

March 2, 1926.

1,574,992

H. C. MILLER

LOOSE LEAF BINDER

Filed Jan. 18, 1924

3 Sheets-Sheet 1

Fig-1-

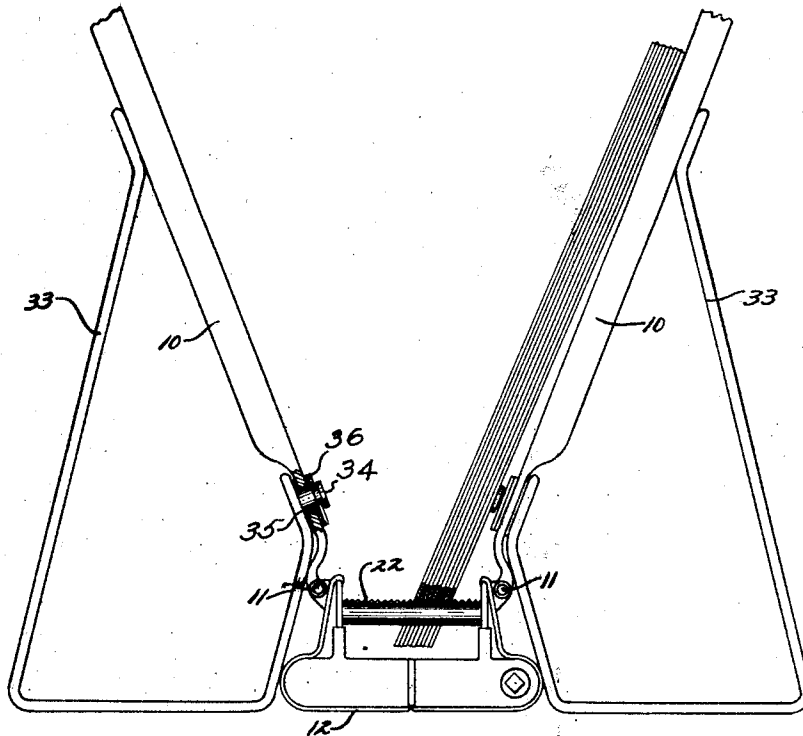
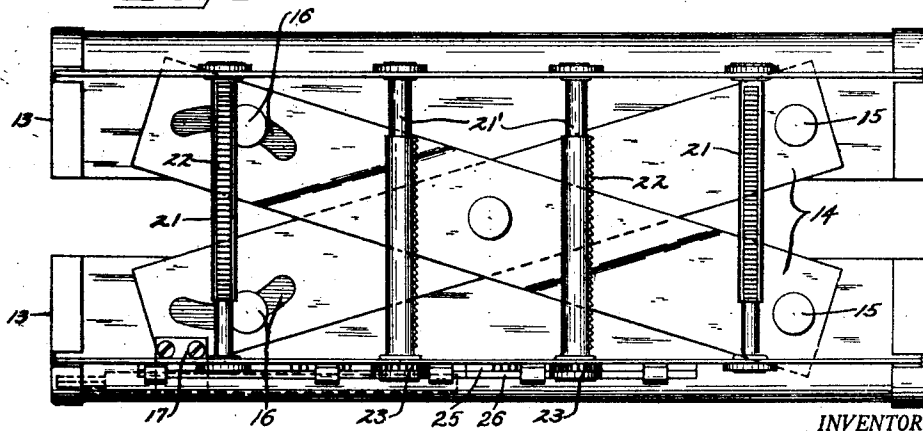


Fig-2-



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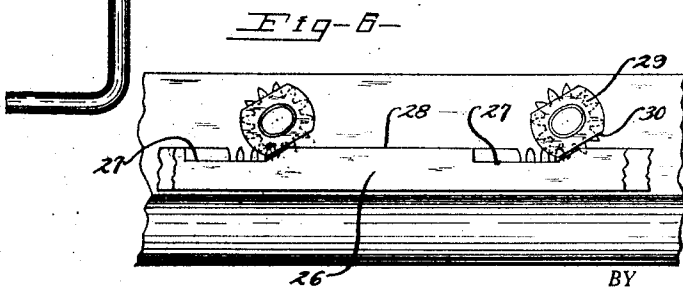
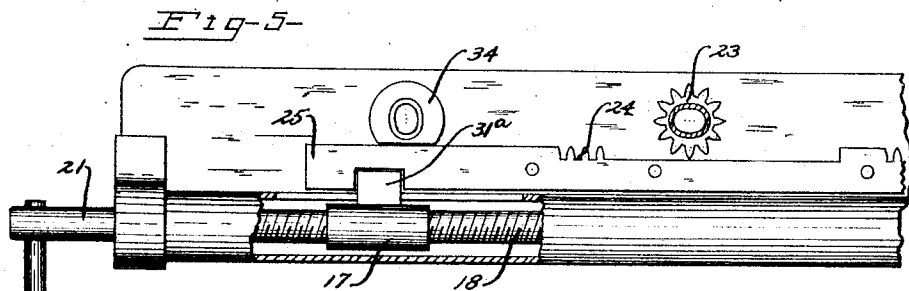
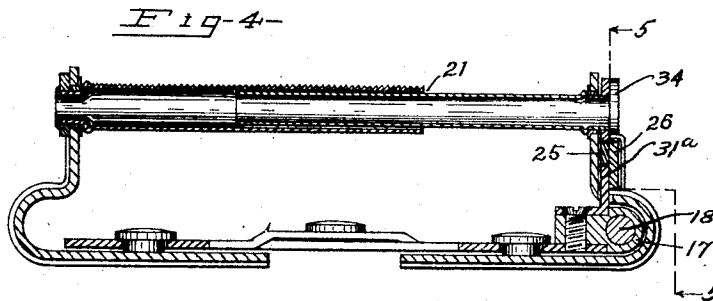
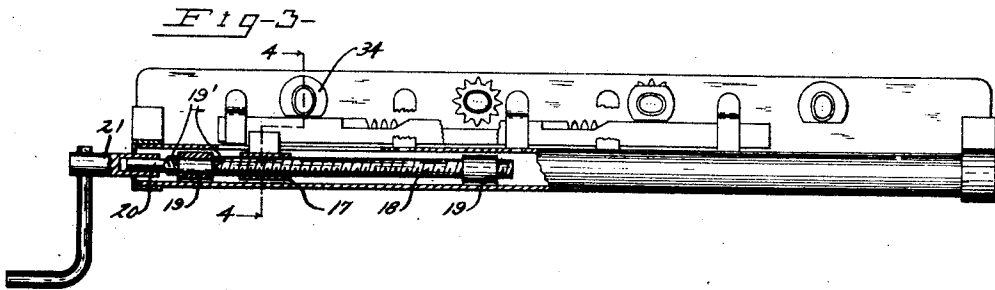
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LOOSE LEAF BINDER

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3 Sheets-Sheet 2



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LOOSE LEAF BINDER

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3 Sheets-Sheet 3

Fig- 7-

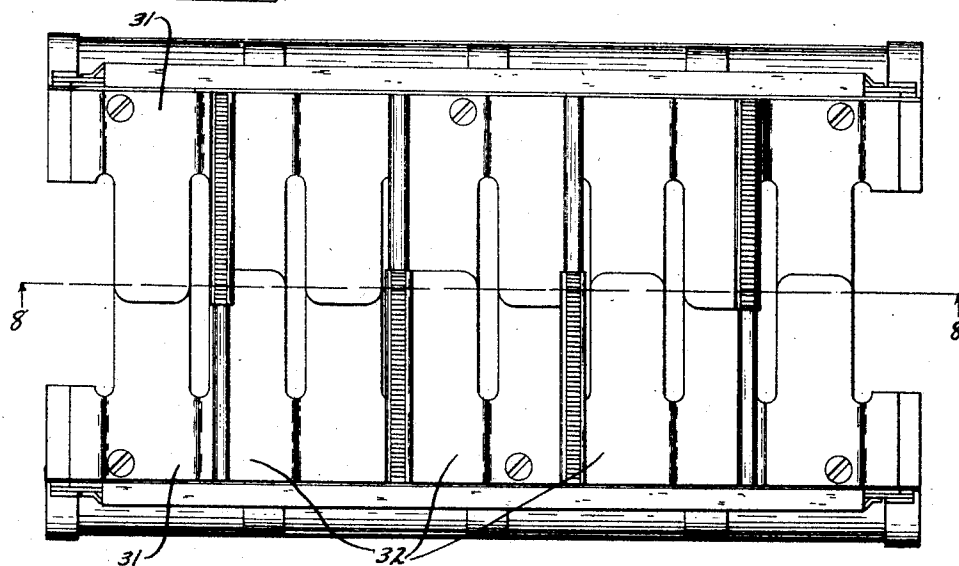
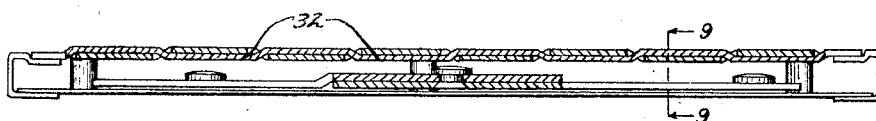


Fig-8-



E19-9-



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UNITED STATES PATENT OFFICE.

HENRY C. MILLER, OF MILWAUKEE, WISCONSIN.

LOOSE-LEAF BINDER.

Application filed January 18, 1924. Serial No. 687,068.

To all whom it may concern:

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

This invention relates to loose leaf binders, and particularly to that type of binders in which the leaves are removably secured between side covers which are adjustably connected together for securely clamping the leaves therebetween.

In binders of this type it is customary to provide binding posts which when properly adjusted co-operate with notches in the leaves for locking the leaves in place, these binding posts being operable separately from the adjustable covers, thereby necessitating two separate actions in locking the leaves in the binder.

It is the particular object of this invention to provide a construction embodying in general all of the advantageous and standard structural features of known loose leaf binders, but providing in addition means whereby the expansible cover and the leaf-locking means may be simultaneously actuated.

With this in mind, the invention consists in the novel combination, construction and arrangement of parts, all as will be made more apparent hereinafter, as the description proceeds, especially when considered in connection with the accompanying drawings wherein:

Figure 1 is a fragmentary side elevation, partly in section, of a loose leaf binder, constructed in accordance with this invention;

Fig. 2 is a top plan view of the back of the device, with certain parts removed for purposes of illustration;

Fig. 3 is a side elevation, partly in section, of the back of the binder;

Fig. 4 is an enlarged sectional view, taken substantially on the plane indicated by the line 4—4 in Fig. 3;

Fig. 5 is a fragmentary sectional view, taken substantially on the plane indicated by the line 5—5 in Fig. 4, on a substantially larger scale;

Fig. 6 is a fragmentary detail view, illustrating the binding post locking means;

Fig. 7 is a top plan view of the back of the binder showing an additional feature;

Fig. 8 is a sectional view, taken substantially on the plane indicated by the line 8—8 in Fig. 7 with the posts omitted; and,

Fig. 9 is a fragmentary detail sectional view, taken substantially on the plane indicated by the line 9—9 in Fig. 8.

Referring now to the drawings wherein like reference characters indicate like parts, it will be noted that the binder consists of a pair of covers 10, which are hingedly connected, as at 11, to the back 12. The back is formed in two sections 13, which are movable toward and away from each other, whereby the leaves may be clamped between the halves of the binder in the usual manner.

The two back sections 13 are connected by toggle levers 14, pivoted at one end, as at 15, to the back sections and adjustably connected at the other end to the back sections, by means of pin and slot connections 16.

Secured to one end of one of the toggle levers 14 is a nut 17, which has a threaded engagement with an operating rod in the form of a shaft 18, revolvably supported within the back by any suitable supports, such as shown at 19. The squared end 20 of the operating shaft is arranged adjacent one end of the binder, whereby it may be engaged by a key 21, for revolving this shaft 18. The portions of the shaft 18 extending through the bearings 19 are reduced in diameter to form shoulders 19' for preventing endwise movement of said shaft.

Each back section is provided with a plurality of binder posts 21, the opposed binder posts of the back sections interengaging in telescopic relation. The two outer binder posts are preferably fixed, while the two inner binder posts 21' are mounted so as to rotate relatively to the back sections. These binder posts are preferably oval-shaped in cross-section and are rotated for interlocking with notches arranged in the edge of the sheets to be contained within the binder.

Each of the binder posts is provided with a serrated or toothed surface 22, which will be engaged by the leaves when the binder is standing on its back, whereby the leaves may be loosely positioned upon the binder posts at one side or the other to permit the easy removal or insertion of additional

leaves therebetween. It is obvious that the serrated surfaces of the center binder posts will, during the unlocked condition of the binder, be positioned upwardly, similar to the two outer posts, as shown in Fig. 2.

Mounted upon one end of each of the inner posts 21' is a pinion 23, which is adapted to mesh with groups or sections of teeth 24, arranged along a rack bar 25. The number of teeth is so selected that when the rack bar 25 is longitudinally displaced, the engagement of the teeth 24 with the pinions 23, will cause the binder posts to make a one quarter turn, at which time the rack bar 25 will have travelled to such an extent as to move the teeth 24 past the pinions 23.

For locking the binder posts in their adjusted positions there is provided a locking bar 26, provided with a plurality of suitably spaced cut-away portions 27, between which are locking surfaces 28 which cooperate with locking heads 29, secured to the ends of the binder posts adjacent to the pinions 23, these locking heads being formed with flattened or slabbed surfaces 30.

The rack bar 25 is rigidly connected to the locking bar 26, and both bars are operated by the projection 31 of the nut 17 which extends into the recess of the bar 25. Thus as the two bars, 25 and 26, are longitudinally displaced, the center binder posts will first be caused to rotate a one quarter turn, whereupon the flattened surface 30 of the head 29 of each of the binder posts, will come into engagement with the straight locking edge 28 of the bar 26, whereupon additional accidental rotation of the binder posts will be prevented.

The locking surfaces 28 of the locking bar 26 are so positioned with relation to the recessed portions 27, that immediately after the last tooth of the toothed sections 24 leaves the binder post pinion 23, the locking portion 30 of the head 29 will rest upon the locking portion 28 of the bar 26, so that the bar 26, as well as the rack bar 25, can continue its movement in opening and closing the back sections, while the revolvable posts are maintained immovable in their adjusted position.

By reference to Fig. 7, it will be noted that cover sections 31 are provided which are mounted upon the back sections for movement therewith, and are adapted to enclose the operating mechanism controlling the back and the binder posts. These cover plates are preferably formed with a plurality of alternately arranged offsets 32, which cooperate with a similar number of offsets on the other plate section, thus producing a flat surface, which may be engaged by the inner edges of the leaves. As shown in Fig. 1, separate angular members 33 may be provided against which the covers rest

and which are adapted to support the covers 10 in open position, whereupon the leaves may be conveniently inserted or withdrawn. The inner ends of the angular members are provided with grooved heads 34 which extend through openings 35 in the cover and are secured thereto in any manner desired, for instance by slotted bars 36 which engage the grooves of the heads. In Fig. 3, it will be noted that the outer binder posts are provided with headed portions 34, flattened at the lower side thereof, but these headed portions do not perform any function save that of assisting in guiding the longitudinally displaceable bars 25 and 26.

From the foregoing it will be immediately apparent that upon rotation of the shaft 18 by means of the key 21, the toggle levers 14 will be operated to move the back sections 13 away from one another for opening the binder. When the back portions and covers have been moved to almost the extent of their open position, the pinions 23 carried by the middle binder posts will be engaged by the rack teeth 24, and rotated a quarter of a turn, whereupon the leaves will be unlocked and easily removable. Obviously the binder posts will be maintained positively in locked position except during the period of rotation by the rack teeth by means of the cooperating locking surfaces formed on the locking bar 26 and the heads 29. In locking the binder the first rotation of the shaft 18 will cause the locking posts to be turned a quarter turn back to locking position and at the same time draw the back sections together, and upon a further rotation of the shaft 18, the toggle levers 14 will be further actuated for drawing the back sections together to tightly clamp the leaves therebetween. Thus the entire operation is accomplished by the use of a single key.

While an embodiment of this invention has been described and illustrated herein in some detail, it is not intended that the invention be unnecessarily limited but reservation is made to make such changes in the details of construction and combination and arrangements of parts as will come within the purview of the accompanying claims.

Having thus described the invention, what is claimed is:

1. In a loose leaf binder, an extensible back, revolvable binding posts and means for simultaneously adjusting said back and revolving said binding posts.

2. A loose leaf binder comprising a sectional extensible back, revolvable binding posts carried by said back and means operatively connected to said back sections and binding posts for simultaneously adjusting said back and rotating said binding posts.

3. In a loose leaf binder, a back including extensible back members, revolvable binding

posts carried by said back members, a key-rotated operating shaft and means connected to said shaft for simultaneously adjusting said back and rotating said binding posts.

5 4. In a loose leaf binder, an extensible back including a pair of back sections and toggle lever means connected to said sections, revolvable binding posts carried by said sections and means operatively connected to
10 said toggle lever and to said binding posts for simultaneously adjusting said back and rotating said binding posts.

5 5. In a loose leaf binder, an extensible back, rotatable binding posts carried by
15 said back, means for adjusting said back and rotating said binding posts and means for locking said binding posts in their adjusted positions.

20 6. In a loose leaf binder, an extensible back, binding posts carried by said back, rack and pinion means for rotating said binding posts and means for adjusting said back and simultaneously actuating the rack
25 of said rack and pinion means.

30 7. A loose leaf binder comprising a back portion including a pair of extensible back members, rotatable binding posts carried by said back members, means for rotating said posts and means operable with said binding
35 post operating means and functioning at the completion of the rotation of said binding posts for locking said binding posts in their adjusted positions.

8. A loose leaf binder comprising a back
35 portion including a pair of back sections

extensibly connected together, revolvable binding posts carried by said back sections, an operating rod and means connecting said operating rod to said binding posts and to said extensible back members for simultane- 40
ously adjusting said back members and rotating said binding posts.

9. A loose leaf binder comprising an extensible back, rotatable binding posts, binding post locking means and a unitary means 45
for simultaneously adjusting said back, rotating said binding posts and operating said binding post locking means.

10. A loose leaf binder comprising a back, binding posts carried by said back, pinions 50
on said binding posts, a longitudinally displaceable rack bar for engagement with said pinions, an operating rod for actuating said rack bar and a locking bar co-operating with
55 a locking head on said binding posts for locking said posts in their adjusted positions.

11. A loose leaf binder comprising a back, binding posts carried by said back, pinions on said binding posts, a longitudinally displaceable rack bar provided with spaced 60
groups of teeth for engagement with said pinions, an operating rod for actuating said rack bar, a locking bar movable with said rack bar and provided with locking surfaces and a locking head secured to said
65 binding posts and co-operating with said locking bar for securing said binding posts in their adjusted positions.

In testimony whereof, I affix my signature.
HENRY C. MILLER.