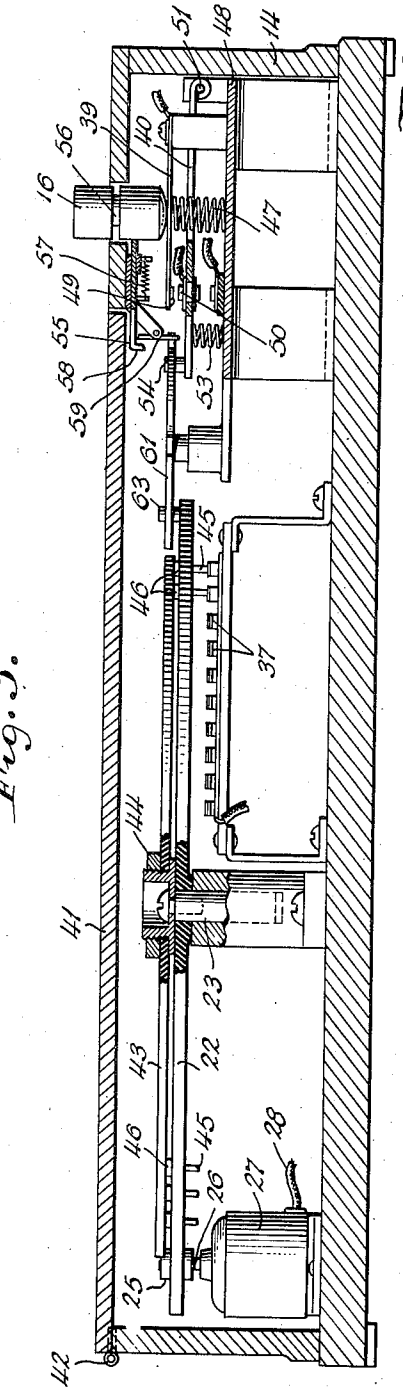

Fig. 3.

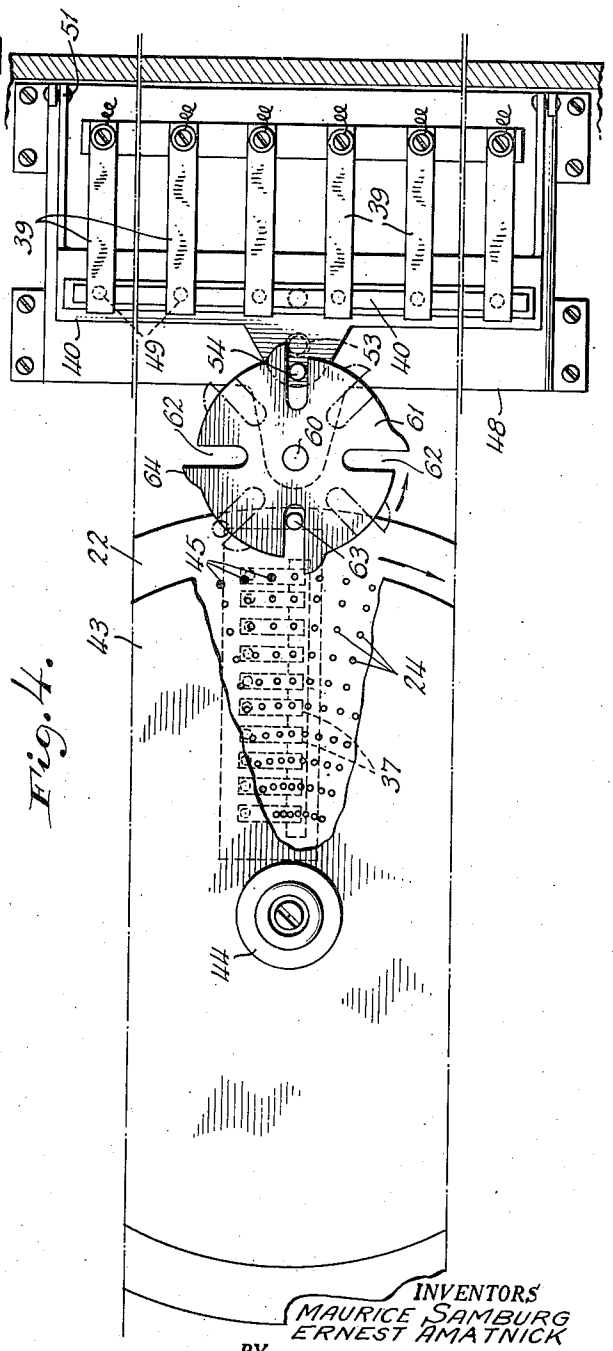

Fig. 4.

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Fig. 5.

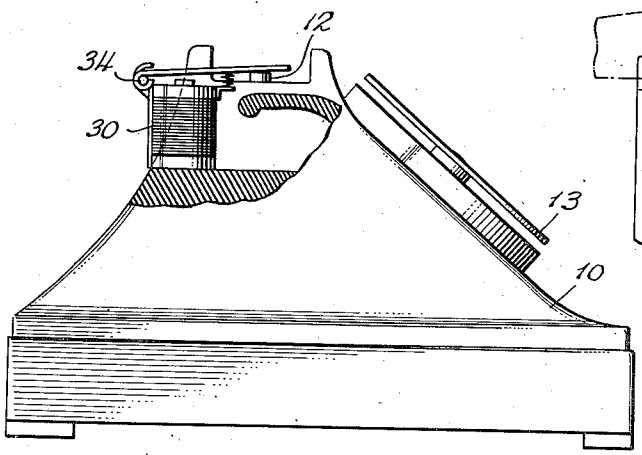


Fig. 6.

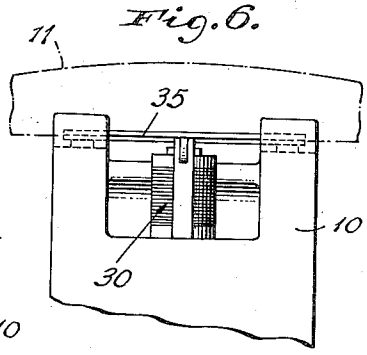


Fig. 7.

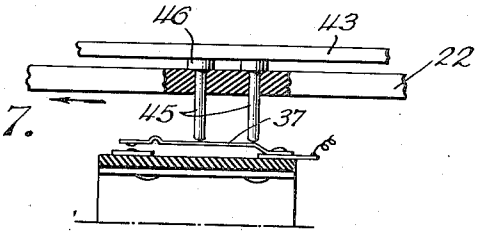
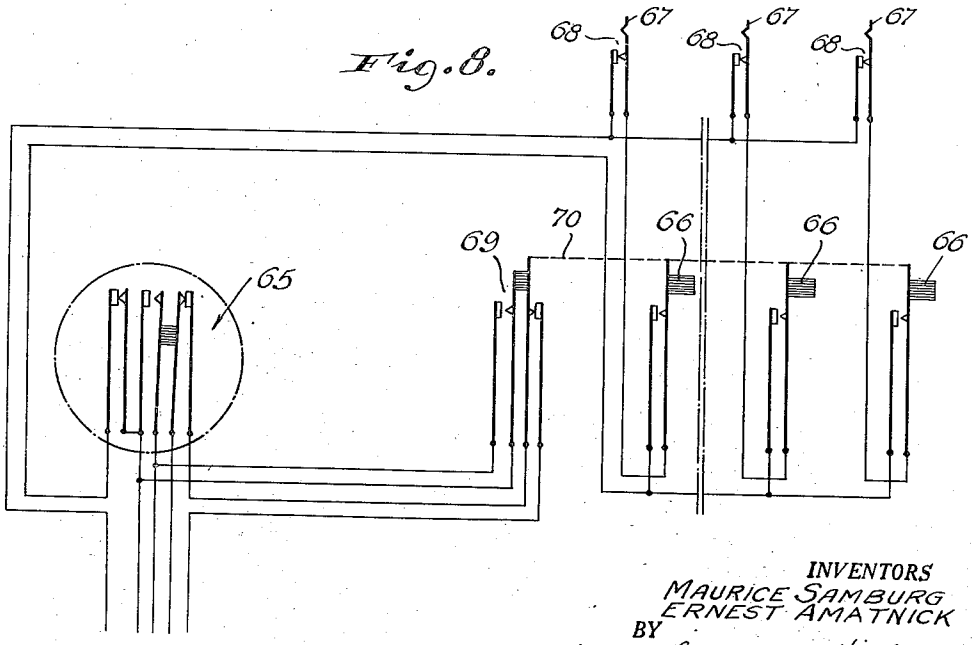


Fig. 8.



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Patented May 16, 1944

2,348,758

UNITED STATES PATENT OFFICE

2,348,758

AUTOMATIC TELEPHONE CALLING SYSTEM

Maurice Samburg and Ernest Amatnick, New York, N. Y.; said Amatnick assignor to said Samburg

Application November 15, 1939, Serial No. 304,476

19 Claims. (Cl. 179—90)

The invention relates to an automatic push-button operated device for attachment and use as an adjunct to a manually operated telephone dialing apparatus, and more particularly to an automatic device to take the place of the conventional manual dialing of a series of numbers identifying the particular station to be called. In conventional practice, such identifying numbers are conjointly used with a central station designation, usually including the first two letters of a name and a sub-central identifying digit. In all cases however, the station to be called is really identified by a series of digits, usually seven, the first two digits representing the numbers on the dial corresponding to the first two letters of the name of the central station.

The primary object of our invention is to provide an automatic device involving the operation of a single element, for instance, a push-button conveniently located near the telephone receiver, the depression of which push-button will automatically institute a series of mechanical operations equivalent to the dialing by the operator, or the person calling the number, of the various digits sequentially by the turning of the ordinary dial of the telephone apparatus. The purpose of this construction is to make possible the provision of a simple device, constituting an attachment to the telephone instrument, by means of which a party having occasion to call the same station several times during the course of a period, such as a day, may call such party without the necessity, and time-consuming operation, of dialing seven digits in precise sequence each time a connection to the particular station is desired. The tediousness of such an operation and the many possibilities of error are well recognized and a busy executive having frequent occasion to call the same number during any specific period of time would save a great deal of energy, time, and annoyance by the use of our novel improvement.

In accordance with our invention, we construct our novel device so as to constitute an accessory or attachment to the conventional type of telephone instrument of the dial type without the necessity of making any change whatsoever in the construction of such conventional instrument. It is, of course possible, as will be shown in connection with a modified embodiment of our invention, to embody our novel device directly into the structure of the telephone instrument. Furthermore, the provision of our device permits the normal operation of the telephone instrument for making calls other than those for which the automatic dialing attachment has been set, so that the device does not in any way interfere with the normal operation of the conventional telephone instrument. Our novel attachment is also so designed that there is no interference with incoming calls and which, upon making an automatically dialed connection, will automatically return, upon completion of such connection, to normal position, so that the instrument is again ready for further operation, either automatically in accordance with our invention, or in the conventional manner of manually dialing a desired number.

The basis of the construction of our novel telephone dialing device is the system underlying the operation of the conventional dial form of telephone instrument. This system depends upon the transmission of a plurality of impulses upon the turning of the dial to a particular point, producing a number of clicks, equivalent to the impulses, the clicks being capable of being produced by moving the bar supporting the receiver, or unitary transmitter and receiver, in rapid succession the number of times equivalent to the number being dialed, including the numbers equivalent to the letters designating an exchange. Our invention is predicated upon the provision of a device to accomplish this clicking or transmission of impulses with sufficient rapidity and a degree of accuracy to cause the automatic dialing of the particular number desired by sending the plurality of impulses, representing each digit, in series through the wires of the conventional telephone set. Of course, the transmission of the impulses in accordance with our novel construction is accomplished automatically in rapid succession without the rotation of the dial of the instrument. The elimination of the rotation of the dial makes it possible to transmit the impulses at a very rapid pace so that the depression of the push-button on the device identifying the particular station or number to be called, is followed, within an extremely short period of time, measured by seconds, by the completion of the connection between the two stations, one the calling station, and the other the receiving station.

A particular and preferred embodiment of our inventive structure is illustrated in the accompanying drawings, in which Fig. 1 is a perspective view of a substantially rectangular box and of a conventional telephone transmitting and receiving set, which may be positioned either directly upon the box or the latter may be positioned at some distance from the instrument, depending

upon the convenience of the person making use thereof; Fig. 2 is a plan view of the revoluble disc, having a multiplicity of apertures therein, which is adapted to be operated by a motor, the figure showing generally the schematic layout of the electrical system, push-button switches and selectors; Fig. 3 is a vertical section longitudinally of the box of Fig. 1; Fig. 4 is a plan view of the mechanism within the box, as viewed when the upper hinged cover thereof has been removed, and showing the push-button switches, with the push button and push button plate removed from the box; Fig. 5 is a side view of the telephone instrument, with a portion thereof removed to illustrate the position of the electromagnet effecting, by the movement of its armature, the clicking of the receiver and transmitter bar; Fig. 6 is an end view of the electromagnet and appurtenant mechanism; Fig. 7 is an enlarged detail showing the operation of the selector switches by the pins inserted into and extending through the revoluble disc of Fig. 2; and Fig. 8 is a wiring diagram showing the application of our novel construction to the wiring circuit of the conventional dial telephone apparatus.

Referring more particularly to the drawings, in which similar reference characters identify similar parts in the several views, a conventional telephone instrument of the dial-operated type is shown in Fig. 1 and comprises a casing 10, a unitary transmitter and receiver 11, and switch buttons 12 supporting the unitary transmitter and receiver. The switch buttons 12, when permitted to rise by the removal of the unit 11, makes possible the transmittal of impulses by the manual operation of the finger wheel 13 of the dial, in the conventional manner of dialing a telephone number. The telephone casing 10 is adapted to be positioned upon a base 14, constituted of a rectangular box within which the major portion of our novel automatic dialing apparatus is enclosed. The telephone casing 10 may, of course, be positioned at a point remote from the box 14, as indicated in Fig. 1, and connected to such box by a cable 15. I have shown in Fig. 1 both of these possible positions of the telephone casing, with the instrument when mounted upon the box 14, being shown in dotted lines.

The base or box 14 is provided, throughout the width of its front portion, with a plurality of push-buttons 16 which may be of any convenient number, depending upon the number of stations for the automatic calling of which the apparatus is designed. In front of such series of push-buttons is positioned a name plate 17, upon which may be inscribed the name of the party desired to be called, and whose telephone number corresponds to that of the station connected by the device upon the depression of one of the push-buttons 16. Extending from the box 14 is a cable 18, the end of which carries a conventional plug 19, adapted to be inserted into a socket connected to the household source of electricity to supply the current for the operation of our device. The cable 15, from the telephone casing is connected to the base 14 by means of plug 20 to be inserted in a socket 21 in the front face of the base 14.

Referring now more particularly to Fig. 2, our novel automatic dialing device comprises a revolvable disc 22 mounted for rotation on a shaft 23 located approximately centrally of the base 14. The revolvable disc 22 is a flat disc, made of a non-conducting material, and is provided with a multiplicity of apertures drilled concentrically of the disc. There are 10 concentric circles of apertures 24 disposed on the disc in such manner that each series of ten apertures extends radially of the disc. In the preferred embodiment of our invention, each concentric circle comprises 90 apertures, so that the flat revolvable disc is drilled with a total of 900 apertures.

The disc 22 is revolved by a friction wheel 25 operative against the periphery of the disc, the friction wheel 25 being mounted upon the end of a shaft 26 of a motor 27. The source of current for the motor is supplied through a cable 28, one wire 29 of such cable leading to an electromagnet 30 mounted upon the rear portion of the telephone box 10, immediately rearwardly of the transmitter and receiver switches 12, and thence by conductor 31 to the source of current derived from the house circuit by means of plug 19. The second wire 32 from the motor cable 28 leads to a switch controlled by the individual switches of the plurality of push-buttons 16.

The electromagnet 30 has its armature 33, pivoted at 34, extend over the transmitter and receiver switches 12, by being clamped in position upon such instrument, the armature for this purpose having a transversely extending bar 35 of substantially the distance between the switch buttons 12.

The coil winding of the electromagnet 30 is connected at one end thereof to the conductors 29 and 31, the former to the motor 27, and the latter to the source of the current, and the other end of such coil winding is connected by conductor 36 to a plurality of selectors 37 equal in number to the number of push-buttons 16, in the particular embodiment illustrated, this number being 10. Each of the selectors 37 is connected by wires 38 to corresponding push-button switches 39, which in turn, are adapted to contact, in the operation of our device, as hereinafter described, an elongated bar 40, extending throughout the distance occupied by the push-button switches 39.

Turning now to the cross-sectional view of the box 14, as shown in Fig. 3, such box is provided with a cover 41, hinged at 42, to provide access to the interior of the box and the setting of the revolvable disc 22. Such disc is surmounted by a cover plate 43 which may be removed by removal of the nut 44 to permit the insertion into the plurality of apertures 24 of the disc of a plurality of pins 45, each having a head 46 in the manner and for the purpose hereinafter described. Extending through the upper surface of the box 14, is a series of push-buttons 16 each of which has a convex bottom adapted to contact the corresponding push-button switch 39. Springs 47, anchored upon a ledge 48, exert pressure on the undersurface of the push-button switches 39, the contact 49 of each switch 39, upon the depression of the push-button 16, being adapted to engage the corresponding contact 50 of the bar 40, pivoted at 51, and to which contact 50 is connected the input wire 52 leading from the household source of current. A spring 53 urges the bar 40 upwardly about its pivot 51. The bar 40 carries at its extremity an upwardly projecting pin 54 for a purpose hereinafter to be described.

When the push-button 16 is depressed, the end of a locking device 55 is adapted to enter a circumferential recess 56 in the push-button and

thereby hold such push-button in its depressed position. The locking device is caused to enter the circumferential recess 56 by spring 57. Releasing of the locking device, to permit the push-button to assume its original position, is accomplished by the abutment of the nose 58 by an upwardly extending bar 59.

Supported from an extension of the ledge 48 is a shaft 60, upon which is mounted for rotation, a cam or star-wheel 61, constituting the means for locking the disc 22 against continued rotation by the motor 27 when a single switching operation, involving the calling of a particular station, has been accomplished. The cam 61 is constituted of a flat wheel having four radially extending slots 62 into which is adapted to enter sequentially upon rotation of the cam, a pin 54, extending upwardly from the bar 40. One of the slots 62, which is opposite that into which the pin 54 enters, is adapted to receive a pin 63 extending from the surface of the disc 22 near its peripheral edge. The cam 61 is adapted to be rotated in the direction of the arrow indicated adjacent the periphery thereof. The peripheral edge of the cam 61 at one side of each of the radial slots 62 has extending therefrom a nose having an arcuate cam surface adapted, upon rotation of the cam 61, to pivot the vertical bar 59, and release the push-button locking device.

In Fig. 8 we have illustrated an embodiment of our invention when applied directly in the construction of a telephone receiving set.

In this embodiment, shown in Fig. 8, the structure of Figs. 3 and 4 as disclosed in these figures is utilized. In such embodiment, no electro-magnet is attached to the exterior of the telephone instrument. The only structural change in the modification is the incorporation of the wiring, leading from the selector switches and the push-button switches, into the wiring of the telephone dial. The selector switches are to be actuated by the pins positioned in the disc, the selector switches being actuated by the abutment of the pins upon the rotation of the disc. A series of buttons 66 (similar to 16 of Figs. 3 and 4) are incorporated into the structure. Similarly, there will be a motor and friction wheel to drive the disc. A cam disc for controlling the rotation of the disc will be utilized and the apparatus will be provided with a locking device such as 55 of Figs. 3 and 4, i. e. the only essential difference will be the absence of a means (such as an electro-magnet) for depressing the telephone switch, since the wiring from the apparatus leads directly into the dial circuit.

In the conventional automatic dialer, there are three pairs of electrical contacts. When the dial is at rest, two of such contacts are closed and one is open. As soon as the dial is turned away from its rest position one of the closed contacts, when the dial begins its rotation backward, opens as many times as corresponds to the number to which the dial was turned. This last portion of dialing is the one that actually "dials" the number.

In the system of the present invention, the same electrical operations, in the same sequence, are performed when a push-button is depressed, as in the conventional automatic dial system. These operations are performed by switches 69 and 68.

Functioning of the automatic telephone calling system of the present invention, as shown in Fig. 8 is, that when any push-button 66 is depressed, one of the contacts is opened, and the other is closed. Only the switch which is under the depressed push-button remains open; the contact 68, corresponding to the depressed push-button, remains in series with the first contact; switch 68 is interrupted in the manner determined by the pins 45 (Fig. 3) in the rotating disc; electrically this is the equivalent of the interruptions in the main switch when the dial is returning to rest.

In the apparatus of Fig. 8, commercial power can be used. Substantially the same construction of apparatus as heretofore described is utilized in such embodiment, but the conductors from the various push-buttons and selector switches are connected directly to the dial mechanism generally designated as 65. From two of the switches in such dial mechanism, conductors lead to the push-buttons 66 and their associated switches through a switch 69 and conductor 70. The individual selectors 67, and their associated switches 68, are connected to each of the push-buttons 66, and to the third switch, respectively, of the dial mechanism. As the interior construction, including the three switches of the dial mechanism, constitutes no part of our invention, their operation and functions are not herein described. It is sufficient, to embody the structure of our invention in accordance with the embodiment in Fig. 8, to connect the plurality of push-buttons and the selectors and their switches to the dial mechanism as indicated.

Turning now to a description to the mode of operation of our novel apparatus, the subscriber, when the automatic dialing device is delivered to him, is enabled to select the particular stations which he desires to be called by the series of push-buttons 16. The setting of the mechanism for this purpose is accomplished by such subscriber as follows:

By opening the top of the box 14 and turning the cover 41 about its pivot 42, the interior of the box is exposed. The subscriber then removes the nut 44 and thereafter the plate 43, and inserts a plurality of the pins 45 in the outermost concentric series of apertures, controlled by the push button No. 1 and therefore the particular station to be called may be contacted upon the depression of such push-button. It is believed that the selection of a particular example with respect to which the setting is to be described, will best illustrate the procedure.

Taking for example, a telephone number such as "Murray Hill 7–4321," the letters of the telephone exchange, usually the first two letters thereof, are transposed to their corresponding number on the telephone dial. Thus "MU" on the dial, corresponding to the numbers 6 and 8. The exemplary telephone number may therefore be dialed as "687–4321." Starting with the disc 22 in normal position, the subscriber fills in in succession as many holes with pins 45 as is the numerical value of each digit in the number of the station to be called. Thus, for the particular number given as an example, for dialing the digit "6," the first six apertures 24 have pins positioned therein. The next three apertures are left open, to provide the necessary timing element. Thereafter, continuing along the outer concentric circle of apertures, the next eight apertures are filled with pins representing the numerical value of the next digit, to wit "8," then three apertures are left open and the next seven apertures, for the digit "7" are filled with pins; then three more apertures are left open and the next four have pins placed therein and so on

along the concentric series of apertures, until the numerical value of the last digit, i. e. "1," leaves only one pin as the last of the particular number being set.

In like manner, the next succeeding series of apertures, in the next concentric ring, is set with pins corresponding in number to the numerical values of each digit of the second telephone number to be dialed. After the last pin or pins have been set, representing the last digit of any number to be called, the remaining apertures in the concentric series, are left empty.

After the setting of the various numbers controlled by each of the push-buttons 16 has thus been made, the plate 43 is replaced and secured in position by a nut 44 and the cover 41 returned to its box closure position.

In the operation of our device, when any of the push-buttons 16 is depressed, the circuit is completed through all of the selector switches 37 and the conductors 38. The particular switch 39, operated by the push-button which is depressed, depresses the bar 40 against the tension of the spring 53. This is attained by engagement of the contact 49 of the switch 39 with the contact 50 on the bar 40. The completion of this circuit will cause the operation of the motor 27 and the rotation of the friction wheel 25 and therethrough the rotation of the disc 22 in the direction of the arrow indicated on Fig. 2. The depressing of the push-button and therefore of the bar 40, causes a depression of the pin 54, thereby releasing the star wheel 61 for rotation in the direction of the arrow near the periphery thereof, by the pin 63 extending upwardly from the disc 22 and which pin enters one of the slots 62 to cause a ¼ revolution of the star wheel or cam 61 about its shaft 60. When the push-button is released, the pin 54 enters the slot 62, which is then opposite such pin. When the pin 63 and the dialing disc 22 have made one complete revolution, the pin 63 turns the star wheel or cam 61 another ¼ of a turn, permitting the pin 54, bar 40, and switch 39 to spring back into their original position, stopping the motor 27 from turning the dialing disc 22 and stopping the dialing disc in exactly its original starting position.

As the electromagnet 30 is connected in series with the dialing switches and with the push-button switches, when one of the selector switches 37, as selected by a push-button, is moved away from the disc by one of the pins 45, the electromagnet will be energized, causing its arm 33 to pivot about its pivot 34 and its extension 35, to depress the two contact points 12 of the telephone instrument to send the necessary impulses. It will thus be seen that, depending upon the number of pins in sequential series placed into the apertures in any concentric series upon the disc 22, the switches 12 will be depressed the same number of times in rapid succession, thereby transmitting the series of impulses in the manner of the ordinary operation of the dial mechanism. By leaving a few, for instance three of the apertures in any concentric series between the numerical values of the various digits open, the various digits are separated by a short time element, so that the numbers of a particular station will be automatically dialed by the rapid and successive clicking of the telephone instrument switches 12.

Referring more particularly to Fig. 3, it will be noted that upon the depression of the push-button 16, the locking mechanism keeping it in the depressed position, is operative. When, however, the star wheel or cam 61 is rotated as hereinabove described, the cam surface 64 to one side of each of the slots 62, pushes against the lower extremity of the pivoted bar 59, causing the upper extremity thereof to abut the nose 58 of the locking mechanism 55 and pull such locking mechanism against the tension of the spring 57 out of the peripheral recess 56 of the push-button, thereby releasing such push-button, so that it is returned to its original position by the spring 47, which at the same time causes a breaking of the circuit between the contacts 49 and 50.

The operation of the embodiment of our invention as illustrated in Fig. 8, is substantially the same as hereinabove described, except that in such embodiment, no electromagnet is utilized or necessary, as the connection to the impulse sending mechanism is directly made to the appropriate elements of our apparatus.

A particular advantage of our novel apparatus as distinguished from structures of the prior art seeking to provide a device to accomplish substantially similar purposes, is that our novel apparatus is adapted to be set for the calling of any stations or numbers by the person who is to make use of the device. In this manner, he is enabled to select for setting of the apparatus, any of a number of stations, depending only upon the number of such stations for which the apparatus has been designed and he is enabled to make such changes therein from time to time as he may deem necessary or convenient. This changing over to effect the automatic dialing of any selected telephone exchange and number can be accomplished with facility and dispatch by following extremely simple directions. In other words, whenever any change has to be made in the particular setup of the various numbers to be called, the instrument does not have to be dismantled or any new structures provided therein, it being only necessary to remove the plurality of pins set to automatically dial a particular exchange and number and to re-align or reset such number of pins in the particular concentric series controlled by the push-button in which the change is to be effected. The entire operation of changing from one preselected station to another takes an extremely short time and, with specific instructions, comparatively no skill whatever. This ability of the subscriber to make such changes from time to time as may be necessary or convenient is an important feature of our novel construction and which has not heretofore been possible with any device of the prior art.

Furthermore, our novel apparatus necessitates no change whatsoever in the ordinary dial telephone instrument or appurtenant mechanism and may be attached thereto either in immediate proximity thereof or any convenient distance therefrom. The only element in immediate contact with the telephone instrument is the electromagnet and its armature which may be attached or clamped to the instrument with facility and dispatch and without interfering with the normal operation of the telephone instrument in the dialing of exchanges and numbers not included in the series of push-buttons and without interference with incoming calls.

While we have described particular embodiments of our invention, it is obvious that various changes therein may be made without departing from our invention. Of course, no unnecessary limitations are to be implied from the illustration and description of our preferred, and illustrated embodiment, since it is apparent that the device

might also be exemplified in other alternative constructions, and particularly since legitimate changes in the form, construction, and relative arrangement of the several parts may be fairly embodied within the spirit and scope of the invention as claimed.

We claim:

1. In an automatic telephone calling system, the combination with the conventional transmitting and receiving instrument including a switch of a revoluble single disc, a plurality of pins placed in series within the apertures of said disc in concentric relationship, means for momentarily operating, by said pins a plurality of series of elements, the sequential disposition of which upon the face of said disc corresponds to the exchange and numerical designation of a subscriber station to be called, to effect the automatic transmission of impulses corresponding to the said designation of such station, a plurality of push-buttons for effecting the operative movement of such elements, a motor for moving said elements in their predetermined order upon depression of one of said push-buttons, and means, controlled by the movement of said elements to transmit said impulses through the switch of the telephone instrument, the sequential disposition of said elements being interchangeable without alteration in the mechanical components of the system.

2. In an automatic telephone calling system, the combination with the conventional transmitting and receiving instrument including a switch, of a revoluble disc, having a plurality of rows of concentrically arranged apertures therein, a plurality of selector switches below said disc, and in line with said apertures, one selector switch below each row of apertures, a plurality of series of elements, capable of disposition in said apertures in sequence to correspond to the exchange and numerical designation of a station to be called, to effect the automatic transmission of impulses corresponding to the said designation of such station, a plurality of push-buttons for effecting the operative movement of such elements, a motor for moving said disc and said elements in their predetermined order upon depression of one of said push-buttons, means whereby, upon depression of one of said push-buttons only the single selector switch corresponding to the depressed push-button, is actuated by the elements in the particular row of concentrically arranged apertures corresponding to said single selector switch, to transmit said impulses, and means controlled by the rotation of said disc to transmit said impulses through to the switch of the telephone instrument.

3. In an automatic telephone calling system, the combination with the conventional transmitting and receiving instrument including a switch, of a revoluble disc, having a plurality of concentrically arranged apertures therein, a plurality of selector switches below said disc, and in line with said apertures, a plurality of series of elements, capable of disposition in said apertures in sequence to correspond to the exchange and numerical designation of station to be called, to effect the automatic transmission of impulses corresponding to the said designation of such station, a plurality of push-buttons for effecting the operative movement of such elements, a motor for moving said disc and said elements in their predetermined order upon depression of one of said push-buttons, means whereby, upon depression of one of said push-buttons only the single selector switch corresponding to the depressed push-button, is actuated by the elements in the particular row of concentrically arranged apertures corresponding to said single selector switch, to transmit said impulses, and means constituted of an electromagnet energized upon the rotation of said disc, and clamped to said instrument to transmit said impulses through to the switch of the telephone instrument.

4. In an automatic telephone calling system, the combination with the conventional transmitting and receiving instrument including a switch, of a revoluble disc provided with a multiplicity of concentrically arranged apertures, a plurality of pins selectively positioned in said apertures, the sequential disposition of which pins corresponds to a plurality of subscriber stations to be called, to effect the automatic transmission of impulses corresponding to the number of such station, a plurality of push-buttons for effecting the operative movement of such pins, a motor for revolving said disc upon depression of one of said push-buttons, means whereby upon depression of one of said push-buttons only the single selector switch corresponding to the depressed push-button, is actuated by said pins in the particular row of concentrically arranged apertures corresponding to said single selector switch, to transmit electrical impulses and means clamped upon said telephone instrument and controlled by the movement of said pins, to transmit said impulses to the conventional switch of the telephone instrument.

5. In an apparatus for the automatic calling of the exchange and number of a telephone subscriber station, the combination of a single revolvable disc having a plurality of series of apertures concentrically disposed throughout the disc, a plurality of pins placed in series within the apertures of said disc in concentric relationship, an electric motor for rotating said disc, a plurality of push-buttons corresponding to each of the subscriber stations to be called, a plurality of selector switches disposed beneath said disc and arranged to be contacted by said pins, means whereby upon depression of one of said push-buttons only the single selector switch corresponding to the depressed push-button, is actuated by said pins in the particular row of concentrically arranged apertures corresponding to said single selector switch, to transmit electrical impulses and means for controlling the rotation of said disc to effect the sequential operation of said selector switches by said pins.

6. In an apparatus for the automatic calling of the exchange and number of a telephone subscriber station, the combination of a single revolvable disc having a plurality of series of apertures concentrically disposed throughout the disc a plurality of pins placed in series within the apertures of said disc in concentric relationship, an electric motor for rotating said disc, a plurality of push-buttons corresponding to each of the subscriber stations to be called, a switch disposed below each of said push buttons, a pivoted bar extending below said switches and carrying a contact element adapted to be engaged by the contact element of any one of said push button switches, a plurality of selector switches disposed beneath said disc and arranged to be contacted by said pins, the number of pins in the series corresponding to the numerical values of the digits representing the number of the subscriber station to be called, the pins representing each such numerical value of each digit being sep-

arated by empty apertures in the disc, means whereby upon depression of one of said push-buttons only the single selector switch corresponding to the depressed push-button, is actuated by said pins in the particular row of concentrically arranged apertures corresponding to said single selector switch, to transmit electrical impulses and means for controlling the rotation of said disc to effect the sequential operation of said selector switches by said pins.

7. In an apparatus for the automatic calling of the exchange and number of a telephone subscriber station, the combination of a revolvable disc having a plurality of series of apertures concentrically disposed throughout the disc a plurality of pins placed in series within the apertures of said disc in concentric relationship, an electric motor for rotating said disc, a plurality of push buttons corresponding to each of the subscriber stations to be called, a plurality of selector switches disposed beneath said disc arranged to be contacted by said pins, means whereby upon depression of one of said push-buttons only the single selector switch corresponding to the depressed push-button, is actuated by said pins in the particular row of concentrically arranged apertures corresponding to said single selector switch, to transmit electrical impulses and means for controlling the rotation of said disc to effect the operation of said selector switches by the pins, said means comprising a cam having a plurality of radially disposed slots, and a pin projecting from the surface of the disc and adapted to enter one of said slots.

8. In an apparatus for the automatic calling of the exchange and number of a telephone subscriber station, the combination of a revolvable disc having a plurality of series of apertures concentrically disposed throughout the disc a plurality of pins placed in series within the apertures of said disc in concentric relationship, an electric motor for rotating said disc, a plurality of push buttons corresponding to each of the subscriber stations to be called, a switch disposed below each of said push buttons, a pivoted bar extending below said switches and carrying a contact element adapted to be engaged by the contact element of any one of said push button switches, a plurality of selector switches disposed beneath said disc arranged to be contacted by said pins, the number of pins in the series corresponding to the numerical values of the digits representing the number of the subscriber station to be called, the pins representing each such numerical value of each digit being separated by empty apertures in the disc, means whereby upon depression of one of said push-buttons only the single selector switch corresponding to the depressed push-button, is actuated by said pins in the particular row of concentrically arranged apertures corresponding to said single selector switch, to transmit electrical impulses and means for controlling the rotation of said disc to effect the operation of said selector switches by the pins, said means comprising a cam having a plurality of radially disposed slots, a pin projecting from the surface of the disc and adapted to enter one of said slots and a pin extending from the pivoted bar and adapted to enter the diametrically opposite slot in said cam.

9. In an apparatus for the automatic calling of the exchange and number of a telephone subscriber station, the combination of a revolvable disc having a plurality of series of apertures concentrically disposed throughout the disc a plurality of pins placed in series within the apertures of said disc in concentric relationship, an electric motor for rotating said disc, a plurality of push buttons corresponding to each of the subscriber stations to be called, a plurality of selector switches disposed beneath said disc arranged to be contacted by said pins, means whereby upon depression of one of said push-buttons only the single selector switch corresponding to the depressed push-button, is actuated by said pins in the particular row of concentrically arranged apertures corresponding to said single selector switch, to transmit electrical impulses, means for controlling the rotation of said disc to effect the operation of said selector switches by the pins, said means comprising a cam having a plurality of radially disposed slots, a pin projecting from the surface of the disc and adapted to enter one of said slots and means for locking the push-button corresponding to the station to be called in its depressed position until the completion of the automatic calling of the number of said station.

10. In an apparatus for the automatic calling of the exchange and number of a telephone subscriber station, the combination of a revolvable disc having a plurality of series of apertures concentrically disposed throughout the disc a plurality of pins placed in series within the apertures of said disc in concentric relationship, an electric motor for rotating said disc, a plurality of push buttons corresponding to each of the subscriber stations to be called, a switch disposed below each of said push buttons, a pivoted bar extending below said switches and carrying a contact element adapted to be engaged by the contact element of any one of said push button switches, a plurality of selector switches disposed beneath said disc arranged to be contacted by said pins, the number of pins in the series corresponding to the numerical values of the digits representing the number of the subscriber station to be called, each such numerical values of each digit being separated by empty apertures in the disc, means for controlling the rotation of said disc to effect the operation of said selector switches by the pins, means whereby upon depression of one of said push-buttons only the single selector switch corresponding to the depressed push-button, is actuated by said pins in the particular row of concentrically arranged apertures corresponding to said single selector switch, to transmit electrical impulses and means for locking the push button corresponding to the station to be called in its depressed position until the completion of the automatic calling of the number of said station.

11. In an apparatus for the automatic calling of the exchange and number of a telephone subscriber station, the combination of a revolvable disc having a plurality of series of apertures concentrically disposed throughout the disc a plurality of pins placed in series within the apertures of said disc in concentric relationship, an electric motor for rotating said disc, a plurality of push buttons corresponding to each of the subscriber stations to be called, a switch disposed below each of said push buttons, a pivoted bar extending below said switches and carrying a contact element adapted to be engaged by the contact element of any one of said push button switches, a plurality of selector switches disposed beneath said disc arranged to be contacted by said pins, the number of pins in the series corresponding to the numerical values of the digits

representing the number of the subscriber station to be called, each such numerical values of each digit being separated by empty apertures in the disc, means whereby upon depression of one of said push-buttons only the single selector switch corresponding to the depressed push-button, is actuated by said pins in the particular row of concentrically arranged apertures corresponding to said single selector switch, to transmit electrical impulses, means for controlling the rotation of said disc to effect the operation of said selector switches by the pins, said means comprising, a cam having a plurality of radially disposed slots, a pin projected from the surface of the disc and adapted to enter one of said slots and a pin extending from the pivoted bar and adapted to enter the diametrically opposite slot in said cam and means for locking the push button corresponding to the station to be called in its depressed position until the completion of the automatic calling of the number of said station.

12. In an apparatus for the automatic calling of the exchange and number of a telephone subscriber station, the combination of a revolvable disc having a plurality of a series of apertures concentrically disposed throughout the disc, a plurality of pins disposed in said apertures, an electric motor for rotating said disc, a plurality of push-buttons corresponding to each of the subscriber stations to be called, a switch disposed below each of said push-buttons, a plurality of selector switches disposed beneath said disc in concentric relationship, the number of pins positioned in the apertures of the disc corresponding to the numerical values of the digits representing the number of the subscriber station to be called, each such numerical values of each digit being separated by empty apertures in the disc, and means for controlling the rotation of said disc to effect the operation of said selector switches by said pins, means whereby upon depression of one of said push-buttons only the single selector switch coresponding to the depressed push-button, is actuated by said pins in the particular row of concentrically arranged apertures corresponding to said single selector switch, to transmit electrical impulses and means for locking the push button corresponding to the station to be called in its depressed position until the completion of the automatic calling of the number of said station, said means comprising a peripheral recess in said push button, a horizontally disposed locking bar, the end of which is adapted to enter said peripheral recess and a plurality of cam surfaces on said star-wheel adapted to pivot a vertical lever attached to said locking bar to release the end of the locking bar from within a peripheral recess.

13. In an apparatus for the automatic calling of the exchange and number of a telephone subscriber station, the combination of a revolvable disc having a plurality of a series of apertures concentrically disposed throughout the disc, a plurality of pins disposed in said apertures, an electric motor for rotating said disc, a plurality of push-buttons corresponding to each of the subscriber stations to be called, a switch disposed below each of said push-buttons, a pivoted bar extending below said switches and carrying a contact element adapted to be engaged by the contact element of any one of said push button switches, a plurality of selector switches disposed beneath said disc in concentric relationship, the number of pins positioned in the apertures of the disc corresponding to the numerical values of the digits representing the number of the subscriber station to be called, each such numerical values of each digit being separated by empty apertures in the disc, means whereby upon depression of one of said push-buttons only the single selector switch corresponding to the depressed push-button, is actuated by said pins in the particular row of concentrically arranged apertures corresponding to said single selector switch, to transmit electrical impulses and means for controlling the rotation of said disc to effect the operation of said selector switches by said pins, said means comprising a star-wheel having a plurality of radially disposed slots, a pin projected from the surface of the disc and adapted to enter one of said slots and a pin extending from the pivoted bar and adapted to enter the diametrically opposite slot in said star-wheel, and means for locking the push-button corresponding to the station to be called in its depressed position until the completion of the automatic calling of the number of said station, said means comprising a peripheral recess in said push button, a horizontally disposed locking bar, the end of which is adapted to enter said peripheral recess and a plurality of cam surfaces on said star-wheel adapted to pivot a vertical lever attached to said locking bar to release the end of the locking bar from within said peripheral recess.

14. In an automatic telephone apparatus as claimed in claim 1, in which the means controlled by the rotation of the disc and therefore the movement of the plurality of elements, is constituted of an electromagnet and armature adapted to be energized upon the rotation of said disc to cause its armature to depress the switch of the transmitting and receiving instrument so as to send a plurality of impulses corresponding to the dialing of the number of the station to be called in series, and with a short-time interval between said series of impulses.

15. The combination claimed in claim 1 in in which the mechanism for effecting the automatic calling of a subscriber station number constitutes an independent adjunct for association with the telephone instrument without any change in the structure of such instrument.

16. The apparatus as claimed in claim 1, in which the selective setting of the plurality of elements is interchangeable, and is adapted for changing, at the will of the operator, the subscriber stations, the numbers of which are adapted to be automatically called.

17. The combination claimed in claim 1 in which the mechanism for effecting the automatic calling of a subscriber station number constitutes an independent adjunct for association with the telephone instrument without any change in the structure of such instrument, and in which the selective setting of the plurality of elements is interchangeable and is adapted for changing, at the will of the operator, the subscriber stations, the numbers of which are adapted to be automatically dialed.

18. In an automatic telephone calling system, the combination with the conventional transmitting and receiving instrument, including a dial mechanism, of a single revoluble disc a plurality of pins placed in series within the apertures of said disc in concentric relationship, means for momentarily operating, by said pins a plurality of series of elements, the sequential disposition of which upon the face of said disc corresponds to the exchange and numerical designation of a subscriber station to be called, to effect the au-

tomatic transmission of impulses corresponding to the said designation of such station, a plurality of selector switches below said disc, and in line with a single series of said elements, a plurality of push-buttons having individual switches for effecting the operative movement of such elements, a motor for moving said elements in their predetermined order upon depression of one of said push buttons, and means controlled by the movement of said elements, to transmit said impulses to the telephone instrument.

19. In an automatic telephone calling system, the combination with the conventional transmitting and receiving instrument, of a single revoluble disc a plurality of pins placed in series within the apertures of said disc in concentric relationship, means for momentarily operating, by said pins a plurality of series of elements, the sequential disposition of which upon the face of said disc corresponds to the exchange and numerical designation of a subscriber station to be called, to effect the automatic transmission of impulses corresponding to the said designation of such station, a plurality of push-buttons for effecting the operative movement of such elements, a motor for moving said elements in their predetermined order upon depression of one of said push-buttons, and means controlled by the movement of said elements to transmit said impulses to the telephone instrument, the sequential disposition of said elements being interchangeable without alteration in the mechanical components of the system.

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