

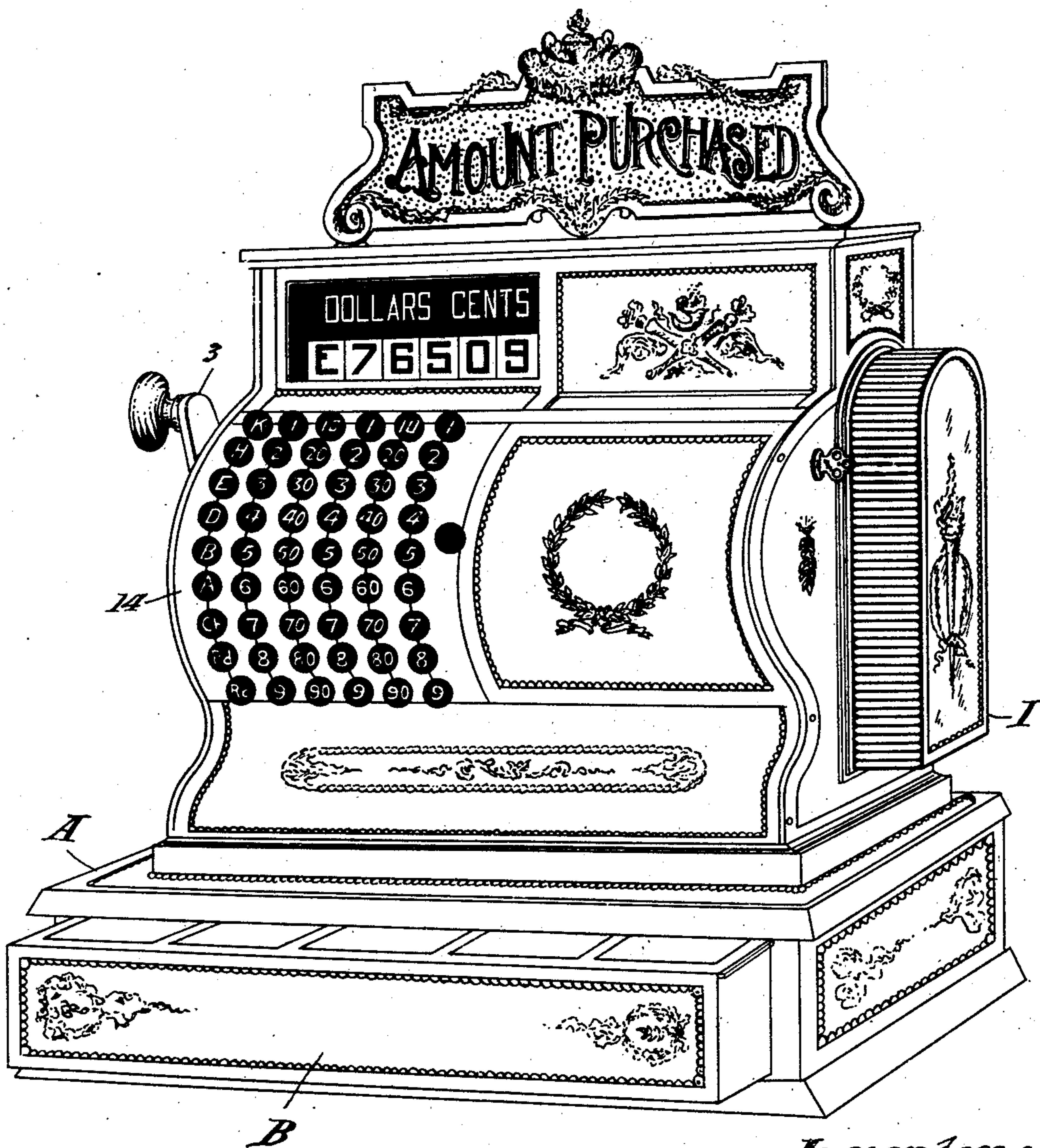
915,090.

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CASH REGISTER.
APPLICATION FILED OCT. 14, 1904.

Patented Mar. 16, 1909.

11 SHEETS—SHEET 1.

Fig. 1



Witnesses:

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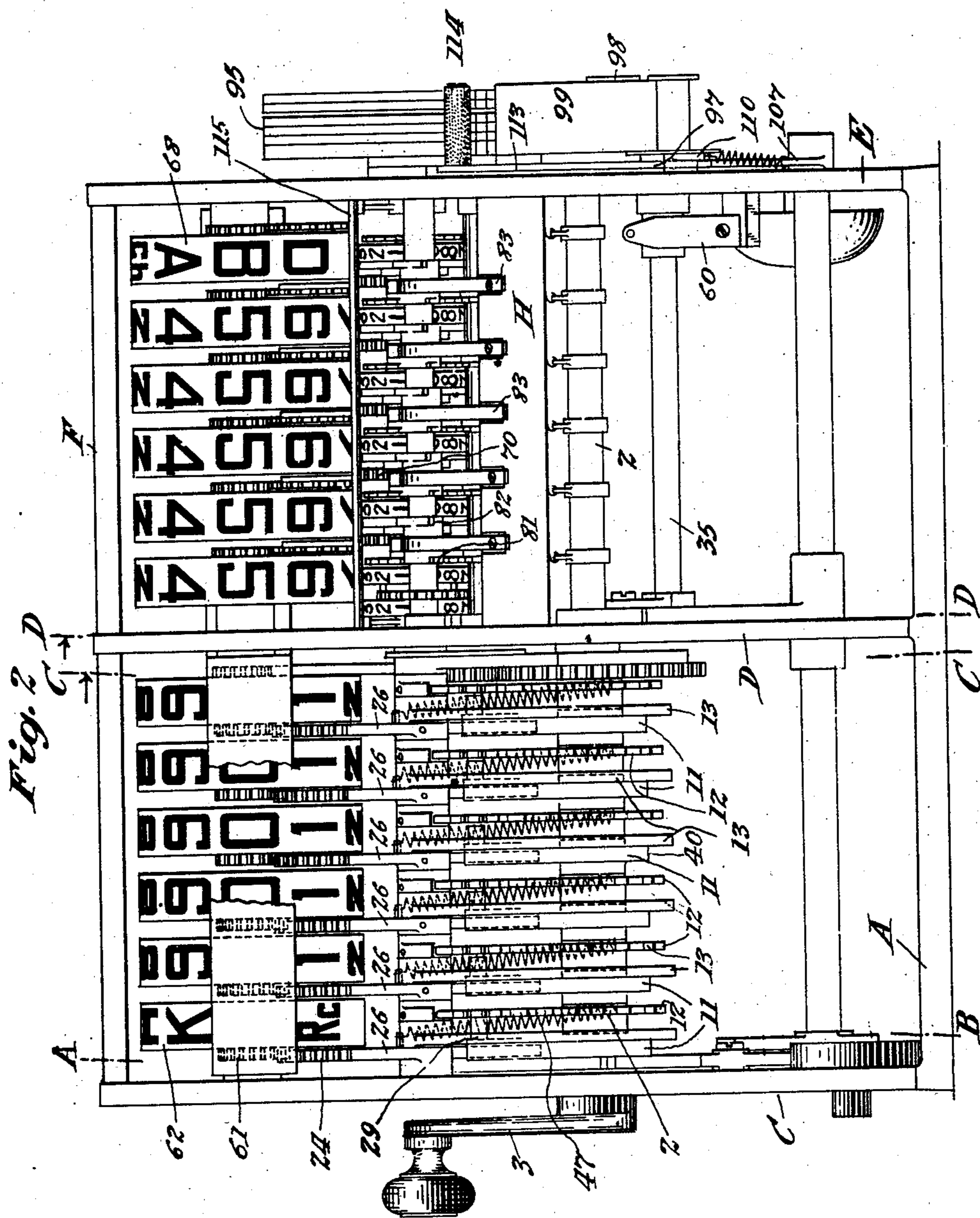
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APPLICATION FILED OCT. 14, 1904.

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11 SHEETS—SHEET 2.



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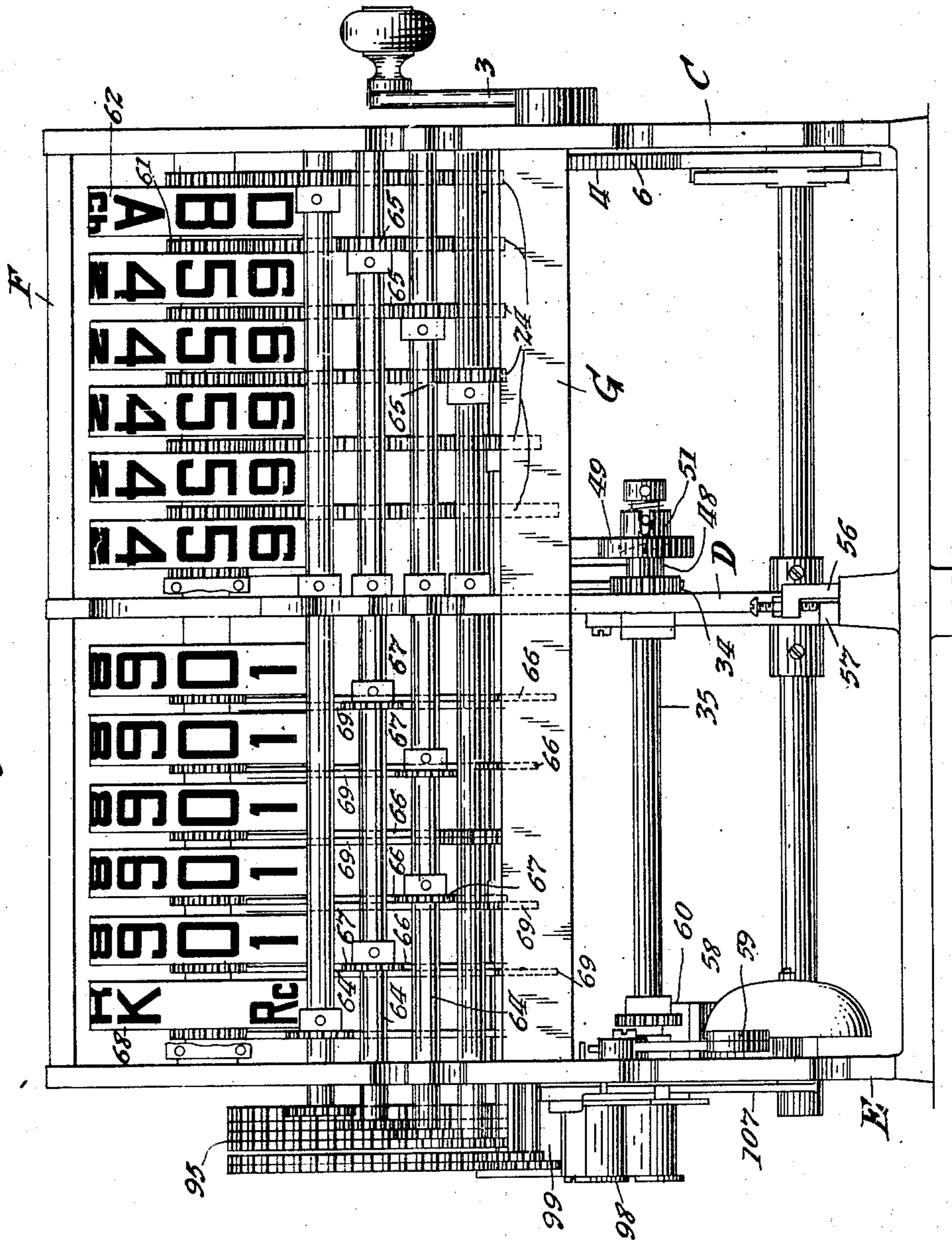
APPLICATION FILED OCT. 14, 1904.

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11 SHEETS—SHEET 3.

915,090.

Fig. 3



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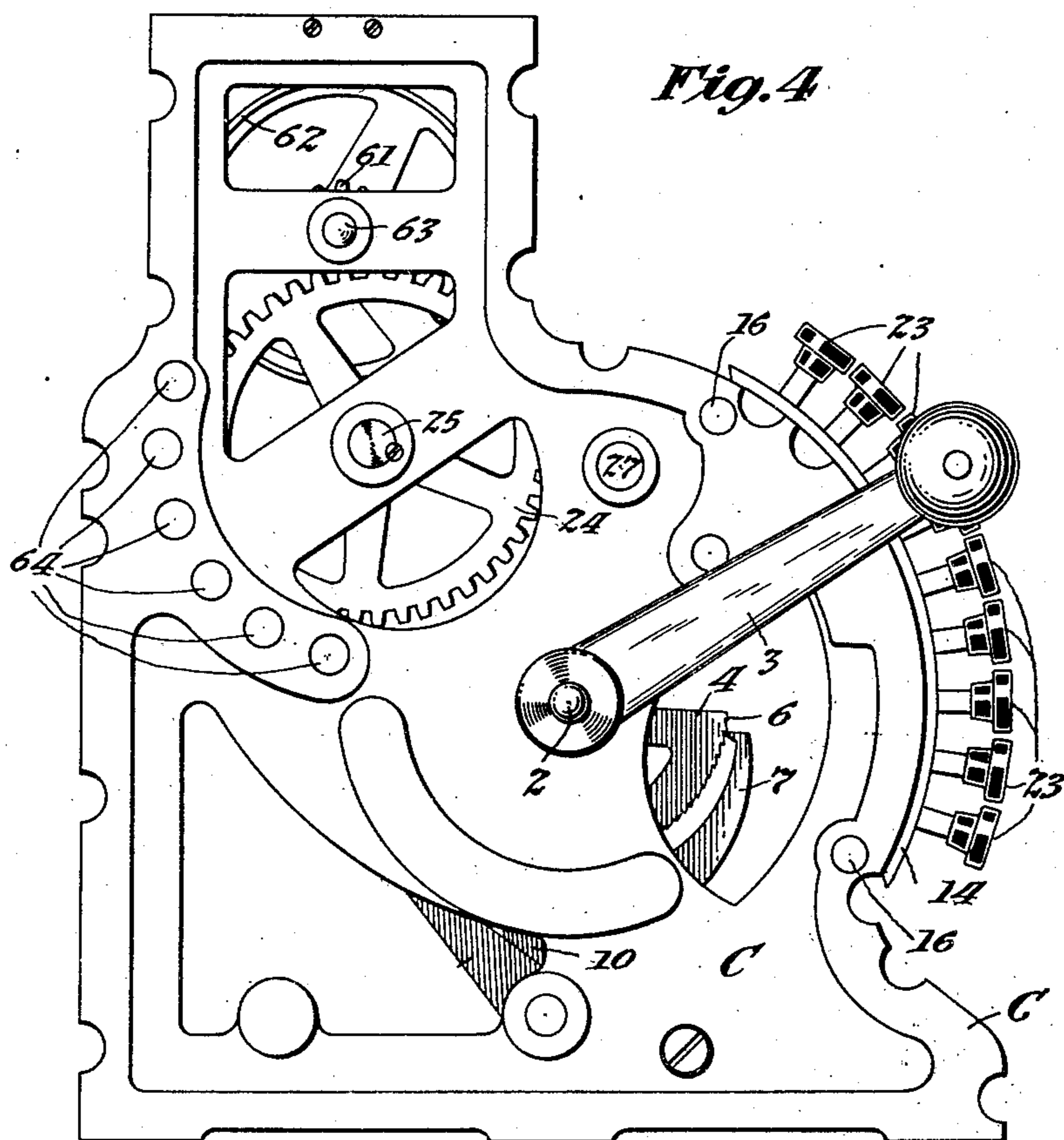
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11 SHEETS—SHEET 4.



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APPLICATION FILED OCT. 14, 1904.

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11 SHEETS—SHEET 5.

Fig. 10

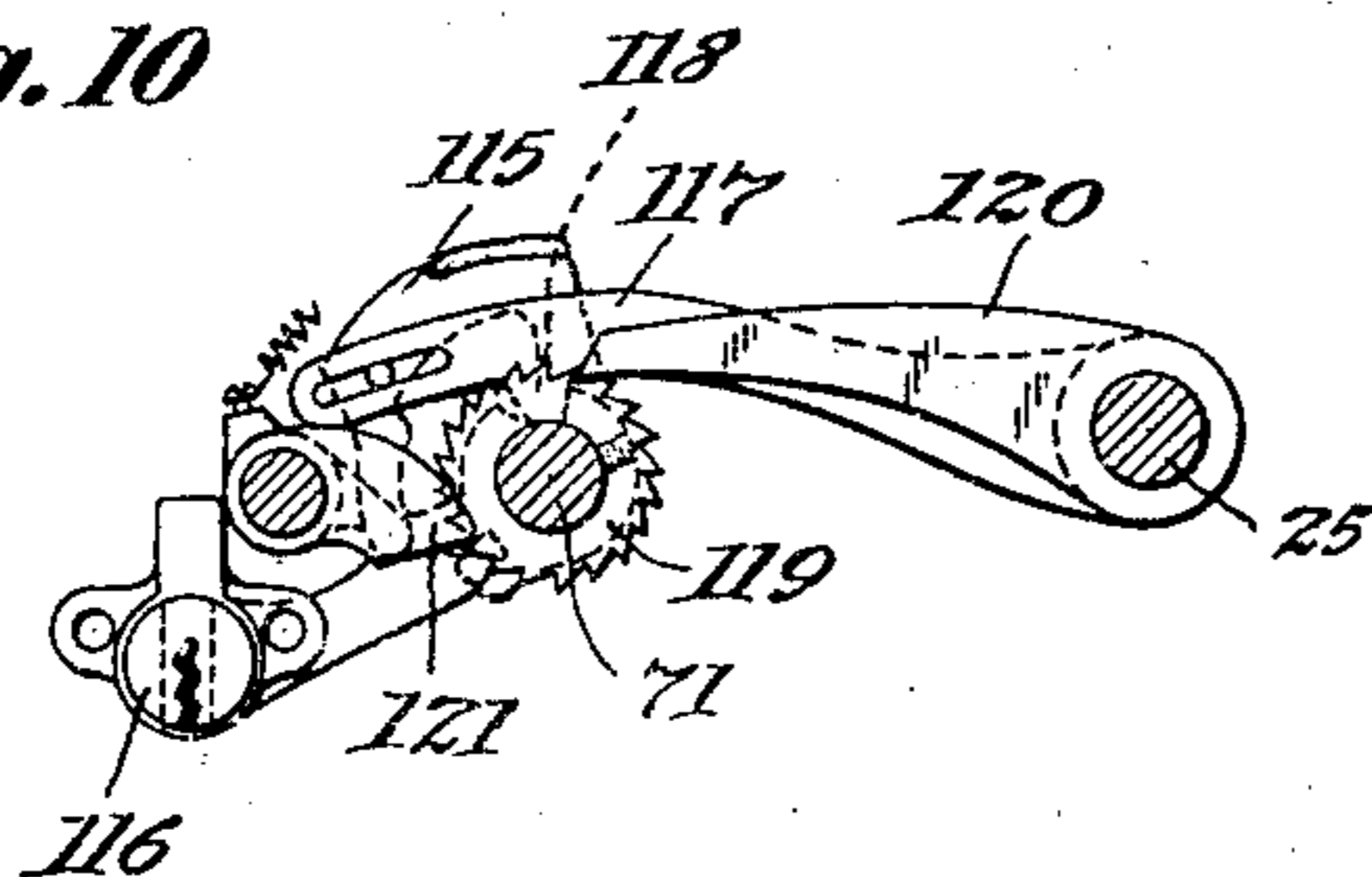
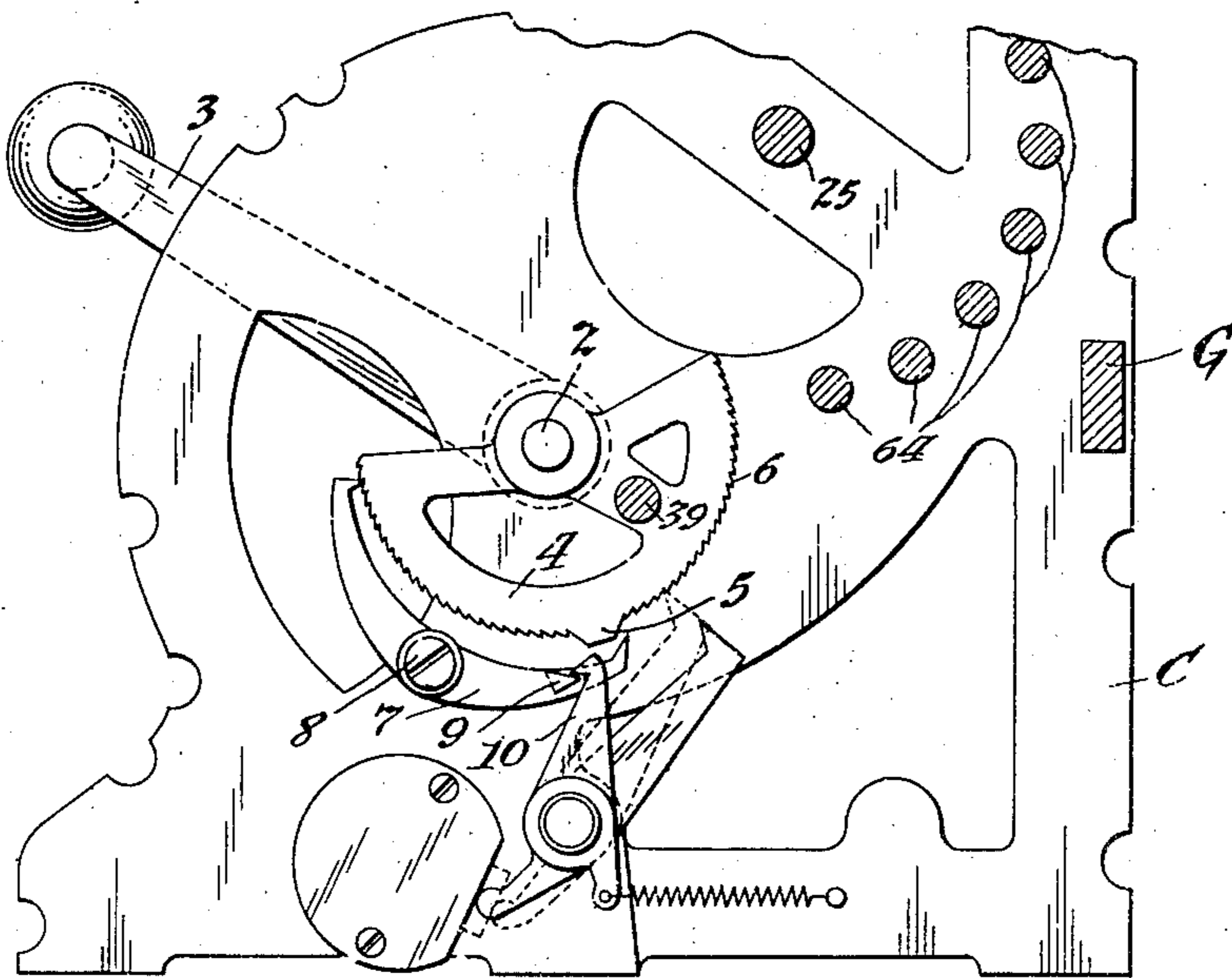


Fig 5



Witnesses:

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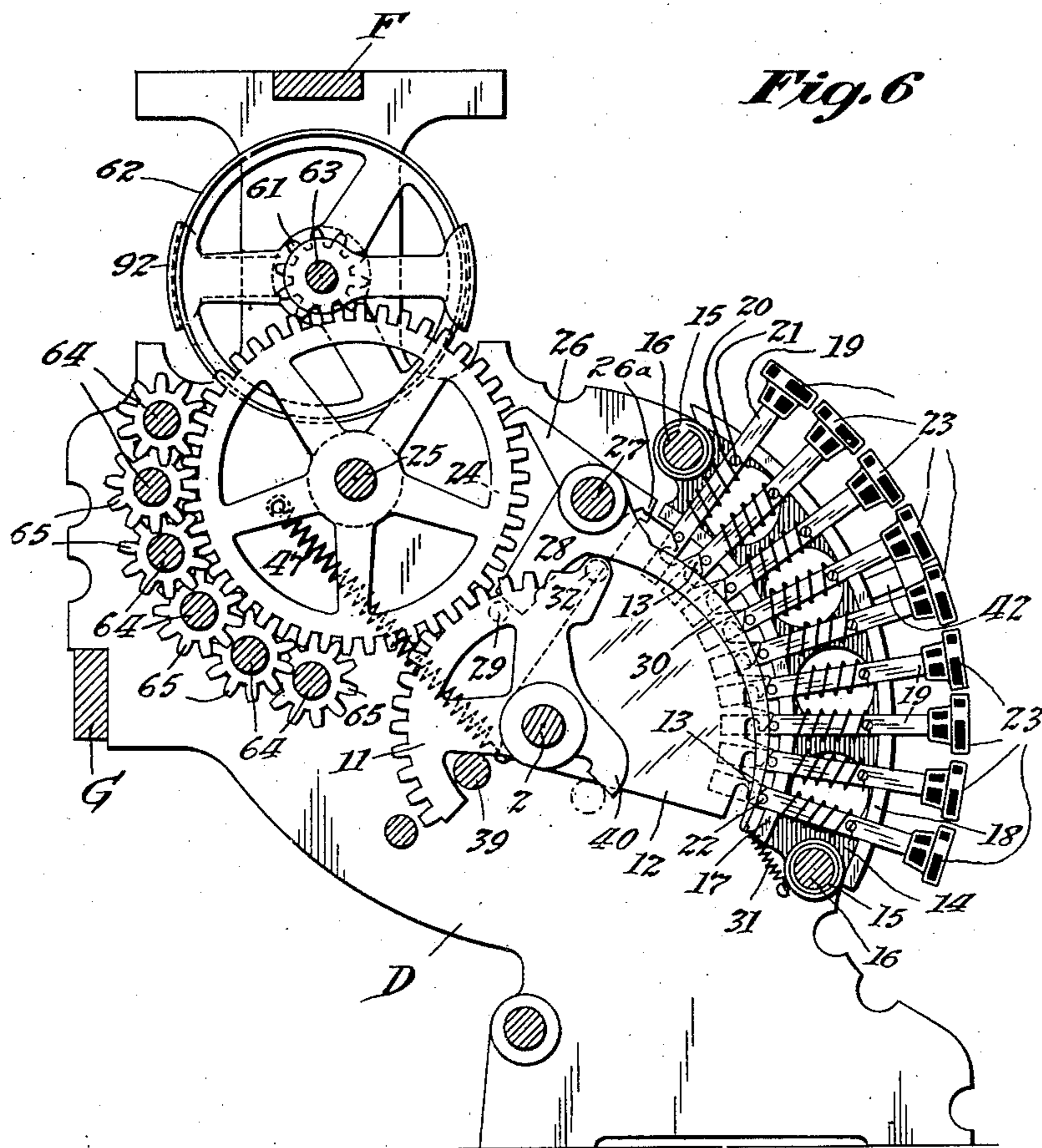
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APPLICATION FILED OCT. 14, 1904.

11 SHEETS—SHEET 6.

Fig. 6



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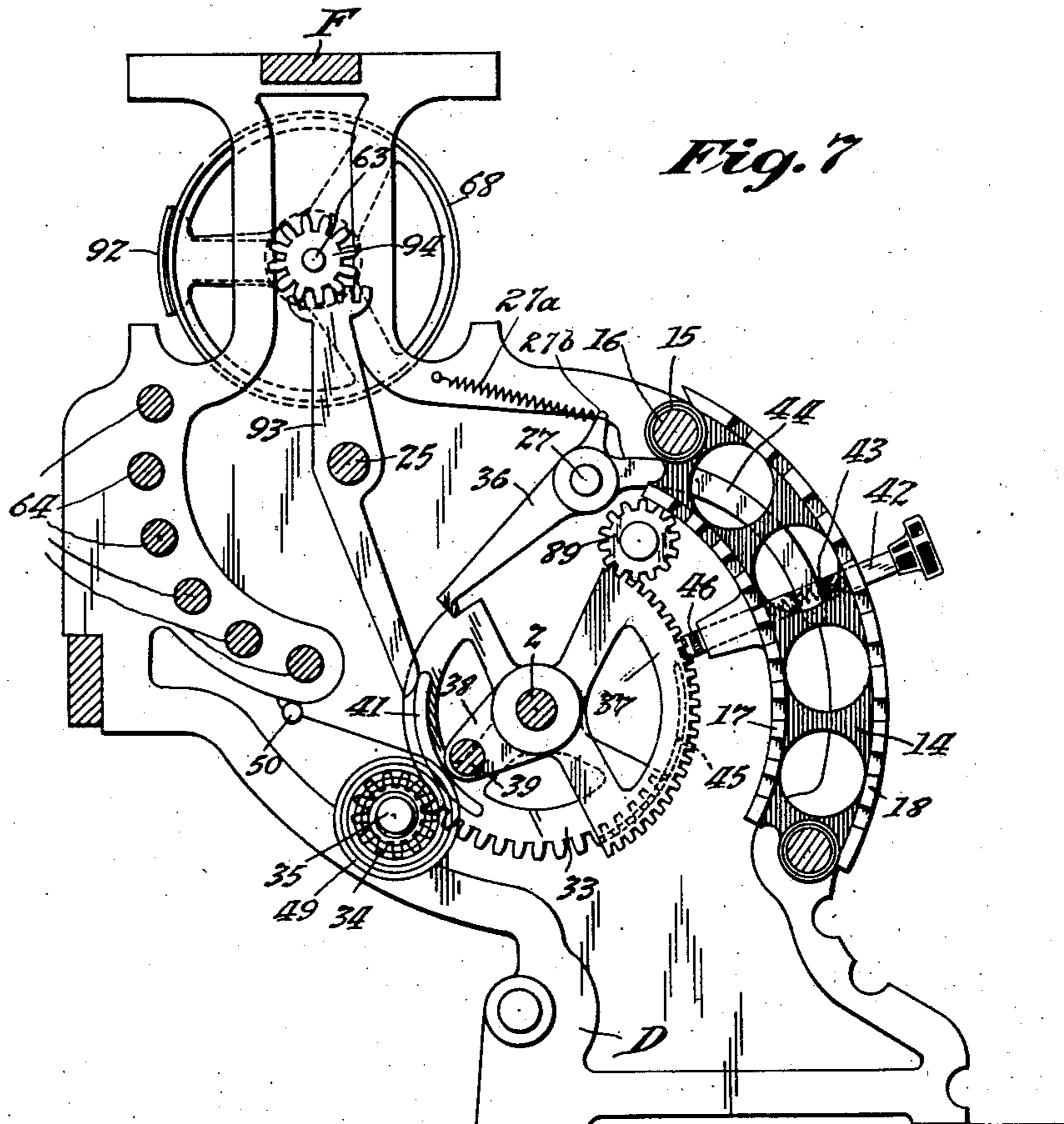
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APPLICATION FILED OCT. 14, 1904.

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11 SHEETS—SHEET 7.

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Patented Mar. 16, 1909.

11 SHEETS—SHEET 8.

Fig. 9

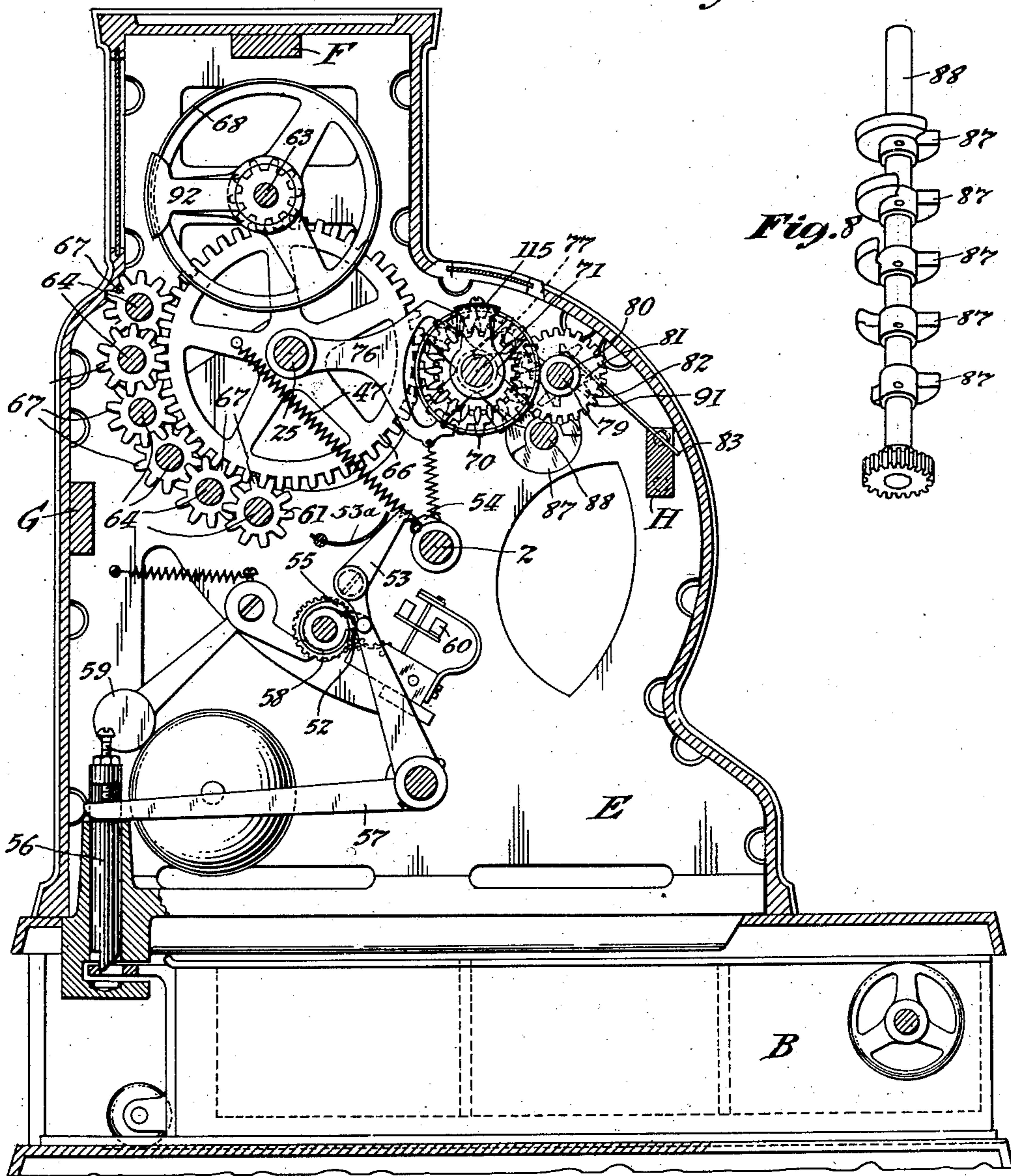
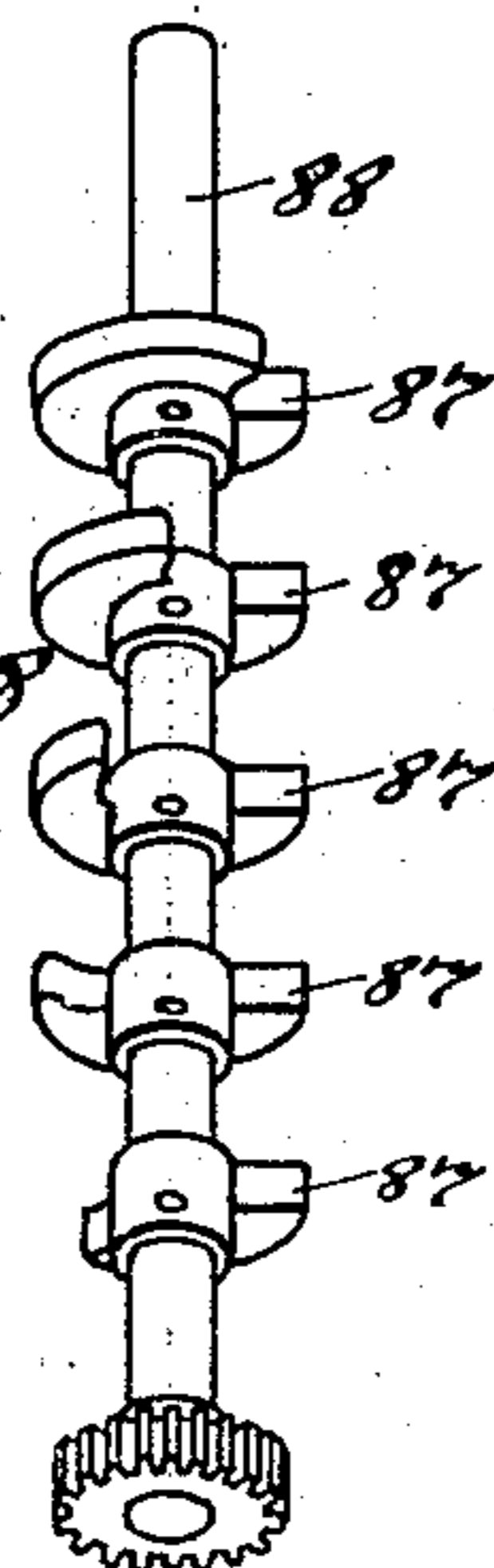


Fig. 8



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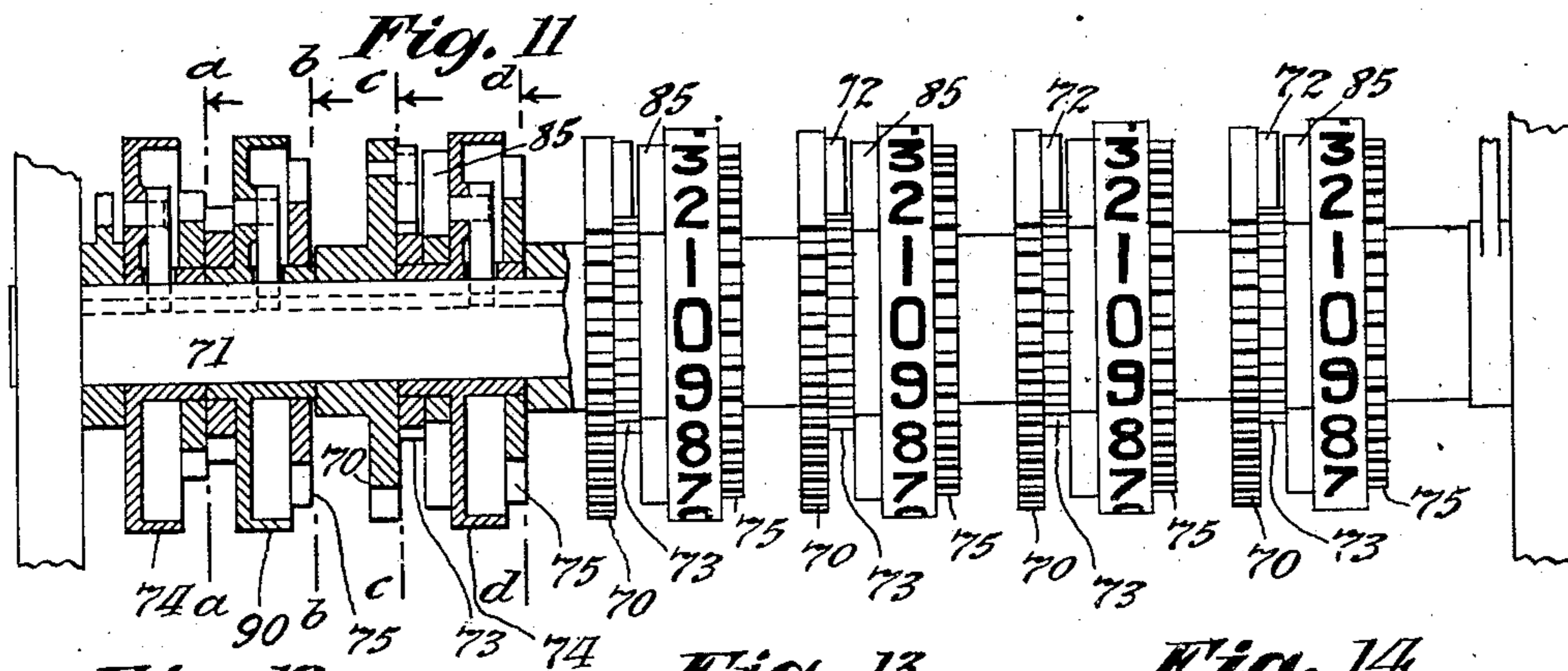


Fig. 12

Fig. 13

Fig. 14

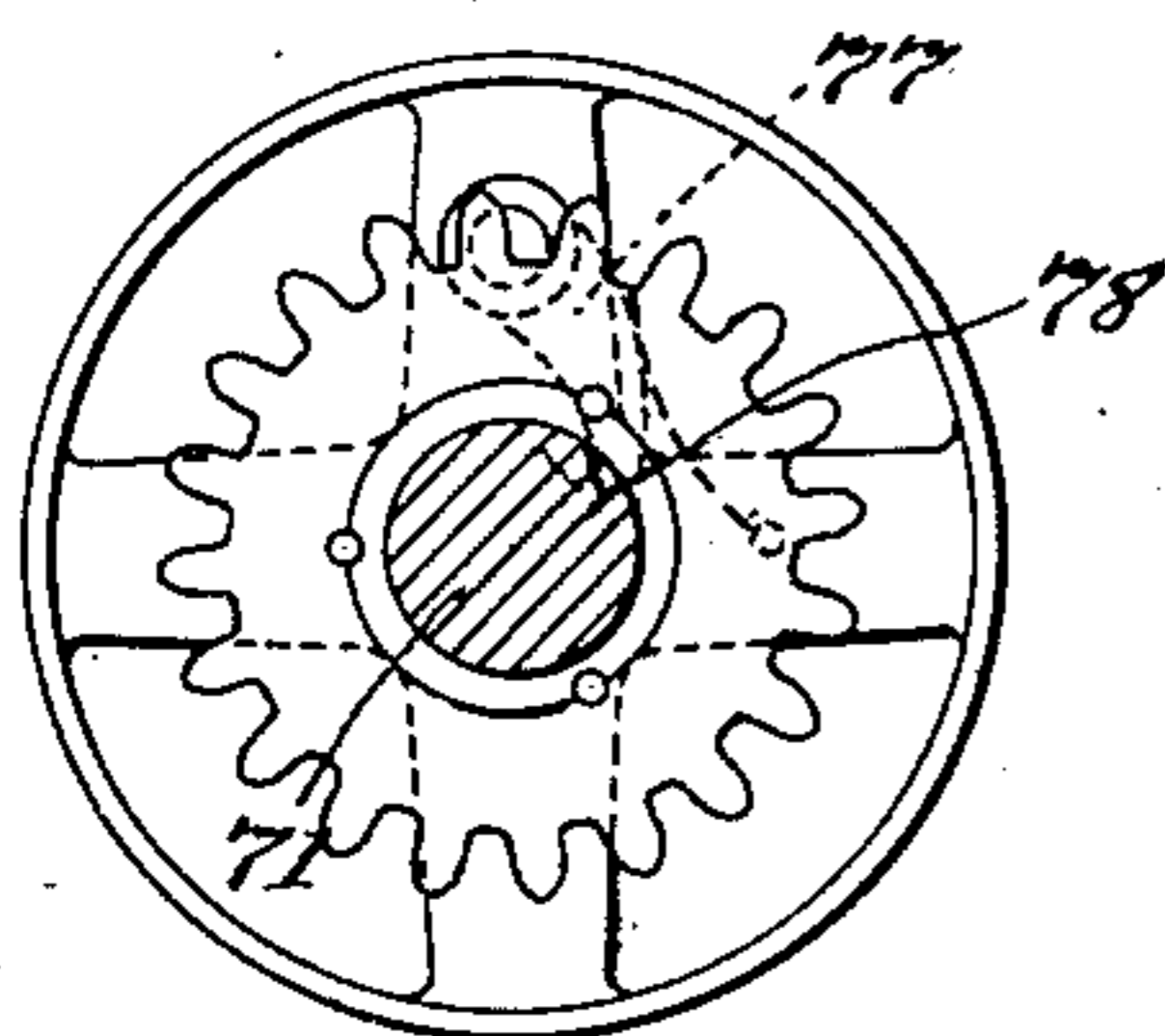


Fig. 15

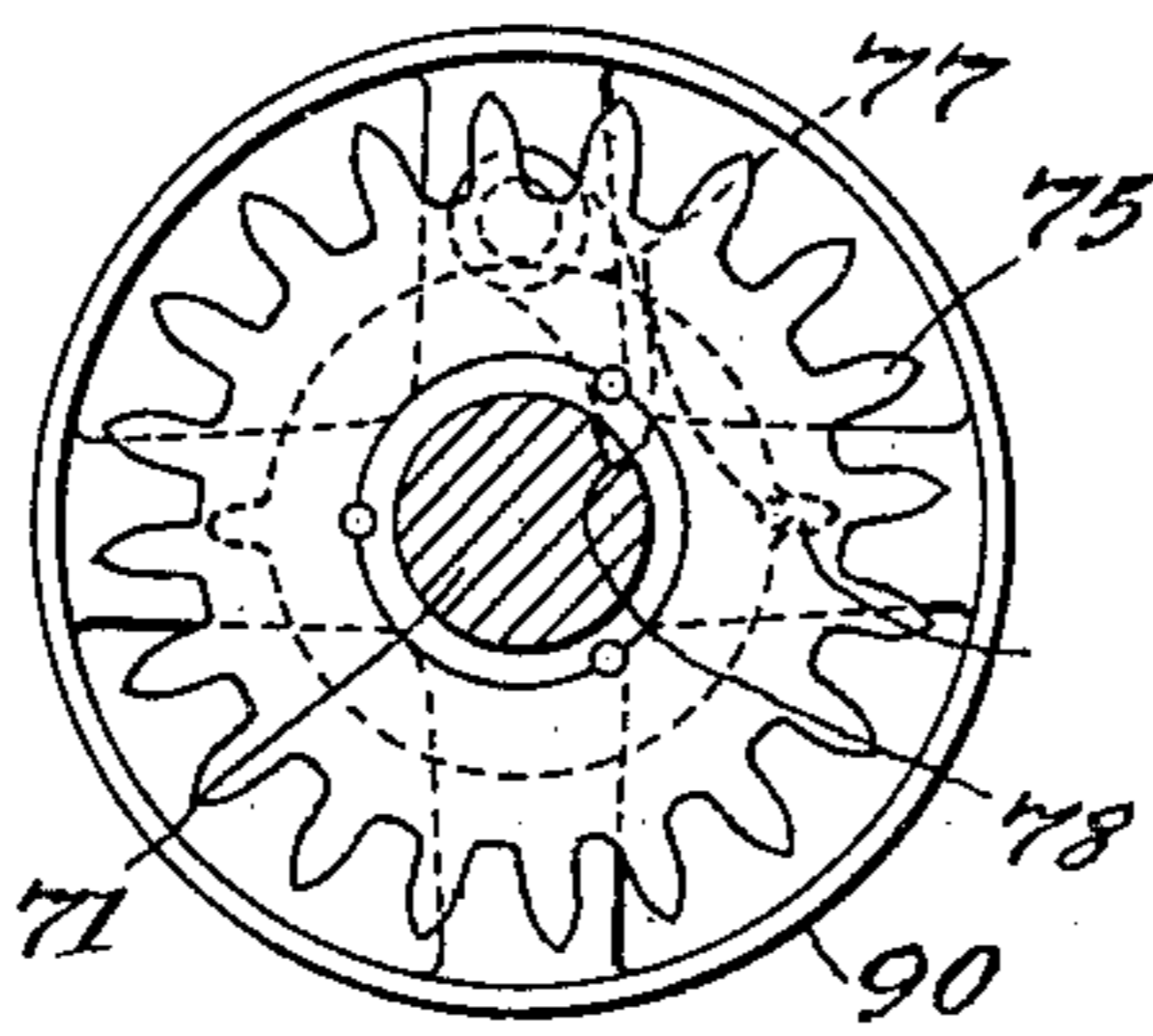
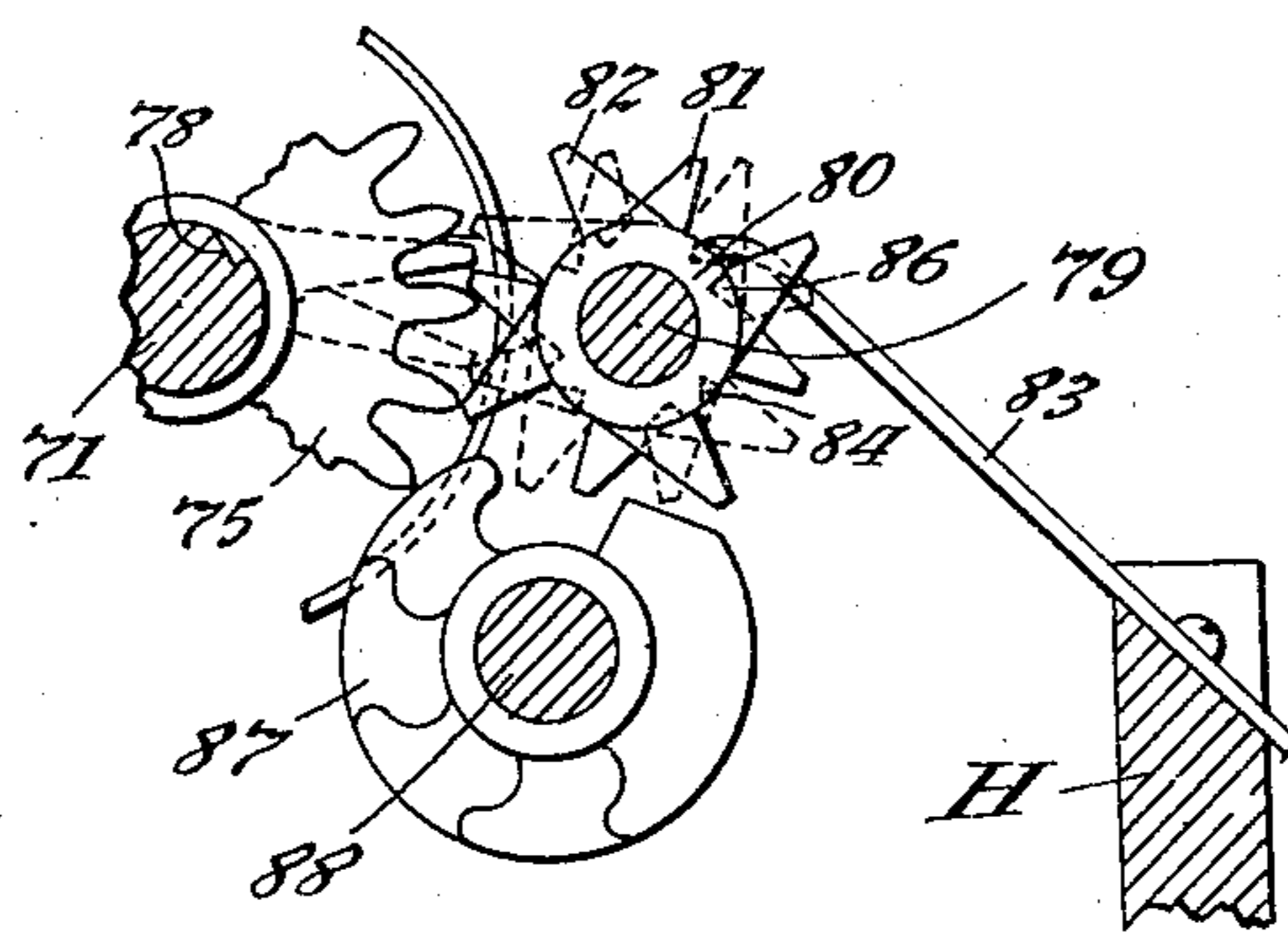
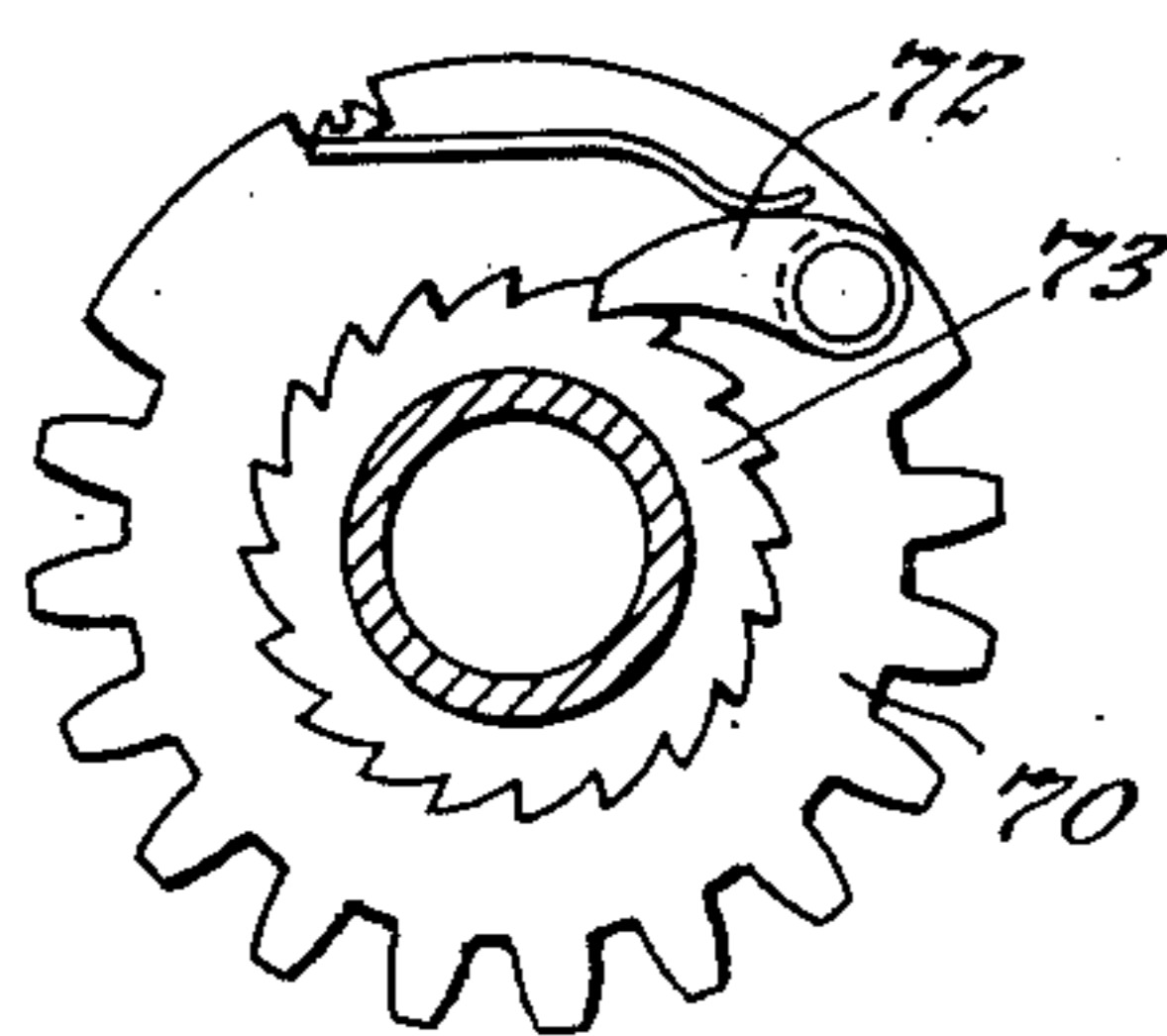
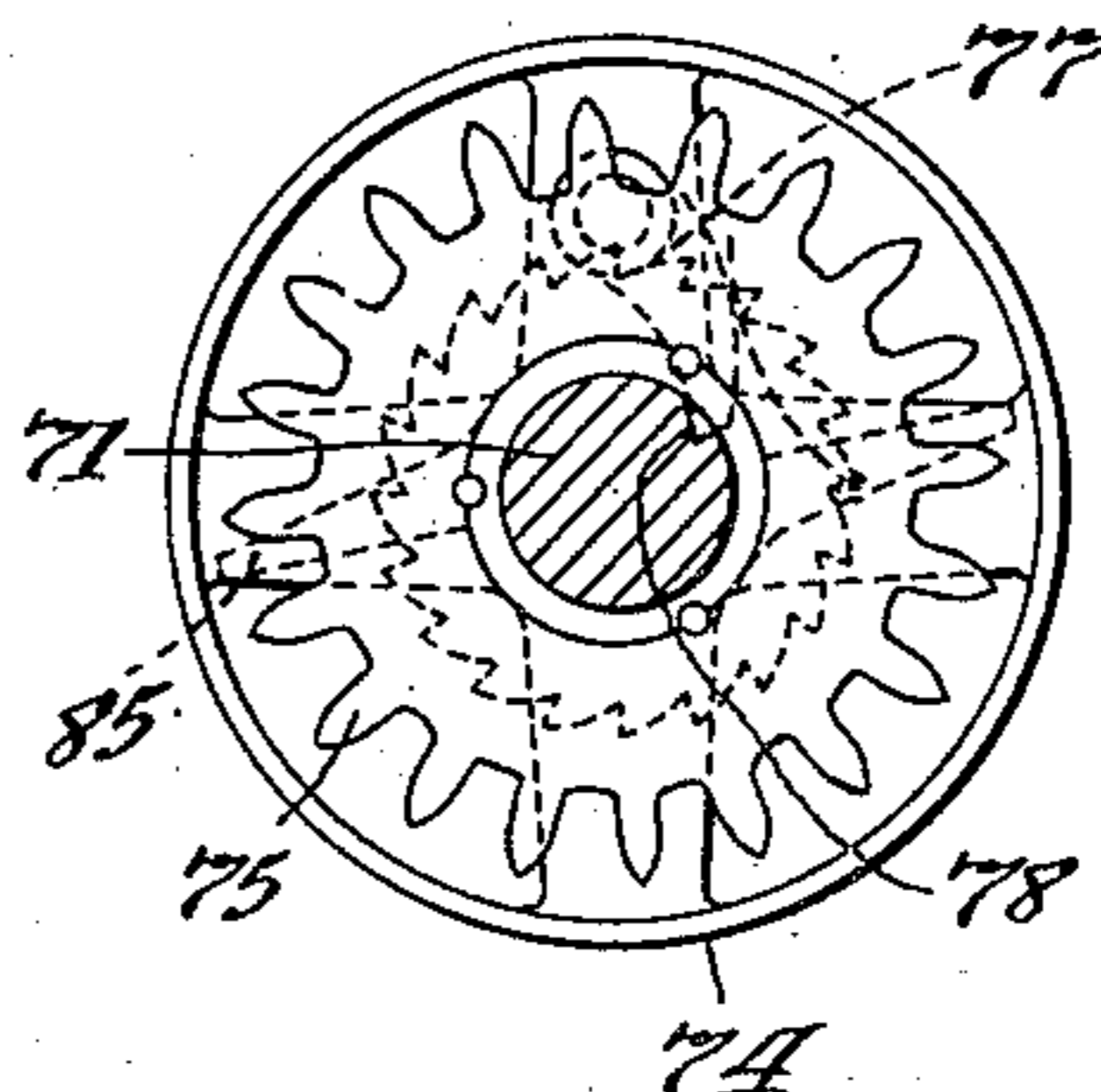


Fig. 16



Witnesses:

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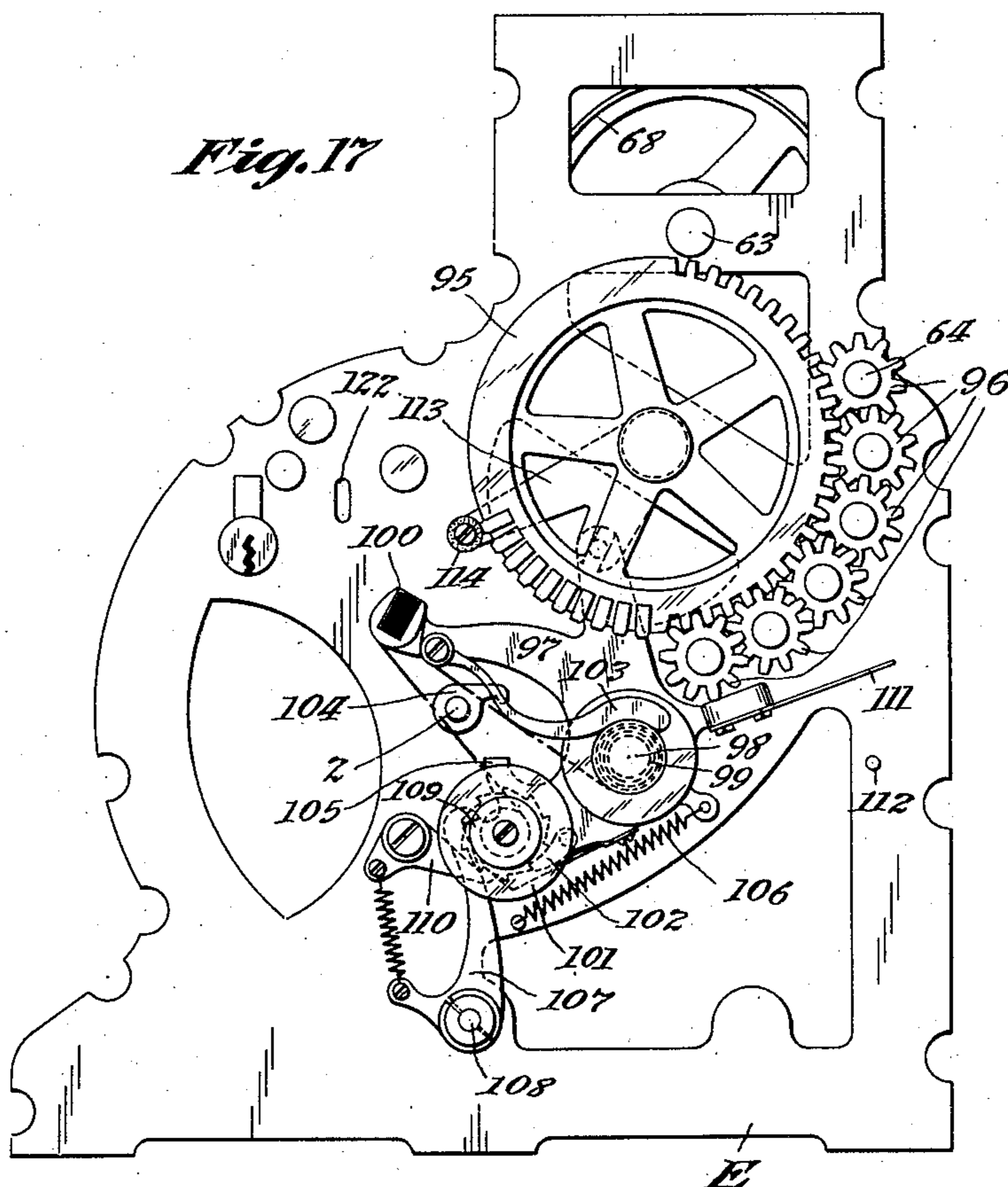
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APPLICATION FILED OCT. 14, 1904.

Patented Mar. 16, 1909.
11 SHEETS—SHEET 10.



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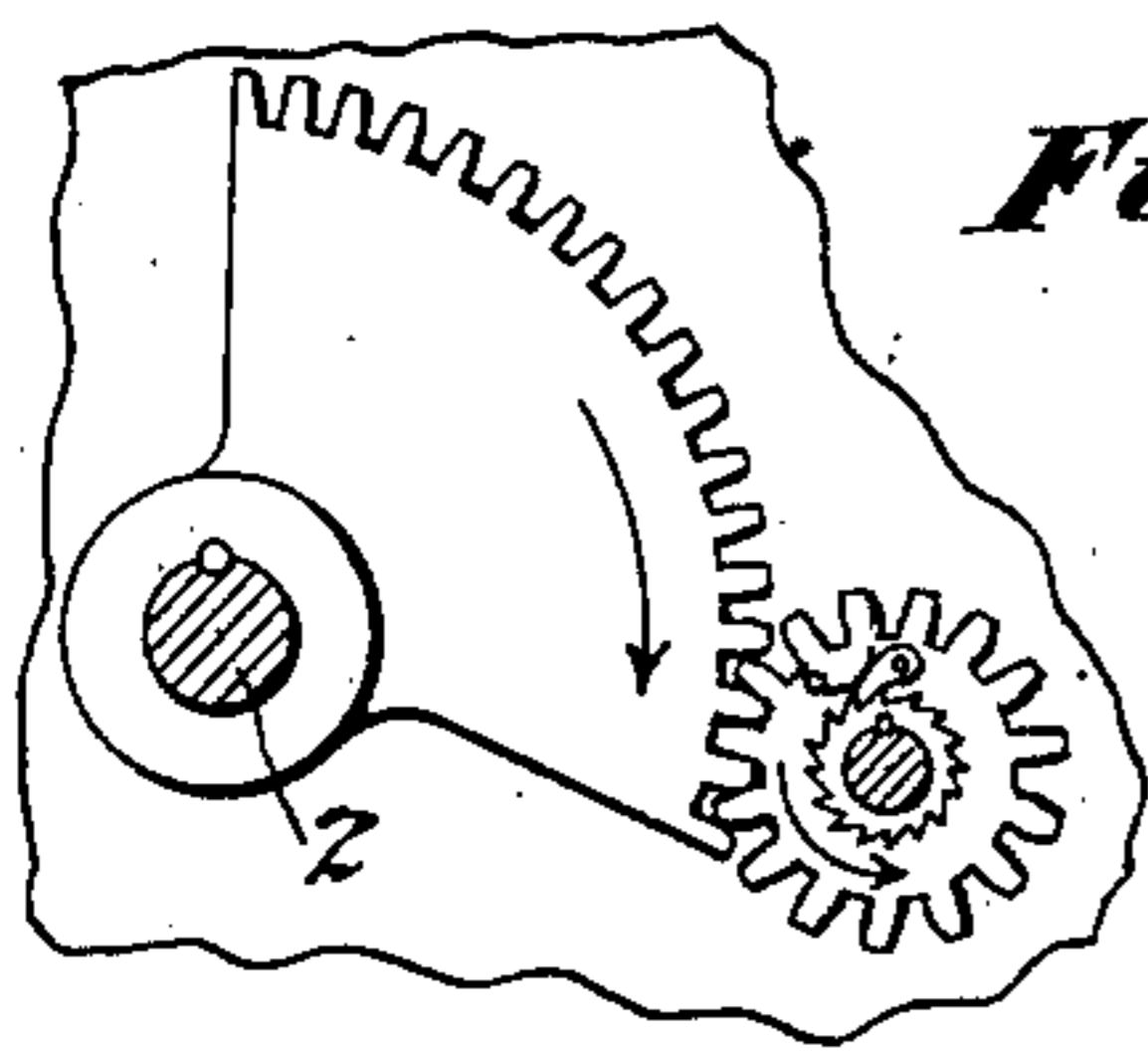


Fig. 19

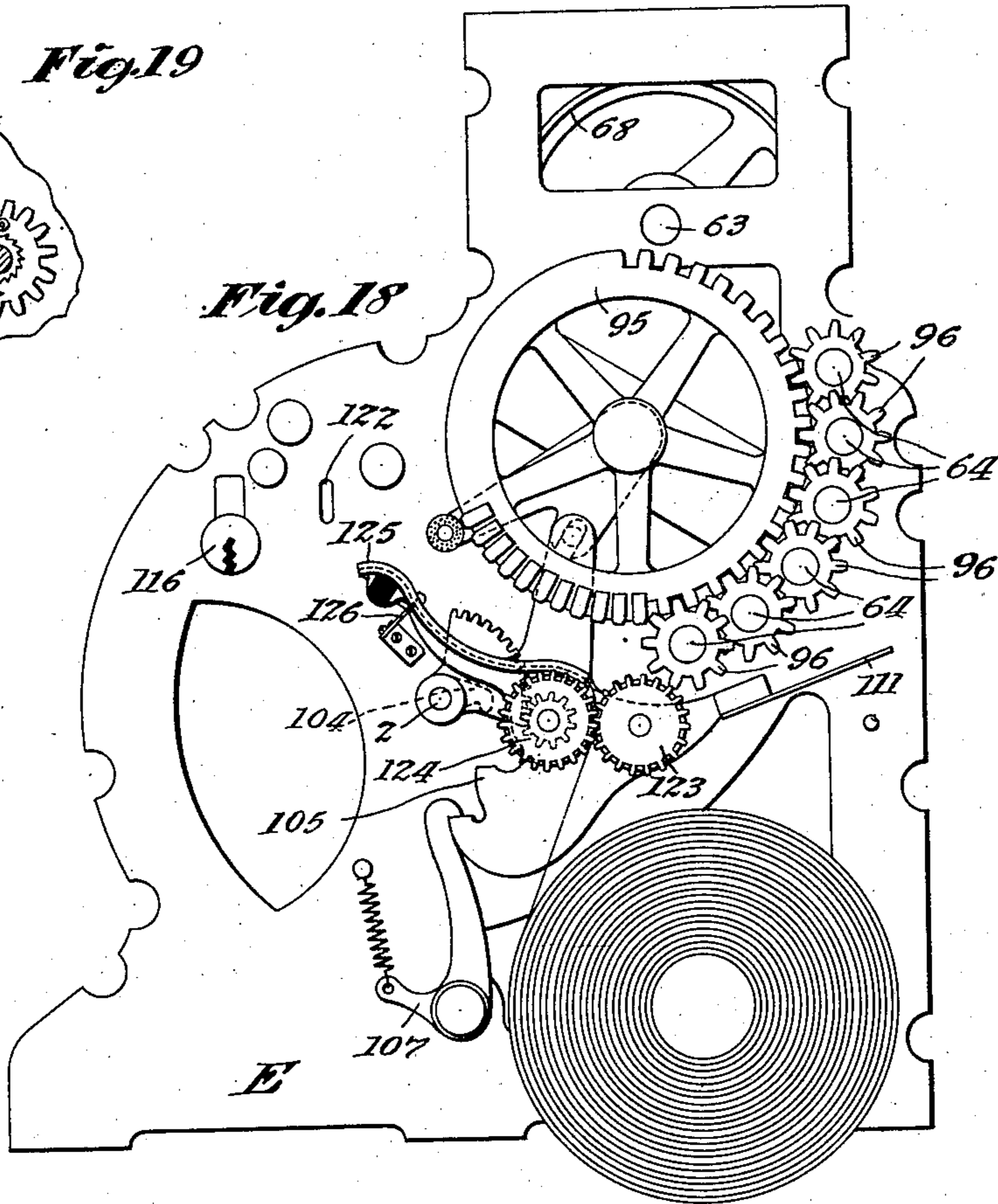


Fig. 18

Witnesses:

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By Marcus Hopkins.

Atty.

UNITED STATES PATENT OFFICE.

FREDERICK L. FULLER, OF TRENTON, NEW JERSEY, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE NATIONAL CASH REGISTER COMPANY, A CORPORATION OF OHIO, (INCORPORATED IN 1906.)

CASH-REGISTER.

No. 915,090.

Specification of Letters Patent.

Patented March 16, 1909.

Application filed October 14, 1904. Serial No. 228,414.

To all whom it may concern:

Be it known that I, FREDERICK L. FULLER, a citizen of the United States, residing at Trenton, in the county of Mercer and State of New Jersey, have invented a new and useful Cash-Register, of which the following is a specification.

The present invention has for its object the provision of a new cash register having a series of motor-driven indicators, a like series of banks of keys therefor which limit the extent of movement (to indicating position) of their respective indicators according to the keys depressed, a like series of detents which in normal position prevent movement of their respective indicators to indicating position but are withdrawn from such position by the depression of keys in their respective banks, and another series of detents normally locking all of the indicators against movement to indicating position and which are all withdrawn from such position by the depression of a special key; these several elements being so constructed and combined that on the depression of a key in one bank, or in each of two or more banks, followed by the depression of said special key, the indicator or indicators corresponding to such bank or banks will be released by both sets of detents and be driven to indicating position, in which position they are arrested by the keys depressed, while the indicators corresponding to those banks in which no keys are depressed will remain in their zero or normal positions. With these mechanisms there are combined, among other things, registering mechanism for totalizing the amounts of the transactions, printing wheels by which the several transactions are printed on a strip of paper, and also a lever for restoring the indicators and printing wheels after one operation to their normal or zero positions before the next operation of the machine and which also serves to put under tension a spring operating, among other things, a printing platen, a drawer-lock and a gong, and also operating a member held in normal position by a detent controlled by the special key aforesaid and which member controls the operation of a shutter mechanism, and when moved by said spring from normal position prevents withdrawal or reoperation of said special key (and therefore reoperation of the machine) until this member, the indicating wheels and print-

ing wheels are returned to normal or zero position.

In the accompanying drawings:—Figure 1 is a perspective view of a machine embodying the present invention. Fig. 2 is a front elevation of the machine with the casing and the banks of keys mounted therein removed. Fig. 3 is a rear elevation of the same. Fig. 4 is a side elevation of the same, looking toward the right of Fig. 2. Fig. 5 is a vertical section taken on the line A—B of Fig. 2, and looking toward the left of said figure. Fig. 6 is a vertical section on the same line but looking toward the right. Fig. 7 is a vertical section on the line C—C of Fig. 2. Fig. 8 is a detail of a shaft and cams thereon for carrying from the lower to the higher wheels of the registering mechanism. Fig. 9 is a vertical section on the line D—D of Fig. 2. Fig. 10 is a detail illustrating a shutter for concealing the registering mechanism, a locking device therefor, and connections for releasing said locking device and moving the shutter so as to expose the registering mechanism. Fig. 11 is a detail, partly in section, of the registering mechanism. Figs. 12, 13, 14 and 15 are sectional details of the several registering wheels shown in Fig. 11, Fig. 12 being a section on the line a—a of Fig. 11, while Figs. 13, 14, 15 are sections on the lines b—b, c—c, and d—d of said figure. Fig. 16 is a diagrammatic section, taken through the registering mechanism. Fig. 17 is a right hand elevation of the machine, showing particularly the printing wheels and printing platen and parts coacting therewith. Fig. 18 is a view similar to Fig. 17 showing a modification for check printing; and Fig. 19 is a detail of the main shaft segment and ratchet arrangement in this modification.

Referring to said drawings, the several mechanisms of the machine are mounted upon a base A in the lower part of which is mounted a sliding money drawer B. The framework of the machine which supports the working parts, consists of three upright partitions C, D, E (see Figs. 2 and 3) fixed to the base and held in vertical position by tie-rods F, G, H, these working parts, partitions and tie-rods being inclosed by a suitable casing which is shown in Fig. 1.

The machine shown is of the double indication type, that is to say, one which simultaneously indicates sales at an opening in the

front of the machine and at a similar opening (not shown) in the rear of the machine. The indicators, consisting of wheels 62, for the front of the machine are located in the left hand half of the machine between partitions C, D, while the indicators, also consisting of wheels 68, for the rear of the machine are located in the right hand half of the machine between partitions D, E; all of these wheels being loosely mounted on a shaft 63 extending entirely across the machine. In the right hand half of the machine is also located the registering mechanism, while outside partition E is located a printing mechanism, inclosed by a supplemental casing I hinged to partition E. All of these mechanisms will be fully described hereinafter.

For the present the description will, for convenience and clearness, be mainly confined to the mechanisms contained in the left hand half of the machine. In the front of the casing, in this part of the machine, there is mounted a keyboard comprising six banks of push keys 23 and a single special key 42, which latter controls the indicating, registering and printing operations, as will hereinafter appear. The keys in the bank at the left of Fig. 1, which are sometimes called "system" keys, bear letters and abbreviations indicating, respectively, the salesman and the character of the transactions, while the keys in the other five banks bear numerals representing amounts, in units, tens, etc. counting from the right of Fig. 1. The keyboard frame in which these keys are mounted is made up of a series (seven in number) of castings 14 (see Figs. 1, 4, 6 and 7) which are I-shaped in cross-section, or, in other words, have inner and outer flanges 17, 18 connected by a vertical web portion, parts of which may be bored or cut out for the sake of lightness, as shown in Figs. 6 and 7. These castings 14 are held together, with the adjacent edges of their flanges 17, 18 in contact with each other, by tubes 15 passing through openings in the upper and lower ends of the several castings, and are secured in position in the machine by rods 16 passing through the tubes 15 and the ends of which enter openings in the vertical partitions C, D, in which they are rigidly held in any suitable manner. Suitable slots or openings are provided in the left hand edges of the flanges 17, 18 of these castings 14 for the reception of the stems 19 of the keys 23, and in the right hand edge of the flanges 17, 18 of one of these castings, namely, that to the right of Fig. 1, additional slots or openings are also provided for the reception of the stem of the special key 42. The stems of all these keys are non-circular in cross-section and the slots or openings therefor in the flanges 17, 18 are of like shape, so as to prevent turning of the keys while permitting

endwise movement thereof in the slots or openings. One advantage of this construction of keyboard is that the several castings 14, with the keys 23, 42 properly positioned therein, may be easily and quickly assembled together upon the tubes 15 and the whole then introduced bodily into the machine and secured in position therein by the shafts 16.

As all of the keys 23 in the six banks representing amounts and also (in one bank) the salesman and character of the transactions are alike in construction, a description of one bank and the keys therein will suffice for an understanding of the construction of all. Referring, therefore, to Fig. 6, (the keys shown in which happen to be the "system" keys shown at the left of Fig. 1) it will be observed that each of the castings 14 is arc-shaped, considered lengthwise, and also that the slots or openings in the flanges 17, 18 thereof for the key stems 19 are radial, so that the key stems 19 in each bank converge toward a common point, namely, a shaft 2 journaled in partitions C, D, E, and upon one end of which, projecting outside the machine casing, is fixed an oscillatory lever 3, hereinafter more fully referred to, and which on each operation of the machine is given a complete reciprocation or oscillation first rearward and then forward. The stem 19 of each key, it will be observed, has coiled about it a spring 20, one end of which is secured by a screw 21 to the stem and has its other end bearing against the outer surface of the flange 17, so that its tendency is to force the key outwardly. A pin 22 passes through and projects from opposite sides of the key stem 19 and normally abuts against the inner surfaces of the adjacent flanges 17 so as to limit such outward movement of the key. One projecting end of this pin 22 (namely that on the left hand side of the stem 19) coacts with the curved arm 30 of a detent 28 loosely mounted on a rock shaft 27, while its opposite end coacts with a key locking plate 12 loosely mounted on shaft 2,—the construction and functions of which locking plate and detent will be hereinafter described in detail.

In the left hand half of the machine there are provided for each bank of keys, in addition to the indicator wheel 62, and the locking plate 12 and detent 28 just referred to, a gear 24 loosely mounted on a shaft 25 parallel to shafts 2 and 63 and meshing with a pinion 61 fast to the side of the indicator wheel 62 so as to drive the latter to indicating position; a segmental gear 11 mounted loosely upon the shaft 2 and meshing with the gear 24; and a spring 47, one end of which is connected with the gear 24 and the other (as shown in Fig. 6) with a projection upon the hub of the locking plate 12. The gears 24 not only drive their respective indicator wheels 62, but also simultaneously

drive the companion or corresponding indicator wheels 68, and the registering and printing wheels, in the right hand half of the machine, as hereinafter described. The functions of each spring 47 are two-fold, namely, to drive the indicator wheel 62, through the gear 24 and pinion 61, to indicating position, (each indicator being thus provided with a separate or independent motor) and also to retain the locking plate 12 yielding in the depressed position in which it is shown in Fig. 6, in which position beveled portions of its periphery rest against the ends of the key stems 19, which thus limit the downward movement of the locking plate. Such movement of the indicator wheel 62 by its spring 47 is, however, prevented by the detent 28 heretofore referred to, which normally lies in the path of a pin 29 projecting from one side of the segmental gear 11, and further by a detent 26 (one of which is provided for each indicator wheel 62) which normally engages the gear 24. It follows, therefore, that, in order to secure such movement of the indicator wheel 62, both of these detents 28 and 26, which are independent of each other, must be moved from their normal positions. This movement of the detent 28 is effected by the depression of a key 23, in the following manner. The curved arm 30, heretofore referred to, of the detent 28, it will be observed, extends along the left hand side of the stems 19 of the keys 23, as viewed from the front of the machine, and in alinement vertically with the ends of the pins 22 projecting from that side of the stems 19, so that, upon the depression of any of the keys 23 in the bank, such projecting end of the pin 22 thereof will engage and depress the arm 30 and through it rock the detent 28 upwardly and out of the path of movement of the pin 29 on the segmental gear 11, against the pull of a spring 31 fast to the casting 14 and to the free end of the arm 30 (see Fig. 6). The key thus depressed is held in its depressed position and the detent 28 therefore held in its raised position out of the path of movement of the pin 29, by the locking plate 12, which, for this purpose, is provided, below its peripheral beveled portions before referred to, with notches or hooks 13 equal in number to the keys in the bank. Upon the depression of a key 23, that end of the pin 22 which projects from the right hand side of the stem 19 will engage the beveled portion in line with it and thus rock the locking plate 12 upwardly against the pull of the spring 47 until the pin 22 comes in line with the undercut portion of the notch or hook 13, when the spring 47 will rock the plate 12 downwardly and thus cause said hook 13 to snap over the end of pin 22 and lock the key in its depressed position. With the key thus depressed, the opposite or left hand projecting end of the pin 22,

being still engaged with the arm 30, will hold the detent 28 in its raised position out of the path of movement of the pin 29. Rotation of the indicator wheel 62 is, however, still prevented by the locking engagement, with gear 24, of the detent 26, which is disengaged therefrom by the depression of the special key 42 through connections which will now be described. It may be noted, in passing, that until such special key 42 is so depressed no indicating or registering operation takes place, so that if a salesman should discover that he had made an error in depressing a certain key 23, he may correct such error by depressing the proper key in the bank, when the locking plate 12, rocked upwardly by the second key depressed, will release the first one depressed and hold the second one in its depressed position. After such special key 42 is depressed, however, no such correction can be made as, by the depression of this key, locking devices, which will also now be described, are thrown into engagement with the locking plate 12 so as to prevent movement thereof, and therefore the depression of any other key 23, either in the banks in which keys have been depressed or in those banks in which no keys have been depressed. The detent 26 for each bank of keys and indicator wheel 62, as before stated, is fixed to the rock shaft 27 and this rock shaft 27 is, as shown in Fig. 7, provided with a curved arm 44 which enters a cut-out 43 in one side of the stem of the special key 42 so that when said special key is depressed it will, through the arm 44, rock the shaft 27 and thereby raise, or move from locking position, the detents 26 of all of the indicators and thus permit the springs 47, of those banks in which keys 23 have been depressed and detents 28, therefore, moved out of the path of the pins or studs 29, to rotate the indicator wheels 62 of those banks to indicating position, the special key 42 and the detents 26 being held in this position throughout the movement of the indicator wheels 62 by means which will presently be described. When the shaft 27 is thus rocked by the depression of key 42, other detents 26 thereon will enter notches in the upper ends of the several locking plates 12 (see Fig. 6) and thus prevent upward movement of any of those plates and therefore the depression of any keys 23. The movement to indicating position of the several indicator wheels 62 is limited by the keys 23 depressed in their respective banks, the stems of which, as will be observed on reference to Fig. 6, are of such length that when depressed their lower ends will project into the paths of movement of studs or pins 32 projecting laterally from the upper ends of the segmental gears 11. Of course, it will be understood that, as the several indicator wheels 62 are independently driven, they will be rotated to different degrees ac-

cording to the keys depressed in their re-
 spective banks; for example, one may be
 arrested by the first key in one bank (count-
 ing from the top) if that is the key depressed,
 5 another by the third key in another bank,
 another by the fifth key in a third bank, and
 so on. It will also be understood that in
 those banks in which no key 23 is depressed
 the detents 28 controlled by such keys 23
 10 still remain in the paths of movement of the
 studs or pins 29 of the segmental gears 11 of
 those banks and will, therefore, prevent ro-
 tation, by springs 47, of the gears 24 and in-
 dicator wheels 62 of those particular banks,
 15 notwithstanding the detents 26 of those
 banks have, with the detents 26 of the other
 banks, been disengaged from the wheels 24
 of those banks by the rocking of shaft 27.
 When the indicator wheels 62 are thus pro-
 20 pelled by their springs 47 to indicating posi-
 tion, as just described, the corresponding or
 companion indicating wheels 68 on the right
 hand side of the machine are also propelled
 to indicating position by the gears 24 of the
 25 respective indicator wheels 62, through
 connections consisting, for each gear wheel
 24 and indicator wheel 68, of a pinion 65
 meshing with gear wheel 24 and fast upon a
 shaft 64 which extends entirely across the
 30 machine and has fixed to it a second pinion
 67 meshing with a gear 66 (like gear 24),
 mounted loosely upon the shaft 25 and
 meshing with a pinion 61 fast to the side of
 the indicator wheel 68. The several shafts
 35 64 are arranged parallel to each other; the
 several pinions 65 thereon are arranged in
 different vertical planes relatively to each
 other for engagement by the gears 24 of the
 several banks as shown in Fig. 3; and the
 40 several pinions 67 thereon for driving the
 several indicator wheels 68 are likewise ar-
 ranged upon the shafts 64 in different ver-
 tical planes relatively to each other, so as to
 mesh with the several gears 66 through
 45 which, and the pinions 61, they drive their
 respective indicator wheels 68. In other
 words, the arrangement of the shafts 64 and
 the pinions 65, 67 thereon is such that the
 units indicating wheel 68 (the first one to the
 50 left of the partition D, Fig. 3) will be driven
 from the gear 24 which drives the units in-
 dicator wheel 62 (the first one to the right of
 the partition D, Fig. 3); the tens indicating
 wheels 68 (the second one to the left of the
 55 partition D, Fig. 3) by the gear 24 which
 drives the tens indicating wheel 62 (the
 second to the right of the partition D, Fig.
 3), and so on; the several indicator wheels 68
 therefore being driven by the same means
 30 as and simultaneously with the indicating
 wheels 62 so as to make the same indication
 at the rear of the machine as that made at
 the front of the machine by said indicator
 wheels 62.

The special key 42 is held in its depressed 65
 position, and the detents 26 therefore held in
 their withdrawn positions, while the indi-
 cator wheels 62 are moving to indicating po-
 sition, by a segmental gear 33 mounted
 loosely upon the shaft 2 and driven by a pin- 70
 ion 34 fast on a sleeve 48 on the end of a shaft
 35 journaled in the partitions D, E (see Figs.
 3 and 7). The sleeve 48 has fast to it one
 end of a spring 49 the other end of which is
 fast to a stud 50 on the partition D, and when 75
 turned to wind up this spring it makes a com-
 plete revolution on the shaft 35 and when
 turned in the opposite direction it gives the
 shaft 35 a complete revolution. The con-
 nections between the sleeve 48 and shaft 35 80
 consist of a clutch member 51 spring pressed
 toward the sleeve 48 and having a pin and
 slot connection with the shaft 35. The ad-
 jacent faces of the sleeve 48 and clutch mem-
 ber 51 have inclined clutch teeth (see dotted 85
 lines Fig. 3) which slip past each other when
 the sleeve 48 is turned to wind up the spring
 49 and interlock when it is turned in the op-
 posite direction. The functions performed
 by shaft 35 when turned by sleeve 48 will be 90
 hereinafter stated. The spring 49 is nor-
 mally under tension but rotation thereby of
 the sleeve 48 is normally prevented by a de-
 tent 36 fast to the rock shaft 27 and engaging
 a notch in the upper end of the segmental 95
 gear 33 (see Fig. 7). As the special key 42
 is depressed, as heretofore described, for the
 purpose of withdrawing the detents 26 from
 locking engagement with the gears 24, it will,
 in order to so withdraw said detents, rock 100
 the shaft 27, through arm 44, and in so rock-
 ing the shaft 27 will raise and disengage the
 nose of detent 36 from the notch in the upper
 end of gear 33, thus leaving segmental gear
 33 and the pinion 34 and sleeve 48 free to be 105
 rotated by the spring 49, which will so rotate
 these parts until the upper end of a cam 41
 (which performs another function herein-
 after stated) comes into contact with the
 upper edge of a segmental gear 37 rigidly 110
 fixed to shaft 2. As the spring 49 thus ro-
 tates the sleeve 48, pinion 34 and segmental
 gear 33, the untoothed peripheral upper por-
 tion of the latter will engage the nose of de-
 tent 36 and retain said detent in its raised 115
 position until the segmental gear 33 is ro-
 tated in the opposite direction and the nose
 of said detent 36 again drops into the notch
 in the upper end of gear 33. The rotation of
 the segmental gear 33 in this direction, to re- 120
 store it to its normal position, is effected by
 the lever 3 and shaft 2 which, at the same
 time, restore, to normal or zero position, any
 indicator wheels 62, 68 that may have been
 moved to indicating position, and also rock 125
 the several locking plates 12 so that any keys
 23 which have been depressed will be re-
 leased, these several operations being per-

formed when the lever 3 is moved rearwardly from the position shown in Fig. 1, as presently described.

The additional function just referred to as performed by the cam 41 on the segmental gear 33, is that of controlling the movement of shutters 92 which normally close the openings through which the indications on the indicator wheels 62, 68 are to be read. These shutters, as best shown in Figs. 3, 6 and 7, are connected together and loosely mounted, through arms upon the shaft 63. One of them, namely, front shutter 92, is provided with a pinion 94 concentric with said shaft and engaged by a toothed sector on the upper end of a lever 93 pivoted on shaft 25 and the lower end of which bears against the periphery of cam 41 (see Fig. 7) in the normal position of segmental gear 33. When the lever is in this position both shutters 92 will be held between the indicator wheels 62 and the front and rear openings, respectively, in the casing through which the indications thereon are to be read. When, however, the detent 36 has been disengaged, by the depression of special key 42, from segmental gear 33 and the latter then rotated upwardly, as heretofore described, the cam 41 will pass out of engagement with the lower end of shutter lever 93 and thus permit the front shutter 92 to be swung downwardly and the rear shutter 92 to be swung upwardly by gravity, (in which case the front shutter will be the heavier one) or by a spring, to expose through the front and rear openings in the casing, the indications on the indicator wheels 62, 68, respectively. The shutters 92 are, like the other parts moved during the indicating operation, returned to normal position by the rearward movement of lever 3, through the connections which will now be described. It will be understood, however, that, following the usual practice in using cash registers, the shutters 92 and indicator wheels will remain in exposing or indicating positions until the next sale is to be indicated and registered and that it is just previous to this next sale that the lever 3 is thus moved rearwardly, to destroy the indication of the previous sale and return the indicating mechanism to normal or zero position, and then moved forward to the normal position in which it is shown in the drawings. Where, therefore, the expression "normal position" is used in this description and in the accompanying claims, it will be understood that by it is meant this position of the parts.

Referring particularly to Figs. 5, 6 and 7, it will be observed, that the shaft 2 carries a rod 39 secured at one end in a crank arm 38 fixed to the shaft 2, preferably by being cast integrally with the hub of the segmental gear 37, and at its other end in a ratchet segment 4 fixed to the opposite end of said shaft. This rod 39 extends behind or be-

neath all of the segmental gears 11 so that when the lever 3 is moved rearwardly, thereby rocking the shaft 2 about one quarter of a revolution, the rod 39 will, in moving from the position in which it is shown in full lines in Fig. 6 to the position in which it is shown in dotted lines in said figure, by engagement with projections 40 integral with segment gears 11, pick up the several segmental gears 11 and restore them to normal position, and at the same time, through them and the gears 24, also restore to normal or zero position all of the indicator wheels 62, 68 that may have been moved to indicating position. As the shaft 2 is thus rocked rearwardly by the lever 3, the segmental gear 37, moving therewith, will, because of the engagement of its forward or upper edge with the upper end of the cam 41, rotate the segmental gear 33 rearwardly to its normal position (shown in Fig. 7), and, when the segmental gear 33 arrives in this position, a spring 27^a connected at one end with the partition D and at its other end with an arm 27^b, fixed to the rock shaft 27, will rock said shaft 27 so as to depress the nose of the latch 36 into reengagement with the notch in the upper corner of the segmental gear 33. The segmental gear 33, it will be observed, as it is thus restored to normal position, will give pinion 34 and sleeve 48 a complete rotation and thus put the spring 49 under tension for the next operation of the mechanism. As the shaft 27 is thus rocked by the spring 27^a, the several detents 26, fixed thereto, will also be depressed into reengagement with their several gears 24, thus locking the indicators 62 in the normal or zero positions to which they have been returned by the rod 39; the several locking detents 26^a will be withdrawn from the notches in the upper ends of the locking plates 12; and the arm 44 fixed to the shaft 27 will also be rocked outwardly or upwardly and thus restore the special key 42 to its normal, projected position in which it is shown in Fig. 7. This outward movement of the special key 42 may be aided, if desired, by an additional spring, having one end connected with the lower wall of the cut-out 43 in the key stem and the other with the outer flange 18 of the casting 14 in which said special key is mounted.

The rod 39 has a slight amount of movement upwardly beyond the position in which it is shown by dotted lines in Fig. 6 so that it may engage the lower edges of the locking plates 12 and rock said plates upwardly to release therefrom any of the keys 23 which may have been depressed and which are then moved outwardly by their springs 20. When the lever 3, and rod 39 are then rocked in the opposite direction, or returned to normal position, (as they must be to permit the machine to be again operated) the several lock-

ing plates 12 will resume the locking positions, with relation to the keys 23, in which the locking plate 12 is shown in Fig. 6, ready to engage the keys 23 depressed for the next sale.

It is desirable that some means should be provided for preventing the rearward movement of the handle 3, just described, before the special key 42 has been depressed sufficiently to release the detent 36 from engagement with the spring actuated segmental gear 33 and the detents 26 from the gears 24, and to also prevent such movement of the lever 3 and shaft 2 while the indicating mechanism is being propelled to indicating position. For these purposes the cut-out 43 in the stem of the special key 42 is of greater width (considered lengthwise of the stem) than the arm 44, the inner edge of which is normally engaged by the lower wall of the cut-out 43, as shown in Fig. 7, so that, when depressed, the key 42 has a certain amount of play relatively to the arm 44 before it engages therewith for the purpose of depressing it. The stem of the key 42 also is provided at its lower end with a channel 46 which is adapted for the passage through it of a rail 45 projecting laterally from one face of the segmental gear 37. Because of the play provided between the cut-out 43 and the arm 44 as the key 42 is depressed, said key must, in order to depress the arm 44 so as to disengage the detent 36 from the segmental gear 33 and detents 26 from the gears 24, be so far depressed that the channel 46 in the lower end of said key stem will pass beyond or inside the plane of rail 45, with the result that the solid portion of said key stem above the channel 46 will be in line with the rail 45 and thereby prevent movement of the lever 3 and shaft 2 until, on the removal of the finger of the operator from the special key 42, said special key is moved outwardly so that the lower wall of the cut-out 43 therein will engage the lower or inner edge of the arm 44 at which time the channel will be in line with the rail 45. When the channel 46 is thus in alinement with the rail 45, it will permit the passage through it of the latter, so that the handle 3 and shaft 2 may be moved rearwardly. When the rearward movement of the handle 3 is completed, the rail 45 will have passed out of the channel 46 so that, when the shaft 27 is rocked by the spring 27^a, as heretofore described, the special key 42 may be moved from its depressed position to the projected position in which it is shown in Fig. 7. Such premature rearward movement of the lever 3 is also prevented by sleeve 48 and shaft 35 through a locking device controlled thereby and engaging the shaft 2. This locking device consists of a pivoted bell-crank lever 53, the upper end of which is backed up by a spring 53^a tending to force it toward the

shaft 2 and into engagement with a tooth 54 thereon, and the lower end of which is normally engaged by a cam 52 on shaft 35 which, in the position of rest of said shaft, holds the opposite end of the lever 53 out of engagement with the tooth 54 (see Fig. 9). This shaft 35, it will be remembered, is given a complete revolution by sleeve 48 (through clutch 51) when driven by spring 49, this taking place, as before described, when detent 36 is disengaged from the notch in segmental gear 33. As soon as the detent 36 is thus disengaged from the notch in the upper end of segmental gear 33 and the rotation of sleeve 48 and pinion 34 begun by spring 49, the shaft 35, rotating with said sleeve and pinion, will move its cam 52 from under the lower end of lever 53 and thus permit the spring to throw the upper end of said lever into engagement with the tooth 54 on shaft 2, thereby preventing rotation of said shaft 2 until said shaft 35 has made a complete revolution, when cam 52 will reengage the lower end of lever 53 and withdraw the upper end thereof from engagement with tooth 54, when the lever 3 and shaft 2 will be free to be rocked rearwardly.

During the revolution of shaft 35 it performs the additional functions of withdrawing the lock 56 from the money drawer B and tripping the gong hammer, which is in the form of a bell-crank lever 59. The first of these functions is performed by a cam 55 on shaft 35 which, when said shaft nears the completion of its revolution, engages one end of a bell-crank lever 57 fixed to a shaft 108 and, rocking the other end thereof upwardly, withdraws the bolt 56 from the drawer. The second function is performed by a cam 58 on shaft 35 which, when said shaft has about completed its revolution, engages and trips the lever 59, causing it to strike the gong beneath it. This hammer-lever shaft 108 is journaled in partition E, with one end projecting into the casing I, and, as will hereinafter appear, assists in the operation of the printing mechanism. Means are also provided for preventing the return of the lever 3 after a partial movement thereof in either direction. The means provided for this purpose (see Fig. 5) consists of the ratchet segment 4 hereinbefore referred to, having two sets of reversely arranged ratchet teeth 6 with a projection 5 midway between them, and a double-ended pawl 7, pivoted at 8, and engaging these teeth. The pawl 7 is provided near one end with a lug 9 of wedge shape against the upper and lower sides of which a spring pressed dog 10 is adapted to bear for the purpose of maintaining the pawl 7 in engagement with one or the other set of ratchet teeth 6. When the operating handle 3 is thrown rearward the forward end of pawl 7 being then in engagement with the forward set of ratchet teeth 6 will prevent any for-

ward movement of the lever until said rearward movement is completed. When such movement is completed the projection 5 on ratchet segment 4 will engage the forward point of the pawl 7 and force it downward and thus raise the rear point of the pawl, the lug 9 then forcing the dog 10 backward until the upper end thereof snaps under the lug 9 so as to hold the rear point of the pawl in engagement with the rear set of ratchet teeth 6 throughout the forward or return movement of the lever 3, at the end of which the projection 5 will again reverse the pawl 7.

The registering mechanism will now be described.

For the five banks of keys bearing numerals there are five register wheels 74 bearing numerals representing amounts in units, tens, etc. counting from the right in Figs. 2 and 11, there being no register wheel for the sixth or "system" bank of keys. The units register wheel 74 at the extreme right of Figs. 2 and 11 is operated by the gear 24 of the units indicating wheels 62, 68; the tens register wheel (which is next in order to the units register wheel) by the gear 24 of the units indicating wheels 62, 68; and so on. In addition to these five register wheels, two others, 90, 91, are provided, shown at the left in Figs. 2 and 11, to which amounts are carried from the last of these five register wheels. The five register wheels operated by the gears 24 are identical in construction, and the connections by which they are driven from their respective gears 24 are also identical. They, as well as the two additional register wheels, 90, 91 referred to, are all mounted loosely on a shaft 71 journaled in the frames D, E, and each has two sets of numerals from 0 to 9 arranged one behind the other on its periphery. Each is also provided with a ratchet 73 engaged by a spring pressed pawl 72 pivoted in the side of a gear 70 also loosely mounted on shaft 71 and by which the register wheel is rotated when registering. The gear 70, which has twenty teeth to correspond with the twenty numerals on the register wheel 74, is driven by the shaft 64 and gear 24 (of the bank to which the register wheel corresponds,) as the latter drives its indicator wheels 62, 68 to and from indicating position, as before described. The connection through which the gear 70 is so driven consists of the shaft 64 (driven by gear 24 through pinion 65), a pinion fixed to said shaft intermediate its pinions 65, 67, and a gear 69 mounted loosely on shaft 25 and meshing with said gear 70. When the shaft 64 is rotated by gear 24 to move its indicator wheel 68 to indicating position, the gear 70 will be rotated thereby in the direction of the arrow Fig. 15 and through its pawl 72 and the ratchet 73 rotate register wheel 74 a distance corresponding to the movement of the indicator wheel, thus registering the amount indicated

by the latter. As the shaft 64 is turned in the opposite direction to return indicating wheel 68 to zero or normal position, gear 70 will be rotated in the opposite direction to that indicated by the arrow in Fig. 15, and its pawl 72 will slip idly over the teeth of ratchet 73, leaving the register wheel 74 in the position to which it has been moved. The register wheel 74 is held in this position by a spring escapement 76 (see Fig. 9) pivotally mounted on shaft 25, and which also prevents overthrow of and accurately positions the register wheel. As the indications on the register wheels are read from the front of the machine and not (as is the case with the indicating wheels 68) from the rear, it will be understood that the gear 69 at the left of Fig. 3 is the one which operates the units register wheel 74; the next gear 69 to the right thereof the one which operates the tens register wheel 74, and so on.

The register wheel shaft 71, which, as before described, is journaled in the frames D, E, is normally prevented from rotating in the direction in which the register wheels rotate by an arm 117 having a tooth entering a recess in the hub of a ratchet 119 fast to the shaft 71, as shown in Fig. 10, and rotation of said shaft 71 in the opposite direction is always prevented by an arm 120 engaging the teeth of said ratchet 119; both of these arms 117, 120 being mounted upon the shaft 25. Means are provided, and will be hereinafter described, for withdrawing the arm 117 from engagement with the recess in the hub of ratchet 119 so that the shaft 71 may be rotated by hand (for which purpose it may be provided with a knob or other suitable device at its right hand end) in the direction in which the register wheels are rotated during the registering operation so as to re-set said register wheels to their zero positions whenever the proprietor or user of the machine desires to do this. The means whereby, on the rotation of said shaft 71 in this direction, said register wheels are returned or re-set to their zero positions, consist of a longitudinal groove or slot 78 on the shaft 71, which, when said shaft is rotated, as just described, will engage spring pawls 77 carried by the several register wheels, as shown in Figs. 12 to 14, and rotate said register wheels to their zero positions. As the register wheels, in the registering operation, are rotated on the shaft 71, these pawls 77 will bear upon the surface of said shaft and pass the groove or slot 78, but when the shaft is rotated said groove or slot 78 will, by engagement with the spring pawls 77, pick up the several register wheels and rotate them to their zero positions.

The registering mechanism also includes devices for carrying amounts from one register wheel 74 to the next higher register wheel, which devices will now be described.

Upon a shaft 79, parallel to the shaft 71, are loosely mounted five sleeves 80 (one for each of the five register wheels 74 driven by the shafts 64) and each of these sleeves is provided at its right hand end with a star wheel 81, and at its left hand end with a star wheel 82, both rigid with the sleeve. The star wheel 81 is adapted to be periodically engaged and rotated, together with sleeve 80, by a pair of fingers 85 projecting from diametrically opposite points of a sleeve or hub at the left hand side of one register wheel 74, while the latter (viz: the star wheel 82) is adapted to be engaged and rotated, with sleeve 80, by a cam 87 on a shaft 88, and when so rotated to engage a gear 75 upon the right hand side of the next higher register wheel 74 so as to rotate the latter one tooth or numeral. Shaft 88 is provided with five cams 87, one for each of the sleeves 80 with its pair of star wheels 81, 82. The star wheel 81 has four teeth and star wheel 82 a like number of teeth, while sleeve 80 is provided circumferentially with four pairs of notches 84, 86, adapted to be engaged by a spring detent 83 fast to the tie-rod H. Normally, as shown in Fig. 16, the detent 83 is in engagement with one of the notches 84 and when the sleeve 80 is in this position one of the teeth of the star wheel 81 lies in the path of movement of the fingers 85 of the lower register wheel 74.

When the lower register wheel 74 has been rotated nine teeth or numerals and is being moved from this position to or beyond the "0" mark which follows, one of its fingers 85 will engage that tooth of the star wheel 81 which then happens to be in its path of movement and rotate said star wheel, from the position shown by full lines to the position shown by dotted lines in Fig. 16, thus rotating the sleeve 80 and the star wheel 82 at the left hand end thereof. When the sleeve 80 has been thus rotated, the detent 83 will drop into the rear notch 86 and retain the sleeve and the star wheels 81, 82 in the position to which they have been rotated or set; this notch 86 being made somewhat deeper than the notch 84 so as to retain the sleeve and its star wheels firmly in this set position against any tendency to displace it due to jar or vibration of the machine. When the sleeve 80 has been moved to this position, a tooth of the left hand star wheel 82 will be brought into the path of movement of its cam 87 on the shaft 88, so that when said shaft is rotated in the direction of the arrow, Fig. 16, this cam, engaging this tooth of the star wheel 82, will further rotate the sleeve 80 and its star wheels the balance of a quarter revolution with the result that the next following tooth of the star wheel 82 will engage the gear 75 of the next higher register wheel 74 and thus rotate said gear wheel and register wheel a distance equal to one tooth

or one numeral. The five cams 87 are arranged spirally upon the shaft 88 so that when said shaft is rotated the cams 87 will operate successively, so that the sleeve 80 and star wheel 82, which carry from the units register wheel to the tens register wheel, will first be operated, then the sleeve 80 and star wheel 82 which carry from the tens register wheel to the hundreds register wheel, and so on. This successive operation of the sleeve 80 and star wheel 82 provides for the carrying from one register wheel to the next highest one, not only in those cases where a register wheel is moved from "9" to "0" by the registering operation, through its gear 70, but also in those cases where a register wheel is so moved during the operation of carrying. For example, if the star wheel 82 of the units registering wheel be operated by its cam 87 to carry one to the tens registering wheel, and it should then happen that the movement of the latter is from "9" to "0", one of its fingers 85 will engage and rotate the star wheel on the sleeve connecting it with the hundreds registering wheel and thus position the star wheel 82 thereon for engagement and rotation by the next cam and consequent engagement with, and operation of, the gear 75 of the hundreds registering wheel.

The shaft 88 is rotated in both directions by the lever 3, through the shaft 2 and segmental gear 37, which latter, as best shown in Fig. 7, meshes with a pinion 89 fixed to the left hand end of the shaft 88. As the lever 3 is rocked rearwardly, the segmental gear 37 will rotate the shaft 88 in the direction indicated by the arrow in Fig. 16, and the cams 87 thereon will successively engage the star wheels 82 that have been set for such engagement, or become so set during the carrying, as just described. When the lever 3 is rocked forward, said shaft 88 will be rotated in the opposite direction, the cams 87 then passing under the teeth of star wheels 82 without engaging them, and the several star wheels and their sleeves 80 being then in normal position, in which position they are held by the engagement of the spring detents 83 with notches 84 on said sleeves (see Fig. 16).

Thus far the description of the carrying devices and the carrying operation has been limited to the five register wheels which are actuated by the gears 24 and shafts 64, as just described, except that it has probably been observed that the sleeve 80 with its star wheels 81, 82 which is set by the fifth register wheel 74, i. e., that one of the five which has the highest denomination, carries from that wheel to the sixth register wheel 90 (counting from the right) shown in Fig. 11. For the purpose of carrying from this latter wheel to the seventh or last wheel 90 of the set (shown at the extreme left in Fig. 11), any suitable form of carrying device may be pro-

vided, such, for example, as the familiar form of carrying device shown, consisting of an idler pinion 91 mounted loosely on the shaft 79 (see Fig. 9) and which is periodically engaged and rotated by a pair of diametrically opposite teeth on the sixth register wheel 90, and as the latter moves from "9" to "0" and when so rotated, in turn rotates the seventh or last register wheel 90 one numeral through a pinion fast to said register wheel and with which said pinion 91 meshes.

Referring now to Figs. 2, 3 and 17, the printing mechanism will be described. This consists of a series of printing wheels 95, mounted loosely on the end of the shaft 25 projecting beyond partition E, a platen 100 coacting therewith to cause the type thereon to print upon a strip or tape 99 (the matter printed on which is to be read from the front of the machine), and an inking roller 114 for inking the type on the printing wheels; all these parts being located in the casing I at the right hand side of the machine. There are six printing wheels 95, one for each of the five banks of keys representing amounts and the remaining one for the bank of "system" keys bearing letters and abbreviations. They are all alike in construction and are all operated by the gears 24 of their respective key banks, the connections through which they are so operated consisting of the shafts 64 rotated by gear 24, and pinions 96 fast to the right hand ends of said shafts (viewed from the front of the machine) and meshing with gear teeth with which their respective printing wheels are provided for a portion of their peripheries. The pinion 96 at the extreme left of the rear elevation, Fig. 3, actuates the units printing wheel 95, the next one actuates the tens printing wheel, and so on, while the one at the extreme right of Fig. 3 actuates the "system" printing wheel 95.

Each typewheel 95 is provided with ten type and, as the indicators 62, 68 are rotated to indicating position, said typewheels will be correspondingly rotated to bring to the printing point the type corresponding to the indications made by the indicator wheels, retaining this position until the indicator wheels are returned to normal or zero position, when they are also returned to normal position by the shaft 64 through pinions 96. The platen 100 is carried in the end of an arm 97 loosely mounted on a stud 98 projecting from the partition E, said arm having connected with it on the opposite side of said stud, one end of a spring 106, the other end of which is connected with the partition E and the function of which is to propel the platen 100 against the printing wheels and paper at the proper time. This spring 106 is put under tension to rock the arm 97 and cause its platen to strike against the paper and type by a cam 104 fast to shaft 2 and which, as lever 3 and said shaft

2 are rocked rearwardly, as heretofore described, engages a projection 105 through which it depresses the arm 97 to the position shown in Fig. 17, and puts spring 106 under tension. This rearward movement of lever 3 and also its forward or return movement to the position shown in the drawings, it will be remembered, takes place between sales, and, according to the usual practice, just before what may be termed the next sale is to be indicated and registered, as previously explained. The arm 97 is retained in this depressed position, with the spring 106 under tension, by a spring-pressed pawl 107, the upper end of which engages a projection 109 on the arm 97. This pawl is mounted on the end of the drawer-lever shaft 108, previously referred to, with a limited amount of looseness or play circumferentially of said shaft (as shown in Fig. 17) permitting movement of said pawl, by its spring, relatively to shaft 108 into engagement with the projection 109 on arm 97. When, as heretofore described, the drawer-lever 57 is rocked by cam 55 on shaft 35 to withdraw bolt 56 from the drawer B, said drawer-lever 57 will rock shaft 108 with which it is rigidly connected, and, engaging the pawl 107, will move the latter, against the pull of its spring, out of engagement with projection 109. The spring 106 will then propel the arm 97 upwardly and cause the platen 100 carried thereby to strike against the paper and the type on the printing wheel, and thus effect the printing. As the arm 97 thus flies upward, a spring 111 thereon will strike against a stop 112 on the partition, first stopping the upward movement of said arm and then moving it downwardly slightly so as to withdraw its platen 100 from the type, in which position it will remain until, just before the next sale, the lever 3 is moved rearwardly and said arm 97 moved downwardly thereby, as just described.

The shaft 35 is geared to a governor 60 which retards its movement when propelled by its spring 49 so that the shutter lever 93 will be released by segmental gear 33, the gong lever 59 tripped and drawer-bolt 56 withdrawn from the drawer after the movement of the indicator wheels 62, 68, to indicating position and of the type wheels 95 to printing position has been completed; the withdrawal of pawl 107 from engagement with projection 109 on arm 97, following the withdrawal of drawer bolt 56, so that the spring 106 may propel said arm 97 upward for printing.

The inking roller 114 is, as will be observed on reference to Fig. 2, of a width sufficient to ink the type of the several printing wheels 95. It is made up of a metal sleeve, revolving freely on a spindle fixed to an arm 113, and a plurality of inking rolls revolving

freely on said sleeve and bearing against the type of the several printing wheels. The arm 113 is mounted, concentrically with the printing wheels, loosely on shaft 25 and is connected, by a pin and slot with the platen-carrying arm 97, so that as the latter flies upward, as just described, to effect the printing, the arm 113 will be swung to the right in Fig. 17, thus causing the inking roller 114 to sweep over the type of the several printing wheels before the platen 100 reaches the printing point. As the arm 97 is then depressed by its spring 111 and later by the rearward movement of lever 3 and rocking of shaft 2 and cam 104 thereon, the arm 113 will be moved upwardly to the position shown in Fig. 17.

The paper strip or tape is introduced into the machine in the form of a roll 99, mounted loosely on stud 98 on which the platen-carrying arm 97 swings, and is led over the platen 100 and thence to a take-up roller or drum 101 carried by arm 97 and provided with a pawl and ratchet 102 which prevent unwinding or back-winding of the paper. A weighted arm 103 pivoted in arm 97 rests upon the roll of paper 99 and keeps it under proper tension. The paper strip is unwound from the roll 99 by a spring-pressed pawl 110 pivoted in partition E and which, on the downward movement, heretofore described, of platen-carrying arm 97, takes in behind a tooth of ratchet on take-up roller or drum 101 and, on the upward movement of said arm 97, rotates said roller or drum one tooth, thus bringing a fresh portion of the paper strip of tape over platen 100 in position to take the next impression from the type on the printing wheels.

The machine is also provided in the front casing with a glass covered opening through which to read the indications on the register wheels 74 and between this opening and the register wheels there is normally interposed a shutter 115 loosely mounted, by arms, on the register-wheel shaft 71 (see Figs. 2, 5, 9, 10 and 11). A lock 116 is provided for operating this shutter and when this lock is turned by its key, the arms are rocked on shaft 71 so as to swing shutter 115 rearwardly or to the right of Fig. 10, and thus expose the register wheels through the opening. The operation of this lock also raises a spring latch 121 engaging a catch (not shown) on the hinged casing I and passing through a slot 122 in partition E, said latch, when engaged with said catch, locking casing I to the main casing of the machine. When the casing I is unlocked by the disengagement of this latch and catch, it may be swung open so that the paper tape and printed matter thereon may be inspected, and, if necessary, removed and replaced by another tape.

A third function performed by the opera-

tion of lock 116 is that of disengaging arm 117 from recess 118, thus permitting rotation of shaft 71 by means of a knob or otherwise, for the purpose of engaging its longitudinal groove or slot 78 with the pawls 77 of the several register wheels and restoring said wheels to zero, as heretofore described; the end of shaft 71 being accessible for this purpose when casing I is opened.

The machine is, as shown in Fig. 5, also provided with a pawl controlled by a key-operated lock and which, when moved by the bolt of said lock to the dotted position shown in Fig. 5, engages the rear ratchet 6 of the segment 4 and prevents operation of the machine; this lock being provided for use by the proprietor or user of the machine when leaving the store or the machine, so that the machine cannot be operated in his absence.

As the operation of the several mechanisms of this machine has been stated in the description of the construction of said several mechanisms, a general statement of the operation of the machine is unnecessary.

In Figs. 18 and 19 I have illustrated a check printing attachment instead of the tape, as in the preceding figures. In this construction are shown a dater 123, a feeding drum 124, and a chute 125, leading to the platen. In this case the feeding drum and dater are revolved in a backward movement by the handle 3 through the ratchet shown in Fig. 9, and the segment on the main shaft 2, the strip being cut by a knife 126 when the arm 97 comes down. In all other particulars the mechanism is the same as in the preceding figures of the drawings.

I claim—

1. In a cash register, the combination of an indicating train having a normal tendency to move in one direction, a member having a normal tendency to move in one direction, a detent adapted to normally lock said member and said train when said member occupies its normal position only, a resetting lever adapted to carry said train and said member to their normal positions, and a special key adapted to actuate said detent to release said train and member, said member when out of normal position locking said special key against movement.

2. In a cash register, the combination of an indicating train having a normal tendency to move in one direction, a member having a normal tendency to move in one direction, a detent adapted to normally lock said member and said train when said member occupies its normal position only, a resetting lever adapted to carry said train and said member to their normal positions, a special key adapted to actuate said detent to release said train and member, said special key arranged to prevent the actua-

tion of said lever during the actuation of said detent by said key.

3. In a cash register the combination of an indicating train having a normal tendency to move in one direction, a member having a normal tendency to move in one direction, a detent adapted to normally lock said member and said train when said member occupies its normal position only, a resetting lever adapted to carry said train and said member to their normal positions, a special key adapted to actuate said detent to release said train and member, and means moved with said resetting lever preventing the actuation of said detent by said special key except when said resetting lever is in its initial position.

4. In a cash register, the combination of an indicating train having a normal tendency to move in one direction, a member having a normal tendency to move in one direction, a detent adapted to normally lock said member and said train when said member occupies its normal position only, a resetting lever adapted to carry said train and said member to their normal positions, a special key adapted to actuate said detent to release said train and member, said special key arranged to prevent the actuation of said lever during the actuation of said detent by said key, and means moved with said resetting lever preventing the actuation of said detent by said special key except when said resetting lever is in its initial position.

5. In a cash register the combination of an indicating train, a series of keys for determining the degree of movement of said train, a locking plate operated by the setting of one of said keys, and a detent for locking said train in its normal position, said detent adapted to lock said locking plate when withdrawn from the train and be locked against withdrawal from the train by said locking plate during the setting of said keys.

6. In a cash register, the combination of an indicating train, a series of keys for determining the degree of movement of said train, a locking plate operated by the setting of one of said keys, a special key, a detent for locking said train in its normal position and adapted to be withdrawn therefrom by said special key, said detent adapted to lock said locking plate when withdrawn from the train and be locked against withdrawal from the train by said locking plate during the setting of said keys, a resetting lever adapted to set said indicating train and prevent the withdrawal of said detent by said special key when said resetting lever is not in its initial position.

7. In a cash register, the combination of an indicating train, a series of keys for determining the degree of movement of said train, a locking plate operated by the setting of

one of said keys, a special key, a detent for locking said train in its normal position and adapted to be withdrawn therefrom by said special key, said detent adapted to lock said locking plate when withdrawn and be locked against withdrawal by said locking plate during the setting of said keys, and a resetting lever adapted to set said indicating train and be locked by said special key during the withdrawal of said detent by said special key.

8. In a cash register, the combination of an indicating train, a series of keys for determining the degree of movement of said train, a locking plate operated by the setting of one of said keys, a special key, a detent for locking said train in its normal position and adapted to be withdrawn therefrom by said special key, said detent adapted to lock said locking plate when withdrawn from the train and be locked against withdrawal from the train by said locking plate during the setting of said keys, a resetting lever adapted to set said indicating train, said resetting lever arranged to prevent the withdrawal of said detent by said special key when said lever is not in its initial position and be locked by said special key during the withdrawal of said detent by said special key.

9. In a cash register, the combination of an indicating train having a normal tendency to move in one direction, a member having a normal tendency to move in one direction, means for retarding said member's movement in said direction, a detent adapted to normally lock said member and said train when said member occupies its normal position only, a resetting lever adapted to carry said train and said member to their normal positions, a special key adapted to actuate said detent to simultaneously release said train and said member, means moved with said lever preventing the actuation of said detent by said special key except when said lever is in its initial position, and a lock operated by said member during its movement from its normal position to lock said lever in its initial position.

10. In a cash register, the combination of an indicating train, a type carrier moved with said indicating train, a platen, a member having a normal tendency to move in one direction and adapted when in its normal position to lock said platen in its normal position, a resetting lever adapted to carry said train, said member and said platen to their normal positions, a detent adapted to lock said train and said member in their normal positions, said member being adapted to release said platen during the movement of said member from its normal position, and means for retarding said member's movement from its normal position to permit the completion of the movement of said train be-

fore the release of said platen when said train and said member are simultaneously released by said detent.

11. In a cash register, the combination of a shutter for total indicating wheels, a casing for printing mechanism, a latch for said casing, and a key operated lock arranged to simultaneously open said shutter and release said latch.

12. In a cash register, the combination of a shutter for total indicating wheels, a resetting shaft for total indicating wheels, and a key operated lock for locking said setting shaft arranged to withdraw said shutter when said setting shaft is unlocked.

13. In a cash register, the combination of a shutter for total indicating wheels, a resetting shaft for total indicating wheels, and a latch for locking said resetting shaft arranged to be released by the withdrawal of said shutter.

14. In a cash register, the combination of a shutter for total indicating wheels, a resetting shaft for total indicating wheels, a latch for locking said resetting shaft, a printer case latch, and a key operated lock arranged to simultaneously release said latches and withdraw said shutter.

15. In a cash register, the combination of a series of segments, transverse tubes upon which said segments are mounted to form a key bank body, frame sections adapted to abut the ends of said tubes, and rods passed through said frame sections and said tubes to support said key bank body.

16. In a cash register, the combination of a series of shafts, a series of indicating wheels respectively geared to said several shafts, a series of total indicating wheels respectively geared to said several shafts in the same order from right to left as said series of indicating wheels, a series of printing wheels respectively geared to said several shafts in the same order from right to left as said series of indicating wheels, and a second series of indicating wheels respectively geared to said several shafts in the reverse order from right to left as said first series of indicating wheels, the gearing between said several indicating and printing wheels and said shafts being continuous.

17. In a cash register, the combination of a series of indicating elements each mounted for movement of varying degree, a main setting lever adapted to set all of said indicating elements in their initial positions, a series of keys for each of said indicating elements, the depression of one of said keys determining the degree of movement permitted the corresponding indicating element, a key for releasing said indicating elements from their set positions, a series of total indicating wheels, each geared to one of said respective indicating elements for advancing

movement only according to the degree of movement of said indicating elements, each of said total indicating wheels having carrying teeth and spur wheels, star wheel members mounted adjacent said total indicating wheels, each of said star wheel members being arranged to be advanced from its normal position by one of said carrying teeth on one of said total indicating wheels toward but not into the path of the said spur wheel of the next succeeding total indicating wheel, and a succession of segmental cams upon a rotatable shaft arranged to successively engage such of said star wheel members as are advanced from their normal positions, and beginning with that advanced star wheel member nearest the unit total indicating wheel successively complete the advancement of each of said star wheel members to its next normal position causing it to engage and advance the spur wheel of the next succeeding indicating wheel, said cams and rotatable shaft being operated by said main shaft.

18. In a cash register, the combination of a series of indicating elements, each mounted for movement of varying degree, a main shaft adapted to set all of said indicating elements in their initial positions, a series of keys for each of said indicating elements, the depression of one of said keys determining the degree of movement permitted the corresponding indicating element, a key for releasing said indicating elements from their normal positions, a series of total indicating wheels geared respectively to said several indicating elements for advancement only, carrying members adapted to be engaged and set by said several total indicating wheels, and a series of successively mounted cams actuated by said main shaft adapted to successively complete the carrying from one to the next of said total indicating wheels by engaging and actuating such of said carrying members as may have been set simultaneously with the operation of re-setting said indicating elements.

19. In a cash register, the combination of a series of banks of depressible keys and a corresponding series of motor-driven indicators arrested at different points in their indicating movements according to the keys depressed in their respective banks, a set of independent detents, one for each key bank, for preventing movement of said indicators to indicating position and which are withdrawn from normal position by the depression of keys in their respective key banks, a second set of detents, one for each key bank, also for preventing such movement of the indicators, a special key, on the depression of which all of said last named detents are withdrawn from normal position, whereby on the depression of keys in certain banks,

followed by the depression of said special key, only the indicators of those banks in which keys are depressed will be driven to indicating position, and a resetting lever for returning all of the parts to normal position.

20. In a cash register, the combination of a series of banks of depressible keys and a corresponding series of motor-driven indicators arrested at different points in their indicating movements according to the keys depressed in their respective banks, a set of independent detents, one for each key bank, for preventing movement of said indicators to indicating position and which are withdrawn from normal position by the depression of keys in their respective key banks, a second set of detents, one for each key bank, also for preventing such movement of the indicators, a special key, on the depression of which all of said last named detents are withdrawn from normal position, whereby on the depression of keys in certain banks, followed by the depression of said special key, only the indicators of those banks in which keys are depressed will be driven to indicating position, a resetting lever for returning all of the parts to normal position, and means coacting with the special key to prevent the actuation of the re-setting lever while the second set of detents is being actuated by said special key.

21. In a cash register, the combination of a series of banks of depressible keys and a corresponding series of motor-driven indicators arrested at different points in their indicating movements according to the keys depressed in their respective banks, a set of independent detents, one for each key bank, for preventing movement of said indicators to indicating position and which are withdrawn from normal position by the depression of keys in their respective key banks, a second set of detents, one for each key bank, also for preventing such movement of the indicators, a special key, on the depression of which all of said last named detents are withdrawn from normal position, whereby on the depression of keys in certain banks, followed by the depression of said special key, only the indicators of those banks in which keys are depressed will be driven to indicating position, and a resetting lever for returning all of the parts to normal position, said resetting lever being provided with means moving with it for preventing the actuation of the second set of detents by the special key except when said resetting lever is in its initial position.

22. In a cash register, the combination of a series of banks of depressible keys and a corresponding series of motor-driven indicators arrested at different points in their indicating movements according to the keys depressed in their respective banks, a set of

independent detents, one for each key bank, for preventing movement of said indicators to indicating position and which are withdrawn from normal position by the depression of keys in their respective key banks, a second set of detents, one for each key bank, also for preventing such movement of the indicators, a special key, on the depression of which all of said last named detents are withdrawn from normal position, whereby on the depression of keys in certain banks, followed by the depression of said special key, only the indicators of those banks in which keys are depressed will be driven to indicating position, a series of displaceable key-locking plates for the several key-banks, and a third set of detents for locking said plates against movement and which are thrown into engagement with them on the withdrawal from normal position of the second set of detents, and a resetting lever for returning all of the parts to normal position.

23. In a cash register, the combination of a series of banks of depressible keys and a corresponding series of motor-driven indicators arrested at different points in their indicating movements according to the keys depressed in their respective banks, a set of independent detents, one for each key bank, for preventing movement of said indicators to indicating position and which are withdrawn from normal position by the depression of keys in their respective key banks, a second set of detents, one for each key bank, also for preventing such movement of the indicators, a special key, on the depression of which all of said last named detents are withdrawn from normal position, whereby on the depression of keys in certain banks, followed by the depression of said special key, only the indicators of those banks in which keys are depressed will be driven to indicating position, a resetting lever for returning all of the parts to normal position, a motor-driven member set in operation by the special key, and means controlled thereby by which the operation of the resetting lever, during the indicating movement of the indicators, is prevented.

24. In a cash register, the combination with printing devices including type carriers, of a spring operated platen for taking impressions from said carriers, a handle for retracting said platen, means for latching said platen when retracted, a device for tripping said latch, and a paper feeding device operated by the movement of said handle.

25. In a cash register, the combination with type carriers, of a movable frame upon which are mounted a platen and detail strip rollers; a spring for retracting the movable frame away from the type carriers; means

for latching the movable frame in said re-
tracted position; means for releasing the
frame to cause the platen to strike the paper
strip against the type carriers; and means
5 for feeding the paper by the movement of
said movable frame.

In testimony whereof I have signed my

name to this specification in the presence of
two subscribing witnesses.

FREDERICK L. FULLER.

Witnesses:

W. B. CASE,

STEPHEN ZIEGLER.