W. S. PROUDFIT, Jr.

BOOKBINDING.

APPLICATION FILED MAR. 13, 1905.

958,170.

Patented May 17, 1910.

3 SHEETS—SHEET 1.

Fig. 1.

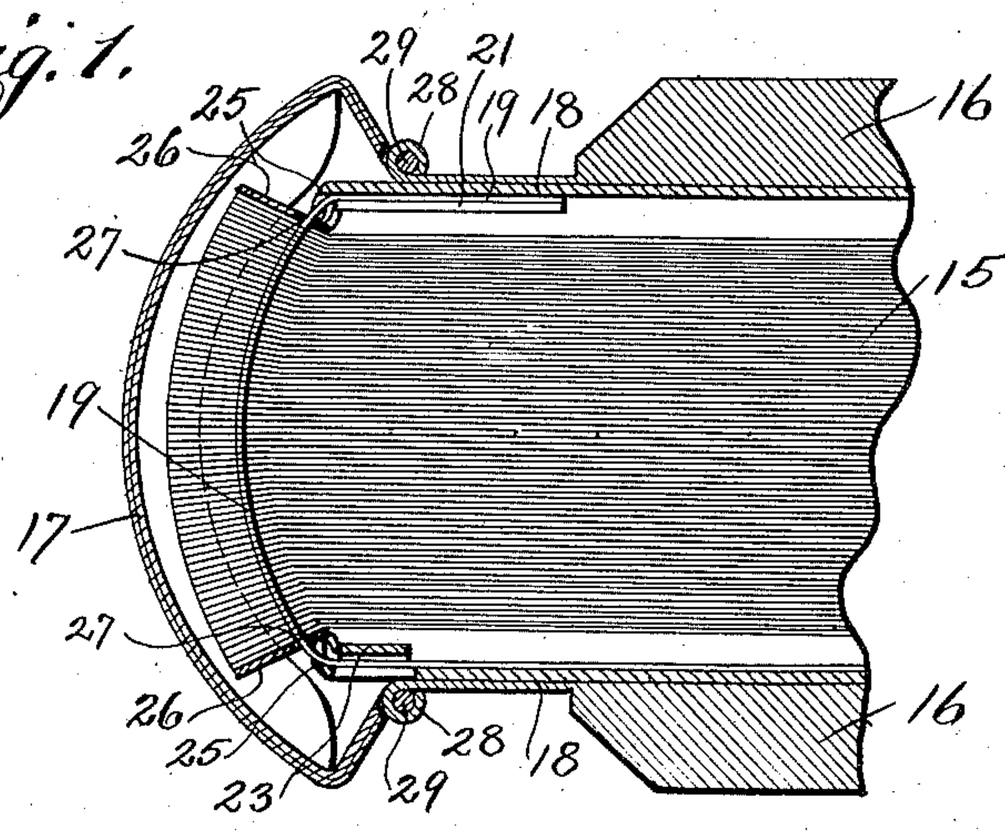

Fig. 2.

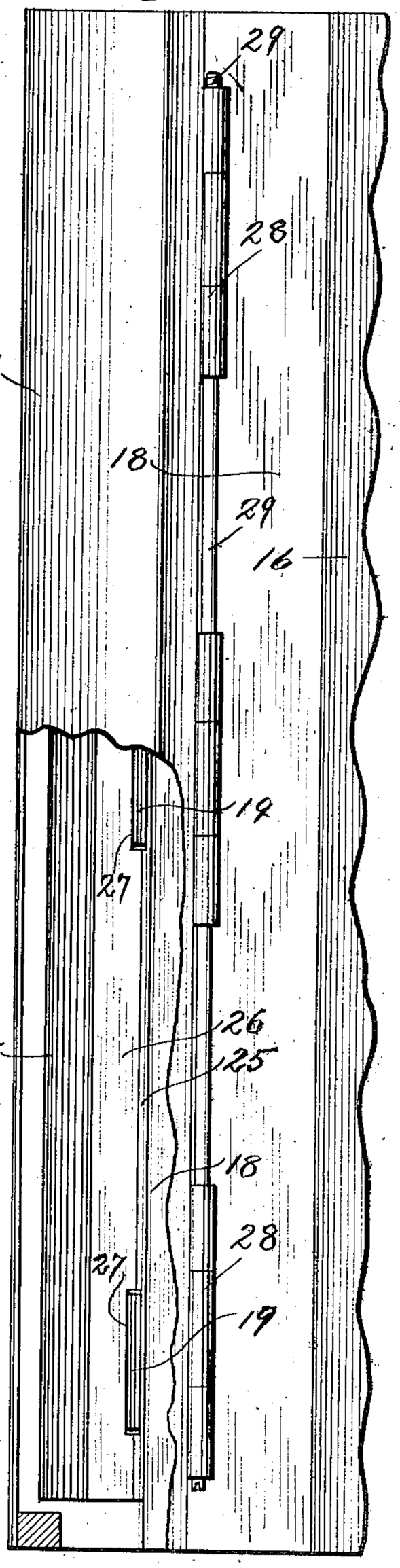

Fig. 3.

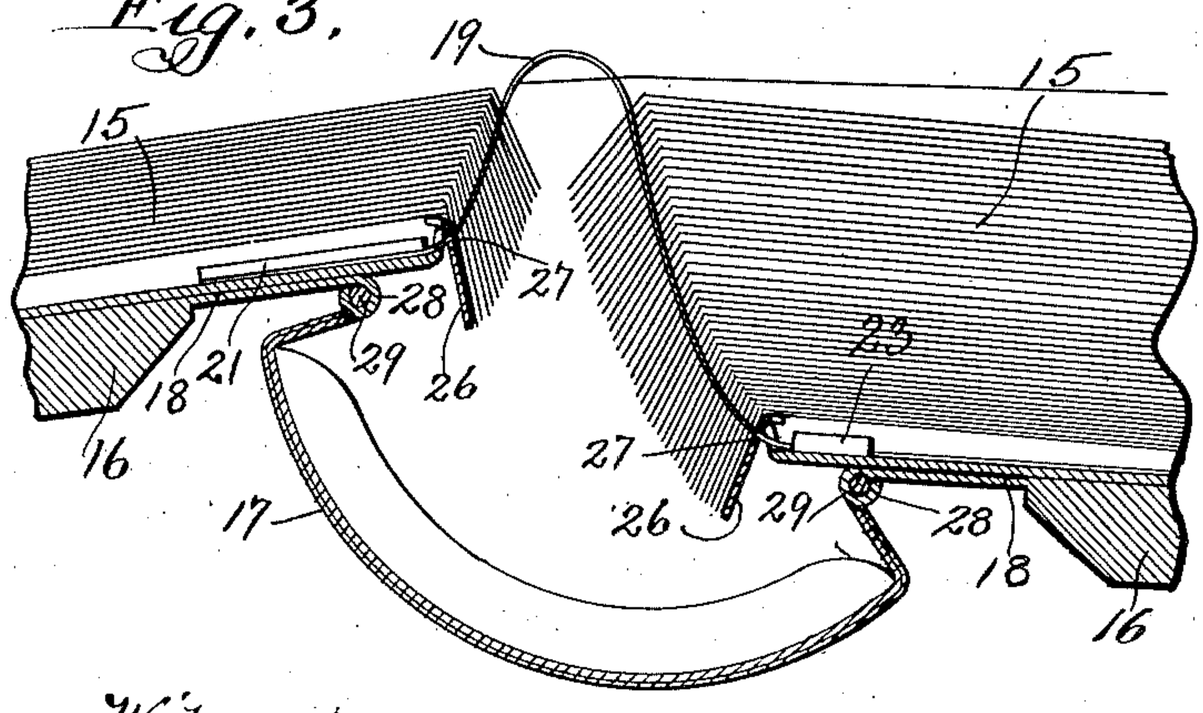

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Fig. 5.

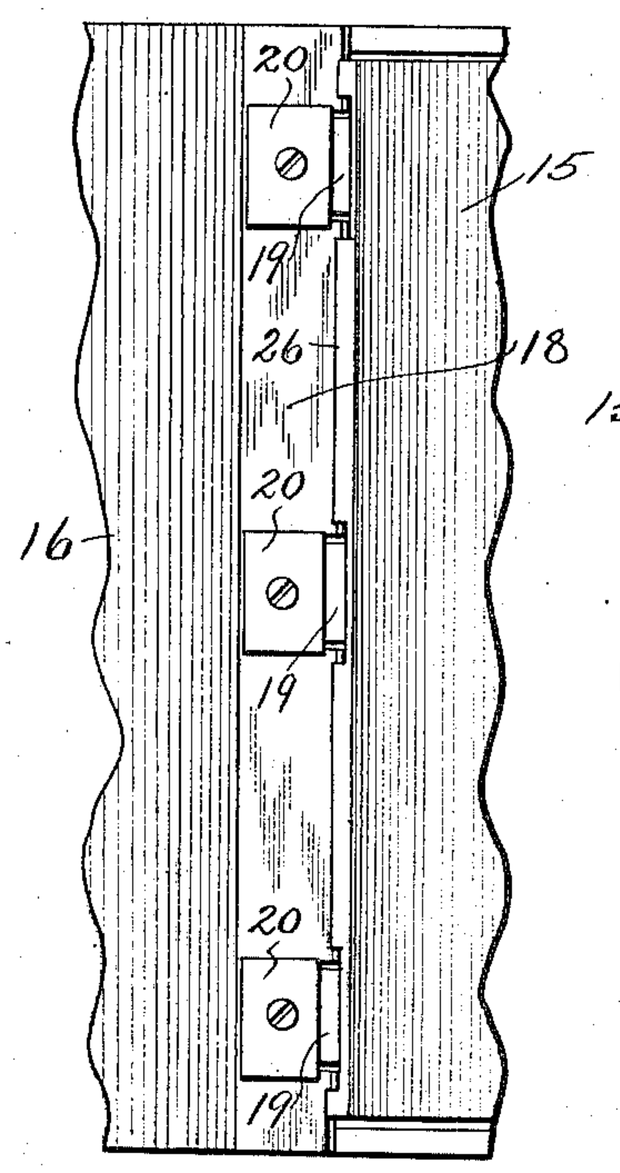


Fig. 6.

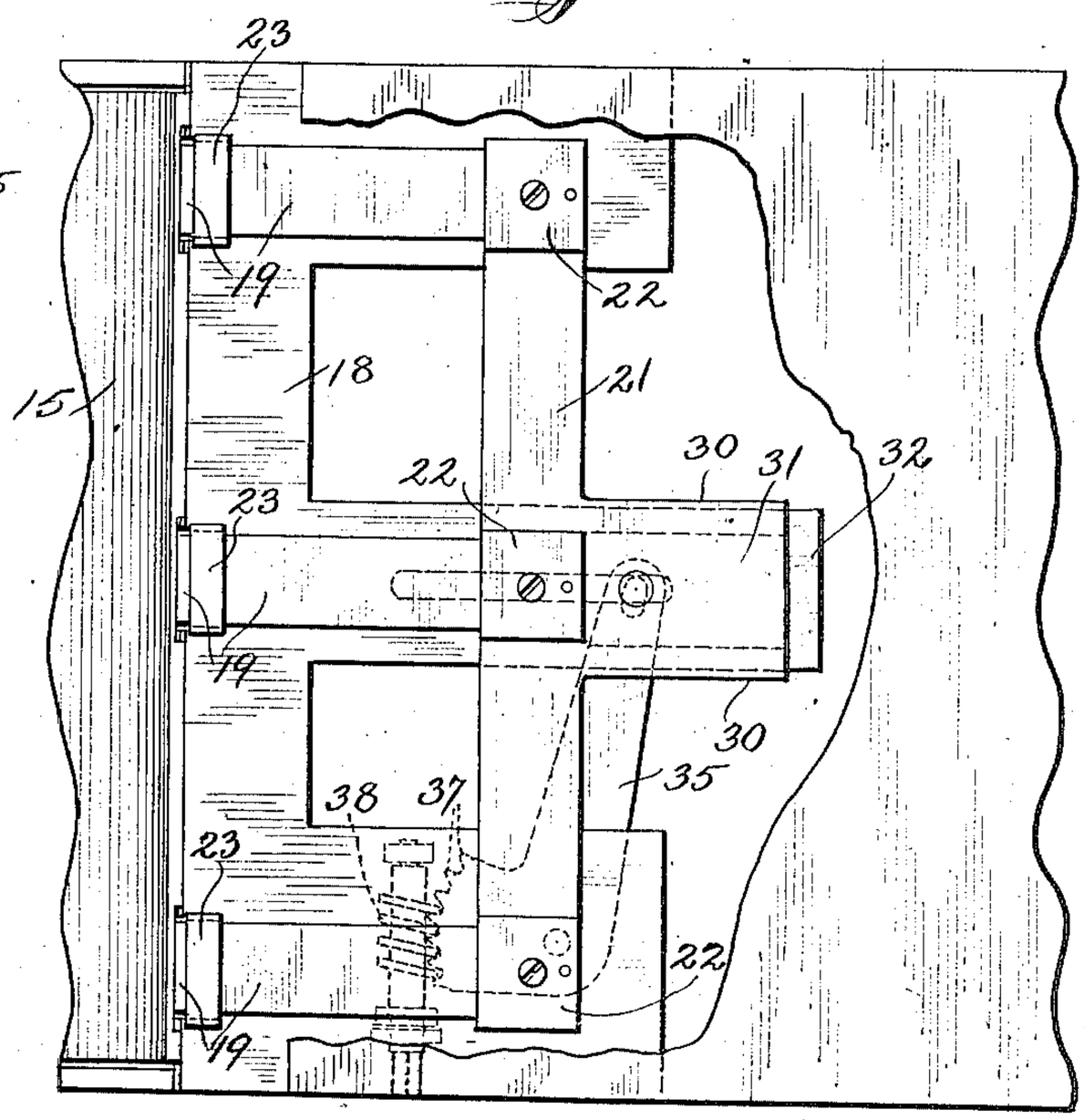


Fig. 7.

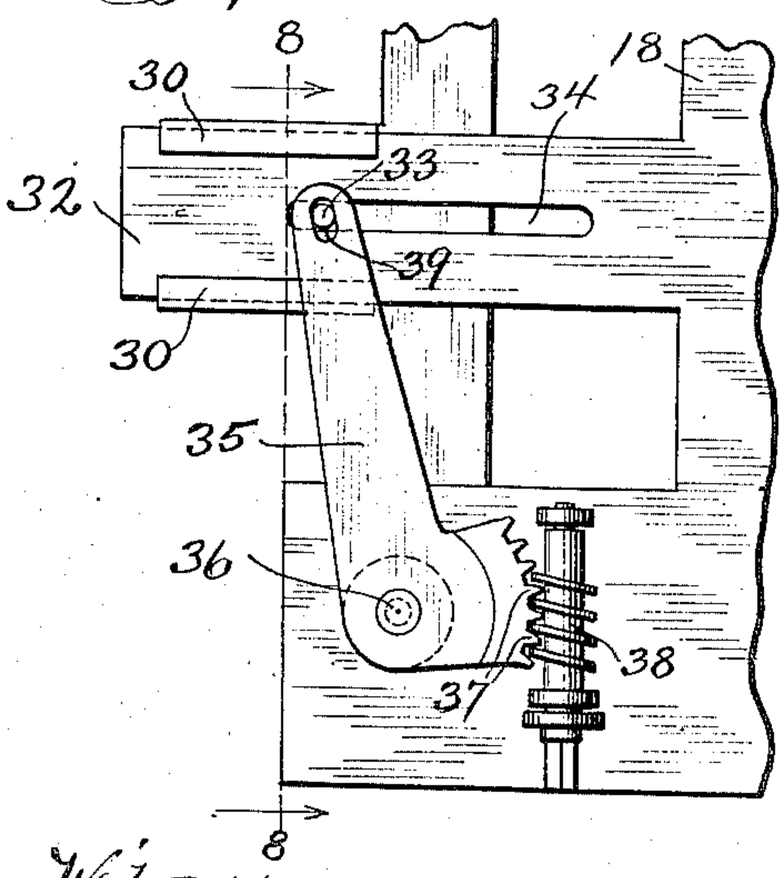
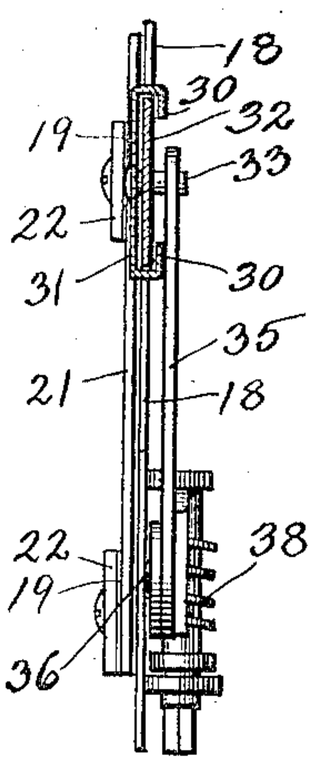


Fig. 8.



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3 SHEETS—SHEET 3.

Fig. 9.

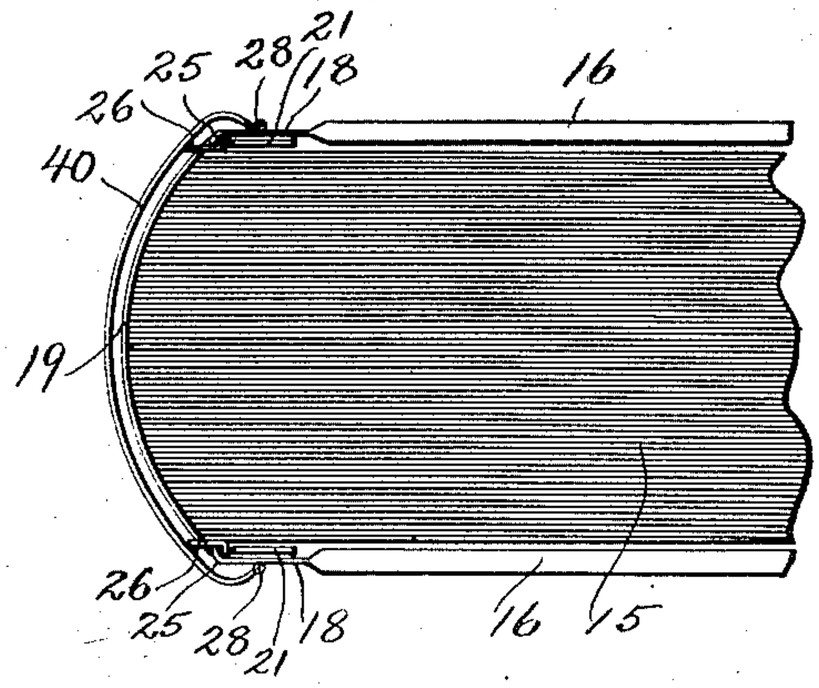


Fig. 10.

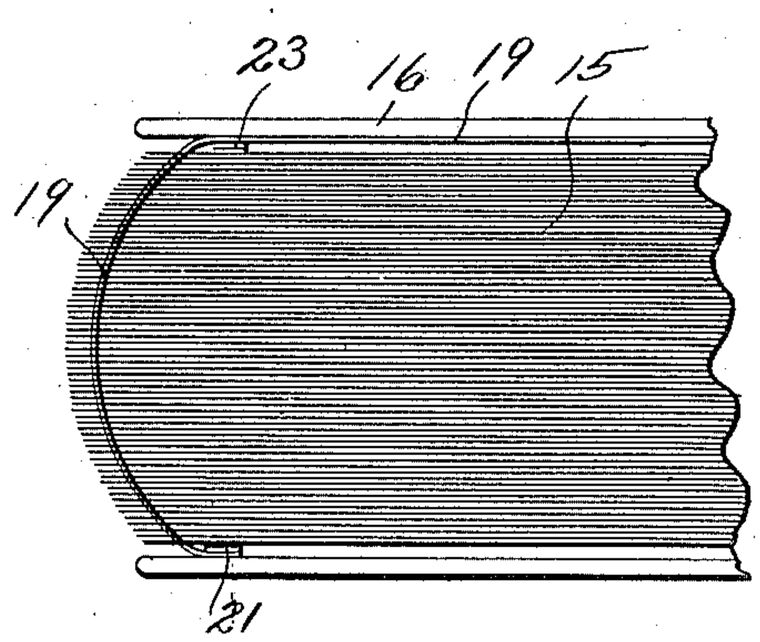
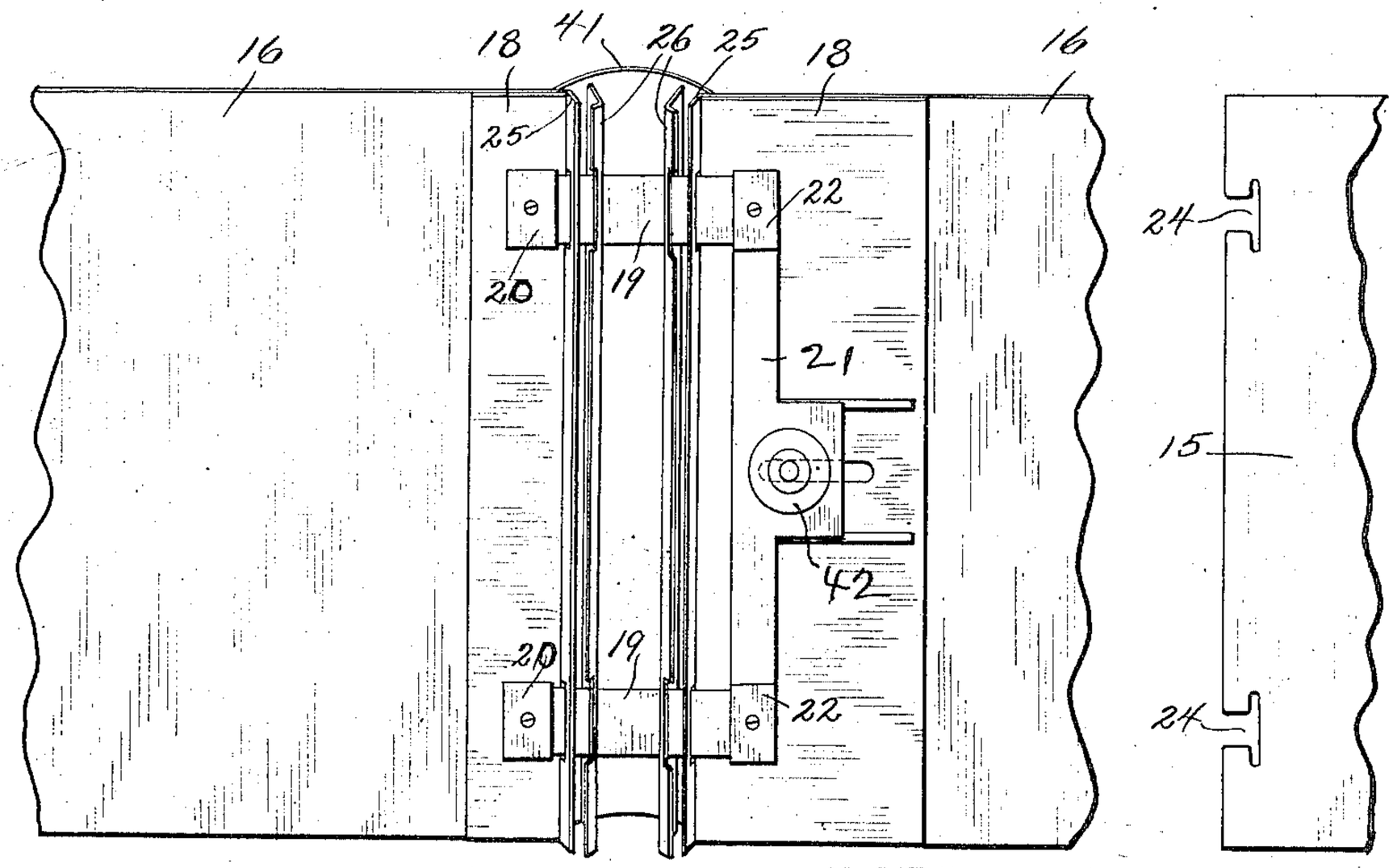


Fig. 11.

Fig. 12.



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UNITED STATES PATENT OFFICE.

WILLIAM S. PROUDFIT, JR., OF CHICAGO, ILLINOIS.

BOOKBINDING.

958,170. Specification of Letters Patent. Patented May 17, 1910.

Application filed March 13, 1905. Serial No. 249,936.

To all whom it may concern:

Be it known that I, WILLIAM S. PROUDFIT, Jr., a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Bookbinding, of which the following is a specification.

My invention relates to bindings for flat opening books generally and in particular to loose leaf books and the objects of my invention are, first, to hinge the covers to the backs in such manner that the back of the leaves will be forced away from the back when the book is opened; second, to provide bearing and lifting strips between the edges of the covers and the leaves; third, to make the back of the book interchangeable; fourth, to make the leaf holding strips of spring material; fifth, to connect the leaf holding strips detachably to the covers; sixth, to provide means for adjusting all the leaf holding strips in unison without adjusting either of the covers or back; and other objects to become apparent from the description to follow.

Heretofore the binding on books has been so made that after some use the covers would become separated from the bound book, and furthermore the book binding was very much strained because the book would not lie flat when opened. In loose leaf books as heretofore made the pages would lie flat to only a certain degree when opened; it was difficult to assemble a complete book full of leaves; an adjustable back was required to provide for different thicknesses of books and numerous other inconveniences were associated with their construction. By my invention all these objectionable features are eliminated and the construction is both durable and simple.

To describe the construction and operation of my invention I have illustrated it on the accompanying sheet of drawing forming a part of this specification in which:—

Figure 1, is a cross sectional view of a book partly broken away embodying my invention; Fig. 2, is a similar view showing the book in an open position; Fig. 3, is a similar view showing the binding strips adjusted in a slack condition to permit the removal of leaves from the book; Fig. 4, is a side view of the book shown in Fig. 1, partly broken away; Fig. 5, is an inside face view of one cover showing the fastenings of the binding strips thereto; Fig. 6, is a similar view of the other cover showing also the binding strip adjusting mechanism; Fig. 7, is a detail of the binding strip adjusting mechanism; Fig. 8, is a section on line 8—8 of Fig. 7; Fig. 9, is a sectional view showing a modification; Fig. 10, is a section showing another modification; Fig. 11, is a perspective view of still another modification and Fig. 12, is a view showing the notches in the leaves.

Similar reference characters refer to similar parts throughout the several views.

The book comprises the leaves 15, two covers 16, and a back 17. The covers 16 at their hinged edges are provided with or made in the form of stiff plates 18 which are preferably metal, and these plates 18 are connected by leaf holding springs 19. One end of each spring is detachably secured to one plate 18 by a clamping block and screw 20, while the remaining end of each spring 19 is secured in a similar way to the bar 21, by the clamping blocks and screws 22. When the book is closed an intermediate portion of the leaf holding springs 19 between the covers, lies in a curve toward the back of the book. As the covers are opened the secured ends of the springs 19 swing with the covers, flexing the intermediate portion of the springs away from the back of the book and forcing it to lie in a curve toward the front of the book and in front of the plane of the covers when in alinement, at the place where the book is opened. The bar 21 is arranged to be moved toward and away from the hinged edge of the cover 16 so as to lengthen or shorten that portion of the springs 19 lying between the edges of the covers 16, and the springs 19 are held in position close to the edge of the cover 16 by passing under guides 23 preferably formed by pressing up a tongue from the plate 18. The leaves 15 are provided with as many T notches 24 in their edges as there are springs 19 and said springs pass through the notches 24 of all the leaves, thus securing them in place. The binding edges of the plates 18 are bent in an angle 25 to press against the leaves 15 just above the spring 19, which serves to bind the leaves above the leaf holding spring 19 and holds the leaves secure. To prevent the mutilation of the leaves 15 at this point from constant wear the angular binding strips 26 are interposed between the binding edge of the plates 18 and the leaves 15. The strips 26

are held in proper position by being provided with slots 27 through which the springs 19 pass.

To relieve the springs 19 from any strain when the book is opened or closed the edges of the plates 18 are made to extend a short distance beyond the hinges and to rest and bear in the angle of the strips 26 as shown in Figs. 1, 2 and 3.

The back 17 is not mechanically adjustable but is preferably made of spring metal in one piece bent to conform to the curvature of the back of a book and is hinged to the plates 18 a short distance above the binding edges of the same at 28, by a pin or rod 29 passing alternately through eyes or loops provided on the covers and on said back. One end of the pin 29 may be screw-threaded to prevent its accidental removal. The back 17 is of such size as to normally cause some pressure against the plates 18 at the hinges 28 and therefore against the leaves 15. When it is desired to increase the thickness of the book beyond the extension of the spring back 17, a larger back 17 is secured in place of the smaller one by the removal and replacement of the pins 29. If a still greater increase in the thickness of the book is desired it may be necessary to insert larger springs 19 by the removal and replacement of the fastenings 20 and 22 and securing a still larger back 17 in place.

It will be seen from the foregoing description that when assembling a complete book, the clamping blocks and screws 20 may be removed; the ends of the springs 19 being thus free can be pushed through the T notches in the whole pile of leaves 15 and then again secured in place by the fastening 20; this obviates the usual tedious work of placing one or two leaves into the book at a time.

It is very desirable to adjust all the springs 19 equally and at the same time so that the portion between the covers may be lengthened or shortened and leaves removed or inserted without displacement or adjustment of either covers or back; this is accomplished by forming flanges 30 on an extension 31 of the bar 21 to serve as guides on either side through a slot 34 in the extension 32.

A bell crank lever 35 is pivoted at 36 to a part rigid with the cover 16, preferably a portion of the plate 18, and has its shorter arm terminating in a segment provided with teeth 37 which are in constant mesh with the worm 38 which is mounted to rotate in bearings preferably secured to a portion of the plate 18. The longer arm of the bell-crank lever 35 is provided with an elongated hole 39 into which the pin 36 extends so that a movement of the bell-crank lever 35 about its pivot 36 will move the bar 21. One end of the shaft carrying the worm 38 is made square to fit a key; so that the springs 19 can be adjusted by turning the worm 38 and locked in such adjusted position.

By an examination of Fig. 1, it will be seen that the covers of the book are inclined to be pressed toward each other because of the position of the hinges 28 and the outward pressure exerted against the binding edges of the plates 18 by the bound edges of the leaves 15. The bound edges of the leaves are preferably made somewhat thicker than the balance of the leaves. By examining Fig. 2, it will be seen that the position of the hinges serves to decrease the distance between the binding edges of plates 18 when the book is opened, and this results in the springs 19 being bent into a perceptible hump at the place of opening, which causes the leaves to lay practically flat. Fig. 3, shows how the springs 19 are forced up at the place of opening when they are adjusted for the removal or insertion of one or more leaves 15. It will be seen that the distance between the hinges 28 is substantially always the same being determined by the size of the back 17. To insert or remove a leaf the book is opened at the desired place and the bar 21 is removed toward the back where a push is exerted against the adjustable ends of the springs 19 which causes said springs to loop up at the place where the book is opened as is clearly shown in Fig. 3.

Fig. 9, shows a modified form designed for regular solid binding without the leaves being removable. The covers 16 are preferably secured to metal plates 18, but the springs 19 are preferably secured to each cover 16 by any convenient means or by fastening previously described. The back 40 may be either a spring back or a flexible back, and the springs 19 instead of passing through T notches in the leaves may be secured to the back of the leaves by pasting or otherwise. It will be understood that in bindings of this kind the springs 19 need not be adjusted.

I am not aware that spring strips have been used for securing leaves in a solid binding before my invention and I therefore lay claim to such a construction broadly. By this construction the life of the book is greatly increased and the body of the book will not break loose from the covers since the connection is made by metal spring strips.

Fig. 10, shows a modified form of my invention in the shape of a file or throw-off. In this form no back is required but a means for adjusting the springs 19 is used. The binding strips adjacent the two outer leaves may also be omitted.

In Fig. 11, is shown a modification in the form of a pocket memorandum book having removable leaves. The back 41 may be either a spring or flexible back. Only two of the springs 19 are shown and but one may

be used, the bar 21 instead of being adjusted by a worm and gear arrangement is simply shifted into proper adjustment by the hand and then is secured against movement by a thumb-nut 42. The bar 21 is provided with means for guiding its movement so that the springs 19 are equally adjusted.

Having thus fully described my invention what I claim as new and desire to secure by Letters Patent of the United States is:—

1. In a book binding, stiff plates integral with the covers and forming their binding edge, a spring back hinged to said plates some distance from their free binding edges, and leaf holding springs secured to said plates extending between the edges of said plates.

2. In a book binding, stiff plates integral with the covers and forming their binding edge, a removable back hinged to said plates some distance from their free binding edges, leaf holding springs secured to said plates extending between the edges of said plates and bearing strips loosely mounted on said springs interposed between the edges of said plates and the leaves of the book.

3. In a book binding, two covers connected by leaf holding springs, a bar adjustably secured to one cover, a guide secured to said cover whereby said bar is retained parallel to the binding edge of said cover and is permitted to move toward and away from said binding edge, one end of each of said springs secured to one cover and the remaining end of each of said springs secured to said bar.

4. In a book binding, stiff plates integral with the covers and forming their binding edge, a back hinged to said plates some distance from their free binding edge, leaf holding springs secured to said plates extending between the edges of said plates, and the binding edge of each of said plates being so bent that the binding force will be exerted against the leaves in front of a line through said leaf holding springs.

5. In a book binding, two covers connected by a plurality of leaf holding springs, one end of each spring secured to one cover and the remaining end of each spring adjustably secured to the other cover, and means for simultaneously adjusting said springs comprising a bar guided to move in one direction, a bell-crank lever arm loosely connected to said bar, and a worm meshing with a segmental gear provided on one arm of said bell crank lever.

6. In a book binding, a back, covers hinged to said back, leaf holding springs secured to said covers having an intermediate portion extending between said covers, and means for adjusting the length of such intermediate portion without displacing the covers or back comprising a bar guided to move toward and away from the binding edge of the cover and be retained in a position parallel to said binding edge.

7. In a loose leaf book binding, a front and back cover provided with a stiff binding edge, a back hinged to said covers near their binding edges, a leaf holding spring strip connected to the covers, extending between the binding edges of said covers and means for increasing the length of said spring strip between the binding edges of the covers by exerting a push on the end of said strip to permit of attaching and detaching leaves to and from said strip.

8. A book binding, comprising a front and back cover hinged to a solid non-adjustable back, leaf holding springs, and means for exerting a push on the ends of said springs thereby increasing the length of said springs between the binding edges of said covers to permit the attaching and detaching of leaves to and from said springs.

9. In a book, the combination of covers provided with binding edges to press against the leaves, an intermediate connecting means having flexible connections with the covers and connecting them; leaf holding strips attached to the covers and bridging the space between them arranged to curve toward the back of the book as the covers are closed and to assume an opposite curve as the covers are opened, means for simultaneously adjusting said leaf holding strips and a separate bearing-strip being interposed between the binding edges of said covers and the leaves.

10. In a book, the combination of the covers; an intermediate connecting means, having flexible connections with the covers and connecting them; a leaf holding strip attached to the covers, and bridging the space between the same arranged to curve toward the back of the book as the covers are closed and to assume an opposite curve as the covers are opened; and means for relieving the strain on said leaf holding strip when the covers are moved comprising bent binding edges on said covers coöperating with an angular bearing strip provided with slots through which said leaf holding strip extends.

11. In a book, the combination of the covers; an intermediate connecting means having flexible connections with the covers and connecting them, a strip secured to said covers and bridging the space between them arranged to curve toward the back of the book as the covers are closed and to assume an opposite curve as the covers are opened; and means for protecting said leaves from abrasion as the covers are opened and closed.

12. In a book binding, two covers connected by a plurality of leaf holding springs, means for simultaneously adjusting said springs comprising a bar guided to move toward and away from the binding edge of the cover and be retained in a position par-

allel to said binding edge and means comprising a worm and gear for moving and locking said bar in position.

13. In a book binding, two covers connected by a plurality of leaf holding springs, and means for simultaneously adjusting said springs comprising a bar guided in its movement on one of said covers and means for moving and locking said bar in position comprising a worm.

14. In a book binding, a back, covers hinged to said back, leaf holding springs secured to said covers having an intermediate portion extending between said covers, and means for adjusting the length of such intermediate portion comprising a bar guided to move back and forth in one direction on one of said covers and means for moving and locking said bar in position comprising a bell crank having its long arm connected to said bar and its short arm provided with a gear meshing with a worm.

15. In a book binding, a back, covers hinged to said back, leaf holding springs secured to said covers having an intermediate portion extending between said covers, and means for simultaneously adjusting said springs comprising a bar guided in its movement on one of said covers and means for moving and locking said bar in position comprising a worm.

16. In a book binding, covers having a free binding edge, a back hinged to said covers some distance from their free binding edge; leaf holding strips secured to said covers and bridging the space between them, and the binding edge of said covers bent to exert pressure against the leaves in front of a line through said leaf holding strips.

17. In a book binding, covers having a free binding edge, a back hinged to said covers some distance from their free binding edge; leaf holding strips secured to said covers and bridging the space between them; bearing strips mounted on said leaf holding strips; the binding edge of said covers arranged to exert pressure against said bearing strips in front of a line through said leaf holding strips.

18. In a book binding, the combination of a back, covers hinged to said back, a leaf holding strip secured to said covers having an intermediate portion between said covers and the ends of said strip arranged to swing with said covers so as to curve said intermediate portion toward said back when the covers are closed and curve it in an opposite direction when the covers are opened and means for adjusting the length of the intermediate portion of said strip without displacing the covers or back.

19. In a book binding, the combination of a cover having its binding edge bent upward and an angular binding strip arranged to engage at its angle the binding edge of the cover.

20. In a book, the combination of the covers, an intermediate connecting means having flexible connections with the covers and connecting them, leaf holding strips, attached to the covers and bridging the space between the same arranged to curve toward the back of the book as the covers are closed and to assume an opposite curve as the covers are opened, and means for simultaneously adjusting said leaf holding strips, comprising a bar adjustably secured to one of said covers, to which said leaf holding strips are attached.

21. In a book binding, the combination of the cover provided with an extending metal binding edge and a binding strip provided with a longitudinal angle arranged to engage the binding edge of said cover.

22. In a book binding, a cover and a binding strip provided with a longitudinal angle arranged to rest against the binding edge of said cover.

23. In a book binding, a cover, a leaf holding strip connected to the cover and a binding strip provided with a perforation to receive said leaf holding strip arranged adjacent to the binding edge of the cover.

24. In a book binding, a cover, a leaf holding strip connected to the cover and a binding strip provided with a perforation to receive said leaf holding strip and a longitudinal angle arranged to rest adjacent to the binding edge of said cover.

25. In a book binding, the combination of the cover provided with an extending metal edge, a leaf holding strip connected to said cover, and a binding strip provided with a perforation to receive said leaf holding strip and a longitudinal angle arranged to rest adjacent to the binding edge of said cover.

26. In a book binding, the combination of a pair of covers, one of which is provided with an internal recess or chamber; a back connecting the covers, a laterally resilient leaf holding strip extending between said covers, movably connected to the cover provided with the internal recess or chamber; leaves detachably connected to said strip; and means situated within said recess or chamber arranged to be operated from the outside of said chamber without opening or uncovering the same, for pushing said strip into a bowed form above said leaves at any point at which said book may be opened, without displacing the covers or back.

27. A loose-leaf binder comprising a curved resilient back, covers hinged thereto and flexible sheet carrying tapes extending across the curved back and associated with means for adjustably exerting endwise stress thereon to press the sides of the back toward each other, said tapes being made of such

stiffness as to assume a definite bowed form when the ends thereof are moved toward each other.

28. A loose-leaf binder comprising a curved, resilient back, covers hinged thereto, sheet-carrying tapes extending across the curved back and attached to one of said covers a distance from the margin of said back, and a screw-threaded actuating device carried by the other cover for exerting endwise straining stress on said tapes.

29. A loose-leaf binder comprising a curved, resilient back, covers hinged thereto, thin flexible metal sheet-carrying tapes extending across said curved back and over upon the covers, screw-threaded means for adjustably exerting endwise straining stress on said tapes, said tapes being connected at their ends to press the sides of the back toward each other when straining stress is exerted on said tapes.

30. A loose-leaf binder comprising a curved, resilient back, covers hinged thereto, thin flexible metal sheet-carrying tapes connected with the covers a distance outside of the side margins of the back and extending across the curved back, and a screw-threaded device for exerting endwise straining stress on said tapes.

31. A loose-leaf binder comprising a curved, resilient back, covers hinged thereto, sheet-carrying tapes attached at their ends to one of said covers and extending across the curved back, a sliding bar having guiding engagement with the other cover, to which the other ends of said tapes are attached and a screw-threaded device for moving said bar toward and from said back.

32. A loose-leaf binder comprising a curved resilient back, covers hinged thereto, sheet-carrying tapes extending across the curved back and attached at their ends to one of said covers, a cross bar to which the other ends of said tapes are attached, said cross bar having guiding engagement with the other cover, and a screw-threaded shaft mounted in said latter cover for moving said bar toward and from the curved back, said cover being provided at its margin with an opening to receive the outer end of said shaft.

33. A loose-leaf binder comprising a curved, resilient back, covers hinged thereto, sheet-bearing tapes extending across said curved back and attached to one of said covers and connected with the other cover by means adapted to exert endwise straining stress on the tapes and binding bars having openings through which said tapes extend and adapted to exert clamping pressure on the opposite sides of the stubs of the sheets carried by said tapes.

34. A loose-leaf binder comprising a curved, resilient back, covers hinged thereto, sheet-bearing tapes extending across said curved back and attached to one of said covers and connected with the other cover by means adapted to exert endwise straining stress on the tapes; binding bars having openings through which said tapes extend and adapted to exert clamping pressure on the opposite sides of the stubs of the sheets carried by said tapes, and flanges on the inner margins of the covers for pressing the binding bars against the stub-ends of said sheets.

35. A loose-leaf binder comprising a curved resilient back, covers, metal plates attached to the inner margins of said covers, overlapping hinge lugs on the inner margins of said plates and the side margins of the curved back, pintles extending through said hinge lugs, sheet-carrying tapes extending across the curved back and connected with the covers by means designed to exert adjustable straining stress on the tapes, apertured binder bars through which said tapes extend, and flanges on the inner margins of the plates adapted to press said binder bars against the stub-ends of the sheets carried by said tapes.

36. In a book binding the combination of a pair of swinging covers, one of which is provided with an internal recess or chamber, laterally resilient leaf holding strips connected to said covers with an intermediate portion lying between said covers, arranged so that the ends of said strips will swing in unison with said covers and flex the intermediate portion of said strips toward the back of the book, as the covers are closed and in the opposite direction as the covers are opened and adjusting mechanism for said strips situated within said recess or chamber and arranged to be operated from the outside of the chamber without opening or uncovering the same.

37. In a book binding, the combination of a pair of covers; an intermediate connecting means having flexible connections with said covers and connecting them; a laterally resilient leaf holding strip extending between said covers; leaves detachably secured to said strips; and means mounted on one of said covers for pushing said strip into a bowed form, above said leaves at any point at which said book may be opened, without displacing the covers or intermediate connecting means connecting them.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses this 9th day of March, 1905, at Chicago, Illinois.

WILLIAM S. PROUDFIT, Jr.

Witnesses:
R. J. Jacker,
Fred Schad, Jr.