

Fig. 1.

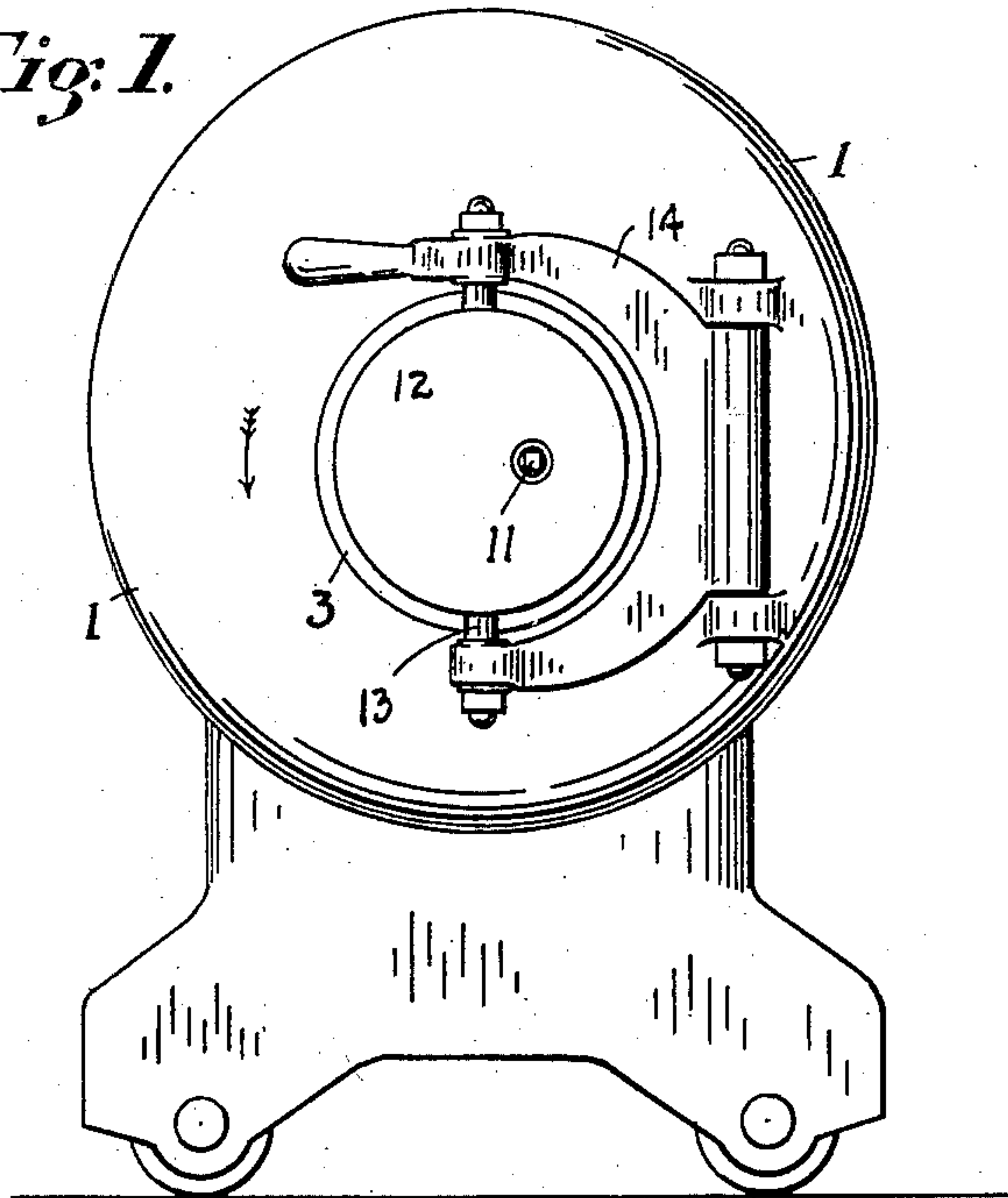
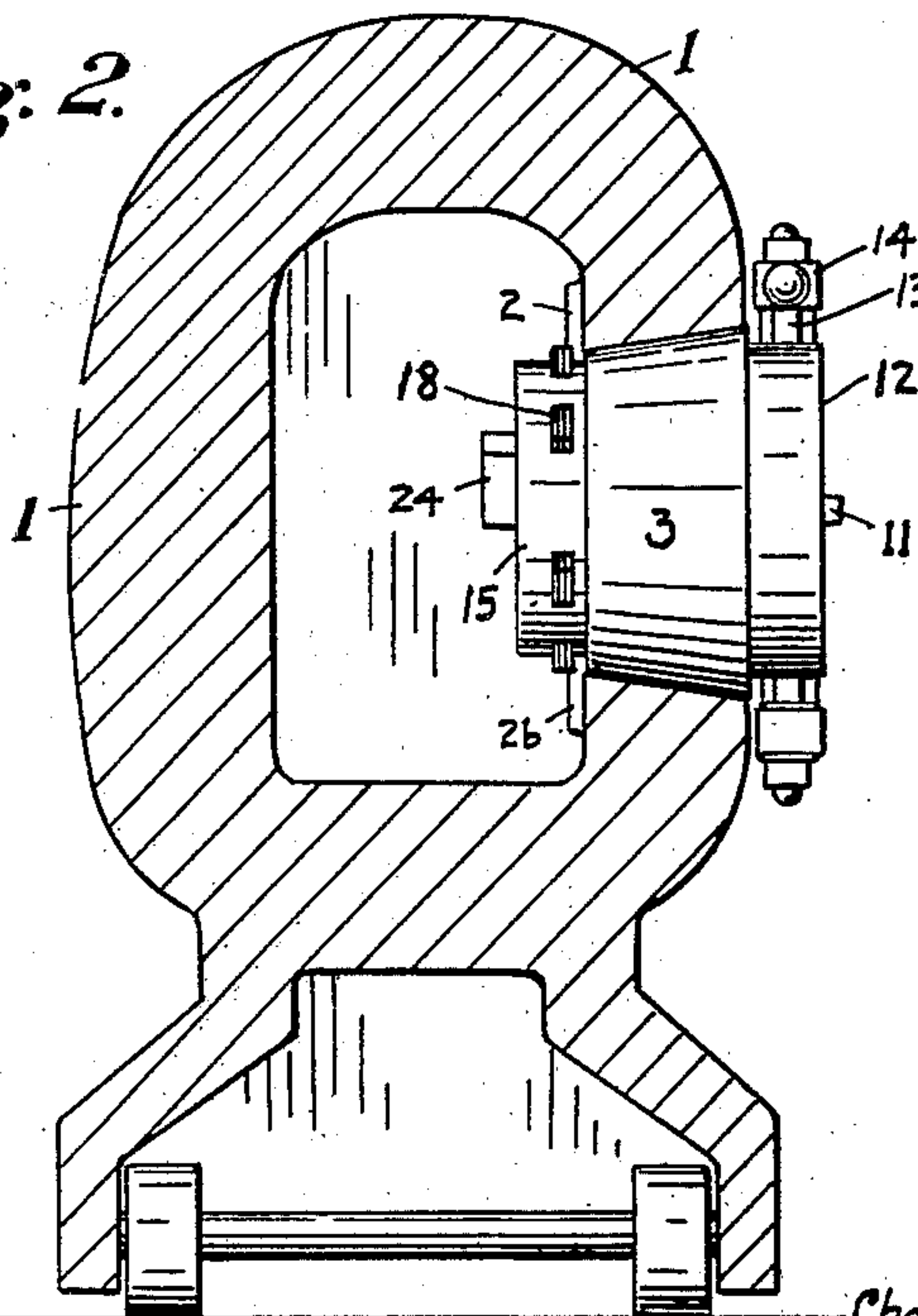


Fig. 2.



WITNESSES:

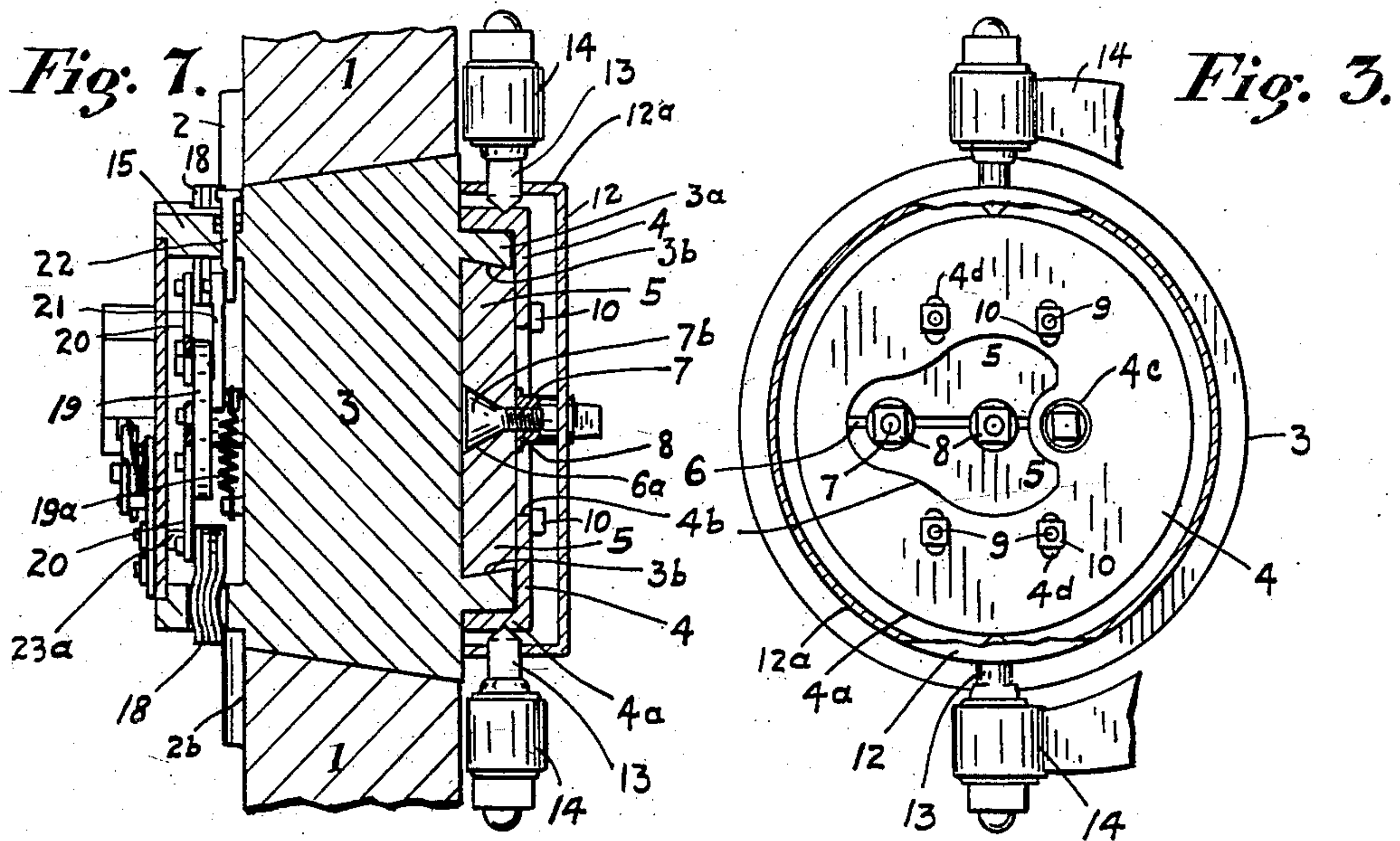
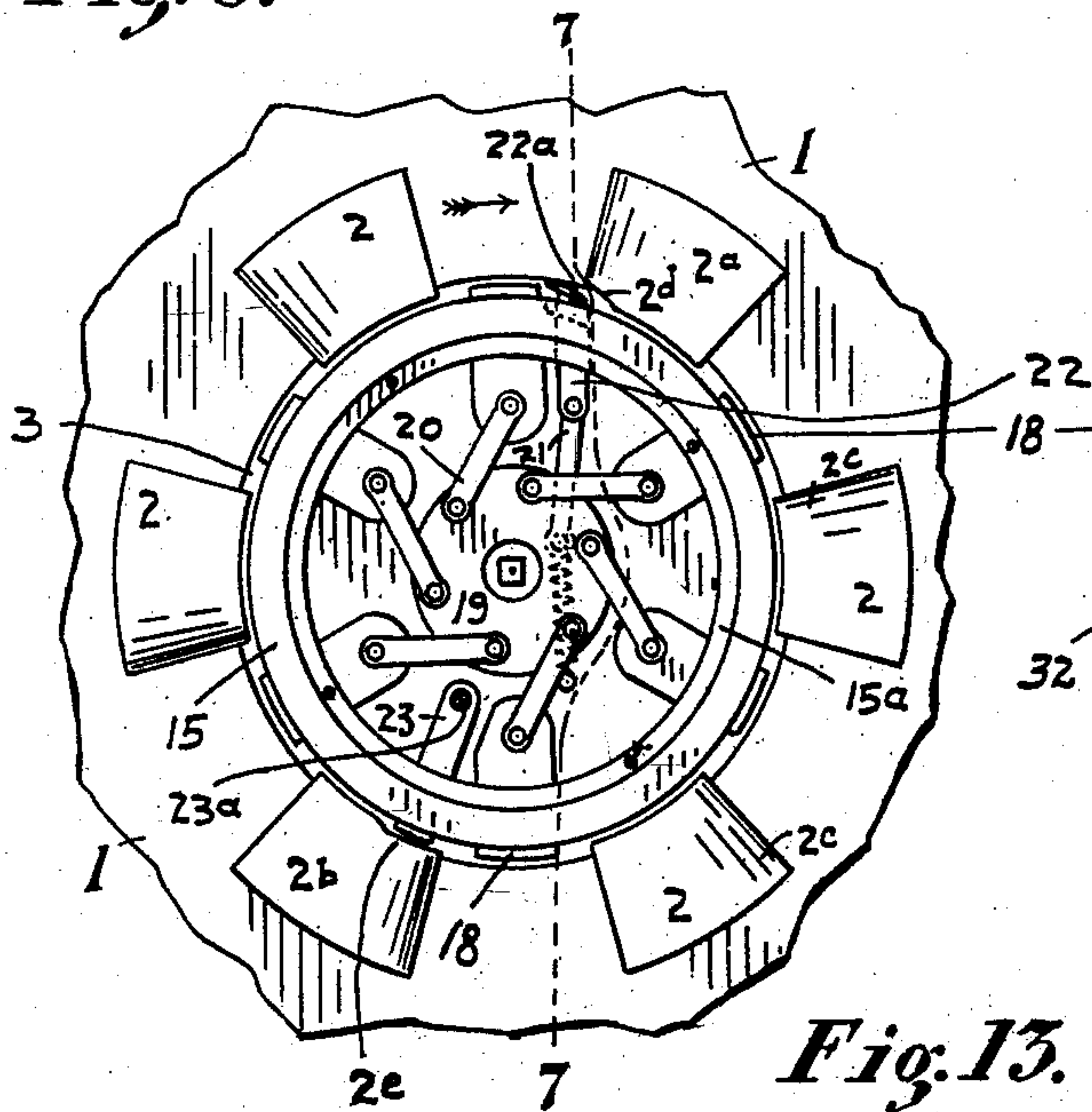
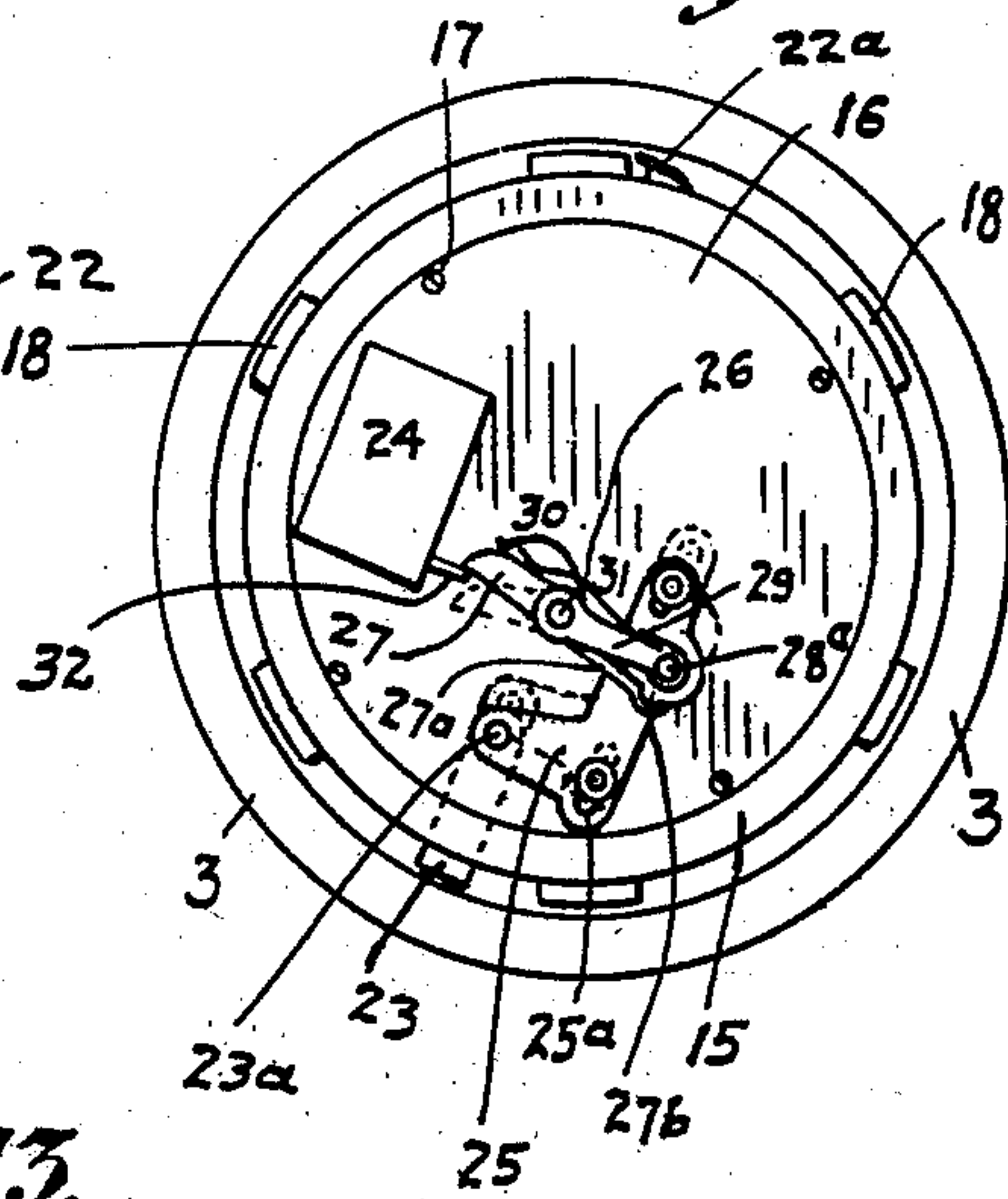
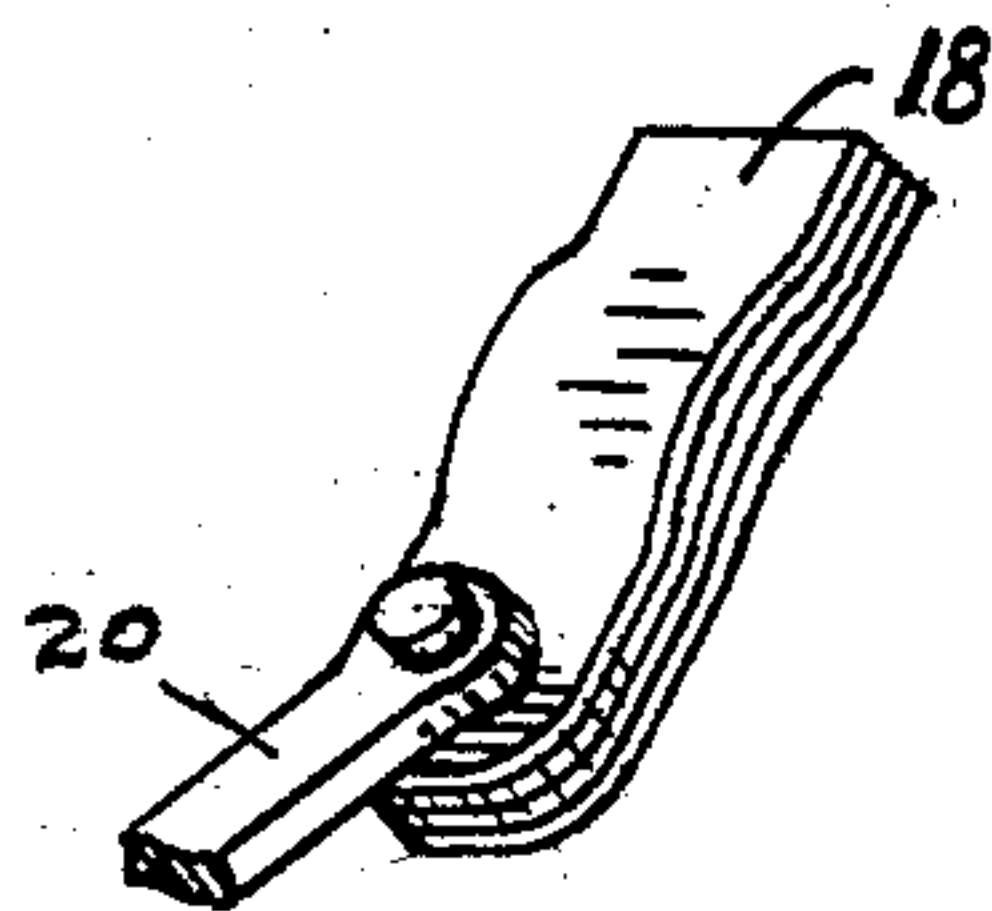
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**Fig. 6.****Fig. 5.****Fig. 13.**

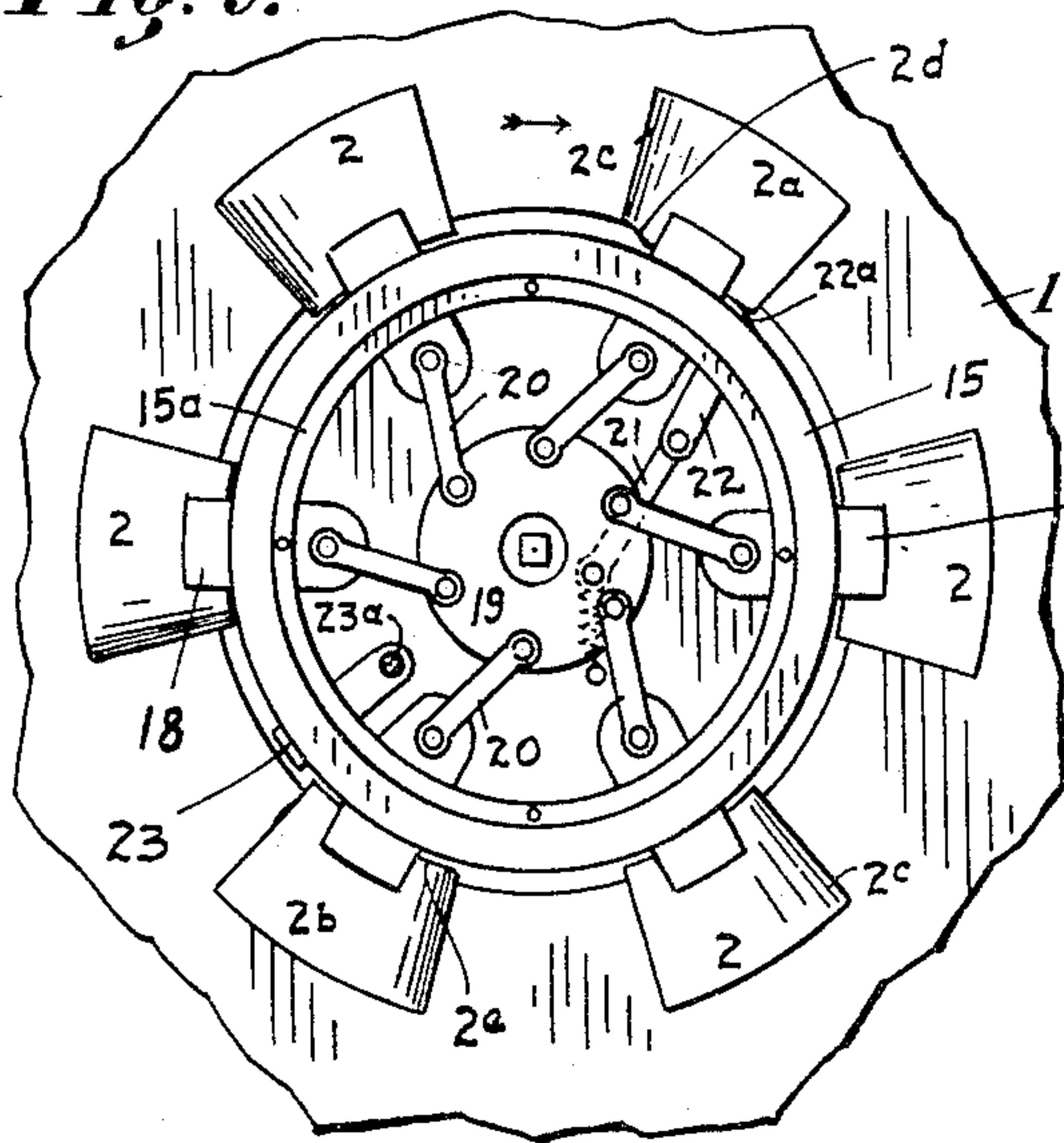
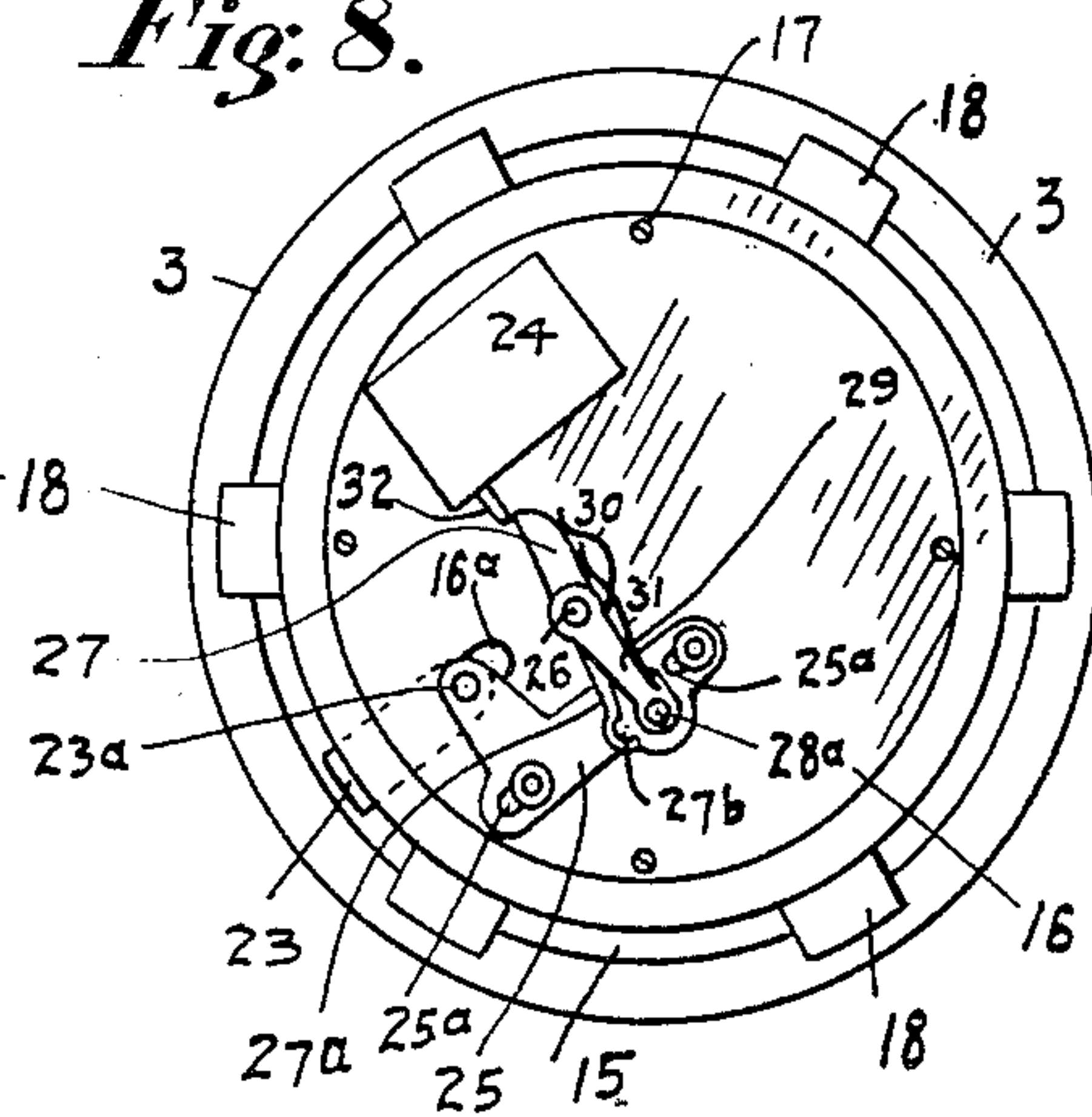
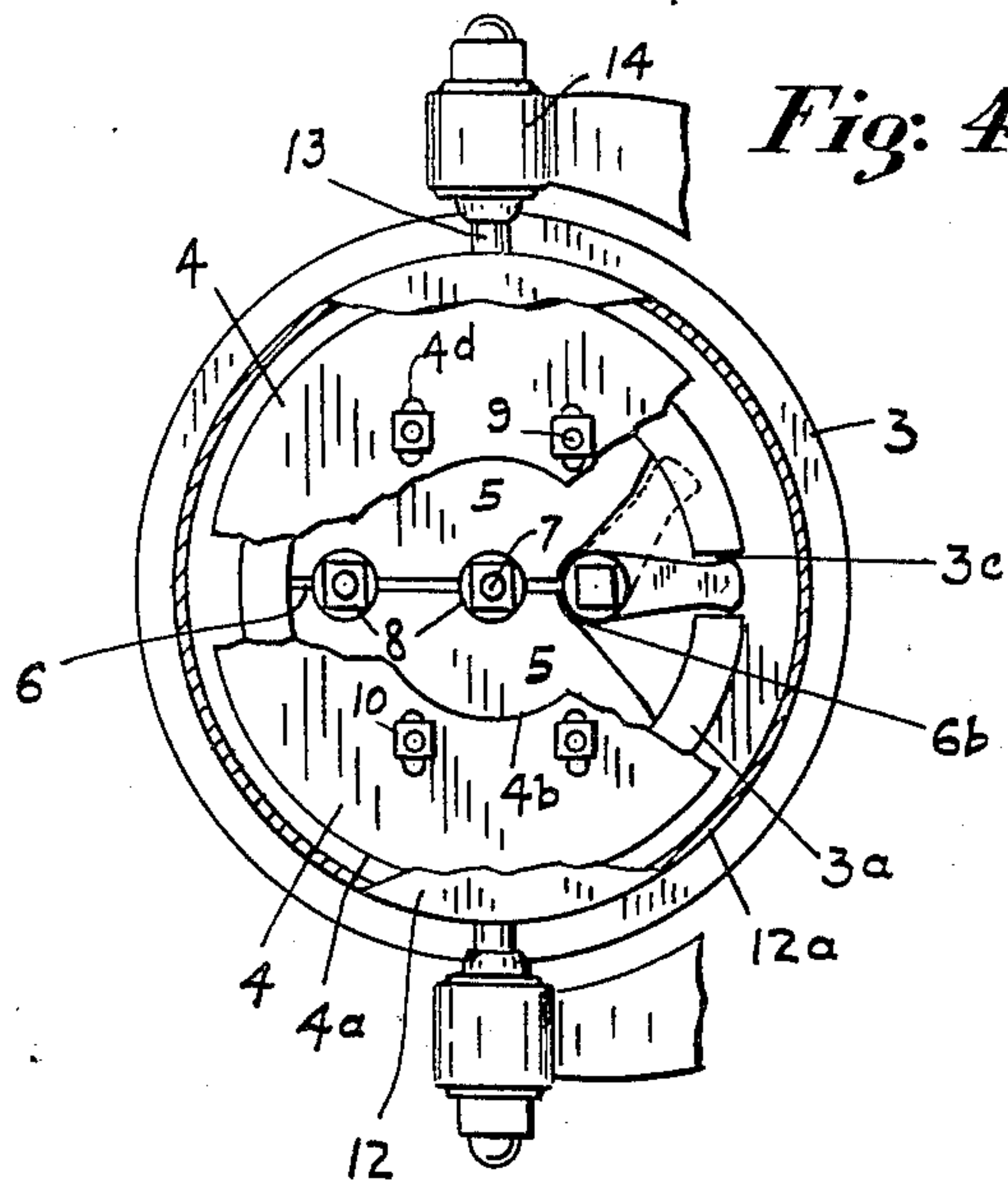
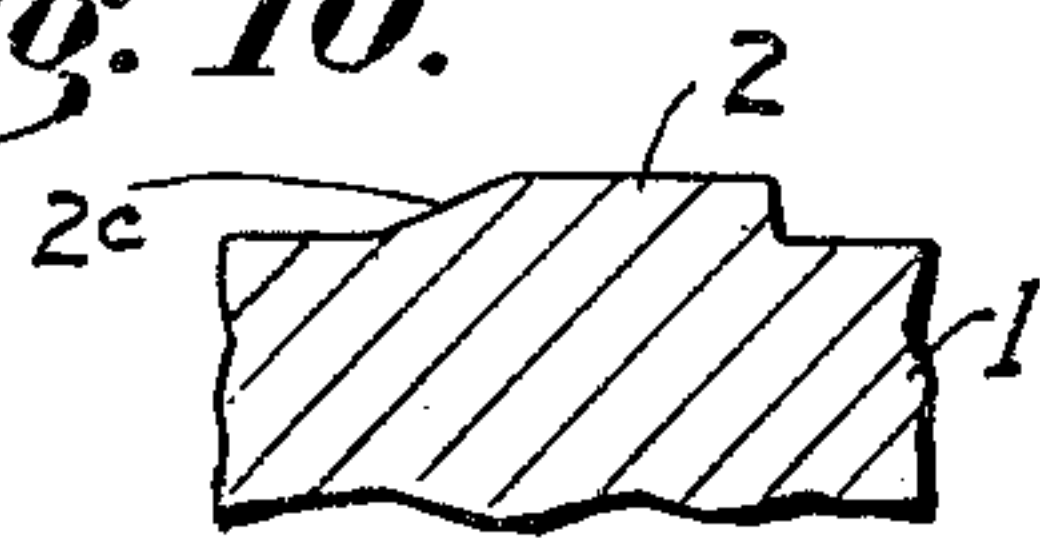
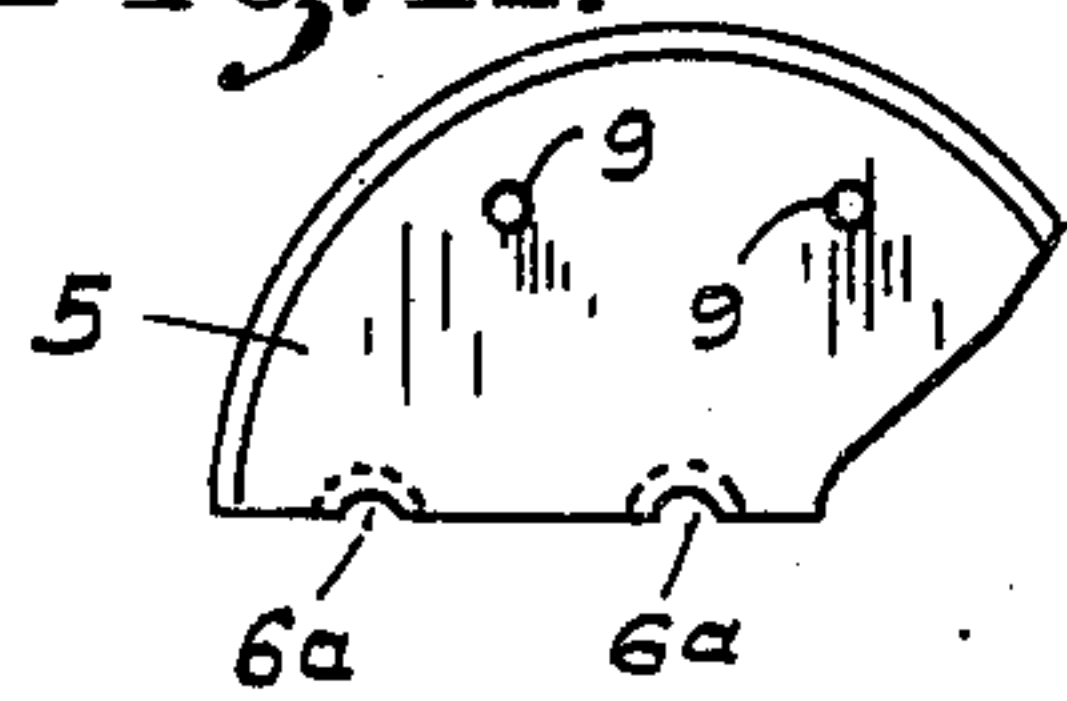
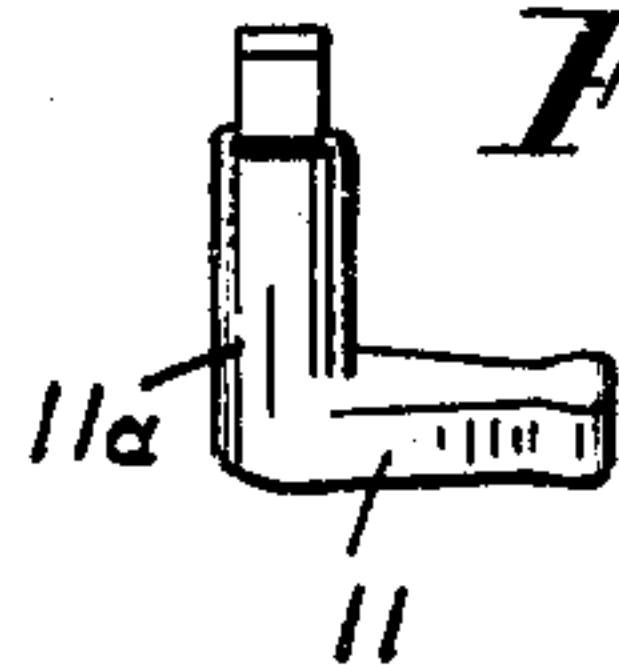
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Fig. 9.*Fig. 8.**Fig. 4.**Fig. 10.**Fig. 11.**Fig. 12.*

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UNITED STATES PATENT OFFICE.

CHARLES E. BLECHSCHMIDT, OF CONNERSVILLE, INDIANA.

SCREW-DOOR SAFE.

No. 894,180.

Specification of Letters Patent.

Patented July 28, 1908.

Application filed January 6, 1908. Serial No. 409,375.

To all whom it may concern:

Be it known that I, CHARLES E. BLECHSCHMIDT, a citizen of the United States, and residing at Connerville, in the county of Fayette and State of Indiana, have invented a new and useful Screw-Door Safe, of which the following is a specification.

This invention relates to locking devices for burglar-proof safes of the circular or screw-door type, and objects of the invention are to provide a safe of the kind referred to which will be certain and positive in operation, easy of manipulation and of simple, economical and effective construction.

The purposes and objects of my invention are accomplished by the mechanism described in this specification, illustrated in the accompanying drawings and pointed out in the claims.

Similar characters of reference refer to like parts in the drawings, in which—

Figure 1 is a front elevation; and Fig. 2 is a vertical central transverse sectional view of a safe equipped with my invention, the door being in closed position, but not locked. Fig. 3 is a front view of my improved safe-door and lock removed, the frontal portion of the cover-plate having been broken away. Fig. 4 is a similar view, the frontal portion of the cover-plate, and also portions of the support-collar being broken away. Fig. 5 is a rear view of the safe-door its parts being in the positions assumed while the door is unlocked. Fig. 6 is a similar view, the back-plate having been removed, and there being shown that portion of the safe-body surrounding the door. Fig. 7 is a transverse sectional view on the line 7—7 Fig. 6. Fig. 8 is a rear view of the safe-door its parts in the positions assumed while the door is locked. Fig. 9 is a similar view, the back-plate having been removed, and there being shown that portion of the safe-body surrounding the door. Fig. 10 is a detached sectional view of a portion of the safe-body and one of the lugs. Fig. 11 is a view of one of the support-plates removed. Fig. 12 is a view of the crank, and Fig. 13 is a detail view of one of the lock-bars detached.

1 designates a spherical metal safe of well known form, made of suitable and accepted metal such as manganese steel. Adjacent the rear edge of the cone-shaped door opening are the radially disposed lugs 2, 2^a and 2^b. These lugs are of substantial thickness and area, are formed integral with the safe-body

and project beyond the edge of the door-opening, as plainly shown in Fig. 6; each has its one side beveled on the line of a gradual incline whereby the wedge-face 2^c is formed, as shown in Fig. 10. The lug 2^a has the beveled corner 2^d, and the lug 2^b has the offset and bevel 2^e, the functions whereof will be presently referred to.

The safe-door body 3 is made of steel of proper hardness and quality, its peripheral face being finished so as to fit the opening therefor with the usual precision; on the front of the body 3 and formed integral therewith, and having its internal face 3^b beveled at an acute angle thereto, is the annular shoulder 3^a adapted to reside rotatably in the support-collar 4.

3^c designates an opening in the annular shoulder in which the arm of the crank removably resides.

The support-collar has the continuous annular flange 4^a. The function of the central aperture 4^b and the hole 4^c will presently be referred to.

5 designates semicircular support-plates machined so as to fit slidingly the shoulder 3^a. The form and construction of these support-plates, as shown in detail in Fig. 11, are such that when they have been inserted into position, there will be a clearance 6 between the plates. Each of the cone-shaped semicircular openings 6^a engage the cone-shaped base 7^b of the threaded adjusting-bolt 7 upon which is disposed the suitably flanged set-nut 8 the function of which is obvious and will be hereinafter referred to. The crank seat 6^b which is formed by the finished edges of the support-plates 5 and the frontal face of the door-body 3 will also be presently referred to.

9 designates the threaded studs which project from the front face of the support-plates, and through the vertical slots 4^d of the support collar and are provided with the nuts 10.

11 designates the crank, its shank 11^a being of such proper form and diameter as to move freely in the seat 6^b and the hole 4^c.

The cover-plate 12 having the angular flange 12^a forms a neat shield. The studs 13 of the crane 14 upon which the safe-door is swung in the usual way, pass through perforations therefor in the flanges of the cover-plate, and pivotally engage the support-collar, as shown in Fig. 7.

In assembling the parts just described, the support-plates 5 which are held temporarily

together by the adjusting bolts 7 are inserted into position as shown in the drawings, a wrench is then applied to the set-nuts 8 and the same are screwed down until the proper disposition of the support-plates into the shoulder 3^a has been obtained. Precise disposition and adjustment of the support-plates may at all times be accomplished by this means. The support-collar 4 is applied to the support-plates, the studs 9 being passed through the slots 4^d, and the shank of the crank which movably resides between the faces of the support-plates will extend through the hole 4^c, then the nuts 10 are screwed down and the support-collar tightened against the support-plates. The door is then free to move rotatably in said support-collar, as will be hereinafter referred to.

On the rear of and formed integrally with the door-body 3 and set in from the peripheral edge thereof a distance slightly greater than the length of the protruding ends of the lugs 2, is the annular wall 15. The internal annular offset 15^a is provided wherein the back-plate 16 resides and is secured by suitable screws 17, thus is formed a casement in which the working parts and lock-mechanism of my invention is contained. Radially disposed guide-slots are provided in the wall 15 spaced to correspond with the number and arrangement of the lugs 2. Slidingly disposed in these slots are the lock-bars 18. These lock-bars are each composed of a plurality of plates made of spring-steel and slightly bent as shown in Fig. 7 and Fig. 13. These plates are laid on each other and are of such general shape and form as to fill and to be held together by the guide-slots provided therefor in the wall 15, and are fastened together and pivotally connected to the connecting-rod 20 by a suitable bolt.

With lock-bars of the construction illustrated any explosive force exerted against the door to blow it open, causes the door to spring away from the door-opening a short distance against the resilient force of the lock-bars without shearing off or shattering the lock-bars so that they immediately spring back to normal position holding the door locked. Lock-bars of this character are specifically described and patented in Letters Patent of the United States numbered 863,584, dated August 20, 1907, granted to me.

19 designates a disk centrally and pivotally disposed, and pivotally connected to which are the connecting-bars 20 which are in like manner connected to the lock-bars 18, so that when the disk is rotated the lock-bars will be simultaneously moved. Slidingly seated in a guide-slot provided therefor in the wall 15 and pivotally connected to the disk 19, by the connecting-rod 21, is the push-bar 22. This push-bar 22 is formed with the beveled flat head 22^a and is so dis-

posed with reference to the position of the lock-bars that it will reside as shown in Fig. 6 so then when the door is swung into closed position the push-bar and the lock-bars will pass the interior edge of the door-opening with proper clearance.

19^a designates a coil-spring its one end being connected to the under side of the disk 19 by a suitable bolt, and the other end to a stud that is secured to the door-body 3 whereby the lock-bars will be retained in the position as shown in Fig. 6.

Slidingly seated in the suitable slot provided therefor in the wall 15, is the snap-bar 23 having its interior end adapted to be pivotally connected to a suitable mechanism that is secured to the back-plate 16, and which mechanism is controlled by a suitable time-lock device which is inclosed in the case 24, also secured to the back-plate.

A stud 23^a extends through the slot 16^a and is engaged by the member 25 that is slidingly secured on the back-plate. Mounted pivotally on a stud 26 therefor on the back-plate is the lever 27 having the arm 27^a and recess 27^b, which recess 27^b engages a stud 28^a rigidly secured to the member 25. The bar 29 is pivotally connected to the stud 26 and the stud 28^a. A coil-spring 30 which surrounds the stud 26 is so strained against the lever 27 that the arm 27^a will be pressed against the stud 28^a. The leaf-spring 31 which is secured to the arm 29 has its free bearing against the lever 27. Thus while the door is in position as swung open, or in closed position but not locked, the snap-bar 23 will be normally yieldingly sustained in the position as shown in Fig. 5 and Fig. 6, the distance it may be forced inwardly being measured by the length of the slots 25^a of the member 25.

My improved safe-door and lock and its parts when in normal position and in readiness for operation, appear as shown in Fig. 6, the door having been swung on the crane into closed position but not yet having been locked. The time-lock is set in the usual way, the trigger 32 engaging the lever 27, and holding it in the position as shown in Fig. 5 and Fig. 8. The usual throw-bar is applied to the crank 11 and rotated in the direction as shown by the arrow in Fig. 1 bringing the crank to the dotted line position shown in Fig. 4. The head of the crank 11 moves in the seat formed by the support-plates 5, and the bearing in the support-collar 4. In its movement in the direction as indicated by the arrow in Fig. 6, the head 22^a of the push-bar 22 engages the bevel face 2^d of the lugs 2^a, causing the movement of the push-bar inwardly and the lock-bars simultaneously outwardly, the lock-bars 18 then engage the wedge-faces 2^c and the door is irresistibly forced into metal-to-metal engagement with the door-opening; with the

full movement of the crank 11 the parts will have assumed the positions as seen in Fig. 9. The snap-bar having been raised by the bevel face 2° at the end of its travel over the lug 2^b returns to its normal position, and being behind the lug 2^b this snap-bar will prevent the reverse rotation of the safe-door until the pre-determined period during which the door should remain locked has passed; at which time the mechanism of the timer causes the trigger 32 to move and the lever 27 is released. By the strain of the spring 30 the arm 27^a is so forced to and sustained against the stud 28^a on the member 25 that the latter is raised and the snap-bar 23 is returned to its initial position as shown by the dotted line in Fig. 5. Thus I obtain by my invention a safe-door, and a lock wherein a positive and dependable action of all of its parts is accomplished and the door wedged into closed position without the use of the well known screw-thread parts or rings, which by reason of their having to be machine finished are made of metal of semi-hardness. Under stress of explosive pressure from within, the resilient lock-bars will permit the door to give slightly until the explosive force has spent itself, when the door will remain in its immovably closed position. Moreover the use of gears, pinions, screw-threads or other inherently weak details at places where any considerable strain may ever be exerted are wholly dispensed with, and there are no passages, apertures or parts that extend through the door-body, the advantages of which arrangement and construction are obvious.

When the period of time during which the door is to remain locked shall have expired, the snap-bar is lifted by the timer in the manner as hereinbefore described; and the rotating of the door by the usual throw bar, in the direction necessary to disengage the lock-bars from the lugs may be effected when desired. When it is the purpose to open the safe the throw-bar is applied in the usual way at the crank and the door is rotated in the direction opposite to that hereinbefore described, and is returned to the position as shown in Fig. 6. In this movement of the door the lock-bars gradually become disengaged from the rear sides of the lugs; the coil-spring 19^a being then free to act, a movement of the disk 19 is caused whereby the lock-bars are retracted. The positions of the parts then appear as shown in Fig. 6. The door is then in unlocked position and by swinging same free from the safe-door opening the safe is opened.

What I claim as my invention and desire to secure by Letters Patent of the United States, is—

1. The combination of a safe-body of the kind described provided with lugs on the interior thereof protruding beyond the

interior edge of the door-opening, with a door having radially disposed movable lock-bars arranged on the rear thereof and adapted to engage the rear side of said lugs when the said lock-bars are in projected position and the door is rotated, a device having connections with the lock-bars which when moved will project said lock bars, a member that is arranged to be engaged by one of the lugs when the door is moved rotatably, to move said device, and automatic means carried by the door to retract the lock-bars when they are disengaged from said lugs by the rotatable movement of the door in reverse direction.

2. In a safe of the kind described, the combination of a plurality of lugs each beveled on one side thereof and formed integrally about the interior edge of the door-opening, a crane-supported door adapted to be swung into and out of the door-opening, movable resilient lock-bars arranged on the rear of the door, a rotatable member having connections with said lock-bars so that when moved the lock-bars will be retracted or projected, a push-bar connected to said rotatable member and adapted to engage one of the lugs when the door is rotated, means carried on the door to normally sustain the lock-bars in retracted position, substantially as described.

3. The combination of a safe-body of the kind described, provided with lugs on the interior thereof protruding beyond the interior edge of the door-opening, with a door having radially disposed movable lock-bars arranged on the rear thereof, a device having connections with said lock-bars to operate the same, a push-bar connected to said device that when pushed will cause the lock-bars to project, there being an inclined edge on one of said lugs to engage said push-bar when the door is moved rotatably, and a spring to normally sustain the lock-bars and push-bar in retracted position.

4. The combination of a safe-body of the kind described, provided with lugs on the interior thereof protruding beyond the interior edge of the door opening, with a door having radially disposed movable lock-bars arranged on the rear thereof, a device having connections with said lock-bars, a push-bar to operate the same connected to said device that when pushed will cause the lock-bars to project, there being an inclined edge on one of said lugs to engage said push-bar when the door is moved rotatably, and a spring to normally sustain the lock-bars and push-bar in retracted position, a radially disposed snap-bar mounted on the rear of said door, strained outwardly by a spring and adapted to pass over and be deposited at the rear of one of the lugs when the door is rotated into locked position, a timer device to withdraw said snap-bar out of its projected position, substantially as described.

5. The combination of a safe-body provided with lugs on the interior thereof protruding beyond the interior edge of the door-opening, with a door having radially disposed movable lock-bars arranged on the rear thereof, a disk that is rotatably mounted and having connections with said lock-bars, a push-bar connected to the said disk that when pushed will cause the lock-bars to project, there being an inclined edge on one of said lugs to engage the said push-bar when the door is moved rotatably, a spring that is secured to said door and connected with said disk to normally sustain the lock-bars and push-bar in retracted position, a radially disposed snap-bar mounted on the rear of said door strained outwardly by a spring and adapted to pass over and be deposited at the angular side of one of the lugs when the door is rotated into locked position, and a timer-device to retract said snap-bar from its projected position, substantially as described.

6. In a safe having lugs on the interior thereof protruding beyond the interior edge of the door-opening including lugs each of which has its end beveled and the rear-sides of all of the said lugs being beveled, the combination with a door having radially disposed movable lock-bars, a rotatable disk mounted on the rear side of the door, members connecting said rotatable disk and the lock-bars, and a push-bar slidingly con-

nected to said rotatable disk and so disposed that when the door is rotated to its closed position the lock-bars will engage said lugs substantially as described, of a snap-bar slidingly secured on the rear of said door and disposed with its end adapted to be projected beyond the peripheral edge of said door, a member 25 slidingly mounted on the back-plate and having connection with the snap-bar and provided with the stud 28^a, a stud 26, a connecting-bar 29 pivotally secured to said stud 28^a and stud 26, a lever 27 pivoted on the stud 26 having the arm 27^a to engage the stud 28^a, a leaf-spring 31 secured on the connecting-bar 29 its free end impinged upon the lever 27, and a coil-spring 30 around the stud 26 having its one end secured and the free-end to impinge against the lever 27, whereby the snap-bar is sustained yieldingly in projected position when the spring 30 is resisted but which will be held in retracted position when the spring 30 is unresisted, and a timer-device to sustain the lever 27 against the strain of the spring 30, substantially as described.

In testimony whereof I sign my name to this specification in the presence of two subscribing witnesses.

CHARLES E. BLECHSCHMIDT.

Witnesses:

GEO. W. COLSON, Jr.,
THEO. P. GRAHAM.