

Jan. 27, 1948.

C. D. RICHARD

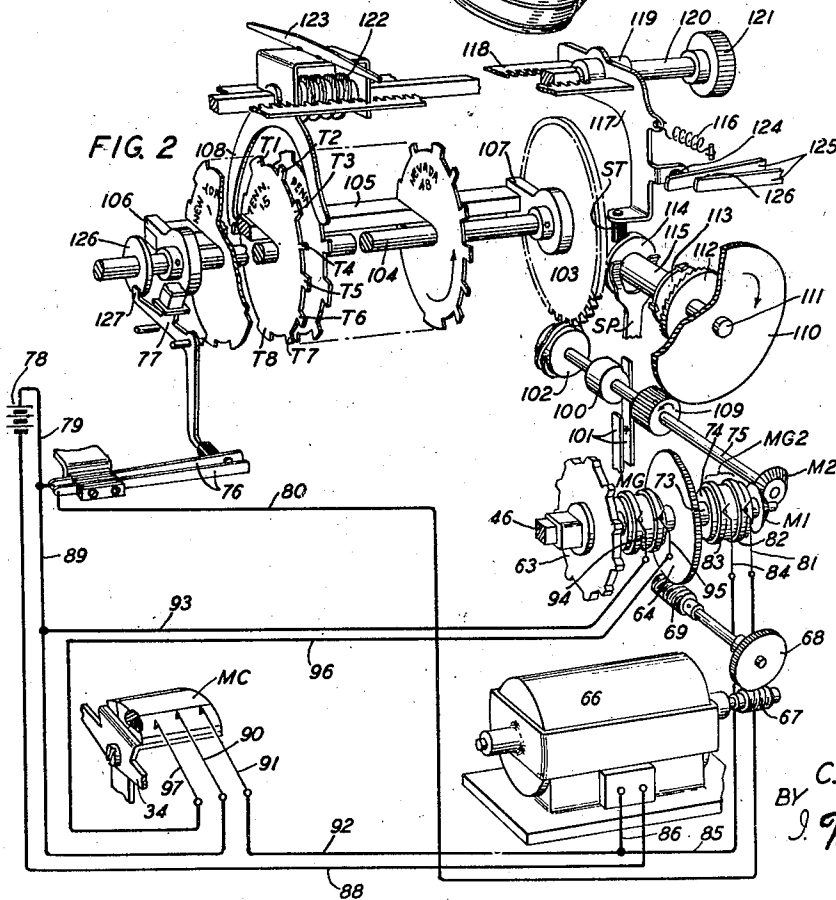
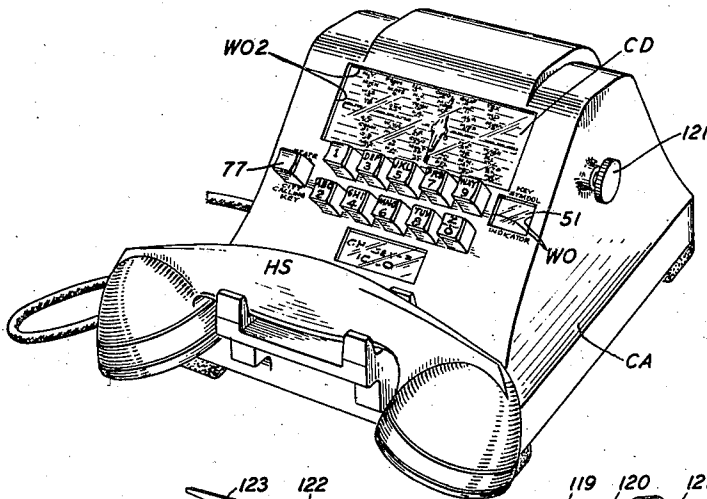
2,434,959

CALL TRANSMITTER FOR INTERSTATE TELEPHONE COMMUNICATION

Filed Sept. 15, 1945

5 Sheets-Sheet 1

FIG. 1



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FIG. 3

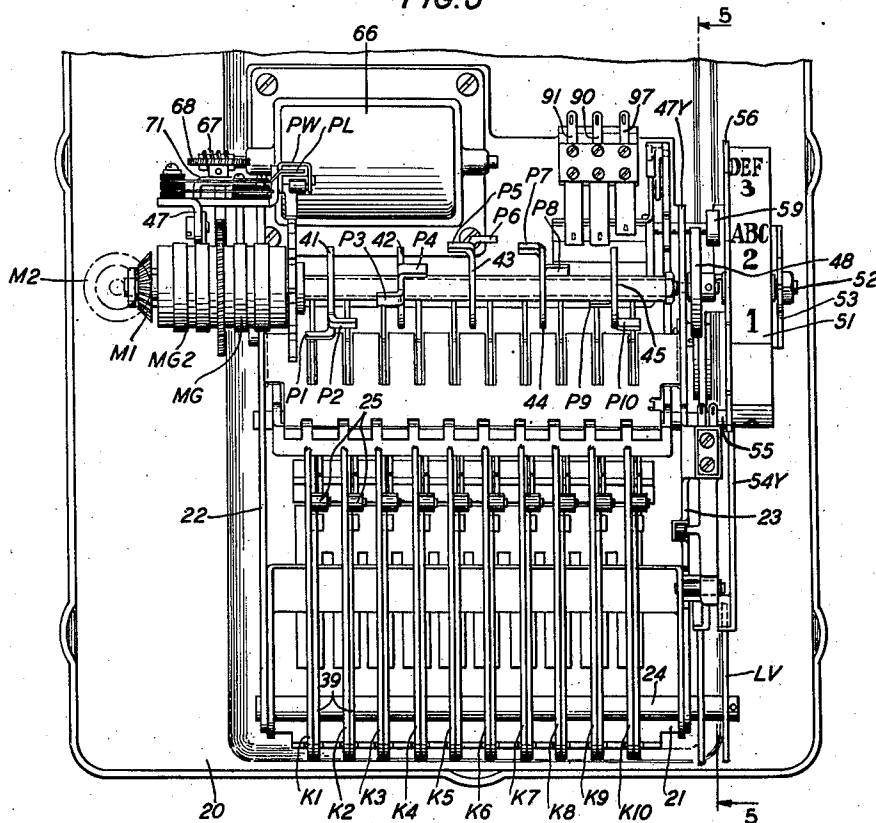
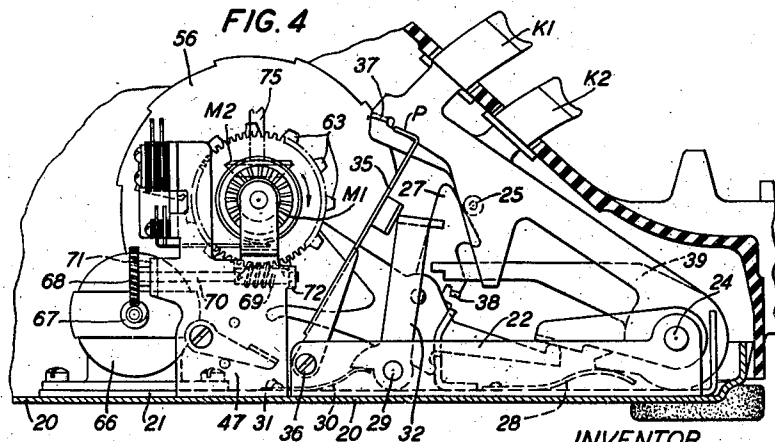


FIG. 4



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FIG. 5

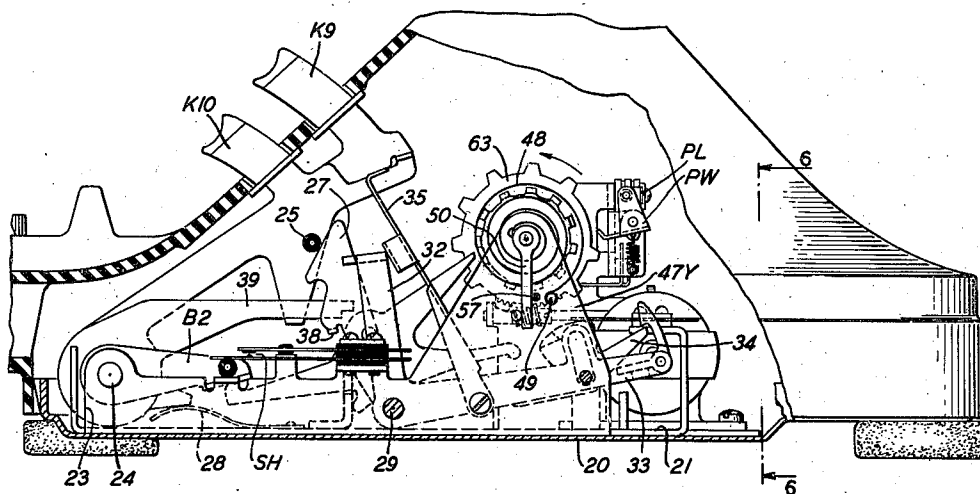
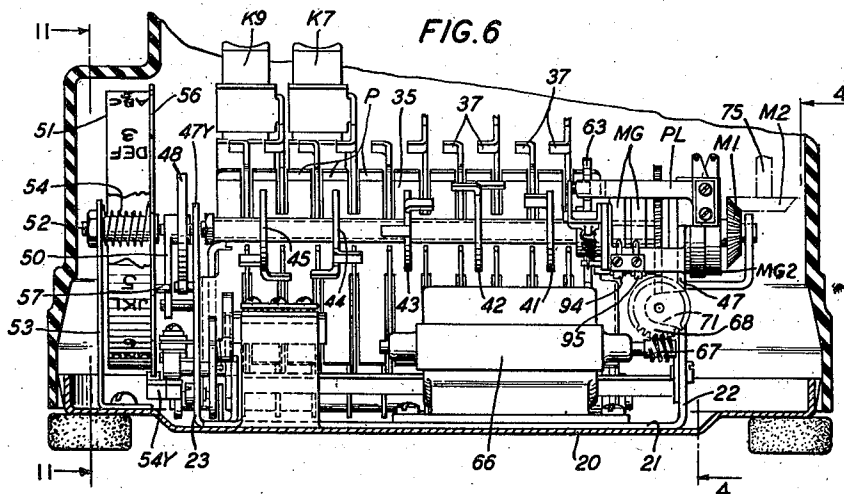


FIG. 6



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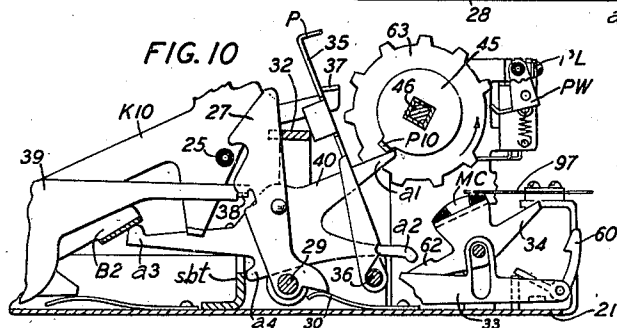
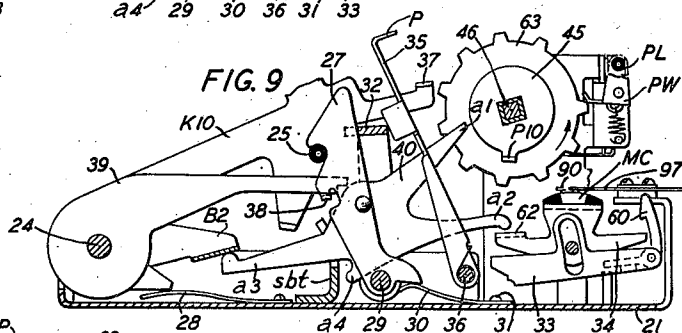
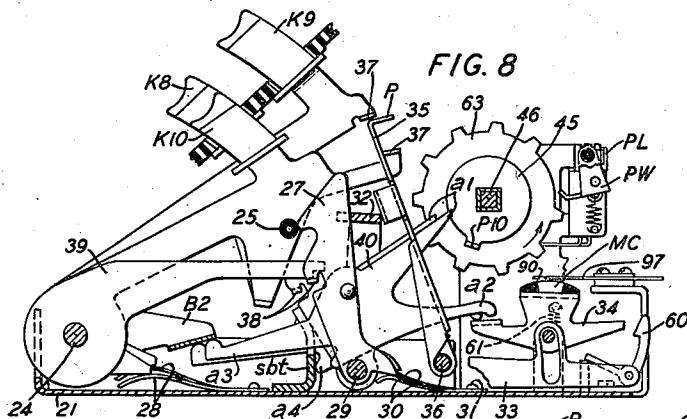
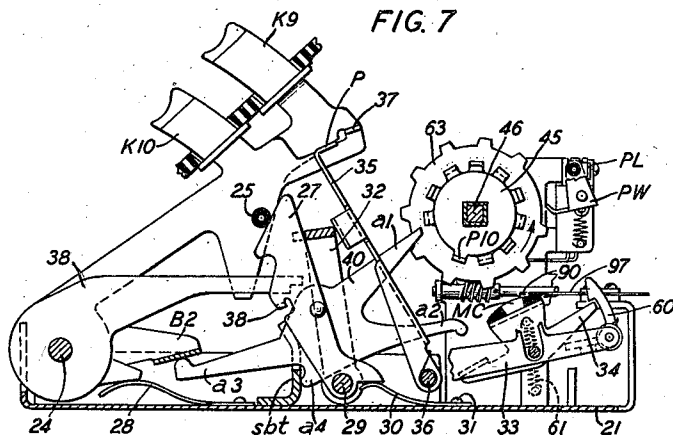
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CALL TRANSMITTER FOR INTERSTATE TELEPHONE COMMUNICATION

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CALL TRANSMITTER FOR INTERSTATE TELEPHONE COMMUNICATION

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FIG 12

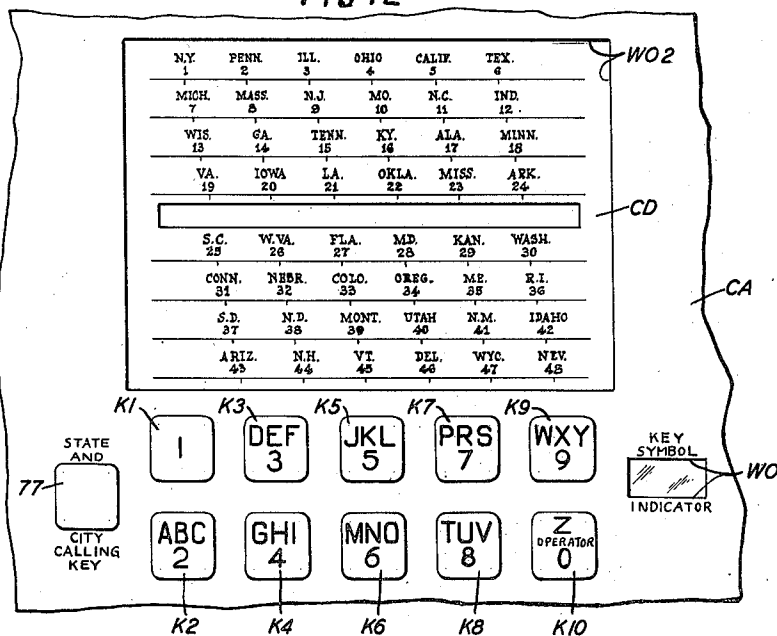
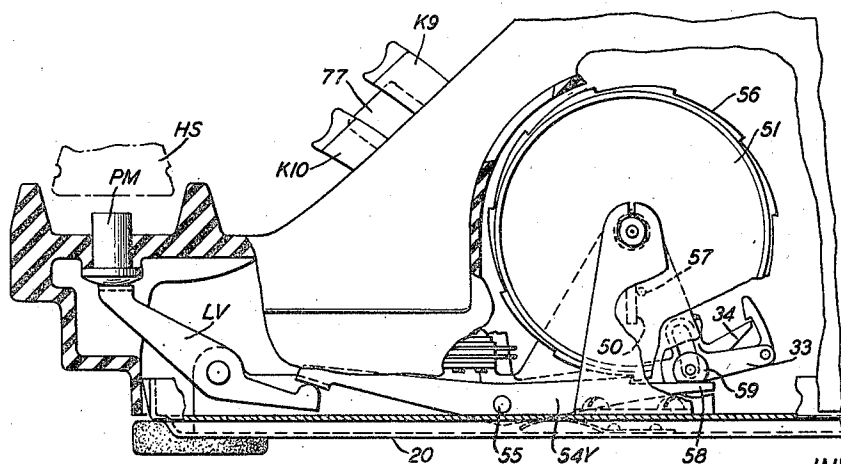


FIG. 11



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UNITED STATES PATENT OFFICE

2,434,959

CALL TRANSMITTER FOR INTERSTATE
TELEPHONE COMMUNICATION

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Application September 15, 1945, Serial No. 616,621

13 Claims. (Cl. 179—90)

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This invention relates to telephone call trans-
mitter devices.

The object of the present invention is the pro-
vision of a call transmitter device of the type
referred to which is particularly well adapted for
use in interstate telephone communications as
by coaxial cables for controlling the operation of
so-called automatic switches for establishing
talking connections between a telephone sub-
scriber in a city in one state with a telephone
subscriber in a local community in another state,
such call transmitter device being simple in con-
struction, convenient in use, positive in operation,
and by which telephone call designations consist-
ing of a number of trains of pulses are transmitted
with a minimum number of manual operations
with means for indicating each of such manual
operations.

In the telephone call transmitter of the present
invention, a manually operable knob is provided
for moving a hair line or index in registry with
the name of the state desired appearing on a
printed card fitted in a window in the casing
housing the transmitter mechanism. The move-
ment of the index is effective to condition a puls-
ing mechanism for transmitting a number of
pulses or a continuous series of trains of pulses
which may be greater than ten pulses represent-
ing the call designation necessary for establish-
ing connection with the selected state followed by
the operation of a key member, controlling the
energization of motor means and that of a clutch
operatively connecting the motor means to a
pulsing mechanism. A second selective operation
of the index relative to numbers printed on the
card is effective to condition the pulsing mecha-
nism for transmitting a call designation to a
telephone exchange located in the called state
nearest to the city of the desired telephone sub-
scriber which is effected following a second opera-
tion of the key member serving to control the
operation of the motor means and that of the clutch.
Means is provided for returning such a
key to normal position for stopping the operation
of the motor and the release of the clutch mecha-
nism following each state and city call transmit-
ting operation by the selective mechanism, while
a set of digit key members is provided for con-
trolling the operation of a second pulsing mecha-
nism actuated by the motor means through the
operation of a respectively associated clutch
mechanism for extending the talking connection
from the city located in the called state to the
desired subscriber, means being provided for in-
dicating the number or symbol of the key de-

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pressed at each stage in the writing of the call
designation.

In the drawing:

Fig. 1 is an elevation view of the call transmitter
of this invention shown in perspective;

Fig. 2 is a diagrammatical view showing the
driving mechanism for operating the state and
city pulsing mechanism and the city to subscriber
pulsing mechanism;

Fig. 3 is a partial top view showing the digit
keys controlling pulsing mechanism with the key
indicator in normal position, the keys being shown
with portions broken away;

Fig. 4 is a partial left side elevation view with
the base and the casing shown in longitudinal
vertical section taken on line 4—4 of Fig. 6, the
operating parts being shown in normal position;

Fig. 5 is a right side elevation view shown with
the casing partly shown in vertical longitudinal
section taken on line 5—5 of Fig. 3, the operating
parts being shown in normal position;

Fig. 6 is a rear elevation view of Fig. 5 shown
in vertical cross section taken on line 6—6 of Fig.
5, a number of operating parts being shown with
portions broken away;

Figs. 7, 8, 9 and 10 are partial views showing
the keys controlled pulsing mechanism in differ-
ent operated positions;

Fig. 11 is an elevation view of the casing partly
in section to show the mechanism operated by
the placing of the telephone handset in a cradle
formed with the casing, such mechanism control-
ling the release of the key-indicating mechanism
at the conclusion of a telephone conversation; and

Fig. 12 is an enlarged view of the card showing
the geometrical arrangement of the state names
and cities number designation and that of the
digit keys used for establishing talking connec-
tions between cities and the telephone subscribers
in such cities also showing the digit indicator for
such keys and the starting key for the motor
actuating the pulsing mechanisms.

According to the construction of the call trans-
mitter of this invention as best seen in Figs. 3, 4,
5 and 6, a base 20 is provided for securing a plate
21 having upright supports 22 and 23 formed in-
tegrally therewith serving to support the ends of
a shaft 24 and on this shaft is pivotally mounted
a set of key members K1, K2, K3, K4, K5, K6,
K7, K8, K9 and K10 which are held in normal
position as shown in Figs. 1, 4, 7 and 11 by similar
retractile springs 28. Each key member K1, K2,
K3, etc., is associated with a pawl-like member
27 provided for locking its respective key in the
operated position as shown by key K10 in Fig. 9

and to perform a function which will be hereinafter described in detail.

Pawls 27 as best seen in Figs. 5, 7, 8, 9 and 10 are pivotally mounted on a shaft 29 and are normally held in engageable relation with studs as 25 carried by keys K1, K2, K3, etc., by the tension of respectively associated retractile springs 30 secured to the base 21 as by rivets 31, the operation of the key members K1, K2, K3, etc., and the stud 25 carried thereby being effective to impart a pivotal movement to these pawls which is transmitted to a U-shaped bar 32 pivoted on shaft 29 and to an arm 33 formed therewith for operating a yoke-shaped member 34 of a switching device which will be hereinafter described in detail.

The operation of any one of the pawls 27 and the U-shaped bar 32 is effective to impart a pivotal movement to a plate 35 mounted on shoulder screws 36 for positioning the bent portions P at the top edge of this plate in the path of lugs 37 formed at the free end of the unoperated key members K1, K2, K3, etc., as the case may be for locking the latter into that position. Each pawl 27 as best seen in Figs. 4, 5, 6, 7, 8, 9 and 10 is formed with a lug 38 for engagement with the free end of an arm 39 serving to hold such a pawl in its operated position for permitting the return of the operated key to normal under condition which will be hereinafter described in detail. On each pawl member 27 is pivotally mounted a four armed lever member 40 which is moved by the operation of its supporting pawl member 27 in position wherein the free end of arm a1 of lever member 40 is positioned in the rotating path of a projection as P1—P2, P3—P4, P5—P6, P7—P8, and P9—P10 as the case may be formed with discs 41, 42, 43, 44 and 45, respectively, which are mounted on a shaft 46 of square cross-section as shown in Figs. 7, 8, 9 and 10 for assisting in readily locating the proper staggered or spaced angular relation of discs 41, 42, etc., relative to each other and relative to the teeth of a pulsing cam 63.

Shaft 46 as best seen in Figs. 3, 5 and 6 is rotatably mounted on upright extending support 47—47Y formed with the mounting plate 21 and to one end of shaft 46 is secured the inner convolution of a spiral retractile spring 48, the outer convolution of which is secured to a pin 49 laterally extending from upright support 47Y as shown in Figs. 5 and 6 while an arm 50 keyed on this end of shaft 46 is provided for engaging a pin 57 carried by a wheel 51 having marks representing the symbol printed on the keys K1, K2, K3, etc., for indicating the operation of the keys and the operation of a pulsing mechanism which will be hereinafter described in detail, the wheel 51 being mounted for free rotation on a spindle 52 secured to an upright support 53 in juxtaposition and in coaxial relation to the longitudinal axis of shaft 46 while a retractile spring 54 is provided for returning the wheel 51 to normal position upon the operation of a retaining pawl 54Y best seen in Figs. 6 and 11 mounted on a pivot 55 laterally extending from upright support 23 of plate 21 and engaging with a ratchet wheel 56 formed or carried by the indicating wheel 51 to hold the latter in each indicating position.

The pawl 54Y is formed at its free end portion with a projection 58 disposed in operable relation with a cam 59, the rotation of which is effective to disengage the pawl 54Y from the ratchet wheel 56 for permitting the return of the indicating wheel 51 to normal position following each operation of a switching device MC of which

the yoke member 34 forms a part from the position shown in Fig. 7 to the position in Fig. 8 as effected by the engagement of a pawl 60 with the arm 34 of the switching device MC upon the pivotal movement of U-shaped bar 32 as above described, the switching device being held in normal and operated position as the case may be by the tension of a toggle spring 61.

The switching device MC is returned to normal position as shown in Figs. 7 and 10 by the engagement of arm a2 of any one of the lever members 40 with a bar 62 formed with the arm 34 of the switching device and common to all the lever members 40 to perform a switching operation which will be hereinafter described in detail.

On the end of shaft 46 as shown in Fig. 2 opposite to the arm 50 is keyed the pulsing cam 63 while a magnetic clutch MG is mounted for free rotation on shaft 46 in attractable relation with the pulsing cam 63 and a worm gear 64 for rotating the pulsing cam and the discs 41, 42, 43, 44 and 45 keyed on shaft 46 upon the energization of the magnetic clutch MG and the simultaneous operation of a motor 66 in a circuit which will be hereinafter described in detail. The operation of cam 63 is effected by a worm 67 keyed on the armature shaft of motor 66 meshing with a worm gear 68 keyed on shaft 70 to the opposite end of which is formed a worm 69 meshing with worm gear 64, the shaft 70 as shown in Figs. 4, 5, 6, and 7 being supported in bearings 71 and 72 formed with upright support 47.

The worm gear 64 is provided with a sleeve 73 best seen in Fig. 2 having a collar portion 74 of magnetic material and on the end of shaft 46 is mounted for free rotation thereon a magnetic clutch MG2 provided for actuating a shaft 75 independently of the operation of pulsing cam 63 by clutch MG following the closing of a contact 76 by the manual operation of a key member 77 for energizing the motor 66 and the magnetic clutch MG2 through a circuit comprising the negative side of battery 78, the conductor 79, the closed contact 76, conductor 80, the brush 81 of magnetic clutch MG2, the slip ring 82, the winding of the clutch (not shown), the slip ring 83, the brush 84, the conductors 85 and 86, the armature winding of motor 66, the conductor 88 to the positive side of battery 78, while the rotation of pulsing cam 63 by motor 66 is effected independently of the operation of shaft 75 upon the energization of motor 66 and magnetic clutch MG through a circuit comprising the negative side of battery 78, the conductors 79 and 89 secured to one of the springs 76, the brush 90, the contact MC of the switching device 34 when operated by the bar 32 under control of any one of the keys K1, K2, K3, etc., the brush 91, the conductors 92 and 86, the armature winding of the motor, the conductor 88 to the positive side of battery 78 thus starting the operation of the motor but the clutch MG is not operated. A circuit for this magnetic clutch is effected following the operation of switching device MC for starting the motor 66 through its conductor 93 connecting with conductor 89, the brush 94, the winding and slip ring of the clutch MG, the brush 95, the conductor 96 and the brush 97 now in engagement with the contact MC of the switching device.

The operation of shaft 75 is effective to rotate a pulsing cam 100 for opening the pulsing contact 101 and to actuate a worm 102, the latter meshing with a worm wheel 103 keyed on one end of the shaft 104 on which is mounted a series of code

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discs numbered 1 to 48, inclusive, and marked with the names representing, for example, the 48 states of the United States. A bar 105 is secured at both ends to arms 106 and 107 keyed to the shaft 104 to serve for locating the discs 1 to 48 in alignment relative to each other on shaft 104, such a bar defining the starting position of such discs relative to an arm 108, the function of which will be hereinafter described in detail.

The operation of shaft 75 through a pinion 109 keyed thereon is effective to rotate a gear 110 keyed at one end of a shaft 111 and thereby a saw-toothed clutch member 112, provided for actuating its complement clutch portion 113 when engaged for rotating a cam 114 mounted on a sleeve 115 for movement as a unit with the clutch portion 113, but normally held against a stud ST carried by an arm 117 by a fork-type light ribbon spring SP which is flexed by the tension of a spring 116 for engaging the clutch 113 with its driving complement clutch 112 under conditions which will be hereinafter described in detail.

The arm 108 is normally held against the periphery of a selected disc as for example Tenn. 15 by the tension of the spring 116 hooked to the arm 117 on which gear racks 118 and 119 are secured, the arm 117 being provided with a bearing portion 119 in which the shaft 120 is supported for rotation as by the manual operation of a knob 121 for actuating a worm 122 engaging the gear rack 118 and 119 for moving the arm 108 selectively in operative relation with any one of the code discs on shaft 104, such selective movement being effective to position the hair line or index 123 carried by arm 108 in registry with the name of the state selected or the number of the telephone exchange particularly of the city in the selected state as the case may be.

The arm 117 is provided with a stud 124 of insulating material disposed in engageable relation with the operable elements 125 of a shunting contact 126 for closing such contacts under the tension of spring 116 when the selecting arm 108 drops into any one of the interdigit spaces or recesses *re* which are of equal length formed by the teeth T1, T2, T3, T4, T5, T6, T7 and T8 which may be of any desired number and which may equal any number of turns of pulsing cam 100 greater than ten pulses, if so desired depending upon the number of trains of pulses necessary for establishing a telephone call designation with a particular exchange in a state and the extending of such call designation to a desired subscriber. The teeth T1, T2, T3, etc., are formed with angular distances corresponding to one or a number of turns of impulse cam 100 while the thread of driving worm 102 is formed so as to impart an intermittent movement to shaft 104 and the code discs carried thereby so as to maintain these discs stationary during the opening period of pulsing contact 101 by the continuous rotation of cam 100, the number of teeth of worm gear 103, being equal to the number of stop positions represented by the teeth T1, T2, T3, etc., of the code discs and therefore that of the number of turns of pulsing cam 100.

On shaft 104 is keyed a disc 126 provided with a recess at its periphery for engagement with a lug 127 formed with a key 77 under the tension of the operable spring of contact 76 to cause the opening of such a contact and the stopping of motor 66 following each complete turn of shaft 104 and to hold this shaft and the code discs

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carried thereby in the normal starting position as shown in Fig. 2.

The key controlled pulsing mechanism and the code disc controlled mechanism are enclosed as shown in Fig. 1 in a housing formed by a casing CA secured to the base 20, the casing having a window opening WO through which the symbol of each successive key appears in the transmitting operation of a call designation in addition to a window opening WO2 through which the card CD bearing the state exchange name, the number of the cities exchanges and the index may be visually observed.

A typical example of operation of the telephone call transmitter of this invention is as follows:

Supposing that a telephone subscriber in New York city desires to establish a telephone connection with a telephone subscriber residing in the State of Tennessee and that the telephone call designation of the subscriber is TENN-48-ZR2374 the manual rotation of knob 121 and the rotation of worm 122 is effective to move the index 123 in registry with the vertical line associated with the name of the desired state, that is TENN 15 as appearing on the card CD best seen in Fig. 12. This selective movement is effective to position the arm 108 in registry or operative relation with the code disc marked TENN 15, Fig. 2. Under this condition the operation of key 77 is effective to close the contact 76 while disengaging the recess of disc 126 on shaft 124. The closing of contact 76 causes the energization of motor 66 and magnetic clutch MG2 in the circuit above described. The rotation of worm gear 64 and disc 74 movable as a unit therewith causes the rotation of the magnetic clutch MG2 and thereby that of miter gears M1 and M2, the latter rotating the shaft 75 and consequently the pinion 109, the pulsing cam 100 and worm 102 in the direction indicated by the arrow shown in Fig. 2. The rotation of pinion 109 is effective to rotate the gear 110 keyed on shaft 111 and thereby the clutch 112.

The shunting contact 126 is closed by the engagement of stud 124 carried by arm 117 under the tension of spring 116 while the arm 108 abuts against the bar 105 and that portion Q at the periphery of code disc TENN 15 preventing the engagement of clutch element 113 with its complement clutch element 112 with the result that the cam 114 is not operated. Under this condition the mechanism above described permits the motor 66 to reach maximum speed prior to the operation of the pulsing mechanism which begins upon the engagement of arm 108 with the peripheral surface of recess *re* forming the first interdigit space. The movement of this arm causes a further flexing of the shunting contact spring 125 and the engagement of clutch 113 with clutch element 112 for rotating the cam 114 a complete turn which corresponds to five turns of shaft 75 due to the speed ratio of pinion 109 and gear 110 or five teeth of worm gear 103.

The rotation of cam 114 is effective to impart a pivotal movement to arm 117 and thereby to arm 108 for positioning the latter on the periphery of tooth T1 simultaneously with the disengagement of the clutch 112-113 by spring SP causing the opening of shunting contact 126 which remains opened during a number of turns of pulsing cam 100 corresponding to the angular distance of tooth T1 when the arm 108 again falls in the interdigit space formed by the digits T1 and T2 for closing the shunting contact 126 and this cycle of operation is repeated to the completion of the call designation TENN 15, i. e., the exchange

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called which while including 8 digits as shown in Fig. 2 may be formed of any number of digits desired within the capacity of the code disc especially when a plurality of switches at different exchanges along a trunk line leading to the called exchange require to be operated. A call designation may be repeated in case the trunk line is found to be busy by the simple operation of key 77 as above mentioned.

The establishment of the telephone connection with the Tennessee central exchange office is followed by the selection of the number 48 included in the call designation Tennessee 48-ZR2374 above mentioned. The call designation 48 which is assigned to the telephone exchange in the city nearest to the subscriber having the telephone call designation ZR2374 is effected by the rotation of knob 121 for moving the index 123 in registry with No. 48 on the card CD which positions the arm 108 with the code disc marked Nevada 48 followed by the operation of key 77 to start the operation of motor 66 for actuating the pulsing mechanism in the manner above described in connection with the calling of the Tennessee exchange office.

Upon the completion of the telephone extension from Tennessee 15-48 the connection from the exchange number 48 is established by the operation of keys bearing the symbols ZP-2374 for operating the pulsing cam 63 as follows:

The operation of the key marked with the symbol

Z
operator
O

the first letter of the call designation ZR2374 above mentioned is effective to impart a pivotal movement to pawl 27, which locks this key in the operated position by the tension of its retractile spring 30. The movement of pawl 27 from normal shown in Figs. 5 and 7 to the position shown in Fig. 8 is imparted to the bar 32 and its arm 33 to cause the pawl 60 carried at the free end thereof to pivot the switching device MC from the position shown in Fig. 7 to the position shown in Figs. 8 and 9 to cause the brushes 90 and 91 to close the energizing circuit of motor 66 but prior to the energization of magnetic clutch MG for permitting the motor to reach maximum speed prior to the operation of the pulsing cam 63. The energizing circuit of motor 66 extends from the positive side of battery 78, the conductor 88, the armature winding of the motor, the conductors 86 and 92, brushes 91 and 90 on contact MC, the conductors 89 and 79 to the negative side of battery 78 while the magnetic clutch is energized through conductor 93, the brush 94, the winding of the magnetic clutch, the brush 95, conductor 96, the brush 97 on contact MC, the brushes 90 and 91, conductor 92, the armature winding of the motor 66, conductor 88, to the positive side of battery 78.

The starting operation of motor 66 is timed to occur when the pawl 27, Figs. 5 to 10 is at its greatest pivotal movement and ready under the tension of its retractile spring 30 to engage the roller 25 carried by key K10 for holding the latter into the operated position as shown in Fig. 9. In that position the arm a1 of the lever member 40 as shown in Fig. 9 is positioned in the path of lug P10 carried by disc 45 associated with the key K10 rotating in the direction indicated in Figs. 7, 8, 9 and 10.

The operation of shaft 46 as effected by the

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magnetic clutch MG and that of pulsing cam 63 keyed on this shaft is effective to actuate the pulsing pawl PW and thereby the pulsing contact PL, Figs. 5, 6, 7, 8, 9 and 10 once for each tooth 01, 02, 03, 04, 05, 06, 07, 08, 09 and 010 of this cam when the projection P10 of disc 45 as shown in Fig. 10 engages the arm a1 of lever member 40 to impart a pivotal movement to this lever member to cause its arm a3 to actuate the bar B2 for closing the shunting contact SH, Fig. 5, for negating the operation of the pulsing contact PL upon the continued operation of pulsing cam 63 and the disc 45 for pivoting the lever member 40 to a point where its arm a4 engages the stop bar sbt to cause the movement of pawl 27 from the position shown in Fig. 9 to the position shown in Fig. 10 for releasing the operated key K10 and for permitting the arm 39 to engage the lug 38 carried by pawl 27 to hold the latter in the operated position until disengaged by the return of key K10 to normal position so that the holding of this key to the operated position by the operator will not permit the reengagement of pawl 27 with that key prior to the return of the previously operated key to normal and that of the operation of the switching device MC in the proper sequence. The pivotal movement of lever member 40 under the action of its associated disc 45 causes the arm a2 of this lever member to engage the bar 62 of the switching device MC to return the latter to normal non-operated position as shown in Fig. 10 to open the motor circuit and thereby deenergizing magnetic clutch MG.

The rotation of shaft 46 from normal, as shown in Figs. 7 and 8, for transmitting the ten pulses corresponding to the digit key K10, the arm 50 keyed on this shaft engages the pin 57 best seen in Figs. 5 and 6 for rotating the wheel 51 for indicating the symbol of the key depressed, that is, key D, K10 marked

Z
operator
O

the indication wheel being held in its operated position by the pawl 54Y engaging the ratchet wheel 51 as shown in Fig. 11. Upon the return movement of key K10 to normal position shown in Fig. 7 this key is effective to operate its associated arm 39 for releasing the pawl 27 which is returned to normal position by the tension of its retractile spring 30 which is followed by the return movement to normal of bar 32 and the pawl 60 on arm 33 in position for operating the switching device MC by the operation of a succeeding key for actuating the pulsing mechanism as above described in connection with key K10.

The placing of the handset HS shown in Fig. 1 in its supporting cradle, the operation of plunger member PM best seen in Fig. 11 is effective to impart a pivotal movement to lever LV and thereby to the pawl 54Y for disengaging this pawl from ratchet wheel 51 to permit the return of the indicating wheel 51 to normal and the transmitter is now ready for a successive call operation in cooperation with the selective mechanism or for transmitting of any local call designation or for transmitting telephone call designations to any connected country outside of the United States if so desired by added code discs.

What is claimed is:

1. A call transmitter device having means for establishing a talking connection from an automatic exchange in a state to another automatic exchange in another state and from the called

state to an automatic exchange in a city in that state, other means for connecting the telephone exchange in that city to a telephone subscriber in another locality, and a plurality of means for indicating the call symbol of the called state, the call symbol of the called city in that state and the call symbol of the subscriber in that city digit after digit upon the transmitting of such a call.

2. In a call transmitter device, means for establishing a talking connection from an automatic telephone exchange in one state to another automatic telephone exchange in another state, said means comprising a set of code elements, means for selecting one of said code elements in said set, a pulsing mechanism controlled by the operation of the selected code element, motor means, a switching device manually operable following the selection of the code element in said set to cause the operation of said motor, and means for controlling the operation of said switching device and stopping the operation of said elements and said pulsing mechanism.

3. In a call transmitter device a set of code discs, each of said discs having a group of symbols marked thereon, one of said symbols in said group representing automatic exchange names in different states and the other symbol in said group representing automatic exchange numbers in cities in such states, a card for indicating said group of symbols, a mechanism having an index movable in position on the symbols on said card representing the exchange names for selecting one of said code discs, a pulsing mechanism controlled by the operation of the selected code disc, said selecting mechanism being movable in position for selecting one of said numbered discs for controlling the operation of said pulsing mechanism in a successive operation, an electric motor for successively actuating said selected code discs and said pulsing mechanism, a normally open contact in the energizing circuit of said motor, a key member operable for closing said contact to cause the operation of said motor, and means operated by the movement of said code disc cooperating with said key member for controlling the operation of said motor.

4. In a call transmitter, a set of rotatable code discs, a mechanism for selecting one of said discs, a pulsing mechanism controlled by the code disc selected, an electric motor, means for rotating said disc and said pulsing mechanism for transmitting a number of trains of pulses according to the selected disc, a set of numbered key members, a pulsing mechanism, means actuated by the operation of any one of said key members to cause the operation of said pulsing mechanism according to the individual operation of said key members and switching means actuated by the movement of the operated key member for starting the operation of said motor for actuating the last-mentioned pulsing mechanism independently of the operation of the first-mentioned mechanism.

5. In a call transmitter device, a plurality of pulsing mechanisms, a plurality of clutches, a plurality of switching devices, and motor means controlled by the operation of said switches for independently actuating said clutches to cause the operation of said pulsing mechanisms for transmitting a telephone call designation in a combination of selecting and keys controlled transmitting operations.

6. In a call transmitter device, a set of code discs, a pulsing mechanism operatively associated

with said code discs, a mechanism for successively selecting a number of said code discs in said set for controlling the operation of said pulsing mechanism for transmitting a number of pulses corresponding to a call designation of an automatic exchange in a given state and to an automatic exchange in a city in that state, another pulsing mechanism, manually operable means for controlling the operation of said other pulsing mechanism for transmitting a number of pulses corresponding to the call designation of the subscriber desired from the automatic exchange in the city connected by the first-mentioned pulsing mechanism, a motor, a plurality of clutches having a common driving element actuated by said motor, an energizing circuit for said motor, switching devices in said circuit for starting the operation of said motor for actuating said pulsing mechanisms.

7. In a call transmitting device, a plurality of pulsing mechanisms operable for establishing a telephone connection in a series of call transmitting operations, a set of code discs, means for selecting one of said codes for controlling the operation of one of said mechanisms, a set of digit key members for controlling the operation of the other of said pulsing mechanisms, means actuated by the operation of the last-mentioned pulsing mechanism for indicating the number of the operated key members successively.

8. In a call transmitter device, a plurality of pulsing mechanisms operable for establishing a telephone connection, a set of digit key members for controlling the operation of one of said pulsing mechanisms, a pawl element for locking the operated key to normal position, a bar actuated by said pawl element, means actuated by said bar for locking the non-operated keys in that position, a lever member pivoted on each of said pawl elements, said pulsing mechanism having a rotatable shaft, a plurality of toothed discs mounted on said shaft, one for each of said locking pawl elements for actuating the pivoted lever member associated with the operated key for releasing the latter upon the operation of said shaft, a shunting contact, means common to all of said pivoted lever members actuated by the movement of the operated pawl for controlling the operation of said pulsing mechanism, a wheel actuated by said rotatable shaft for indicating the operation of said pulsing mechanism prior to the operation of said shunting contact, the other of said pulsing mechanisms comprising a set of code elements, a pulsing cam, a mechanism for selecting one of said code elements, said selective mechanism being operable by the movement of the selected code disc for controlling the operation of said pulsing cam and a card having written thereon numbered symbols for indicating each of said selected positions, and a motor common to said pulsing mechanisms.

9. In a call transmitter device, a set of key members, a pulsing mechanism, an electric motor, a magnetic clutch operatively connecting said motor to said pulsing mechanism, an energizing circuit for said motor having a branch circuit for energizing said magnetic clutch, switching means having a plurality of brushes, a common contact for said brushes, said contact being operable by the movement of any one of said key members for energizing a number of said brushes in a predetermined extent of movement to close the circuit of said motor to start the operation thereof and in a continued movement to engage the other of said brushes to close

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said branch circuit for energizing said magnetic clutch for actuating said pulsing mechanism.

10. In a call transmitter device a set of key members, a pulsing mechanism, an electric motor, a magnetic clutch for operatively connecting said pulsing mechanism to said motor, an energizing circuit connecting said motor and said clutch, a normally opened switching device in said circuit having a plurality of stationary brushes and a common movable contact element, means operable under control of any one of said key members for operating said switching device for causing the energization of said motor for rotating one element of said magnetic clutch, the continued movement of said switching device causing the energization of said magnetic clutch for actuating said pulsing mechanism, an indicating wheel actuated by said pulsing mechanism, a ratchet mechanism for holding said wheel in the indicating position, and means actuated by the operation of said switching device for actuating an element of said ratchet mechanism for permitting said indicating wheel to return to normal position upon the operation of a succeeding key in said set.

11. In a call transmitter device, a set of key members, pawl like members, one for each of said key members, a lever member pivoted on each of said pawl like members, a rotatable shaft disposed across said lever members, a pulsing cam and a plurality of toothed discs carried by said shaft one of said discs for each of said lever members, a pulsing contact actuated by said cam, a shunting contact for negating the operation of said pulsing cam following the operation of said pulsing mechanism as controlled by the engagement of one of said toothed discs with the pivoted lever member associated with the operated key member, a motor for actuating said pulsing mechanism, an energizing circuit for said motor having a switching device controlled by the movement of the depressed key for starting the operation of said motor, means disposed in engageable relation with said lever member for returning said switching device to normal position for stopping the operation of said motor following the operation of said pulsing mechanism and the operation of the pawl-like member asso-

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ciated with the operated key for releasing the latter, means for locking said pawl-like member to operated position during the return of the operated key to normal and means carried by said key for actuating said locking means upon the return of said key to normal for releasing said pawl-like member.

12. The combination of two independently operating mechanisms forming the components of a single telephone call transmitter for controlling the operation of automatic switches by a series of call transmitting operations for establishing a talking connection from a telephone substation to an exchange in one state represented by a name to another exchange in another state represented by a number and from the last-mentioned exchange to an exchange in a city in that state located nearest to the desired subscriber and from the telephone exchange in that city to the desired subscriber having a call designation represented by a group of letters and numbers, a motor for actuating said mechanisms, and means set by the operation of one of said mechanisms for indicating said letters and numbers at each state in the transmitting of the last-mentioned call designation.

13. The combination of two independently operable pulsing mechanisms forming the components of a single telephone call transmitter for controlling the operation of automatic switches by a series of continuous trains of pulses, a motor for actuating said mechanisms, and a plurality of electrically actuated means for controlling the operation of said motor following the transmitting of each of said trains of pulses.

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