

June 19, 1923.

1,459,234

A. W. MORRIS

LOCK

Filed July 10, 1922

3 Sheets-Sheet 1

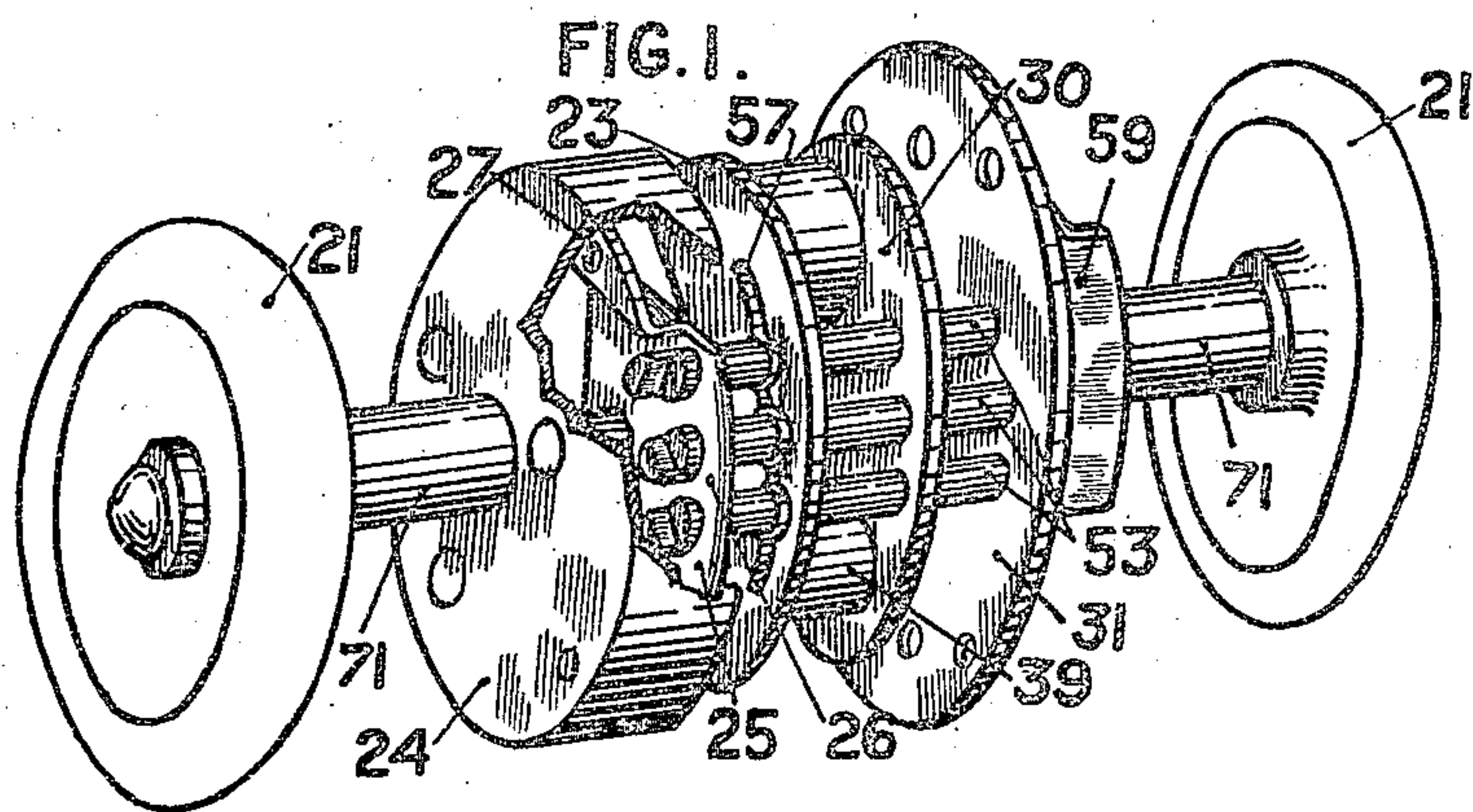
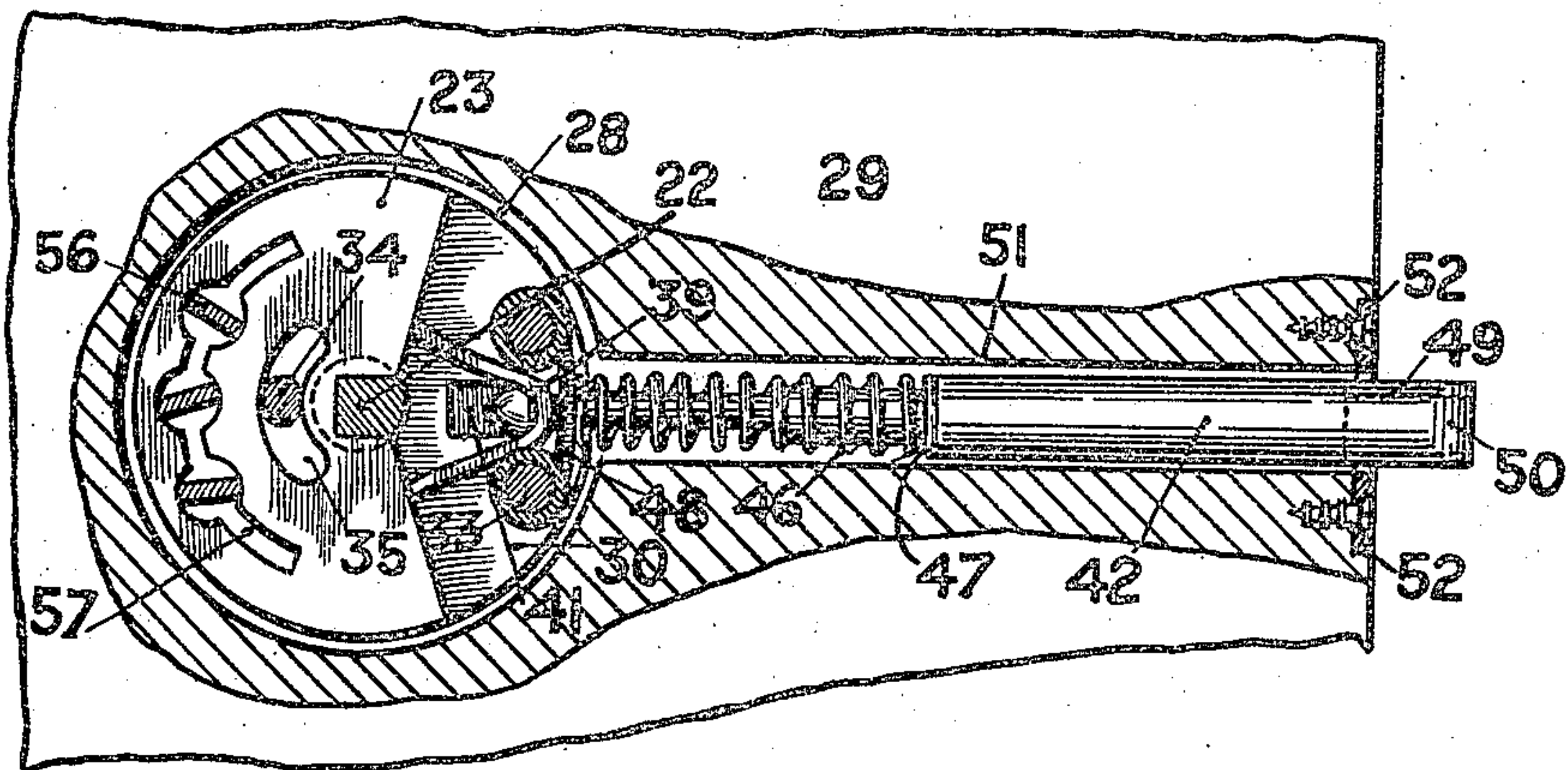


FIG. 2.

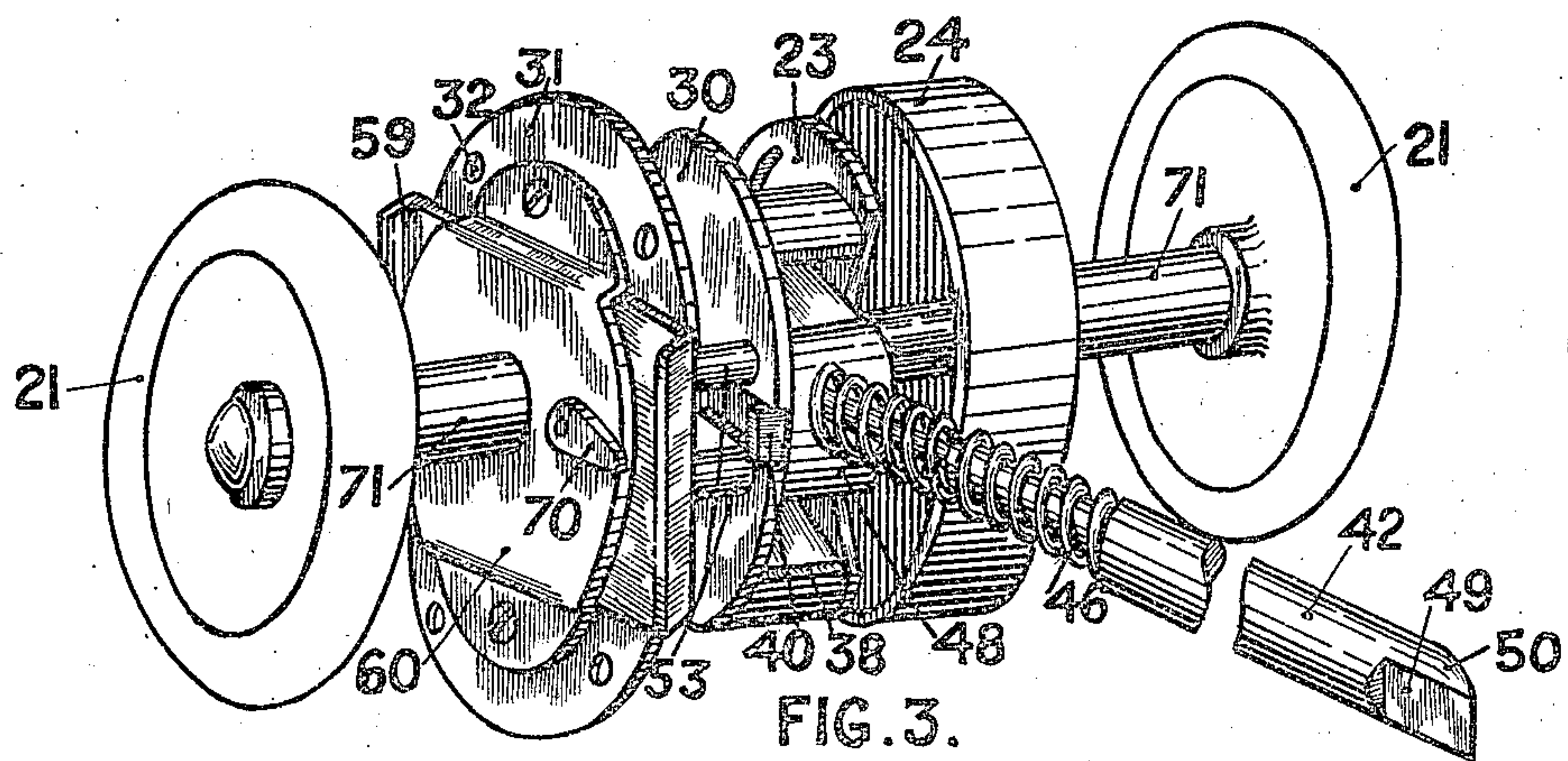


FIG. 3.

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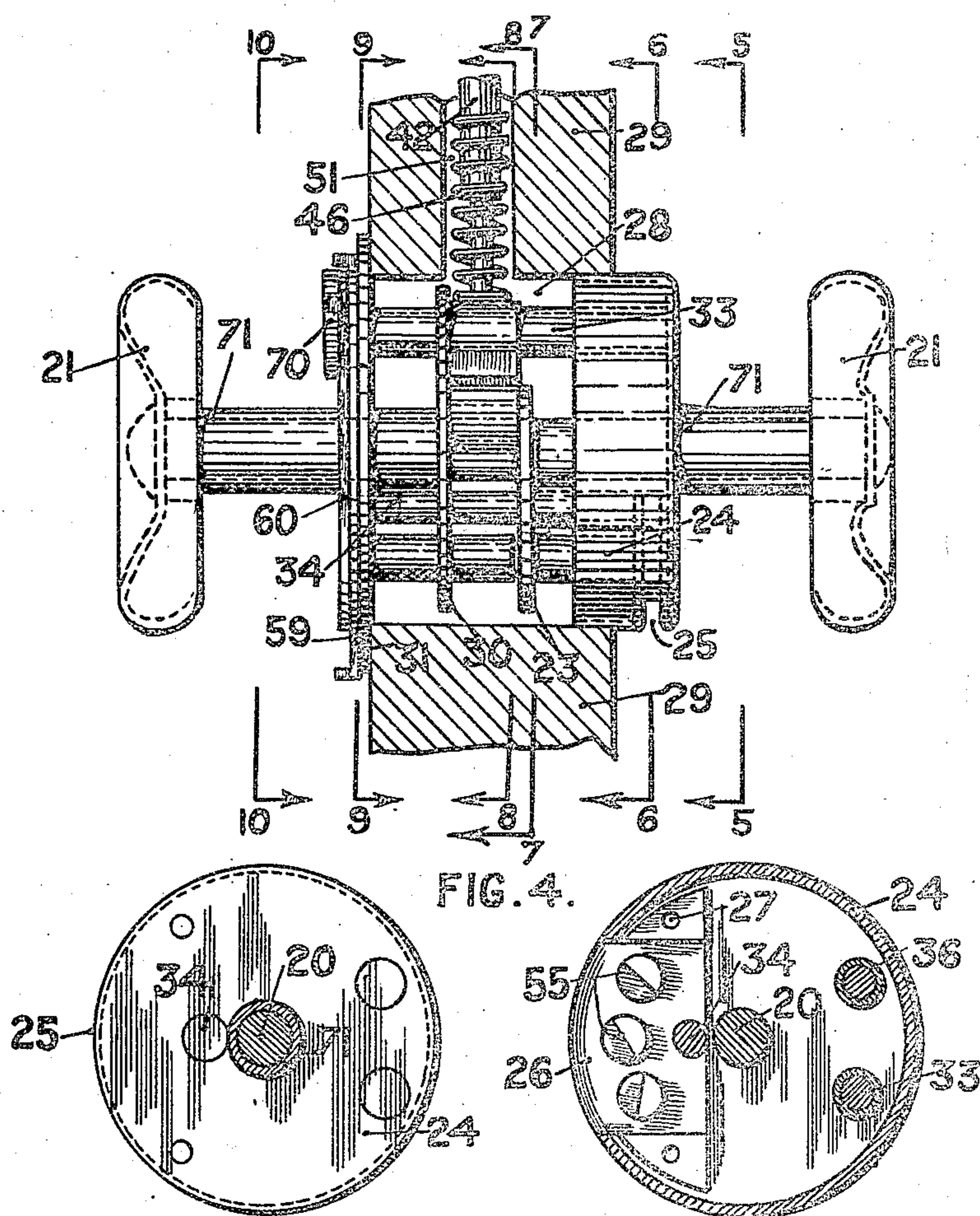


FIG. 4.

FIG. 5.

FIG. 6.

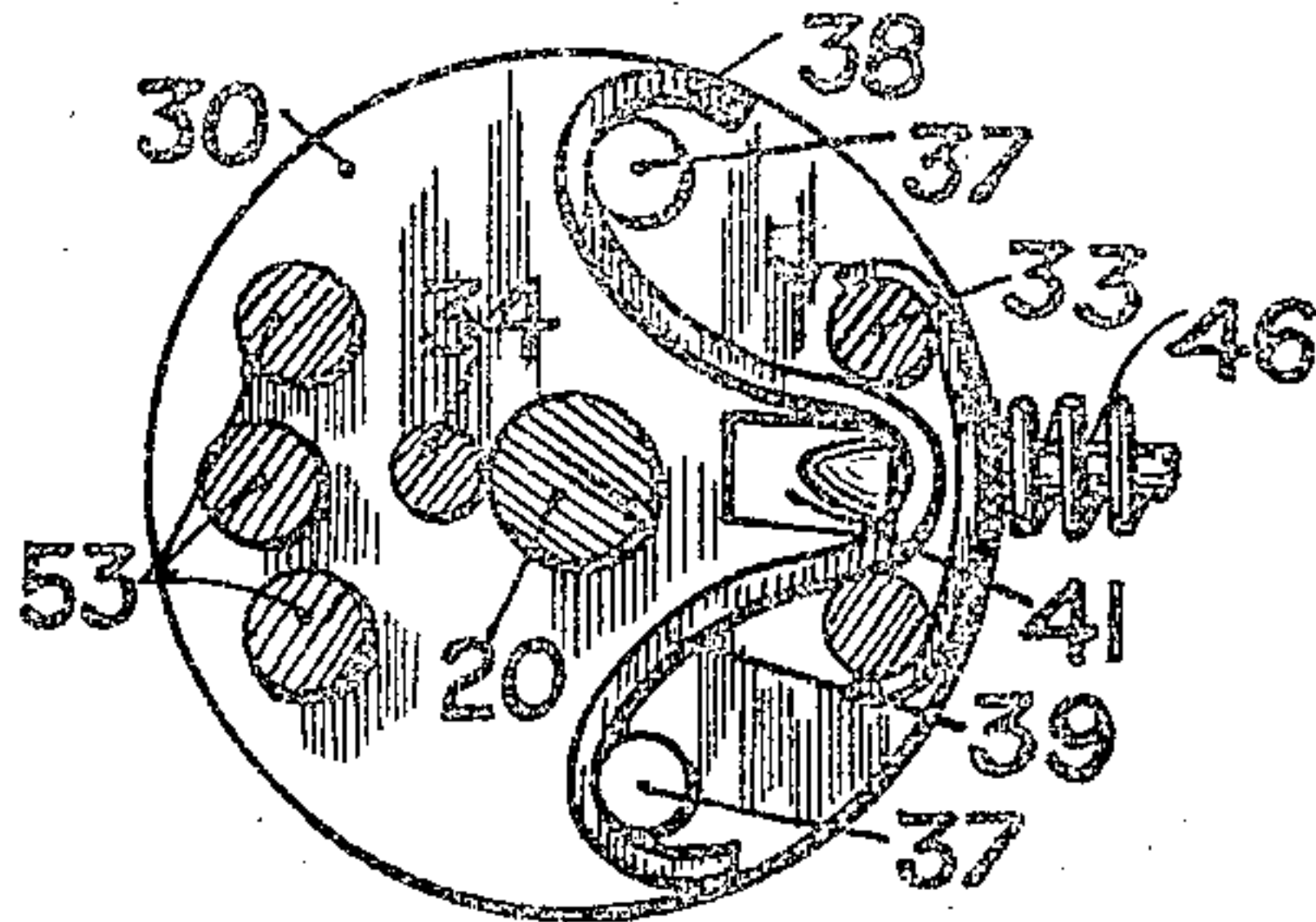
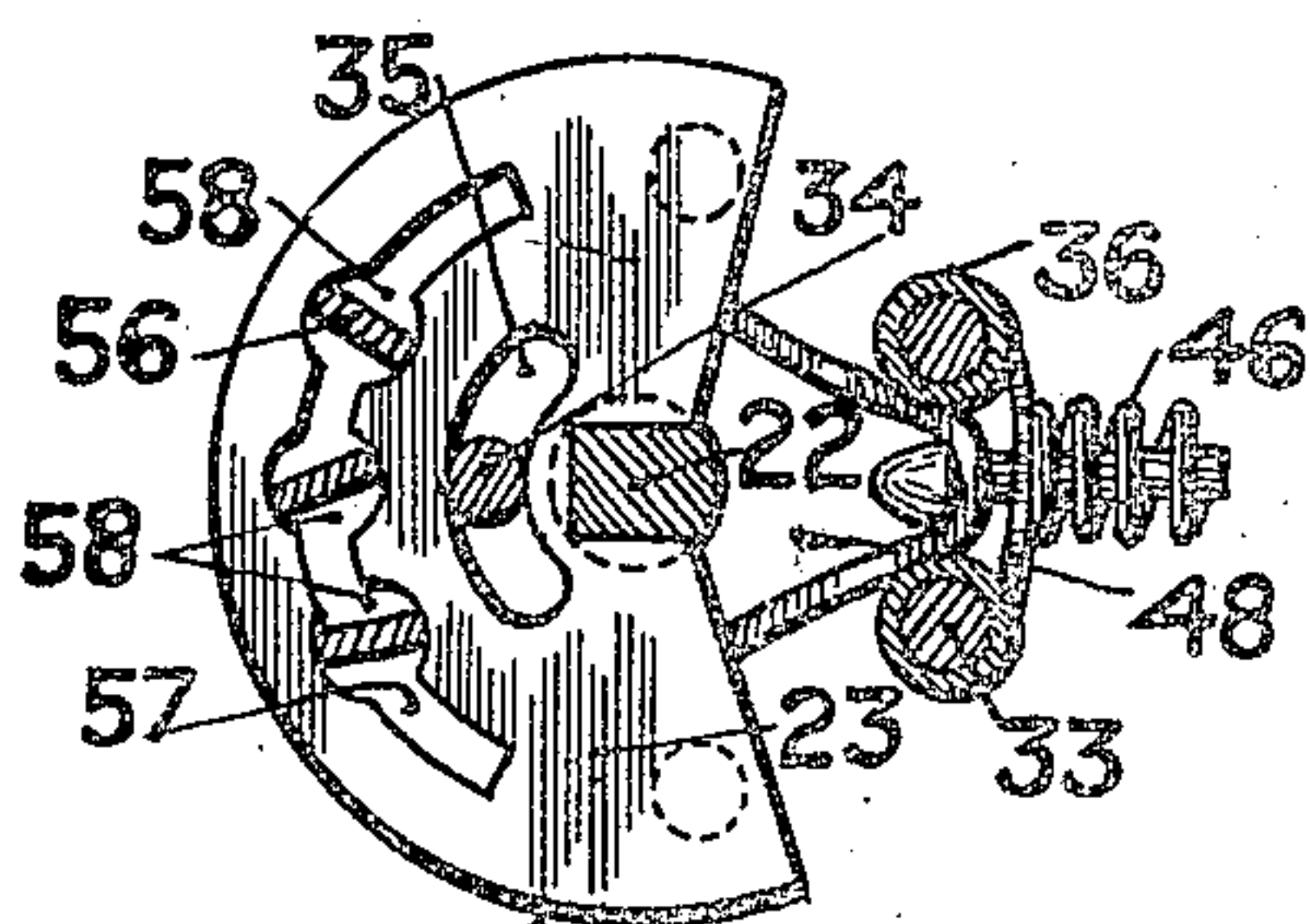


FIG 7.

FIG. 8.

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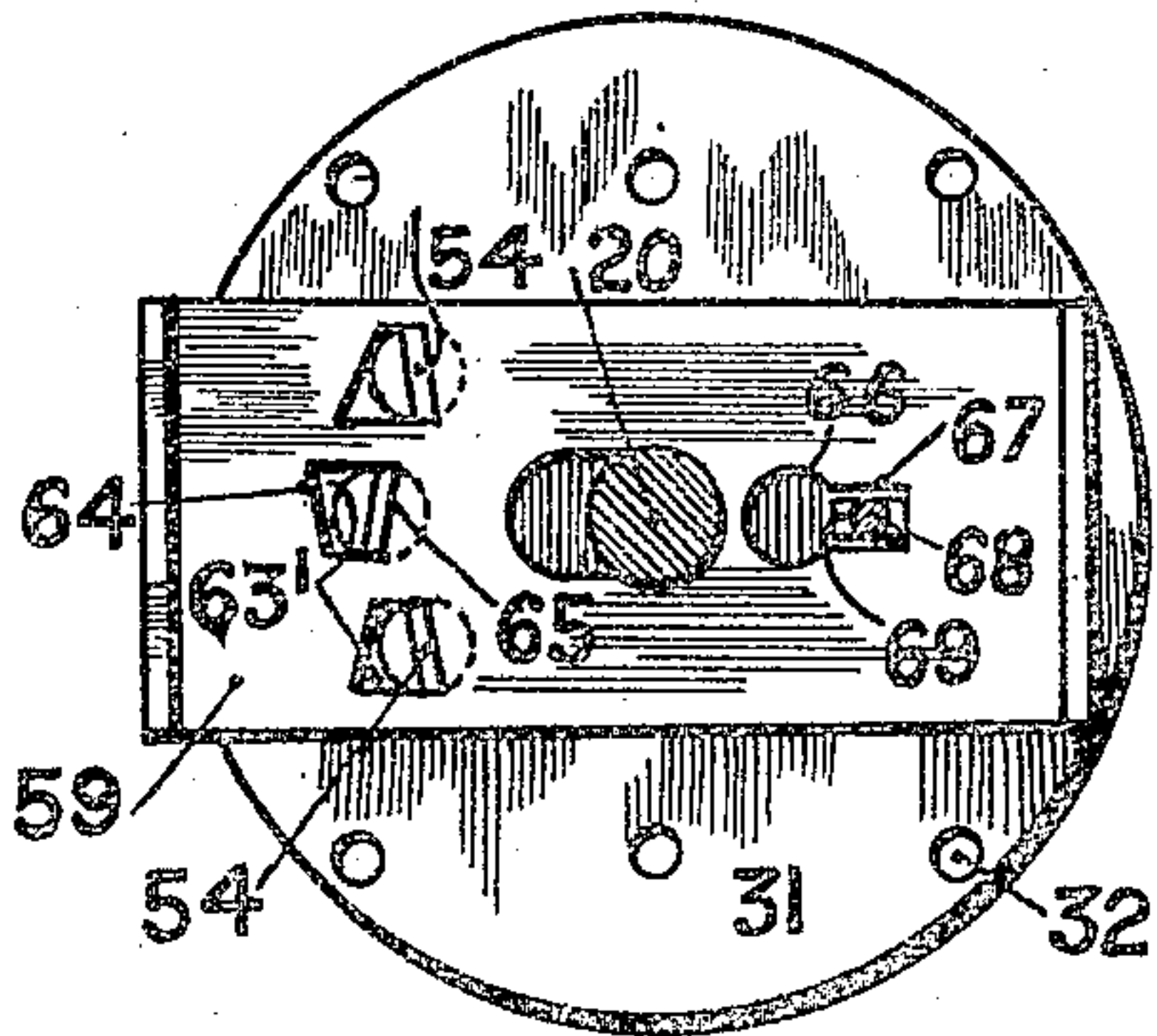


FIG. 9.

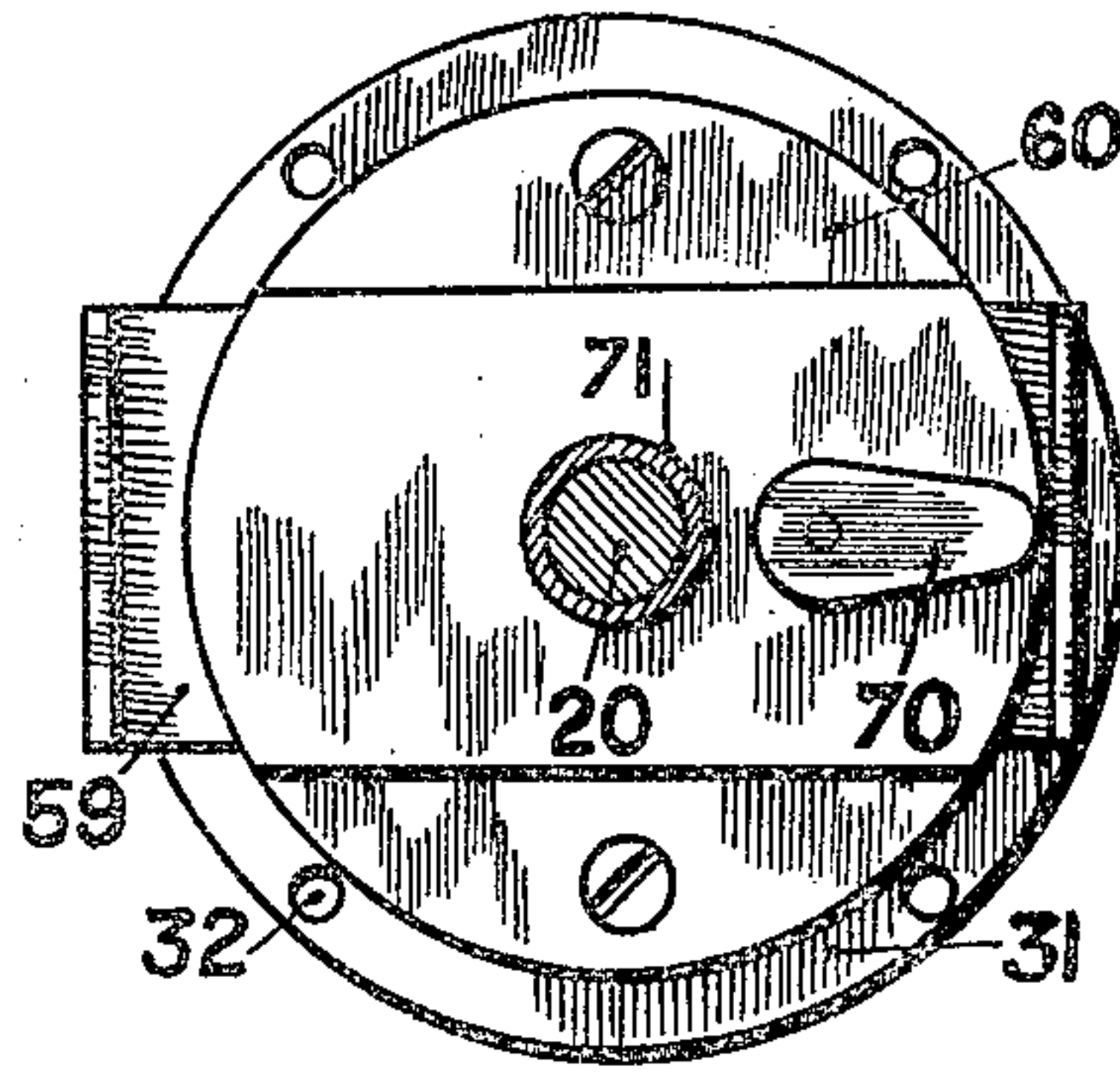


FIG. 10.

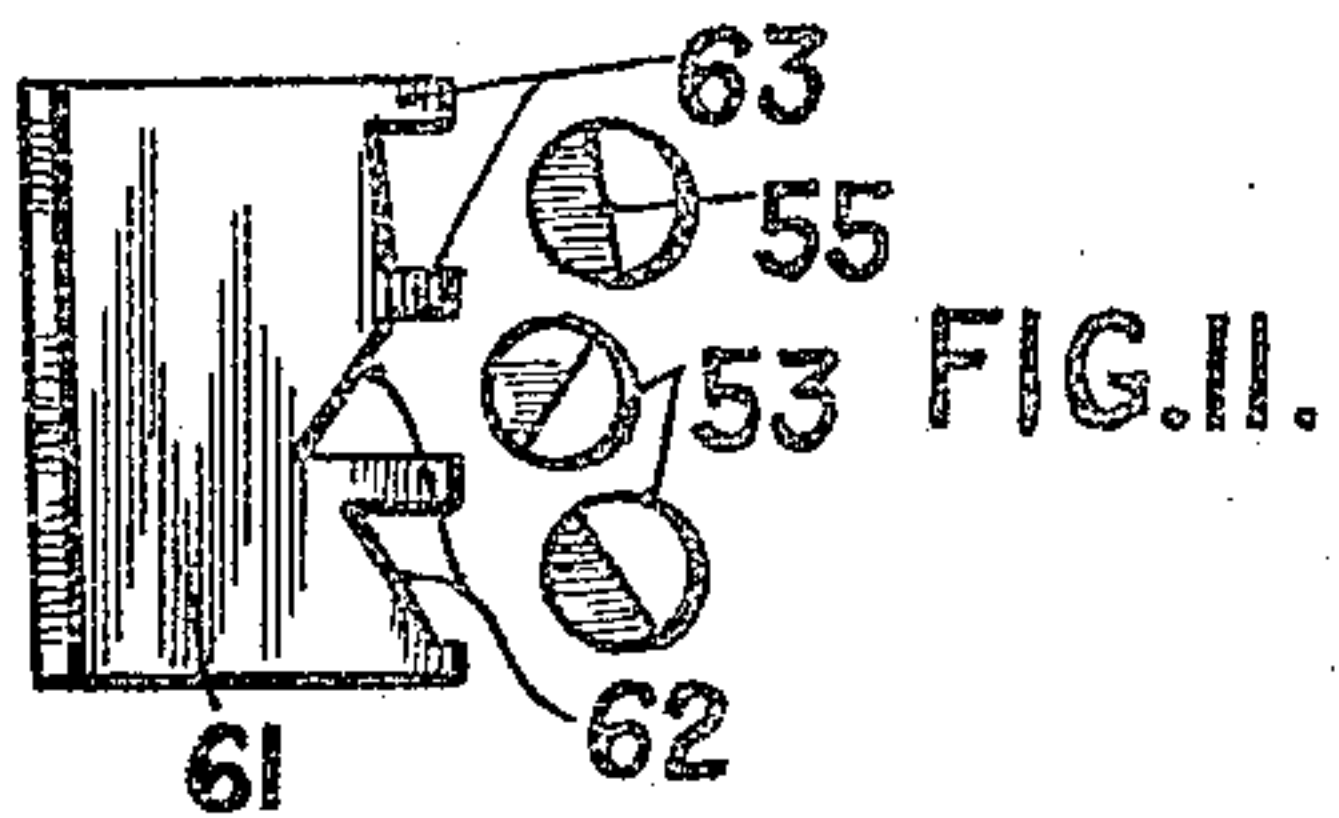


FIG. 11.

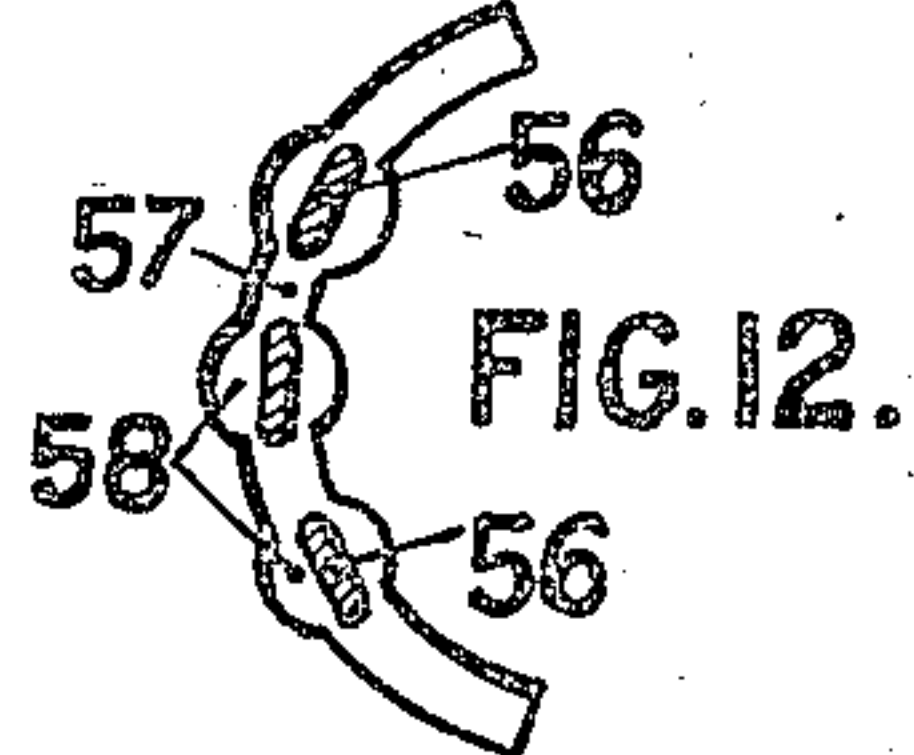


FIG. 12.

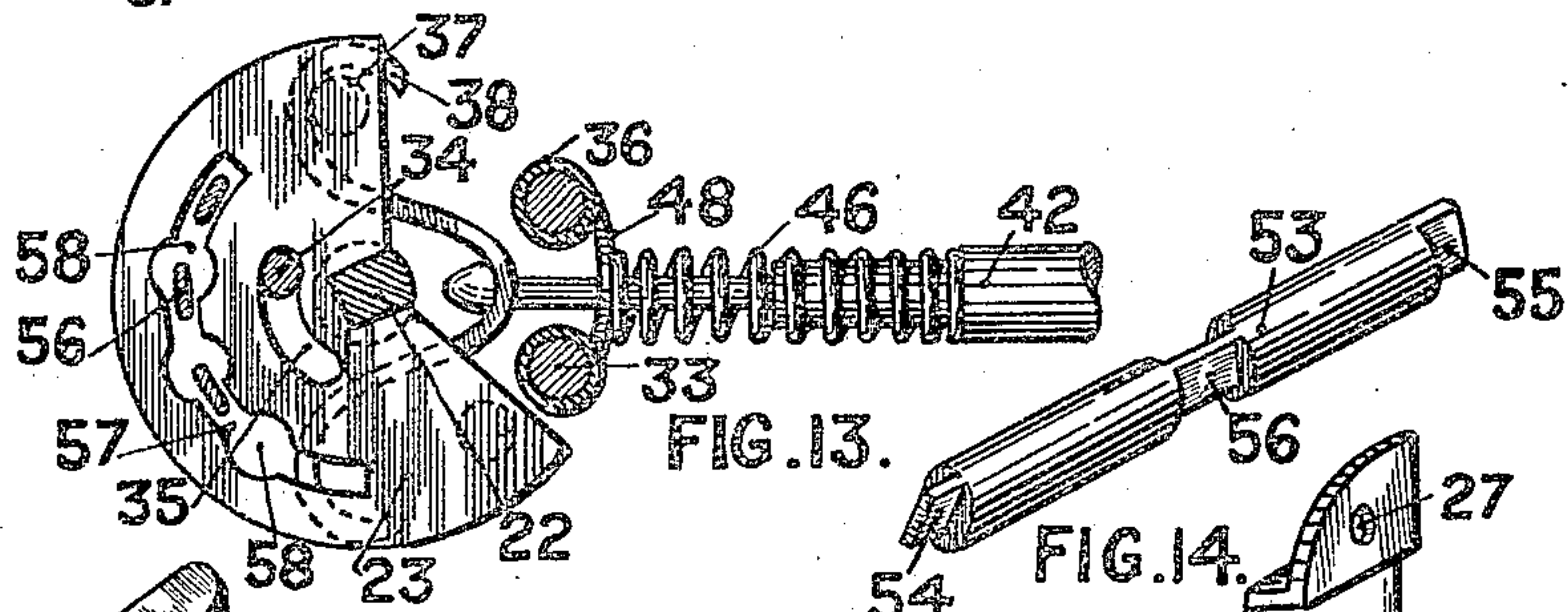


FIG. 13.

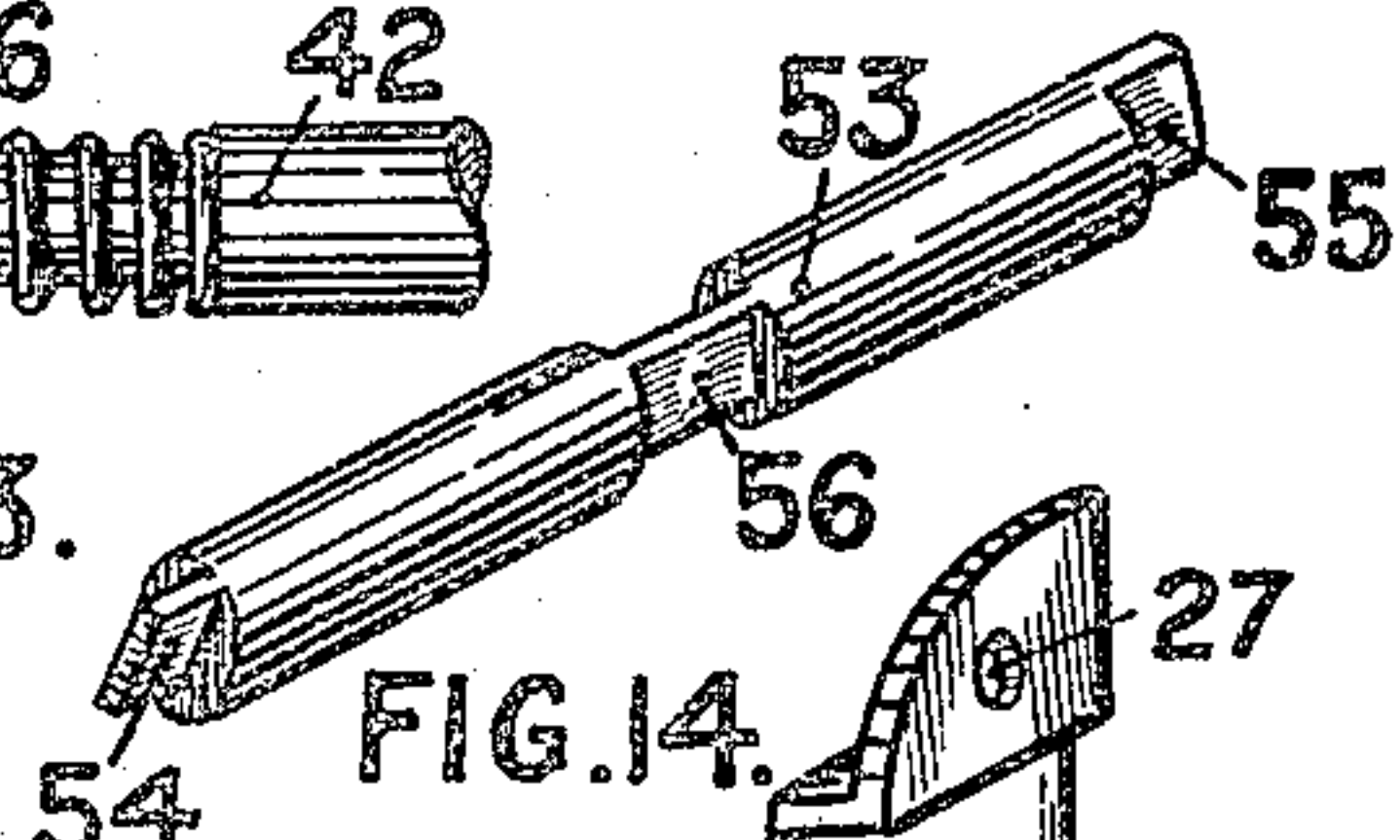


FIG. 14.

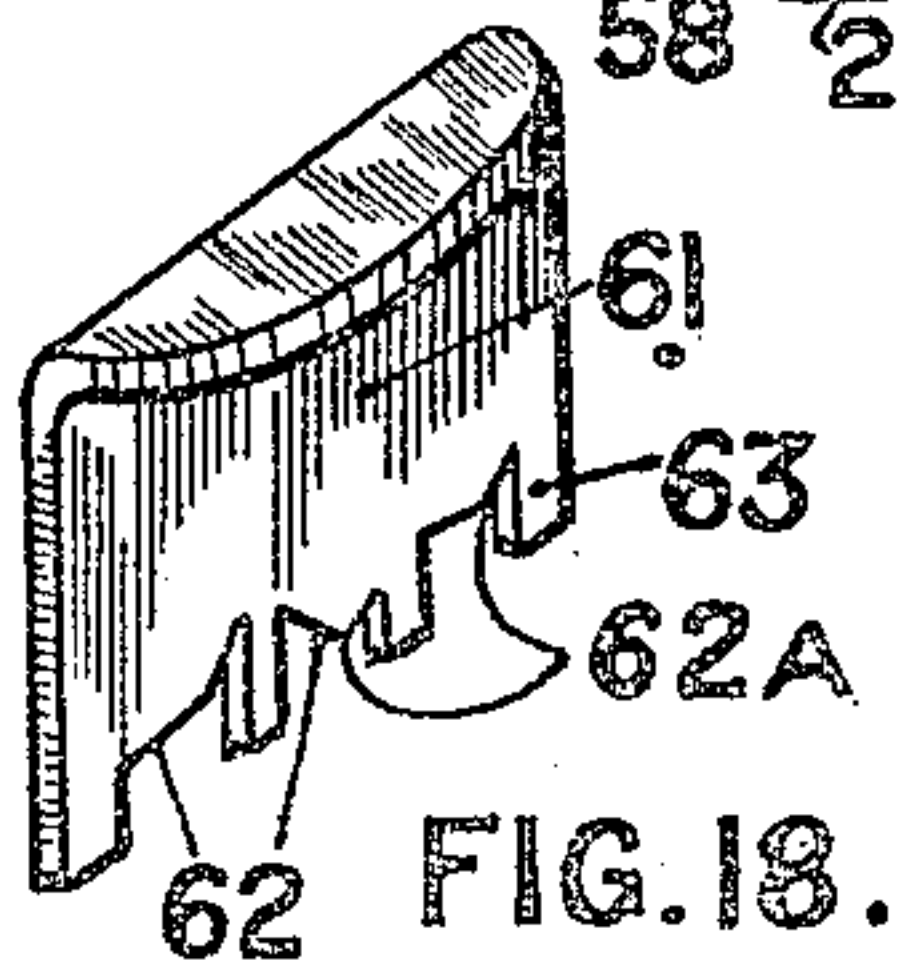


FIG. 15.

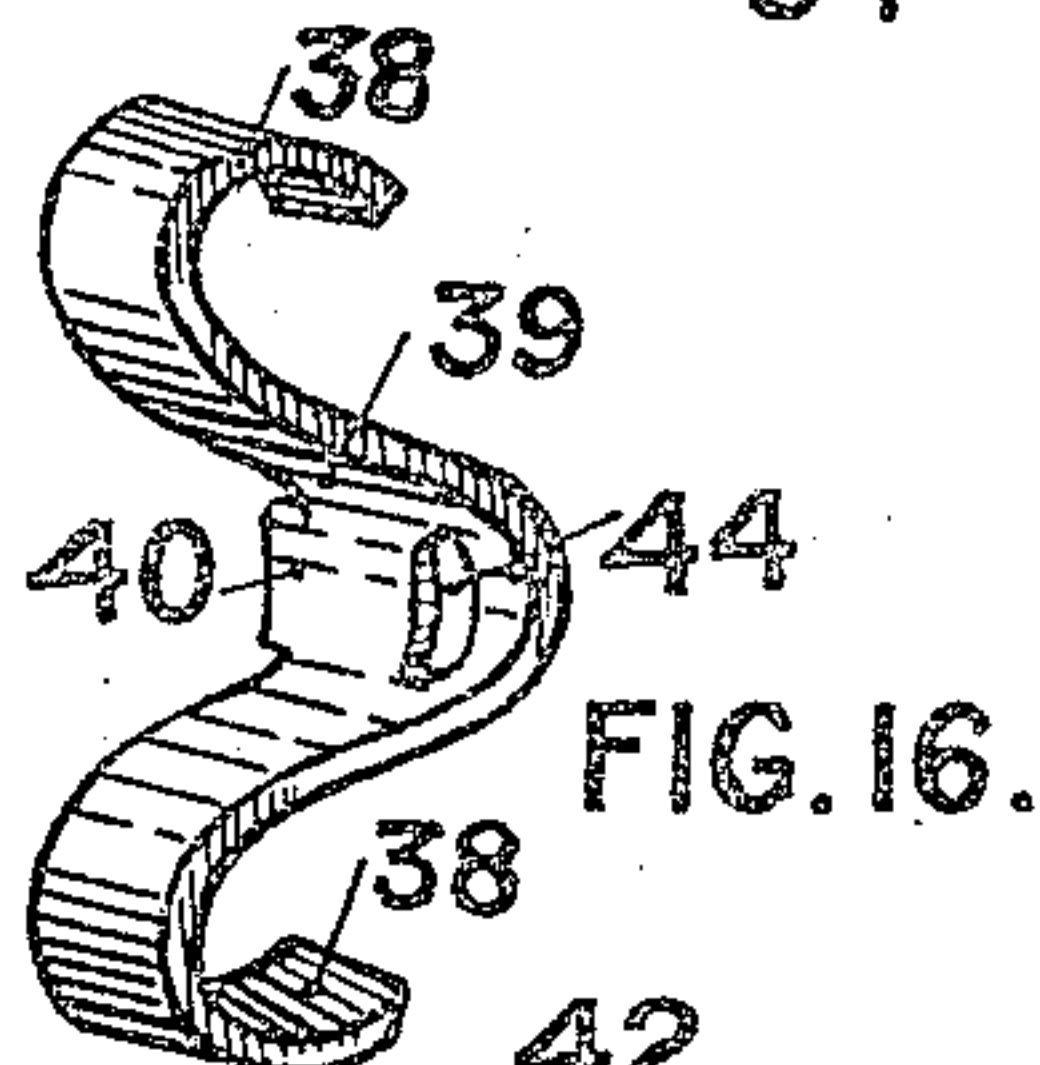


FIG. 16.

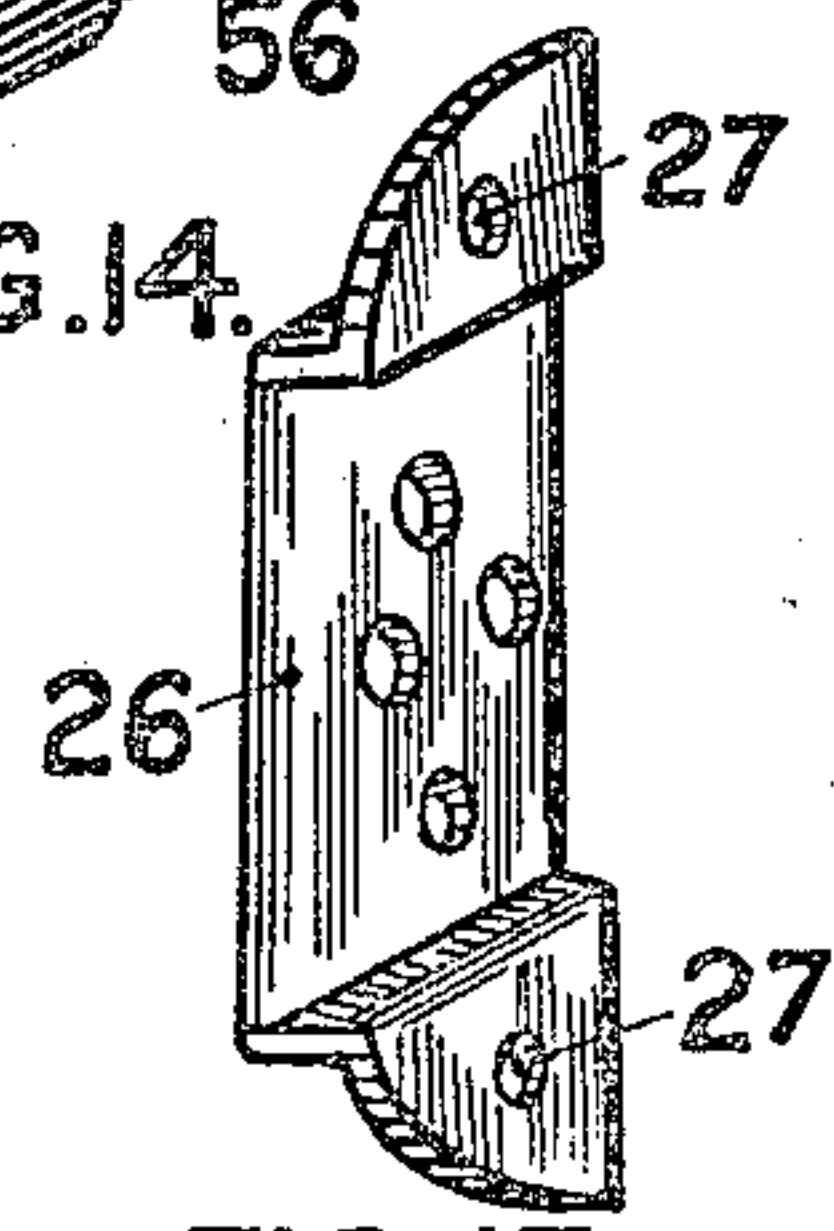


FIG. 17.

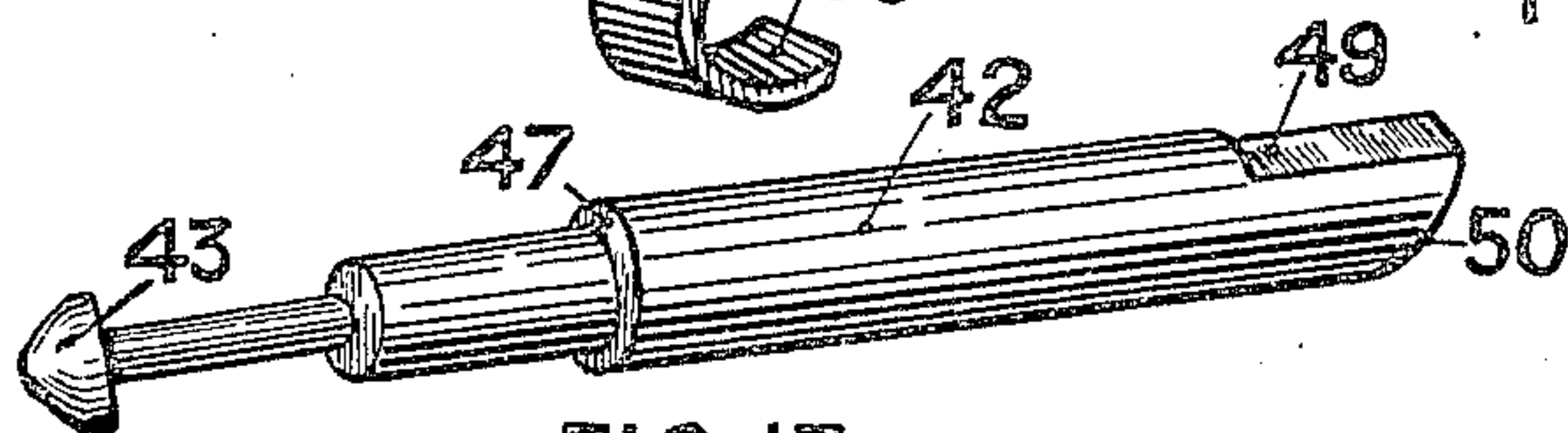


FIG. 18.

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By: B. Singer, Att.

Patented June 19, 1923.

1,459,234

UNITED STATES PATENT OFFICE.

ARCHIBALD WILLIAM MORRIS, OF RUSSEL POCKET, KULARA, VIA CAIRNS,
QUEENSLAND, AUSTRALIA.

LOCK.

Application filed July 10, 1922. Serial No. 573,841.

To all whom it may concern:

Be it known that I, ARCHIBALD WILLIAM MORRIS, a subject of the King of Great Britain and Ireland, residing at Russel Pocket, Kulara, via Cairns, in the State of Queensland, Commonwealth of Australia, have invented certain new and useful Improvements in Locks (for which I have filed application in Australia, No. 3216, on 24th August, A. D. 1922), of which the following is a specification.

The object of this invention is to provide a fastening for swinging doors and the like, in which a single element serves as both a latch and a bolt, which is easily fitted to a door, which will serve as an ordinary latch permitting the opening of the door by simply turning the handle on either side thereof, which may be set so that the door can be opened from the outside only by the use of a specially formed key, and which may be set so that neither handle may be turned unless unlocking means are manipulated.

With these and such other objects as may be apparent from the following description of the construction and operation of the lock, my invention consists in a lock comprising various combinations of co-operating elements as defined in the several appended claims.

Reference is made to the accompanying drawings in which Fig. 1 is a transverse sectional elevation of the lock fitted to a door of which part is shown.

Fig. 2 is a perspective elevation of the lock by itself, part being broken away to clearly show parts of the internal mechanism.

Fig. 3 is another perspective elevation of the reverse side of the lock to that shown in Fig. 2.

Fig. 4 is a plan view of the lock, fitted in a door which is shown in sectional plan.

Fig. 5 a sectional elevation on line 5.5. of Fig. 4.

Fig. 6 a sectional elevation on line 6.6. of Fig. 4.

Fig. 7 a sectional elevation on line 7.7. of Fig. 4.

Fig. 8 a sectional elevation on line 8.8. of Fig. 4.

Fig. 9 a sectional elevation on line 9.9. of Fig. 4.

Fig. 10 a sectional elevation on line 10.10. of Fig. 4.

Fig. 11 represents a key approaching the

locking pins constituting part of the lock, and

Fig. 12 represents the disposition of other parts of said pins in relation to an arcuate slot in one of the lock elements, after the key has functioned.

Fig. 13 is a sectional elevation of the parts illustrated in Fig. 7 when in unlocked position and the bolt retracted.

Fig. 14 is a perspective view of a locking pin, and

Fig. 15 a similar view of the key-hole plate.

Fig. 16 is a perspective view of the yoke or bolt retracting element of the lock,

Fig. 17 a perspective view of the bolt, and

Fig. 18 a perspective view of a key showing a modification of the wards or operative faces thereof shown in Fig. 11.

In Figs. 3 and 4 that end of the lock which is on the outside of the door is shown to the right, and in Fig. 2 to the left.

The spindle 20 of the lock is fitted at either end with handles 21 securely attached in any suitable manner but so as to be non-rotatable on the spindle. The spindle is of circular cross section for the whole of its length between the handles except for a very short distance about its midlength where it is cut away to a substantially rectangular section 22 on which is fitted a segmental rocking plate 23. This construction is clearly shown in Figs. 7 and 13. The rocking plate is of just sufficient thickness to neatly fit the length of the rectangular portion of the spindle, so that the rocking plate is maintained in fixed position on the spindle and rotates therewith.

Spaced from the rocking plate 23 and freely mounted on the spindle is a dished cap 24 provided with a slot shaped key-hole 25 to admit a flat key such as is shown in Figs. 11 and 18. Fitted within the cap is a key-hole plate 26 (see Figs. 15 and 2) riveted to the cap through holes 27. The cap 24 is of a diameter to neatly fit the hole 28 bored transversely through the door 29. (see Fig. 4).

On the other side of rocking plate 23 and spaced therefrom is a guide disc 30 freely mounted on the spindle. And more remote from the rocking plate and spaced from the guide disc is a fixing plate 31 of circular form, said fixing plate being of greater diameter than the hole 28 in the door and be-

ing attached to the door by screws passed through holes 32 (see Fig. 3) serves to secure the lock to the door.

The cap 24, rocking plate 23, guide disc 30 and fixing plate 31 are held in their relative positions by a pair of through pins 33 and a single through pin 34 (see Figs. 1, 5, 6, 7, 8, and 13), pin 34 passing through an arcuate slot 35 in the rocking plate 23 so as to permit the latter to rotate with the spindle except when locked as hereinafter described. Tubular distance pieces 36 are fitted on these pins between the various said elements to properly space them, and the pins themselves are provided with countersunk heads on their inside ends, their other ends being rivetted or burred over on the outside of the cap. Projecting from the rocking plate 23 and towards the guide disc 30 are a pair of pins 37 which respectively engage the hooked ends 38 of a yoke 39 (Fig. 16) which is provided on one side with a lug 40 which engages in a radial slot 41 formed in the guide disc 30 (see Fig. 41). Thus when the rocking lever is rotated in either direction by rotation of the spindle 20, the yoke is drawn radially inwards, being guided in a straight line path by the engagement of its lug 40 with the slot 41 in guide disc 30. This retractive movement of the yoke draws in the bolt 42, (see Fig. 17) the T headed end 43 of which passes through an elongated slot 44 in the yoke, and being turned to be across same, prevents the bolt from being detached from said yoke by the outward pressure of a coil spring 46 which surrounding a portion of the bolt bears at one end against a shoulder 47 formed on the bolt, and at the other end against a bow 48 (see Figs. 13 and 3) which extends between the through pins 33, the intumed ends of said bow engaging respectively those parts of the said pins which bridge the space between the rocking plate 23 and the guide disc 30.

The outer end of the bolt is formed on one side with a flat 49, and its extremity is bevelled as shown at 50 (Fig. 17).

The body portion of the lock being fitted as described in the transverse hole 28 in the door, the bolt is passed through a hole 51 (see Fig. 1) bored from the edge of the door to meet hole 28, the T head 43 passing through a slotted hole in the bow 48 and engaging the yoke as before described. A keeper plate 52 having a hole formed to fit the flattened end of the bolt is then passed over that end and is screwed to the door edge. The bolt is thus prevented from turning and becoming disengaged from the yoke 39.

I will now proceed to describe the mechanism of the lock, by which rotation of the rocking plate, radial movement of the yoke, and retraction of the bolt are prevented or

permitted as desired, that is to say, the mechanism which enables the lock to function as a lock and not merely as a latch such as is constituted by the parts hereinbefore described.

There are provided a plurality of rotatable locking pins 53, the lock illustrated including three of these disposed in parallel relation and arcuate arrangement concentric with the spindle. Each of these pins (see Fig. 14) is formed at one end with a tang 54, at the other end with a flat 55, and about its midlength with a waist 56. These pins are arranged in axial parallel relation to the spindle, are rotatably held at their ends in spaced holes in the fixing plate 31 and keyhole plate 26, and pass freely through holes in the guide disc 30. The waists 56 of the pins register with an arcuate slot 57 (see Figs. 2, 12, 13 and 7) in the rocking plate 23, said slot being enlarged at three points 58 to an extent not less than the width of the broad sides of the waists 56 of the pins, while the width of the slot between and beyond the enlargements is of sufficient width to pass the waists when the latter are presented edge on thereto as shown in Figs. 2 and 12, but insufficient to pass them when they are transversely turned as shown in Fig. 7. It will thus be obvious that the rocking plate may be rotated in either direction only when the waists are presented edge on to the arcuate slot 57, and that when the waists are disposed as shown in Fig. 7 the rocking plate cannot rotate but is held in mid position with the bolt 42 pushed outwardly to the limit of its travel by the spring 46. It will also be noted that the waists cannot be turned to the locking position unless the rocking plate is in mid position.

The tangs 54 of the locking pins 53 project through and are rotatable in holes in a setting plate 59 slidable transversely between the fixing plate 31 and an angled cover plate 60 screwed to said fixing plate, the ends of the tangs contacting with said cover plate and thus preventing the pins from moving longitudinally in one direction. Similarly the flattened ends of the pins 53 project through the keyhole plate 26 and terminally contact with the inner face of the cap 24.

The angular relationship between the flat, waist and tang of any pin is capable of considerable variation during manufacture, and each pin differs from the other in this regard, so that the total number of variations is practically infinite within certain limits as will be understood from what hereinafter follows:

The key 61 (see Figs. 11 and 18) is a flat piece of metal of such dimensions that it is a freely sliding fit in the key hole 25, and is formed with a number of operative faces

62 separated by guiding tongues 63. As the key is pushed home, these tongues take about the ends of the locking pins 53 which project through the keyhole plate as here-
 5 inbefore explained, and the operative faces 62 contact with the flats 55 of the locking pins and turns each of same to a position parallel to the operative face contacting therewith as shown in Fig. 11. The turn-
 10 ing of the flats results in the waists 56 of the pins being turned edge on to the arcuate slot 57 in the rocking plate so that the latter may be rotated by turning either handle and the bolt thus retracted.

15 It will be observed that the operative faces of the key are set at different angles; hence the angular relation of the flats to the waists of the pins must be different in order that the required disposition of all the
 20 waists may be brought about.

If any one operative face of the key is at an incorrect angle, then one locking pin will not be turned so as to bring its waist edge on to the slot 47 in the rocking plate, and the
 25 latter cannot be rotated even though the other pins may be correctly set.

In the key illustrated in Fig. 18 it will be noted that the operative faces do not extend in a straight line from one guiding tongue to
 30 another but are cut back towards one end leaving points as at 62^a. This construction provides that the first point of contact of an operative face with a flat on a locking pin is not right in the angle between the
 35 face and the tongue, and there is therefore less likelihood of the parts jamming.

The setting of the parts so that the door will be locked when closed, is effected from the inside of the door by manipulation of
 40 the sliding plate 59 before referred to. This plate has three apertures 63 of irregular form, and each aperture is formed to provide at opposite sides angular operative
 45 faces 64 and 65 respectively. These faces are so disposed that when the plate 59 is moved to the right (Fig. 9), faces 64 contacting with the tangs 54 of the locking pins, turn the latter to the locked position
 50 i. e. with the waists transverse to the slot 57 in the rocking plate, so that when the door is slammed the bevelled end of the bolt 42 contacting with the usual striking plate (not shown) the bolt is moved inwardly
 55 against the pressure of spring 46 which forces the bolt outwardly again behind the striking plate. This is common in latch construction and need not be further described beyond stating that the attachment of the
 60 bolt to the yoke 39 is such that inward movement of the bolt is permitted without disturbing the yoke.

To minimize the risk of the sliding plate 59 being accidentally moved to the locking position, I provide therein an aperture 66
 65 from which there extends to the right a

comparatively narrow slot 67. Through the cover plate 60 is a rotatable pin 68 and fixed on the one end thereof is a block 69 the width of same being slightly less than that of slot 67, the length of said block being
 70 greater than its width. This block takes in the aperture 66, and when its length is disposed parallel to slot 67 sliding movement of plate 59 is permitted in either direction, but when the block is in the aperture 66
 75 and its length transverse to slot 67 plate 59 cannot be moved to the extent required to affect the angular disposition of the locking pins 53. For the manipulation of block 69 I provide on the other end of pin 68 and
 80 operating on the face of the cover plate 60, a trigger or finger 70.

It will be observed that the axial length of the cap 24 from the keyhole plate 26 to the inner edge, is such as to provide for con-
 85 siderable variation in the thickness of the door to which the lock is to be fitted. Provided that the inner edge of the cap is located within the thickness of the door, the
 90 locking pins cannot be manipulated from outside except through the keyhole.

In order that lengthwise pull on the spindle shall not be resisted only by the internal parts of the mechanism, I provide
 95 tubular distance pieces or sleeves 71 fitting over the spindle between either handle and the fixing plate and cap respectively.

The foregoing describes the construction of a lock according to my invention but it is to be understood that I do not confine my-
 100 self to the actual details described and illustrated as same may be varied or modified in any manner falling within the scope of the appended claims.

What I claim and desire to secure by
 105 Letters Patent is:—

1. In a lock, a rotatable spindle, a rocking plate fixed thereon, a bolt retracted by the turning of the rocking plate, said rocking
 110 plate having means to operate said bolt, and a plurality of locking pins arranged in arcuate formation parallel to the spindle, each of said pins having a cut away portion or waist which is wider in one direction than
 115 in the other, and said pins being rotatable by means of a key to present either the narrower or the greater width of their waists to the direction of rotation of the rocking plate to either permit or prevent movement of the
 120 latter.

2. In a lock, a rotatable spindle, a rocking plate fixed thereon and having an arcuate slot cut in it, said slot having enlargements
 125 at intervals, a bolt retracted by the turning of said rocking plate, a plurality of locking pins arranged in arcuate formation parallel to the spindle and rotatable by means of a key, each of said pins having a cut away portion or waist entering said slot and of
 130 less width in one direction than same but

of greater width in the other, so that when said greater width is turned in one of said enlargements transversely to the slot the rocking plate is prevented from turning but is permitted to turn when the narrower width is presented to the slot.

3. In a lock, in combination, a fixing plate and a dished cap held in fixed spaced relation, a rotatable spindle passing axially through said fixing plate and cap, a rocking plate fixed on said spindle between said fixing plate and cap and having an arcuate slot enlarged at intervals, an outwardly spring pressed bolt retracted by rotation of said rocking plate, a plurality of locking pins rotatable by means of a key inserted in the cap and arranged in arcuate formation and parallel to said spindle, said pins having bearing at one end in said fixing plate at the other end in a plate fixed in the cap, each of said pins having a cut away portion or waist registering with the arcuate slot in the rocking plate, said waist being wider in one direction than the other and cooperating with said slot as described to prevent or permit rotation of the rocking plate.

4. In a lock, in combination, a fixing plate and a dished cap held in fixed spaced and parallel relation, said cap being provided with a key hole and having a keyhole plate fixed therein, a rotatable spindle passing axially through said fixing plate and cap, a handle on each end of said spindle, a rocking plate fixed on said spindle between said fixing plate and cap and having an arcuate slot enlarged at intervals, an outwardly spring pressed bolt retracted by rotation of said rocking plate, a plurality of rotatable locking pins arranged in arcuate formation parallel to the spindle, each of said pins having at one end a flat projecting through the keyhole plate for actuation by a key, at the other end a double sided tang projecting through the fixing plate, and about

its midlength a cut away portion or waist registering with said slot and cooperating therewith to prevent or permit rotation of the rocking plate, and a plate slidable on said fixing plate and having operative faces cooperating with the tangs on the locking pins to turn said pins to operative or inoperative position.

5. In a lock, in combination, a fixing plate, a dished cap and an intermediate guide plate held in fixed spaced and parallel relation, a rotatable spindle passing axially through said fixing plate, cap and guide plate, a segmental rocking plate fixed on the spindle between said fixing plate and cap and having an arcuate slot enlarged at intervals, a pair of pins projecting from said rocking plate towards the guide plate, a yoke of which the ends engage said pins, an outwardly spring pressed bolt releasably attached to said yoke and retracted with the yoke by the turning of the rocking lever in either direction, means for preventing turning of the bolt, a plurality of rotatable locking pins arranged in arcuate formation parallel to the spindle, each of said pins having at one end a flat projecting through the keyhole plate for actuation by a key, at the other end a double sided tang projecting through the fixing plate, and about its midlength a cut away portion or waist registering with said slot and cooperating therewith to prevent or permit rotation of the rocking plate, a plate slidable on said fixing plate and having operative faces cooperating with the tangs on the locking pins to turn said pins to operative or inoperative position, and means for preventing movement of said sliding plate in a direction to turn the locking pins to operative position.

Signed at Cairns, this thirtyfirst day of March, A. D. 1922.

ARCHIBALD WILLIAM MORRIS.