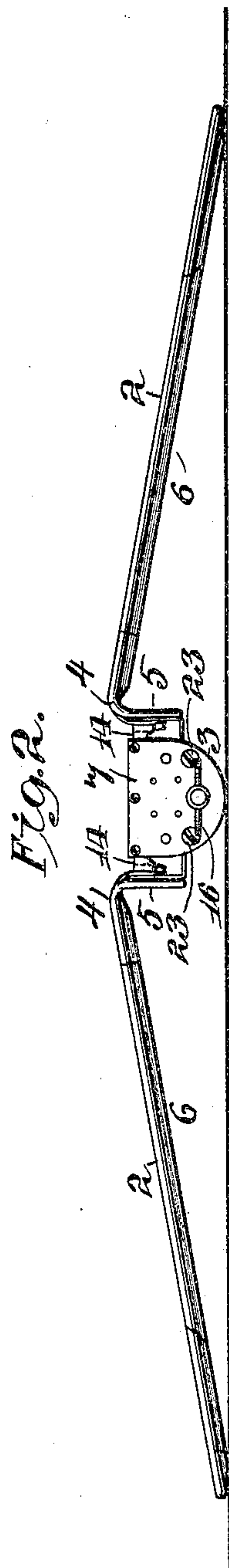
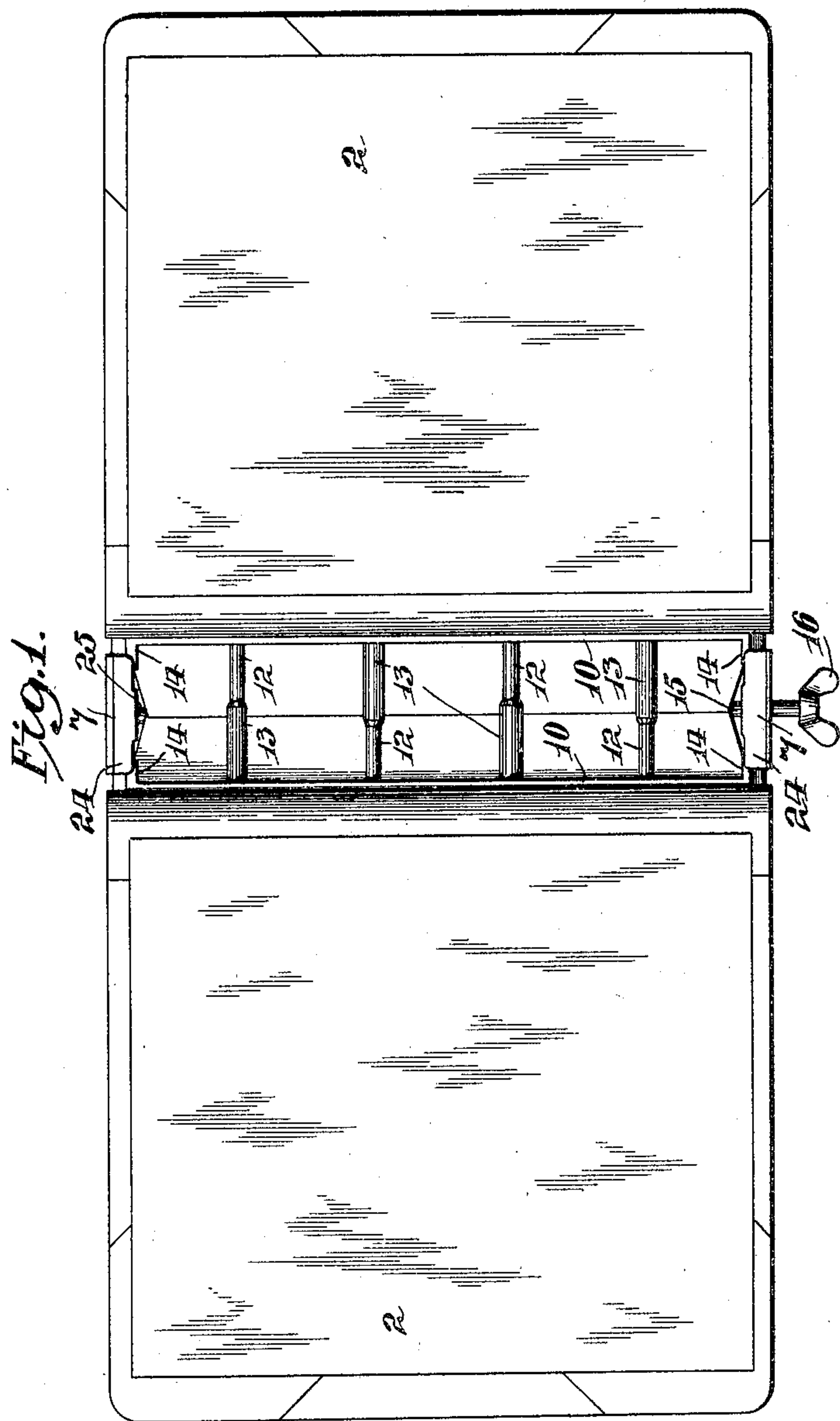


No. 793,638.

PATENTED JULY 4, 1905.

E. COLEMAN.  
LOOSE LEAF BINDER.  
APPLICATION FILED AUG. 26, 1903.

4 SHEETS—SHEET 1.



Witnesses  
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Edward Coleman Inventor  
By his Attorney *H. A. West*

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4 SHEETS—SHEET 2.

Fig. 3.

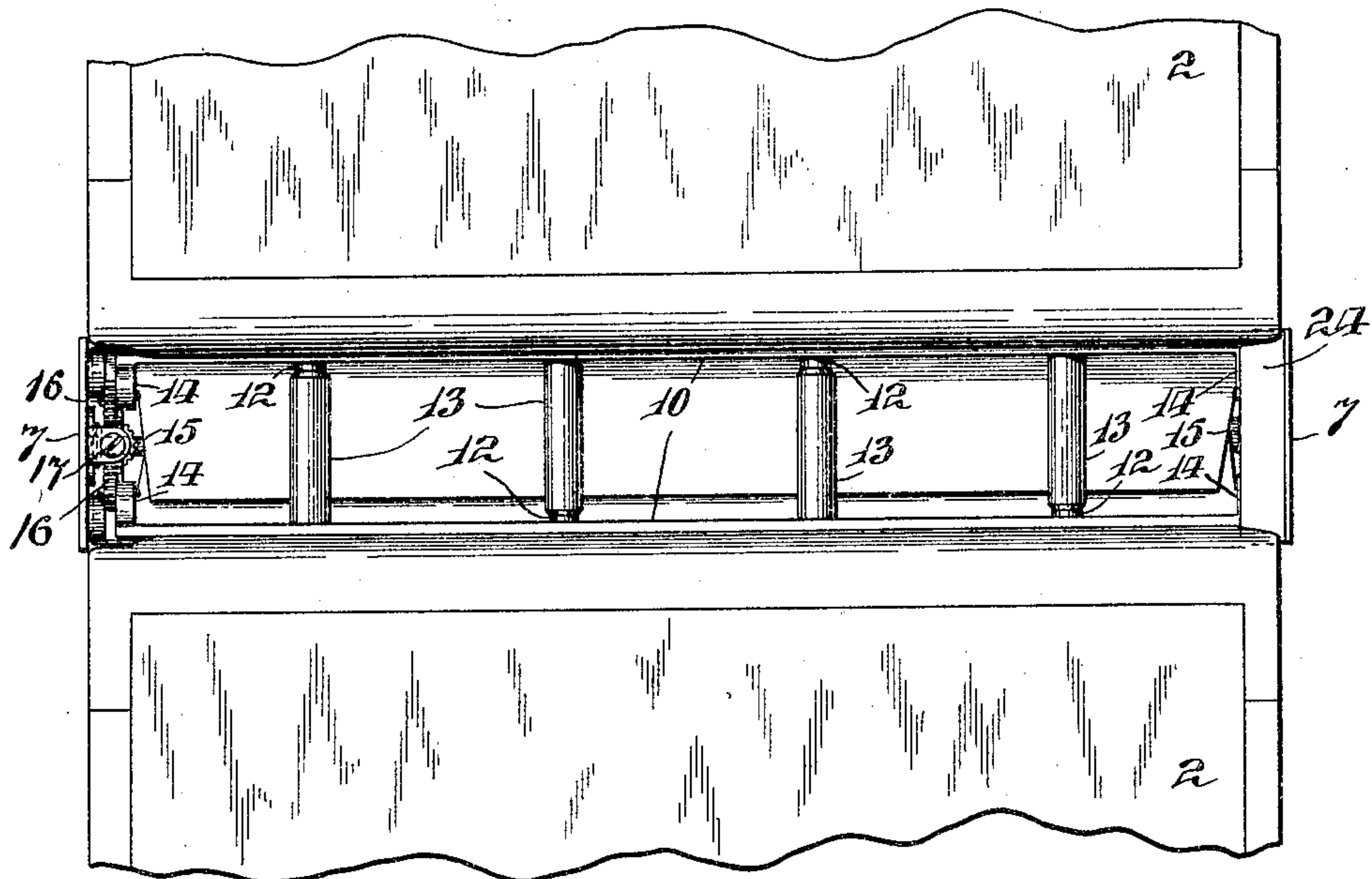
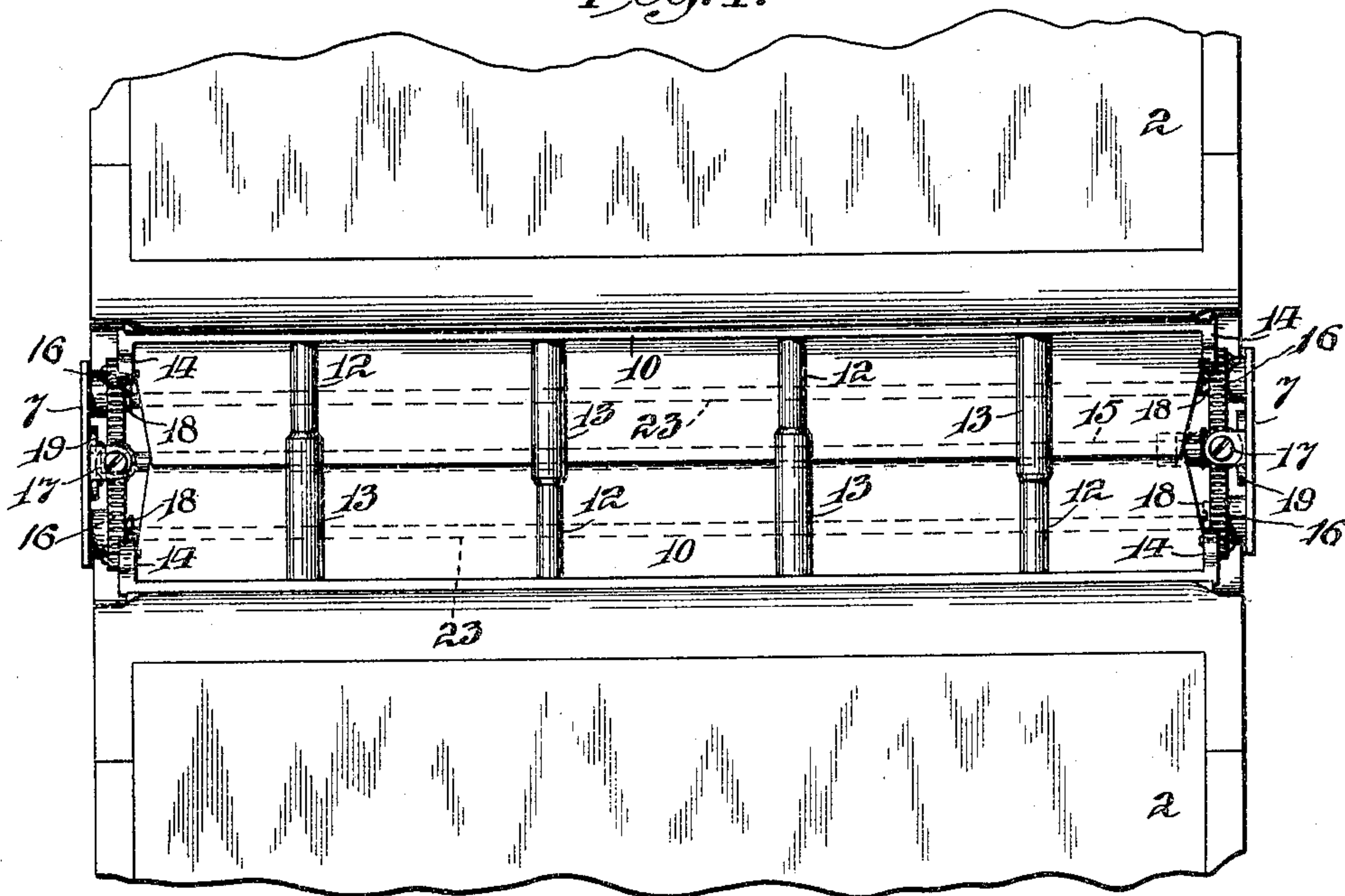


Fig. 4.



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4 SHEETS—SHEET 3.

Fig. 5.

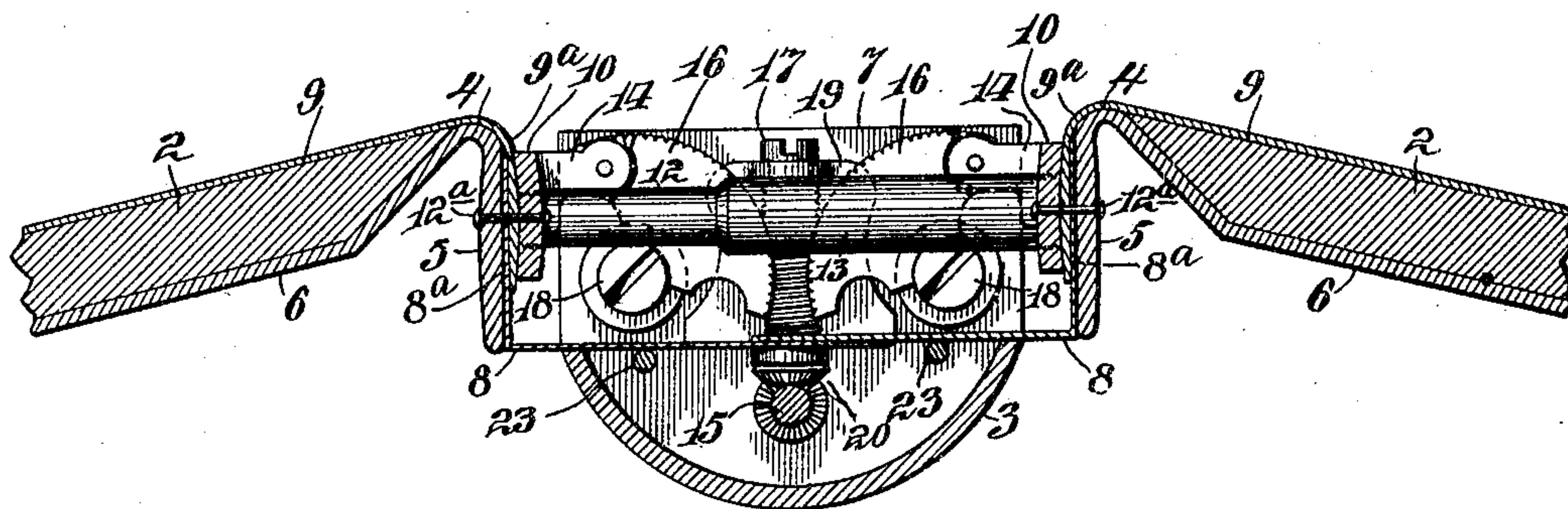


Fig. 6.

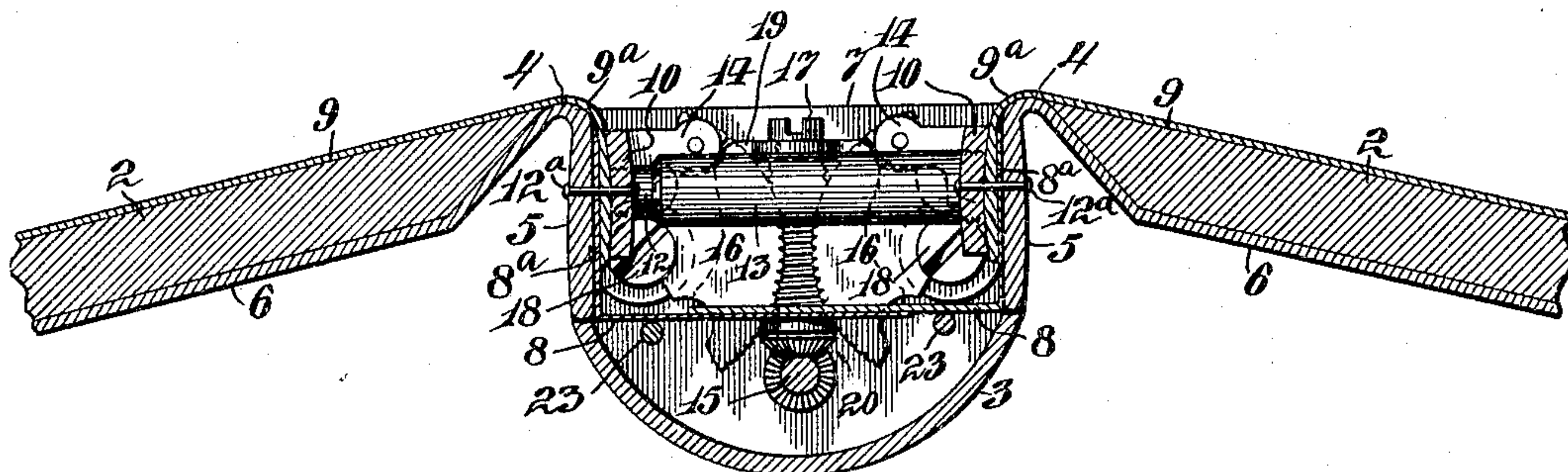
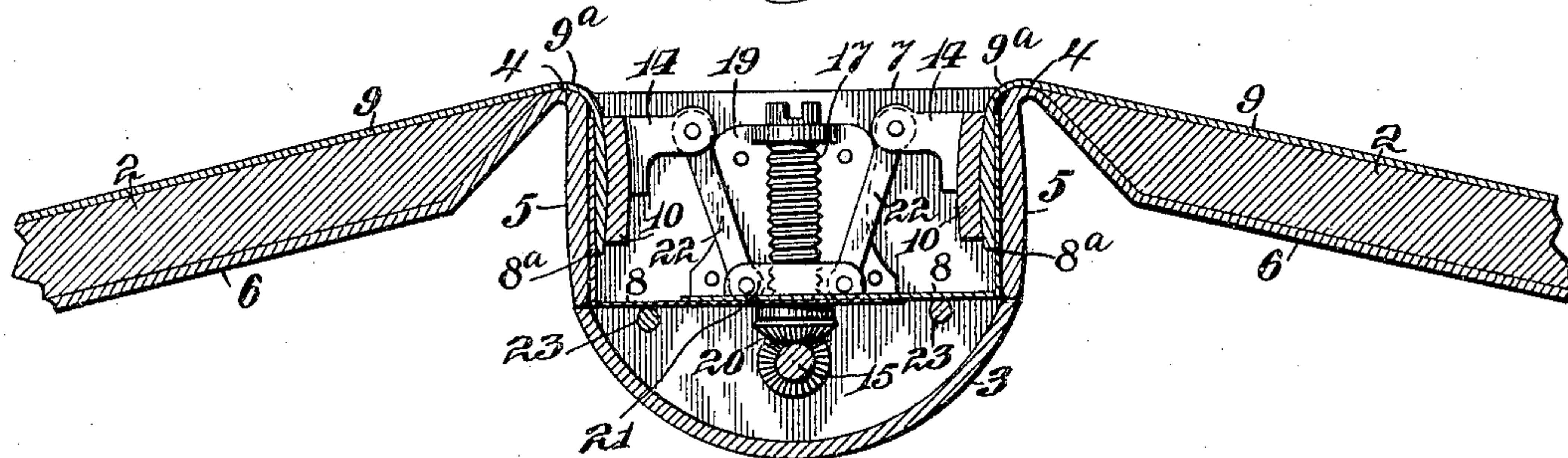


Fig. 7.



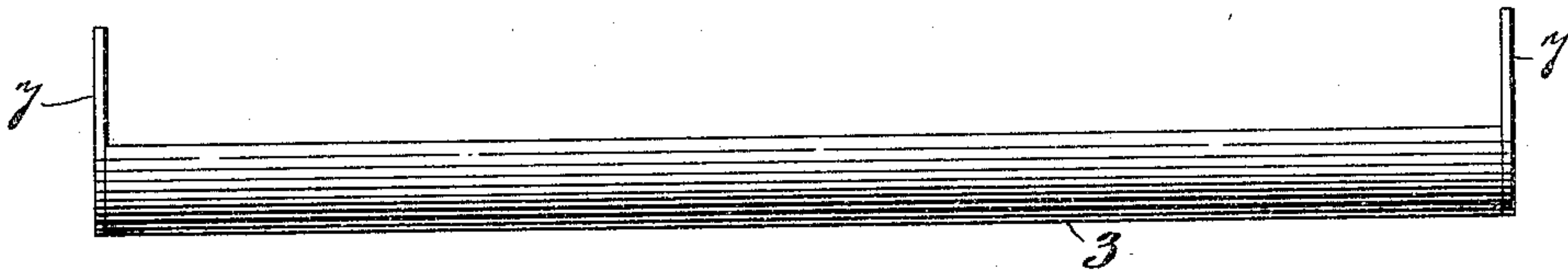
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Jacob Mahay.

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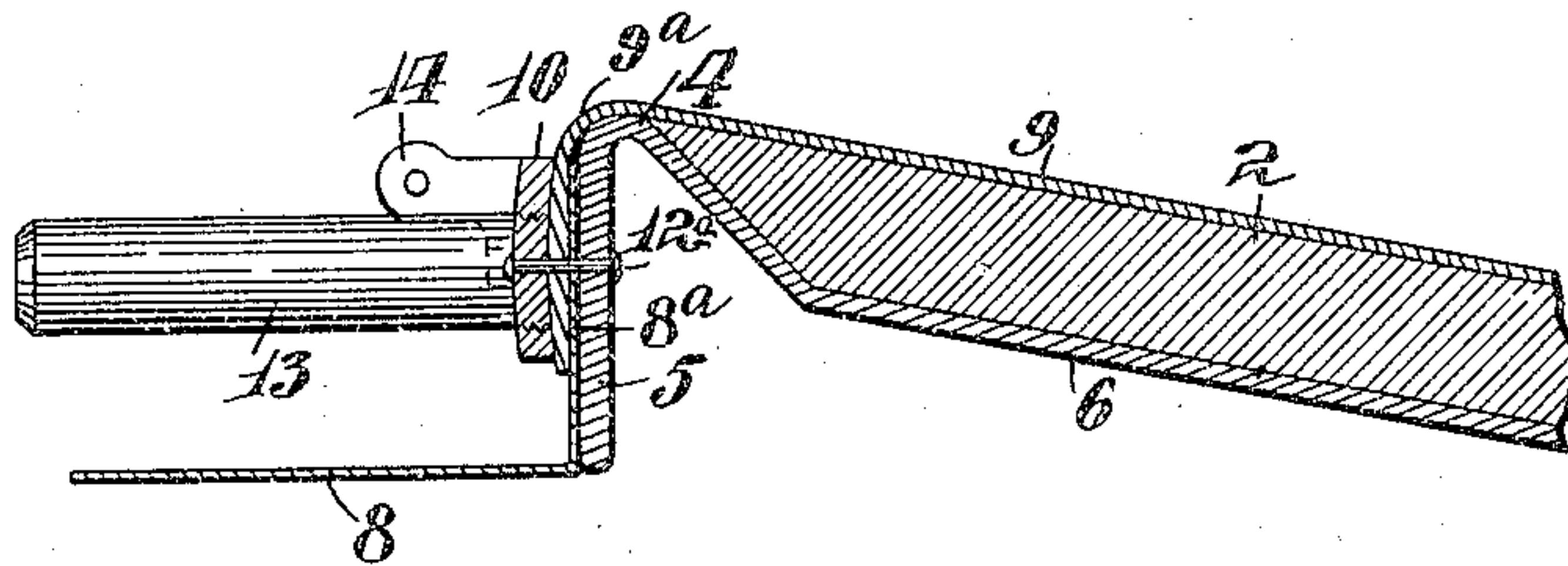
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4 SHEETS—SHEET 4.

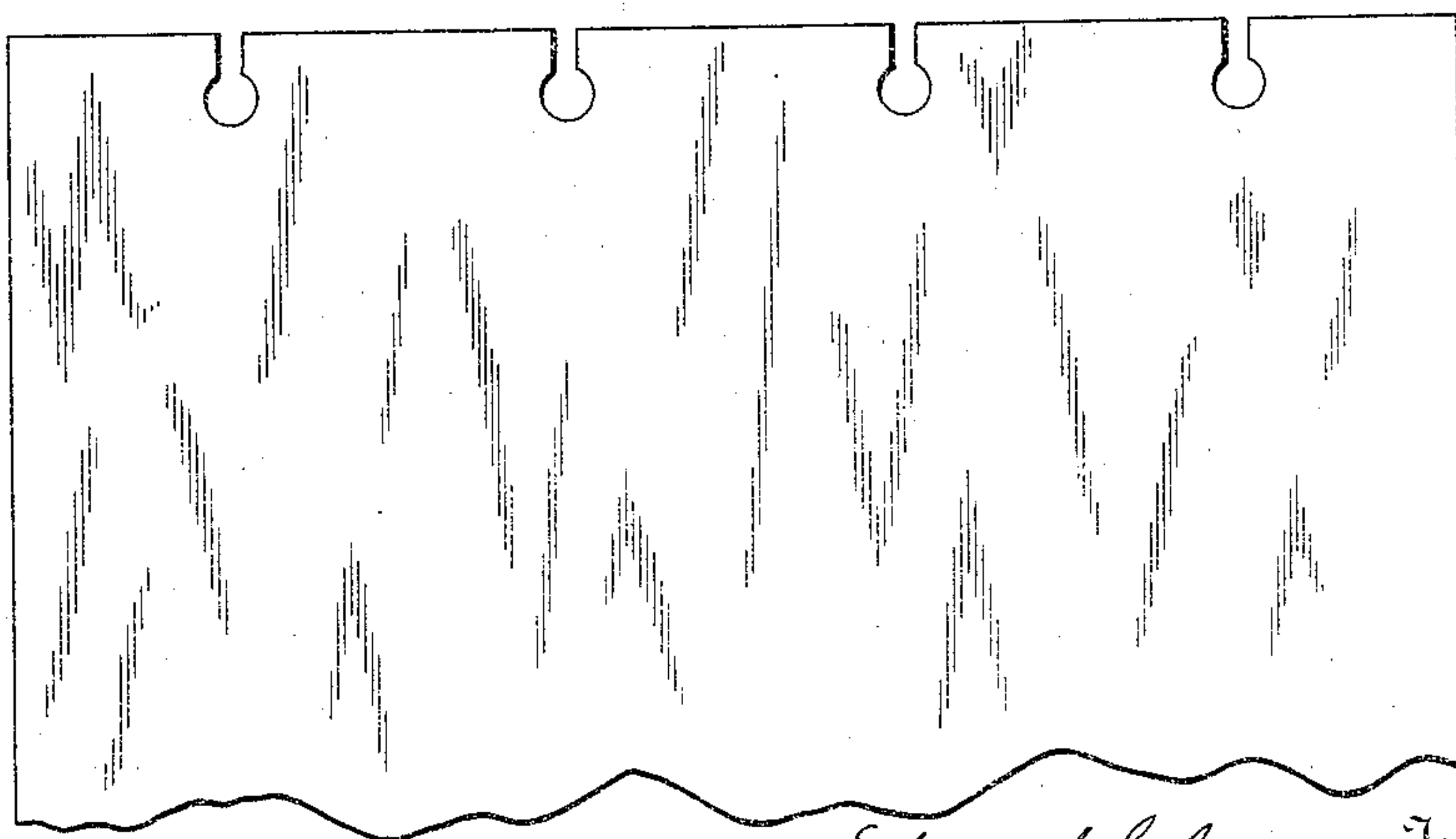
*Fig. 8.*



*Fig. 9.*



*Fig. 10.*



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# UNITED STATES PATENT OFFICE.

EDWARD COLEMAN, OF NEW YORK, N. Y.

## LOOSE-LEAF BINDER.

SPECIFICATION forming part of Letters Patent No. 793,638, dated July 4, 1905.

Application filed August 26, 1903. Serial No. 170,764.

*To all whom it may concern:*

Be it known that I, EDWARD COLEMAN, a citizen of the United States, and a resident of New York, borough of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Loose-Leaf Binders, of which the following is a specification.

My invention relates to loose-leaf binders; and it consists mainly of a binder which may be spread and contracted by mechanism inclosed by the back of the binder and end pieces secured thereto, the spreading and contracting being for the purpose of enabling sheets to be placed in and removed from the binder. By my invention the spreading and contracting of the binder is performed by mechanism which operates to slide plates back and forth in the back, to which plates the covers are attached. By preference the spreading and contracting mechanism is duplicated on each side of the binder and at each end of the back, so that by a single operation both sides are opened or closed simultaneously—that is, both covers are preferably spread and contracted by one and the same operation. The back of the binder is provided with end plates of greater width than the depth or thickness of the back, and the covers, with their side pieces connected at right angles to the above-mentioned plates, serve to form an expansible inner or false back and also serve to form the main movable sides of the back. The said sides, which, as stated, are adapted to slide out and in, are provided with means for holding the sheets of paper, preferably telescoping tubes, on which perforated and slotted paper may be placed in a well-known manner. To the said end pieces, which are secured to the ends of the main back, are journaled threaded shafts, which are geared to a main shaft, which is located beneath the said inner or false back and so that by turning the said main shaft by a key or otherwise the said threaded shafts will be rotated. This rotation of the threaded shafts is converted by segmental worm-wheels or equivalent mechanism connected to the sides of the binder into reciprocating motion,

which operates to spread and contract the sides of the binder and to close the sides firmly down upon the leaves or sheets, binding them firmly together. The back edges of the sheets when placed in the binder abut against the said inner or false back, which holds them squarely in the book and prevents the sheets from shifting out of place in the use of the book.

My invention further consists in the construction of the covers and side pieces thereof, in the construction of the main back, in the operating mechanism, and in the details and various combinations of parts, all as hereinafter described and claimed.

In the accompanying drawings, to which reference is made and which form a part of this specification, Figure 1 is a plan view of my new and improved loose-leaf binder shown in open position, showing the key applied to the end of the main shaft. Fig. 2 is an end elevation of the same. Fig. 3 is an open plan view showing the operating mechanism at one end. Fig. 4 is a like view showing the operating mechanism at both ends. Fig. 5 is an enlarged sectional elevation showing the sides in expanded position. Fig. 6 is a like view showing the sides in contracted position. Fig. 7 is a like view showing a modification of the operating mechanism. Fig. 8 is a detailed side view of the main back with its end pieces secured thereto. Fig. 9 is a detailed sectional view of one of the covers and parts connected thereto, and Fig. 10 is an enlarged plan view of a sheet of paper adapted to be used with my new binder.

In the drawings, 2 2 designate the covers of the binder, and 3 the back. The covers are provided at the hinge 4 thereof with a strip 5, which by preference is an extension of the canvas, leather, or outer covering 6 on the outside of the board. The strips 5 are of less width than the back 3 when considered as including the end pieces 7 7 and have secured to them the back plates 8, of metal, wood, or other suitable material, and which form a false or inner back. The inner covering 9 of the covers of the binder are carried over vertical portions or flanges 8<sup>a</sup>, secured to or made



as a part of the supports or back plates 8, forming flaps 9<sup>a</sup>, upon which are placed bars 10, of metal or other suitable material, which bars are firmly secured in place by any suitable means, as here shown by means of rivets 12<sup>a</sup>, which also serve to hold the several parts together—that is, the rivets 12<sup>a</sup>, secure together the strip 5, the flange 8<sup>a</sup>, the strip 9<sup>a</sup>, and the bar 10. (See Figs. 5 and 6.) The bars 10 hold and squeeze the sheets of paper in the binder, and for this purpose are by preference provided with telescoping tubes 12 13, upon which the paper is placed. The telescoping tubes are by preference alternately arranged on the bars 10, as shown in Figs. 3 and 4, so that they serve to brace the back and to increase the rigidity of the binder and hold the bars 10 parallel. The bars 10 are formed at the ends with arms 14 14, by which the spreading mechanism is connected to the covers for spreading and contracting them, as will be hereinafter described.

The back 3 is by preference of metal, having secured to its ends the upright end plates 7 7. In the said end plates is journaled a shaft 15, adapted to be turned by a key 16 or other device for operating the spreading and contracting mechanism which is secured to the inner surfaces of the end plates 7 7.

The spreading and contracting mechanism is, by preference, duplicated at each end of the binder. This mechanism, by preference, consists of two worms 16 16, by preference, segmental in form, held to embrace opposite sides of a threaded shaft 17. The upper ends of the said worms are connected to the arms 14 14 of the bars 10 and are journaled on the studs 18 18, (see Figs. 5 and 6,) screwed into the end pieces 7. The said studs 18 18, on which the worms are journaled, are located between the plates 8 8, which form the false bottom, and the arms 14 14, as shown clearly in Figs. 5 and 6. The shafts 17 at each end of the binder are journaled in housing-plates 19, secured to the inner surfaces of the end plates 7 7, and are rotated from the main shaft 15 through a pair of beveled gears 20 20, so that when the worms 16 16 are moved from the position shown in Fig. 6 to that shown in Fig. 5 they will operate to spread the covers apart, thus allowing papers to be placed in or removed from the binder. When the sheets have been placed in the binder, the shaft 15 will be turned to shift the worms 16 16 from the position shown in Fig. 5 to that shown in Fig. 6, which will cause them to draw the sides of the binder toward each other and cause the bars 10 10 to press upon and firmly bind the papers in place.

In place of the segmental worms 16 I may employ on the threaded shaft 17 a nut 21, as shown in Fig. 7, which is connected to the binder by links 22. I do not limit myself to any special mechanism for spreading and con-

tracting the binder, as various other modifications and equivalents may be devised for this purpose, all within the spirit and scope of my invention.

The plates 8 8, acting with the flanges 8<sup>a</sup> 8<sup>a</sup>, support the sides of the binder from the lower edges thereof, while the upper edges are firmly held in position by the arms 14, connected to the spreading and contracting mechanism, and for the purpose specified the plates 8 8 are supported, preferably, by rods 23 23, held by the end plates 7 7, and which reach from plate to plate.

In the completed binder the spreading and contracting mechanism is inclosed and covered from view by face-plates 24 24, as shown in Fig. 1 and at the right of Fig. 3, which are held in place by screws passed through the end plates 7 7.

While I have shown the spreading and contracting mechanism in duplicate for each side of the binder, I do not limit myself to such arrangement, as the parts at one end or at one side can be manufactured and used separately within the scope of my invention.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A binder comprising a back, and an end piece connected to said back, a support or plate held by said back, a side piece connected to said support or plate, an arm projecting inward from said side piece, a main shaft, a threaded shaft geared to said main shaft, and means connected to said threaded shaft and to said arm for moving the said side piece, substantially as described.

2. A binder comprising a main back, end pieces connected to said back, plates or supports 8, side pieces 8<sup>a</sup> connected to said plates or supports, arms 14 projecting inward from said side pieces, a main shaft journaled in said end pieces, threaded shafts held by said end pieces and geared to said main shaft, worm-segments embracing said threaded shafts and connected to said arms, substantially as described.

3. In a binder a main back, plates or supports 8 resting on the edges of the main back and forming an inner false back, side pieces 8<sup>a</sup> connected to said plates or supports, supports 23 for said plates or supports, a shaft located between said plates and the main back and means operated by said shaft for moving the said plates, substantially as described.

4. In a binder a back, end pieces connected to said back, a main shaft journaled in said end pieces, vertical worm-shafts held by said end pieces and geared to said main shaft, segmental worms held by said end pieces and engaging with said worm-shafts and a movable side piece connected to said segmental worms, substantially as described.

5. In a binder a back, end pieces connected



to said back, a main shaft journaled in said end pieces, vertical worm-shafts held by said end pieces and geared to said main shaft, segmental worms held by said end pieces on each side of said worm-shafts, and movable side pieces connected to said segmented worms, substantially as described.

6. In a binder a segmental worm pivoted to an end piece of the back, a movable side piece connected to the segmental worm, a vertical worm-shaft and a main shaft geared to said worm-shaft, substantially as described.

7. In a binder, a main back, supports on a line with the side edges of said back, side pieces 8<sup>a</sup> connected to plates or supports 8, the latter forming an inner or false back, a main shaft located between the main back and the

said plates or supports 8, and means operated by said shaft for moving the said side pieces 8<sup>a</sup> and plates or supports 8 to and from each other, substantially as described. 20

8. In a binder the laterally-movable side pieces 8<sup>a</sup> and the covers 2 having the outer covering 6 and inner covering 9 thereof applied to the surfaces of the said side pieces 8<sup>a</sup>, 25 in combination with the bars 10 having the paper-holding devices secured thereto and secured to the plates 8<sup>a</sup> upon the inner covering 9, substantially as described.

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