L. R. DICKERSON.

PRESSED STEEL LEDGER BINDER.

APPLICATION FILED FEB. 1, 1909.

952,668.

Patented Mar. 22, 1910.

2 SHEETS—SHEET 1.

Fig. 1

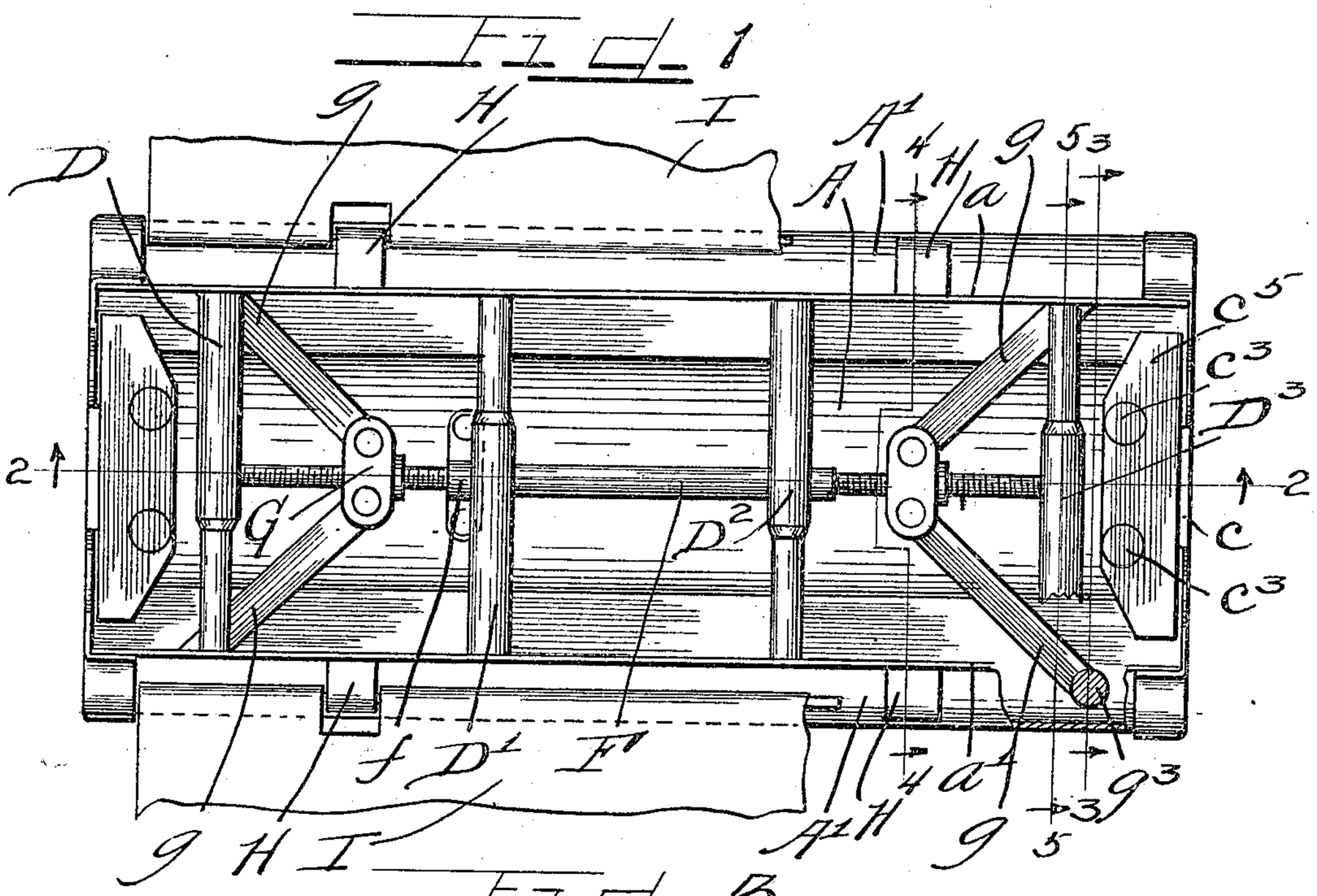


Fig. 5

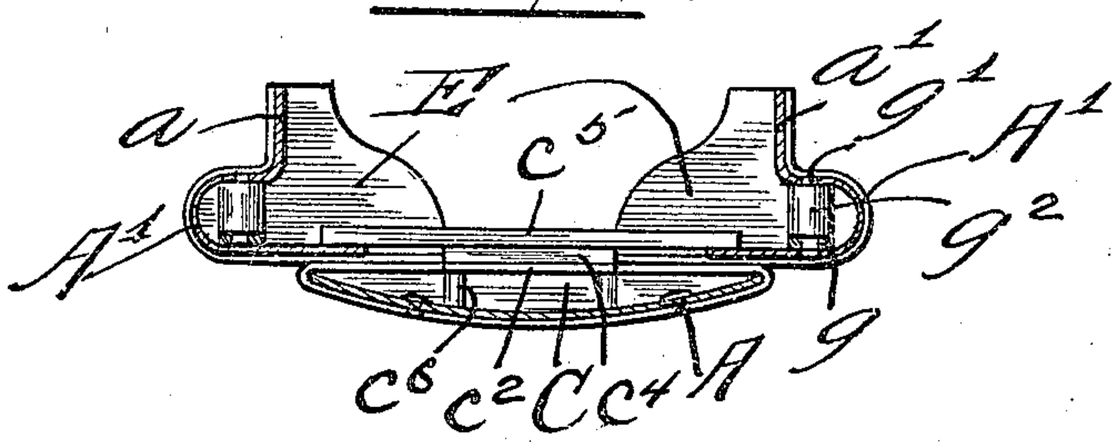
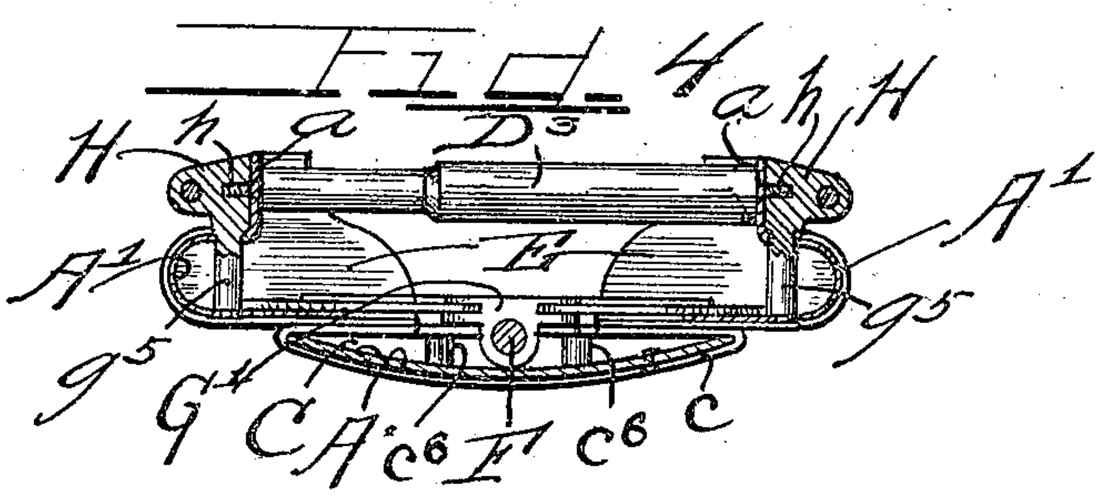


Fig. 4



Witnesses

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2 SHEETS—SHEET 2.

Fig. 2

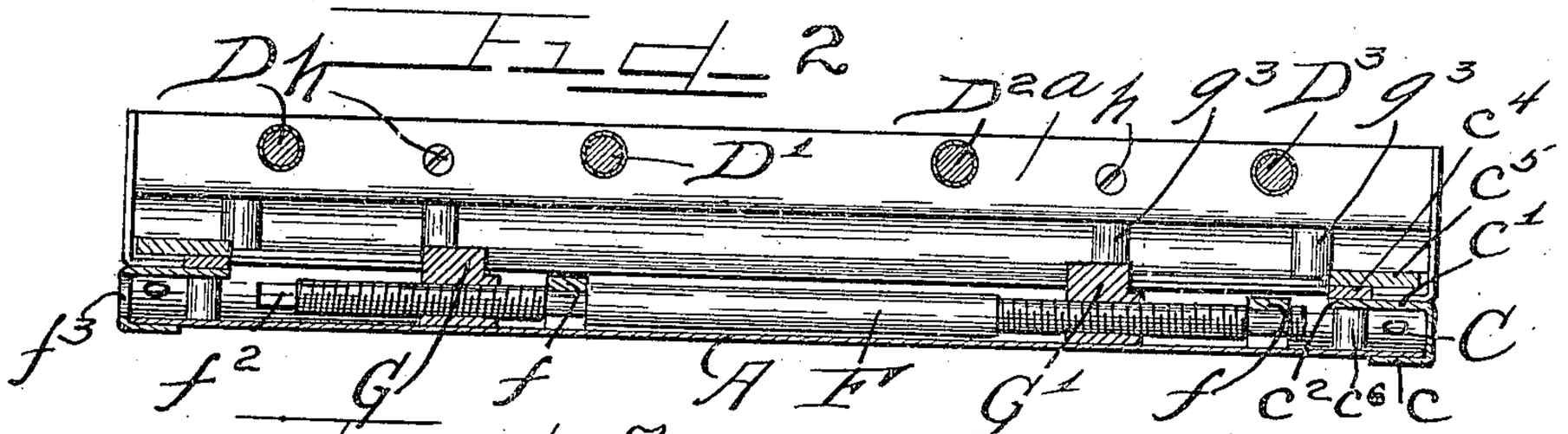
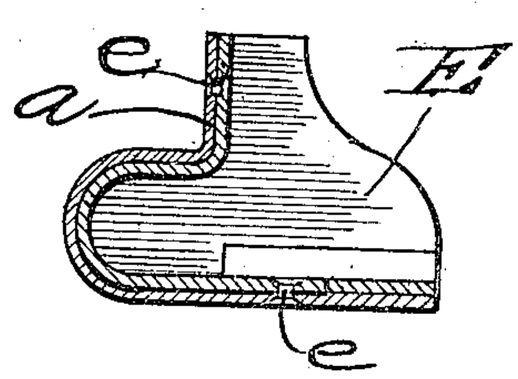


Fig. 7

Fig. 6



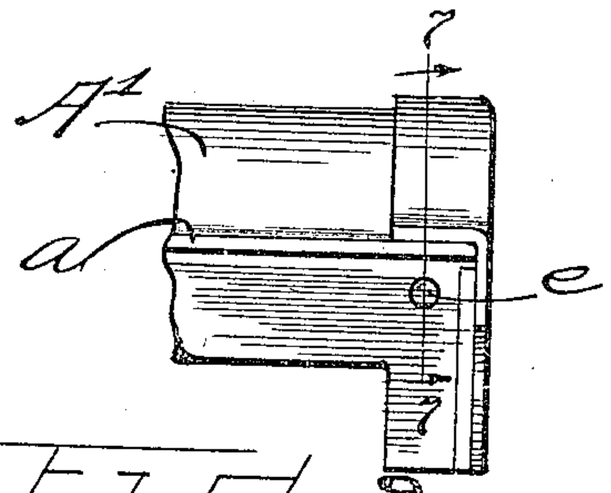


Fig. 8

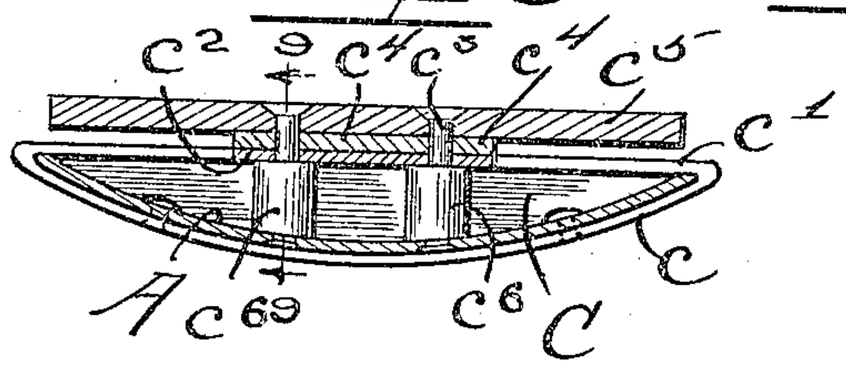


Fig. 9

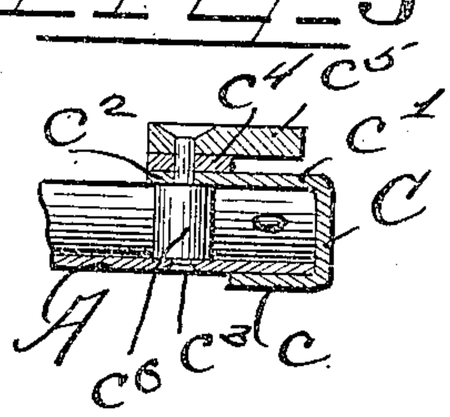
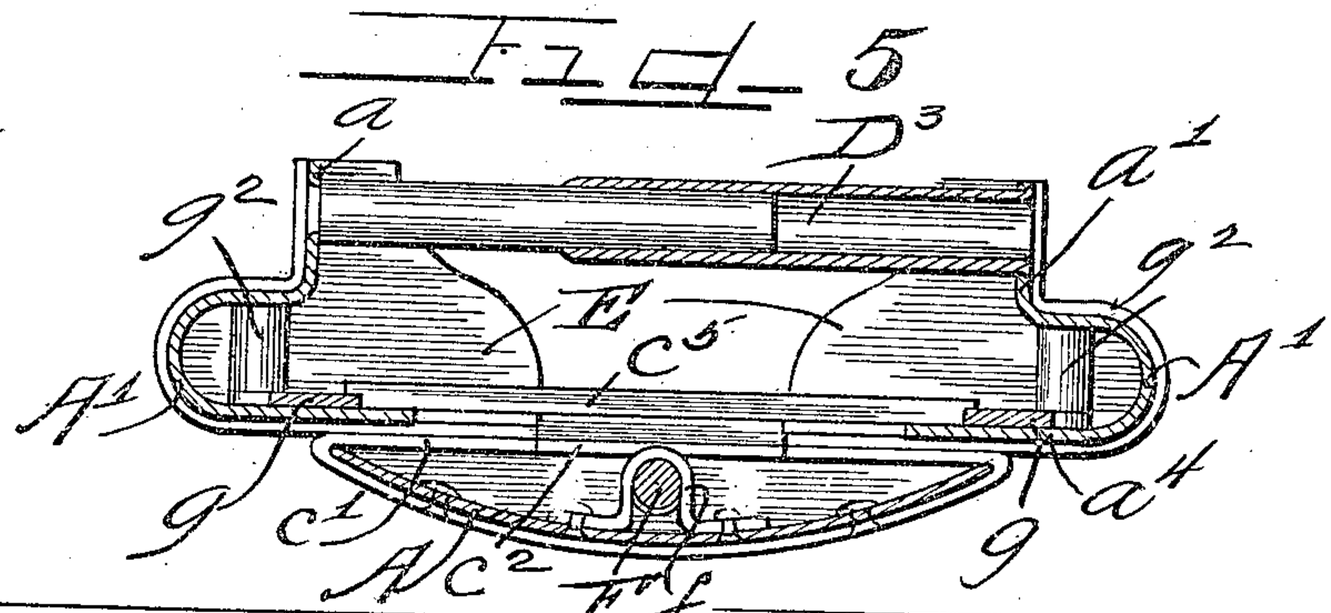


Fig. 5



Witnesses

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UNITED STATES PATENT OFFICE.

LEONARD R. DICKERSON, OF CHICAGO, ILLINOIS, ASSIGNOR TO RALPH B. WILSON, OF CHICAGO, ILLINOIS.

PRESSED-STEEL LEDGER-BINDER.

952,668. Specification of Letters Patent. Patented Mar. 22, 1910.

Application filed February 1, 1909. Serial No. 475,327.

To all whom it may concern:

Be it known that I, LEONARD R. DICKERSON, a citizen of the United States, and a resident of the city of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Pressed-Steel Ledger-Binders; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

Heretofore loose leaf binders have frequently been constructed with three piece backs, sometimes of cast aluminum and sometimes with castings of other metal and provided with key operated means for moving the lateral back sections from or toward each other. When so constructed, the backs have either been unduly expensive because of the high price of aluminum or very heavy, and, in any event, owing to the thickness of metal required where the parts thereof are cast, the construction is somewhat clumsy. Where aluminum is used, owing to the slight resiliency and comparatively low tensile strength of that metal, the castings of necessity must be of considerable thickness to afford the requisite strength inasmuch as the stresses exerted in such binders on compression are very great. Furthermore, it is a common practice owing in part to the metal employed, that the impaling posts have been arranged opposite the lugs whereby the covers are secured to the binding plates, thus taking advantage of the increased thickness of the metal at the lugs. Where so constructed, the manufacturer can only change the distance between the impaling posts by constructing separate patterns for all the different sizes or arrangement of posts and this of necessity frequently runs into considerable expense.

The object of this invention is to afford a binder of the class described in which practically all of the construction excepting the impaling posts and the actuating shaft is of pressed steel thereby affording an exceedingly light and neat as well as an exceedingly strong and rigid construction.

It is also an object of the invention to afford in connection with a pressed steel back section, pressed steel end members adapted to be rigidly engaged thereon and to afford anchorage for important parts of the internal mechanism of the binder.

It is also an object of the invention to afford a construction permitting the impaling posts to be arranged at any desired distances between sections for the length of the back without necessitating special tools or back patterns for this purpose, and to secure the lugs for attachment with the covers upon the binding plates at any desired point either opposite the impaling posts or between the same as may be preferred.

It is also an object of the invention to afford in a device of the class described interior reinforcing means for the lateral back sections or binding plates to greatly increase the strength thereof and to afford all the advantages for the binding plates that would be afforded by the use of a rigid bar.

The invention embraces many novel features and consists in the matters hereinafter described and more fully pointed out and defined in the appended claims.

In the drawings: Figure 1 is an inner plan view of a loose leaf or ledger binder embodying my invention with the covers broken away. Fig. 2 is a central section taken on line 2—2 of Fig. 1. Fig. 3 is a section taken on line 3—3 of Fig. 1. Fig. 4 is a section taken on line 4—4 of Fig. 1. Fig. 5 is an enlarged detail section taken on line 5—5 of Fig. 1. Fig. 6 is an enlarged fragmentary inner plan view of one end of one of the lateral sections. Fig. 7 is a section of one end on line 7—7 of Fig. 6. Fig. 8 is an enlarged transverse section taken through the end of the central back section. Fig. 9 is a section on line 9—9 of Fig. 8.

As shown in the drawings: Said binder comprises a frame consisting of a central convex back section A, and lateral back sections A′, which are shaped to afford also the binding plates *a*—*a*′, integral therewith and having the inner faces thereof parallel, and within and engaged to the members affording said back frame is the actuating shaft and its connections for expanding or contracting the binder. The central back section A, is constructed of thin sheet steel cut to suitable length and stamped to afford a convex back externally, and a concave inner face. End caps C, are then stamped or pressed of soft steel to afford a segment shaped, hollow member, the convex back *c*, of which has the same curvature as the cen-

tral back section A, and the front wall c', of which is straight to afford a part of the guide for the lateral back sections. As shown, said straight inner face of said cap is provided with a forwardly directed tongue c^2, positioned centrally of the cap, as shown in Figs. 8 and 9. The ends of the central back section are forced into said end caps C, under considerable pressure and may be brazed or riveted therein, if desired, and as shown, rivets c^3, extend through said back section A, the tongue c^2, and transverse spacing plate c^4 thereon, and an upper guide plate c^5, and rigidly engages the same together, and as shown, a cylindric sleeve through which said rivet c^6, passes is engaged between the back section and the tongue c^2, of the cap so that when the rivets are headed or closed down all said plates and members are rigidly engaged together in unvarying relation. Each of the lateral back sections is also constructed of thin pressed steel and consists of a binding plate a—a', from the rear edge of which the metal is pressed to curve outwardly to afford a back extension and thence rearwardly and inwardly in a plane substantially at right angles with the binding plate portion thereof, said inwardly extended or flanged portion a^4, of each of said lateral sections extending in the same plane and fitting and sliding in the guideway afforded by the inner side c', of the pressed steel cap piece, and the guide bar c^5, said flange also having a width sufficient for the edges thereof to nearly meet when the back is fully closed.

As shown, impaling posts D—D′—D² and D³, each comprising a plurality of telescoping sections, are secured at opposite ends on the binding plates a—a', for this purpose the binding plate is drilled, the post section inserted therethrough to interfit with the complemental post section from the opposite binding plate and the ends thereof in the binding plate are riveted down or secured in place in any other suitable manner to afford a rigid connection in the binding plates.

Rigidly secured by means of rivets e, as shown in Fig. 7, on the ends of the lateral back sections, are pressed steel corner and end plates E, shaped to fit or conform to the exterior of the binding plate and back section as shown in Figs. 6 and 7, and of a length on the back approximately equal to one half the width of the back of the binder when fully contracted. Conveniently, the end or corner members for the lateral back sections for each end of the binder may be constructed in one stamping and cut apart by the use of a suitable tool to afford two independent members after the stamping is completed.

Rigidly secured centrally and longitudinally in the central back section is the actuating shaft F. This, as shown, is journaled in bearings f, rigidly secured in the middle back section, as shown in Figs. 1 and 2, and is threaded with a right and left thread respectively at its opposite ends and one end f^2, of said shaft F, extends to near the end of the back section to be engaged by a suitable key inserted through an aperture f^3, in the bottom end cap, as shown in Fig. 2, and whereby said shaft may be rotated.

Threaded on the opposite ends of the shaft are nuts or carriages G—G′, to each end of which is pivotally engaged a toggle bar g, which extends from said nut or carriage outwardly and toward the adjacent ends of the lateral back section and are pivotally engaged to said back sections by means of rivets g', which extend therethrough and through the substantially parallel faces of the back section, and also through an apertured post g^2, similar to the posts or sleeves c^6, before described and whereby when the rivet is closed down, a positive bearing is afforded for the end of the link or toggle and likewise the opposing faces of said lateral back section are held in unvarying relation to greatly increase the rigidity of the section. As shown, a plurality of such apertured posts are provided to afford an interior brace for said lateral back sections, conveniently at least one of said posts may be provided not far from the point of attachment of the covers and in each instance are secured in place by means of rivets passed through the substantially parallel sides of the back section and through the posts g^2, as before described, or if preferred, said posts may be turned or formed as in a screw machine integrally with the rivets as indicated by the post and rivet g^3, in Fig. 1.

The attaching lugs H, are not cast integral with the binding plates, but may be secured in place in any convenient position along the binding plate by means of a screw h, which extends through the binding plate from the inner side and is threaded into said lug. Integral with said lugs are spacing posts g^5, similar to the posts g^2, which are riveted in place on the under side of the binding plates.

The covers I, as shown, are notched at their inner margins to receive the attaching lugs H, therein, as shown in Fig. 1, and are provided with a hinge plate bound in the inner margin of the cover and affording a pintle aperture near the margin to register with the pintle aperture through the lug and a pintle is inserted therethrough and through the lugs to positively engage the covers thereto.

The operation is as follows: For the construction of the binder back such as described a very light gage of sheet metal may be employed inasmuch as all parts to which stress is applied are thoroughly

braced and reinforced, the central back plate or section by the pressed steel end caps, and the lateral back sections by the posts, and rivets which engage the back flange with the outwardly curved portion closely adjacent to the binding plate. The links or toggles are positively connected with the lateral back sections at the end rivets or posts, thus the rigidity afforded by the pressed steel end cap for the lateral back section and afforded by the post is utilized to prevent any distortion of the lateral back section whatever under the severe stress capable of being applied by the rotation of the shaft F.

The thin pressed steel ends of the corner or end plates E, for the lateral back sections positively engage in the slideways afforded on the end caps of the central back section by the inner face of said end cap and the guide plate c^5, in consequence the movements of the lateral back sections are always in unison and the guide plates c^5, extending well into the ends of said lateral back sections, serve also as guide to prevent any relative longitudinal movement of the side sections with reference to the central back section. When so constructed, the adjustment under any and every condition is positive and a comparatively close fit being afforded between the guides and the end plates, the binder is not likely to be injured by rough usage, as by falling from a desk—hence great durability is assured. Of course, the position of the impaling posts in the binding plate may be arranged as desired for each individual customer, if preferred, and either two or more posts may be installed, as desired, and wheresoever the punching of the sheets used by the customer may require. Furthermore, it is obvious that posts of any desired size may be employed and if thought desirable, post rivets may be provided beneath the impaling posts. These ordinarily, however, are not required inasmuch as the impaling posts serve but to hold the sheets in place when the binder is open, and the stress exerted in closing the binder is of course, exerted by means of the links directly to the most rigid portions of the lateral back sections as hereinbefore described.

Of course, I am aware that numerous details of construction may be varied. I have, however, shown but one of several adaptations of my invention and I therefore do not purpose limiting this application for patent otherwise than necessitated by the prior art.

I claim as my invention:

1. A pressed steel binder of the class described comprising oppositely movable binding plates of pressed sheet steel, each affording an integral flange along its inner edge, said flange extending outwardly, thence curving inwardly substantially parallel to the outwardly extending portion, posts engaged between the parallel faces of said flange at a plurality of points in its length and independent attaching lugs secured to the binding plates, each provided with an integral spacing post.

2. In a device of the class described oppositely movable binding plates of pressed steel each formed with parallel portions, post rivets engaged between the parallel portions and riveting the same together at a plurality of points in its length, a steel back plate and steel end caps secured to the ends of the back plate.

3. A loose leaf binder embracing oppositely movable pressed sheet steel binding plates, an integral flange on the inner edge thereof extending outwardly, then curving inwardly parallel with the outwardly directed portion, post rivets engaged at a plurality of points between said parallel faces of the flange and rigidly securing the same together, pressed steel end members on said binding plates rigidly secured thereto, and actuating means for the binding plates pivotally engaged on the end rivets.

4. A pressed steel binder of the class described comprising oppositely movable binding plates of pressed sheet steel, each affording an integral flange along its inner edge, said flange extending outwardly, and curving inwardly substantially parallel to the outwardly extending portion, means engaged between the parallel faces of said flange at a plurality of points in its length to secure the same in unvarying relation, independent attaching lugs secured to the binding plates and a post integral with each lug extending through the parallel faces and riveted to the bottom face.

5. A loose leaf binder embracing two oppositely pressed sheet steel binding plates provided with a rounded part forming an inwardly opening channel, spacing posts engaged at a plurality of points in said channel, pressed steel end members on said binding plate, a central back plate of pressed steel, a steel one piece cap secured on each end of the back plate on which the binding plates are supported and guides secured thereto adapted to bear against the end members to prevent relative longitudinal movement of the binding plates.

6. A loose leaf binder embracing two oppositely movable pressed sheet steel binding plates shaped to provide an inwardly opening channel, bracing members in the channel, a central back section, horizontal guides secured thereto, a steel cap secured to each end of the back section having a horizontal top, end members secured to the binding plates fitting between the guides and the horizontal top faces of the caps and said end members also bearing against the outer sides of the respective guide.

7. A pressed metal ledger binder embracing a central pressed sheet metal back section, pressed metal end caps engaged thereto, pressed metal lateral back sections slidably engaged on the central back section, a binding plate engaged on each lateral section, braces stiffening each lateral section, a right and left threaded shaft rotatably engaged on the central back section, carriages thereon, links pivotally engaged on each side of the carriage and directed outwardly and toward the ends of the lateral back sections and pivotally engaged thereon at the end braces therefor.

8. A pressed metal ledger binder embracing a central pressed sheet metal back section, pressed metal inwardly facing end caps engaged thereto, pressed metal lateral back sections slidably engaged on the central back section having binding plates engaged thereto, end members secured to the lateral back sections, braces stiffening each lateral section, a right and left threaded shaft rotatably engaged on the central back sections, carriages thereon, links pivotally engaged on each side of the carriage and directed outwardly and toward the ends of the lateral back sections and pivotally engaged thereon at the end braces therefor, and guides secured to the central back section adapted to engage the end members of the lateral back sections therebeneath and also to prevent relative longitudinal movement of the lateral back sections.

9. A pressed steel binder comprising a back section concave on its inner side and convex on its outer side, slidable back and binding sections, a cap secured to each end of the back section provided with one flange concave to receive the respective end of the back section and a horizontal flat flange, a guide secured to each cap, and a spacing member between the cap and guide.

10. A pressed steel binder comprising a back section concave on its inner side and convex on its outer side, slidable back and binding sections, a cap secured to each end of the back section provided with one flange concave to receive the respective end of the back section and a horizontal flat flange, a guide secured to each cap, a spacing member between the cap and guide, end sections on each binding plate engaged between the guides and horizontal flanges of the caps and spacing posts rigidly secured between the flanges of the cap.

11. In a device of the class described a pressed steel back section, pressed steel caps secured on the ends thereof, pressed steel binding plates, pressed steel end members thereon and guides secured to the steel caps.

12. In a device of the class described a pressed steel back section, pressed steel caps secured on the ends thereof, pressed steel binding plates, pressed steel end members thereon, guides secured to the steel caps, spacing posts secured to the caps, independent lugs secured to the binding plates and actuating mechanisms for the binding plates.

13. In a device of the class described a back plate, binding plates, inwardly facing caps secured to the ends of the back plate, an inwardly directed member integral with each cap, and a guide secured to and spaced a distance from each member.

14. In a device of the class described a back plate, binding plates, inwardly facing caps secured to the ends of the back plate, an inwardly directed member integral with each cap, a guide secured to and spaced a distance from each member, spacing posts secured between each member, and the back plate, sleeves bracing the walls of the binding plates, independent lugs secured to the binding plates for attachment of the covers and shaft operated actuating mechanism.

In testimony whereof I have hereunto subscribed my name in the presence of two subscribing witnesses.

LEONARD R. DICKERSON.

Witnesses:
K. E. HANNAH,
L. REIBSTEIN.