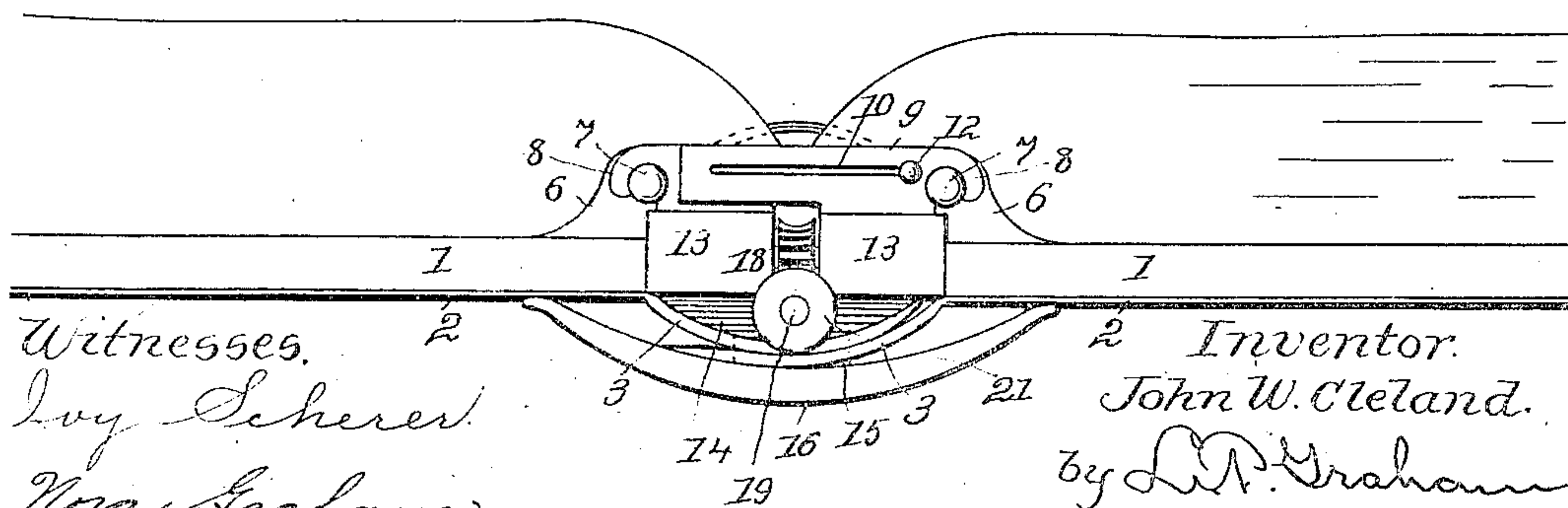
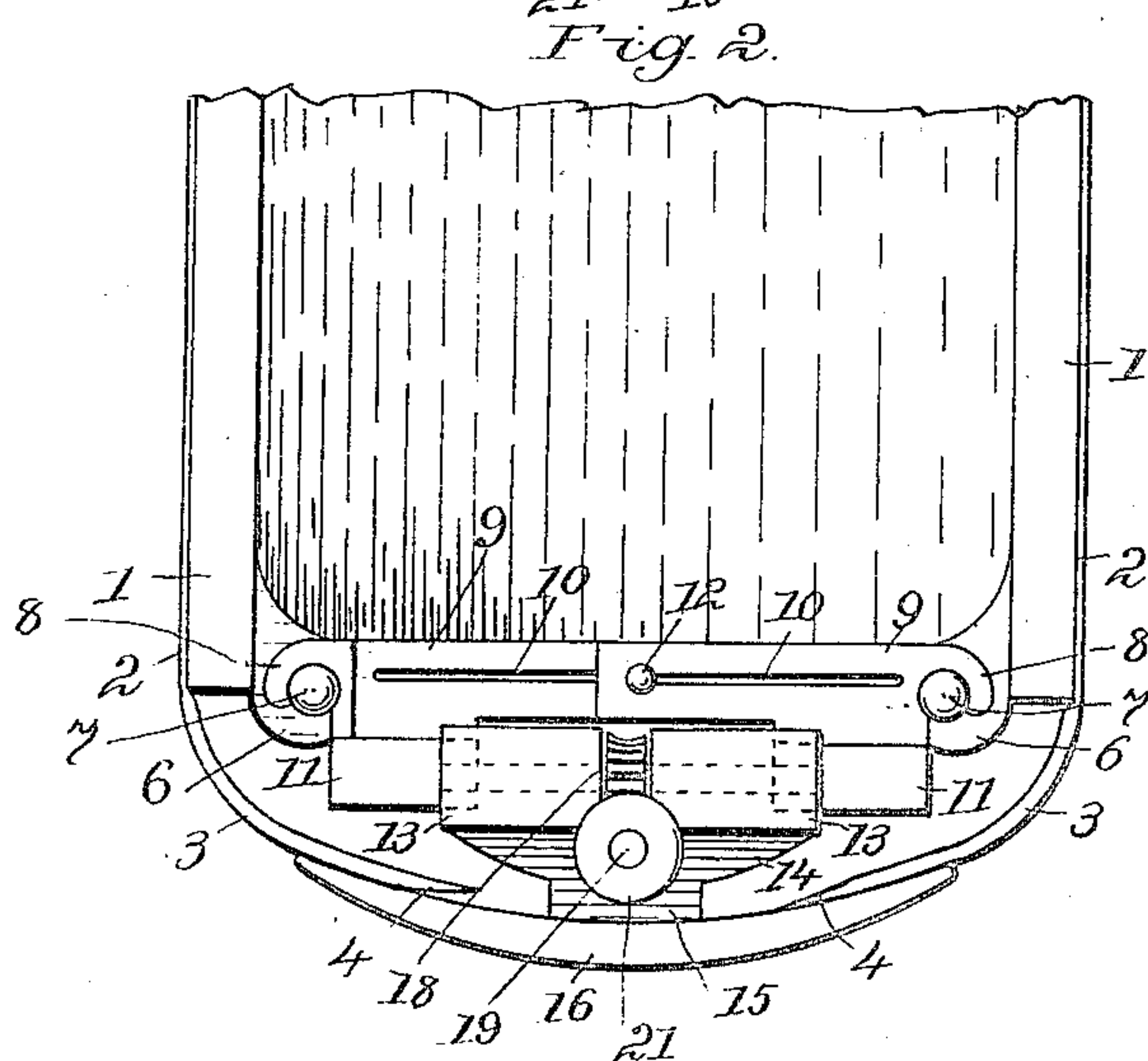
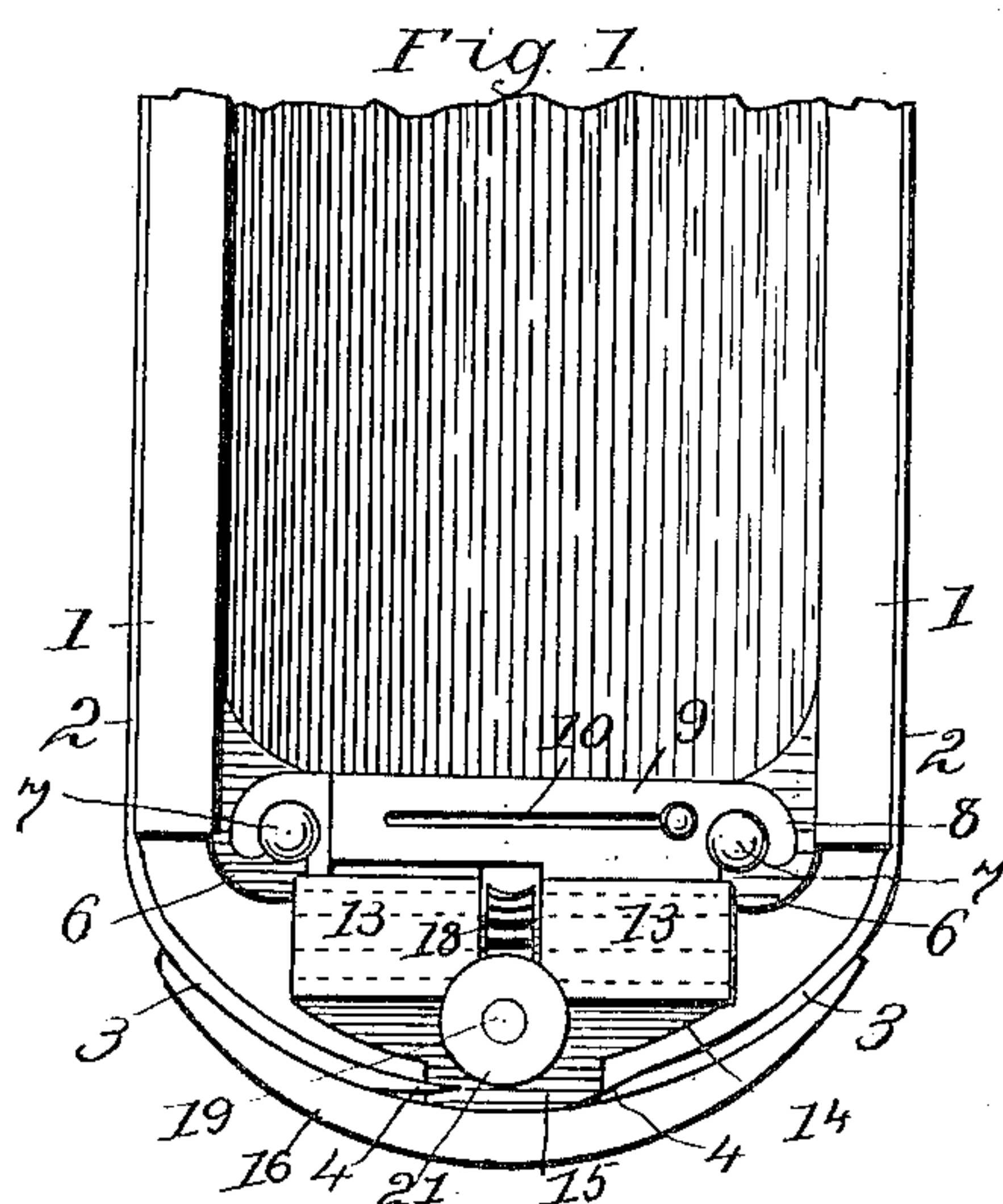


No. 828,640.

PATENTED AUG. 14, 1906.

J. W. CLELAND.
LOOSE LEAF BOOK.
APPLICATION FILED MAR. 2, 1906.

2 SHEETS—SHEET 1.



Witnesses. 2
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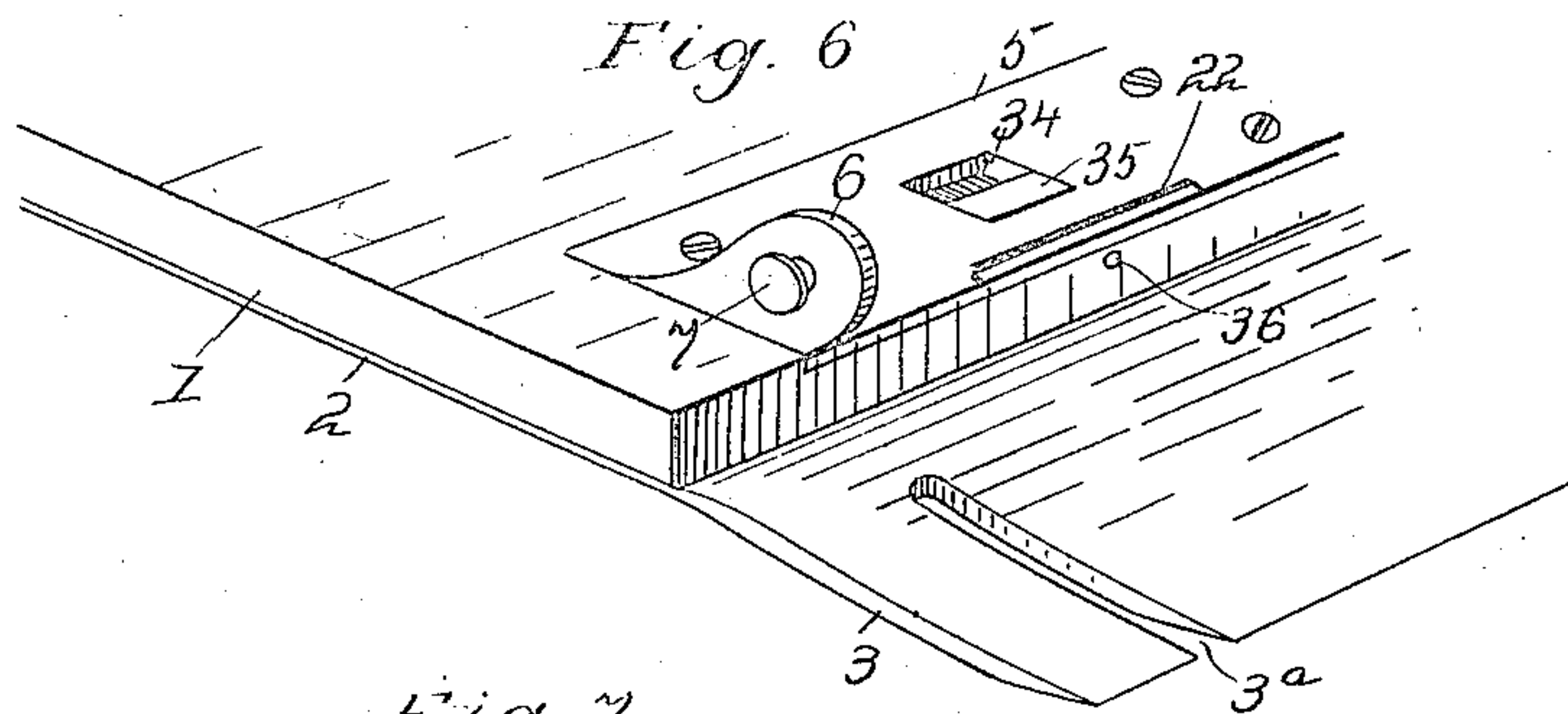
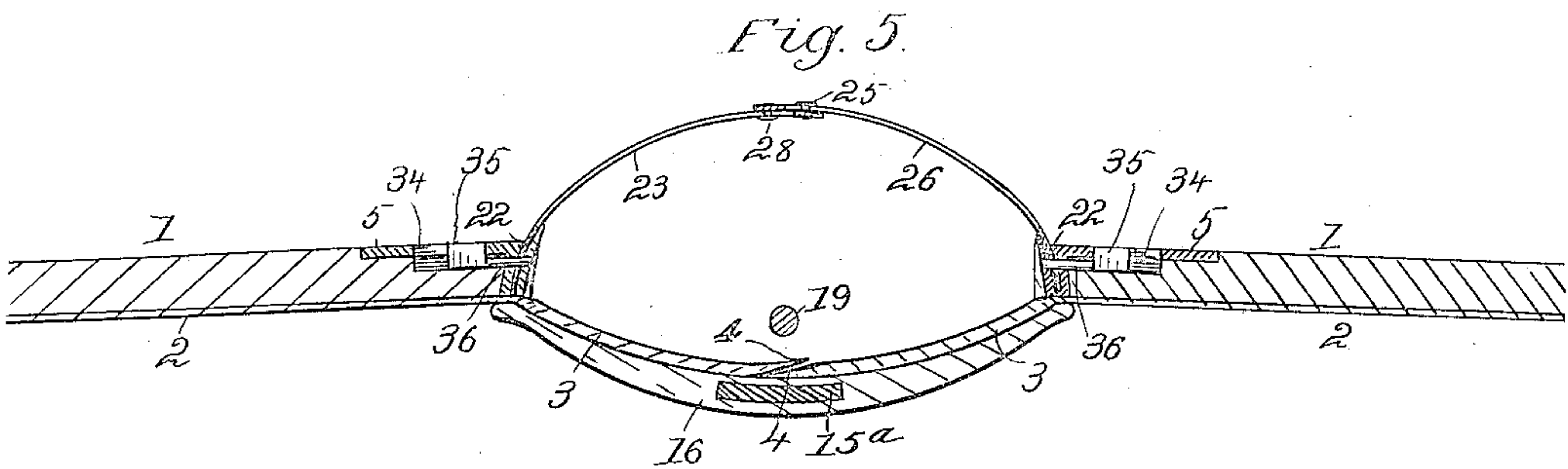
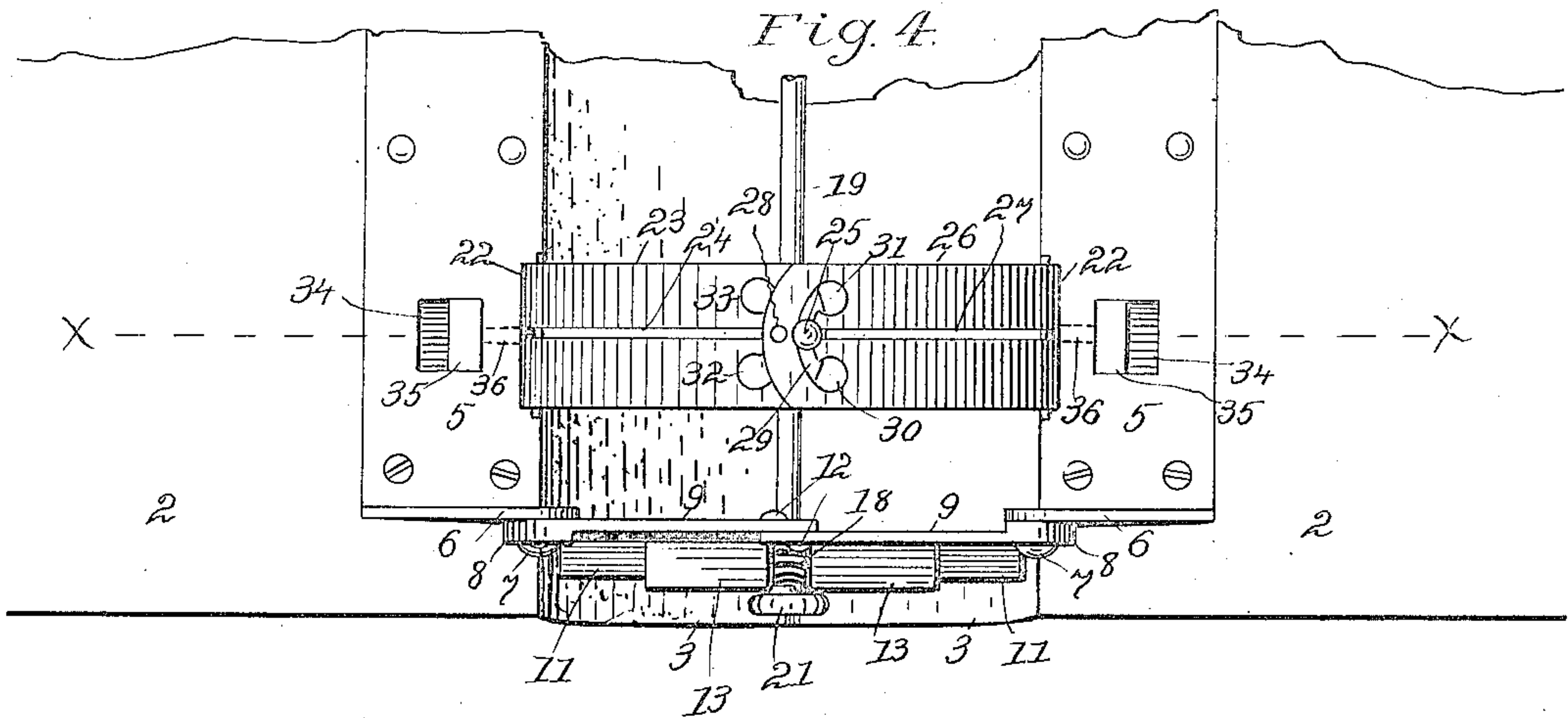
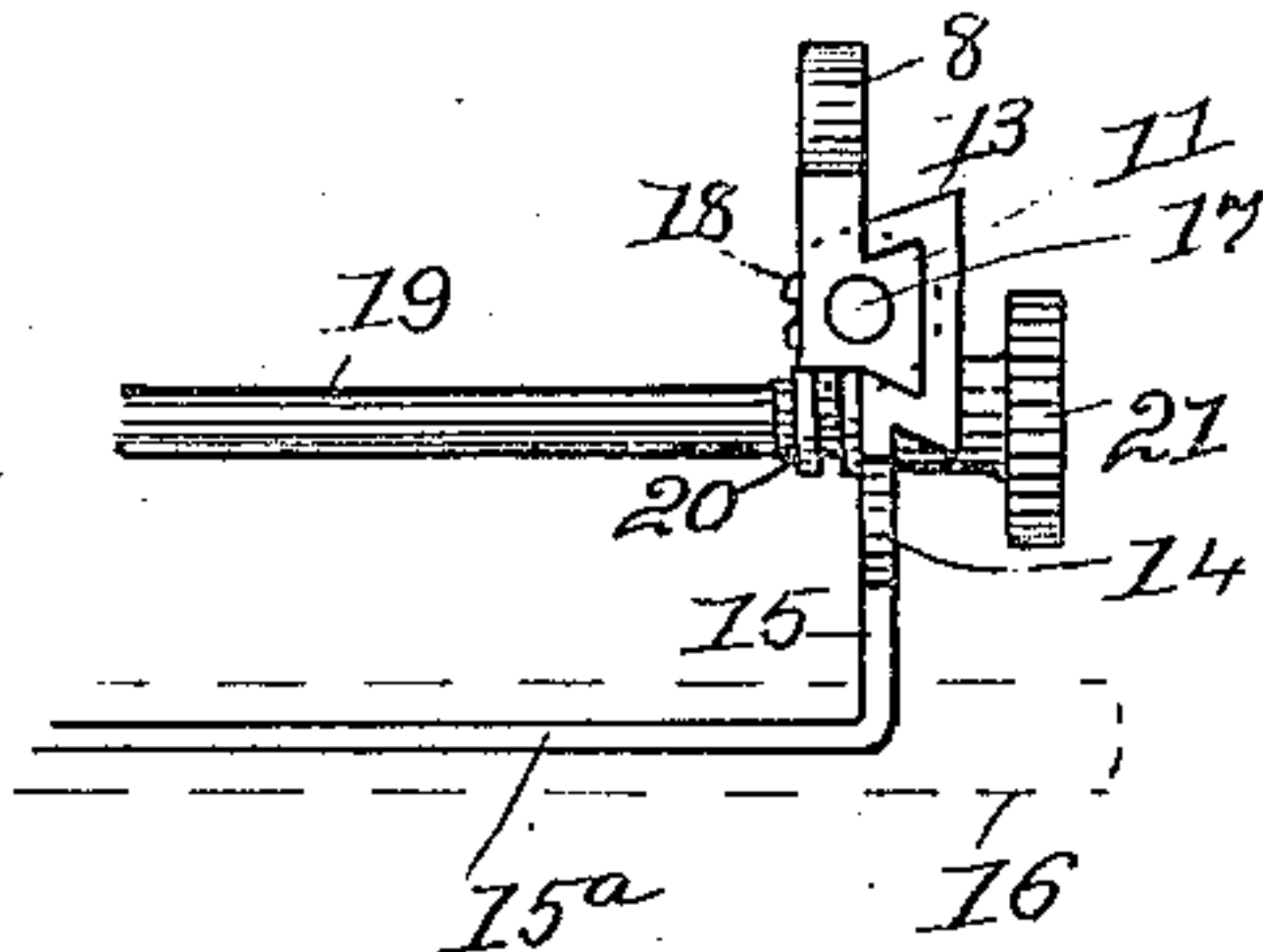


Fig. 7.



Witnesses:

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Inventor,
John W. Cleland
by L. P. Graham
his attorney.

UNITED STATES PATENT OFFICE.

JOHN W. CLELAND, OF DECATUR, ILLINOIS.

LOOSE-LEAF BOOK.

No. 828,640.

Specification of Letters Patent.

Patented Aug. 14, 1906.

Application filed March 2, 1906. Serial No. 303,857.

To all whom it may concern:

Be it known that I, JOHN W. CLELAND, of the city of Decatur, in the county of Macon and State of Illinois, have invented certain new and useful Improvements in Loose-Leaf Books, of which the following is a specification.

The principal object of this invention is to provide a bookbinding the covers of which are adjustable to hold a greater or less number of detachable leaves.

Another object is to provide improved means for detaching or inserting the leaves.

Another object is to so construct the binding that the covers may be opened as wide as desired and that when so opened the binders will bend to permit the leaves to assume the shape taken by the leaves in a permanently-bound open book.

The invention is exemplified in the structure hereinafter described, and it is defined in the appended claims.

In the drawings forming part of this specification, Figure 1 is an end view of so much of a book as is needed to explain my invention, the covers being shown therein at their closest approach when closed. Fig. 2 is a similar end view showing the covers adjusted apart to their extreme capacity. Fig. 3 represents a binding adjusted to width as shown in Fig. 1 and opened. Fig. 4 is a plan of an open binding, showing in detail the various features of my invention, the covers being adjusted apart to their extreme capacity. Fig. 5 is a cross-section on line *x* in Fig. 4. Fig. 6 is a perspective detail of certain features of the binding. Fig. 7 is a side view of the mechanism used to adjust the covers so as to vary the space between them.

The boards or stiff parts of the covers are shown at 1, and the leather or other outer layers are shown at 2. Back extensions 3, which are preferably continuations of the outer layers 2, extend beyond the hinge edges of the covers substantially as shown. The extensions have some stiffness, but are sufficiently elastic to assume the several positions shown in the drawings when forced thereinto by the swing of the covers and the resistance of the back. The function of the extensions 3 is to bridge the spaces between the covers and the back when the covers are closed, and they are slotted, as shown at 3^a in Fig. 6, to pass the supporting-plates 15 for the back 16. The edges of the extensions 3 are beveled in opposite directions, as shown at 4, so that

one will override the other when the covers are open.

Plates 5 are secured to the inner surfaces of the covers at the hinge edges thereof, and they have lugs 6 at their ends from which pivot-pins 7 project.

The upper parts of bars 9 overlap, as shown in Fig. 4, and each has a hook 8 on its outer end which is adapted to engage a pivot-pin 7. The lower parts of bars 9 are cut away at their inner ends to form a space for a worm-wheel 18, and slides 11 are formed one on each bar on opposite sides of the worm-wheel. A plate 14 extends below the worm-wheel and is connected with the guideways 13 for slides 11. An extension 15 of plate 14 enters back 16 and is preferably extended lengthwise thereof, as shown at 15^a in Fig. 7, for the purpose of making the connection secure and stiffening the back along its longitudinal center. The extensions 15 of plate 14 form the sole connections of the back to the covers, and the back is sufficiently elastic to assume the different forms shown in the drawings. The back 16 and the extensions 3 of the covers are each preferably stiffened by thin elastic metal sheets.

A shaft 19 is journaled near its ends in plates 14. It is provided with worms 20, which engage the worm-wheels 18, and on one end it is provided with a finger-wheel 21 or with other means for giving it rotary motion. The worm-wheel 18 is rigidly mounted on screw-shaft 17, one end of which has a right-hand thread and the other a left-hand thread. The screw-threads enter the slides 11 and provide means for forcing them apart or drawing them together.

The overlapping parts of bars 9 are slotted, as shown at 10 in Figs. 1, 2, and 3, and pins 12 extend one from each bar through the slot of the other, as shown in Fig. 4.

Plates 5 are each provided with a set of mortises, as 22 in Figs. 4, 5, and 6, which receive ends of the strips used to bind the leaves in the covers. Each binding-strip is composed of two separable parts slidably conjoined. The parts of the binding-strips are shown, one at 23 and the other at 26, in Figs. 4 and 5, and they are identical in construction. Part 23 has a longitudinal slot 24 and part 26 has a similar slot 27. Each longitudinal slot runs into a cross-slot, as 29, and the ends of each of the cross-slots are enlarged, as shown at 30, 31, 32, and 33 to permit passage of the heads of the pins 25 and 28,

which are used to hold the parts slidably together. The pin 25 extends upward from part 23 through slot 27 of part 26, and its head is above part 26. The pin 28 extends downward from part 26 through slot 24 of part 23, and its head is below part 23. The outer ends of the parts composing the binding-strips enter the mortises 22, and they are provided with holes for the securing-pins 36. As a matter of preference the securing-pins 36 extend from slides 35, which have slide-ways 34 in plates 5; but this is a matter of mechanical detail susceptible of variation.

Excepting finger-wheel 21 the cover-adjusting mechanism herein shown and described is duplicated in reverse arrangement at the opposite end of the book, and as many binding-strips may be used as are needed to properly hold the leaves securely in place.

In adjusting the covers to hold more or fewer leaves the finger-wheel 21 is turned one way or the other, imparting motion to the screw-shaft 17 through worm 20 and worm-wheel 18. Motion in one direction will cause the right and left screw-threads to draw the slides together and motion in the opposite direction will force them apart. The covers are connected to the slides through hooks 8 and pins 7, and so the covers partake of the motion of the slides. As the covers approach each other or are moved apart the pins 25 and 28 of the two-part binding-strips slide in slots 24 and 27 and permit the binding-strips to lengthen or shorten to conform to the distance between covers. Adjustment of the covers is preferably effected when the book is closed.

The pins 12 sliding in slots 9 permit the covers to be moved apart as far as the screw-shaft 17 will properly operate, and they effectually prevent further separation.

When it is desired to remove or insert, or remove and insert leaves in the front of the book or the back of the book, the cover on the side at which the change is to be made is raised far enough to give access to the slide-heads 35 of the securing-pins 36 and the pins are withdrawn from their connections with the binding-strips. The finger-wheel 21 is then turned to widen the space between covers enough to release the binding-strips from the mortises 22. The cover is then laid back or opened and the leaves placed on or taken off the binding-strips. If the manipulation adds to the leaves in the book, the binding-strips must be extended to hold the addition and the reverse operation under reverse conditions. After the change in leaves is made the binding-strips are reinserted in the mortises, the pins 36 are slid into engagement with the binding-strips, and the distance between covers is readjusted to conform to the leaves therebetween. When the covers are at their greatest distance apart and are entirely filled with leaves, separation of the

covers may be made by releasing the binding-strips from one cover, detaching-pins 7 of that cover from hooks 8, and raising the cover clear of the ends of the binding-strips. In changing leaves from the center of the binding-strips the covers may best be separated until the pins 25 and 28 are in the position shown in Fig. 4; when the book being opened the conjoining ends of the strips may be slid sidewise in opposite directions, carrying the pins through the narrow cross-slots and into enlargements 31 and 32, for instance, and then separating the strips by passing the heads of the pins through the enlargements of the slots.

The foregoing description of the mode of operation has reference to leaves in which the perforations are closed, so that the binding-strips must be inserted through the perforations. In the use of leaves having open or slotted perforations the leaves may be connected to the binding-strips at any place along the same in the customary or any well-known manner.

The pivot-pins 7 are inside the cover, while the mortises for the binding-strips are located in the covers and are therefore farther apart than the pins when the book is closed. When the book is open, the mortises are as close together as the pins, owing to the action of the connecting-bars on the pins and the relation of the pins to the mortises. The pins are in line with the mortises when the book is closed, the distance between the pins is approximately uniform, but the mortises being off center swing toward and from each other as the book is opened and closed. The binding-strips are held in such position in the mortises that they are bent upward by opening motion of the covers, and the approach of the mortises toward each other aids in forming the bends.

I claim as new and desire to secure by Letters Patent—

1. In a loose-leaf book, the combination with a pair of covers, of extensible connecting-bars to the ends of which the covers are hinged, and flexible and extensible binding-strips detachably secured to the covers and adapted to hold the leaves, substantially as described.

2. In a loose-leaf book, the combination with a pair of covers, of two-part extensible connecting-bar to which the covers are hinged, means for adjusting the connecting-bars lengthwise, and flexible and extensible binding-strips adapted to hold the leaves and detachably secured to the covers, substantially as described.

3. In a loose-leaf book, the combination with a pair of covers having extensible binding appliances, of two-part connecting-bars hinged to the covers and conjoined by means of a screw-shaft having right-hand threads on one end and left-hand threads on the

other end, a shaft extending lengthwise of the book and having worms engaging the worm-wheels and means for rotating the longitudinal shaft, substantially as described.

5 4. In a loose-leaf book, the combination with a pair of covers having extensible binding appliances, of two-part, overlapping extensible connecting-bars hinged to the covers, means for adjusting the connecting-bars
10 lengthwise and stops on the overlapping parts to limit the extension of the bars, substantially as described.

5 5. In a loose-leaf book, the combination with a pair of covers having extensible binding appliances, of extensible connecting-bars to which the covers are hinged, and a back held in position by the connecting-bars, substantially as described.

20 6. In a loose-leaf book, the combination with a pair of covers having extensible binding appliances, of extensible connecting-bars to which the covers are hinged, plates sustained from the bars, in which the bars move slidably, and a back secured to and held in
25 place by the plates, substantially as described.

30 7. In a loose-leaf book, the combination with a pair of covers having extensible binding appliances, of extensible connecting-bars to which the covers are hinged, a back held

in position from the connecting-bars, separate from the covers, and flexible extensions from the covers extending inside the back, substantially as described.

8. In a loose-leaf book, the combination 35 with a pair of covers, of a two-part flexible binding-strip slidably conjoined, and means for detachably securing the ends of the strips to the covers.

9. In a loose-leaf book, the combination 40 with a pair of covers, of a two-part flexible binding-strip slidably and detachably conjoined, and means for detachably securing the ends of the strip to the covers.

10. A two-part extensible binding-strip 45 for a loose-leaf book, comprising a pair of flexible strips each slotted longitudinally, each having a cross-slot at an end of the longitudinal slot and enlargements at the ends of the cross-slots, a pin secured to each strip 50 and extended through the slot of the other strip and heads on the pins adapted to pass through the enlargements, substantially as and for the purpose set forth.

In testimony whereof I sign my name in 55 the presence of two subscribing witnesses.

JOHN W. CLELAND.

Witnesses:

E. S. McDONALD.

ROSA VOELCKER.