Dec. 8, 1936. J. H. ROUSE 2,063,830

TELEPHONE CALL SYSTEM

Filed Aug. 28, 1933

Fig. 1

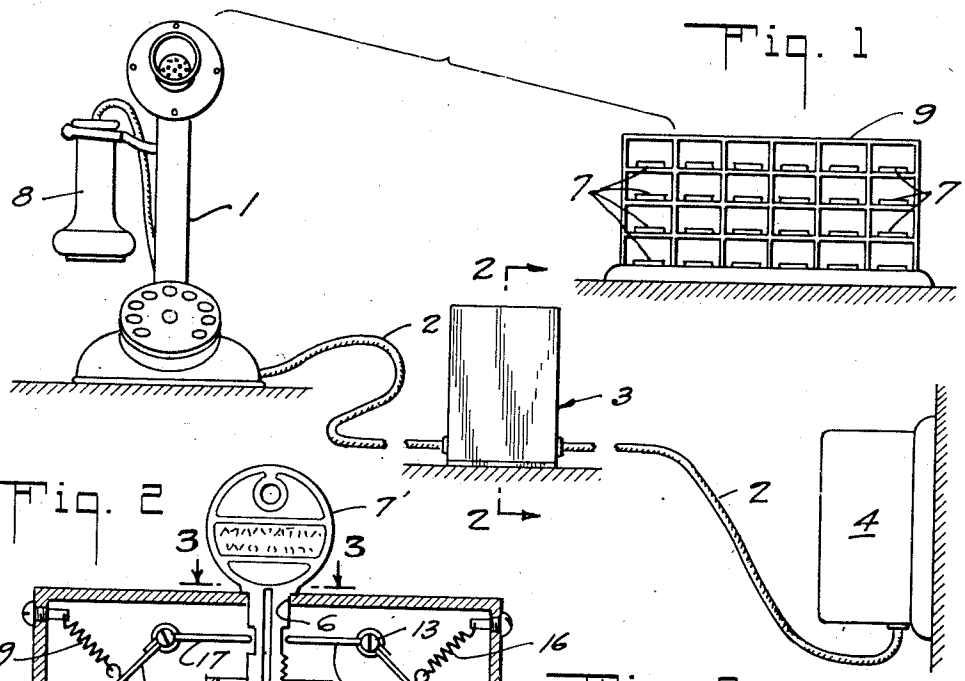


Fig. 2

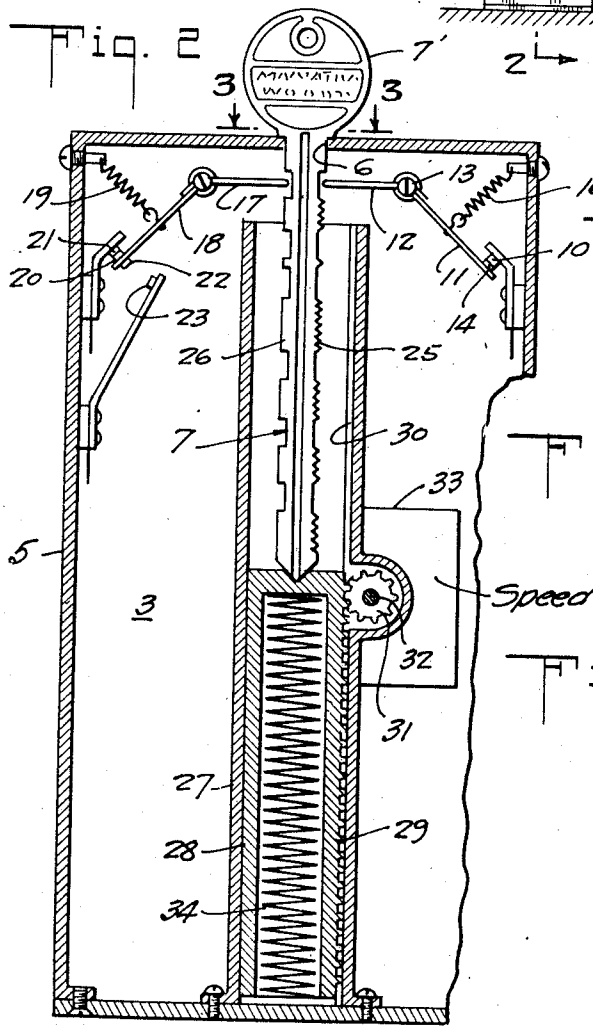


Fig. 3

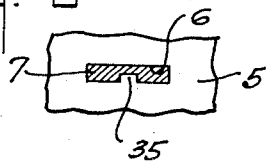


Fig. 4

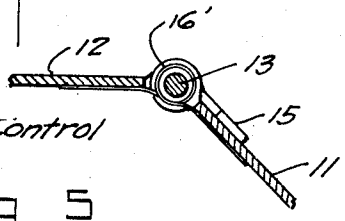
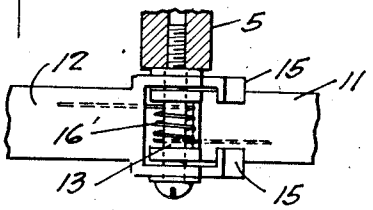


Fig 5



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2,063,830

TELEPHONE CALL SYSTEM

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12 Claims. (Cl. 179—90)

This invention relates to a system for calling a subscriber to an automatic telephone exchange.

In most of the larger cities, such automatic exchanges are now in common use. In order to call a subscriber, a dial is used, which is arranged to control a plurality of contacts. Each dialing operation (that is, the rotation of the dial by a definite angle and its reverse rotation under a controlled speed), causes a pair of contacts to be interrupted a definite number of times, corresponding to the angle of movement; and also the operation causes another set of contacts to operate through a cycle. These circuit controlling acts operate to connect the calling station to the subscribing station. Since the electrical connections for obtaining this result are well understood, further description thereof is not essential for an understanding of the present invention.

It is one of the objects of this invention to provide a mechanism that is precise for performing these controlling operations; as for example by the use of a key or tape or its equivalent, corresponding to a definite number to be called.

It often happens that one station or a group of telephone stations are called frequently by a subscriber. It is another object of the invention to provide, for such use, one or a number of calling devices, corresponding to the numbers desired, which can be used interchangeably as desired, for automatic and correct "dialing" of the corresponding station.

This result is accomplished by providing code carrying members, such as in the form of an appropriately notched bar or key, which when used, causes correct "dialing" of the station to which the member corresponds. Such an arrangement can if desired, merely supplement the usual dial mechanism, or may replace it.

The advantages of such a system are numerous. For example, a subscriber, instead of giving his phone number to anyone who may desire to call, would instead give to that person a "key" or its equivalent, which can be used when desired to get connected to the subscriber's station. Or, when numerous calls are to be made to a selected group of subscribers, the "dialing" members corresponding to these subscribers can be conveniently kept on a rack and appropriately indexed by name or number.

This invention possesses many other advantages, and has other objects which may be made more easily apparent from a consideration of one embodiment of the invention. For this purpose there is shown a form in the drawing accompanying and forming part of the present specification. This form will now be described in detail, which illustrates the general principles of the invention; but it is to be understood that this detailed description is not to be taken in a limiting sense, since the scope of the invention is best defined by the appended claims.

Referring to the drawing:

Figure 1 is a diagram illustrating the invention as applied to a conventional phone;

Fig. 2 is an enlarged sectional view of a mechanism incorporating the invention, taken along plane 2—2 of Fig. 1;

Fig. 3 is a detail section, taken along plane 3—3 of Fig. 2;

Fig. 4 is a detail section of one of the contact fingers; and

Fig. 5 is a fragmentary top plan view of one of the contact fingers.

In Fig. 1, the telephone 1 is shown as connected by a cable 2 to a calling mechanism 3 and the usual connection and ringer box 4. This box 4 may be appropriately supported on a wall or the like. The calling mechanism 3, incorporating the invention, is indicated in the present instance as enclosed in a rectangular box 5 (Fig. 2). This box has a slot 6 (Figs. 2 and 3) in which any of a number of "dialing" members 7 may be inserted for calling a number after the receiver 8 of telephone 1 is removed from its hook. A rack 9 is indicated in Fig. 1, for accommodating a number of members 7, although other forms of receptacles or files could be used therefor.

In the present instance, the members 7 are each in the form of a strip of metal, having a head 7' by the aid of which it may be readily manipulated. Thus these members resemble an ordinary key; but it is to be understood that other forms of such code carrying members can be used.

Referring now to the mechanism 3, which is enclosed in box 5, this mechanism has a pair of circuit controllers, which operate circuits in a well known way to obtain a connection to a subscriber station. In the present form, one of these circuit controllers includes the stationary contact 10. A movable contact arm cooperates therewith, and is formed of a pair of hinged arms 11, 12, (Figs. 2, 4, 5). Both these arms are pivoted on a headed pin 13. The arms are furthermore so arranged that actuation of arm 12 in one direction about pivot 13, is effective to move the arm 11, carrying the contact 14.

Thus for example, arm 12 has a pair of stop projections or fingers 15 (Figs. 4 and 5) which

engage the upper side of finger 11. When arm 12 is moved in a clockwise direction, fingers 15 serve to move arm 11 on a corresponding direction, for separating contacts 10, 14, against the action of a tension spring 16. On the other hand, if arm 12 is moved in a counterclockwise direction, the fingers 15 merely separate from arm 11. A coil spring 16' (Figs. 4 and 5) can be placed over pin 13, resiliently holding the fingers 15 in contact with arm 11.

Another circuit controller of substantially the same construction as described, is provided at the upper left hand side of the mechanism 3. This controller includes the actuating arm 17 (similar to arm 12), and the contact carrying arm 18 (similar to arm 11). These arms 17, 18 are hinged together. A tension spring 19 urges arm 18 so that its front contact 20 engages stationary contact 21. When arm 17 is moved in a counterclockwise direction, contacts 20, 21 are separated, spring 19 is stretched, and back contact 22 is moved to engage stationary contact 23.

It is thus apparent that contacts 10 and 14 operate through a circuit controlling cycle whenever a projection passes upwardly past the end of arm 12. The contacts 10, 14 first separate and are later permitted to engage, under the influence of spring 16.

Similarly, contacts 20, 21, 22 and 23 operate through additional circuit controlling cycles whenever a projection passes upwardly past the end of arm 17. The contacts 20, 21 separate and contacts 22 and 23 close in response to a projection engaging the end of arm 17, and as this projection moves sufficiently so that arm 17 is free, the latter is returned to its initial position by tension spring 19 thus separating contacts 22 and 23 and re-engaging contacts 20 and 21.

The mechanism for actuating the circuit controllers will now be described. The top of box or casing 5 is provided with a rectangular opening 6 to receive a key 7 as before mentioned, this key being so disposed that arms 12 and 17 are adjacent opposite edges thereof. Each edge is provided with a group of projections 25 and 26 adapted to engage arms 12 and 17. Centrally disposed beneath aperture 6 is a cylindrical sleeve 27 secured to the casing 5 in any convenient manner. Slidable within this sleeve is a hollow plunger 28 provided with a longitudinally extending rack 29. Sleeve 27 is provided with a slot or keyway 30 to accommodate this rack. Thus plunger 28 is permitted to move axially but is prevented from turning. Pinion 31 engages rack 29 and is mounted on a shaft 32, which drives a speed control 33, suitable gearing being interposed if necessary. This speed control is preferably of the centrifugal type which acts only in one direction; thus there will be no retardation exerted against the depression of the plunger 28, but the speed at which it is raised, as by a spring 34, will be reduced and held within close limits. The compression spring 34 is confined within plunger 28 between the top thereof and the bottom of the casing 5, and serves to raise the plunger against the action of the speed control 33.

It is obvious that the number of projections 25 and 26 will determine the number of controlling cycles executed by contacts 10, 14, 20, 21, 22 and 23 in response to one transit of key 7, and that by connecting leads from these contacts to the proper conductors in cable 2, impulses may be delivered to the central station switching apparatus, in the same manner as from the regular "dialing" mechanism.

For example, it is common practice in many cities to have telephone numbers consisting of two letters denoting the exchange and four figures, the letters being the same as two additional figures as far as the dialing and switching operations are concerned. Thus key 7 has six projections 25 and six projections 26, one of each corresponding to a figure of the number. Projections 25 have teeth cut in them, the number of these teeth depending on the number of units in the corresponding figure.

The upper portion 7' of the key may be marked with suitable indicia for identification purposes such as the name of the firm or individual whose number it will call, or the number or any desired information.

The operation of the calling mechanism is as follows: A key for the desired number is selected and inserted in opening 6, a small projection 35 on one side of the latter engaging a slot in the body of the key to insure correct placement. The point of the key engages the top of plunger 28 which is at the upper limit of its travel and, as the key is forced in, the plunger is depressed, compressing spring 35. At the same time, arms 12 and 17 swing downwardly to let projections 25 and 26 pass under them, but due to their hinged construction previously described do not move the contacts. When the key has been fully inserted, it is released; spring 34 immediately begins to expand, forcing plunger 28 upwardly at a rate determined by the speed control mechanism 33, together with the key 7. As the projections on it pass under the arms 12 and 17, circuit control cycles are initiated; thus when the uppermost of projections 26 reaches arm 17, the circuit between contacts 20 and 21 will be broken, while that between contacts 22 and 23 will be closed. Also, the circuit between contacts 10 and 14 will be broken each time one of the teeth on projection 25 passes under arm 12. When a projection 26 has passed arm 17, arm 18 is allowed to return to its initial position, breaking the circuit between contacts 22 and 23 and remaking that between contacts 20 and 21. It should be understood that the parts are so proportioned as to insure contact between points 22 and 23 being maintained during the time a group of teeth are passing arm 12. From the foregoing, it will be evident to one skilled in the art that electrical impulses corresponding to the number and grouping of the teeth on the key will be delivered from contact 10 and that additional circuit changes corresponding to the usual operation of the dial mechanism will be made by contacts 20, 21 and 22, 23, and that by suitable connections these can be made to operate the prevailing type of switches in automatic telephone exchanges.

These connections, as heretofore stated, are old in the automatic telephone art. Contacts 10, 14 are used to send a definite sequence of impulses to the telephone exchange, to cause the proper connections to be made at the exchange. These contacts should be connected in series with the regular dial contacts, when the present system is used in conjunction with a dial phone.

Contacts 22 and 23 can be used to shunt out the transmitter or both the transmitter and the receiver at the calling station, during periods that the impulse contacts 10, 14 are in operation. If contacts 22 and 23 shunt only the transmitter, contacts 20 and 21 can be used to open the receiver circuit during operation of contacts 10, 14.

The sets of contacts 10, 14; 22, 23; and 20, 21, are thus the full equivalents of corresponding contacts in an ordinary dial phone and operate in the same manner.

I claim:

1. In an impulse transmitting device, a contact mechanism capable of being operated by movement of a number of separate removable contact operating members, and means forming a receiver for but a single member to position it operatively with respect to said mechanism at a time.

2. In an impulse transmitting device, a contact mechanism, a series of separate members, and means forming a common receiver for said members, said members being capable of optional use to cause operation of said contact mechanism by movement of the member relative to the mechanism and said common receiver, said common receiver being adapted to receive one member at a time and forming a guide to place said one member into operative relation to the mechanism.

3. In an impulse transmitting device, a contact mechanism, a series of separate members capable of optional use to cause operation of said contact mechanism by movement of the member relative to the device, means forming a common receiver for said members, to place the members in working relation to the mechanism, from which common receiver the members are removable and with which one member is used at a time to the exclusion of all the other members.

4. In an impulse transmitting device, a contact mechanism, a series of separate members capable of optional use to cause operation of said contact mechanism by movement of the member relative to the device, said members causing a different sequence of impulses to be transmitted, and means for removably receiving all of said members, and capable of receiving but one member at a time to the exclusion of all the other members, for placing said selected member into working relation to the mechanism.

5. In an impulse transmitting device, a contact mechanism, a series of different and separate keys capable of optional use to cause operation of said contact mechanism by movement of the member relative to the device, and means forming a common guide for all of the keys, and capable of receiving but one key at a time to the exclusion of all the other keys, whereby any key can be placed in operative relation to the contact mechanism.

6. In an impulse transmitting device, a contact mechanism, a series of members, any one of which can cause operation of said contact mechanism by relative movement with said contact mechanism, and means forming a guide for any one of said members, from which the member is removable, whereby any one of the series of such members can be optionally used in identical relation with the guide, for operating said mechanism.

7. In an impulse transmitting device, a contact mechanism, a series of independent keys for operating said mechanism by relative movement of any key with said contact mechanism, and means whereby any one of said keys can be removably placed in operative relation to said contact mechanism, including a single guide means common for all of the keys for holding any of said keys in identical relation with said guide.

8. In an impulse transmitting device, a contact mechanism, a member causing operation of said contact mechanism by relative movement with said contact mechanism, means forming a guide for said member from which the member is removable, whereby any one of a series of such members can be optionally inserted in said guide in identical relationship thereto, and means for returning said member through said guide at a predetermined speed.

9. In combination in a communication system and its appropriate connections, a circuit controlling device for said connections, comprising a housing, and a plurality of contact mechanisms, there being an opening in said housing adapted to receive a selected member having groups of elements arranged to operate said mechanisms, and means to move said member through said opening, said contact mechanisms including means whereby they are operated only during the movement of the selected member under the influence of said moving means.

10. In combination in a communication system and its appropriate connections, a circuit controlling device for said connections comprising a housing, a plurality of contacts, with associated one way means for controlling them, a member having groups of elements arranged to actuate said means for controlling said contacts, a guide for said member, and means for returning said member through said guide at a predetermined speed.

11. In combination in a communication system and its appropriate connections, a circuit controlling device for said connections comprising a housing, contact mechanism within said housing, a key member having groups of elements for operating said contact mechanism slidable within and removable from said housing, a speed control for limiting the rate in at least one direction of the speed at which said key moves, said contact mechanism including one pair of contacts arranged to deliver a plurality of impulses in response to movement of said key in one direction only, a second pair of contacts which are held closed during the operation of said first pair, and a third pair which are held open during the operation of first pair.

12. In combination in a communication system and its appropriate connections, a circuit controlling device for said connections, including a receiving member and a contact operating member movable with respect to the receiving member, said operating member having groups of elements corresponding to a subscriber's number, means forming a guide for said operating member to position said member in cooperative relation to the receiving member, said receiving member having a contact mechanism actuated by the operating member in proper sequence upon movement of the operating member with respect to the receiving member.

JOHN H. ROUSE.

CERTIFICATE OF CORRECTION.

Patent No. 2,063,830. December 8, 1936.

JOHN H. ROUSE.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 3, first column, line 8, claim 1, after the word "of" first occurrence, insert any of; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 16th day of February, A.D. 1937.

(Seal)

Henry Van Arsdale
Acting Commissioner of Patents.