No. 749,582. PATENTED JAN. 12, 1904.

G. A. ROEDDE.

LOOSE LEAF BINDER.

APPLICATION FILED JAN. 22, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1a.

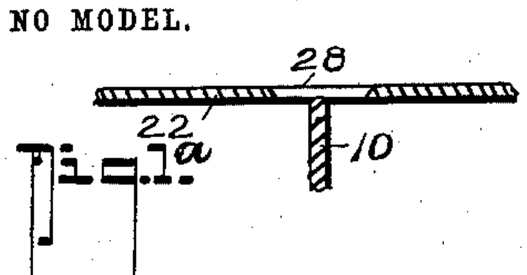


Fig. 1.

Fig. 2a.

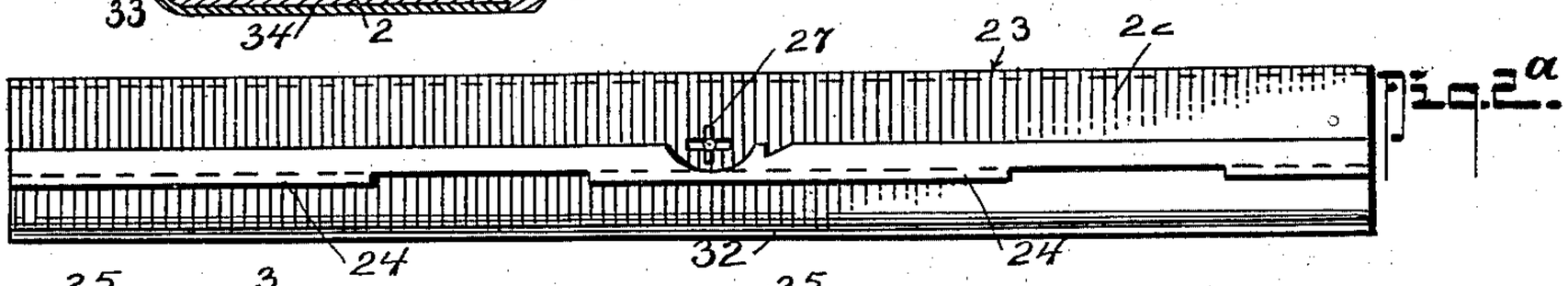


Fig. 2.

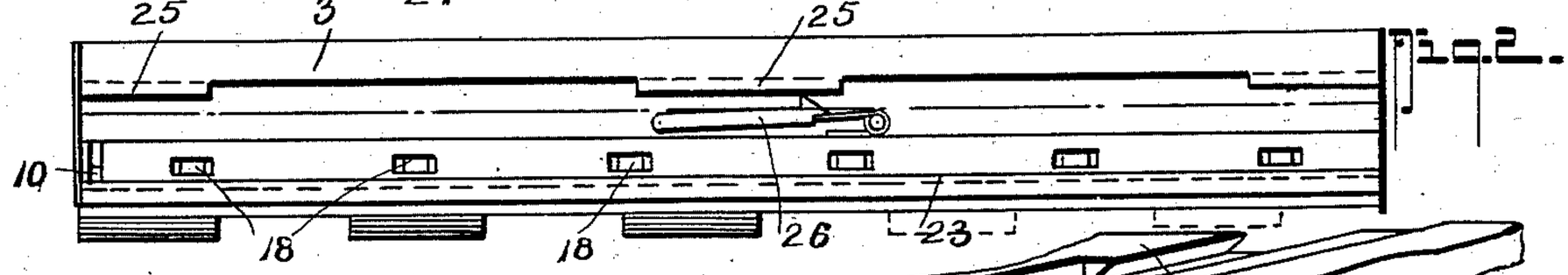


Fig. 3.

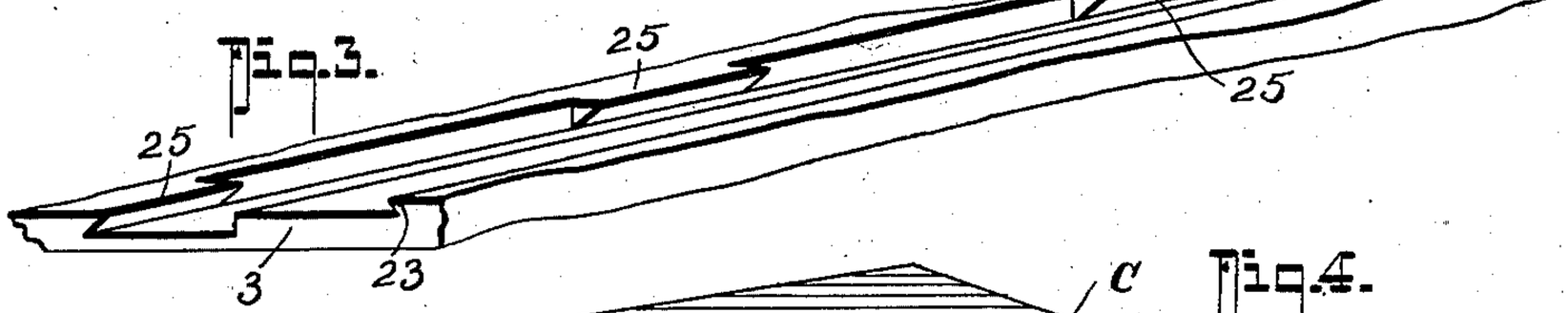
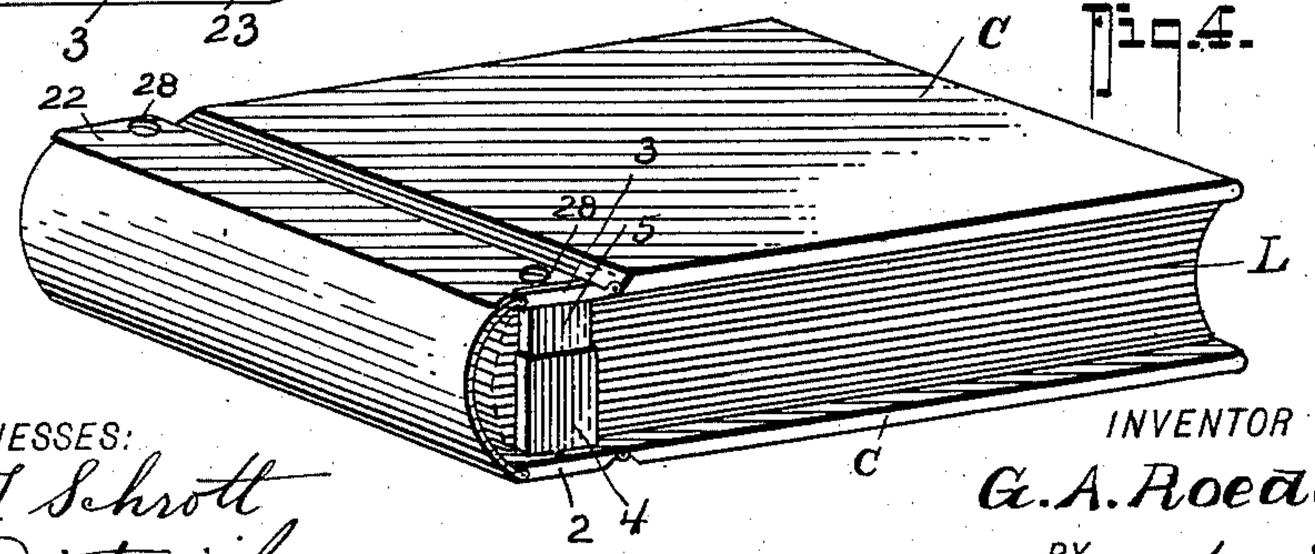


Fig. 4.



WITNESSES:

John T. Schrott

Louis Dieterich

INVENTOR

G. A. Roedde

BY

Fred G. Dieterich

ATTORNEY

No. 749,582. PATENTED JAN. 12, 1904.

G. A. ROEDDE.

LOOSE LEAF BINDER.

APPLICATION FILED JAN. 22, 1903.

NO MODEL. 2 SHEETS—SHEET 2.

Fig. 7.

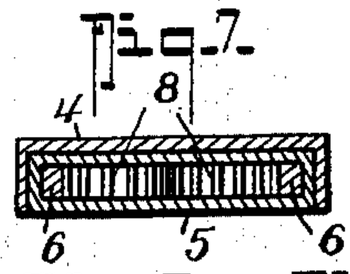


Fig. 8.

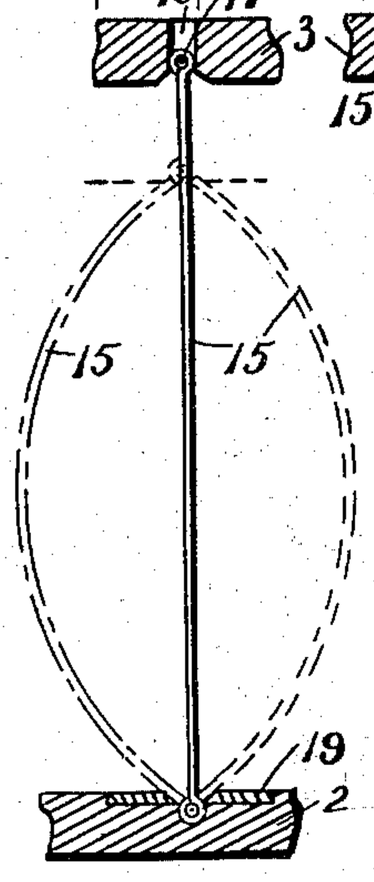


Fig. 8a.

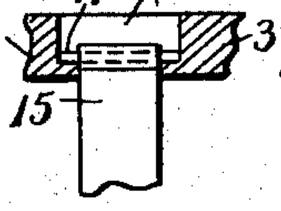


Fig. 9.

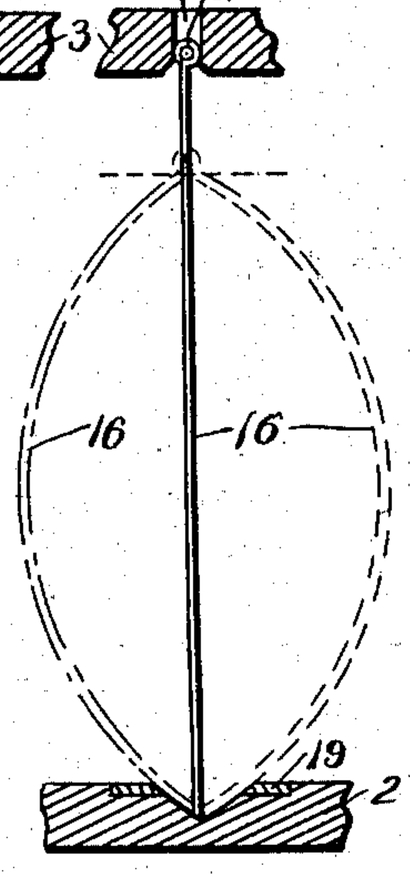


Fig. 6.

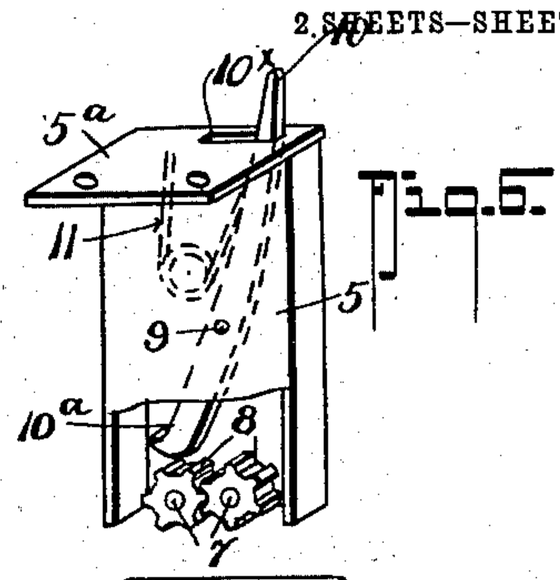


Fig. 5.

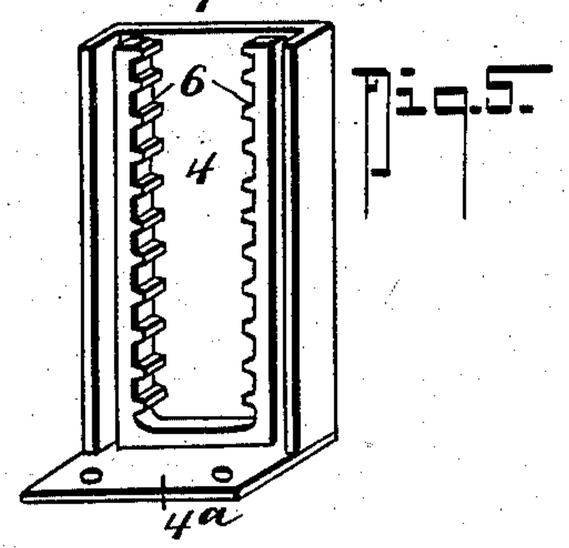


Fig. 10.

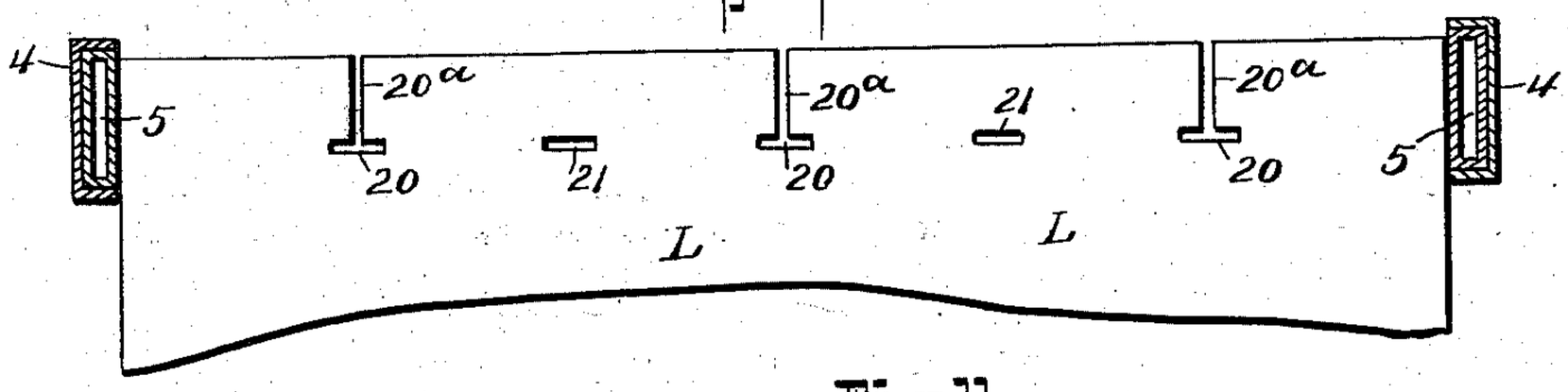


Fig. 11.

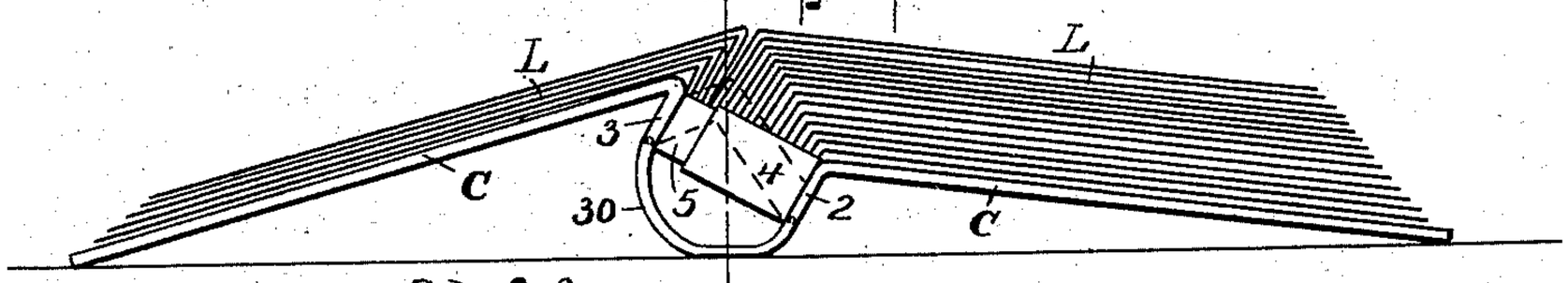
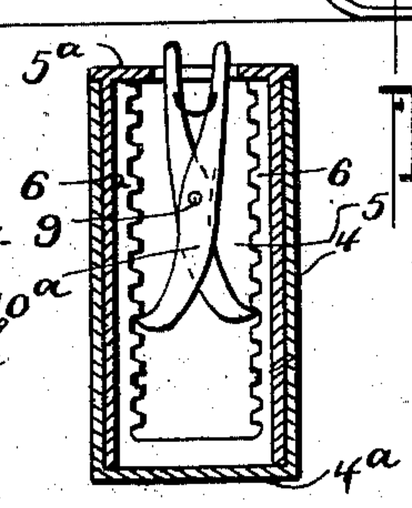


Fig. 12.



WITNESSES:
John T. Schott
Louis Dieterich

INVENTOR
G. A. Roedde
BY
Fred G. Dieterich
ATTORNEY

No. 749,582. Patented January 12, 1904.

UNITED STATES PATENT OFFICE.

GUSTAV ADOLF ROEDDE, OF VANCOUVER, CANADA.

LOOSE-LEAF BINDER.

SPECIFICATION forming part of Letters Patent No. 749,582, dated January 12, 1904.

Application filed January 22, 1903. Serial No. 140,147. (No model.)

To all whom it may concern:

Be it known that I, GUSTAV ADOLF ROEDDE, a citizen of the Dominion of Canada, residing at Vancouver, in the Province of British Columbia, Canada, have invented a new and useful Improvement in Loose-Leaf Binders, of which the following is a specification.

My invention relates to an improvement in loose-leaf binders directed to the attainment of a lighter and less cumbersome book than has hitherto been produced and which will open at any part with a free flat spread and be therefore more convenient to write in.

My object has, in fact, been to retain the desirable features both in appearance and general handiness of a well-bound account-book, but with the modern requirements that it shall have removable leaves and be expansible between the covers. I have realized that in addition to convenient leaf engaging and clasping means a really efficient loose-leaf binder should have a rounded back, so that the book when opened will "balance" properly and that the leaf-engaging members at the same time should be flexible, so as to "throw" or curve outward and enable the leaves to lie open as flat as possible. The want of these qualifications has been a serious drawback to all existing loose-leaf binders, and I have directed my invention to the improvement of these points. The flexibility of the leaf-engaging members also enables the curve of the back edges of the leaves when the book is closed to be thrown with the convexity toward the hollow of the rounded back, making a neater and better looking book, as well as a more convenient one to open. To attain these objects, I fasten the leaves by suitable perforations to a series of flexible and resilient strips attached to lower and upper leaf compressing-bars extending along the length of the back of the book. These bars may be automatically clasped together at their ends by suitable clasping devices holding the leaves closely bound, the flexibility of the leaf-engaging strips permitting them to bend and adapt themselves to a variation in the number of leaves, the bend being toward the back, as in an ordinary well-bound book. An outwardly-rounded back is secured to the back edges of the leaf-compressing bars, and to the front edges are hinged or otherwise flexibly connected the covers of the book. On the clasping devices being released by means provided the resilience of the bent leaf-engaging strips will force the compression-bars apart a sufficient distance to free the leaves from the pressure of the bars, when the clasping means is again thrown into engagement to retain them there, and the flexible leaf-engaging strips will bend outward as the book is opened and the rounded flexible back will permit the book to balance and the leaves to open flatly at any part of the book.

My invention is fully described in the following specification and illustrated in the drawings which accompany it.

Figure 1 is a part section, part perspective, showing the correlation of the several parts of my binder; Fig. 1ª, a detail section showing the aperture in the cover-plate through which the clasp-release lever may be actuated; Fig. 2, a plan of the upper leaf-compressing bar with the cover removed, showing my means of securing and locking the cover-plate; Fig. 3, a perspective of the securing dovetails; Fig. 4, a perspective of a book complete having my binding devices; Fig. 5, a perspective of the lower clasp member; Fig. 6, a similar view of the upper clasp member with a portion of the side removed to show the clasping mechanism; Fig. 7, a cross-section through the upper and lower clasp members when engaged. Figs. 8 and 9 show the leaf-engaging and leaf-securing members. The dotted lines show the spring members thrown to the backward curve. Fig. 8ª is a section showing the means of securing the ends of the leaf-engaging members. Fig. 10 is a plan of a leaf, showing the manner of its perforation and its position in relation to the clasps. Fig. 11 is an end elevation of a book open, showing the manner of its balance when fitted with my binding; and Fig. 12 is an alternative arrangement of the clasping mechanism.

The lower and upper leaf-compressing members 2 and 3 are simple bars extending the length of the back of the book and having the flexible back 30 secured to one end of each and the opening covers C of the book hinged

or flexibly connected to the other. To the extreme ends of these bars, just beyond the edges of the leaves L, are secured the lower and upper clasping members 4 and 5, slidable telescopically one within the other. The lower member 4 of each clasp is trough-shaped in cross-section with the open side toward the leaves of the book, and having a base portion 4^a, by which it is secured to the bar 2. The upper member 5 is a similarly-shaped flattened rectangle adapted to slidably fit within 4 and be flush within the edges of its open side. To the base 4^a of 4 are secured centrally within its sides the upwardly-projecting rack members 6, so as to permit of the member 5 sliding freely within 4, with the rack members within 5, and rotatably mounted within the lower end of 5 on pins 7, secured in the side walls, are the equal pinions 8, meshing together and adapted to mesh also with the teeth of the racks 6 when the part 5 is inserted within the part 4. These pinions steady the movement between the parts 4 and 5, and fulcrumed on a pin 9 in the side walls of 5 is a detent-lever 10, having an end 10^a beveled on the under side, so that it will run over the teeth of one of the rack members 6 when the parts 4 and 5 are pressed together, but will hold and resist any pull to separate them. Aspring 11 is so placed as to keep the end 10^a normally in the position of engagement, and the upper end of 10 passes through an aperture $10^\times$ in 5^a and a corresponding one in the bar 3, so that it can be engaged by the finger-nail to effect the release of 10^a. The end of 10^a may, if found desirable, be made to engage the teeth of one of the pinions and by preventing their rotation effect the same purpose of securing the parts 4 and 5 together, or the pinions may be removed altogether and the member 5 be provided with double rack-engaging levers arranged scissors-wise, as in Fig. 12. The leaf-compressing bars 2 and 3 may thus be moved together, and they will be automatically clasped on the included leaves; but when it is desired to release the clasps and relieve the leaves from the grip of the bars such release can be effected readily by pulling over with the finger-nail the detent-levers 10.

The leaf engaging and securing members 15 and 16 are each flat strips of resilient material, made either of one thickness, as drawn, or of thin laminæ, and are alike save in the manner of securing them to the bars 2 and 3.

The leaf-engaging members 15 (see Fig. 8) are not intended to be removed save when the capacity of the book is to be changed, when longer or shorter strips may be substituted, as the occasion requires. They are therefore secured by pins 17 through a loop or eye in each end of each strip, the pin of the upper end resting in a recess or pocket 18 in the bar 3 (see Fig. 8^a) and the lower end beneath a plate 19, which is sunk flush in the upper side of 2 and attached thereto by screws.

The leaf-securing strips 16 are intended to be removable by any one having the required authority to remove or add leaves to the book, and their upper end (see Fig. 9) is secured in a pocket 18 in the upper bar 3 in the same manner as the strips 15; but the lower end has no securing means, but enters a notch in the bar 2 through a suitable aperture in the plate 19. The flexibility of these strips enables them to bend either way, as required, (see Figs. 8 and 9) if less than the full number of leaves are in the book and the bar 3 is closed on 2 and also for other important reasons, which will be explained later, and their resilience will tend to straighten them, and when the clasping members are released the bars 2 and 3 will spring apart the limit of the length of the strips or as much within that limit as may be desired.

Fig. 10 shows the manner in which the leaves L are perforated to attach them to the strips 15 and 16. The apertures 20 21 for the strips 15 and 16 are alike; but those for the leaf-engaging strips are cut out to the back edges of the leaves, as 20^a, while those for the leaf-securing strips are entire, as 21. By this method while the strips 16 are in place no leaves can be removed or added; but when the strips 16 are taken out and the compression-bars moved apart the cut apertures 20 20^a enable leaves to be disengaged from the strips 15 and removed from the book or fresh leaves to be added. To prevent the strips being removed by an unauthorized person, a cover-plate 22 is removably secured over the pockets 18 in the bar 3, which cover-plate is provided (see Figs. 1, 2, and 3) with one continuous dovetail edge 23, engaging a corresponding dovetail in the bar, and toward the other edge has an interrupted dovetail 24, which engages a corresponding interrupted dovetail 25 in the bar 3, so that the cover-plate may be placed in the dovetail 23 laterally out of the center, and being moved to the center the dovetail portions 24 of the cover-plate will engage and be secured by the dovetail 25 in the bar. A spring-actuated bolt 26, pivotally secured to the bar 3, has a V-shaped end designed to enter a notch in the cover-plate and secure it against being pulled out. This bolt 26 may be pressed out of engagement in the notch of the cover-plate by a key 27, and the cover-plate 22 may be moved laterally far enough to be freed from the interrupted dovetails 24 25, when it may be lifted out and the strips 15 or 16 withdrawn, as required.

To obtain access through the slidable cover-plate 22 to the upper ends 10 of the clasp-release levers, oval openings 28 are provided, through which the ends of the levers can be engaged by the finger-nails. (See Fig. 1^a.)

To the back edges of the bars 2 and 3 is secured a flexible back 30, which may be fastened to the bars in any suitable manner; but I prefer it to be done somewhat in the way shown

in Fig. 1 as offering a greater freedom to its flexibility. In this construction wired or beaded edges 31 are retained in suitable grooves of the bars 2 and 3 by the bent-over edges 32 33 of the plate 22 on the upper bar and 34 on the lower, and a full measure of hinge movement is thus permitted to the back as the bend varies with the release of the clasps. By removing the plates 22 and 34 and the pins 31 the said back 30 can be easily removed from the bars 2 and 3. The back may have a certain amount of resilience given to it by reinforcing-springs 35, inserted at intervals, or light coil-springs at its ends.

The covers C of the book may be hinged to the bars 2 and 3, as indicated in Fig. 1, or flexibly connected in any suitable manner.

It is perhaps necessary to explain briefly the manipulation of a book bound in the manner I have just described.

When shut, the book has the appearance as illustrated in Fig. 4, for before pressing and clasping the bars 2 and 3 together the front edges of the leaves are pressed in with the fingers, and the bend of the leaf engaging and securing strips is thrown with its convexity toward the hollow of the back and the bar 3 pressed down and clasped. This gives a neat and compact volume. When it is desired to open the book for use, the clasping devices are released by the application of the fingers at 28 to the upper ends of the detent-levers 10. and the resilience of the strips 15 and 16 and the back 30 forces apart the leaf-compressing bars 2 and 3 and affords sufficient freedom to allow the leaves to throw forward as the book is opened.

The dotted lines in Fig. 11 show how the flexible leaf-engaging strips enable the leaves to lie flat when the book is open and also how the rounded flexible back permits the book to balance, while flattening sufficiently at the point of contact on the desk or table to obviate excessive "rolling."

It is obvious that with the reinforcing-springs in the flexible back tending to press the leaf-compressing bars apart I may dispense with the necessity for resilient leaf-engaging strips and have them merely flexible, thus enabling them to more easily yield outward toward the opening of the book in the manner indicated by the dotted lines in Fig. 11.

Although I have shown with some detail the construction of the various parts, I do not desire to be confined strictly to the use as illustrated. Thus the flexible strips may be composed of laminæ and the attachment to the leaf-compressing bars may be varied. The means of closing and locking the access to the strips may also be modified to suit the requirements of manufacture; but I hereby declare that

What I claim as new, and desire to be protected in by Letters Patent, is—

1. In a loose-leaf binder, a pair of securing-bars, covers hinged to said bars, means for securing the leaves within the book, said means comprising a series of flexible strips fastened at each end to the securing-bars, a second series of flexible strips secured at one end to one of the securing-bars, said second series of strips being adapted to be removed from the book at predetermined times, each of said strips being adapted to pass through apertures in the leaves to be bound, for the purposes specified.

2. In a loose-leaf binder having bars to which the covers of the book are flexibly connected, and automatic clasping devices whereby they are adapted to a varying thickness of book; leaf engaging and securing devices comprising thin flat strips secured between the bars to which the covers are attached and having a spring tendency to straighten when freed from restraint.

3. In a binder of the class described having leaf-compressing bars to the edges of which the covers and back of the book may be flexibly connected, and which are adjustable to suit the thickness of the included leaves; a series of flexible and resilient leaf-engaging members secured at each end to both these bars, a further series of similar members secured to one bar and fitting in a notch in the other, and locked means for obtaining access to remove the latter series.

4. In a binder of the class described having leaf-compressing bars to which the covers of the book are flexibly connected, and means for clasping such together, a series of flexible resilient leaf-engaging strips secured to either one or both bars, and a rounded flexible back that will adapt itself to the varying thickness of the book.

5. In a binder having cover elements between which loose leaves may be secured, and clasping means to regulate the distance of the covers apart, an outwardly-rounded flexible resilient back suitably secured to the cover elements and having a spring tendency to straighten or flatten the curve of the round.

6. In a loose-leaf binder, the combination with leaf-compressing bars to which the covers of the book are flexibly connected, of clasping means at each end of such bars, flexible leaf engaging and securing members removably secured to the bars between the clasps, and a flexible and outwardly-rounded back secured to the back edges of the cover elements.

7. In a loose-leaf binder having upper and lower leaf-compressing members to the front edges of which the covers of the book are secured, and between which bars are flexible and resilient leaf engaging and securing members; means for securing such leaf engaging and securing members to the upper side of the upper bar; a cover-plate giving access to such securing means, and means for locking such cover-plate whereby access to remove the leaf-

engaging members can be had only by those having means to unlock the plate.

8. In a loose-leaf binder having upper and lower leaf-compressing bars between which the leaves are secured, and to which the covers and back of the book are flexibly connected; an automatic clasping means mounted between and covered by the upper and lower bars at each end, between which the leaves are designed to fit, and by which the alinement of their edges is preserved, and means for effecting the release of the clasp-detent from the upper bar.

9. In a loose-leaf binder of the class described; the lower and upper bars 2 and 3, to the front edges of which the covers C are flexibly connected, the clasping members 4 and 5 having the racks 6, pinions 8 and detent-lever 10, the leaf engaging and securing strips 15 and 16 having eyes at their upper ends and pins 17 designed to be held in pockets 18 in the bar 3; similar eyes and pins at the other ends of 15 to be retained beneath a plate 19 secured to the lower bar 2; free ends to the strips 16 to enter notches in the lower bar 2; the cover-plate 22 having on one edge a continuous bevel 23 to engage a similar bevel in the bar 3, and toward the other edge an interrupted bevel 24 to engage a similar interrupted bevel 25 in the bar; the pivoted lock-bolt 26 designed to engage a V-shaped notch in the cover-plate and secure it against lateral movement to disengage the interrupted bevels, and a key whereby the bolt may be disengaged from the notch in the plate and the latter moved laterally; the flexible back 30 with or without spring reinforcements 35, having wired edges 32 designed to be held in grooves in the bars 2 and 3 by the overturned edges 32 and 33 of the cover-plates 22 and 34.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GUSTAV ADOLF ROEDDE.

In presence of—
ROWLAND BRITTAIN,
ELLICE WEBBER.