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W. E. BLACKBURN & G. H. SWARTWOUT.

BINDER.

APPLICATION FILED DEC. 13, 1902.

NO MODEL.

FIG. 2.

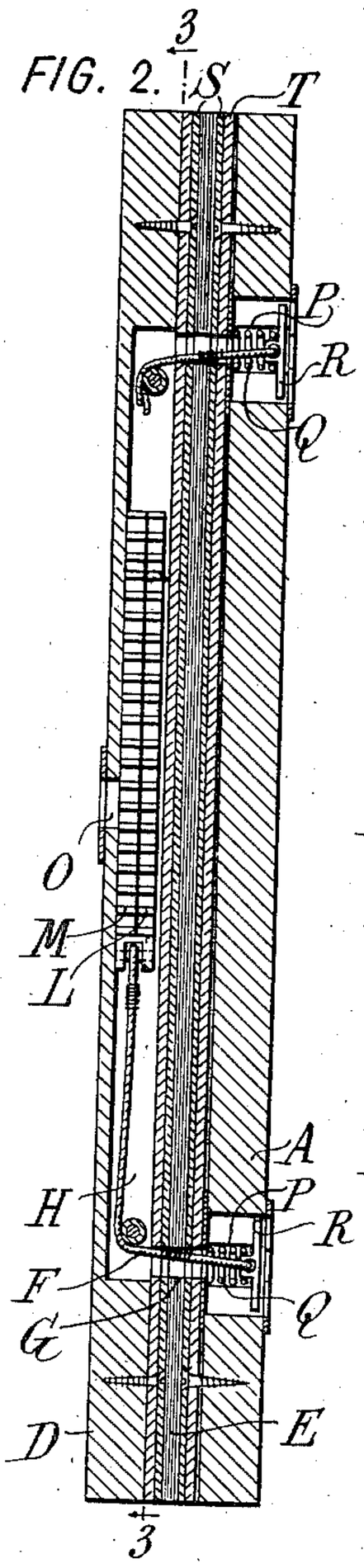


FIG. 3.

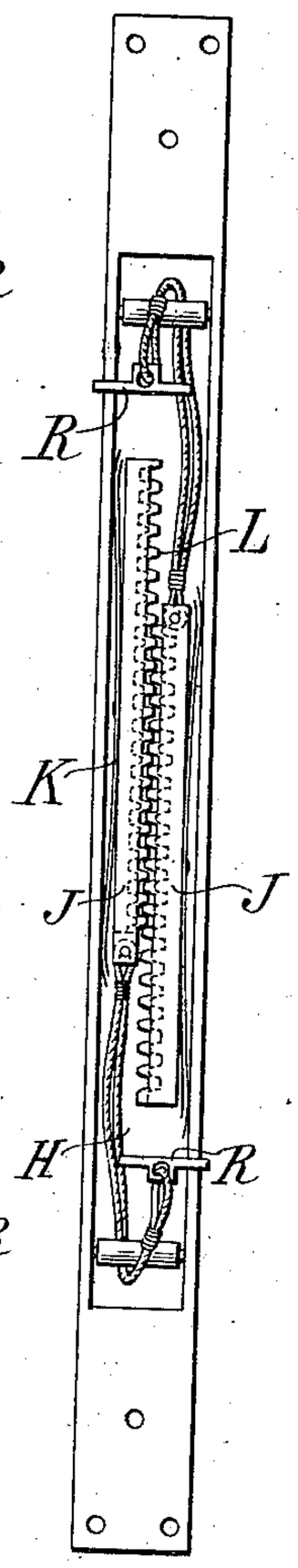


FIG. 1.

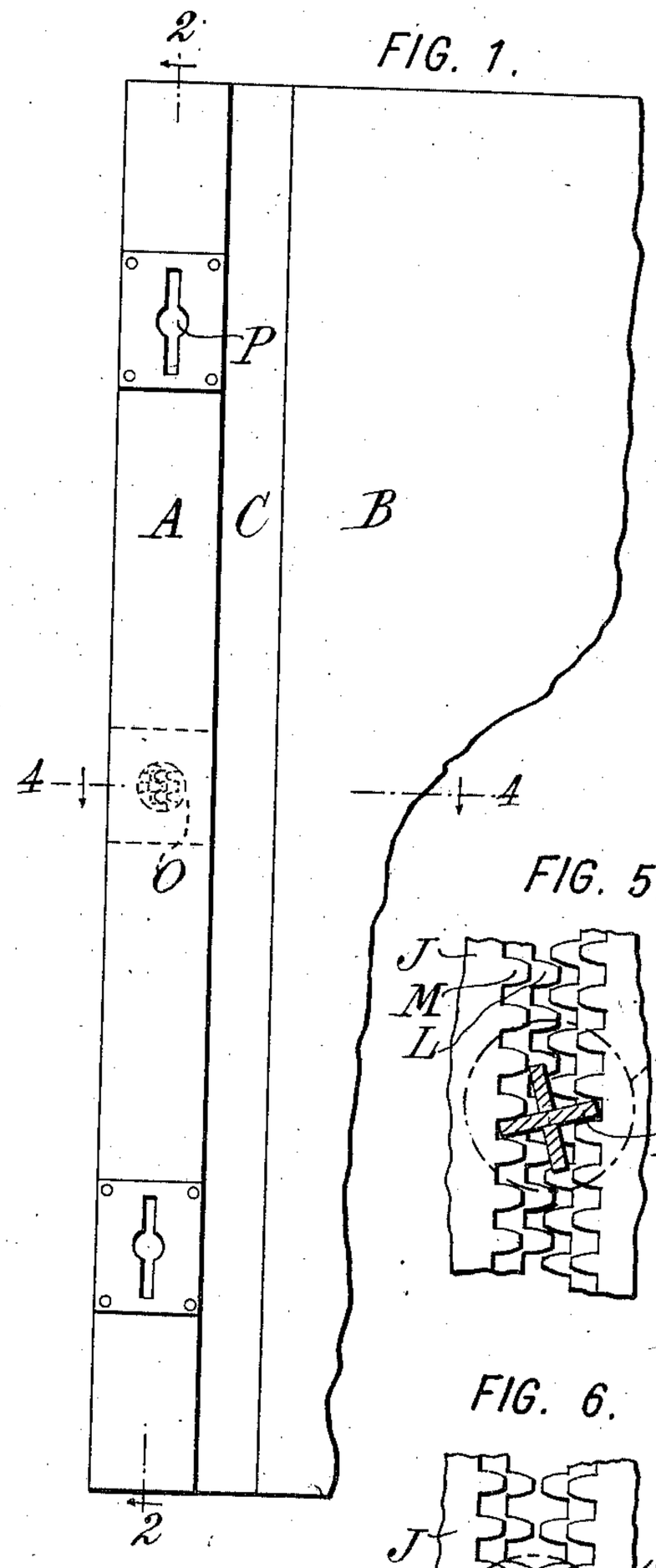


FIG. 5.

FIG. 6.

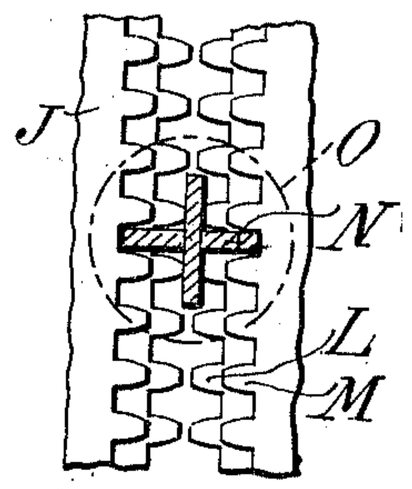
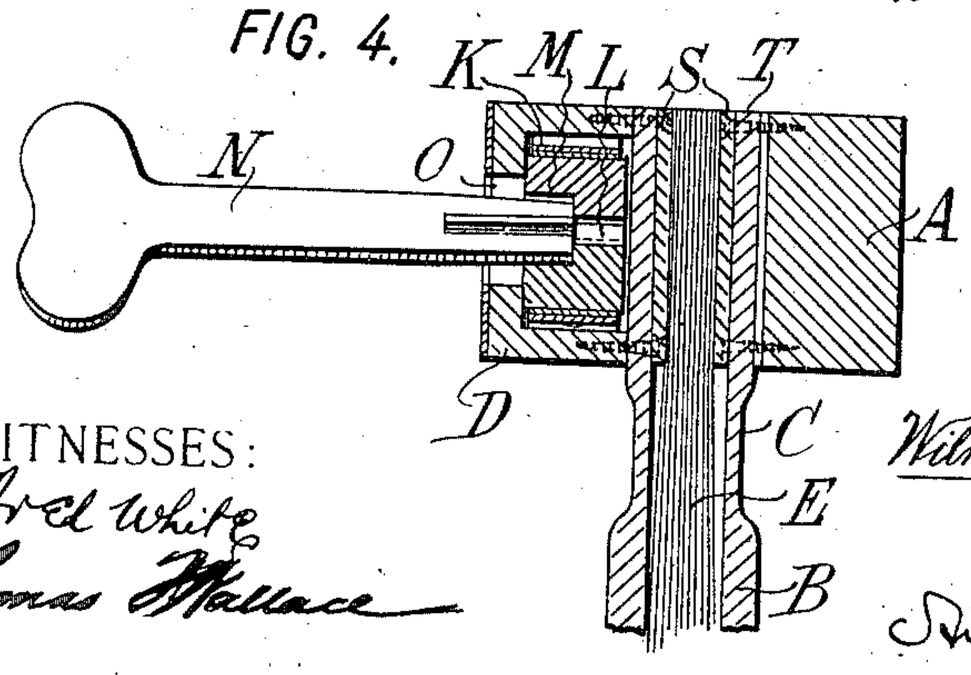


FIG. 4.



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UNITED STATES PATENT OFFICE.

WILMUTH E. BLACKBURN AND GEORGE H. SWARTWOUT, OF NEW YORK, N. Y.

BINDER.

SPECIFICATION forming part of Letters Patent No. 736,482, dated August 18, 1903.

Application filed December 13, 1902. Serial No. 135,035. (No model.)

To all whom it may concern:

Be it known that we, WILMUTH E. BLACKBURN and GEORGE H. SWARTWOUT, citizens of the United States, residing in the borough of Brooklyn, county of Kings, city and State of New York, have invented certain new and useful Improvements in Binders, of which the following is a specification.

Our invention aims to provide certain improvements in binders adapted specially to the binding of separate loose leaves which are to be withdrawn or added to at will, such as are commonly called "loose-leaf" ledgers, or other books or temporary binders.

Our invention aims to provide improvements in this class of binders whereby the binder is made very durable and the operation of inserting or withdrawing leaves is made very simple and easy and whereby also other advantages, hereinafter specified in detail, are obtained.

Referring to the accompanying drawings, illustrating an embodiment of our invention, Figure 1 is a plan of the same in use, the cover and book proper being cut away. Fig. 2 is a section on the line 2 2 of Fig. 1. Fig. 3 is a plan view of one of the chambered members with its cover and the book-cover removed, so as to show the operative parts therein. Fig. 4 is a transverse section on the line 4 4 of Fig. 1, showing a key in position for separating or adjusting the ends of the cord. Figs. 5 and 6 are enlarged views of the portions of the rack-bars adjacent to the keyhole, showing two successive positions of the key.

Our invention is adapted for use in binding leaves having simple perforations near their edge or having any other common or suitable structure to permit of their engagement by the cord or equivalent flexible element which we use to bind them together. These leaves are held together by means of members on their upper and lower sides, respectively, and these members are drawn and held together by means of the cord referred to, so as to hold the leaves tightly between them. Preferably the cord is in two pieces, each of which is connected at one end to one of the members and at its other end to one of two rack-bars arranged in the other member of the binder, facing each other and normally held in mesh with each other so as to hold the ends of said cords together, it being necessary to separate these rack-bars in order to adjust the ends of the cord relatively to each other and so vary the thickness of the book. Preferably the parts are so arranged that a single key serves to separate the rack-bars and to give them a relative longitudinal movement at one operation. Preferably the cords, besides the positive adjustment, are yieldingly held taut by a suitable spring, which permits them to yield and accommodate a bundle of leaves of slightly-varying thickness. Were only the positive adjustment provided it would be difficult to clamp with equal firmness bundles of leaves the thickness of which varied by an amount less than a step of the positive adjustment; but with the additional spring adjustment provided by our invention the leaves may be clamped with substantially equal firmness in all cases.

Referring now to the embodiment of the invention illustrated in the drawings, Figure 1 shows at A what for the sake of distinction we call the "upper" member of the binder, which extends transversely along the inner margin of the leaves and which preferably carries a stiff cover B, provided near its rear edge with a flexible portion C. (See Fig. 4.) The opposite or lower member D of the binder is provided with a similar book-cover. The leaves E are clamped between the upper and lower members A and D, the latter being held together by means of cords F, each of which is connected at one end to the member A in a manner hereinafter explained, passes through perforations G in the leaves and similar perforations in the upper and lower members of the binder and into a chamber H in the lower member, where they are provided with means for drawing the ends together to clamp the two members together or for separating the ends to permit of the withdrawal of leaves or the addition of more leaves.

The lower ends of the cords F are attached to rack-bars J, arranged facing each other in the chamber H and pressed toward each other by springs K, bearing against the side walls of the chamber, so that ordinarily they stand

with a set of teeth L of one in engagement with an identical set of teeth on the other. Besides the teeth L the rack-bars J are provided with another set of teeth M, preferably of the same proportions as the teeth L, but offset a distance backward from said teeth L, as illustrated most clearly in Fig. 4. The teeth M are provided for engagement with a key N of substantially cross shape, which enters through a hole O in the outer face of the member D. The rack-bars ordinarily will stand in the position shown in Fig. 5. The key N may then be introduced between the teeth M in the position shown. If now the key be turned in the direction of the hands of a clock to the position of Fig. 6, the two rack-bars J are thereby separated and by the continued movement of the key are moved longitudinally relatively to each other a distance of one tooth, when the key again takes the position of Fig. 5 and the parts are interlocked. The rotation of the key may of course be continued in the same direction to move the parts through any desired distance.

The upper member A of the binder is provided with two small chambers P of the shape shown in Fig. 1 for the reception of spiral springs Q and fasteners R, attached to the ends of the cords F. These springs Q serve a double purpose. They permit of a slight increase or diminution of the number of leaves without the necessity of altering the operative length of the cord by one complete tooth of the rack-bar, as previously explained. They also serve when the cord is lengthened to force the fasteners R out of their chamber or socket in the member A, so that they can be taken hold of. The fastener R can then be turned and shoved endwise through the spring Q, or, what is the same thing, the upper member A and its cover may be lifted and additional leaves added. The fastener R may be threaded through the leaves in the same way that it is threaded through the spring Q—that is to say, by turning it so that it lies alongside the end of the cord. The fastener comprises a long bar pivotally attached to the cord at an intermediate point of its length, so that when drawn through the member A it may be turned transversely of the cord and drawn down into the chamber B across the spring and against the resistance thereof. The construction of this fastener admirably adapts it for leaves which have a simple perforation near the edge and which are easily and cheaply obtained or which may be easily perforated by hand.

The chambers in the members A and D of the binder and in which the adjusting means are carried—the positive adjusting means in one and the spring adjustments in the other—are covered by means of plates S, preferably of metal, between which and the members referred to the edges T of the book-covers B are fastened. This construction is very simple and at the same time very strong and makes the members A and D substantially permanent parts of the covers of the book. They may, however, be used without any covers whatever or with a cover on only one member.

The means for separating and moving the rack-bars is not necessarily a removable key, as shown, but may be a permanent part of the device.

Various other modifications of the specific embodiment of our invention disclosed may be made in the details and in the arrangement and combination of the parts without departure from the invention.

We claim as our invention—

1. A binder comprising in combination cords or the like for holding together the leaves to be bound, rack-bars connected to free ends of said cords, means for normally holding said rack-bars in mesh with each other to hold the ends of said cords together, and means for separating said rack-bars to permit relative adjustment of the ends of said cords.

2. A binder comprising in combination cords or the like for holding together the leaves to be bound, rack-bars connected to free ends of said cords, means for normally holding said rack-bars in mesh with each other to hold the ends of said cords together, and a key for separating said rack-bars and moving them longitudinally relatively to each other.

3. A binder comprising in combination top and bottom members, cords or the like for holding them together, a pair of rack-bars in one of said members longitudinally adjustable, springs pressing said rack-bars toward each other to hold them in mesh and to hold the ends of said cords together, an additional row of teeth carried by each of said rack-bars and facing each other, a key adapted to enter between said additional rows of teeth and upon being turned to separate said rack-bars and move them longitudinally relatively to each other.

4. In a binder, the combination of top and bottom members, a cord having a free end, a fastener on said end adapted to pass through the leaves to be bound, a spring carried by one of said members for holding said cord taut and permitting it to yield to accommodate a varying number of leaves, and means carried by the other of said members for positively adjusting the operative length of said cord from its opposite end.

5. In a binder the combination of a member extending transversely along the inner margin of the leaves to be bound, a cord passing through said member, a spring carried by said member holding said cord taut, a fastener on the end of said cord against which said spring bears, said fastener being adapted to be released from said spring to release said cord.

6. A binder comprising in combination top and bottom members, cords or the like for holding said members together, rack-bars connected to free ends of said cords, means for normally holding said rack-bars in mesh with each other to hold the ends of said cords to-

gether, means for separating said rack-bars to permit a positive relative adjustment of the ends of said cords, and springs acting to hold said cords taut so as to accommodate a varying number of leaves.

7. A binder comprising in combination cords or the like for holding together the leaves to be bound, a spring for holding said cords taut, means for holding the ends of said cords locked against movement, and means for unlocking, positively adjusting and relocking said ends at one operation.

8. A binder comprising top and bottom members one of which has an aperture, a cord for holding the same together, a fastener on the end of said cord adapted to be moved to two positions in one of which it can pass through said aperture, and in the other of which it is prevented from passing through said aperture, and thus holds said members together, and means in the other of said members for positively adjusting the length of said cord, without changing the position of said fastener, in combination with correspondingly-apertured leaves to be held between said members.

9. In a binder the combination with a cover, of means for adjusting the binder for varying numbers of leaves, a member having a chamber in which said means are carried, a plate covering said chamber, and a flexible book-cover attached between said chambered member and said plate.

In witness whereof we have hereunto signed our names in the presence of two subscribing witnesses.

WILMUTH E. BLACKBURN.
GEORGE H. SWARTWOUT.

Witnesses:
FRED WHITE,
THEO. T. SNELL.