W. G. JONES.

BINDER.

APPLICATION FILED JAN. 29, 1915.

1,155,067.

Patented Sept. 28, 1915.

3 SHEETS—SHEET 1.

Fig. 1.

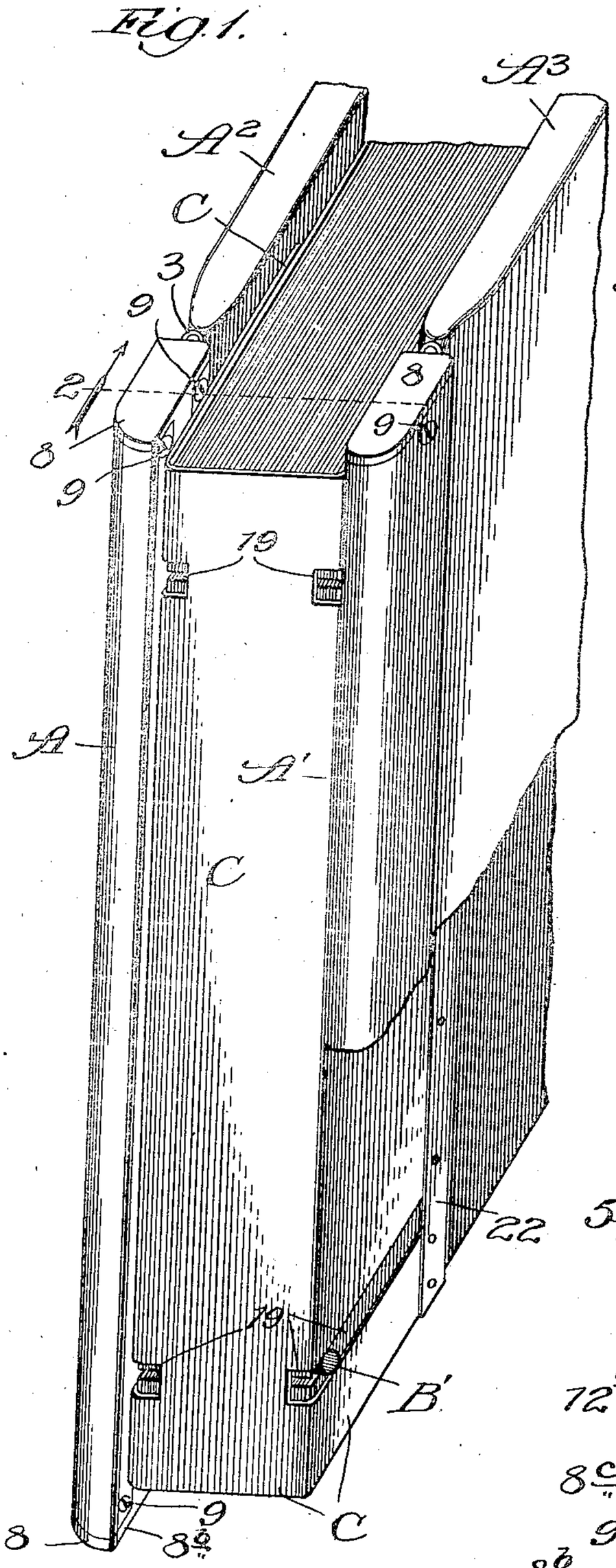
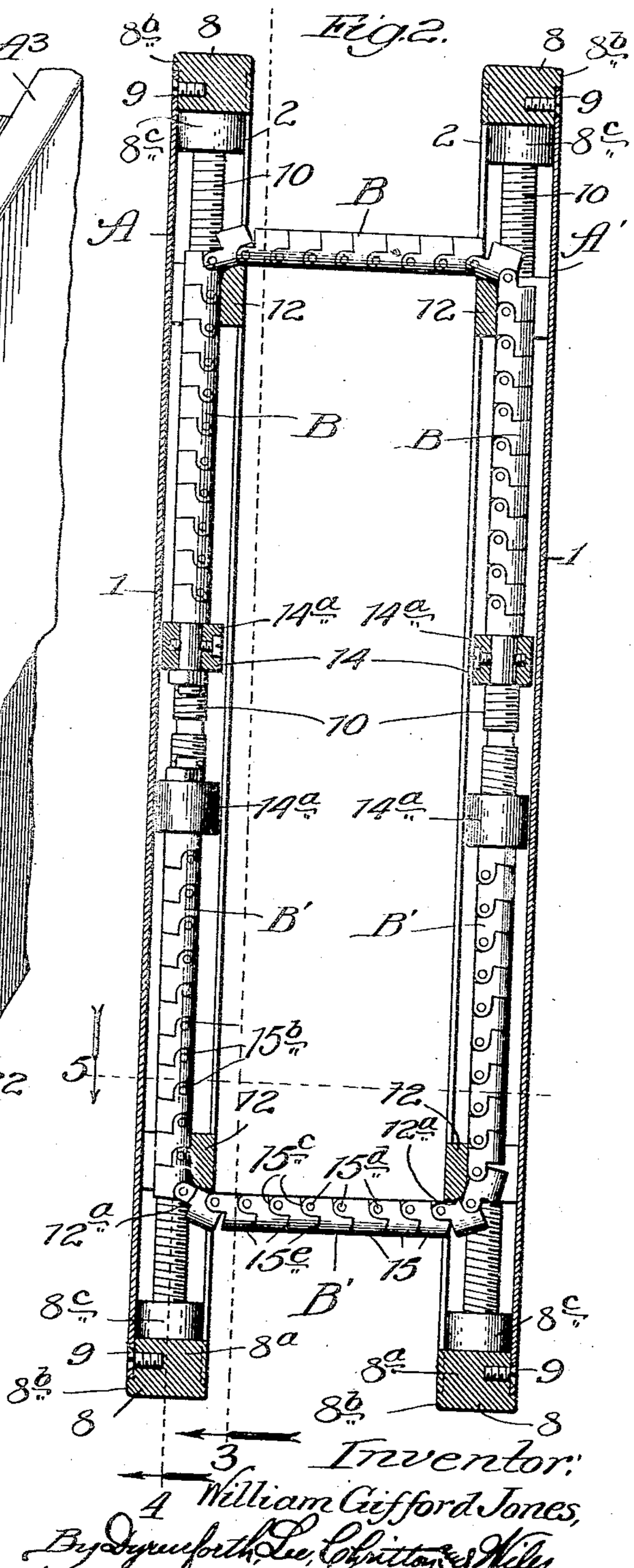


Fig. 2.



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Irwin C. Bowman.

Inventor:
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Attys.

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3 SHEETS—SHEET 2.

Fig. 4.

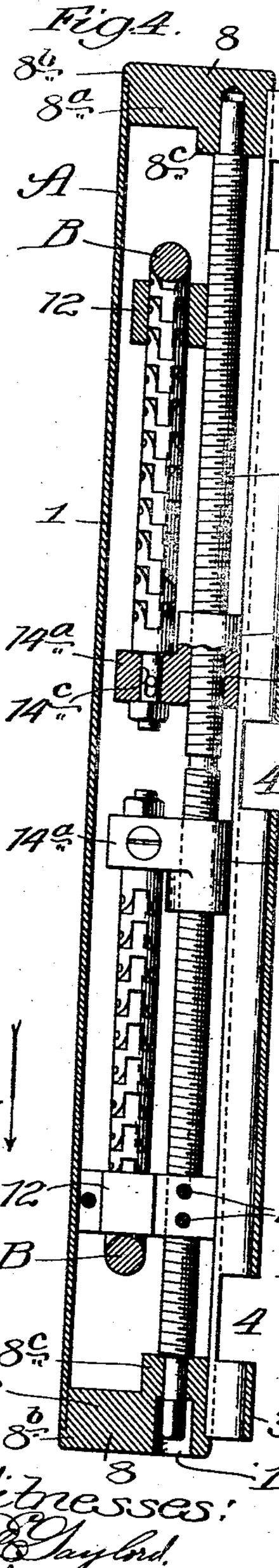


Fig. 3.

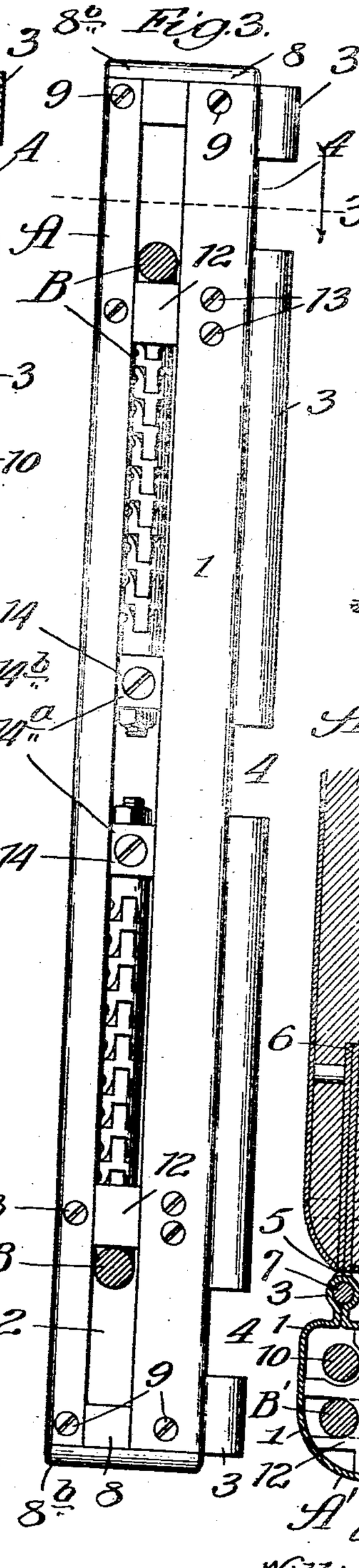


Fig. 7.

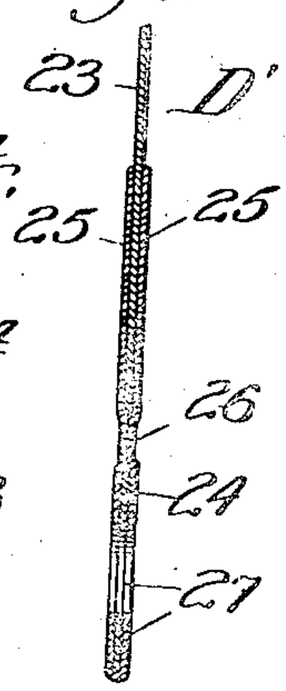


Fig. 3a.

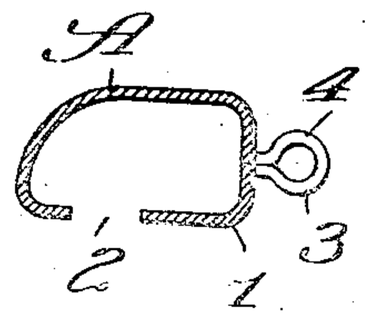


Fig. 6.

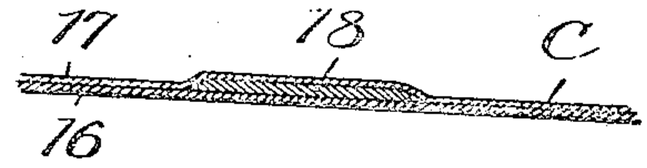
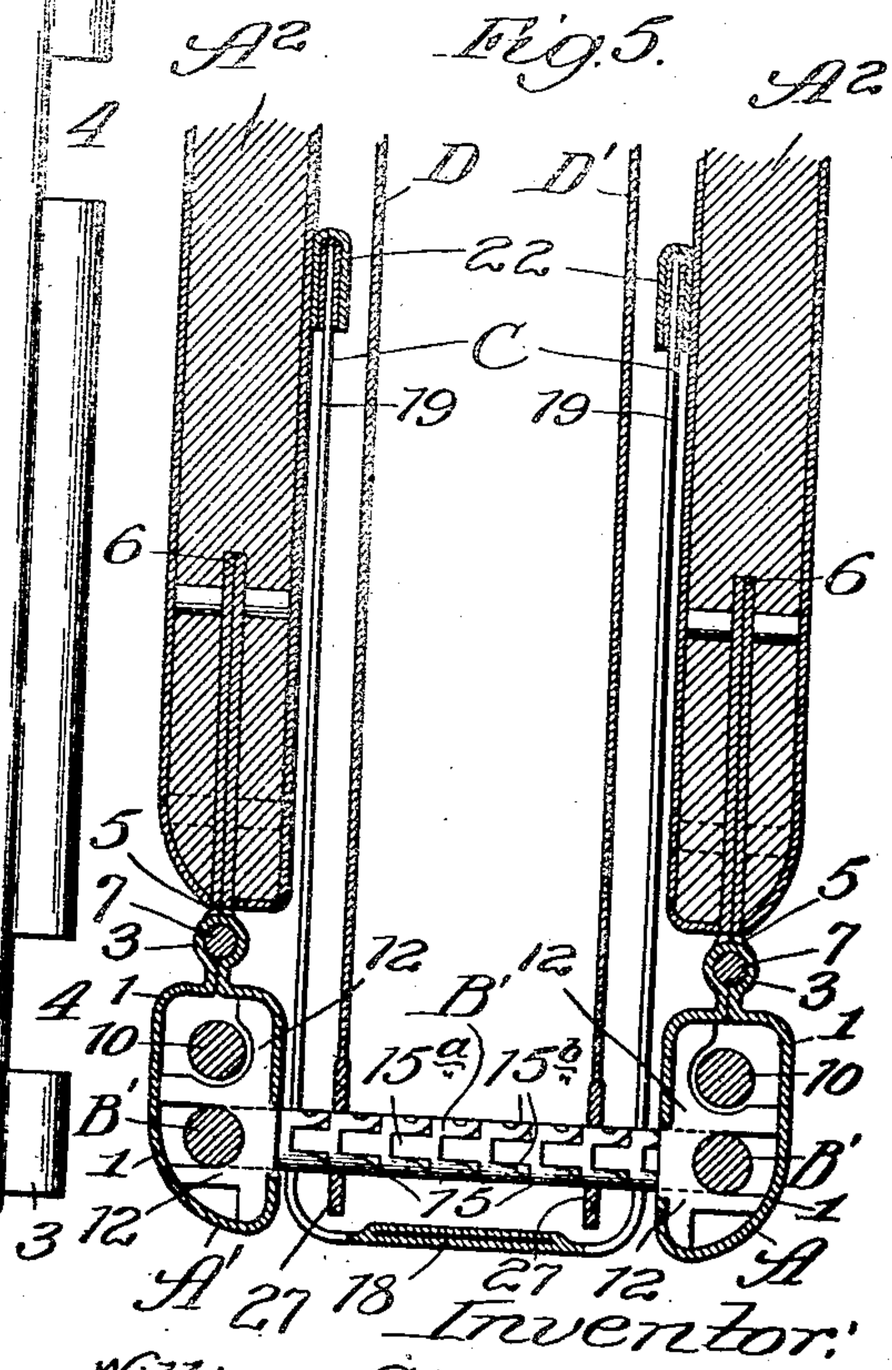


Fig. 5.



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3 SHEETS—SHEET 3.

Fig. 8.

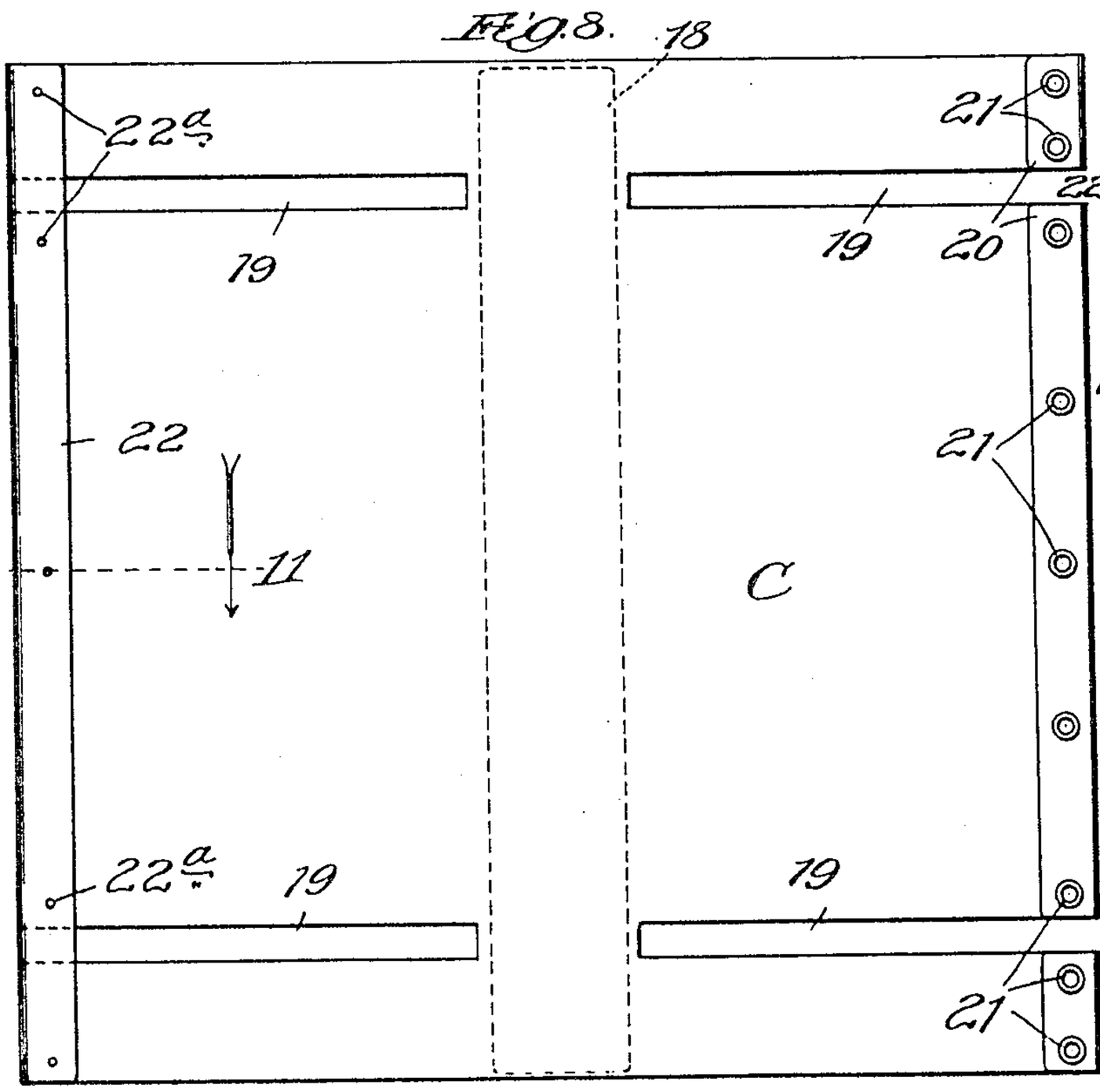

Fig. 9.

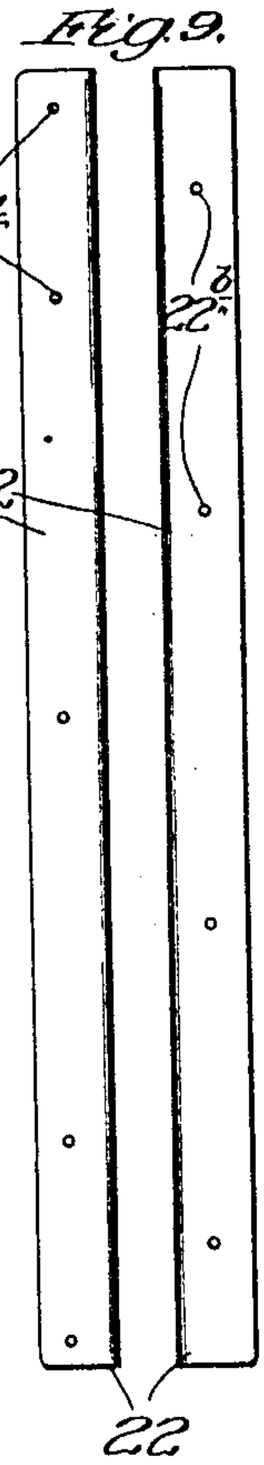

Fig. 10.

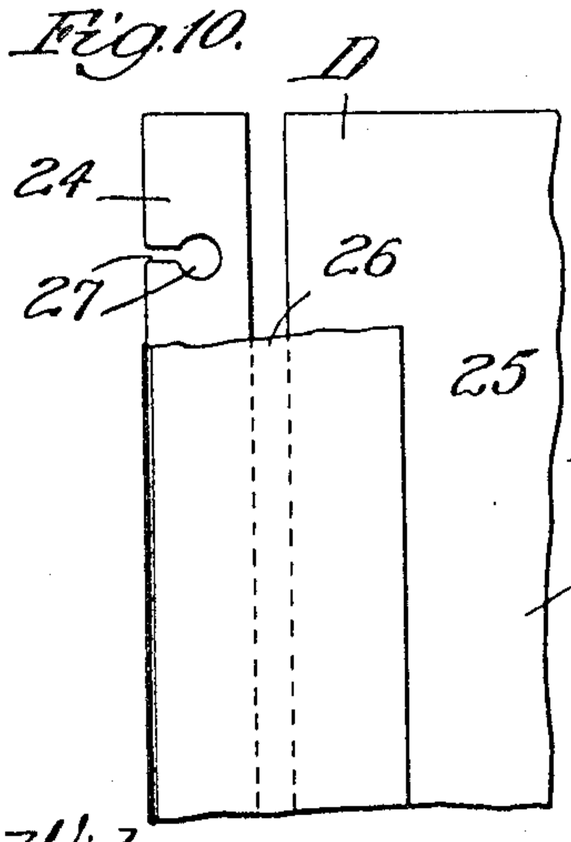

Fig. 12.

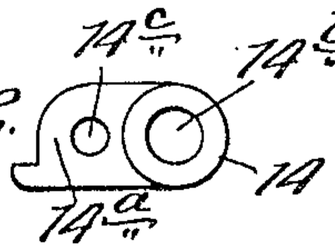

Fig. 13.

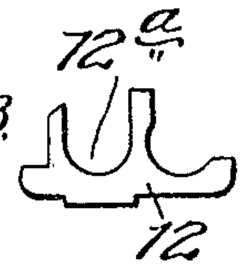

Fig. 14.

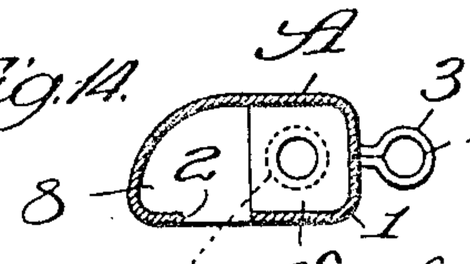

Fig. 11.

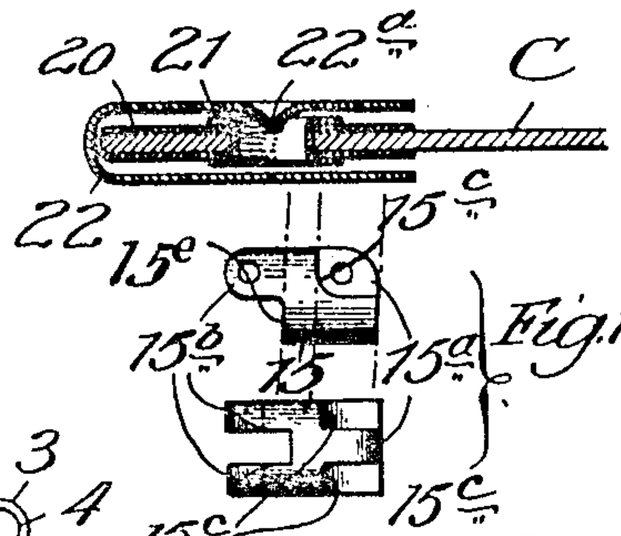

Fig. 15.

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BINDER.

1,155,067. Specification of Letters Patent. Patented Sept. 28, 1915.

Application filed January 29, 1915. Serial No. 4,991.

To all whom it may concern:

Be it known that I, WILLIAM GIFFORD JONES, a citizen of the United States, residing at Oak Park, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Binders, of which the following is a specification.

This invention relates particularly to loose-leaf binders and is especially desirable for loose-leaf ledger purposes.

The primary object is to provide an improved loose-leaf binder of simple and durable construction, possessing large expansion capacity.

Numerous other important objects are attained, as will be understood from the detailed description hereinafter given.

The invention is illustrated in its preferred embodiment in the accompanying drawings, in which—

Figure 1 represents a broken perspective view of a loose-leaf ledger constructed in accordance with this invention; Fig. 2, a section of the binder frame, taken as indicated at line 2, Fig. 1; Fig. 3, a section taken as indicated at line 3 of Fig. 2 and showing one of the clamping-members employed; Fig. 3ª, a section taken as indicated at line 3ª of Fig. 3; Fig. 4, a section taken as indicated at line 4 of Fig. 2, showing in section the clamping-member depicted in Fig. 3; Fig. 5, an enlarged broken section, taken as indicated at line 5 of Fig. 2; Fig. 6, an enlarged broken sectional view of the flexible back employed; Fig. 7, a broken sectional view, on an enlarged scale, of one of the fly-leaves or end-sheets employed; Fig. 8, a plan view, or development, of the flexible back employed; Fig. 9, a view showing both sides of a binding-clip used in connection with the flexible back; Fig. 10, a broken view showing a detail of the fly-leaf which is shown in section in Fig. 7; Fig. 11, a broken, sectional view, on an enlarged scale, taken as indicated at line 11 of Fig. 8, showing the manner in which the binding-clips are secured to the edge-portion of the flexible back; Fig. 12, a view of one of the nuts or followers employed; Fig. 13, a view of one of the guides for the flexible leaf-engaging connections which connect the two clamping-members; Fig. 14, a sectional view showing also one of the end-plugs forming a detail of the hollow clamping-bar employed; and Fig. 15, a view showing in plan and in inner elevation one of the links of the flexible connections employed.

In the embodiment shown, A, A′ represent clamping-members, with which are pivotally connected cover-sections A³; B, B′ flexible connections between the clamping-members, said flexible connections serving also as leaf-engaging members, or link-constituted binding-posts; C, a flexible back for the binder; and D, D′, fly-sheets of an imperishable nature, with which the binder is desirably provided.

The clamping-members A, A′ and the cover-sections A² may be of any desired construction. It is desirable, however, that, where a high expansion binder is required, the clamping-members should both be hollow. In the preferred form, which is shown, each clamping-member is hollow, and is formed by bending a strip of sheet metal 1 into approximately hollow rectangular form, in such manner as to bring the edges of the strip into spaced relation along the inner side of the hollow clamping-member, thus leaving a longitudinal slot 2 at the inner side of said clamping-member. In the forming operation, the metal is curved or folded upon itself to form a longitudinal eye 3 at the inner or hinge-edge; and sections of the longitudinal eye are cut away, as indicated at the points 4, to afford spaces for projecting eye-portions 5, with which the hinge-members 6 of the cover-sections are equipped. The eye-portions are connected by a pintle 7, and thus a piano-hinge effect between the cover-section and clamping-member is obtained.

An end-plug 8 is provided in each end of each hollow clamping-member, the end-plug having a shank 8ª extending into the hollow member and a flange 8ᵇ which abuts against the end-edge of the formed sheet-metal piece. Each end-plug is provided with a bearing 8ᶜ for the reduced ends of the screw-rods employed. The plugs are secured in the ends of the tubular members by screws 9.

In each hollow clamping-member is journaled a right-and-left threaded screw-rod 10, whose reduced extremities are received in the bearings 8ᶜ, and thus the screw-rods are confined against longitudinal movement. At one end of the binder-frame, the plugs 8 are provided with perforations or sockets 11 adapted to receive a key, or the socket-

portion of a crank (not shown) which may be employed to rotate the screw-rod. The adjacent end of the screw-rod is square to receive the key or small crank. A short distance from the end of each hollow clamping-member there is secured a guide-member or bridge-piece 12, which extends across the slot 2 and is provided with a curved groove or guide surface 12^a, about which the link-constituted flexible post, or flexible connection between the clamping-members, passes. The bridge-piece or guide 12 may be secured in place by screws 13.

Each right-and-left threaded screw-rod 10 is equipped with a pair of nuts, threaded sleeves, or followers 14, each of which has a rearwardly-extending projection 14^a to which the adjacent extremity of the appropriate flexible connection is joined. The hollow clamping-members serve as guides within which the nuts can move, and prevent the nuts from rotating with the screw-rods. In Fig. 12, 14^b represents the threaded bore of the nut, and 14^c represents the perforation in the projection 14^a, which receives the reduced shank with which the end-link of the chain is provided, as shown in Fig. 4.

The preferred arrangement is shown in Fig. 2, from which it appears that the flexible member B has its end-portions passed over two transversely-opposite bearings 12 and extending within the hollow clamping-members A and A′, the extremities being connected with nuts which are transversely opposite to each other and which are adapted to move in either direction, according to the direction of rotation of the screw-rods; and it appears that the flexible member B′ is similarly arranged at the opposite end of the binder-frame and similarly connected with the other nuts with which the screw-rods are equipped.

It will be understood from the foregoing that either screw-rod may be rotated independently of the other, to cause the flexible connections to be "taken up" or "paid out," according to desire.

Each flexible connection B, B′ is preferably composed of a single series of links 15 of circular cross-section, the links being close-connected, so as to form a practically continuous surface so that the portions between the clamping-members will serve as leaf-engaging members or binding-posts. Thus, each link 15 (see Fig. 15) may be described as a very short rod-form member having at one end a web-form hinge-portion 15^a, and at the other end projecting hinge-ears 15^b. The web-form pivot-portion 15^a is formed by milling or cutting away the piece, and leaving curved shoulders 15^c, with which the curved surfaces of the ears 15^b correspond. When the links are connected, by pintles 15^d, the links are free to swing with relation to each other in one direction only, for it will be understood that they are held against lateral movement by the ears 15^b embracing the webs 15^a, and are held against swinging beyond the straight line, as shown in Fig. 2, by shoulders 15^e. It will be noted that the shoulders 15^e are staggered with relation to the shoulders 15^c, this feature being of importance to insure freedom of movement of the leaves, whose perforations engage the flexible posts. It will be noted, also, from Figs. 2 and 15, that in addition to having the ears 15^b project beyond the shoulders 15^e, thus giving the overlap or offset-shoulder effect mentioned, the shoulders 15^e are inclined or at an angle to the axes of the links. Thus the shoulders 15^e may be described as undercut, and the effect is to prevent the possibility of the leaves entering between the joints by shifting longitudinally of the clamping members, while the staggering of the shoulders 15^e with reference to the shoulders 15^c prevents the leaves from entering the joints when moved along the chain-posts.

The flexible back C is preferably composed of an outer piece of leather 16 and an inner lining 17, which may be of thin leather; and a comparatively narrow strip of card-board, or the like, 18, interposed between the members mentioned (see Fig. 6). The lateral edges of the flexible back (see Fig. 8) are provided with slots 19, which extend in opposite directions from the central strip 18 and are of sufficient width to embrace the flexible posts in the manner shown in Fig. 5. The lateral portions of the flexible back are disposed parallel with each other and lie adjacent the inner surfaces of the cover-sections A^2, as shown in Fig. 5. The edge-portions are equipped with U-shaped binding-clips 20 (Figs. 8 and 11), through which the slots 19 are extended. The clips 20 are provided with recesses or eyelets 21; and detachable continuous clips 22 are provided. The clips 22 are U-shaped strips, provided in one member, or ply, with indentations 22^a, and in the other ply or member with indentations 22^b (Fig. 9). The indentations 22^a engage alternate eyelets 21, and the indentations 22^b engage the remaining alternate eyelets 21, it being understood that the clip 22 is of springy metal so that it can be applied, or detached, at will.

Each fly-sheet D, D′ preferably comprises a sheet of heavy, durable paper 23, which may be given any desired appearance, and a metal strip 24 connected to the rear edge of the sheet 23 by a linen strip 25 which is folded upon itself and serves to connect the parts in the manner shown in Figs. 7 and 10, thus affording a hinge at 26. The thin metal strip 24 and the folded linen strip 25 are

slotted or perforated, as indicated at 27, to engage the flexible binding-posts, in a manner understood in the art.

From the description given, it will be understood that either screw-rod may be rotated to "take up" or "pay out" the flexible connections; and it will be understood that the flexible back will adjust itself to the conditions as the binder is expanded and more leaves inserted. It has been demonstrated that the flexible connections described are of ample strength to withstand all stress, even in the largest size binders, so that it is unnecessary to use either intermediate telescopic posts connecting the clamping-members, or intermediate flexible connections. It will be understood that when one screw-rod is being operated, the other screw-rod simply serves to hold the opposite ends of the flexible connections.

It is desirable to employ two screw-rods, thereby rendering it possible to "pay out" the flexible connections to a greater extent. In this way, it is feasible, in a binder having a height of approximately ten inches, to secure a range of expansion from a little over one inch to about six inches. Thus, a single binder of the improved construction may replace three binders having a more limited range of expansion, between different points. It will thus be understood that the improved binder is of great advantage to the user, both from the stand-point of economy and from the stand-point of avoiding substitution of a binder of larger capacity, as increased ledger capacity is required.

From the standpoint of the manufacturer, a vast economy results: first, because of reduced cost of construction; second, because it is possible to reduce the stock to be carried to approximately one-third; third, because it is easier to carry completed parts, and assemble them, according to necessity; and fourth, because a large saving can be effected in the use of individual boxes for the ledgers, freight boxes for the individual boxes, and freightage, owing to the completely collapsed condition in which the binder can be shipped.

From the standpoint of the dealer, economy results, because it is possible to carry a smaller stock, and because less shelf-room is required for the ledgers, not to mention the increased salability from the fact that a greater range of expansion is secured.

Since the embodiment of my invention in a commercially practicable loose-leaf ledger, I have learned, by investigation, that others have proposed the use of flexible connections attached to nuts actuated by screw-rods disposed in hollow clamping-members; but, so far as I am aware, no commercially successful device operating on this principle has been placed upon the market.

Among the features which render my invention highly practicable may be mentioned: 1st, the disposition of the actuating rods 10 and the portions of the flexible posts B′ parallel therewith in the same plane as the closed cover-sections, as shown in Fig. 5; 2nd, the use of clamping-members (A, A′) of cross-section elongated in planes perpendicular to the leaf-engaging portions of the flexible binding-posts, so as to occupy the same planes as the cover-sections, when closed; 3rd, the disposition of the actuating rods between the housed or inturned portions of the binding-posts and the cover-section hinges, thus attaining a maximum length and minimum thickness of binder; 4th, the use of a flexible back having inturned marginal portions slotted to embrace the binding posts, thus giving finish to the binder and protecting the rear ends of the leaves; 5th, the use of improved flexible posts consisting of a single series of links of such form as to afford a circular cross-section; 6th, the improved form of clamping-member employed, and the resultant improved hinge-connection; and 7th, the general mode of disposing and assembling the parts, which gives maximum capacity, minimum thickness, and a parallel cover effect.

The foregoing detailed description has been given for clearness of understanding only, and no unnecessary limitation should be understood therefrom, but the appended claims should be construed as broadly as permissible in view of the prior art.

Various embodiments may be given to the invention, the principle of which has been explained in connection with the preferred embodiment.

What I claim as new and desire to secure by Letters Patent is:

1. In a binder, the combination of a pair of cover-sections, a pair of hollow clamping-members having their inner sides adapted to clamp the leaves and said members being provided near their rear edges with lateral openings and bearings thereat for flexible posts, right-and-left threaded screw-rods disposed within said clamping-members near the front edges thereof, flexible binding-posts passing about said bearings and having their end-portions housed within said clamping-members back of said screw-rods, and nuts on said screw-rods connected with the extremities of said flexible binding-posts.

2. In a binder, the combination of a pair of cover-sections, a pair of hollow clamping-members connected therewith and of elongated cross-section to lie in the same plane with the cover-sections in their closed condition, said clamping-members having binding-post bearings at their inner sides, flexible binding-posts extending through said bear-

ings and connecting the clamping-members and having end-portions extending into the clamping-members, nuts within the clamping-members and attached to the ends of the flexible binding-posts, and actuating screw-rods for the nuts journaled in said clamping-members and disposed between the cover-sections and the housed portions of the binding-posts.

3. In a binder, the combination of a pair of hollow clamping-members of elongated cross-section and provided at their inner sides near their rear edges with longitudinal slots, bearings extending across said slots, flexible binding-posts connecting the clamping-members and extending about said bearings and into the clamping-members, nuts having rearwardly-extending portions to which the ends of the binding-posts are attached, and actuating screw-rods journaled in said clamping-members in front of the housed portions of the binding-posts.

4. In a binder, the combination of a pair of cover-sections, a pair of hollow clamping-members of elongated cross-section and lying in the planes of the cover-sections, when the cover-sections are closed, hinge-connections between the cover-sections and clamping-members, nuts movable longitudinally within the clamping-members, actuating screw-rods journaled in the clamping-members and disposed in the rear of said hinge-connections, flexible binding-posts having portions extending through lateral openings into said clamping-members and disposed in the rear of said actuating screw-rods and attached to rearward extensions of said nuts, and bearings at said openings in said clamping-members about which said flexible posts pass.

5. In a binder, the combination of hollow clamping-members equipped at their inner sides with bearings arranged in oppositely-disposed pairs, chain binding-posts each composed of a single series of close-jointed links of substantially circular cross-section and extending about said bearings and into the clamping-members, and take-up mechanisms in said clamping-members to which the extremities of said chains are attached.

6. In a binder, the combination of a pair of clamping-members, chain binding-posts extending into one of the clamping-members and composed of a single series of close-jointed rod-form links having complemental pivot-portions and affording a practically continuous surface, and take-up mechanism in said clamping-member to which the extremities of said chains are attached.

7. In a binder, the combination with flexible posts, a pair of nuts connected with the extremities of said flexible posts, and a right-and-left threaded screw-rod engaging said nuts, of a clamping-member containing the nuts and screw-rod and comprising a sheet metal member bent into hollow form and equipped with end-plugs affording bearings for the screw-rod, the edge-portions of said sheet-metal member being separated to afford a longitudinal slot at the inner side of the clamping-member, and bearings in the clamping-member crossing the slot and about which the flexible binding-posts pass.

8. In a binder, a clamping-member comprising a sheet-metal strip bent into hollow form and provided at its inner side with a longitudinal slot, end-caps for said hollow member, and bearings for flexible posts extending across said slot.

9. In a binder, a clamping-member comprising a sheet-metal strip bent into hollow form, with a longitudinal slot at the inner side thereof, end-plugs for said hollow member provided with bearings for a screw-rod, and bridge-pieces extending across said slot and adapted to afford bearings for flexible posts.

10. In a binder, a clamping-member comprising a sheet-metal strip bent into hollow form and having the metal at one edge curved and folded upon itself to afford a hinge-eye, said hollow member having a longitudinal slot at its inner side, and end-caps for the hollow member provided with bearings for a screw-rod.

11. In a binder, the combination of a pair of clamping-members equipped with cover-sections, flexible leaf-engaging binding-posts between the clamping-members and extending into the clamping-members, longitudinal threaded rods and nuts thereon within the clamping-members for actuating the flexible binding-posts and a back having flexible portions disposed adjacent the inner sides of the cover-sections and provided with slots for the flexible binding-posts and withdrawable closing means for the ends of said slots.

12. In a binder, the combination of a pair of clamping-members equipped with cover-sections, flexible leaf-engaging binding-posts between the clamping-members and extending into the clamping-members, means within the clamping-members for actuating the flexible binding-posts, a back having flexible portions disposed adjacent the inner sides of the cover-sections and provided with slots for the flexible binding-posts, and detachable binding-clips for the inturned edges of said back.

13. In a binder, a back having flexible portions provided near their upper and lower edges with slots, binding-clips through which said slots extend, and detachable binding-clips applied to said first-named binding-clips.

14. In a binder, a binding-post comprising a single series of close-connected relatively short links of circular cross-section having complemental offset pivot-portions formed by recessing the links and having shoulders adapted to engage each other and

thus form a practically continuous surface, said chain having at its extremity means for attachment to adjusting mechanism.

15. In a binder, a flexible binding-post comprising a single series of links of circular cross-section, each link having at one side projecting ears removed from the longitudinal axis of the link, and a web for connection with the ears of an adjacent link, whereby a practically continuous surface is afforded in the extended condition of the binding-post.

16. A fly-leaf for binders, comprising a sheet, a continuous thin resilient metal strip provided with a plurality of post-engaging perforations and narrow slots opening therefrom at the rear edge, whereby the metal may be sprung to admit the binding-post to the post-engaging perforation, and a flexible hinge-strip connecting said metal strip to said sheet.

17. A hollow clamping-member for a binder, comprising a metal strip bent into hollow form and having the metal curved at one edge of the hollow member to afford a hinge-eye, the edges of the strip being spaced to afford a longitudinal slot at the inner side of the hollow member.

18. A hollow clamping-member for a binder, comprising a metal strip bent into hollow form and having the metal curved at one edge of the hollow member to afford a hinge-eye, the edges of the strip being disposed at the inner side of the hollow member.

19. In a binder, a chain-post comprising a single series of short links having offset pivot-ears and shoulders forming overlaps and providing a continuous surface.

20. In a binder, a chain-post comprising a single series of short links having pivot-ears and offset shoulders forming overlaps and providing a continuous surface, said shoulders being inclined with respect to the longitudinal axes of the links, for the purpose set forth.

21. In a binder, a chain-post comprising a single series of short links having pivot-ears and offset shoulders forming overlaps and providing a continuous surface, said chain having at its extremity means for attachment to adjusting mechanism.

WILLIAM GIFFORD JONES.

In the presence of—
NELLIE B. DEARBORN,
OTTILIE C. AVISUS.