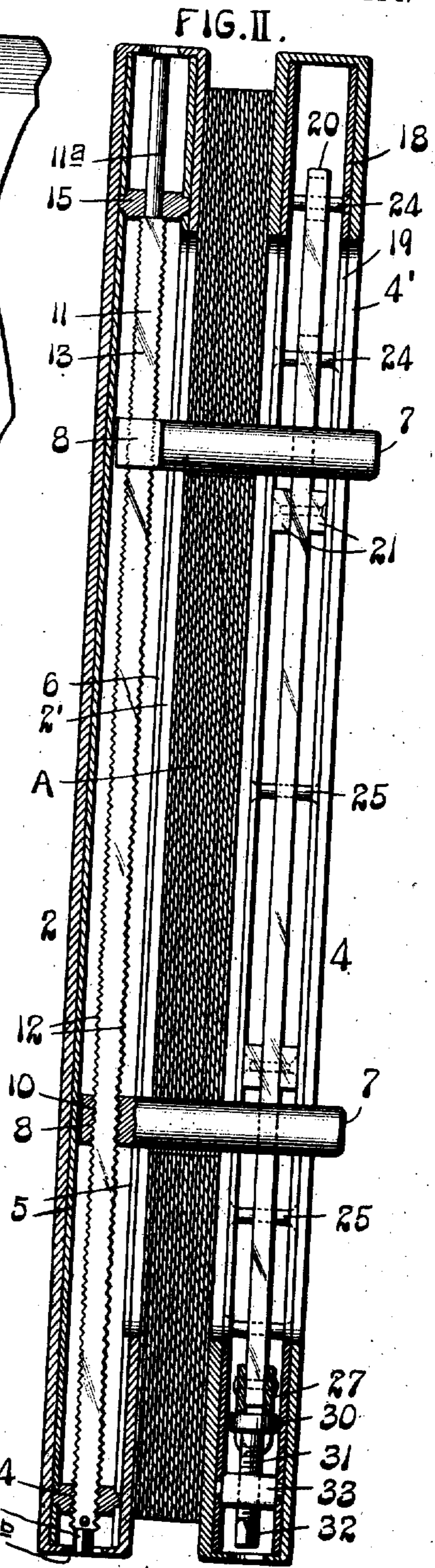
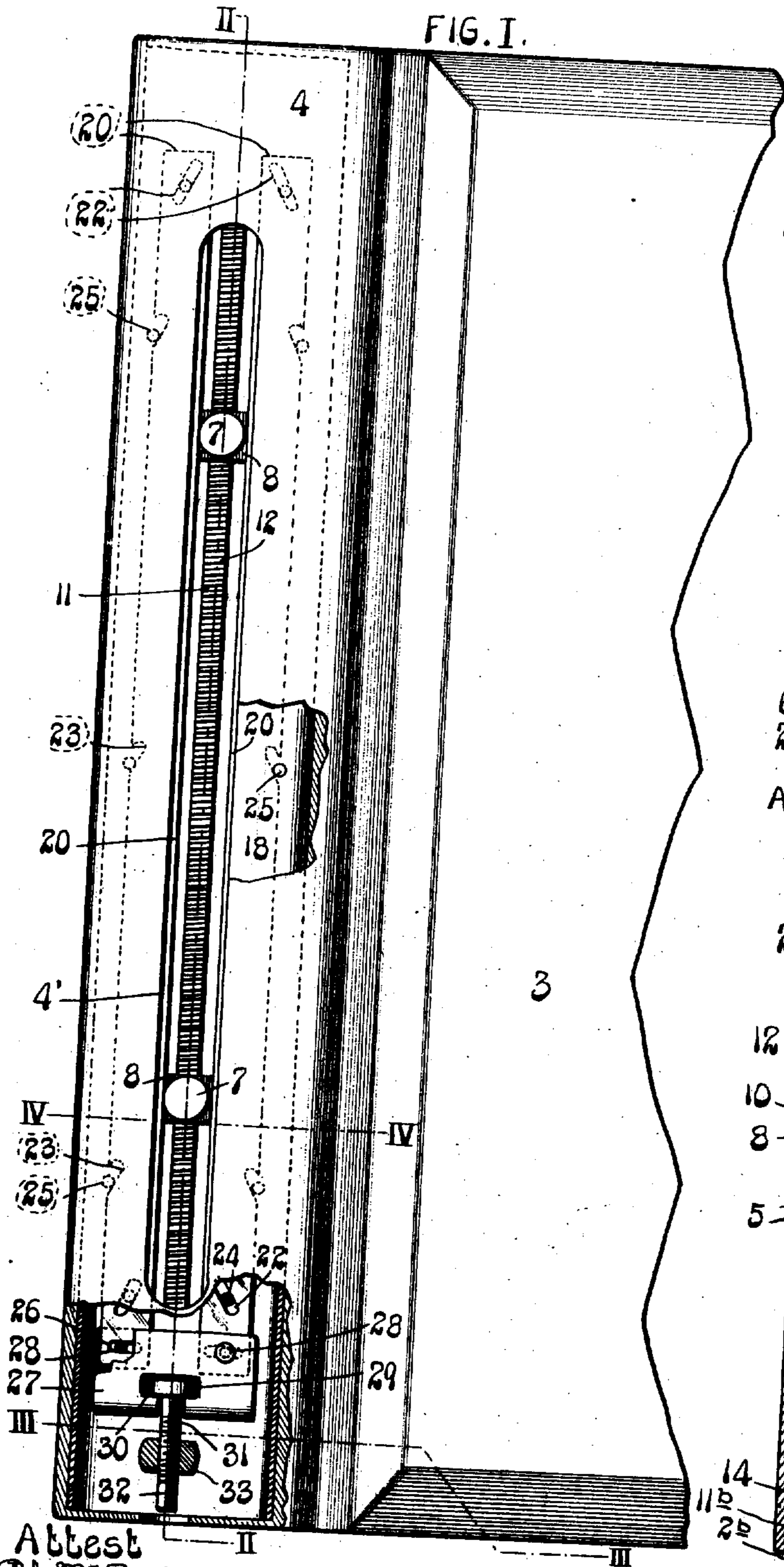


H. G. FORNOFF & H. C. KLAGES.
LOOSE LEAF BINDER.
APPLICATION FILED FEB. 26, 1910.

973,932.

Patented Oct. 25, 1910.

2 SHEETS—SHEET 1.



Attest
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Atty.

973,932.

Patented Oct. 25, 1910.
 2 SHEETS—SHEET 2.

Fig. III.

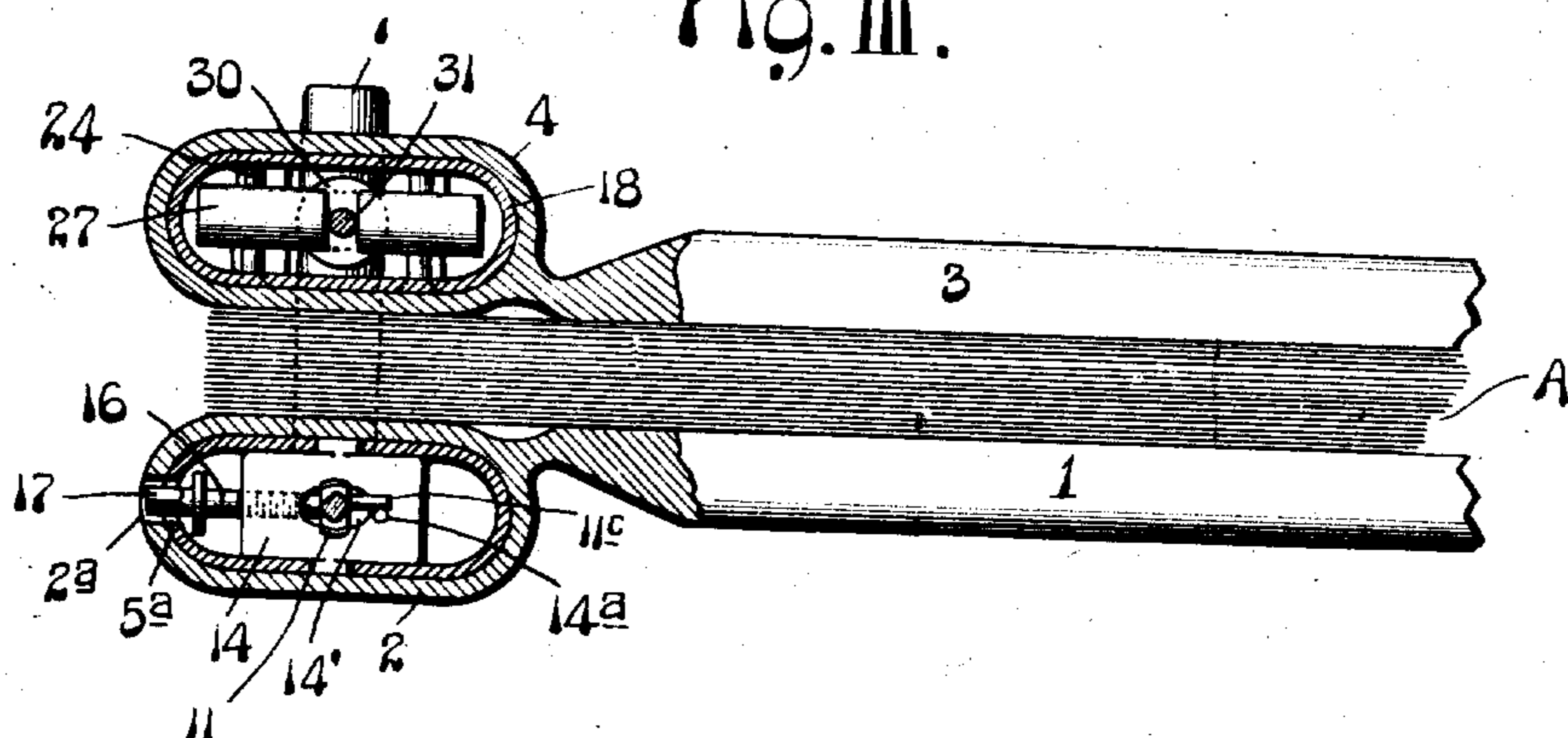


Fig. IV.

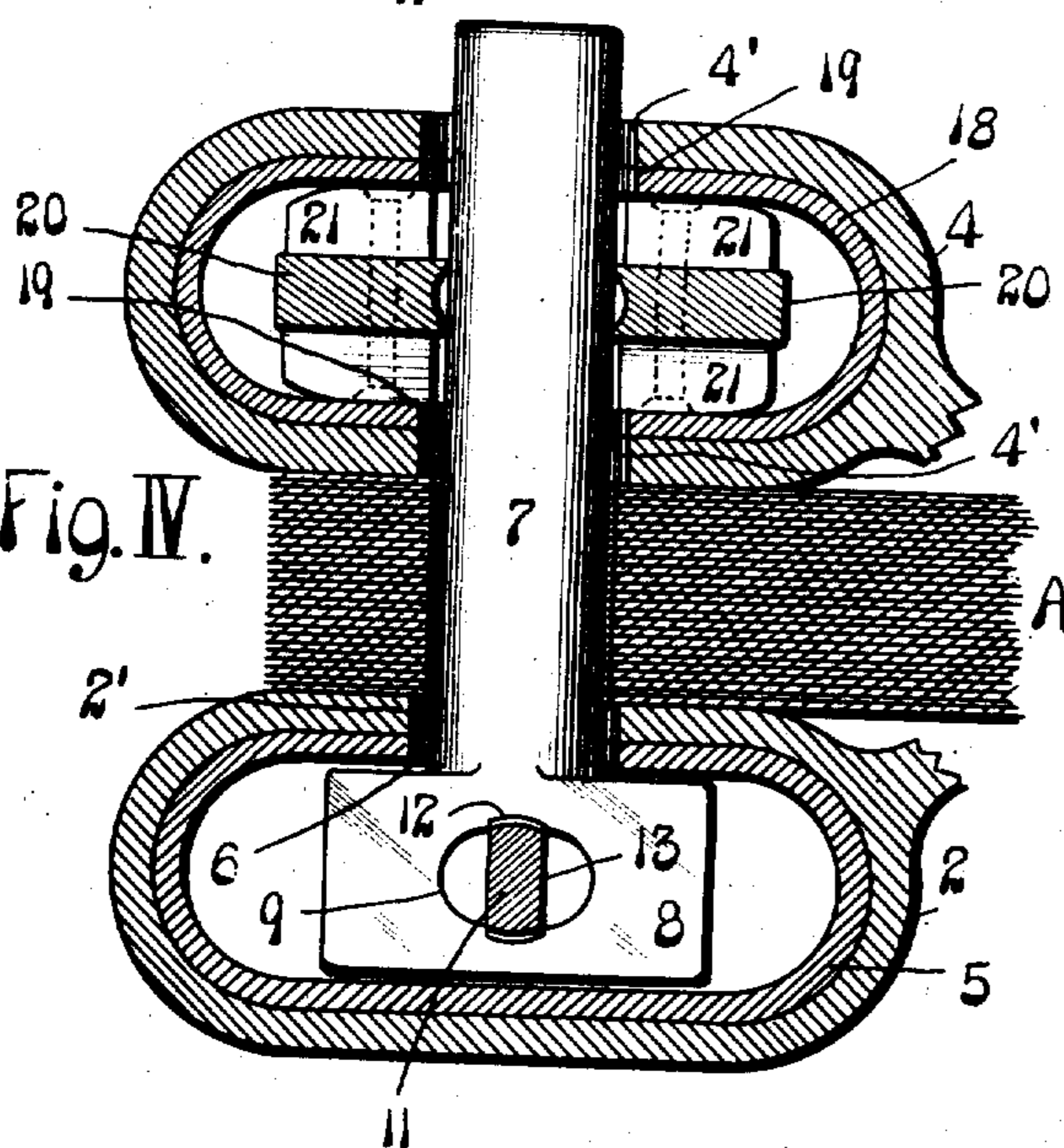


Fig. V.

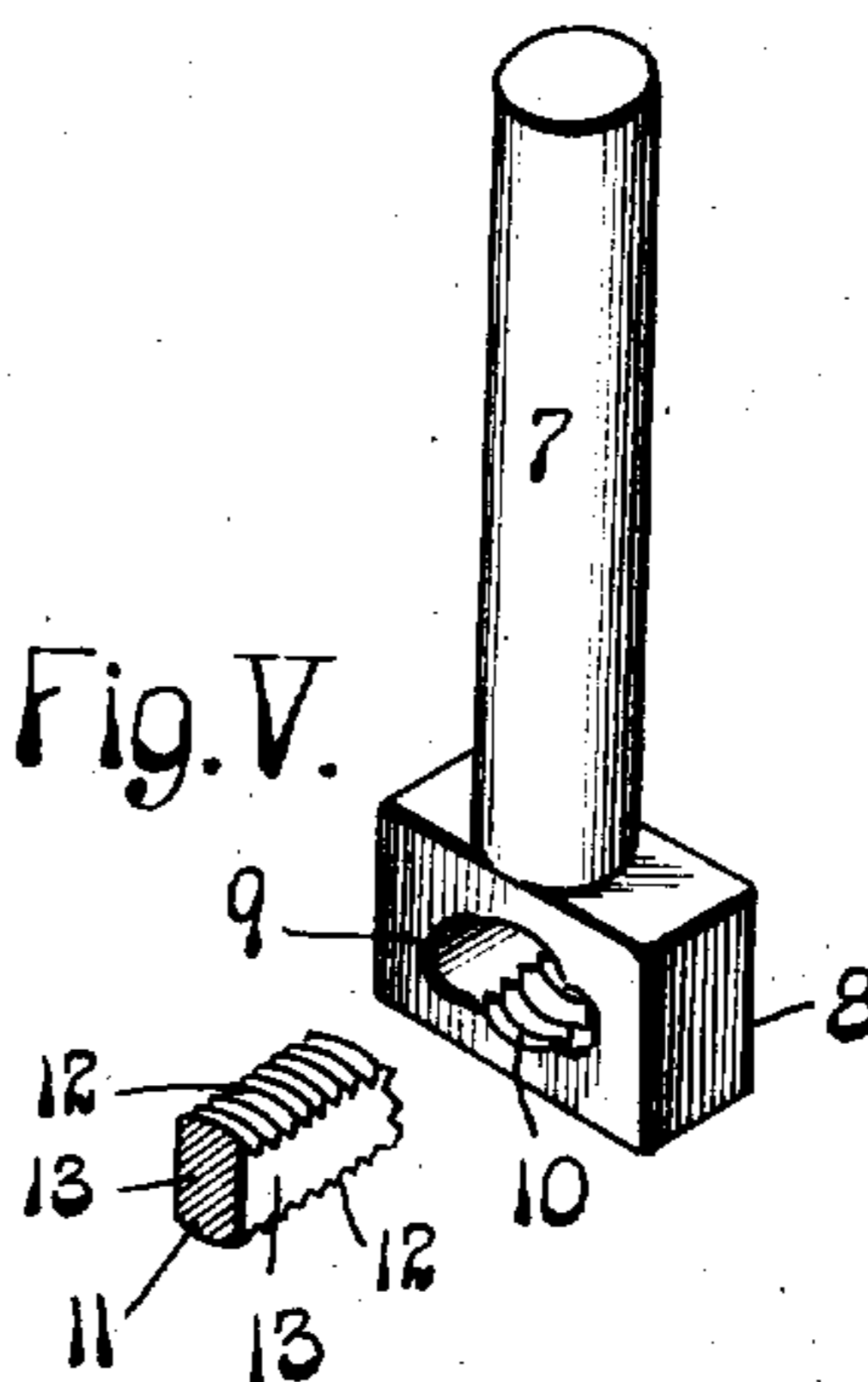
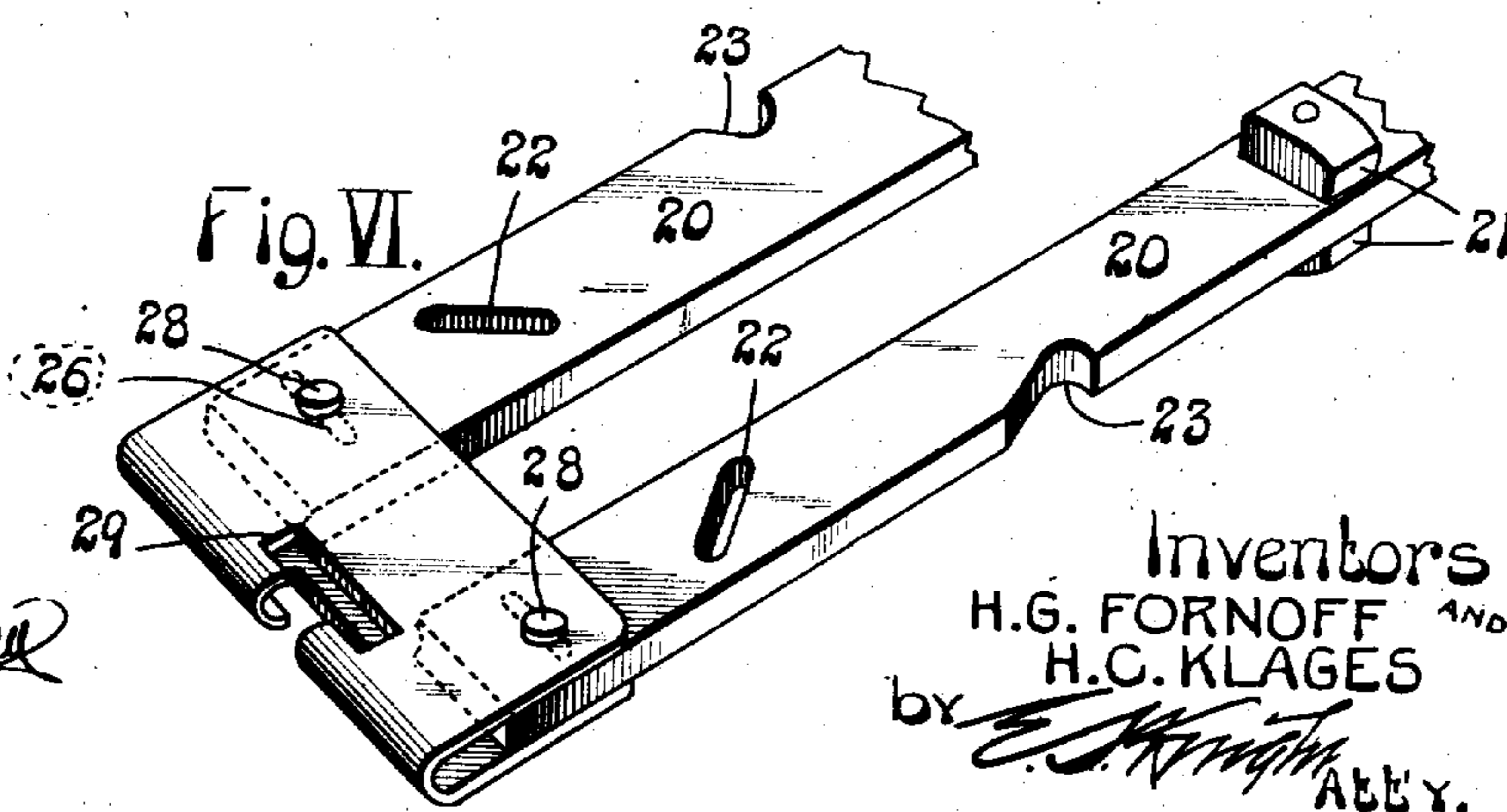


Fig. VI.



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UNITED STATES PATENT OFFICE.

HENRY G. FORNOFF AND HENRY C. KLAGES, OF ST. LOUIS, MISSOURI.

LOOSE-LEAF BINDER.

973,932.

Specification of Letters Patent.

Patented Oct. 25, 1910.

Application filed February 26, 1910. Serial No. 546,095.

To all whom it may concern:

Be it known that we, HENRY G. FORNOFF and HENRY C. KLAGES, citizens of the United States of America, residing in the city of St. Louis and State of Missouri, have invented certain new and useful Improvements in Loose-Leaf Binders, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

Our invention relates to a loose leaf binder, and it has for its object to provide in a binder of this description means whereby the posts that receive the loose leaves are adjustably mounted in order that they may be shifted to properly space them according to the locations of the perforations in the leaves that are to be used in the binder and which means also provides for the removal or insertion of leaf receiving posts to supply the binder with the requisite number of posts according to the number of perforations in the loose leaves.

Our invention further relates to a novel clamping means for engagement with the binder posts to hold the top cover positively positioned relative to the lower cover of the binder after the loose leaves have been applied to the binder posts.

Figure I is a view partly in plan and partly in section of the rear portion of our binder. Fig. II is a longitudinal section taken on line II—II, Fig. I. Fig. III is a cross section taken on line III—III, Fig. I. Fig. IV is an enlarged cross section taken on line IV—IV, Fig. I. Fig. V is a perspective view of one of the posts of the binder and a fragment of the post holding rod shown in the position the rod occupies when the binder posts are in stationary positions. Fig. VI is an enlarged perspective view of one end of the post clamping device carried by the top cover.

In the accompanying drawings: 1 designates the bottom cover and 3 the top cover of our loose leaf binder, these covers being respectively provided at their rear edges with pocket members 2 and 4 that extend longitudinally of the covers. The binder covers are designed to confine loose leaves A that are perforated near their rear edges, as usual, the perforations providing for the leaves being applied to posts of the binder that will be hereinafter described.

5 designates a tubular housing located in the pocket member 2 of the bottom cover 1

and is preferably of oval shape in cross section and in the upper wall of which is a slot 6 that registers with a slot 2' in the top of the pocket member, these slots being provided to permit movement of the binder posts longitudinally of the pocket member 2 and the housing 5 therein.

7 designates the binder posts, which are provided with heads 8 movable within the housing 5, while the stems of said posts extend vertically through the slots 6 and 2'. The head of each post 7 contains a non-circular aperture 9, preferably of oval shape, and in each head, at the aperture therein, are serrations 10 that are located in the wider walls of the aperture, while the remainder of the aperture is of smooth bore.

11 designates a non-circular post holding rod that extends through the heads of the posts of the binder, and the edges of which are provided with serrations 12, while the sides of the rod are smooth, as seen at 13. It will be readily appreciated that when the non-circular post holding rod 11 is in such position in the heads of the post 7 that its serrated faces are presented to the smooth surfaces of the apertures in the posts, the posts may be moved at will longitudinally of the rod 11, whereas, when said rod is turned to bring its serrations into engagement with the serrations 10 in the post heads, said posts are held from movement upon the rod.

14 and 15, (see Fig. II), are bearing blocks mounted in the housing 5 near its ends in which the post holding rod 11 is rotatably fitted. The bearing block 14 receives the post holding rod near one of its ends and at a point at which the serrated and smooth surfaces are present, while the bearing block 15 contains a circular bore that receives a round stem 11' at the end of the rod farthest removed from that supported in the bearing block 14. The aperture 14' in the bearing block 14 through which the post holding rod extends is non-circular in shape and partially threaded and partially smooth, in correspondence to the apertures in the heads of the posts 7, thereby providing for the post holding rod being held from endwise movement in said block when the serrations of the rod are in engagement with the serrations in the block, and also providing for said rod being moved longitudinally through the block when the serrations in said rod are out of engagement with the serrations in said block. At one end of the post holding

rod is a key receiving head 11^b to which a key may be applied for the purpose of turning the rod, and the rod is provided with a stop pin 11^c extending laterally therefrom and adapted to engage a stop pin 14^a projecting from the face of the bearing block 14, and whereby rotation of the post holding rod in one direction to a degree greater than that which will provide for the post heads being locked to the rod is prevented.

16 is a set screw mounted in the bearing block 14 and extending transversely therein relative to the post holding rod. This set screw is adapted to impinge against one of the sides of the post holding rod, as seen in Fig. III, when said rod is in post holding position, thereby preventing accidental rotation of the rod; and the screw is provided with a key receiving head 17 that is accessible at the rear edge of the pocket member 2 through apertures 2^a and 5^a respectively located in the pocket member 2 and housing 5.

In mounting the binder posts of our binder, the post holding rod 11 is introduced into the binder by passing it first through an opening 2^b of the pocket member 2, (see Fig. II), then through the bearing block 14 so that its serrations are opposed to the unserrated walls of the bearing block. The posts are put in place so that their heads are present within the housing 5, and the post holding rod is slipped through them while the serrations of the rods and the serrations in the apertures of the post heads are free of engagement with each other, the introduction of the rod being continued until its stem 11^a has been passed through the bearing block 15. During the introduction of the post holding rod, the set screw 16 is in a retracted position to permit the passage of the rod through the bearing block 14 and, therefore, after the post holding rod has been entirely inserted, it may be readily turned until its serrations are brought into engagement with the serrations in the bearing block 14 and in the heads of the post 7 to prevent endwise movement of the rod and also to prevent shifting of the posts upon the rod so that they will remain in positions to which they are adjusted. After the post holding rod has been turned, as stated, to lock it in place, it is held from rotation by inward movement of the set screw 16 actuated by a suitable key and which upon its inward movement impinges against a side of the rod, as seen in Fig. III. It should be noted that the posts may be quickly adjusted in any desired degree by freeing the rod of the holding office exerted by the set screw 16, and then turning the post holding rod to place its serrations out of engagement with the serrations in the heads of the posts, thereby permitting movement of the posts upon the rod, after which the rod is returned to its former position and held from move-

ment as before. It is also to be noted that the post holding rod may be partially withdrawn from the binder at any time upon turning it into the position it occupied when it was inserted for the purpose of permitting separation of a post, or posts, from the rod and their removal from the part of the binder by which they are carried, or to permit the mounting of a greater number of posts than previously in place in the binder.

We will next proceed with the description of the clamping means by which the upper cover is secured to the binder posts.

In the inner and outer walls of the pocket member 4 of the upper cover are slots 4' corresponding in dimensions to the slot 2' and the slot 6, respectively, in the pocket member 2 of the bottom cover and the housing 5 within said cover.

18 is a housing within the pocket member 4 and which preferably corresponds in shape to the housing 5 in the pocket member 2 of the bottom cover. This housing 18 is provided with slots 19 in registration with the slots 4' in the pocket member 4 and through which, as also through the slots 4', the binder posts 7 are adapted to pass when the top cover is placed upon the sheets of paper laid upon the bottom cover.

20 designates clamping bars loosely mounted in the housing 18 at opposite sides of the slots 19 therein and which are adapted to be moved into engagement with and out of engagement with the binder posts when they are present in the pocket members 4. Each clamping bar is provided with runners 21 that ride in engagement with the bottom and top faces at the interior of the housing 18 to reduce the frictional engagement between said bars and housing. Each clamping bar is also provided with slots 22 extending diagonally therein, and at its outer edge with inclined faces 23 that extend diagonally with the bars parallel with said slots. The diagonal slots 22 receive guide pins 24 rigidly mounted in the bottom and top of the housing 18 and the inclined faces 23, which are located throughout the length of the clamping bars between the diagonal slots 22, receive guide pins 25, also rigidly mounted in the bottom and top of the housing 18.

27 is a shifter head, preferably of U-shape, so that ends of the clamping bars 20 may be confined between wings thereof. This shifter head is loosely connected to the clamping bars by pivot pins 28 mounted in the shifter head and extending loosely through transverse slots 26 in the clamping bars, (see Figs. I and VI). The shifter head is provided with a T-slot 29 located midway of its length, and which receives the head 30 of a shifter screw 31 that is provided with a key receiving head 32 and is rotatably mounted in a bearing block 33,

screw threaded internally to receive the shank of the screw.

Assuming that the clamping bars 20 are sufficiently separated to permit of the passage of the binder posts 7 between them when the top cover is put in place in the binder, the posts will pass between these bars ready to be engaged by the bars when they are moved toward each other. Then, to effect a clamping action of the post upon the bars, it is only necessary to turn the shift screw 31 in the proper direction, whereby the shifter head 27 is moved inwardly and acts to impart endwise movement to the clamping bars. These bars are, during their endwise movement caused to move laterally toward the binder posts and become engaged therewith, due to the riding of the clamping bars against the guide pins 24 that extend through the diagonal slots 22 and also due to the riding of the inclined faces 23 of the clamping bars against the guide pins 23. A movement of the shift screw 31 in a reverse direction provides for the clamping bars being moved backwardly relative to their first movement, with the result of disengaging the clamping bars from the binder posts when it is desired to remove the top cover.

We claim:—

1. In a loose leaf binder, a cover having a pocket member, leaf receiving posts loosely mounted in said pocket member, and means within said pocket member on which said posts are adjustably mounted.

2. In a loose leaf binder, a cover having a pocket member provided with a slot, leaf receiving posts mounted in said pocket member and movable in said slot, and means mounted in said pocket member upon which said posts are adjustably mounted.

3. In a loose leaf binder, a cover, leaf receiving posts, and a post holding rod mounted in said cover and to which said posts are adjustably fitted, the rod being provided with means for engaging said posts to hold them from movement longitudinally of the rod.

4. In a loose leaf binder, a cover, leaf receiving posts provided with apertures, a post holding rod extending through the apertures in said posts adapted when in one position of adjustment to hold the posts from movement thereon, and to permit movement thereon of the posts when in another position.

5. In a loose leaf binder, a cover, leaf receiving posts, and a serrated rod mounted in said cover and extending through said posts to hold them in adjusted positions.

6. In a loose leaf binder, a cover, leaf receiving posts, and a non-circular post holding rod rotatably mounted in said cover and extending through said posts, the rod being provided with serrations and the posts hav-

ing non-circular apertures with serrations therein to receive the serrations upon said rod.

7. In a loose leaf binder, a cover, leaf receiving posts provided with non-circular apertures, a non-circular post holding rod extending through the apertures in said posts adapted when in one position of adjustment to hold the posts from movement thereon, and to permit movement thereon of the posts when in another position, and means for holding said rod from rotation after it has been adjusted.

8. In a loose leaf binder, a cover, leaf receiving posts provided with non-circular apertures, a non-circular post holding rod extending through the apertures in said posts adapted when in one position of adjustment to hold the posts from movement thereon, and to permit movement thereon of the posts when in another position, and a set screw carried by said cover and adapted to impinge against said rod to hold it in a fixed position.

9. In a loose leaf binder, a cover, leaf receiving posts loosely mounted in said cover and provided with non-circular apertures partially serrated, a non-circular post holding rod extending through the apertures in said post and having serrations at its edges for engagement with the serrations in the apertures in the posts, and means for holding said rod from rotation when the serrations of the rod are in engagement with the apertures in the posts.

10. In a loose leaf binder, a cover, leaf receiving posts loosely mounted in said cover and provided with non-circular apertures partially serrated, a non-circular post holding rod extending through the apertures in said post and having serrations at its edges for engagement with the serrations in the apertures in the posts, and a set screw for holding said rod from rotation when the serrations of the rod are in engagement with the serrations in the apertures in the posts.

11. In a loose leaf binder, a cover, leaf receiving posts carried by said cover, a second cover adapted to receive said posts, a pair of post clamping bars loosely mounted in said second cover capable of longitudinal movement parallel with each other and of transverse movement to and from said posts, and means for moving said clamping bars into and out of engagement with said posts.

12. In a loose leaf binder, a cover, leaf receiving posts carried by said cover, a second cover adapted to receive said posts, a pair of post clamping bars loosely mounted in said second cover capable of longitudinal movement parallel with each other and of transverse movement to and from said posts, means for moving said clamping bars into and out of engagement with said posts, said clamping bars being provided with guide-

ways extending diagonally relative to lines extending longitudinally of the clamping bars, and guide pins carried by said second cover serving as directing members against which the guideways of the clamping bars operate.

13. In a loose leaf binder, a cover, leaf receiving posts carried by said cover, a second cover adapted to receive said posts, a pair of post clamping bars loosely mounted in said second cover capable of longitudinal movement parallel with each other and of transverse movement to and from said posts, means for moving said clamping bars into and out of engagement with said posts, said last named means comprising a shifter loosely connected to said clamping bars, and means for operating said shifter.

14. In a loose leaf binder, a cover, leaf re-

ceiving posts carried by said cover, a second cover adapted to receive said posts, a pair of post clamping bars loosely mounted in said second cover capable of longitudinal movement parallel with each other and of transverse movement to and from said posts, and means for moving said clamping bars into and out of engagement with said posts; said means comprising a shifter connected to said clamping bars, and a shifter screw loosely fitted to said shifter.

In testimony whereof, we have hereunto affixed our signatures, this 22nd day of February, 1910.

HENRY G. FORNOFF.

HENRY C. KLAGES.

In the presence of—

E. B. LINN,

A. J. McCAULEY.