April 2, 1940. T. W. MacKENZIE 2,195,519

AUTOMATIC TELEPHONE DIALER

Filed Aug. 25, 1937 4 Sheets-Sheet 1

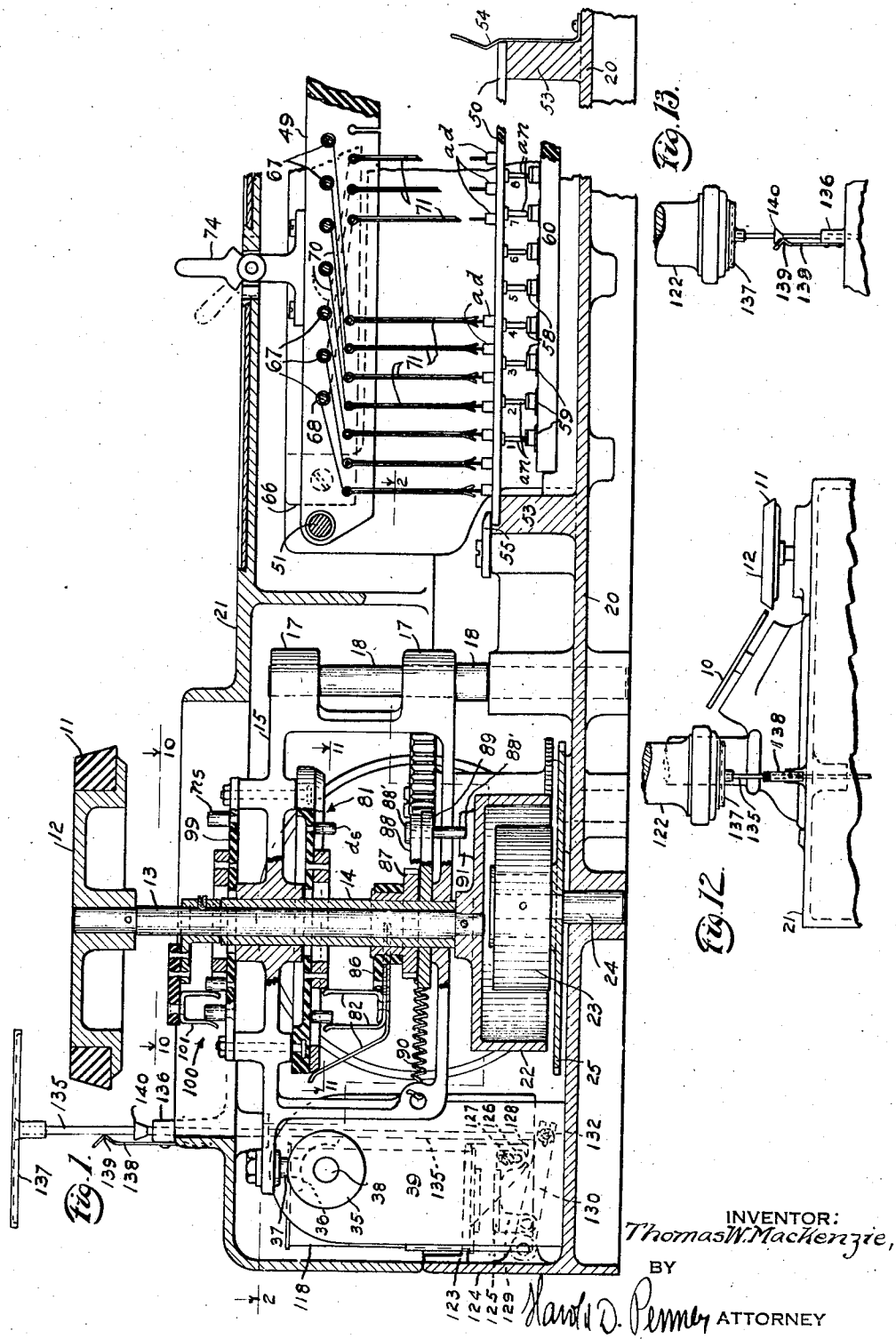


Fig. 1.

Fig. 13.

Fig. 12.

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AUTOMATIC TELEPHONE DIALER

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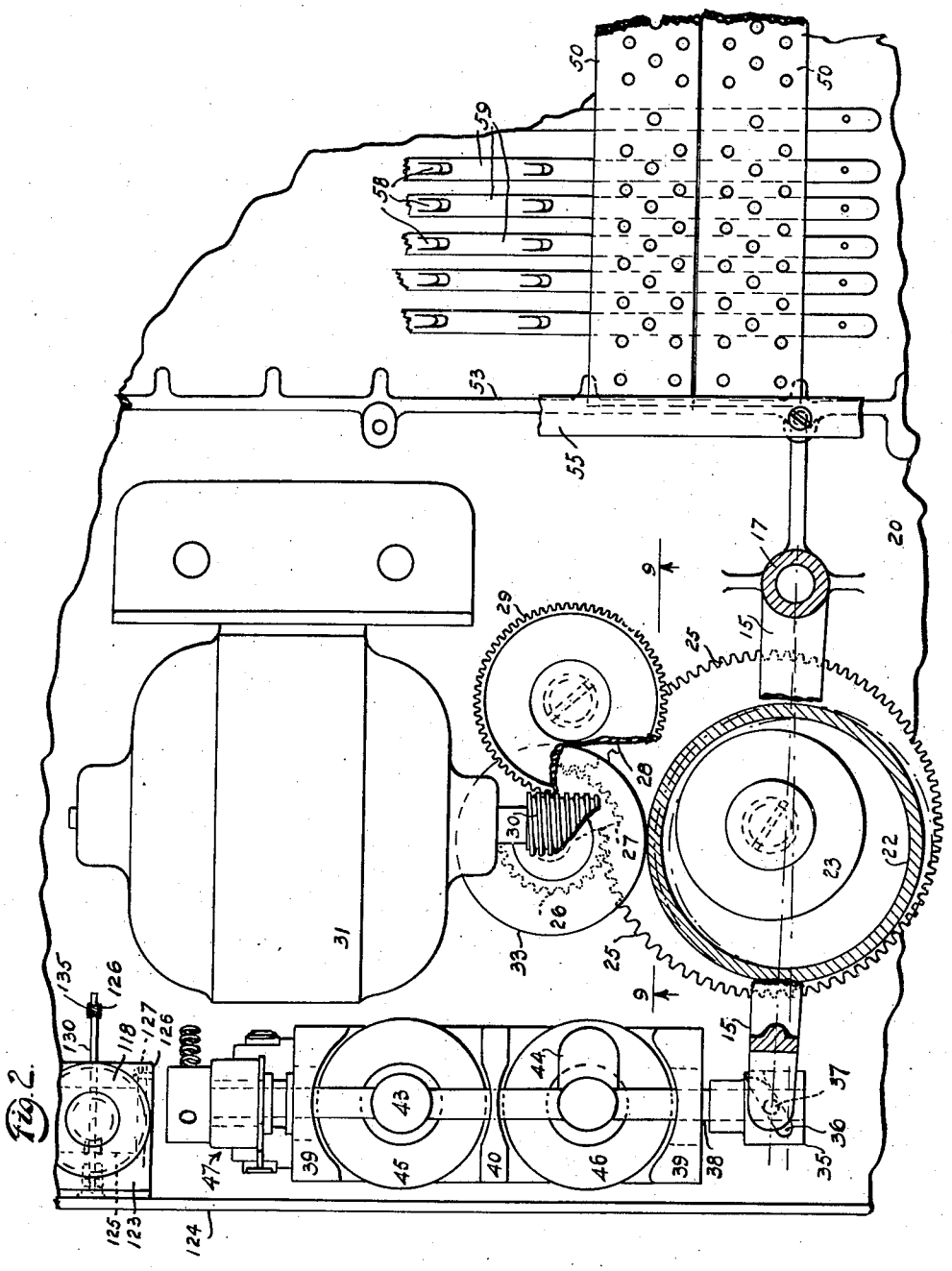


Fig. 2.

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Fig. 3.

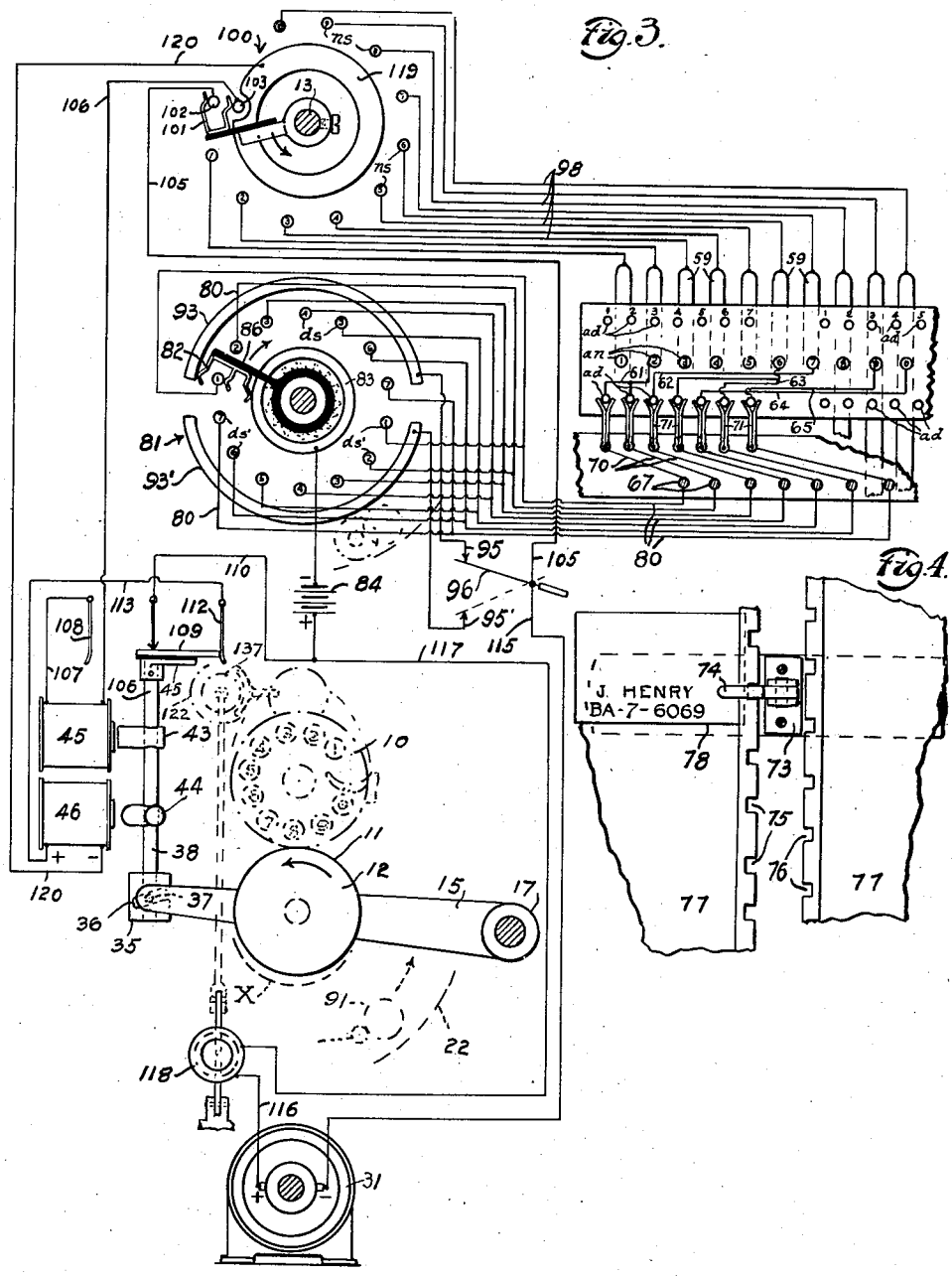


Fig. 4.

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AUTOMATIC TELEPHONE DIALER

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Fig. 9.

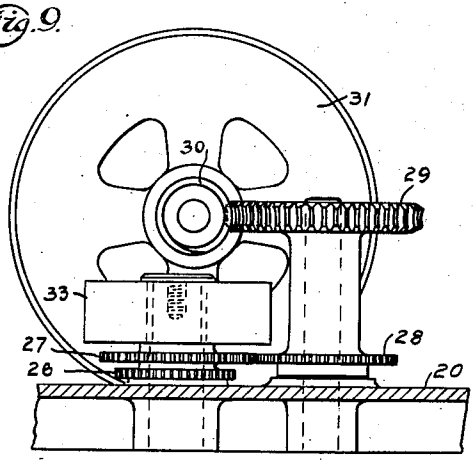


Fig. 7.

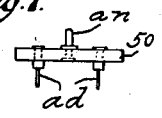


Fig. 6.

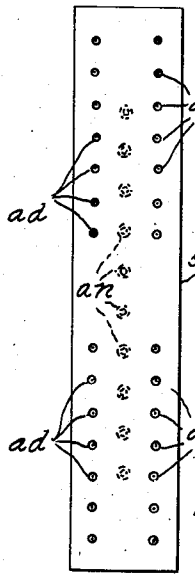


Fig. 5.

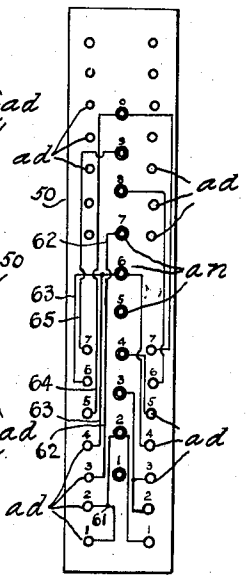


Fig. 10.

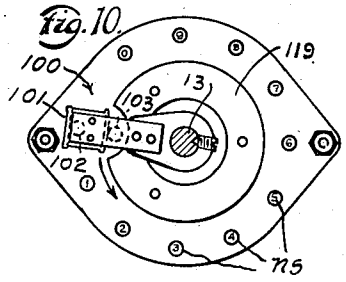


Fig. 11.

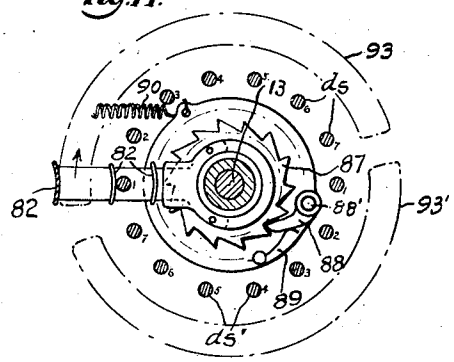
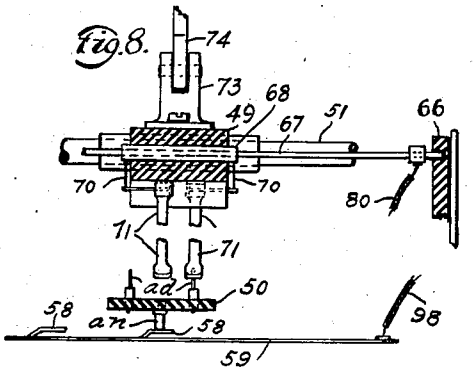


Fig. 8.



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Patented Apr. 2, 1940 2,195,519

UNITED STATES PATENT OFFICE

2,195,519

AUTOMATIC TELEPHONE DIALER

Thomas W. MacKenzie, Union County, N. J.

Application August 25, 1937, Serial No. 160,736

13 Claims. (Cl. 179—90)

This invention relates to means for automatically obtaining telephone connections and more particularly to apparatus and devices for obtaining such connection by operating the dial of any of the usual types of dial telephones; though it is noted that in some of the claims the invention is not limited to dial operation nor even to telephones.

Objects of the invention are to provide an improved device or apparatus of this kind which will automatically dial the ordinary dial telephone without changing the telephone structure or adding thereto any attachment whatever, at the same time leaving the telephone entirely free for the usual manual operation. Results of this operation are the avoidance of errors, saving of time and labor, and enable one operator to effect dialing of a number of telephones at the same time.

Other obects of the invention are to provide an improved device of this kind which is easily adaptable for selectively calling any one of a large list of subscribers and their numbers, which list may easily be changed to add or substitute new numbers without the expense of additional parts or material.

Additional objects of the invention are to improve generally the simplicity and efficiency of such apparatus and to provide a simple apparatus of this kind which is labor-saving, economical, durable, accurate and reliable in operation, and economical to manufacture and install.

Still other objects of the invention will appear as the description proceeds; and while herein details of the invention are described in the specification and some of the claims, the invention is not limited to these, since many and various changes may be made without departing from the scope of the invention as claimed in the broader claims.

The inventive features for the accomplishment of these and other objects are shown herein in connection with a novel telephone dialer which, briefly stated, includes dialing means including a friction wheel dialing member engageable with the edge of the telephone dialing disk, an advancing means adapted when electrically energized to cause said member to engage and advance said disk, and restoration means adapted when energized to disengage and restore the dialing member. There are a plurality of selectable subscriber assemblies each corresponding to a different subscriber number and each comprising digit contacts, numeral contacts and conductors connecting each digit contact to its corresponding numeral contact. Digit selector switch means influenced by each restoration of said dialing member successively electrically connect the digit contacts of a selected assembly with a pole of the source. Numeral selector switch means advanced in unison with the advancing dialing member are adapted when in normal position to electrically connect said advancing means in circuit with the current source to cause the dialing means to advance from normal, and are adapted when so advancing to successively connect said numeral contacts of such selected assembly, through the restoration means to the other pole of the source thereby to disengage and restore the dialing member as soon as the corresponding numeral is reached, thus to allow the telephone disk to restore as in manual operation.

In the accompanying drawings showing, by way of example one of many possible embodiments of the invention,

Fig. 1 is a fragmental transverse vertical sectional view, partly in elevation, showing the dialing apparatus, the section being taken substantially through the dialing means and the subscriber assembly selector-means;

Fig. 2 is a fragmental plan, partly in section on the line 2—2 of Fig. 1, showing the motor for the dialer, the restoration and operation magnets and subscriber assemblies;

Fig. 3 is a wiring diagram of the apparatus;

Fig. 4 is a fragmental plan showing the parts of the assembly selector means;

Fig. 5 is a bottom plan showing the connections of a subscriber assembly;

Fig. 6 is a top plan of the assembly;

Fig. 7 is an end elevation of the assembly;

Fig. 8 shows a fragmental end elevation, partly in section, of the assembly selector means or carriage;

Fig. 9 is a fragmental end elevation partly in section on the line 9—9 of Fig. 2, showing the motor and reducing gears;

Fig. 10 is a plan, partly in section on the line 10—10 of Fig. 2, showing the numeral selector switch;

Fig. 11 is a plan, partly in section on the line 11—11 of Fig. 1, showing the digit selector advancing means;

Fig. 12 is a fragmental side elevation showing the relation of the dialing member with the receiver and dialing disk of a telephone, and

Fig. 13 is a fragmental elevation showing the receiver raising means.

The dialing is effected by engagement of the edge of the telephone dialing disk 10 (Fig. 12) by a

rotary friction rim 11 (Figs. 1 and 12) of rubber or the like of the dialing wheel or member 12 fast on the upper end of the dialing shaft 13 rotatably mounted in the bearing bushing 14 carried in a frame 15 having spaced bored ears 17 pivotally received on a post 18 carried on the bottom 20 of the machine housing 21.

Fast on the lower end of the shaft 13 is a friction ring wheel 22 having its inner periphery engageable with a restoring friction wheel 23 (Figs. 1 and 2) rotatable on a short shaft 24 mounted in the base. The wheel 23 is fast with a gear 25 meshing in intermediate pinion 26 driven by gears 27 and 28 from the worm wheel 29 meshing with the worm 30 fast on the shaft of the motor 31.

When the frame 15 is swung toward the bottom of Fig. 2, the friction ring wheel 22 engages the wheel 23; and the dialing wheel 12 is driven in return or restoring direction. When the frame is moved in the opposite direction, the friction periphery 11 engages the dial 10, and the outer periphery of the wheel 22 engages in advancing friction wheel 33 fast on the pinion 26, whereby the dialing shaft, the friction rim 11 and disk 10 are rotated at high speed in dialing direction.

The above mentioned movement of the frame is effected by the oscillation of a cam head 35 provided with a cam slot 36 receiving a pin 37 carried by the frame 15. Said head is carried on a shaft 38 mounted in brackets 39, 40 on the base. Said shaft carries radial armatures 43, 44 disposed at an angle to each other, and respectively attracted by electromagnets 45, 46 mounted between the brackets. When armature 43 is attracted the ring wheel 22 moves into engagement with the wheel 33 for dialing, and when the armature 44 is attracted, the wheel 23 is engaged for restoring the dialing shaft to normal. A snap switch 47, later to be described, is operated by the shaft 38. The function of the snap switch and the energization of the magnets 45, 46 will be presently explained.

The number of the subscriber to be called is selected by sliding a contact carriage, or assembly selector 49 (Figs. 1 and 8) over a plurality of assembly plates 50 of insulating material transversely disposed under the path of the carriage on parallel supporting rails 51 mounted on the housing walls, the plates being supported on rails 53 on the bottom of the housing and held in place by spring clamps 54 engaging over one end of the plate and a bar 55 mounted on the rail at the other end of the plate and laterally projecting over such end. These plates correspond to different telephone numbers in accordance with the connections on the plates as will be explained. In the present embodiment, each plate is adapted to provide for four different telephone numbers at the same time.

Each assembly plate is provided with one set of downwardly pointed numeral contact pins *an* corresponding to the ten possible numbers 1 to 0 of each digit; and these contact pins respectively engage with spring contact tongues 58 pressed up from ten spaced bus bars or conducting strips 59 secured parallel with the path of the carriage on an insulating board 60 secured on the bottom 20 between said rails. Each contact pin *an* of each plate engages a tongue 58 of each strip. There is only one set of pins *an* for the four telephone numbers on each plate 50.

Upwardly pointing from each assembly plate 50 are four sets of longitudinal rows of seven upwardly pointed digit contact stems *ad* (Figs. 1 and 3) numbered 1 to 7, one stem for each digit of the telephone number. If the telephone number has more or less digits than seven, the number of stems *ad* would be more or less than seven.

Said rows are placed in the four quarters respectively of the plate 50 (Figs. 3 and 6) and each row corresponds to a telephone number to be called. To adapt each row of stems for its number, each digit stem *ad* is connected by a connector to its corresponding numeral stem *an*. For instance, in the telephone number BA–7–6069, where B and A represent the same dial position as numeral 1, the first and second digit stems are connected by conductors 61 (Fig. 5) to numeral pin 2 (corresponding to B and A), the third digit stem *ad* is connected by conductor 62 to numeral pin 7; the 4th and 6th digit stems are connected by conductors 63 to numeral pin 6; the fifth digit stem is connected by conductor 64 to numeral pin 0; and the 7th digit stem is connected by conductor 65 to numeral pin 9. In this example, no digit stem *ad* is connected to any of numeral pins *an* 1, 3, 4, 5, 8 and 0, since corresponding numerals do not occur in the number BA–7–6069.

The selector carriage 49 is slidably supported on the parallel supporting rods 51 carried, above the ends of the number plates. Insulating plates 66 (Fig. 1) carried on the upper margins of the housing walls carry seven parallel digit bus rods 67, corresponding to the respective digits; and each is engaged by a sliding contact 68 (Fig. 8) carried in the insulating body of the carriage 49 and each connected by a conductor 70 to a corresponding digit contact clip 71 in each of two relatively off-set rows of spring digit contact clips 71 carried at opposite end portions of the carriage.

Each row of digit stems *ad* is alined with a row at the other end of the number plate; adjacent rows are spaced a convenient distance a part; and the rows of clips 71 are off-set from each other just half said distance. Thus when one row of clips 71 engages one row of digit stems *ad*, the other row of clips 71 will be offset from and out of contact with the rows of stems *ad* at the other end of the plate.

Mounted on top of the middle of the carriage is a bracket 73 (Fig. 4) carrying a pivoted latch 74 adapted to be pivotally moved toward either end of the carriage to engage, one at a time, in staggered notches 75, 76 provided in spaced plates 77 forming part of the top of the machine. Each notch 75 or 76 is positioned to hold the carriage in position to cause a row of clips to engage a row of digit stems *ad*; and beside each notch is a name plate 78 carrying the name and number of the subscriber corresponding to the telephone number of the stems *ad* which are engaged by the clips when the carriage is in such position.

Each digit bus rod 67 is connected by a conductor 80 to a corresponding digit contact stem *ad* and by a conductor 80 (Fig. 3) to two corresponding digit selector contacts *ds* and *ds'* of one of each semicircular banks of the digit selector contacts of the digit selector switch 81, said contacts *ds, ds'* being engaged one at a time (for each successive digit dialed) by the triplex brush 82, which also engages the slip ring 83 connected to the minus terminal of the electric current source 81, whereby the digit stems are successively connected to the source of current, as the triplex brush 82 is moved step-by-step a stem for each digit of the telephone number, as will now be explained.

The triplex brush 82 is carried on an insulating piece 86 (Fig. 1) carried fast on the hub of a ratchet 87 carried on the bearing bushing 14 and moved one step by a spring pressed pawl 88 (Fig. 11) pivoted on a pin 88' mounted on a disk 89 oscillatory on said bushing and moved against the tension of the spring 90 by the engagement of a lug 91 (Fig. 1), on the ring wheel 22, with the pin 88', each time the ring wheel returns to normal position after a digit is dialed; whereby the brush 82 is moved to a higher digit contact *ds* or *ds'*. The brush 82 is normally engaged with the number 1 contact *ds* or *ds'*, and moves up to number 2 contact *ds* or *ds'* after the first digit is dialed and so on past number 7 and to *ds'* or *ds* contact number 1.

The digit selector switch 81, comprises also semicircular or arcuate contacts 93, 93' (Fig. 3) engaged by the triplex brush, one at a time during the dialing of one complete number, the brush moving successively from contacts *ds* or *ds'* during this time. When the ring wheel restores 22 after the dialing of the last digit, the triplex brush is moved from one arcuate contact 93 or 93' to the next, thereby transferring the minus charge of the source 84 from one fixed contact 95 or 95' of the transfer switch 96 to the other fixed contact for a purpose which will be explained.

Each numeral bus bar 59 is connected by a conductor 98 to a corresponding fixed numeral contact post *ns* (Fig. 3) carried on an insulating plate 99 of the rotary numeral selector switch 100 and engageable by the insulated duplex brush 101 carried fast on the dialing shaft 13. In normal restored position, the duplex brush 101 engages the two contact posts 102, 103, and the starting switch transfer contact 96 (Fig. 3) is connected to the semi-circular contact 93 or 93' to which the triplex brush 82 happens to be not connected, in which case no current passes from minus to the starting switch transfer element 96, or to conductor 115 and the motor 31 or to conductor 105, pins 102, 103 and conductor 106 to the electro-magnet 45. Such a position of the transfer contact is that of the dotted position, the revolving slider contact happens to be at the upper semicircular contact.

Now suppose a caller wishes to dial a number. He first slides the carriage 49 until its contacts 71 are engaged with the digit stems *ad* corresponding to the number card of the telephone to be called and he then raises the receiver (unless it is done automatically as will be explained) and shifts the starting switch transfer element 96 from the dotted position to the full line position. This causes minus current to find a path from the current source 84, contact 93 or 93', element 95 or 95', element 96, conductor 105, post 102, brush 101, post 103, conductor 106, operation electromagnet 45, conductor 107, snap switch element 108, element 109 (then engaging element 108), conductor 110 to the plus terminal of the source 84, whereby the magnet 45 is energized, armature 43 attracted, shaft 38 rotated and the ring wheel 22 moved into contact with the friction wheel 33 ready for dialing. At the same time the switch element 109 snaps over to element 112 connecting conductor 113 and the other magnet 46 through conductor 113 with the plus terminal of the source 84. Also when said operation magnet 45 is energized as stated, minus current passes from the starting transfer element 96 through conductors 115, 116, 117, the magnet 118 (later to be described) and the motor 31 to plus for driving the dialing shaft.

This starts the dialing operation and moves the duplex brush 101 from posts 102, 103 into contact with the notched contact ring 119, and until contact with the first charged post *ns* takes place, the post *ns*2 in the present instance.

When contact with post 2 takes place, the dial has been moved two dial spaces to dial the "B"; and minus current immediately passes through the triplex brush, contact *ds*1, conductor 80, contact 71, contact *ad*1, conductor 61, contact *an*2, bus bar 59, conductor 98, post *ns*2, duplex brush 101, notched ring 119, conductor 120, magnet 46, conductor 113, switch elements 112, 109, conductor 110 to plus, thus attracting armature 44, withdrawing friction wheel 12 from the dial disk (allowing the dial disk to return) also withdrawing friction ring 22 from wheel 30 into contact with the restoring wheel 23 thereby restoring the duplex brush 101 to its normal position.

When the friction ring 22, returns to its initial position the lug 91 (Fig. 1) strikes the pawl plate pin 88' and moves the pawl, ratchet and digit brush 82 one step, from the post *ds*1 to digit post *ds*2; whereupon, the device immediately proceeds to dial the second digit. As the second digit "A" has the same dial position as digit "B", connector 61 also connects the second assembly digit contact *ad*2 to numeral pin *an*2, so that the dialing of the second digit "A" is exactly the same as before, except that the circuit is completed through stem *ad*2 and post *ds*2, instead of through stem *ad*1 and post *ds*1 as at first; and when the dialing shaft restores, the triplex brush moves from post *ds*2 to post *ds*3, ready to dial the third digit, which takes place immediately, as before.

When the third digit "7" is dialed, the duplex brush 101 moves from the illustrated initial position, as before, but when *ns* pins 1, 2, 3, 4, 5 and 6 are successively engaged, no circuit is completed through them, since they and their corresponding assembly pin *an*7 are not in circuit with post *ds*3 on which the triplex brush 82 now rests. But when the brush 101 meets post *ns*7 connected to bus bar 59, engaged by pin *an*7, a circuit is formed from minus through brush 82, post *ds*3, stem *ad*3, conductor 62, pin *an*7, post *ns*7, triplex brush 102, ring contact 119, conductor 120, magnet 46 to plus as before.

The remaining digits "6069" are dialed, restore and complete their circuits through *ds* posts 4, 5, 6, 7, *ad* stems 4, 5, 6, 7, *an* pins 6, 0, 6, 9 and *ns* posts 6, 0, 6, 9 respectively, as will be understood from the foregoing.

When the dialing shaft restores after dialing the last digit, the pawl 88 shifts the triplex brush from post *ds*7 and the upper arcuate contact 93 (connected with engaged switch contact 93) to the post *ds*1 and the lower arcuate contact 93' connected to contact 95' which is not engaged by the transfer element 96 of the starting switch. This breaks the motor circuit, causing the motor to stop, but leaves the machine in position to be started by the next caller by moving the transfer element 96 to contact 95'.

As stated, the telephone receiver may be raised by hand or automatically. If the receiver is always to be raised by hand, the magnet 118 and associated parts may be omitted. If they are omitted, the telephone receiver 122 is raised by hand before the starting switch element 96 is operated for starting. If the magnet and associated automatic receiver raising means are pro-

vided, the current through conductors 115, 116, 117 which on operation of the starting transfer element 96, energizes the motor also energizes the magnet 118.

The magnet 118 (Fig. 1) is mounted on a bracket 123 on the housing wall 124, and when energized attracts an armature 125 having down-turned corner ears 126, at the corners remote from the wall, each ear having a vertical slot receiving a screw 127 mounted in a down-turned ear 128 on the bracket 123. At the middle of the edge near the wall, the armature 125 is provided with a down-turned ear 129 pivoted to a lever 130, fulcrumed at one end to the wall 124.

The free end of the lever 130 has a pin-and-slot connection 132 with a vertical rod 135 slidable in a boss 136 at the upper part of the housing and carrying a platform 137 disposed just under the receiver 119 (Fig. 12).

When the magnet 118 is energized, it causes its armature, the lever 130, the platform 137, the receiver 122 and the receiver hook to rise, thus permitting the telephone to dial, the receiver and platform being held raised by means of a flat spring 138 having a cam (Figs. 1, 12 and 13) end 139 adapted, when the platform is raised, to engage under a cone collar 140 (Fig. 13) fast on the rod, thereby to hold the receiver and hook raised, should the subscriber not remove the receiver before the dialing ceases. After using the receiver, the subscriber merely replaces the receiver onto the hook, in the ordinary way, with enough force to force the collar 138 below the cam end 139.

What is claimed is:

1. In a telephone dialer, a source of current; dialing means including a dialing member, advancing means adapted when energized for advancing said member and restoration means adapted when energized to restore the member; subscriber assemblies each comprising digit contacts, numeral contacts and conductors connecting each digit contact to a corresponding numeral contact; means influenced by each restoration of said member to successively connect the digit contacts of a selected assembly with a pole of the source; means advanced in unison with the advancing dialing member and adapted when in normal position to electrically connect said advancing means in circuit with the source, and to successively connect said numeral contacts of such selected assembly, through the restoration means to the other pole of the source.

2. In a telephone dialer, a source of current; dialing means including a dialing member, advancing means for advancing said member, and restoration; means adapted when energized to restore the member; subscriber assemblies each comprising digit contacts, numeral contacts and conductors connecting each digit contact to a corresponding numeral contact; means influenced by each restoration of said member to successively connect the digit contacts of a selected assembly with a pole of the source; means advanced in unison with the advancing dialing member and adapted when advancing to successively connect said numeral contacts of such selected assembly, through the restoration means to the other pole of the source.

3. In a telephone dialer, a source of current; dialing means including a dialing member, advancing means adapted when energized for advancing said member, and restoration means adapted to restore the member after a numeral is dialed; means advanced with the advancing dialing member adapted when in normal position to electrically connect said advancing means in circuit with the source.

4. In a telephone dialer, a dialing member; advancing means for advancing said member from normal position in dialing direction; settable digit selector means influenced by restoration of said member, to successively set the selector for different digits; numeral selector means advanced in unison with the advancing dialing member from normal position to successive numeral positions; means cooperating with the numeral selector and advancing means when in normal position to advance the numeral selector means and dialing member; subscriber assemblies each comprising digit elements and numeral elements associated therewith corresponding to a number to be called; and means adapted to be selectively associated with any assembly, and associating said digit and numeral elements with said digit and numeral selector means respectively when the latter are in positions corresponding to said elements to cooperate therewith to cause said dial member to restore.

5. In a telephone dialer, a dialing member adapted to be advanced in dialing direction and restored; digit selector means influenced by restoration of said member to successively set the selector for different digits; numeral selector means advanced in unison with the advancing dialing member from normal position to successively numeral positions; subscriber assemblies each comprising digit elements and numeral elements associated therewith corresponding to a number to be called; and means adapted to be associated with any assembly and associating said elements with said selector means when the latter are in positions corresponding to said elements to cooperate therewith to cause said dial member to restore.

6. In a telephone dialer, a source of current; dialing means including a dialing member, advancing means adapted when energized for advancing said member dialing direction and restoration means adapted when energized to restore the member; a digit selector switch comprising a bank of selector contacts; means operative on each restoration of said member to successively connect the digit selector contacts with a pole of the source; a dialing switch means operated and restored in unison with the dialing member and comprising numeral contacts and adapted when in normal position to connect said advancing means to in circuit with source, and to successively connect said numeral contacts through the restoration means to the first pole; subscriber assemblies each comprising digit contacts, numeral contacts, and conductors connecting each digit contact to a corresponding numeral contact; and selective means adapted to connect all of the digit contacts of any assembly to corresponding selector contacts and the switch numeral contacts to the corresponding assembly numeral contacts.

7. In a telephone dialer, a source of current; dialing means including a dialing member, advancing means adapted when energized for causing the advance of said member, dialing direction and restoration means adapted when energized to bring about the restoration of the member; a digit selector switch comprising a bank of selector contacts; means operative on each restoration of said member to successively connect the digit selector contacts with a pole of the source; subscriber assemblies each comprising digit contacts,

numeral contacts, and conductors connecting each digit contact to a corresponding numeral contact; selective means adapted to connect all of the respective digit contacts of any selected assembly to corresponding digit selector contacts; a dialing switch means operated and restored in unison with the dialing member and comprising numeral contacts and adapted when in normal position to electrically connect said advancing means in circuit with the source, and to successively connect said numeral contacts through the restoration means to the other pole; and conductors connecting the switch numeral contacts to the corresponding assembly numeral contacts.

8. In a telephone dialer, a source of current; a dialing member engageable with a telephone to dial a number; a restoration magnet and an operation magnet each having its coil connected to one pole of the source; motor means settable by the operation magnet, when energized, into condition for causing said member to operate in dialing direction, and when the restoration magnet is energized to disengage and restore the member to normal; a digit selector switch comprising a bank of digit selector contacts; means operative on each restoration of the dialing member for successively connecting the digit selector contacts with the second pole; a starting means for supplying driving current to the motor means only until all of said contacts have been engaged; subscriber assemblies each comprising assembly digit contacts, numeral contacts, and conductors connecting each assembly digit contact to a corresponding assembly numeral contact; selective means adapted to connect all of the respective assembly digit of any assembly to corresponding digit selector contacts; a dialing switch means operated and restored in unison with the dialing member and comprising numeral selector contacts and adapted when in normal position to electrically connect said operation magnet to said second pole, and to successively connect said numeral selector contacts through the restoration magnet to the first pole; and conductors connecting the numeral contacts to the respective corresponding numeral contacts of each assembly.

9. In a telephone dialer, a source of current; means including a dialing member engageable with a telephone to dial the telephone; a restoration magnet and an operation magnet each having its coil connected to one pole of the source; means set in operation by the operation magnet when energized for causing said member to dial the telephone in dialing direction, and when the restoration magnet is energized to disengage and restore the member to normal; and means for selectively energizing said magnets.

10. In a telephone dialer, a source of current; a rotatable dialing member engageable with the telephone disk to turn the disk; a motor having one terminal connected to the pole of said source; a restoration magnet; an operation magnet; a snap transfer switch having its transfer element connected to the plus pole of the source, and its fixed elements connected to said coils of said magnets respectively; means operated by the operation magnet when energized for snapping the transfer element from connection with the starting magnet to connection with the restoration magnet, and to cause said member to engage the disk and said motor when operating to rotate the disk in dialing direction, and when the restoration magnet is energized to disengage and restore the member, and snap the transfer element into connection with the operation magnet; and means for selectively connecting said coils to the other pole of the source.

11. In a telephone dialer, a source of current; dialing means including a dialing member, means for advancing and restoring said member, and a motor adapted to drive said member and means and having one terminal connected to a pole of said source; a switch comprising a brush connected to the second pole of the source, a pair of contacts one only being engageable by the brush during the dialing of a number and means operative on each restoration of the dialing member for moving said brush from one arcuate contact to the next after each number has been dialed; and a transfer starting switch having a starting transfer element connected with the other terminal of the motor and adapted to be electrically connected to either contact, and normally connected to the unengaged arcuate contact.

12. In a telephone dialer, a source of current; dialing means including a dialing member, advancing means adapted when energized for advancing said member, restoration means adapted when energized to restore the member when a numeral is dialed, and a motor adapted to drive said member and means and having one terminal connected to a pole of said source; a digit selector switch comprising a revolving brush at all times connected to the second pole of the source, a pair of semicircular contacts, each associated arcuate contact being engageable by the brush during a different half of the brush revolution; and means operative on each restoration of the dialing member for moving said brush along one of said contacts, and from one arcuate contact to the next after every digit of the number has been dialed; a transfer starting switch having a starting transfer element adapted to be electrically connected to either arcuate contact, and normally connected to the unengaged arcuate contact and permanently connected with the other terminal of the motor; whereby when the brush passes from one arcuate contact to the next, the starting transfer element will be disconnected from said second pole.

13. In combination, a source of current; operating means including an advancing member, advancing means adapted when energized for advancing said member and disabling means adapted when energized to disable the member; assemblies each comprising two sets of contacts, and conductors connecting each contact of one set to a corresponding contact of the other set; means operated on each advance of said member to successively connect the contacts of the first set of a selected assembly with a pole of the source; means advanced in unison with the advancing member and adapted when in normal position to electrically connect said advancing means in circuit with the source, and to successively connect said contacts of the second set of such selected assembly, through the disabling means to the other pole of the source.

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