

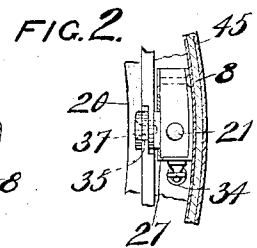
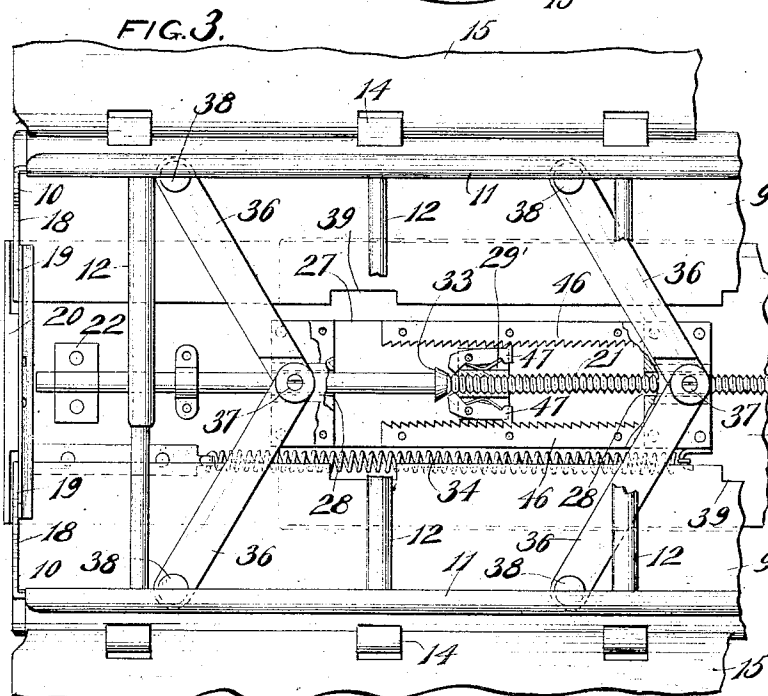
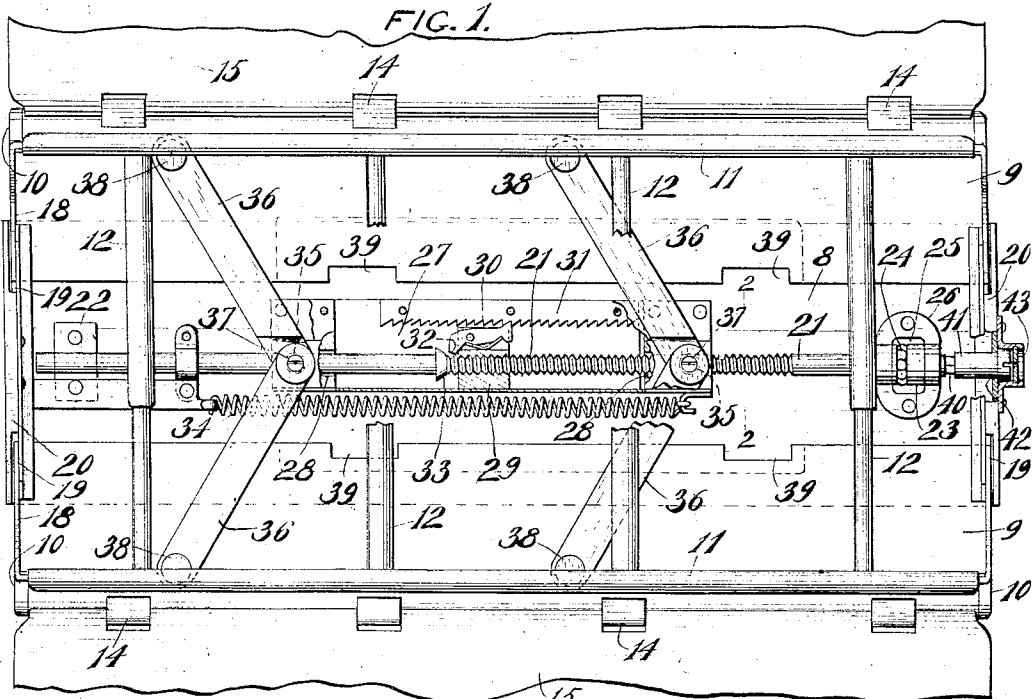
H. C. MILLER.
LOOSE LEAF BINDER.

APPLICATION FILED JUNE 28, 1909.

Patented Nov. 12, 1912.

3 SHEETS-SHEET 1.

1,043,955.



WITNESSES.

L. H. Thuermer
Anna Schmidt Thuermer

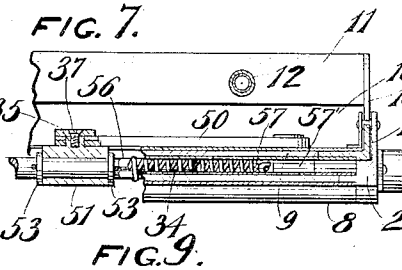
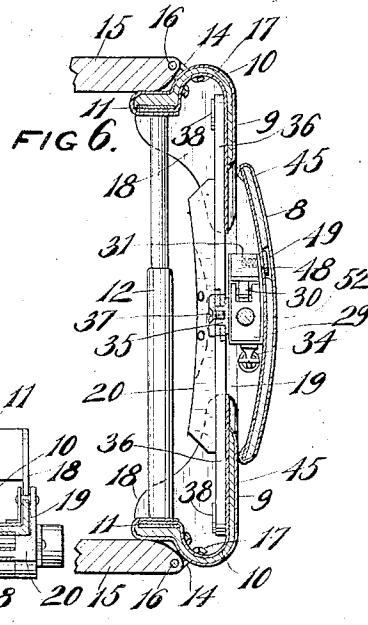
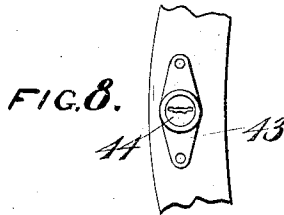
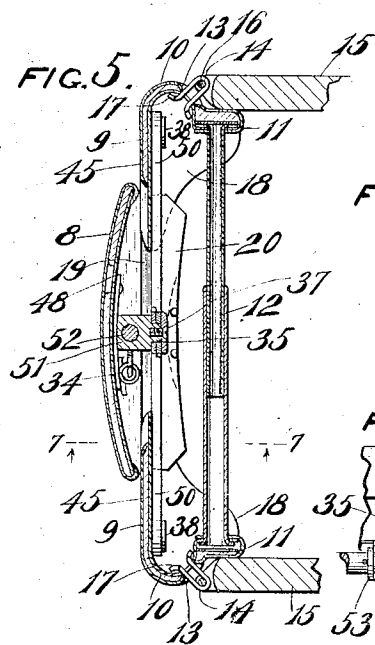
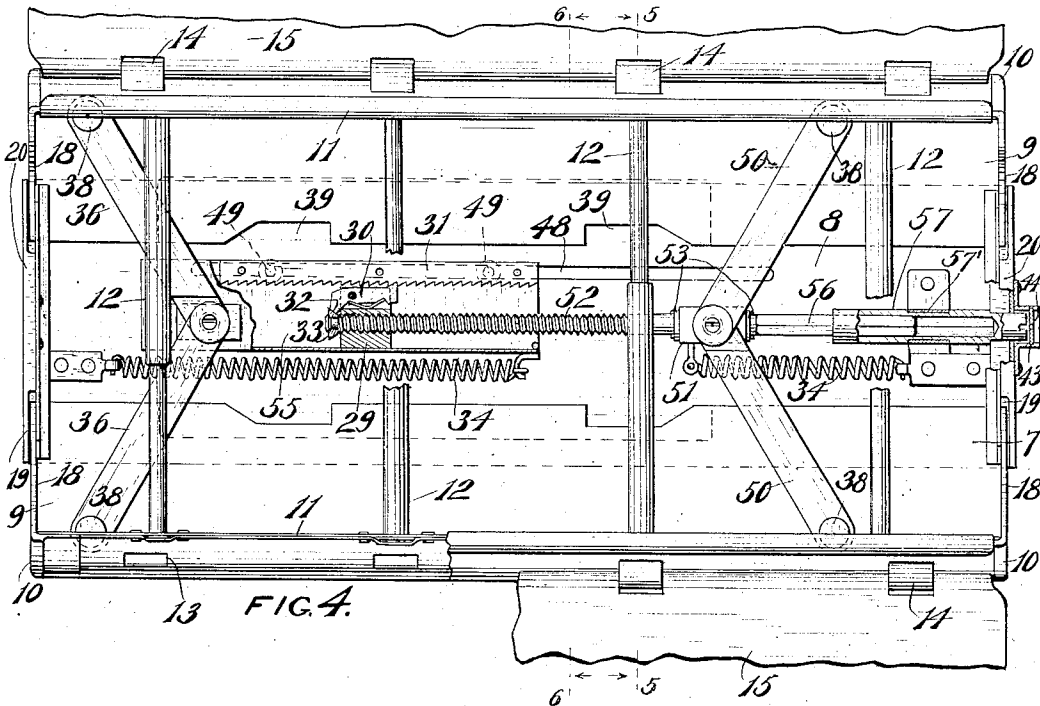
INVENTOR.
Henry C. Miller
By *Benedict, Morsell & Caldwell*
ATTORNEYS.

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3 SHEETS-SHEET 2.



WITNESSES.

L. J. Themer
Anna Schmidtbauer

INVENTOR.
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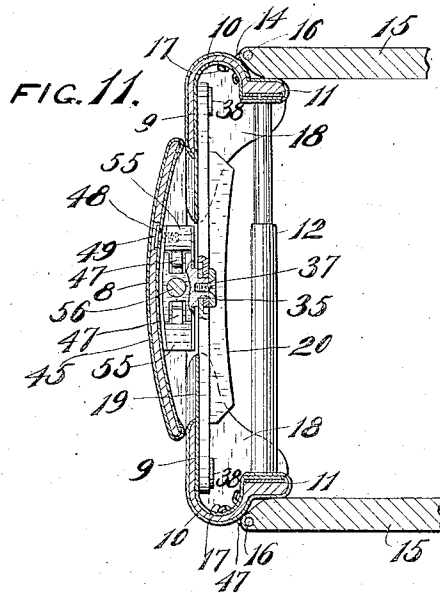
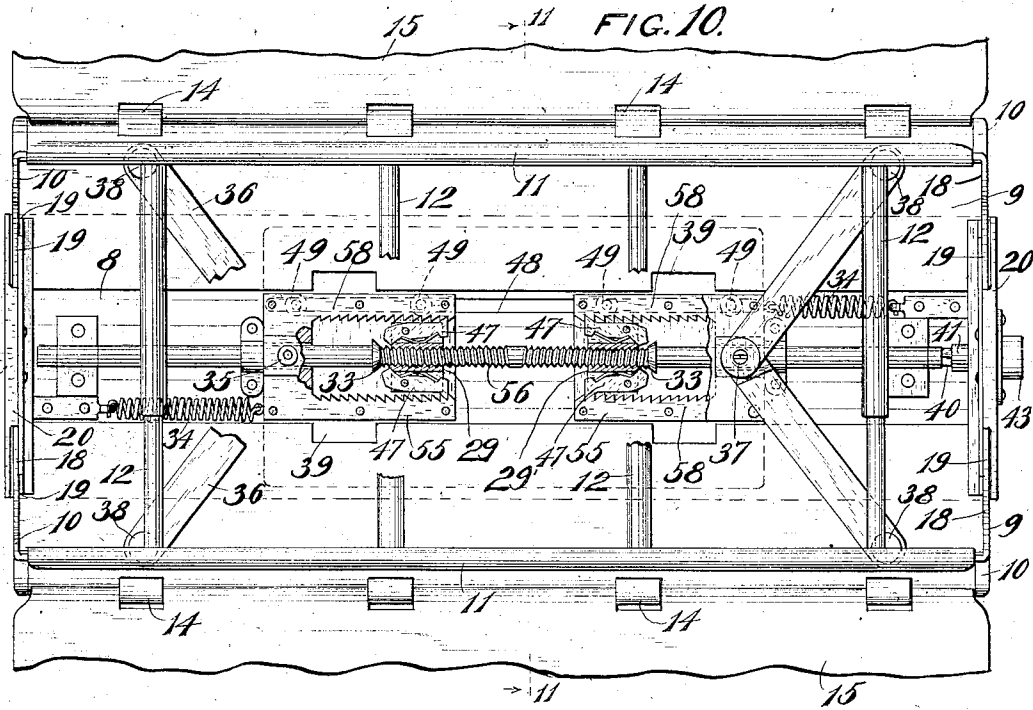
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3 SHEETS—SHEET 3.

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WITNESSES.

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UNITED STATES PATENT OFFICE.

HENRY C. MILLER, OF MILWAUKEE, WISCONSIN.

LOOSE-LEAF BINDER.

1,043,955.

Specification of Letters Patent.

Patented Nov. 12, 1912.

Application filed June 28, 1909. Serial No. 504,693.

To all whom it may concern:

Be it known that I, HENRY C. MILLER, residing in 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 improvements in loose leaf binders of that class in which the covers and extensible back clamping sections are arranged to be moved toward and away from each other and are provided with telescoping posts which are adapted to engage and hold in locked position, loose leaves inserted between the covers and extensible sections.

One of the objects of the invention is to provide a loose leaf binder in which the toggles which draw the sections together are so pivoted and positioned with relation to the sections and the clamping screw that the greatest clamping effect is produced with but the minimum effort.

A further object of the invention is to provide means whereby when the binder is unlocked the extensible sections will automatically open, and when in an open position the sections may be closed by a direct pressure thereon and when pressed the sections will be automatically held in locked positions of adjustment.

A still further object of the invention is to provide means whereby the hinged covers are permitted to yield or give under strain outwardly at the hinge joints to provide for the bulging outwardly of the leaves at this point.

A still further object of the invention is to provide a binder in which the working parts are almost entirely inclosed and made practically dust proof thus prolonging the wear of the working parts.

A still further object of the invention is to provide attaching means whereby the binder is convertible from an ordinary clock key operating and locking means to a Yale key operating and locking means thereby obviating the necessity of the manufacturer carrying two kinds of binders in stock.

With the above and other objects in view the invention consists of the devices and parts, or their equivalents.

In the accompanying drawing in which the same reference characters indicate the

same parts in all of the views: Figure 1 is an elevation of the extensible clamping sections of the binder in a partly open position, parts being broken away and other parts in section, and fragments of the cover hinge leaves also being shown; Fig. 2 is a transverse section thereof taken on line 2—2 of Fig. 1; Fig. 3 is a view of one end of a modified form of binder provided with two pawls; Fig. 4 is an elevation of another modified form, parts broken away to show interior construction; Fig. 5 is a transverse sectional view taken through the telescoping tubes of the binder shown in Fig. 4; Fig. 6 is a transverse sectional view, looking toward the left of the same binder; Fig. 7 is a detail taken on line 7—7 of Fig. 5; Fig. 8 is a detail view of the escutcheon plate of the lock; Fig. 9 is a perspective detail view of one of the hinge clips; Fig. 10 is an elevation of another modification, parts broken away to show interior construction; and Fig. 11 is a transverse sectional view taken on line 11—11 of Fig. 10.

Referring to the drawings the numeral 8 indicates the back of the binder and 9 the extensible back sections slidably connected thereto. These extensible sections are formed of sheet metal flat on the back and with their outer ends bent over to form semicircular portions 10 and again bent at right angles to the back to form flanges 11 to which telescoping posts 12 are connected. The semicircular portions of the extensible sections are provided with slots 13 through which U-shaped shouldered hinge clips 14 project and covers 15 are hinged thereto by means of hinge pins 16 passing through the loops or eyes of the clips, and also through eyes provided in the cover. The shoulders 17 of the hinge clips prevent their withdrawal outwardly from the slots and the connection of said clips to the sections permits them to yield or swing outwardly from the extensible back sections to accommodate the bulging of the leaves just beyond the point of clamping engagement of the extensible back sections with said leaves.

The extensible back sections are provided with end portions 18 rigidly connected thereto, and these back end portions are adapted to slide in the angular shaped grooves 19 formed in the end portions 20 of the back 8.

The threaded clamping screw 21 is mounted in bearings 22 connected to the inner surface of the back 8 and is held from end-

wise movement by the shoulders 23 formed by the ball bearing cup 24. The ball bearing is positioned in the space 25 between two portions of a bearing plate 26 fastened to the inner surface of the back 8.

A chambered slidable member 27 surrounds the clamping screw 21, and is provided with guide openings 28 through which the clamping screw freely extends. A nut 29 threaded to the clamping screw and positioned within the chamber of the slidable member is provided with a pivoted spring actuated pawl 30 which is adapted to normally engage the ratchet teeth 31 formed on the slidable member within the chamber. The pawl and ratchet teeth are so positioned with relation to each other that in turning the clamping screw to draw the cover sections together the nut will be immovably held with relation to the slidable member, but if it is desired to partly close the book by direct pressure on the cover sections, the pawl will slide over the ratchet teeth and hold the cover sections in adjusted positions and a still greater clamping effect may then be given the cover sections by turning the clamping screw. The free end 32 of the pawl is beveled off at an angle and is adapted to be engaged by a conical unlocking member 33 connected to the clamping screw 21 when it is desired to disconnect the pawl from the ratchet teeth in order to quickly open the binder, this result being accomplished by unscrewing the clamping screw until the conical face of the unlocking member engages the beveled free end of the pawl and moves it outwardly and the other end of the pawl inwardly to disconnect it from the teeth of the ratchet. A coiled spring 34 having one end connected to the slidable member and the other end to the binder back is adapted to automatically open the cover sections when released by the pawl and nut.

Trunnions or extensions 35 on which are pivotally mounted pairs of links 36 project from the slidable member and holding screws 37 threaded therein and provided with washers bear against the outer link and hold the links from working off of the ends of the trunnions. The trunnions are of such length that when the holding screws are screwed home sufficient space is provided between the washers and the nuts to permit the free turning of the links on the trunnions.

The other ends of the links are pivotally connected to the inner surface of the flat portions of the extensible backs by rivets 38 forming a toggle joint connection between the extensible backs and the clamping screw whereby when the clamping screw is turned in one direction on the nut the slidable member will be advanced therewith and the extensible backs will be moved into clamping engagement with the leaves inserted

therebetween, and when the clamping screw is turned in the opposite direction the slidable member will be drawn in the opposite direction by the coiled spring and when the pawl is engaged by the unlocking member the extensible backs will open outwardly for the insertion or removal of leaves. The flat portions of the extensible backs are positioned so that their inner edges will butt against each other when in a closed position, and when in this position they serve to form a dust tight inclosure in which the clamping screw is positioned, portions of the extensible backs being cut away to provide openings 39 for the trunnions to project therethrough for engagement with the toggle links.

One end of the clamping screw rod 21 is provided with a squared end 40 and a slotted extension rod 41 provided with a squared hole is adapted to engage the squared end of the screw rod. The enlarged slotted end of the extension rod 41 extends through an opening 42 provided in one of the ends 20 and into an escutcheon plate 43. The escutcheon plate is riveted to the end 20 over the opening 42 and is provided with a revoluble key-hole disk 44 mounted therein. The key-hole in the disk is formed to correspond with the shape of the cross section of the key used so that in manufacturing it is only necessary to change the disk in the escutcheon plate in order to accommodate different shaped keys, the slot in the extension rod being as wide as the thickest key used. In some cases it is desirable to arrange the binder so that an ordinary clock key may be used to lock and unlock the same and to accomplish this result it is only necessary to remove or omit the escutcheon plate and the extension rod and the binder is then adapted to be operated by inserting an ordinary clock key through the opening 42 in the end of the back and engage the squared end of the screw rod in the same manner as it is engaged by the extension rod. Portions of the back and the extensible back sections of the binder are covered with leather 45 or other desirable binding material to give the desired finish thereto.

In the modified form shown in Fig. 3, two ratchet toothed plates 46 are positioned within the slidable member and the clamping screw nut is provided with two ratchet pawls 47 adapted to engage the teeth of said plates. In other respects the binder is the same as the form shown in Fig. 1.

In the forms thus far described the link connections with the slidable member form parallelograms and in moving, the links on one side of the binder are always parallel with relation to each other and there is consequently no tendency for the binder sections to bind in opening or closing, but in the modified forms shown in Figs. 4 to 11 inclusive the medial pivotal connections of

the links are adapted to move toward and away from each other in opening and closing the binder, thus making it necessary to provide guiding means for the slidable members. In these forms the backs of the binders are provided with elongated slots 48 and the slidable members are provided with guide pins 49 which are adapted to slide in said slots.

10 In the Fig. 4 modification one pair of links 50 are pivotally connected to a sleeve 51 mounted on the clamping screw 52 between two collars 53. A coiled spring 54 is connected to this sleeve and to the binder 15 back and in connection with the spring 34 serves to spread the extensible sections apart when the pawl 30 is released from the rack 31 connected to the slidable member 55. The links 36 are connected to the slidable 20 member in the same manner as in the principal form. In this form the end 56 of the clamping screw is squared for a considerable distance and the slotted extension rod 57 provided with a squared hole is adapted 25 to engage the squared end of the clamping screw to adjust the position of the screw. The elongations of the squared screw end and the squared opening in the extension rod permits the longitudinal movement of 30 the screw without becoming disengaged from the rod. The extensible rod is held in place by means of its reduced portion being engaged by the bearing 57'.

In the modified form shown in Fig. 10 35 two slidable blocks 55 are provided and the clamping screw 56 is provided with right and left handed screw threads which are engaged by nuts 29' positioned within the slidable members. Each of these nuts is 40 provided with two pawls which engage the two racks 58 with which each slidable member is provided.

If it is desired to open the binder the operation is as follows: The clamping screw 45 is turned to the left by means of a key inserted in the key-hole and engaging and turning the extensible rod, or the screw rod direct if the escutcheon plate and extensible rod are omitted, and this movement will 50 move the nut and slidable member to the left until the beveled free end of the pawl engages the conical face of the unlocking member. When this engagement takes place the pawl will be disengaged from the rack teeth and the coiled spring connected 55 to the slidable member will move said member and straighten the toggle links and expand or open the extensible sections.

The operation of the modified form of 60 binder shown in Figs. 10 and 11 is similar to the foregoing with the exception that a plurality of nuts, slidable members, pawls, racks and coiled springs are moved by the turning of the key instead of the single parts 65 shown in the other forms of the invention.

When in an open position leaves provided with openings and with slots leading therefrom to the rear edge of the sheets (not shown) and registering with the locking posts, are positioned between the extensible 70 back sections with the openings in register with the posts. The clamping screw is then turned in the opposite direction until the pawl is released by the unlocking member and again engages the ratchet teeth. The 75 extensible sections are then pressed together to clamp the leaves. During this movement the pawl will slide over the teeth and hold the sections in adjusted positions. The clamping screw is now turned to provide 80 the requisite power to firmly clamp the leaves in position, and when sufficiently clamped so that the leaves are firmly bound in the binder the key is removed and the binder may be used in the ordinary way. 85

From the foregoing description it will be seen that a binder is provided which is very desirable and possesses many features of novelty.

By placing the inner pivotal connections 90 of the toggle links in line with the clamping screw and the outer pivotal connections near the outer portions of the back sections the greatest possible leverage is obtained in a construction of this character, and by 95 means of the coiled springs connected to the slidable member, the extensible sections automatically open when the pawl is released from the rack teeth.

The working parts of the binder are practically dust proof when in a closed position and by means of the provision of the flexibility of the hinge clip connections the covers are adapted to yield at the hinge joint 100 to compensate for the bulging of the leaves and permit the covers to lie flat against said leaves. 105

By means of the novel arrangement of the escutcheon plate and the extension rod the binder is convertible for different 110 styles of keys which is a very desirable feature from a manufacturing point of view.

What I claim as my invention is:

1. A loose leaf binder, comprising a back, 115 extensible back sections slidably connected to said back and formed with flanges, a clamping screw mounted on the back, a slidable member operatively and releasably connected to said screw and having trunnions projecting therefrom, a spring connected to 120 the slidable member and to the back for moving said slidable member when released from the screw, links pivotally mounted in pairs on each trunnion of the slidable member and pivotally connected to the extensible 125 back sections, covers hinged to said back sections, and posts connected to the flanges of the extensible sections.

2. A loose leaf binder, comprising a back, 130 extensible back sections slidably connected

to said back and formed with flanges, covers hinged to the sections, a clamping screw mounted on the back, a slidable member operatively and releasably connected to said screw and having trunnions projecting therefrom, a spring connected to said slidable member and to the back for moving said slidable member when released from the screw, links pivotally mounted in pairs on each trunnion and pivotally connected to the extensible back sections, and posts connected to the flanges of the extensible sections.

3. A loose leaf binder, comprising a back, extensible back sections slidably connected to said back and formed with flanges, covers yieldingly hinged to the sections, a clamping screw mounted on the back, a slidable member provided with a nut operatively connected to said screw and having trunnions projecting therefrom, means for releasably connecting the nut to the sliding member, links pivotally mounted in pairs on each trunnion and pivotally connected to the extensible back sections, and posts connected to the flanges of the extensible sections.

4. A loose leaf binder, comprising a back provided with end grooves, extensible back sections positioned to slide in said grooves and provided with openings and with flanges, covers yieldingly hinged to said sections, a clamping screw mounted on the back, a slidable member provided with a nut releasably connected thereto threaded to said screw and having a trunnion projection therefrom, links pivotally mounted on said trunnion and pivotally connected to the extensible back sections, a spring connected to the slidable member and to the back, for moving said member when released from the nut and posts connected to the flanges of the extensible sections.

5. A loose leaf binder, comprising a back, extensible back sections slidably connected to said back and formed with flanges, a clamping screw mounted on the back, a slidable member releasably connected to said screw and having trunnions projecting therefrom, a spring connected to said slidable member and to the back for moving said slidable member when released from the screw, links pivotally mounted in pairs on each trunnion and pivotally connected to the extensible back sections, covers yieldingly hinged to said sections, and posts connected to the flanges of the extensible sections.

6. A loose leaf binder, comprising a back provided with end grooves, extensible back sections positioned to slide in said grooves and formed with flanges, covers yieldingly hinged to said sections, a slidable member positioned between the extensible sections and the back and provided with a rack, a clamping screw mounted on the back, a nut threaded to said screw and having a pawl which engages the rack of the slidable mem-

ber, links pivotally mounted in pairs on the slidable member and pivotally connected to the extensible back sections, and posts connected to the flanges of the extensible sections.

7. A loose leaf binder, comprising a back having ends extending at right angles to the back and with an opening in one end, extensible back sections having slidable connection with said ends and formed with flanges, covers hinged to said extensible sections, a clamping screw mounted on said back and provided with an end shaped to be engaged by a turning device inserted through the opening in the end of the back, a slidable member provided with a rack, a nut threaded to said screw and having a pawl which engages the rack of the slidable member, links pivotally mounted in pairs on the slidable member and pivotally connected to the extensible back sections, and posts connected to the flanges of the extensible sections.

8. A loose leaf binder, comprising a back having ends extending at right angles to the back and with an opening in one end, extensible back sections having slidable connection with said ends and formed with flanges, covers hinged to said extensible sections, a clamping screw mounted on said back and provided with an end shape to be engaged by a turning device inserted through the opening in the end of the back, a turning device provided with a slotted end inserted through said end opening and engaging said clamping screw, an escutcheon plate connected to said end and provided with an opening positioned to register with said end opening, a revoluble disk provided with a key opening mounted in said escutcheon plate, a nut threaded to said screw, a slidable member, said nut having a pawl and ratchet connection with the slidable member, links pivotally mounted in pairs on the slidable member and pivotally connected to the extensible back sections, and posts connected to the flanges of the extensible sections.

9. A loose leaf binder, comprising a back having ends extending at right angles to the back and said ends provided with grooves, extensible back sections positioned to slide in said grooves and provided with flanges, covers hinged to said sections, a clamping screw mounted on the back and provided with a squared end adapted to be engaged by a key inserted through the opening in the end of the back, an escutcheon plate and a screw engaging member constructed to be connected to the end of said back, a slidable member provided with ratchet teeth, a nut threaded to said screw and having a pawl in engagement with said ratchet teeth, links pivotally mounted in pairs on said slidable member and pivotally connected to the ex-

tensible back sections, and posts connected to the flanges of the extensible sections.

10. A loose leaf binder, comprising a back having ends extending at right angles therefrom, extensible back sections having a slidable connection with the ends and provided with portions which are adapted to form an inclosure when in a closed position, a clamping screw positioned within said inclosure and mounted on said back, a slidable member provided with ratchet teeth immovably fixed thereto, a nut threaded to said screw and having a pawl engaging said ratchet teeth, links pivotally connected to the slidable member and to the extensible back sections, and posts connected to said extensible back sections.

11. A loose leaf binder, comprising a back, extensible back sections slidably con-

nected to said back, a clamping screw mounted on said back, a slidable member provided with ratchet teeth, a nut engaging the clamping screw and provided with a pawl engaging the ratchet teeth, links connecting the slidable member to the extensible back sections, and a spring connected to the slidable member and to the back and positioned to move the slidable member in a direction at an angle to the direction of movement of the back sections to open the same.

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

HENRY C. MILLER.

Witnesses:

ADOLPH G. LOTHER,
R. E. GEHRKE.