

April 17, 1945.

T. L. DOWEY

2,374,082

TELEPHONE CALL TRANSMITTER

Filed Aug. 22, 1942

5 Sheets-Sheet 1

FIG. 1

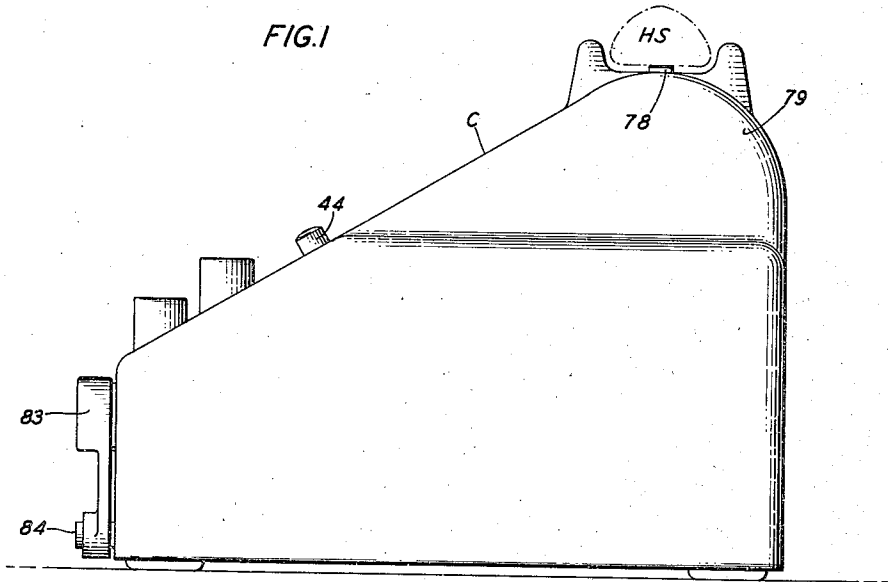


FIG. 2

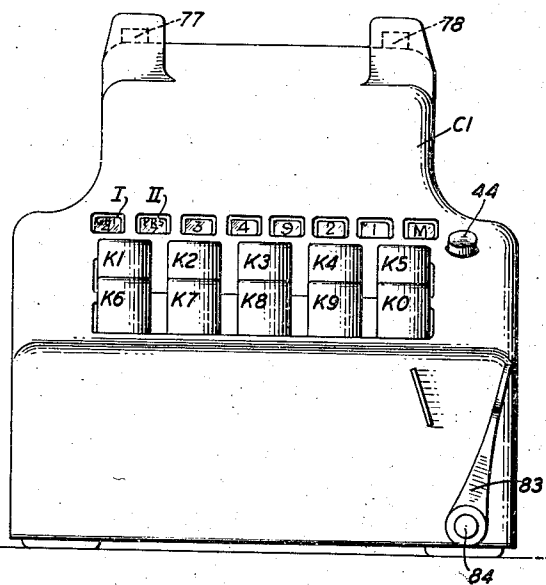


FIG. 14

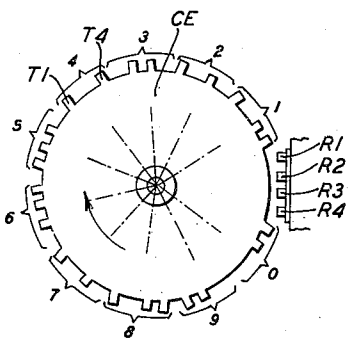
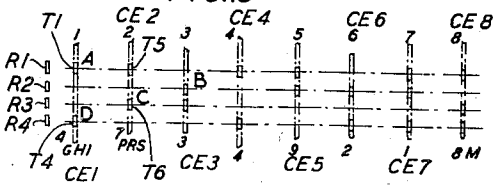


FIG. 15



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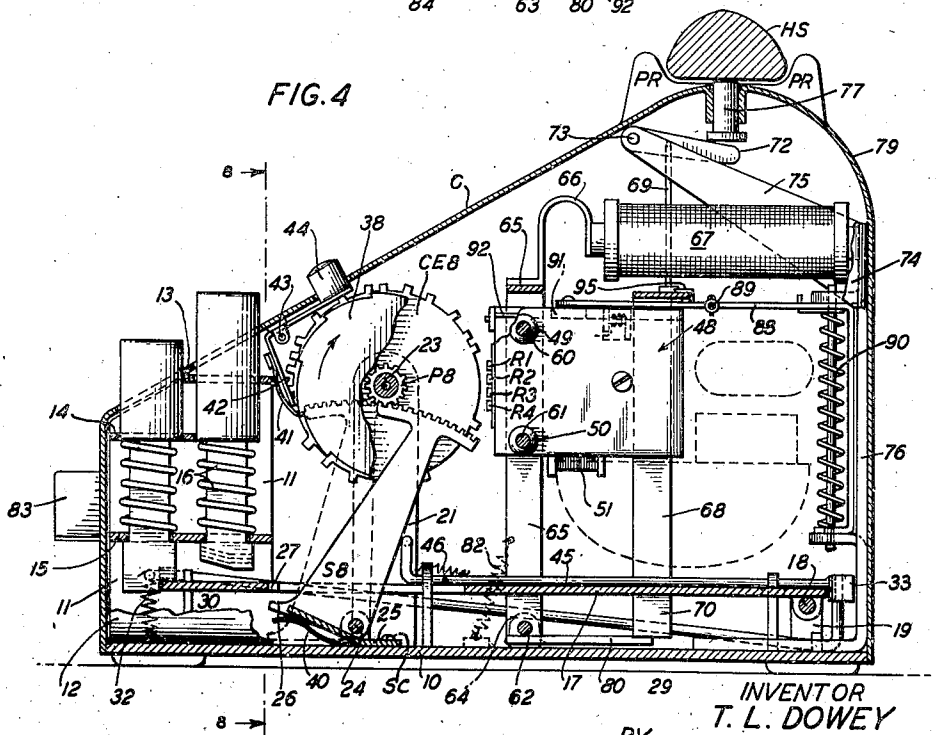
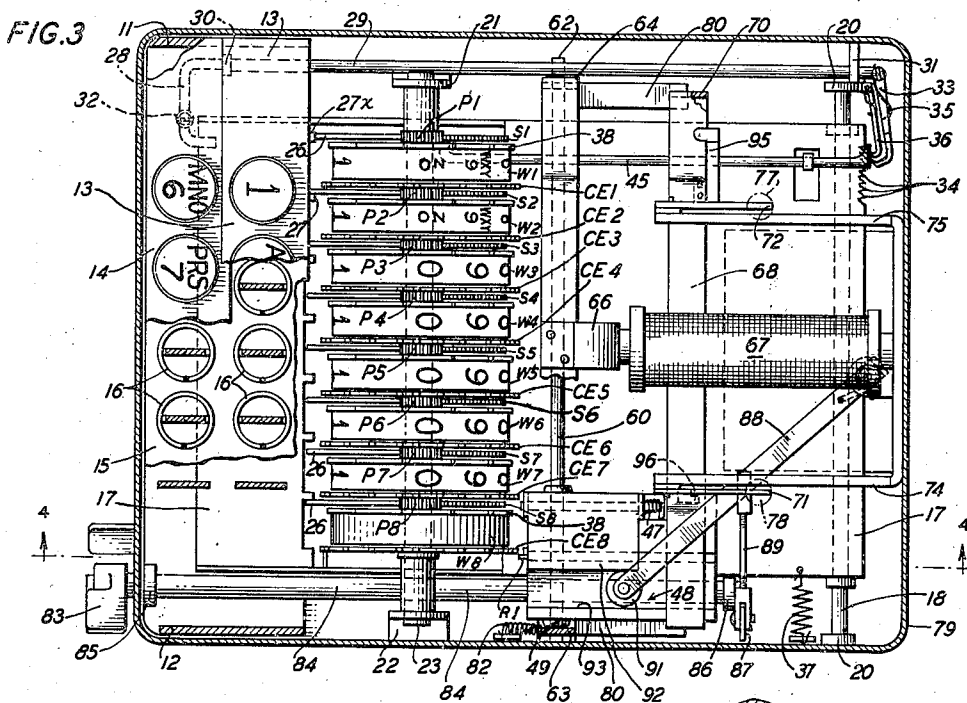
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FIG. 5

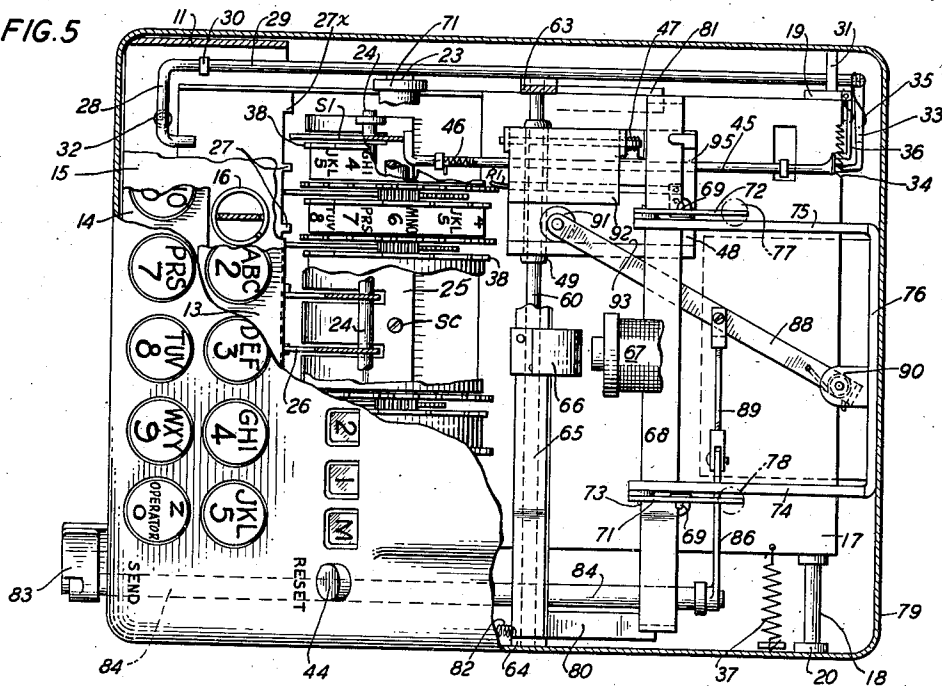
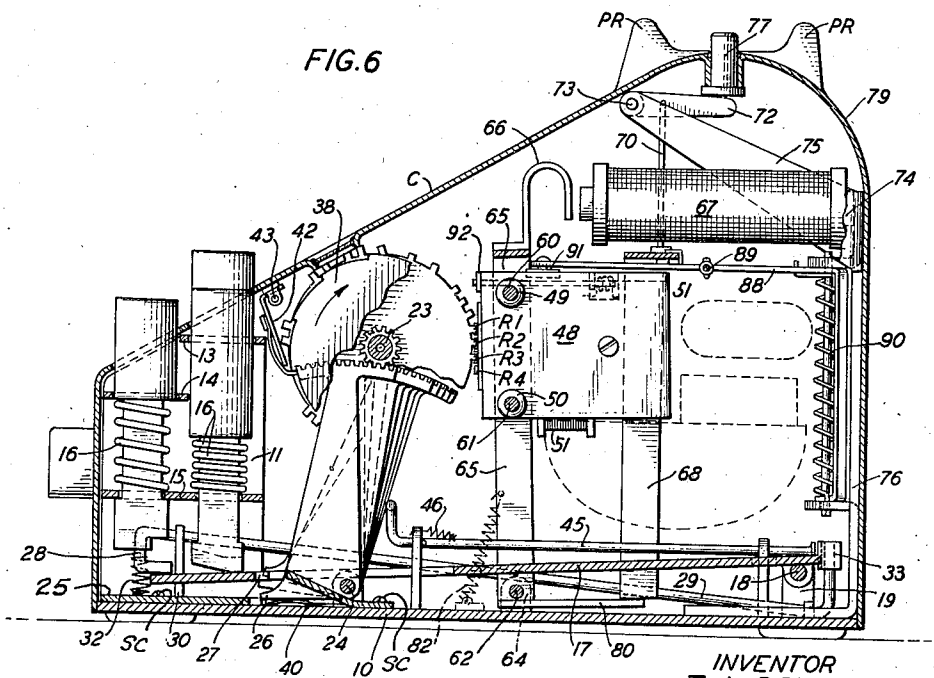


FIG. 6



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FIG. 7

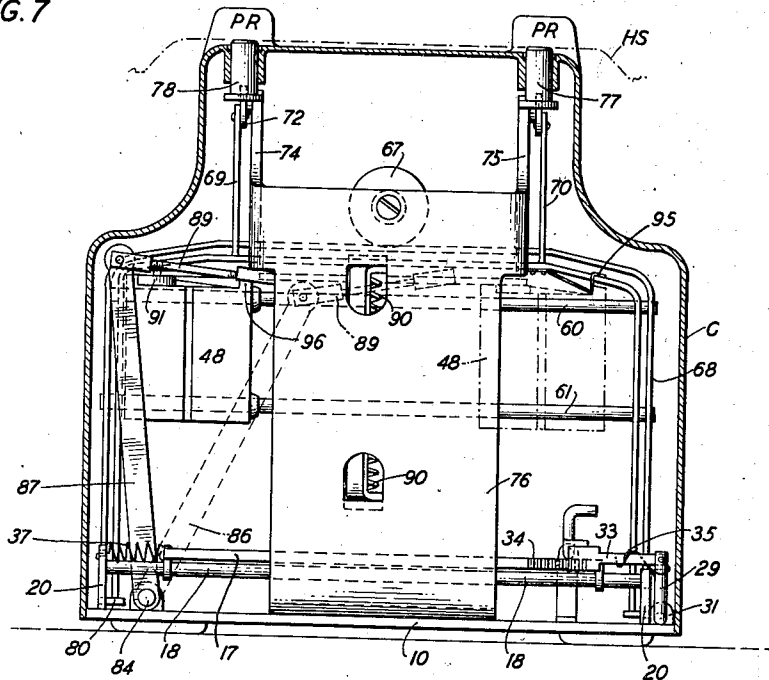
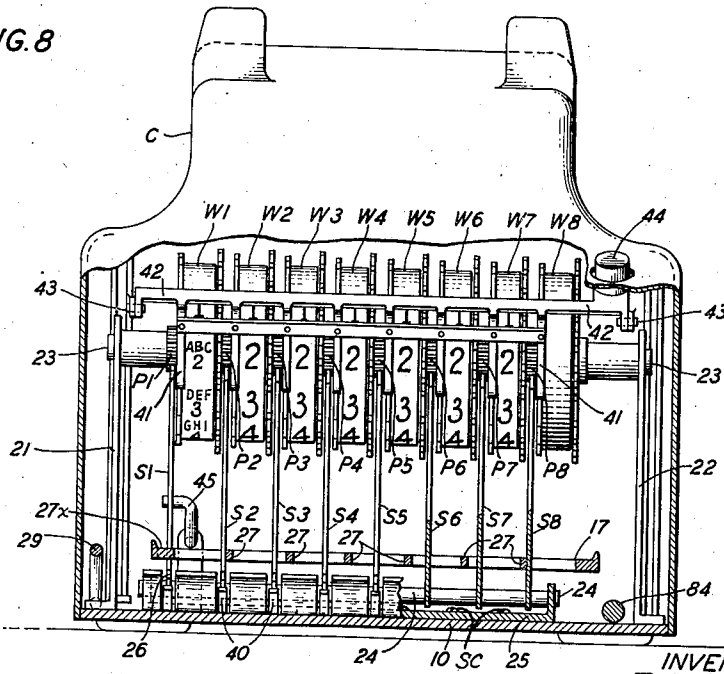


FIG. 8



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FIG.9

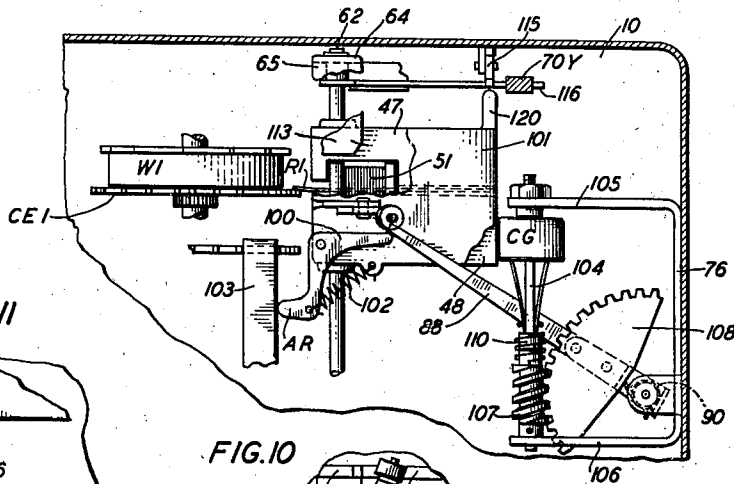


FIG.11

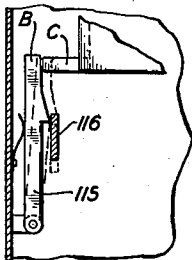


FIG.10

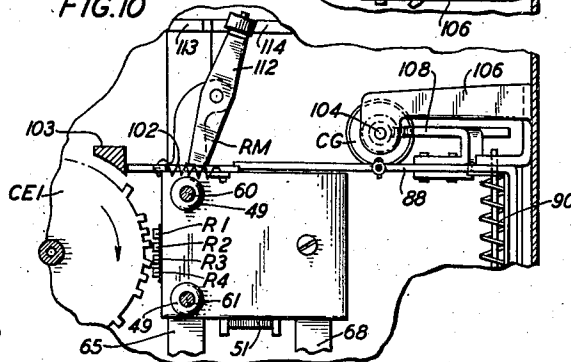


FIG.12

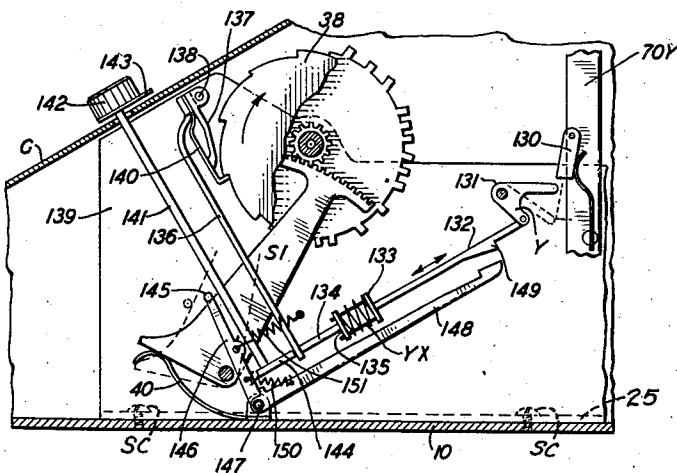
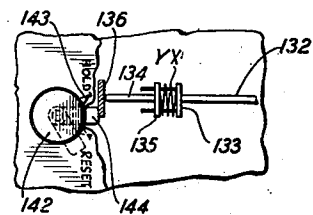


FIG.13



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UNITED STATES PATENT OFFICE

2,374,082

TELEPHONE CALL TRANSMITTER

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York, N. Y., a corporation of New York

Application August 22, 1942, Serial No. 455,744

10 Claims. (Cl. 179-90)

This invention relates to preview preset key-operated call transmitter devices for use, for example, in automatic telephone systems for establishing talking connections by the operation of vibrative elements in a magnetic field for generating alternating current representing the operation of the keys.

According to the call transmitter of the invention, the operation of manually operable key members disposed in parallel rows is effective to differentially actuate a pivoted plate and a ratchet mechanism for imparting to the plate, in addition to pivotal movement, a step-by-step transverse movement relative to indicating wheels for placing means carried by this plate in successive operative relation with means in the form of gear sector members to rotate the indicating wheels and code elements carried thereby for setting and indicating the call. Means in the form of a manually operable key member controls the return movement of the code wheels from selected to normal unoperated positions as effected by the tension of respectively associated retractile springs, as for correcting a wrong setting of a telephone call designation and following each successive call transmitting operation. In a modification the control of the code wheels following the transmitting of a call is effected by a mechanism operable by the placing of the telephone handset on its support, the operation of such mechanism in turn being controlled by the movement of manually operable means to positions indicated on the casing housing the transmitter mechanism.

A pivoted frame actuated by the mechanism under control of the telephone handset, in one position permits the movement of the generator on guiding means transverse of the indicating wheels from normal to starting position ineffectively relative to the code elements such movement being effected by the operation of a handle lever as for tensioning a motor spring serving to return the generator to normal for transmitting the call under control of electromagnetic means energized through the operation of switches placed at the telephone exchange with which the call transmitter of this invention may be connected.

In a modification the back and forth operation of the generator relative to the code wheels in its movement to normal unoperated position as to cause the operation of the vibrative elements is simulated by the pivotal operation of an angle lever actuated through the tension of the motor

spring under control of a speed governor mechanism.

Other novel features and advantages of the invention will appear from the following description and by the claims appended thereto, reference being had to the accompanying drawings in which:

Fig. 1 is a side elevation view;

Fig. 2 is a front elevation view showing the indicating wheels in operated position;

Fig. 3 is a top assembly view shown with a number of operating parts with portions broken away and the casing housing the transmitter mechanism in horizontal section;

Fig. 4 is a vertical sectional view taken on line 4-4 of Fig. 3 shown with a number of parts in operated position but with the alternating current generator in normal non-operated position;

Fig. 5 is a top view showing the alternating generator in operated starting position;

Fig. 6 is a side view showing one of the keys and the digit indicating wheels in operated position;

Fig. 7 is a rear assembly view shown with the casing in vertical cross section;

Fig. 8 is a front view showing the casing and a number of operating parts in section taken on line 8-8 of Fig. 4;

Fig. 9 is a top view of the alternating current generator operating mechanism shown in Figs. 3, 4, 5 and 6 modified, the generator being shown in normal starting position;

Fig. 10 is a side view of Fig. 9;

Fig. 11 is a detail view of Fig. 9;

Fig. 12 is a side view of an alternative mechanism for returning the indicating wheels to normal non-operated position;

Fig. 13 is a detailed view of Fig. 12;

Fig. 14 is a view of one of the code elements; and

Fig. 15 is a diagrammatical view of the code elements set for transmitting a predetermined telephone call designation.

According to the call transmitter of this invention, a base 10 is formed at its front end portion with a key mounting consisting of two upright extending portions 11 and 12 interconnected by spacer plates 13, 14 and 15, the spacer plate 15 having rectangularly-shaped openings cooperating with circularly-shaped openings in the spacer plates 13 and 14 for guiding a set of longitudinally movable key members K1, K2, K3, K4, K5, K6, K7, K8, K9 and K10 in their movement from normal to operated position against

the tension of similar retractile springs 16 shown in Figs. 4 and 6.

The lower disposed end portions of key members K1, K2, K3, K4 and K5 extend at different spaced relations from a plate 17 mounted on a shaft 18 journaled in upright extending bearings 19 and 20 formed with a base 10, the plate 17 being movable pivotally and longitudinally on shaft 18 in a manner and for a purpose which will be hereinafter described in detail.

On base 10, as shown in Figs. 3, 4, 5 and 8, are mounted the upright supports 21 and 22 provided for supporting a shaft 23 on which are mounted for free rotation thereon a plurality of digit indicating wheels W1, W2, W3, W4, W5, W6, W7 and W8. The wheels W1, W2, W3, etc., are each provided with a pinion P1, P2, P3, P4, P5, P6, P7, P8 engaged by respective gear sectors S1, S2, S3, S4, S5, S6, S7 and S8 which are pivoted on a common shaft 24 journaled at both ends in upright members formed with a support 25, in turn secured to the base 10 as by a number of screws SC. The gear sectors S1, S2, etc., are formed with similar projections 26 so disposed as to be engaged by respectively associated lug members 27 upon the step-by-step transverse movement of plate 17 on its supporting shaft 18 as effected by a ratchet mechanism consisting of a crank arm 28 resting on the plate 17 against the tension of a retractile spring 32 as shown in Figs. 3, 5 and 6. This crank arm is formed contiguous to a rod 29 pivoted at both ends in lugs such as 30 and 31 formed with a base 10 while the opposite end of rod 29 is bent at right-angles to the length of the rod for mounting an actuating pawl 33 best seen in Fig. 3 held in operative relation with the ratchet teeth 34 formed at the rear edge of plate 17 by a retractile spring 35, while a pawl 36 holds the plate 17 in each advanced position against the tension of a retractile spring 37. The plate 17 when in normal non-operated position as shown in Fig. 4, has its lug portion 27X placed directly for operating the gear sector S1 following the movement of any one of the keys K1, K2, K3, etc., for rotating the wheel W1 to the position represented by that key.

The wheels W1, W2, W3, etc., are held in selected position against the tension of retractile spring S40 acting on the gear sectors S1, S2, S3, etc., by similar ratchet wheels 38 engaged by respectively associated pawls 41 mounted on a common plate 42, pivoted on a shaft 43 and provided at one end with an arm 44, best seen in Figs. 4 and 8, the operation of which is effective to simultaneously disengage the pawls 41 from their ratchet wheels 38 to permit the return of the latter to normal non-operated position as for cancelling and correcting a wrong call setting operation, the return of the digit indicating wheel W1 and its actuating gear sector S1 from selected to normal non-operated position, being effective to engage and move a rod 45 longitudinally against the tension of its retractile spring 46, see Figs. 5, 6 and 8, for disengaging the driving pawl 33 and retaining pawl 36, simultaneously, from the ratchet teeth 34 of plate 17 to permit the return movement of the latter to normal non-operated position as effected by its retractile spring 37.

The digit indicating wheels W1, W2, W3, etc., are provided at their periphery with sets of code teeth as shown in Figs. 4, 6, 12 and 14, representing the digits 1 to 0 provided for actuating vibrative elements in the form of reeds R1, R2, R3 and R4. These reeds extend through the core

of a coil 51 and are secured collectively between the pole-pieces 47 and 48 by a pair of eyelets 49 and 50, see Figs. 5 and 6, serving for slidably mounting the generator thus constructed on guiding rods 60 and 61. These rods are in turn supported at both ends in the arms of an inverted U-shaped frame 65, itself pivoted on a shaft 62 supported at both ends in lugs 63 and 64 formed with the base 10. The frame 65 has an armature 66 disposed in attractable relation with a magnet 67 provided for moving the generator and the vibrative elements carried thereby against the tension of a retractile spring 82 out of engageable relation from the sets of code teeth formed at the periphery of the digit indicating wheels W1, W2, W3, etc., for a purpose which will be hereinafter described in detail.

The lower end portion of one of the arms of U-shaped frame 65 is formed with a projection 80 on which rests the prong of a second U-shaped frame 68 to which are secured the rods 69 connecting at their opposite ends with arms 71 and 72 pivoted on studs 73 carried by the extensions 74 and 75 of a bracket 76. The arms 71 and 72 having their free end portions disposed in engaged relation with the plungers 77 and 78 operated by gravity upon the placing of the telephone handset HS in a cradle in the form of projections PR carried by the casing 79 housing the transmitter mechanism, the placing of the handset in its cradle being effective to cause the pivotal movement of arms 71 and 72, the downward movement of frame 68 and thereby the pivotal movement of frame 65 as for moving the vibrative elements R1, R2, R3 and R4 out of engageable relation from the code teeth of the digit wheels W1, W2, W3, etc., against the tension of retractile spring 82.

The alternating current generator may be moved manually from normal non-operated position shown in Fig. 3 to starting position transverse of the wheels W1, W2, W3, etc., shown in Fig. 5 by a handle lever 83 at one end of a shaft 84. This shaft is pivoted in bearings 85 and 86 formed with the base 10 and to the opposite end of shaft 84 adjacent bearing 86 is keyed a lever member 87, Figs. 3, 5 and 7, extending upwardly for connection with an arm 88 as by an adjustable link 89, the arm 88 is provided at its free end with a roller 91 engaging the edge of a plate pawl 92, pivoted on the pole-piece 47 of the generator as shown in Figs. 3 and 5, while the return movement of the generator is effected by the tension of retractile spring 90 through the engagement of roller 91 at the end of arm 88 with a ridge 93 formed with the pole-piece 48 but under control of electromagnet 67 in a manner which will be hereinafter described in detail. The generator, however, is normally held in starting position by a pawl 95 shown in Figs. 3 and 5 engaging a projection 96 which is moved from engaged relation from pawl 95 following the pivotal movement of frame 65 as for engaging the code wheels upon the removal of the handset HS from plungers 77 and 78.

In Figs. 9 and 10 is shown a modification in which the back and forth movement of the pivoted frame 65 which supports the alternating current generator is effected by an angle lever 100 pivoted on a plate 101 secured to the pole-pieces 47 and 48 of the generator and held in retracted position by a spring 102. Angle lever 100 has one of its arms engaging the lever 88 which under the tension of motor spring 90 causes the pivotal movement of angle lever 100 due to the

arm AR of this lever abutting against a stop bar 103 to cause the movement of the frame 65 against the tension of spring 82 shown in Figs. 3, 4, 5 and 6 for disengaging the vibrative reeds R1, R2, R3 and R4 of the generator from the code wheel as W1, the motor spring continuing the movement of the generator on guiding rods 60 and 61 to the point wherein the vibrative reeds of the generator engage the code wheel W2 by the tension of spring 90 for repeating the cycle of operation as described in connection with the code carried by wheels W1.

The movement of lever 88 and that of the generator under the tension of motor spring 90 is effected under control of a speed governor through the operation of a shaft 104 journaled in arms 105 and 106 of bracket 76 and on this shaft is mounted for free rotation thereon a worm 107, meshing with a gear sector 108 securely mounted on the generator driving arm 88, the shaft 104 being rotated by the movement of the worm 107 through a one-way operable clutch 110 in the form of a ribbon spring coiled on the drum portion of worm 107 and the enlarged portion of shaft 104.

In the modification shown in Figs. 9, 10 and 11, a yoke 112 has one of its arms normally disposed in engageable relation with the free end of lever 88 so that the movement of this lever by the handle 83 is effective to move the generator in the starting position shown in Fig. 9 wherein the roller at the end of the other arm of yoke 112 is caused to engage a camming surface 113 for pivoting the yoke in position where its arm RM is disengaged from the operating arm 88 while a second cam surface 114 (see Fig. 10) is provided for pivoting this pawl in the opposite direction following the transmitting of the call thus placing its arm RM in engageable relation with the operating arm 88 to prepare this mechanism for moving the generator from normal to starting position, the disengaged condition of yoke 112 from arm 88 prior to the effective return movement of the generator being to prevent the damaging of the generator operating parts as, for example, by the unintentional operation of the handle 83 during the effective or return movement of the generator to normal position.

In this modification a spring-pressed pawl 115 (Figs. 9 and 11) engages an arm 116 secured to one arm of U-shaped frame 65 for normally holding this frame and the generator mounted thereon in position wherein the vibrative reeds R1, R2, etc., are ineffective to engage the code elements carried by the wheels W1, W2, W3, etc., during the movement of the generator from normal to starting position, the engagement of pawl 115 with arm 116 being effected as by placing the telephone handset on plungers 77 and 78 shown in Figs. 3, 4, 5 and 6 with the consequent operation of vertically movable frame 68, the pawl 115 being disengaged from the arm 116 by a lug 120 formed with the plate 101 engaging the pawl 115 a small distance prior to the normal starting position of the generator.

In Figs. 12 and 13 is shown a modification of the indicating wheel releasing mechanism shown in Figs. 2, 3, 4, 5 and 6. In this modification the return of the indicating wheels W1, W2, W3, etc., to normal is effected under control of the vertically movable frame 68, actuated as above mentioned by the placing and removing of the telephone handset HS from plungers 77 and 78. According to the mechanism shown in Figs. 12 and

13, the arm 70Y of the inverted U-shaped frame 68 is provided with a spring-pressed pawl 130 disposed in engageable relation with a pivoted double armed lever member 131, the arm 70Y of which is connected to one end of the rod 132, the opposite end of this rod terminating in the form of a disc 133 disposed in coaxial relation with a compression spring YX, while a second rod 134 is formed with a disc portion 135 engaging the other end of the spring and the opposite end of this rod operatively engages with the free end of an arm 136, the other end of which is secured to a plate 137 extending transverse of the indicating wheels W1, W2, W3, etc., and pivoted at both ends as at 138 on upright supports 139 and on pivoted plate 137 are mounted a plurality of spring-pressed pawls 140 so that the pivotal movement of plate 137 is effective to cause the disengagement of pawls 140 collectively from their respectively associated ratchet wheels 38 for permitting the return of indicating wheels W1, W2, W3 to normal unoperated position upon the operation of rods 132 and 134 in a manner which will be hereinafter described in detail.

A rod 141 having one of its ends extending through an opening in a casing C1 serves for mounting a knob 142 and an index 143 cooperating with instruction as the words Hold, Reset, printed on the casing and provided for indicating the position of an arm 144 securely mounted on the opposite end of rod 141 relative to the arm 136 of the retaining pawls supporting plate 137, the arm 144 at the end of rod 141 being to prevent the pivotal movement of plate 137 and thereby the disengagement of pawl 140 following the operation of arm 70Y, the pawl 130, the double armed lever 131 and the rod 132 as for compressing spring YX whenever it is required or desired to repeat a call, while the rotating of knob 142 for moving the arm 144 to the position shown in dotted line in Fig. 13, will cause the operation of rod 134 through the tension of spring YX and thereby the operation of arm 136 for pivoting the plate 137 for disengaging the pawls 140 from their respective ratchet wheels 38.

A bar 145 (Fig. 12) extends transverse of gear sectors S1, S2, S3, etc., and is secured at both ends to a pair of arms 146 pivoted at 147 on lugs formed with the base 10 and one of the pivots 147 serves for pivotally mounting a latch 148 disposed for engaging a ratchet tooth 149 formed with rod 132 under the tension of spring 150, upon the movement of the bar 145 as effective by the operation of the sector members S1, S2, S3 from normal to operated position, as for the setting of a call. The holding of rod 132 and arm 131 in operated position prevents the release of indicating wheels W1, W2, W3, etc., during the call transmitting operation and the reengagement of retaining pawls 140 with their respective ratchet wheels S2, S3, until all the indicating wheels W1, W2, W3 have been returned to normal position by the tensioning of retractile springs 40 irrespective of the quick successive operation of arm 70Y as may be effected by the placing and removing of the telephone handset from its cradle, the latch 148 being operated for releasing the rod 132 by the movement of the rod 145 under the tension of a retractile spring 151 timed to occur when the indicating wheels W1, W2, W3 are returned but a small distance from normal non-operated position.

In a typical example of operation in the transmitting of the telephone call designation

GP-34921-M, for example with the handset HS resting on plungers 77 and 78 as shown in Figs. 1 and 4, frame 68, Figs. 3 and 4, through its arm 70Y holds the frame 65 in position wherein the current generator and the vibrative elements carried thereby may be moved from the position shown in Fig. 3 to starting position shown in Fig. 5 ineffective relative to the code elements CE1, CE2, CE3, etc., carried by the indicating wheels W1, W2, W3, etc., as effected by the manual operation of handle 83, rotating the shaft 84 for moving the lever 86 at the opposite end of the shaft and thereby operating the arm 88 through link 89, the arm 88 engaging the pawl plate 92 as shown in Fig. 3, the generator being held in starting position as shown in Fig. 5 and in dotted lines in Fig. 7 by the spring-pressed pawl 95 engaging the projection 96 carried by the pole-piece 47 of the generator.

The operation of the key

GHI
4

the first digit of the called designation above mentioned is effective to impart a pivotal movement to the plate 17 through an angle depending upon the longitudinal movement of this key from its engaged point with this plate to its stop positions, through the projection 27X carried by this plate now in registry with the projection 26 of gear sector S1, thus rotating the indicating wheel W1 to a position wherein the letter G appears under the glass plate window 1 of casing C1, while placing the teeth T1 and T4 of code element CE of indicating wheel W1 in a path to be engaged by the vibrative elements R1 and R4 of the generator as will be hereinafter described in detail. The downward pivotal movement of plate 17 causes a pivotal movement of rod 29 through its arm 28 and retractile spring 32 for advancing the driving pawl 33 carried by this rod, a distance of one tooth of ratchet teeth 34 (see Figs. 3 and 5) thus causing the lateral movement of plate 17 on supporting shaft 18 against the tension of its retractile spring 37 for placing the projections 27 of this plate (see Fig. 8) in registry with the projection 26 of gear sector S2 upon the return movement of plate 17 to normal position when the key K4 bearing the designation

GHI
4

is released, the plate being held in each lateral advanced position by the retaining pawl 36.

The operation of key K7 bearing the designation

PRS
7

the second digit of the called designation above-mentioned, is effective to cause the pivotal movement of the plate 17 for moving the gear sector S2 and thereby the indicating wheel W2 in position wherein the letters

PRS
7

appear in registry to the glass plate 11 in the casing C, this indicating wheel like indicating wheel W1 being held in selected or operated position by respective spring pawls 41 and this call setting operation is repeated for each successive key K3, K4, K9, K2, K1 and M, the latter representing a particular signal not used in the setting of ordinary telephone call designations.

The removal of handset HS from plungers 77 and 78 causes the arm 80 to move the frame 68 upwardly under the tension of spring 82 serving to pivot the frame 65 for placing the vibrative reeds R1, R2, R3 and R4 in operable relation with the code elements of wheels W1, W2, W3, etc., while causing the ratchet tooth 96 carried by the pole-piece 47 of the generator to slip sideways from the retaining pawl 95 so as to permit the movement of the generator on its guiding rods 60 and 61 by the tension of motor spring 90 until arrested by the engagement of vibrative reeds R1 and R4 coming into contact with the teeth T1 and T4 of code wheels CE1 carried by indicating wheel W1, causing the flexing of these reeds in timed relation with the energization of electromagnet 67 through electrical impulses generated at the telephone exchange, thus disengaging the reeds from the code CE1 element to cause the vibration of these reeds for transmitting signals corresponding to the selected position of wheel W1 set by the operation of key K4. The deenergization of magnet 67 causes the pivotal movement of frame 65 under the tension of spring 82 as above mentioned for moving the generator and the vibrative reeds carried thereby in position wherein the reeds engage the teeth T5 and T6 of code wheel CE2 carried by the indicating wheel W2, wherein in these reeds are flexed under the action of motor spring 90 when the next energization of magnet 67 causes the release of these reeds so as to permit their vibration to transmit a signal corresponding to the operation of key K7 and this cycle of operation is repeated for each digit in the call designation GP-34921-M above-mentioned when the generator has reached its normal non-operated position and the handset HS is placed on the plungers 77 and 78 causing the downward movement of frame 68 and thereby the pivotal movement of frame 65 as above described when the key 44 is operated for moving the pawls 41 in position disengaging their respective indicating wheels which return to normal position by tension of retractile springs 40. The pivotal movement of frame 65 as effected by the removal of handset HS from plungers 77 and 78 is effective to place the guiding edge of pawl plate 95 below the under surface of roller 91 so that the movement of handle 83 is ineffective to return the generator to starting position prior to reaching its normal non-operated position, but roller 91 due to the pivotal movement of pawl plate 92 may be reengaged with the guiding edge of this pawl plate when the frame 65 and the generator have reached their normal non-operated position shown in Fig. 4.

In the operation of the modified generator actuating mechanism as shown in Figs. 9, 10 and 11, the driving arm 88, as above described, engages one arm of angular lever 100 while the arm AR of this lever abuts against the bar 103. Under this condition the generator is moved from starting position by the tension of motor spring 90 on its guiding bars 60 and 61 causing the vibrative reeds of the generator to flex when coming into engagement with the teeth of the code element CE1 carried by wheels W1 and thereby momentarily arresting the generator and causing the pivotal movement of angle lever 100 against the tension of its retractile spring 102 for imparting a pivotal movement to frame 65 as for disengaging the vibrative reeds R1, R2, R3, R4, as the case may be from the code elements to the vibration of these reeds, the movement of arm

88 being under control of the speed governor CG through gear sector 108, worm 107 and clutch 110.

In this modification the unintentional operation of handle 83 as for moving the generator to starting position during its call transmitting operation is prevented by the positioning of the double armed lever 112 by the cam 113 in a path wherein this lever is disengaged from the arm 88 but reengaged with the arm 88 when the generator reaches its normal starting position by the cam 114.

In the operation of the modified indicating wheel releasing mechanism as shown in Figs. 12 and 13, whenever it is required or desired to repeat a call, the arm 144 at the end of rod 141 is moved by the rotation of knob 142 to the position shown in Figs. 12 and 13 wherein the placing of the receiver HS on the plungers 77 and 78 as for operating the frame 70Y, the movement of rod 132 is taken up by the spring YX due to the blocking of rod 134 and the arm 136 and therefore the plate 137 and pawls 140 mounted thereon are not operated.

As above-mentioned the operation of gear sectors S1, S2, S3, etc., from normal to selected position causes the pivotal movement of bar 145 (see Fig. 12) and tension the springs 150 and 151, the spring 150 moving the pawl 148 in engagement with the tooth 149 of rod 132, simultaneously with the movement of frame 68 by placing the handset HS on plungers 77 and 78 at the termination of a telephone conversation, the pawl 148, however, holds the rod 132 from operating until all the digit indicating wheels have returned to normal unoperated position at which position the spring 151 acting on the arm 146 of bar 145 causes the pivotal movement of pawl 148 for disengaging the latter from the tooth 149 thus permitting this rod and the double armed lever 131 to return to normal unoperated position, so that the quick successive placing and removing of the handset on its plungers 77 and 78 do not prevent the full return of movement of the indicating wheels to normal non-operated position at the end of each successive call transmitting operation.

What is claimed is:

1. In a call transmitter, a plurality of code elements disposed in a row, gearing mechanisms, a set of key members for actuating said mechanisms for moving said elements in selected position for setting a call, an alternating current generator having vibrative reeds, a motor, means actuated by said motor for imparting movement to said generator at right angles to the movement and transverse of said code elements to cause the engagement of said reeds with said elements for transmitting signals corresponding to the operation of said key members and a governor mechanism for controlling such transverse movement.

2. In a call transmitter, a set of key members, a plurality of indicating wheels, code elements carried by said wheels, a pivoted plate actuated by the operation of said key members, a ratchet mechanism actuated by the pivotal movement of said plate for moving the latter in direction transverse of said wheels, and gear sectors actuated by the successive pivotal and transverse movement of said plate for actuating said indicating wheels for setting and indicating the call.

3. In a call transmitter, a set of key members, a plurality of indicating wheels, code elements carried by said wheels, a pivoted plate actuated variably by the operation of said key members,

a ratchet mechanism actuated by the pivotal movement of said plate for moving the latter in direction transverse of said wheels, gear sectors actuated by the successive pivotal and transverse movement of said plate for actuating said indicating wheels for setting and indicating the call, spring means tensioned by the operation of each of said gear sectors, ratchet means for normally holding each of said wheels in said indicating position, and manually operable means for actuating said ratchet means for permitting the return of said wheels to normal under the tension of said springs and the operation of said mechanism upon the return movement of one of said wheels for permitting the return operation of said plate.

4. In a call transmitter, a plurality of longitudinally movable key members, a plate operated in one direction by the operation of said key members, a ratchet mechanism operated by the movement of said plate for moving the latter in uniform step-by-step operation in direction at right angles to the first-mentioned direction, a plurality of indicating wheels, code elements carried by said wheels, gear sectors operatively engaging said wheels, means carried by said plate for successively engaging said gear sectors for moving said wheels in position for setting and indicating the call and an alternating current generator movable transverse of said code elements for engaging the latter for transmitting call signals representing the operation of said key members as indicated by the position of said wheels.

5. In a call transmitter, a plurality of digit key members, a plurality of indicating wheels actuated by the operation of said key members, code elements carried by each of said wheels, an alternating current generator having vibrative reeds, a pivoted frame for said generator, means for normally positioning said frame wherein the movement of said generator transverse of said code element is ineffective relative to said reeds, manually operable means for effecting such transverse movement, a motor spring tensioned by the movement of said manually operable means, latching means for normally holding said generator in said operated position, and electromagnetic means operable to cause the operation of said frame for releasing said generator for permitting its movement to cause the successive engagement of said code elements with said reeds during the return operation of said generator to normal position under the tension of said motor spring.

6. In a call transmitter, a plurality of key members, a plurality of digit indicating wheels actuated by the operation of said key members, code elements set in selected position by the movement of said wheels, an alternating current generator having vibrative reeds mounted for movement transverse of said code elements and a plurality of actuating means for imparting movement to said generator in direction at right angles to each other for successively engaging said vibrative reeds with said code elements for transmitting a call corresponding to the operation of said key members as indicated by said wheels.

7. In a call transmitter, a plurality of key members, a plurality of digit indicating wheels, code elements carried by said indicating wheels representing the digits of said key members, gearing mechanisms actuated variably by the operation of said key members for rotating said wheels in position for setting a call, an alternating current generator, a pivoted frame, means carried by

said frame for guiding said generator transverse of said code elements, means operable for normally maintaining said frame in position wherein said code elements are ineffective relative to said generator in its movement from normal to starting position, a handle lever for effecting such a movement, a motor spring tensioned by the movement of said handle lever for returning said generator to normal upon the operation of said operable means to render said code elements effective relative to said generator for transmitting the call.

8. In a call transmitter, a plurality of digit indicating wheels, a common shaft for rotatably supporting said wheels, a set of key members, a pivoted plate actuated variably by the operation of said key members, a driving pawl actuated under control of said key members in the setting of a call for moving said plate step-by-step in direction transverse of said wheels, a retaining pawl for holding said plate in each of said step-by-step positions, gear sectors, means carried by said plate successively engaging means carried by said gear sectors for rotating said wheels according to the variable movement of said plate for indicating the number of the call, code elements set by the operation of said wheels, an alternating current generator having vibrative reeds, a plurality of means operable for moving said generator in direction at right angles to each other to cause the engagement of said vibrative reeds with said code elements for transmitting the call, means manually operable for permitting the return movement of said indicating wheels to normal, and means operated by one of said gear sectors for disengaging said driving and said retaining pawls from said plate for permitting the return of the latter to normal position following the transmitting of the call.

9. A telephone call transmitter having a handset and a cradle for receiving the handset, a frame actuated by the placing and removal of the handset from the cradle, a plurality of combined code and indicating wheels movable from normal to selected position for setting a call, ratchet wheels and retaining pawls for holding said indicating wheels in said selected position, a mechanism actuated by said frame for operating said pawls for permitting the return movement of said wheels to normal non-operated po-

sition, a mechanism comprising a pawl carried by said frame, a pivoted double armed lever member having one of its arms disposed for operation by said pawl upon the movement of said frame, a rod having one of its ends connected to the other arm of said lever member, another rod disposed coaxially to the first-mentioned rod, a compression spring disposed between the adjacently disposed end of said rods, a pivoted plate for mounting said retaining pawls, an arm carried by said mounting plate having its free end disposed for operation by the movement of the second-mentioned rod for disengaging said retaining pawls from said ratchet wheels for permitting the latter to return to normal non-operated position, manually operable means movable in two positions, in one position permitting the operation of said retaining pawls upon the operation of said frame by the placing of the telephone handset in its cradle and in the other position causing the tension of said spring to be ineffective to operate said arm for disengaging said retaining pawls from said ratchet wheels for repeating the call.

10. A call transmitter having a handset, a set of key members, gear sectors, a plurality of digit indicating elements moved by the operation of said gear sectors under control of said key members in position for setting a call, a plurality of ratchet means for holding said elements in said actuated positions, a mechanism having plunger members and a frame operable upon the placing of the handset on said plungers to cause the operation of ratchet means for releasing said indicating elements following the transmitting of the call, an abutting arm having an indicator, a pivoted bar actuated by said gear sectors in their movement for setting the call, means actuated by said bar cooperating with said abutting arm to render the operation of said frame ineffective relative to said ratchet mechanism upon the movement of said frame following the removal and the placing of the handset on said plungers for repeating the call, spring means for retracting said bar to cause the release of the means actuated by said bar for permitting the return movement of said indicating wheels to normal upon the operation of said abutting arm by said indicator.

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