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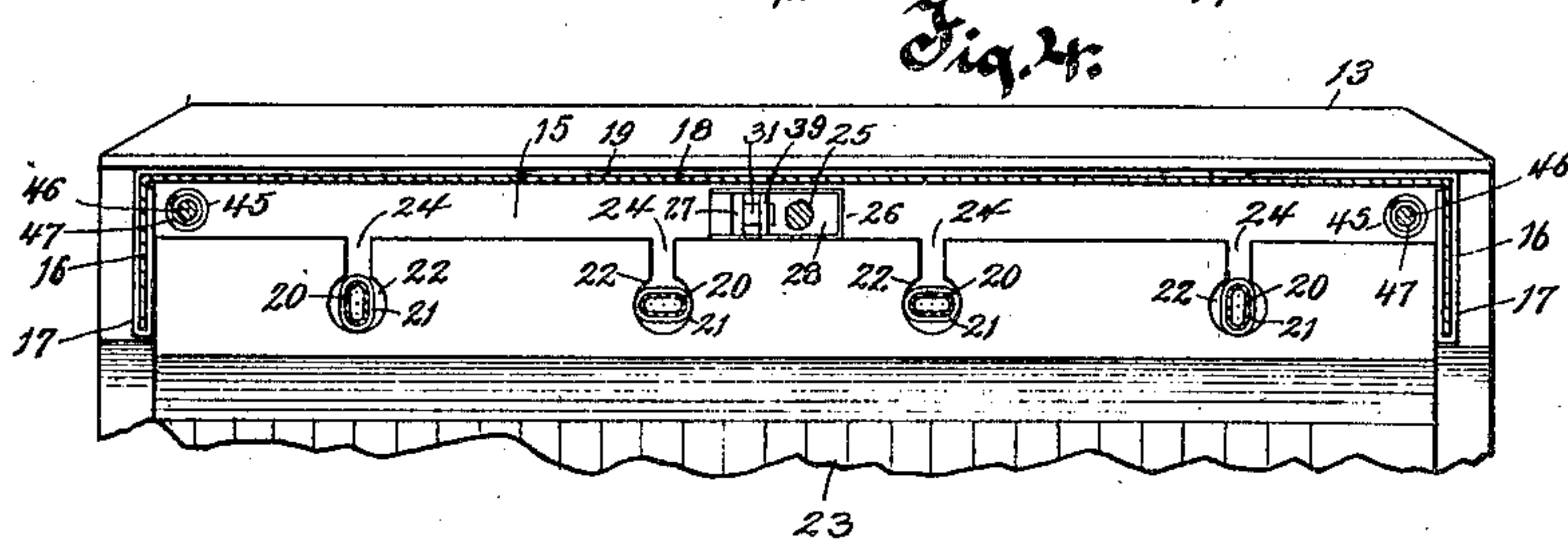
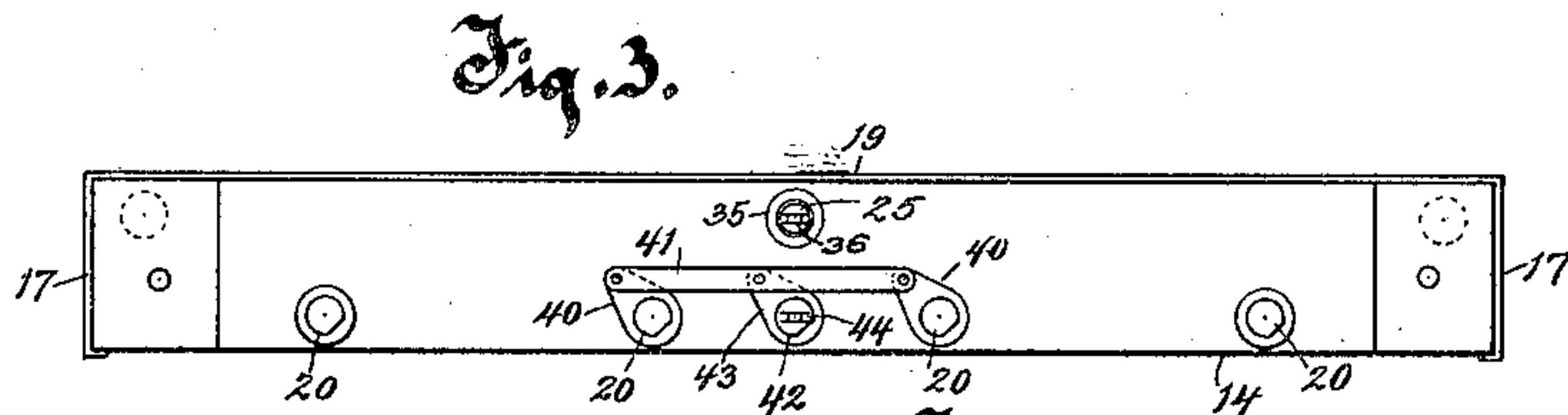
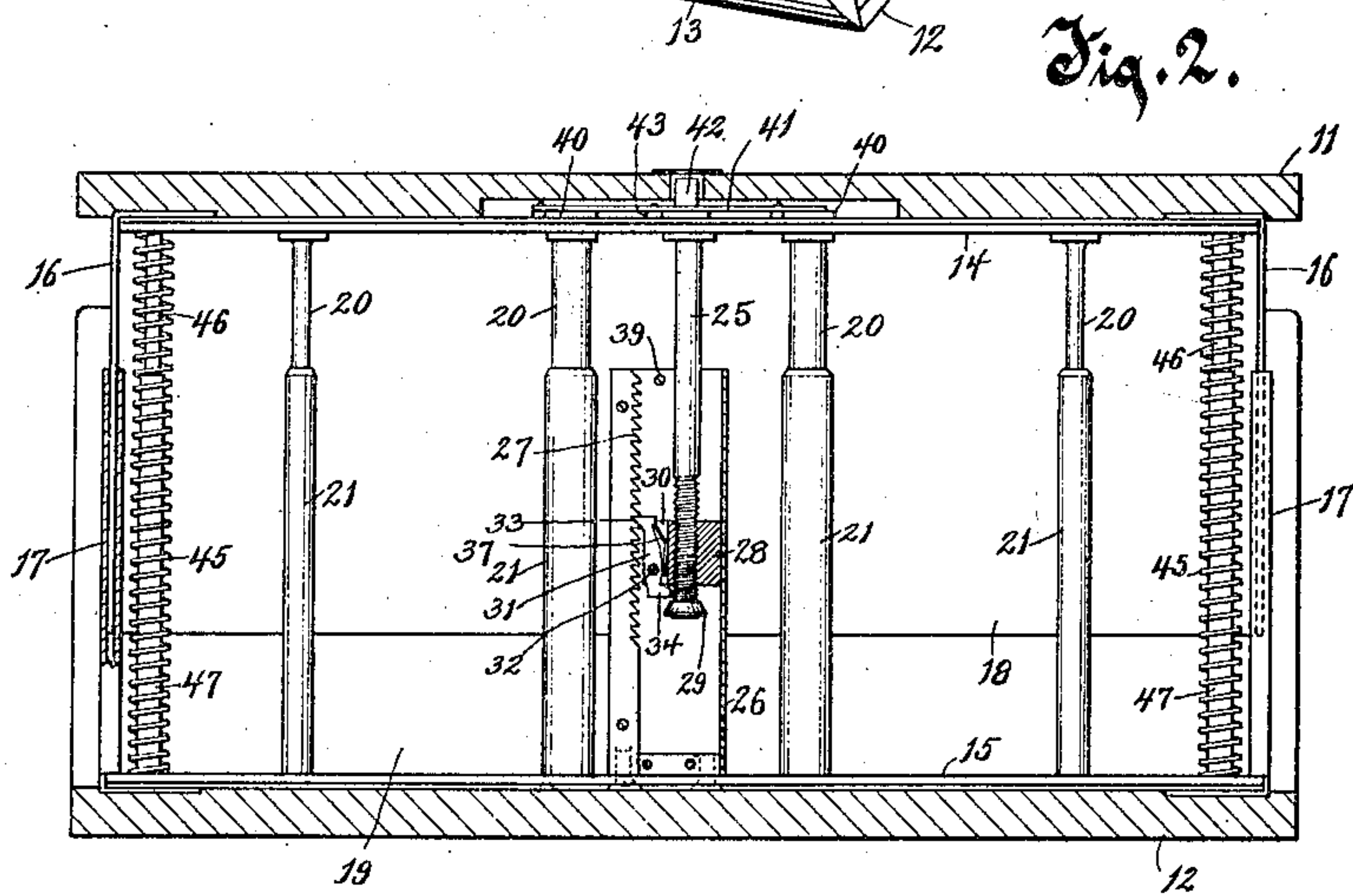
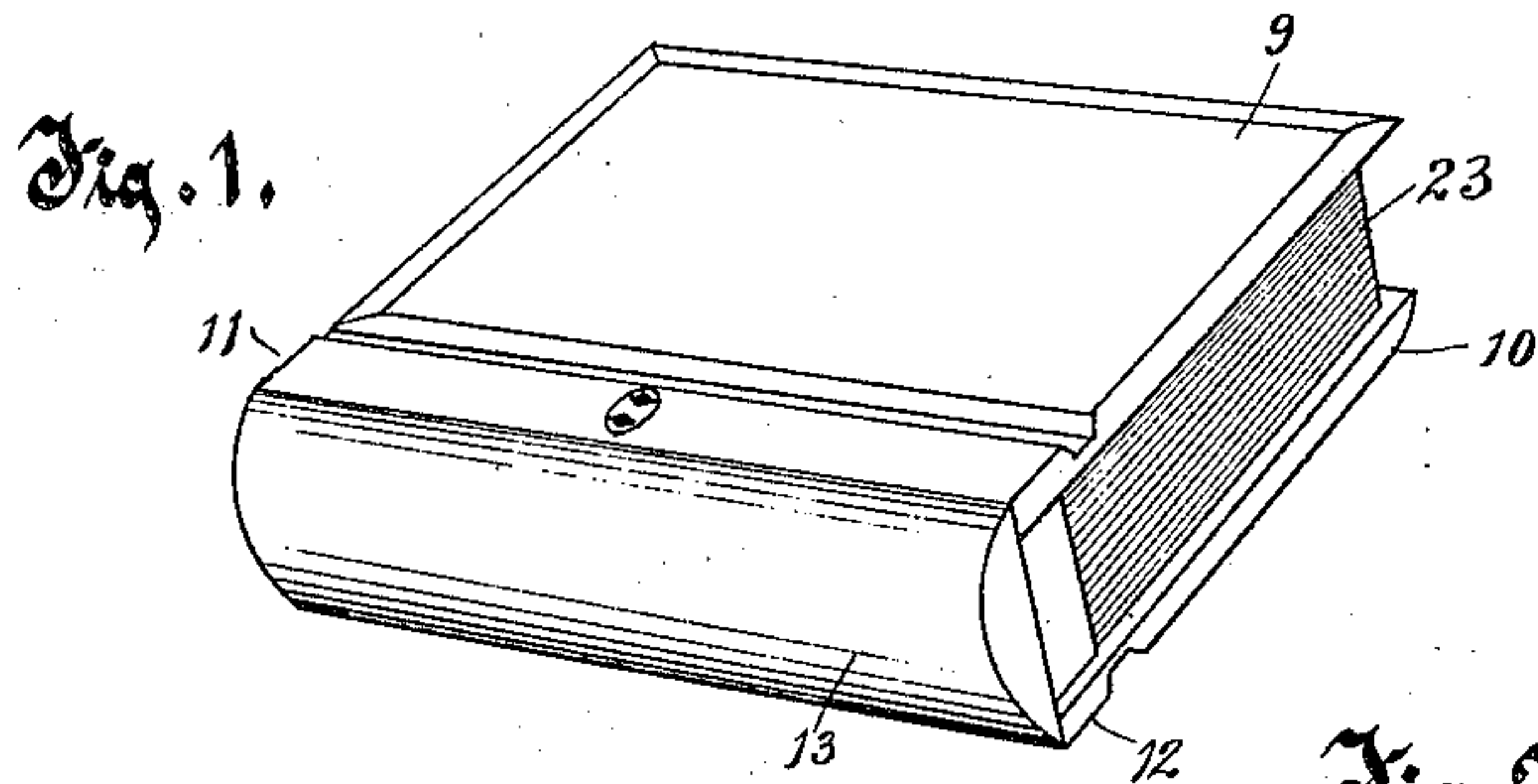
PATENTED SEPT. 20, 1904.

H. C. MILLER.
LOOSE LEAF BOOK.

APPLICATION FILED JAN. 5, 1904.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses:
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Anna F. Schmidtbauer

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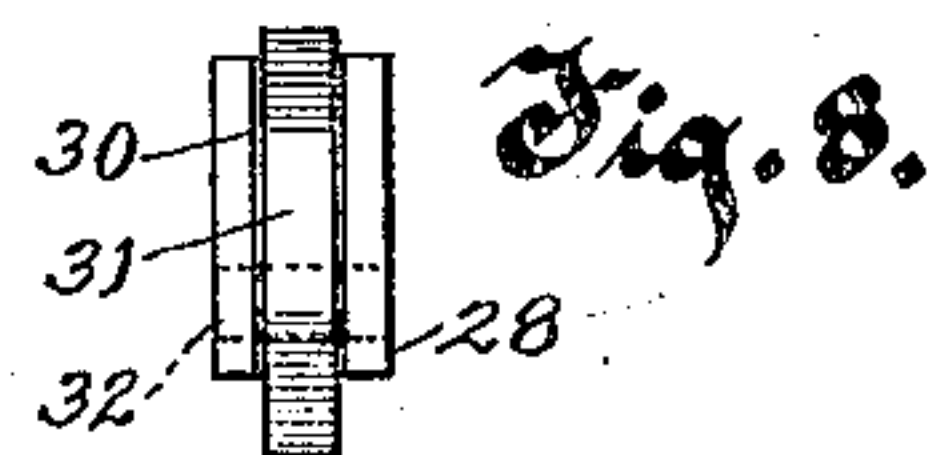
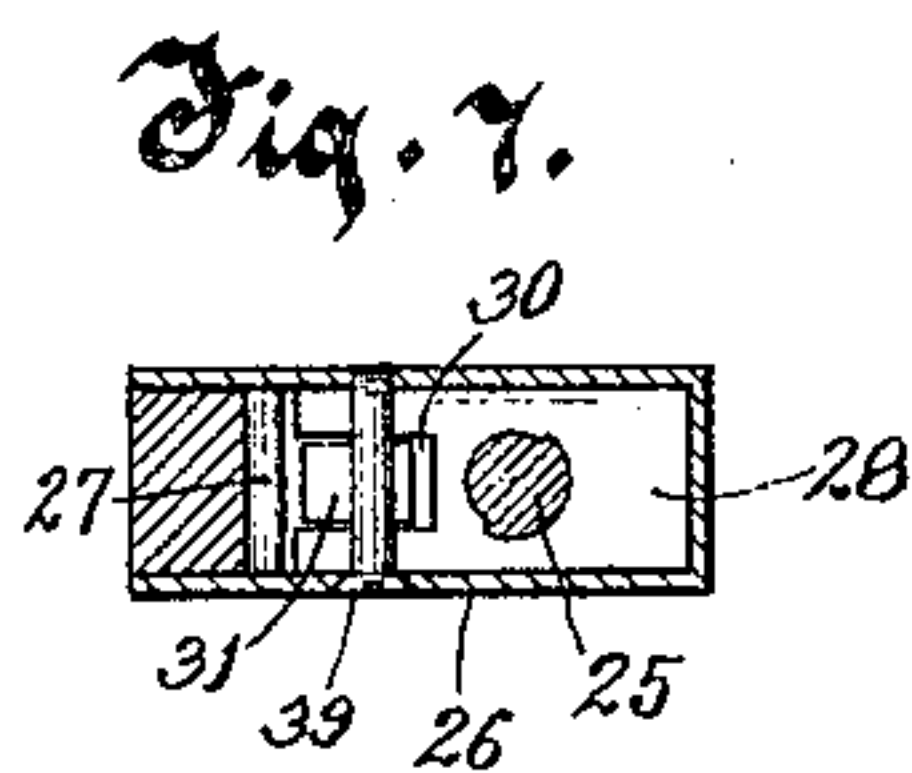
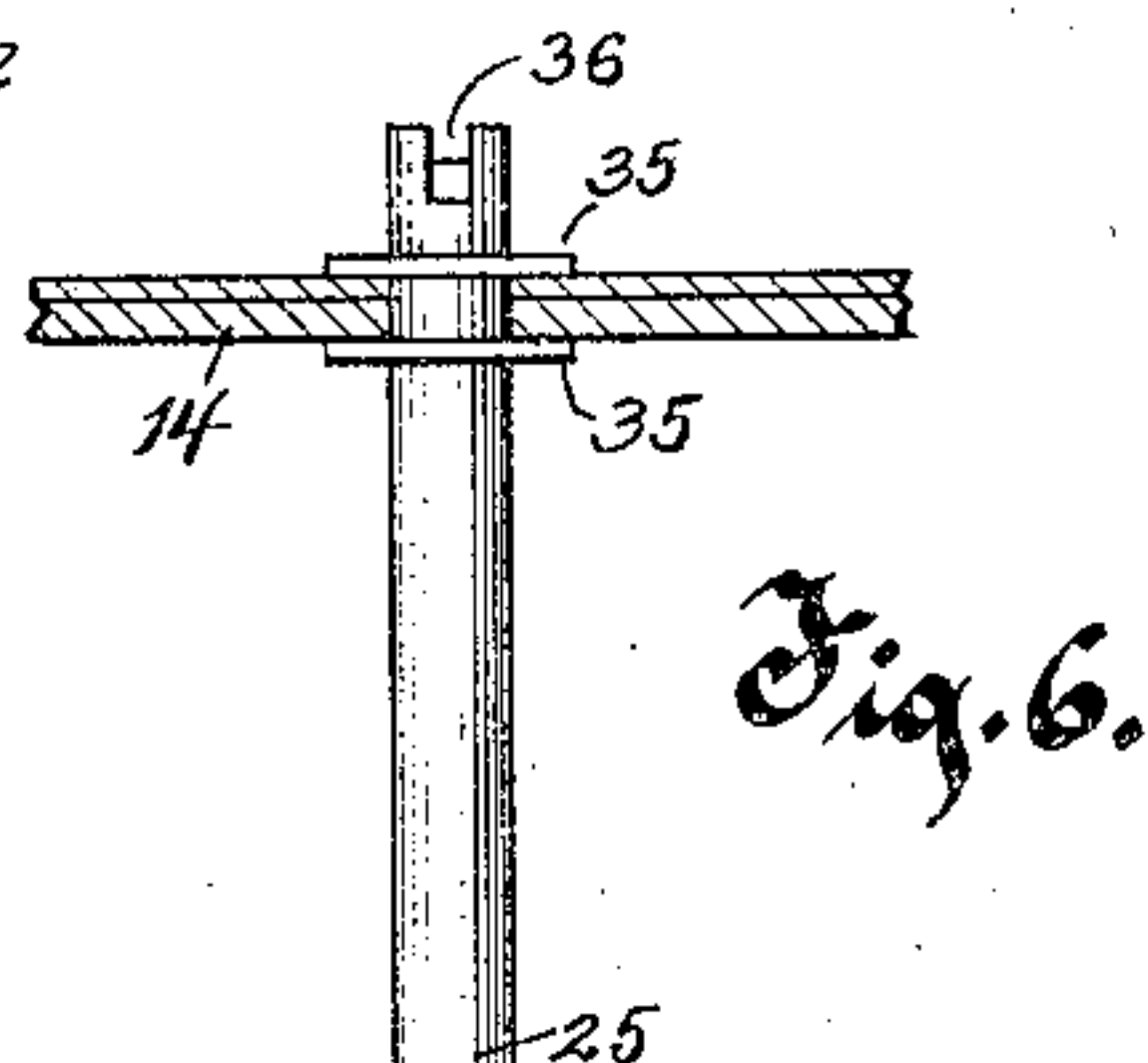
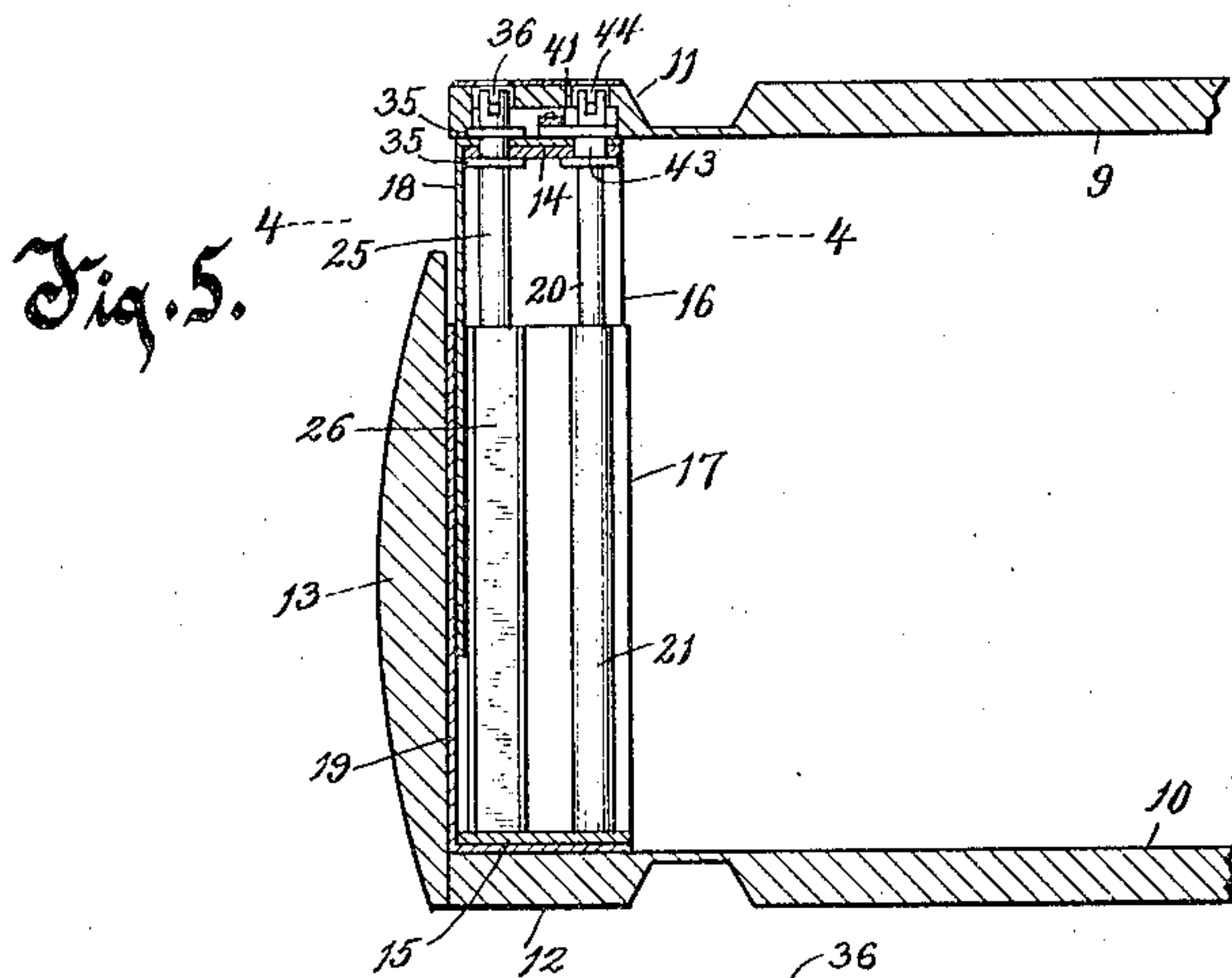
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NO MODEL.

2 SHEETS—SHEET 2.



Witnesses.

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UNITED STATES PATENT OFFICE.

HENRY C. MILLER, OF MILWAUKEE, WISCONSIN, ASSIGNOR TO H. C. MILLER & COMPANY, OF MILWAUKEE, WISCONSIN, A CORPORATION OF WISCONSIN.

LOOSE-LEAF BOOK.

SPECIFICATION forming part of Letters Patent No. 770,379, dated September 20, 1904.

Application filed January 5, 1904. Serial No. 187,776. (No model.)

To all whom it may concern:

Be it known that I, HENRY C. MILLER, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented a new and useful Improvement in Loose-Leaf Books, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

My invention has relation to improvements in loose-leaf books.

In loose-leaf books or ledgers provision is usually made for locking the covers between which the removable leaves are disposed at such distances apart as to accommodate the particular number of leaves which are adjusted between the covers at various times during the use of the book. In some forms of loose-leaf books this locking means consists of a ratchet-and-pawl arrangement comprising a turnable ratcheted bar adapted to telescopically fit a bored-out post, said post provided with a dog which when the ratcheted bar is turned in one direction and to a certain extent is adapted to engage the teeth of said bar, and thereby hold the covers a distance apart, but permitting said covers to separate when the bar is turned so as to bring the teeth thereof out of engagement with the dog. This form of locking means has been found in practice to be open to objection, inasmuch as it is always desirable that the cover-pieces should be brought down firmly against the leaves between said cover-pieces, and as hand-pressure in such constructions must be relied upon to accomplish this it has been found impossible to obtain a sufficient compression in that manner.

It is therefore the primary object of my invention to obtain the desired compression by an improved mechanical means; and with this end in view the invention consists of the devices and parts or their equivalents, as hereinafter more fully pointed out.

In the accompanying drawings, Figure 1 is a perspective view of a loose-leaf book or ledger embodying my improvements. Fig. 2 is a section transversely of the rear portion of the book or ledger. Fig. 3 is a plan view

of the means for simultaneously turning a plurality of the telescoping binder-posts. Fig. 4 is a section on the line 4 4 of Fig. 5. Fig. 5 is a central longitudinal section through a fragment of the ledger. Fig. 6 is a detail view of the locking means and the mechanical compression means. Fig. 7 is a horizontal section of Fig. 6 on the line 7 7 of said figure, and Fig. 8 is a detail view of the nut and the locking-dog carried thereby.

Referring to the drawings, the numerals 9 and 10 indicate the pieces constituting the cover of the ledger, and 11 and 12, respectively, the rear binding-pieces, which are hinged in the usual manner to the cover-pieces. The binding-piece 12 is provided with an upwardly-extending back piece 13. Within the rear binding-pieces are arranged upper and lower longitudinal strips 14 and 15, respectively, which strips are preferably of metal. The strips may be provided, respectively, with upwardly-extending end pieces, the end pieces 16 16 of the strip 14 fitting and telescoping in the tubular end pieces 17 17 of the strip 15. These longitudinal strips 14 and 15 may also be provided, respectively, with back pieces 18 and 19, which are fitted slidably together and lie inside of the back piece 13 of the binding-piece 12.

The strip 14 has depending therefrom a series of binder-post sections 20, which telescopically fit a series of tubular post-sections 21, extending upwardly from the strip 15. I prefer to employ post-sections of such shape as to have a greater width in one direction than in the other, as most clearly shown in Fig. 4. These binder-posts are adapted to extend through openings 22 in the leaves 23, which are adjusted between the cover-sections. From the openings 22 of the leaves lead straight openings or slots 24, which extend to the rear edges of said leaves.

Referring to the improved locking means, the numeral 25 indicates a rod extending from and revolvably connected to one of the longitudinal strips, the drawings showing it as extending from the strip 14, and the numeral 26 indicates a post extending from the oppo-

site longitudinal strip or the strip 15. Of course, if desired, this arrangement could be reversed and the post 26 made to extend from the strip 14 and the screw-rod 25 from the strip 15. The post 26 is hollow or provided with an interior chamber, and one of the side pieces thereof is provided with inwardly-extending downwardly-inclined ratchet-teeth 27. The rod 25 enters the bore or chamber of the post 26, and the lower end of said rod is screw-threaded for a desired distance upwardly. This lower screw-threaded portion is adapted to extend through and engage the threaded opening of a nut 28, which is arranged within the bore or chamber of the post 26. The lower extremity of the rod 25 is provided with an enlargement or head 29, and the outer edge of this enlargement or head is preferably beveled upwardly. One side of the nut 28 is provided with a recess 30. In this recess is fitted a dog 31, said dog turning on a pivot-pin 32, which intersects the recess near the lower end of said recess. The upper end of the dog is provided with an outwardly-projecting engaging lug 33, which is beveled to conform to the bevel or inclination of the ratchet-teeth 27. The lower end of the dog is provided with an inwardly-projecting foot 34, the end edge of said foot being preferably beveled to correspond to the bevel of the head 29 of the rod 25. It will be understood that the upper end of the rod 25 is revolvably supported by the longitudinal strip 14, preferably by being extended through an opening in said longitudinal strip, and provided with flanges 35 35, disposed, respectively, above and below said strip. The rod may be turned in any desirable manner, but is preferably provided with a key-slot 36 for the insertion of a key, which of course when inserted in the slot is adapted to turn the rod in one direction or the other, in accordance with the direction of turning of the key.

The outwardly-projecting lug 33 at the upper end of the dog 31 is normally held in engagement with the ratchet-teeth 27 by means of a flat spring 37, disposed between the inner edge of the dog and the inner wall of the recess 30 of the nut, the center of said spring being above the pivot 32, so as to cause said spring to so exert pressure as to compel the upper engaging lug 33 to normally engage the ratchet-teeth 27. The spring is prevented from working upwardly out of the recess by the engagement of its upper end with a shoulder 38 at the upper inner edge of the dog and is prevented from working downwardly out of the recess by reason of the lower foot 34 of the dog.

In assembling the parts after the rod 25 and the nut 28 are inserted in the chamber or bore of the post 26 a screw 39 is turned across the upper end of the chamber of the post, said screw thereby acting as a stop to limit the upward movement of the nut or to pre-

vent said nut from being forced entirely out of the chamber. When it is desired to remove the nut and screw-rod from the chamber, all that is necessary to be done is to turn out the screw 39.

I prefer to employ in connection with this form of binder a means for simultaneously turning a plurality of the telescoping binder-posts, and in the accompanying illustration I have shown this means in connection with two of the telescoping posts—viz., the two intermediate or inner posts. This means consists in providing the upper ends of the sections 20 20 of said posts with cranks 40 40, which are pivotally connected to opposite ends of a link 41. A short turnable stud 42 extends upwardly from the longitudinal strip 14, and this stud is likewise provided with a projecting crank 43, said crank being pivotally connected to a central point of the link 41. The stud is provided at its upper end with a key-slot 44, and when a key is inserted in said slot and turned it is evident that the two binder-posts 20 21 are simultaneously turned. In this manner the greatest width of said posts may be brought athwart of the openings 22, as shown most clearly in Fig. 4, and thereby render it difficult for the leaves to become disengaged from said posts; but when the disengagement is desired the said posts can be turned at right angles, so as to bring their greatest width in line with the extension-slots 24, when of course the leaves may be readily removed. Where, as in the binder illustrated in the accompanying drawings, only the two intermediate binding-posts are thus connected so as to be caused to turn simultaneously, the outer posts are provided more especially for steadying the leaves toward the outer side edges thereof. When the cover-pieces are unlocked, the separation thereof is effected automatically by means of spring-pressure, and these springs are shown in the accompanying drawings as coiled springs, (indicated by the numerals 45 45,) said springs encircling telescoping post-sections 46 47 and bearing at opposite ends against the longitudinal strips 14 and 15.

In the position of the parts illustrated in Fig. 2 the cover-sections of the book are locked a certain distance apart, and if it is desired to release the locking mechanism in order to either insert additional leaves or remove leaves from between the cover-pieces the key is inserted in the key-slot of the screw-rod 25 and said rod turned in the proper direction to cause an up movement of the same in the nut 28. When said screw-rod has moved upwardly a sufficient distance to bring its head 29 into contact with the foot 34 of the locking-dog, said dog is turned on its pivot in a direction to release its engaging lug 33 from the ratchet-teeth 27. The moment this release occurs the springs 45 expand and force the cover-pieces apart to their full extent,

the upward movement of the nut being limited by contact of the upper surface of said nut with the screw 39. The device is now in condition for the insertion or removal of leaves. After the required number of leaves are inserted or removed the screw-rod is turned in a reverse direction, so as to bring its head 29 out of engagement with the foot of the dog, and when this disengagement takes place the spring 37 again forces the engaging lug 33 of the dog into engagement with the ratchet-teeth. Hand-pressure is now exerted on one of the cover-pieces, and said cover-piece is in this manner forced downwardly against the action of the coiled springs 45 as far as possible. When said hand-pressure is removed, the dog of course is left in engagement with the ratchet-teeth and the nut thereby held locked. As stated at the outset of the specification, the hand-pressure is seldom sufficient to secure the desired compression of the cover-sections against the leaves. With my improved construction, however, when further compression is desired all that is necessary after the hand compression has been completed in the manner described is to turn the screw-rod in a direction to cause the same to move downwardly through the threaded opening of the nut, the nut being retained by the engagement of the dog with the ratchet-teeth in the position to which it was forced by means of hand compression. It will be understood that the nut is not only held against up-and-down movement by the engagement referred to, but it is also so fitted in the post 26 as to be incapable of rotation in said post. This down movement of the screw-rod through the nut and while the nut remains stationary has the effect of course of bringing the cover-section 9 toward the cover-section 10, and in this manner a firm mechanical compression of the cover-sections against the contained leaves is effected. After the desired mechanical compression is obtained the nut may be again released by turning the screw-rod upwardly through said nut to the same extent that said screw-rod was turned downwardly through the nut, or, in other words, until the head of the screw-rod again contacts with the foot 34. It will therefore be evident that the screw-rod is turned upwardly through the nut the same distance that said screw-rod is turned downwardly through said nut.

From the foregoing description it will be seen that I provide a construction wherein, if desired, the cover-sections may be brought into contact with the contained leaves merely by hand compression, or where a further and more firm compression is desired said cover-sections may be subjected to mechanical compression.

What I claim as my invention is—

1. In a loose-leaf book or ledger, the combination with cover-sections movable toward

and from each other to clamp leaves between them and release the same respectively, of means having a ratchet engagement with one of said cover-sections, and having an engagement with the other of said cover-sections, the latter engagement being of such construction as to permit of vertical adjustment of said other cover-section independent of the ratchet-engaging means.

2. In a loose-leaf book or ledger, the combination of cover-sections movable toward and from each other to clamp leaves between them and release the same respectively, of means having a ratchet engagement with one of said cover-sections and a screw-threaded engagement with the other of said cover-sections, the said screw-threaded engagement permitting of vertical adjustment of said other cover-section independent of the ratchet-engaging means.

3. In a loose-leaf book or ledger, the combination with cover-sections movable toward and from each other to clamp leaves between them and release the same respectively, of means having a ratchet engagement with one of said cover-sections and having an engagement with the other of said cover-sections, the latter engagement being of such construction as to permit of vertical adjustment of said other cover-section independent of the ratchet-engaging means, and means for releasing the ratchet-engaging means.

4. In a loose-leaf book or ledger, the combination with cover-sections movable toward and from each other to clamp leaves between them and release the same respectively, a member extending from one of the cover-sections, a lock-carrying device carried by said member, another member projecting from the other cover-section and provided with engageable means adapted to be engaged by the locking device at any position to which the cover-sections may be adjusted apart, adjustable engaging means between the member carrying the lock-carrying device and said lock-carrying device and constructed to permit the cover-section carrying the lock-carrying member to be brought closer to the other cover-section and thereby subject the contained leaves to mechanical compression, and means for releasing the locking device from the engageable means to permit of the separation of the cover-sections.

5. In a loose-leaf book or ledger, the combination of cover-sections movable toward and from each other to clamp the leaves between them and release the same respectively, a rack carried by one of said sections, a member carried by the other section and provided with a dog adapted to normally engage the teeth of the rack, the connection between said member and said cover-section being such that the said cover-section has a movement toward or from the opposite cover-section and independent of

the dog-carrying member, and at a time when said dog-carrying member is held stationary by the engagement of the dog with the rack-teeth, and means for releasing the dog to permit of the separation of the cover-sections.

6. In a loose-leaf book or ledger, the combination with cover-sections movable toward and from each other, to clamp leaves between them and release the same respectively, a member extending from one of the cover-sections, a device carried by said member and carrying a locking-dog, another member projecting from the other cover-section and provided with ratchet-teeth adapted to be engaged by the dog at any position to which the cover-sections may be adjusted apart, adjustable engaging means between the member carrying the dog-carrying device and said dog-carrying device, whereby the said member may have a movement independent of the dog-carrying device in order to bring the cover-section to which said member is attached closer to the other cover-section, and thereby subject the contained leaves to mechanical compression, and means for releasing the dog from the ratchet-teeth to permit of the separation of the cover-sections.

7. In a loose-leaf book or ledger, the combination of cover-sections movable toward and from each other to clamp leaves between them and release the same respectively, a rack carried by one of said sections, a member carried by the other cover-section and provided with a dog adapted to normally engage the rack-teeth, and a screw-threaded connection between said member and said cover-section, whereby the said cover-section may have a movement independent of the dog-carrying member and toward and from the opposite cover-section, and at a time when said dog-carrying member is held stationary by the engagement of the dog with the rack-teeth, said screw-threaded connection operating in one direction to subject the cover-sections to mechanical compression against the contained leaves, and when operated to a certain extent in the opposite direction releasing the locking-dog from the ratchet-teeth.

8. In a loose-leaf book or ledger, the combination with cover-sections movable toward and from each other to clamp leaves between them and release the same respectively, of a ratchet engagement between the cover-sections, the said ratchet engagement including screw members, the said screw members adapted for giving mechanical compression to the leaves between the cover-sections.

9. In a loose-leaf book or ledger, the combination of cover-sections movable toward and from each other to clamp leaves between them and release the same respectively, a toothed member projecting from one of the cover-sections, a nut carrying a locking-dog normally in engagement with the teeth of the

toothed member, a rotatable screw-rod projecting from the other cover-section and engaging the threads of the nut, means for normally retaining the dog in locking engagement with the teeth, and means for throwing said dog out of engagement with the teeth.

10. In a loose-leaf book or ledger, the combination of cover-sections movable toward and from each other to clamp leaves between them and release the same respectively, a toothed member projecting from one of the cover-sections, a nut having a locking-dog pivoted thereto, said dog being normally in engagement with the teeth of the toothed member, a rotatable screw-rod projecting from the other cover-section and engaging the threads of the nut, means for normally retaining the dog in locking engagement with the teeth, and means for turning the dog on its pivot out of engagement with the teeth.

11. In a loose-leaf book or ledger, the combination of cover-sections movable toward and from each other to clamp leaves between them and release the same respectively, a toothed member projecting from one of the cover-sections, a nut carrying a locking-dog normally in engagement with the teeth of the toothed member, a rotatable screw-rod projecting from the other cover-section and engaging the threads of the nut, means for normally retaining the dog in locking engagement with the teeth, and means on the screw-rod, and adapted upon the turning of said screw-rod in one direction and to a certain extent to operate on the dog and release the same from the teeth.

12. In a loose-leaf book or ledger, the combination of cover-sections movable toward and from each other to clamp leaves between them and release the same respectively, a toothed member projecting from one of the cover-sections, a nut carrying a locking-dog normally in engagement with the teeth, a rotatable screw-rod projecting from the other cover-section and engaging the threads of the nut, a spring bearing against the locking-dog and normally retaining said dog in locking engagement with the teeth, and means for throwing said dog out of engagement with the teeth.

13. In a loose-leaf book or ledger, the combination of cover-sections movable toward and from each other to clamp leaves between them and release the same respectively, a toothed member projecting from one of the cover-sections, a nut carrying a pivoted locking-dog normally in engagement with the teeth, the said dog provided at its lower end with an inwardly-projecting foot, a rotatable screw-rod projecting from the other cover-section and engaging the threads of the nut, said rod provided at its lower end with a head or enlargement adapted, when the screw-rod is turned upwardly to a certain extent, to act on the foot of the locking-dog and turn said dog in a direction to release it from engagement with

the teeth, and means for normally retaining the dog in locking engagement with the teeth.

14. In a loose-leaf book or ledger, the combination with cover-sections movable toward
5 and from each other to clamp leaves between them and release the same respectively, of a threaded rod extending from one of the cover-sections, a nut which the threaded rod engages,

and means for holding the nut adjustably to the other cover-section.

In testimony whereof I affix my signature in presence of two witnesses.

HENRY C. MILLER.

Witnesses:

ANNA F. SCHMIDTBAUER,
C. T. BENEDICT.

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