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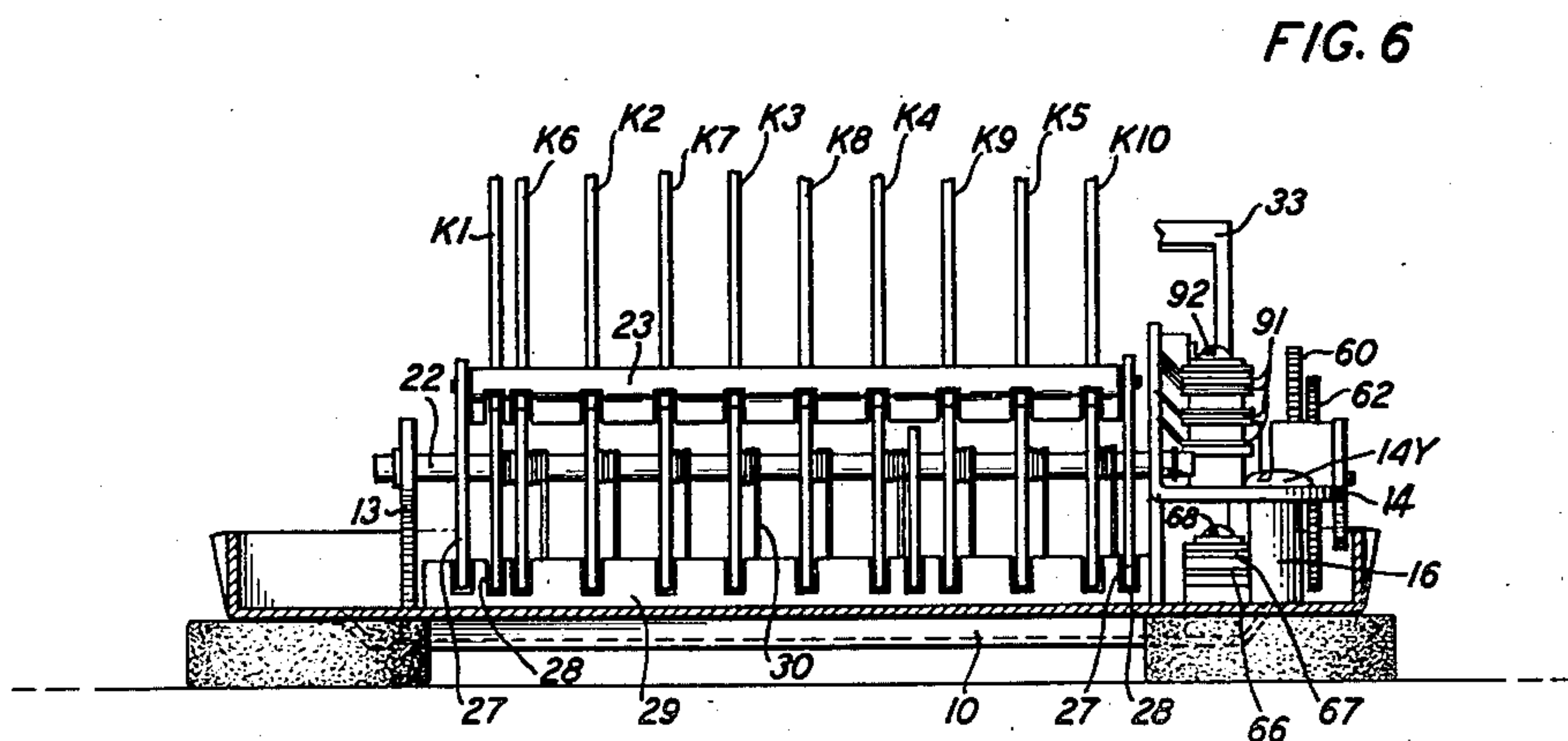
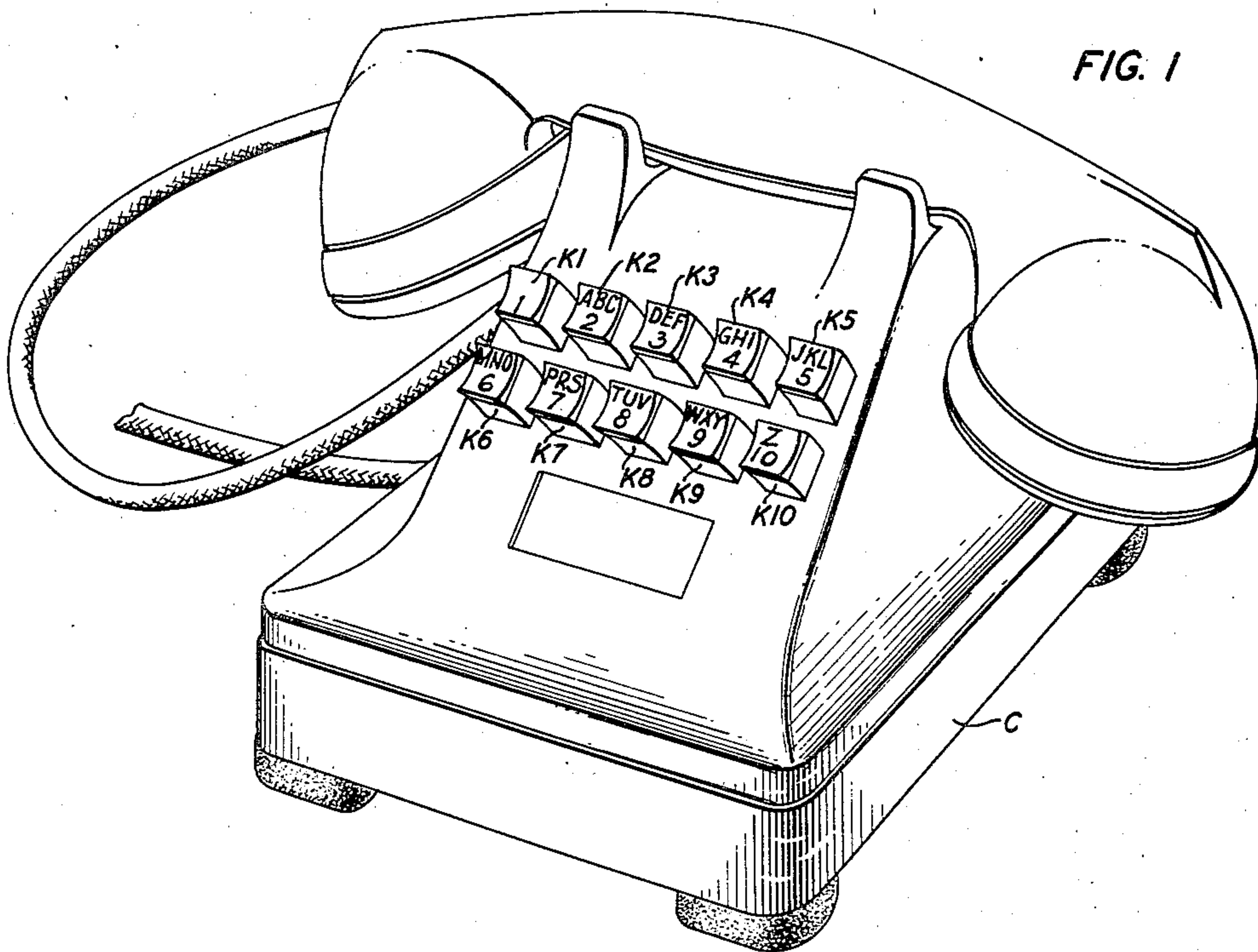
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2,412,625

TELEPHONE CALL TRANSMITTER

Filed Jan. 18, 1945

3 Sheets-Sheet 1



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3 Sheets-Sheet 2

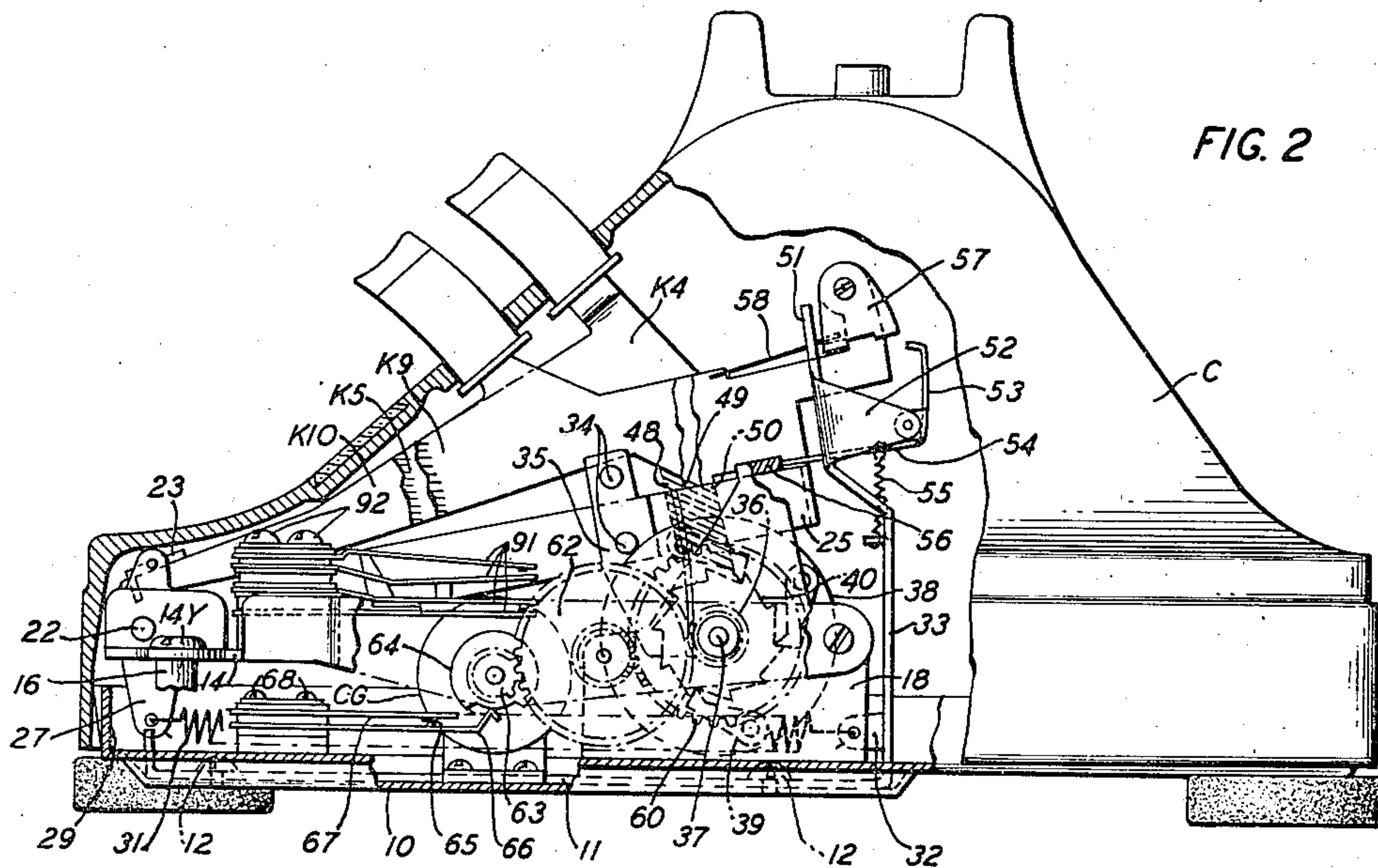


FIG. 2

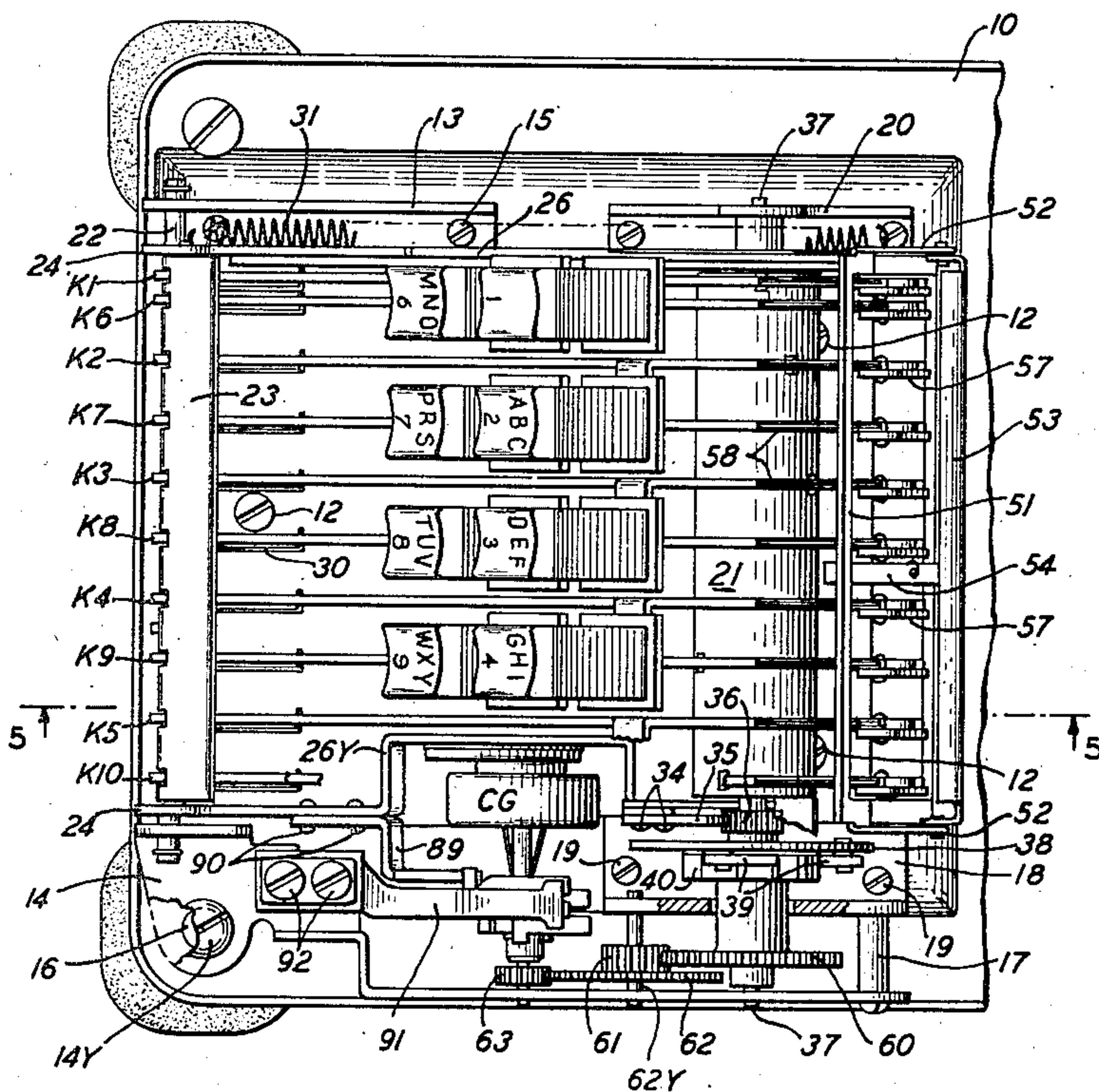


FIG. 3

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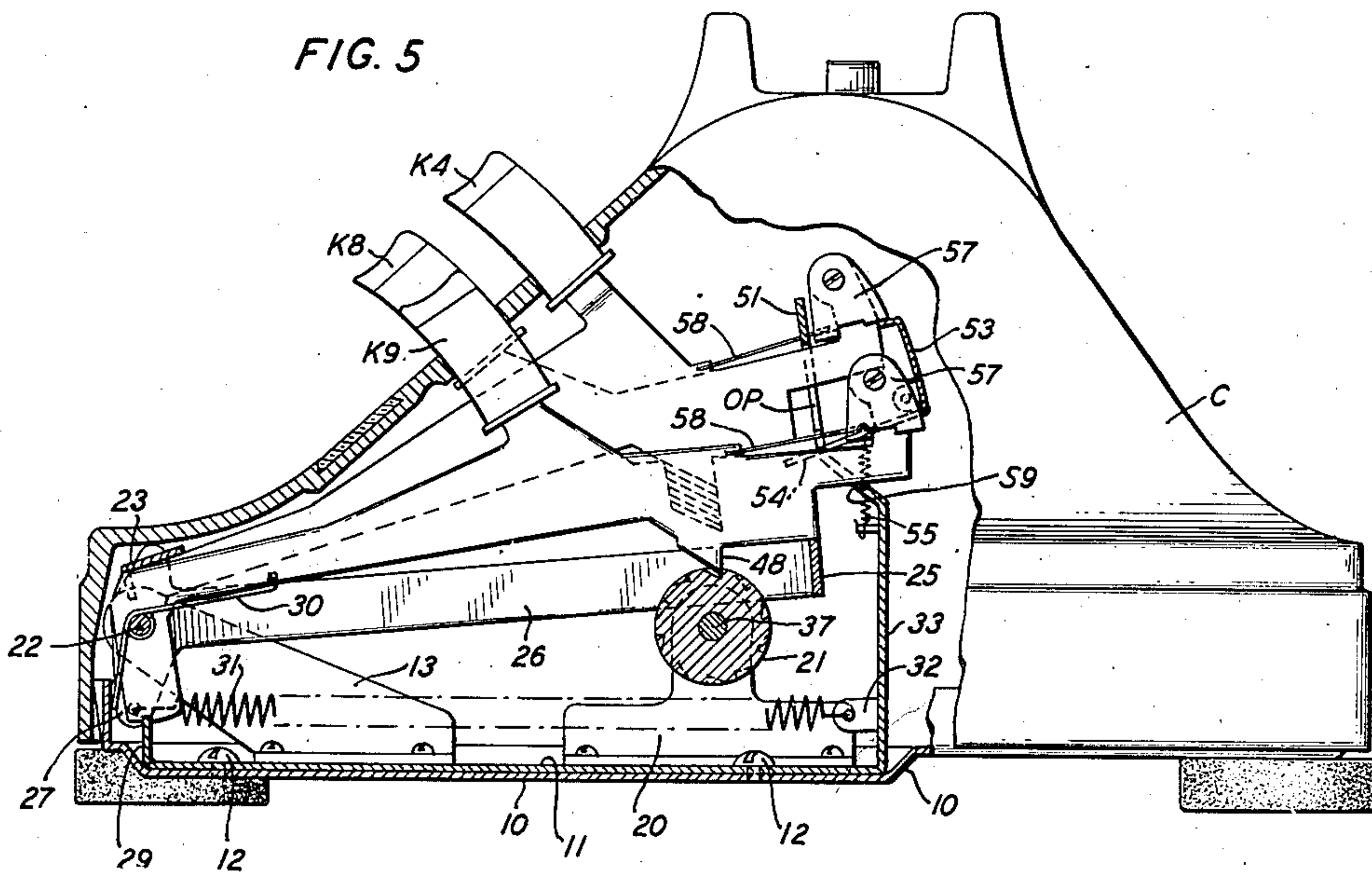
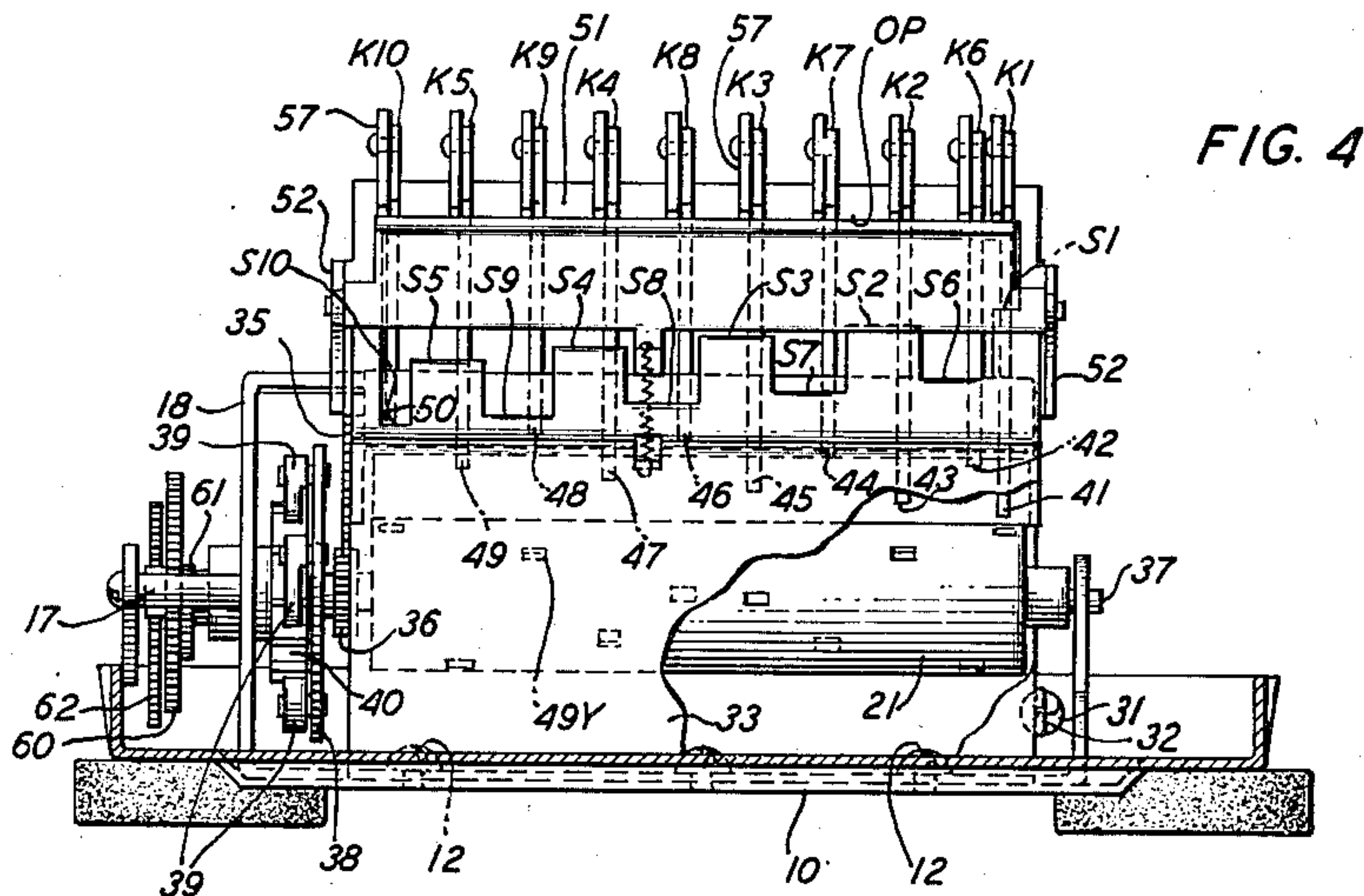
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2,412,625

TELEPHONE CALL TRANSMITTER

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Application January 18, 1945, Serial No. 573,422

4 Claims. (Cl. 177—380)

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This invention relates to key-operated call transmitter devices of the type used in telephone systems for controlling the operation of automatic selector and connector switches for establishing talking connections.

The object of the present invention is the provision of a telephone call transmitter device of the type above referred to which will be simple in construction, convenient in use and positive in operation.

A feature of the invention is the provision of a set of pivoted key members for individually actuating means in the form of a U-shaped bar and a gear sector carried by the bar for rotating a pinion and thereby elements of a ratchet mechanism relative to a ratchet wheel for rotating the latter upon the return of the bar and the gear sector to normal position for actuating a pulsing mechanism.

Another feature is the provision of means in the form of a cylinder or drum movable with the elements of the ratchet mechanism and engaged by means carried by the keys for determining the angular movement of the ratchet elements relative to the ratchet wheel for actuating the pulsing mechanism according to the digit of the key depressed as effected during the return of the bar and the gear sector to normal position by a motor spring tensioned during the operation of the U-bar by the operated key member, the depressed key returning to normal by the tension of its own retractile spring prior to the return of the bar which is itself under control of a governor mechanism.

Another feature is the provision of means carried by the keys engageable with means operable upon the movement of the U-shaped bar by any one of the keys for locking the non-operated keys in that position during the operation of the pulsing mechanism, the pawl carried by the operated key permitting the return of this key to normal without interference from the pawl bar prior to the operation of the latter for releasing the non-operated keys by the return movement of the U-shaped bar to normal position.

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 an elevation view shown in perspective with the keys in normal position.

Fig. 2 is a right side elevation view shown with the casing housing the transmitter mechanism partly in vertical longitudinal section and with a

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number of operating parts with portions broken away.

Fig. 3 is a top view shown with the casing removed from the base, a number of operating parts being shown with portions broken away.

Fig. 4 is a rear elevation view shown with a number of operating parts with portions broken away and with the casing removed, the keys being shown in normal position.

Fig. 5 is a vertical longitudinal cross-sectional view taken on line 5—5 of Fig. 3 showing one of the keys and a number of operating parts controlled thereby in the operated position; and

Fig. 6 is a partial front view with the casing removed showing the means used for holding the keys in spaced relation to each other on their supporting shaft, the base being shown in vertical section.

Referring to the drawings 10 is a base which in cooperation with a casing C forms a housing for the transmitter mechanism. On the base 10 is secured as by a number of similar screws 12 a mounting plate 11 provided for securing as by a plurality of screws 15 an upright support 13 and a spacer member 16, the latter as shown in Figs. 2 and 3 supporting one end of a bracket 14 which is secured to the spacer member by a screw 14Y, while the other end of bracket 14 is secured to a stud 17 laterally extending from a bracket 18 secured to the mounting plate 11 by a pair of screws 19, the bracket 18 in cooperation with an upright support 20 serving for rotatably mounting a shaft 37 to which is keyed a cylinder or drum 21 provided for a purpose which will be hereinafter described in detail.

Upright support 13 and bracket 14 as best seen in Fig. 3 serve to support the ends of a shaft 22 provided for pivotally mounting a set of key members K1, K2, K3, K4, K5, K6, K7, K8, K9 and K10, held in spaced relation to each other by a notched bar 23, itself supported at both ends in bearing portions 24 formed with the arms 26 and 26Y of a U-shaped bar 25 extending transverse of the key members K1, K2, K3, etc., with its arms 26 and 26Y pivoted on shaft 22, the U-shaped bar 25 being held against movement longitudinally of shaft 22 through lug portions 27 formed with its arms 26 and 26Y extending downwardly for free movement in notches 28 formed in the upturned portion 29 of mounting plate 10 as shown in Figs. 2, 5 and 6.

The key members K1, K2, K3, etc., are held in normal position by individual retractile springs 30 while the U-shaped bar 25 is held in normal position as shown in Fig. 2 by the normal tension

of a motor spring 31 having one of its ends hooked to lug 27 formed with arm 26 of this bar and the other end of this spring is hooked to a lug 32 laterally extending from an upright extending portion 33 formed with mounting plate 11, the motor spring 31 being tensioned by the pivotal movement of the U-shaped bar 25 upon the operation of any one of the key members K1, K2, K3, etc., for actuating a pulsing mechanism which will be hereinafter described in detail.

To the arm 26Y of U-shaped bar 25 as shown in Figs. 2, 3 and 4 is secured as by rivets 34 a gear sector 35 meshing with a pinion 36 keyed on the shaft 37 for rotating the drum 21 keyed thereon and a disc 38 which is secured to the hub of pinion 36 for moving spring-pressed pawls 39 ineffectively on the teeth of a ratchet wheel 40 mounted for free rotation on the shaft 37. The angular movement of disc 38 is determined by the spaced relation of ratchet teeth 41, 42, 43, 44, 45, 46, 47, 48, 49 and 50 best seen in Fig. 4 formed with the key members K1, K2, K3, K4, K5, K6, K7, K8, K9 and K10 to the periphery of drum 21 where the ratchet teeth 41, 42, 43, etc., engage with corresponding notches disposed at different angular distances at the periphery of the drum, while the movement of the keys is controlled by respective stops S1, S2, S3, S4, S5, S6, S7, S8, S9 and S10 formed in an opening OP best seen in Fig. 5 in an upright portion 33 of mounting plate 11, the opening being limited at the top end of the upright portion 33 by a bar 51 against which the key members K1, K2, K3, etc., are held in normal position by the tension of their respective retractile springs 30.

The upright 33 is provided with two bearing portions 52 best seen in Figs. 2, 3 and 4 serving for pivotally supporting a pawl bar 53 having an arm 54 bearing against the upper disposed edge of U-shaped bar 25 by the tension of its retractile spring 55 while a lug 56 formed at the top end of the bracket 18 serves as a normal position stop for the U-shaped bar 25, the pawl bar 53 being normally pivoted against the tension of its retractile spring 55 to the position shown in Fig. 2 out of engageable relation from spring pressed pawls 57 carried by the keys K1, K2, K3, etc., for permitting the operation of any one of the keys and that of the U-shaped bar 25 such movement causing the movement of pawl bar 53 under the action of its retractile spring 55 from the position shown in Fig. 2 to the position shown in Fig. 5 for locking the non-operated keys to that position.

The operation of U-shaped bar 25 and that of the gear section 35 carried thereby is effective to rotate the pinion 36, the shaft 37, the drum 21 and the disc 38 for moving the pawls 39 as above-described ineffectively on the teeth of ratchet wheel 40 having a number of teeth corresponding to the notches at the periphery of drum 21. The return movement of U-shaped bar 25 to normal position as effected by the tension of motor spring 31 following the release of the depressed key by the operator, the pawl 39 engages the ratchet wheel 40 for rotating this wheel and a gear wheel 60 formed as a unit with the ratchet wheel. Rotation of gear 60 is imparted to a pinion 61 and a gear wheel 62 mounted on a shaft 62Y journaled at both ends in brackets 14 and 16. The gear 62 engages a pinion 63 for rotating a speed governor CG and a pulsing cam 64 provided for opening a contact 65 between springs 66 and 67 secured as by a number of screws 68 in a pile-up arrangement on the mounting plate 11.

To the U-shaped bar 25 is secured as by rivets 99 an arm 29 disposed in engageable relation with a set of so-called off-normal contact springs 91 secured in a pile-up arrangement on the bracket 14, these contact springs being provided to perform switching operations well known in the automatic telephone art but which forms no part of the present invention.

In a typical operation of the transmitter mechanism as for transmitting a series of pulses by the operation of key K9, for example, the operation of this key from the position shown in Fig. 2 to the position shown in Fig. 5 is effective to impart an angular movement to the U-shaped bar 25 and to the gear sector 35 carried thereby for rotating the drum 21 nine tenths of a turn to a point wherein the key K9 engages its stop S9 in the upright portion 33 of mounting plate 11 which occur simultaneously with the engagement of ratchet tooth 43 formed with this key with the notch 49Y at the periphery of drum 21 for arresting the rotation of the drum and that of disc 38 when the spring-pressed pawls 39 carried thereby automatically engage the ratchet wheel 40.

The movement of U-shaped bar 25 as effected by the operation of key K9 above-mentioned permits the pivotal movement of pawl bar 53 under the tension of its retractile spring 55 from the position shown in Fig. 2 to the position shown in Fig. 5 in the path of the spring pressed pawl 57 for locking the non-operated keys in that position while the pivotal movement of the spring pressed pawl respective to the operated key permits the immediate return of this key to normal when this pawl engages the pawl bar 53 prior to the return of the U-shaped bar 25 and the gear sector 35 carried thereby now actuating the gear 60, pinion and gear unit 61-62, the pinion 63 and pulsing cam 64 under control of centrifugal speed governor CG. The return movement of U-shaped bar 25 from operated position shown in Fig. 5 to normal position shown in Fig. 2 is effective to rotate the pulsing cam 64 nine turns thus causing nine interruptions of contact 65 for transmitting nine pulses, that is the digit represented by key K9 the U-shaped bar engaging the arm 54 of the pawl bar 53 for pivoting the latter to the position shown in Fig. 2 thus releasing all the keys to prepare the transmitter mechanism for the operation of a succeeding key which is effected in a manner similar to that of the operation of K9 in the example above-mentioned.

What is claimed is:

1. In a call transmitter, a set of digit key members, a pivoted bar actuated by the operation of any one of said key members, a gear sector carried by said bar, a shaft disposed transverse of said key members, a pinion keyed on said shaft engaged by said sectors for rotating said shaft upon the operation of said bar, a drum member keyed on said shaft, means carried by each of said key members engaging means disposed in spaced relation at the periphery of said drum member for limiting the movement thereof to an angular distance corresponding to the digit of the operated key member, a motor spring tensioned by the operation of said bar for returning the latter to normal, a pulsing mechanism, and a ratchet mechanism operable upon the return of said bar to normal position for actuating said pulsing mechanism.

2. In a call transmitter, a set of digit key members, a U-shaped bar actuated by the operation of any one of said key members, a shaft, a drum

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and a pinion keyed on said shaft, a gear sector carried by said U-shaped bar engaging said pinion for rotating said shaft, a disc member keyed on said shaft, a ratchet wheel mounted for free rotation on said shaft, spring pressed pawls carried by said disc member engaging said ratchet wheel for rotating the latter upon the return operation of said bar and said gear sector to normal position, means carried by each of said key members engaging means carried by said drum for controlling the movement thereof, and a pulsing mechanism actuated by the movement of said ratchet wheel.

3. In a call transmitter, a set of digit key members, a pivoted U-shaped bar disposed for operation by the individual movement of said key members, a rotatable shaft disposed transverse of said key members, a pinion keyed on said shaft, a gear sector carried by said bar engaging said pinion for rotating said shaft upon the operation of said bar by any one of said key members, a drum member carried by said shaft, a plate having stop means for defining the movement of said key members, means carried by each of said key members engaging means carried by said drum for limiting the movement of the latter to angular distances corresponding to the digits represented by said key members, a disc member keyed on said shaft, a ratchet wheel mounted for free rotation on said shaft, a gear movable as a unit with said ratchet wheel, spring pressed pawl elements mounted on said discs and engaging said ratchet wheel for rotating the latter

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upon the reverse movement of said U-shaped bar to normal position, and a pulsing mechanism actuated by the gear movable with said ratchet wheel during the return movement of said bar for transmitting pulses according to the movement of said drum and of the operated key member.

4. In a call transmitter, a set of pivoted key members, a U-shaped bar having a gear sector actuated by the movement of any one of said key members, a mounting plate having an upright extending portion, means in said upright portion for limiting the movement of each of said key members from normal to operated position, a spring pressed pawl carried by each of said members, a pawl bar pivoted on said upright portion and extending transverse of said key members for movement in the path of said spring pressed pawls following the movement of said U-shaped bar by the operated key member for preventing the operation of the unoperated key members during the movement of said U-shaped bar, a motor spring tensioned by the operation of said U-shaped bar, a pulsing mechanism actuated by said gear sector under the tension of said motor spring following the return of the operated key to normal position, the pawl respective to the operated key operating upon its engagement with said pawl bar for permitting the return of that key to normal prior to the movement of said pawl bar by said U-shaped bar.

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