

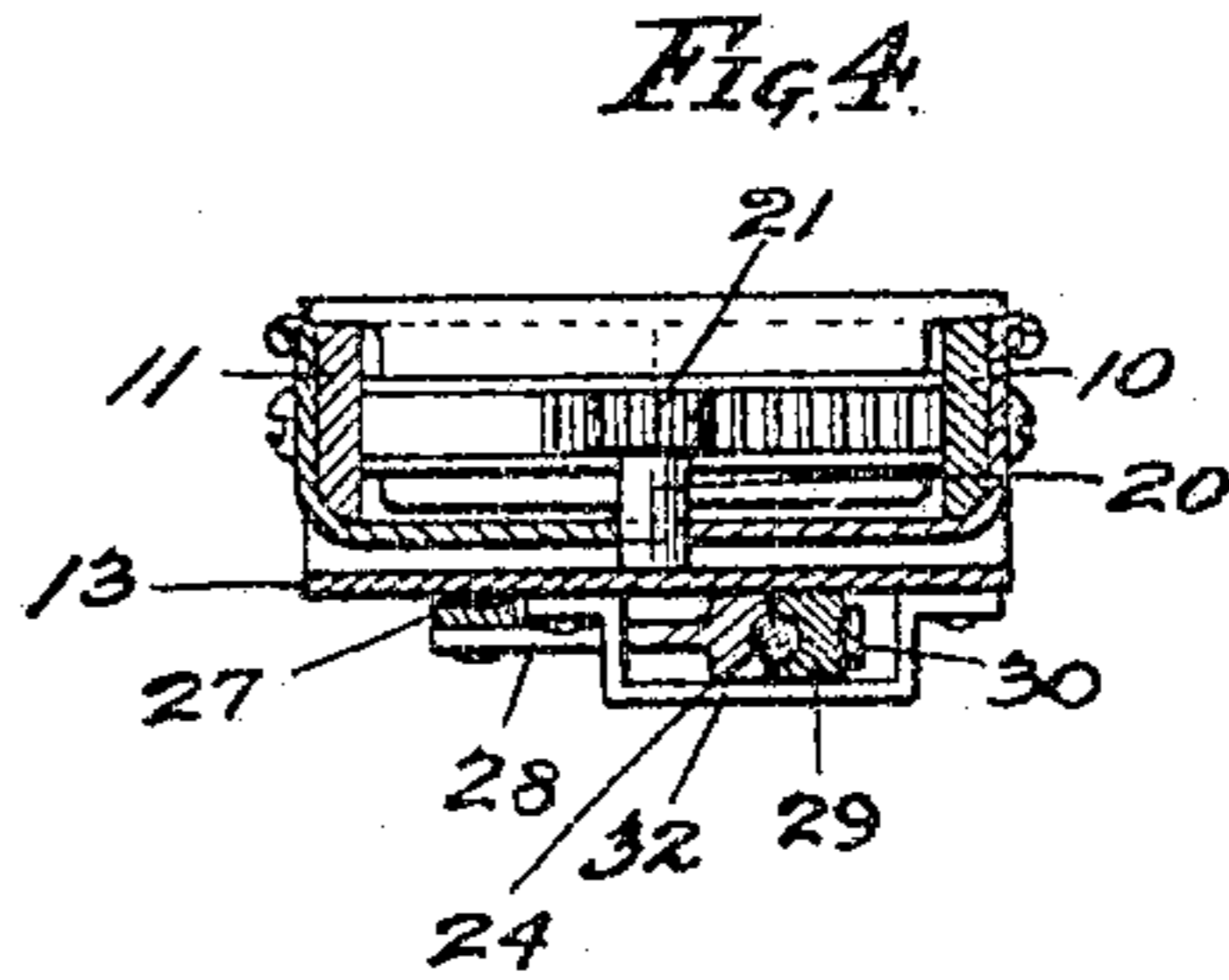
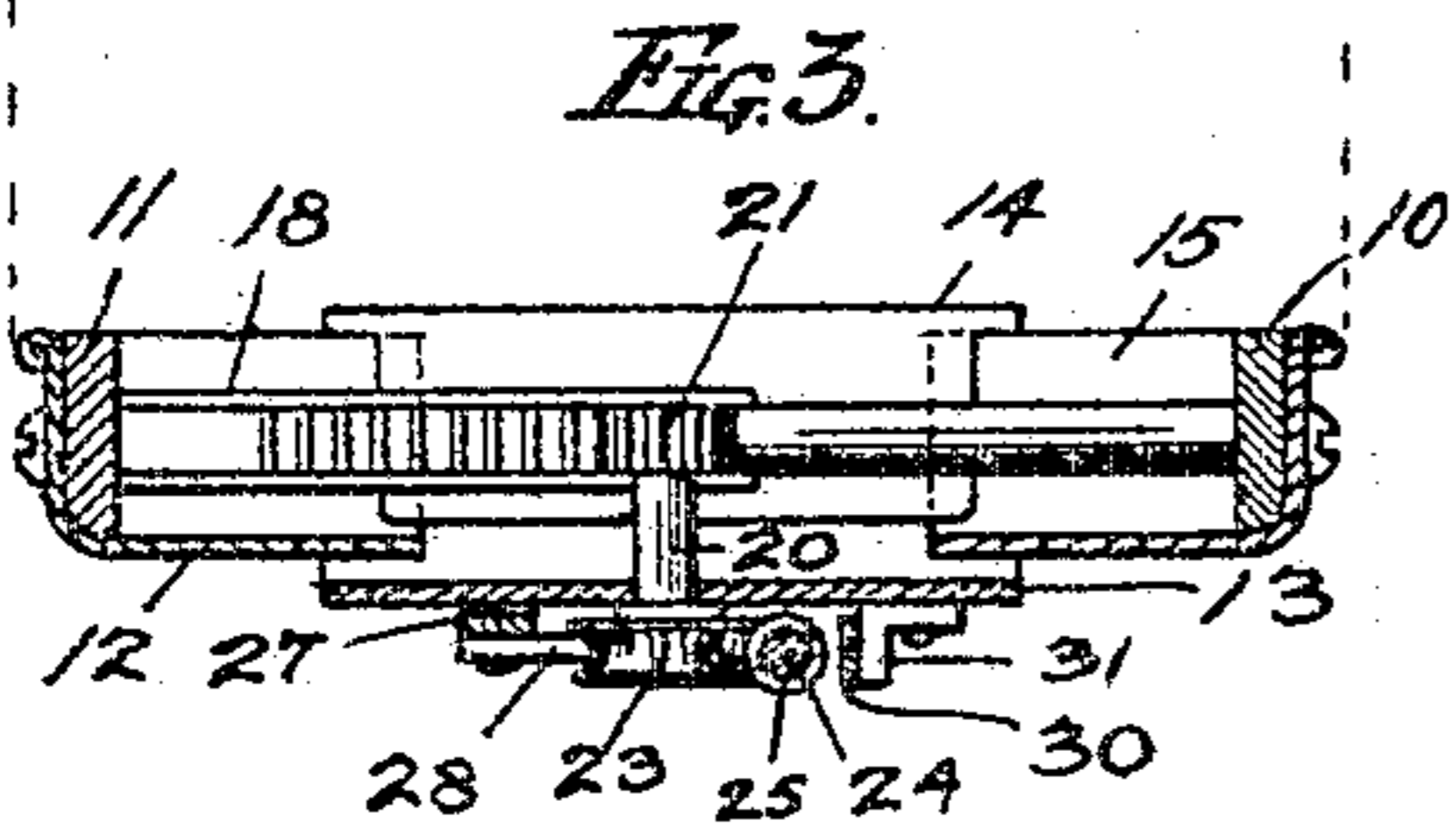
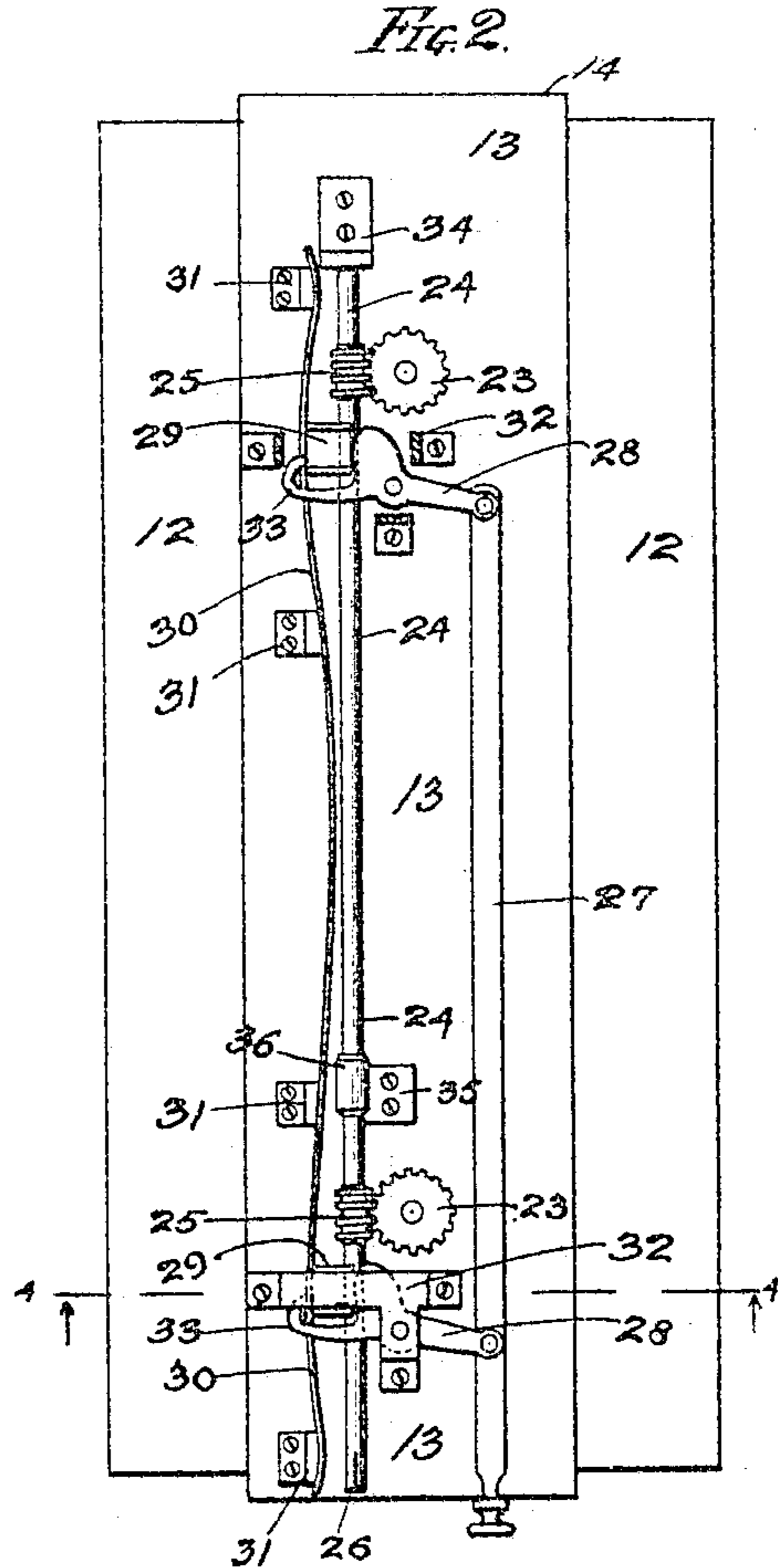
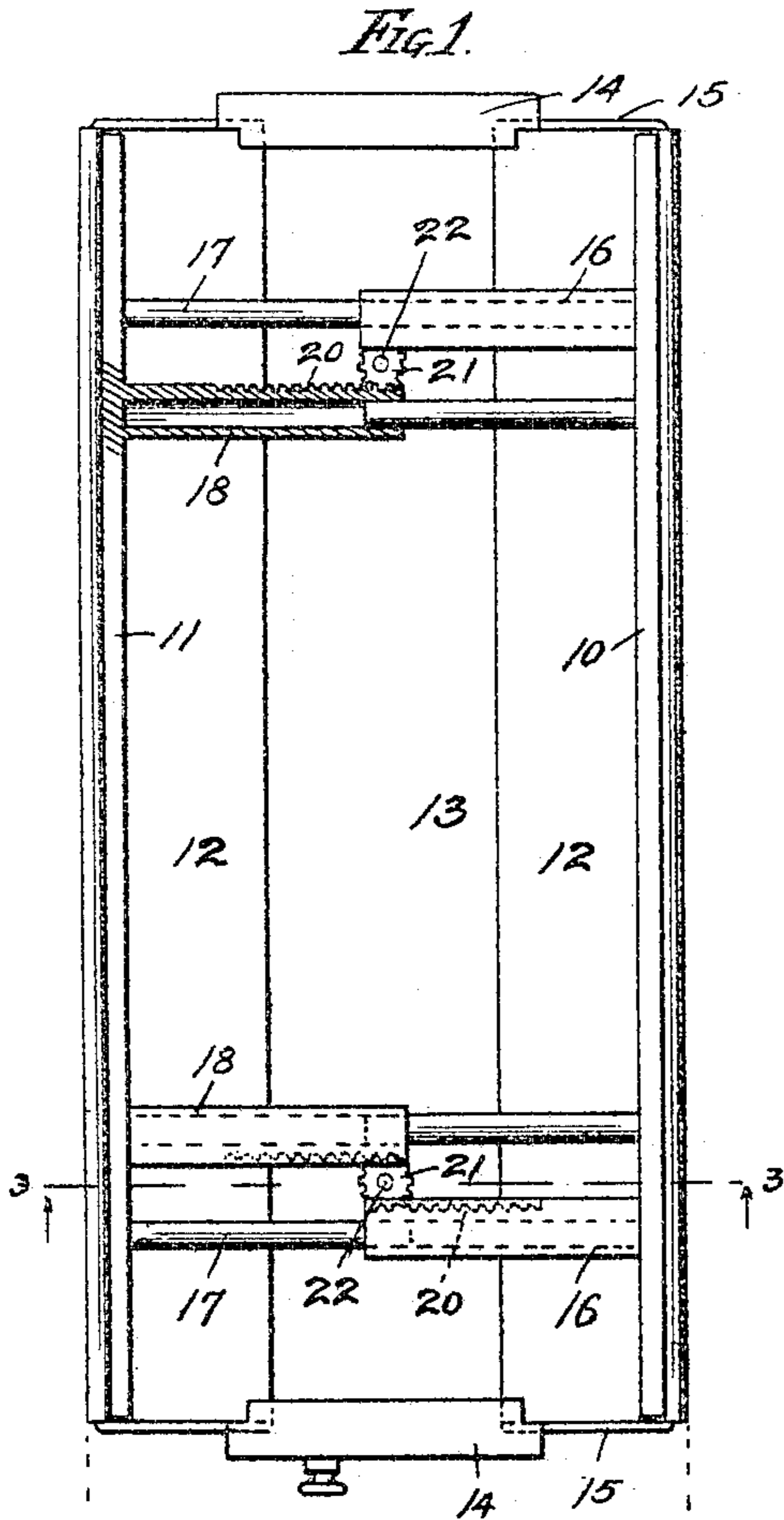
No. 775,057.

PATENTED NOV. 15, 1904.

G. F. WATT.
LOOSE LEAF BINDER.

APPLICATION FILED FEB. 3, 1902.

NO MODEL.



WITNESSES:
F. B. Townsend,
H. W. Munday,

INVENTOR.
George F. Watt.
BY
Munday, Watts & Adcock.
ATTORNEYS

UNITED STATES PATENT OFFICE.

GEORGE F. WATT, OF CHICAGO, ILLINOIS.

LOOSE-LEAF BINDER.

SPECIFICATION forming part of Letters Patent No. 775,057, dated November 15, 1904.

Application filed February 3, 1902. Serial No. 92,272. (No model.)

To all whom it may concern:

Be it known that I, GEORGE F. WATT, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Loose-Leaf Binders, of which the following is a specification.

This invention relates to the construction of the binders employed in loose-leaf ledgers and other similar books; and its main feature lies in the construction of the mechanism for locking the posts after expanding or contracting the covers.

The nature of the invention as well as its mode of operation will be fully understood from the accompanying drawings, in which—

Figure 1 is an inside view of the binder, showing it expanded and partly in section. Fig. 2 is an outside view. Fig. 3 is a section on the line 3 3 of Fig. 1, and Fig. 4 is a section on the line 4 4 of Fig. 2.

My invention as shown in the drawings is applicable to what is known as a "three-piece-back" binder—that is to say, it embodies the clamping-bars 10 and 11, to which the covers (not shown) are hinged, each bar being provided with an overhanging flange 12, forming part of the back of the book, and a plate 13, covering the open space between the flanges 12 and lapping over them. This plate 13 forms a support for the devices, by which the clamping-bars are locked together, and at its ends it is bent at right angles, as at 14, and extended around the end flanges 15 of the clamping-bars. The flanges 12 and 15 are preferably of metal secured to the bars.

The posts upon which the paper is threaded are four in number, and each is composed of a male and a female section adapted to telescope and permit the clamping-bars to approach each other to the extent necessary to cause pressure upon the contents. In the case of the outer posts the female sections 16 are attached to the same bar, in this instance to bar 10, and their opposing male sections (shown at 17) to the other bar and in this instance bar 11. The female sections 18 of the inner posts are also both attached to the same bar—as, for instance, to bar 11—and the male

sections of the same posts are both attached to the opposing bar, which in the construction shown is bar 10. With this number of posts and this construction all the leaves will be uniformly positioned, because all will be bearing against either the female section 16 or 18, and both pairs of those sections are adapted to hold the leaves upon them in identical positions.

The female post-sections 16 and 18 are provided with racks 20 on their proximate sides, and between each pair of them is located a pinion 21, meshing with the racks of both sections and mounted upon shafts 22, having bearings in the plate 13. The pinions are free to revolve whenever the post-sections 16 and 18 move in opposite directions and carry the clamping-bars toward or away from each other. The pinions are locked normally so they are unable to turn or relieve the clamping pressure upon the contents of the book, and this locking is caused by providing the shafts 22 with worm-pinions 23, arranging a worm-shaft 24 with worms 25 longitudinally of plate 13, the pinions 23 coming in mesh with the worms 25. The pinion-shafts may be actuated in either direction by this worm-shaft, which is squared at its lower end, as at 26, to receive a key for turning it. Ordinarily, however, when expanding or contracting the covers I prefer to release the lock upon the pinions 21, and this I accomplish by any suitable means adapted to move the locking worm-shaft out of mesh with the worm-pinions. These means may consist of a push-bar 27, extending to the outside, where it can be operated by hand, and a couple of pivoted elbow-levers 28, each having one arm attached to the push-bar and the other arm bearing on the side of the shaft.

When the user pushes on the knob of the push-bar, he actuates the levers in a direction which forces the shaft away from the worm-pinions and destroys the mesh between them and the worms on the shaft, so that the user is then free to expand the book as much as desired. After the changes in the leaves have been made the covers can be forced together and again locked by the reengagement of the

worms and worm-pinions, and this reengagement is preferably made automatically, and a suitable construction is the following: The shaft is given no fixed bearings, but is held
 5 between the levers 28, which are shaped to conform to the shaft on one side and movable bearing-blocks 29 upon the opposite side of the shaft, such blocks being held in contact with the shaft by a spring 30, having
 10 abutments 31 for keeping it in acting position. Clips 32 pass over the blocks 29 and hold them against the plate 13, and the levers 28 are also preferably provided with hook-shaped arms 33, the points of which extend
 15 over the spring and bear against it on its back side. These arms are therefore calculated to maintain constant contact between the springs and blocks. With this construction the spring constantly presses the shaft against the
 20 worm-pinions, and after the shaft has been forced out of mesh by the operation of the push-bar and elbow-levers it will be returned automatically into mesh by the spring as soon as the push-bar is released, the levers and bar
 25 being returned to normal positions at the same time.

The worm-shaft is held against longitudinal movement in one direction by the stop 34 at its end and in the other direction by the stop
 30 35 and the shoulder 36 on the shaft. The stop 35 may be formed of sheet metal with one edge bent into tubular form, so as to inclose the shaft, and the shoulder 36 is formed on the shaft where it will bear against the
 35 bent-over part of the stop and prevent any longitudinal movement by the shaft in the opposite direction from that prevented by the stop 34.

The two posts at the top of the book are located as close together as the pinion 21 will permit, and the openings in the leaves are made large enough to encircle both, and the same is true of the two posts at the bottom of the book.

45 I claim—

1. The combination with the clamping-bars, the telescoping rack-carrying posts and the pinion meshing with the racks, of a worm-pinion rigid with the rack-pinion and a worm
 50 normally in mesh with said worm-pinion and locking the rack-pinion but separable therefrom so as to release the locking, and means for causing such separation at will, substantially as specified.

55 2. The combination with the clamping-bars and the telescoping posts provided with racks on their proximate sides, a pinion between the posts meshing with said racks, a worm-pinion on the shaft with said rack-pinion, a worm
 60 meshing with said worm-pinion and locking the latter, and means for moving the worm out of mesh while expanding or contracting the book, substantially as specified.

65 3. The combination with the clamping-bars, the telescoping rack-carrying posts and the

pinion meshing with the racks, of a worm-pinion rigid with the rack-pinion and a worm normally in mesh with said worm-pinion and locking the rack-pinion but separable therefrom so as to release the locking, means for
 70 causing such separation, and means for returning the parts into mesh, substantially as specified.

4. The combination with the clamping-bars, the telescoping rack-carrying posts and the
 75 pinion meshing with the racks, of a worm-pinion rigid with the rack-pinion and a worm normally in mesh with said worm-pinion and locking the rack-pinion, but separable therefrom so as to release the locking, a hand-operated device for causing such separation and
 80 a spring for returning the parts into mesh, substantially as specified.

5. The combination with the clamping-bars and the rack-carrying telescoping posts arranged in pairs, pinions meshing with the
 85 post-racks, worm-pinions on the same shafts with the rack-pinions, a worm-shaft having worms meshing with said worm-pinions, movable devices for holding said shaft, means for
 90 moving the shaft so as to carry the worms out of mesh, and a spring for returning the shaft, substantially as specified.

6. The combination with the clamping-bars, the telescoping rack-carrying posts arranged
 95 in pairs, pinions meshing with the racks upon the posts, worm-pinions rigid with the rack-pinions, and worms in mesh with the worm-pinions, said worms being on the same shaft and the shaft being movable to carry the
 100 worms into and out of mesh, and means for moving said shaft, substantially as specified.

7. The combination with the clamping-bars, the telescoping rack-carrying posts arranged
 105 in pairs, pinions meshing with the racks upon the posts, worm-pinions rigid with the rack-pinions, and worms in mesh with the worm-pinions, said worms being on the same shaft and the shaft being movable to carry the
 110 worms into and out of mesh, means for moving said shaft to destroy the mesh of the worms, and automatic means for returning the shaft, substantially as specified.

8. The combination with the clamping-bars, the telescoping rack-carrying posts arranged
 115 in pairs, pinions meshing with the racks upon the posts, worm-pinions rigid with the rack-pinions, and worms in mesh with the worm-pinions, said worms being on the same shaft, and the shaft being movably supported between levers 28 and opposing spring-pressed
 120 blocks 29, and said levers acting to move the shaft and destroy the mesh of the worms, substantially as specified.

9. The combination with the clamping-bars
 125 and posts of a loose-leaf ledger, of racks and pinions whereby the posts are moved to clamp and release the contents, a shaft extending longitudinally of the clamping-bars and carrying worms for controlling said pinions, and
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means at the end of said worm-shaft whereby it may be actuated.

10. The combination with the posts of a loose-leaf ledger arranged in pairs, of racks
5 on the posts, pinions meshing with the racks and operating the posts, worms and worm-pinions for locking the rack-pinions, and

means for disengaging the worms and worm-pinions, substantially as specified.

GEORGE F. WATT.

Witnesses:

GERTRUDE WATT,
H. M. MUNDAY.