No. 720,754. PATENTED FEB. 17, 1903.

T. A. W. TENGWALL.

LOOSE LEAF BINDER.

APPLICATION FILED OCT. 20, 1902.

NO MODEL.

Fig. 1.

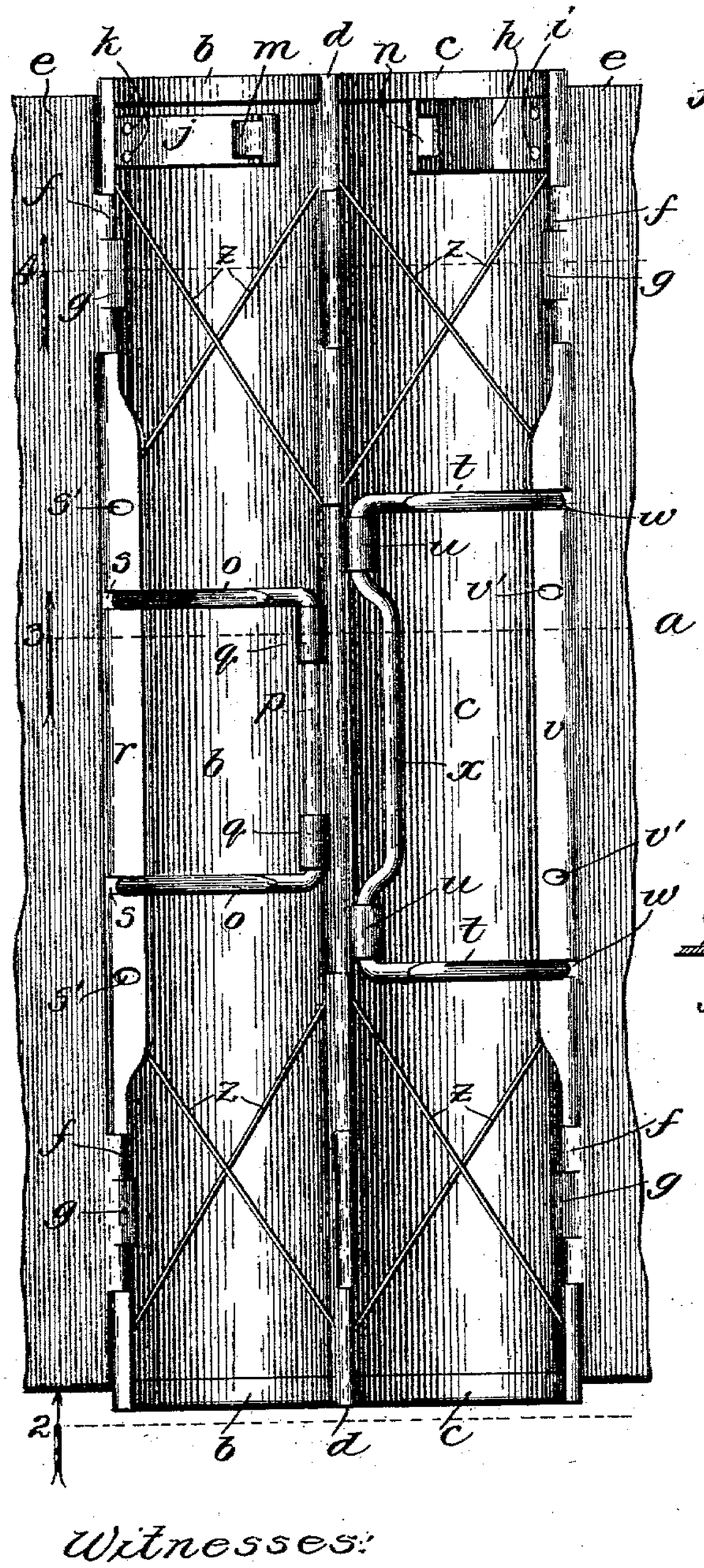


Fig. 2.

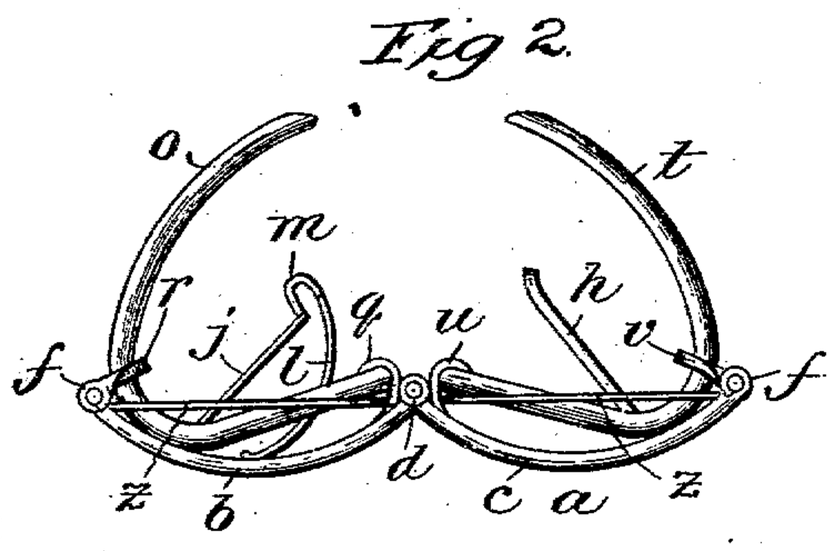


Fig. 3.

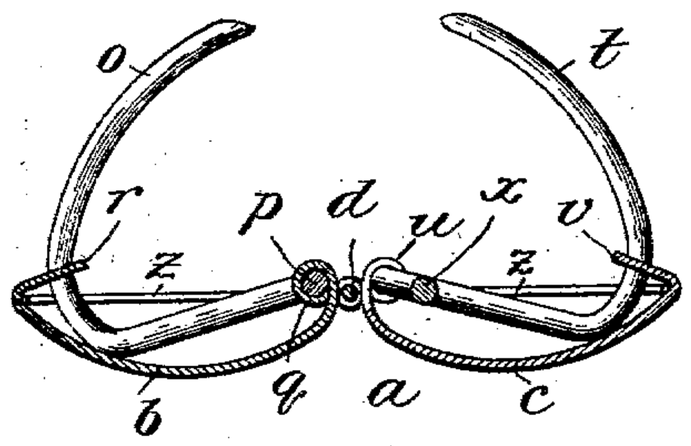


Fig. 4

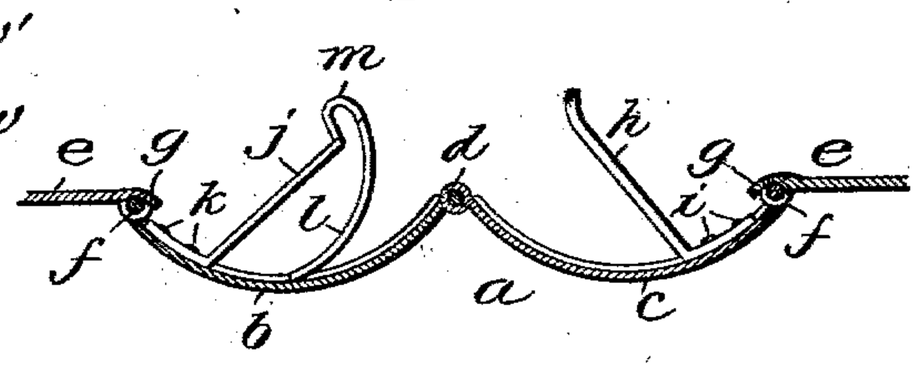
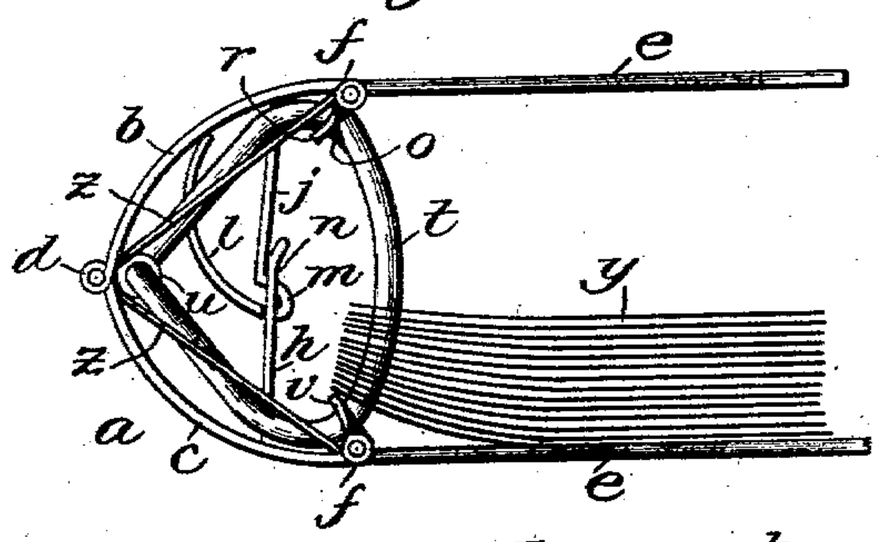


Fig. 5.



Witnesses:
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UNITED STATES PATENT OFFICE.

THEODOR A. W. TENGWALL, OF CHICAGO, ILLINOIS.

LOOSE-LEAF BINDER.

SPECIFICATION forming part of Letters Patent No. 720,754, dated February 17, 1903.

Application filed October 20, 1902. Serial No. 128,016. (No model.)

To all whom it may concern:

Be it known that I, THEODOR A. W. TENGWALL, a subject of the King of Sweden and Norway, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Loose-Leaf Binders, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in which corresponding letters of reference in the different figures indicate like parts.

The object of my invention is to provide a binder for loose leaves which shall be so constructed that it may be light, strong, durable, cheaply constructed, and easily manipulated.

To these ends my invention consists in the combination of elements hereinafter more particularly described, and definitely pointed out in the claims.

In the drawings, Figure 1 is an inside plan view of the back of my improved binder as the same would appear when open and in an unlocked position to permit the insertion or removal of the leaves. Fig. 2 is an end view thereof, taken upon the line 2, as indicated by the arrow there shown. Fig. 3 is a transverse sectional view taken upon the line 3, Fig. 1, viewed in the direction of the arrow there shown to illustrate the retaining-hooks, the spring-catch mechanism being purposely omitted. Fig. 4 is a transverse sectional view taken upon the line 4, Fig. 1, viewed in the direction of the arrow there shown, and Fig. 5 is an end view showing said binder closed and locked with leaves secured therein.

Referring to the drawings, *a*, in a general way, represents my improved binder, which consists of a sectional back formed from two curved plates *b c*, hinged to each other throughout their length, as shown at *d*. Covers *e e* are hinged at *f f* to said sections, as shown. Upon the inside of each cover, preferably where the hinge is located, is provided a projecting flange *g*, Figs 1 and 4, which engage with the back-sections when the covers are closed to limit the inward movement of the latter to the position shown in Fig. 5. This overcomes the tendency of the back to sag or roll and prevents the book from becoming misshapen or distorted when laid upon its side.

In order to secure the binder in a closed position, I provide an automatic locking mechanism which consists of a rigid bracket or arm *h*, formed from sheet metal and riveted, as shown at *i*, Figs. 1 and 4, or otherwise rigidly attached to the section *c*. A spring-catch *j* is riveted at *k* to the section *b* opposite the part *h*. Said spring is provided with a bent portion *l*, which bears loosely against the back and serves to reinforce the mainspring, while permitting the outer end to yield. Upon the outer end of said spring is formed a bent portion or knob *m*, which is adapted when the binder is closed to enter an opening *n*, Fig. 1, in the part *h* and lock the sections together in the manner shown in Fig. 5. By depressing the spring the catch may readily be released. In order to avoid confusion, said catch mechanism is omitted from Fig. 3.

Leaf-retaining hooks *o o* are constructed and attached to the section *b* in the following manner: Said hooks are made in one piece and are connected with each other by means of a connecting portion *p*, Figs. 1 and 3, which is arranged parallel with the hinge-joint *d*. Clips *q q* are cut from the section *b* and bent over the part *p* to secure it rigidly in place. A flange *r* is formed upon the outer edge of the section *b* and bent inwardly, as shown, said flange being provided with openings *s*, through which the hooks *o o* are passed. In securing said hooks in place they are first passed through said openings, after which the clips *q* are bent over the part *p*, which serves to secure both hooks firmly in place without the use of solder. Similar retaining-hooks *t t* are attached in like manner to the section *c* by means of clips *u u* and a flange *v*, formed upon said section, said flange being provided with openings *w* for the reception of said hooks. The clips *u* are placed farther apart than the clips *q*, and the part *x*, which serves to connect the hooks *t t*, is made longer than the part *p* and is bent or offset, as shown, in order not to interfere with said part when the binder is closed. Perforations *s' s'*, Fig. 1, are formed in the flange *r* for the reception of the ends of the hooks *t*, while like perforations *v' v'* are formed in the flange *v* for the reception of the ends of the hooks *o* when in use, as shown in Fig. 5. The leaves *y* in

said last-named figure are perforated in the usual way and inserted in place upon the hooks when the binder is open.

In order to stiffen the sections and prevent them from bending when in use, I provide transverse braces consisting of wires *z*, the ends of which are soldered to opposite edges of each section, said wires being crossed, as clearly shown in Fig. 1. This feature enables lighter material to be used in the sections, while resulting in a stronger device.

An important feature of my device consists in constructing the hooks of each section in a single piece or making them integral and securing them in the manner described, which lessens the number of operations in assembling, eliminates the use of solder, insures registration, and lessens the cost of construction.

Having thus described my invention, I claim—

1. The combination in a loose-leaf binder, of a sectional back, the sections of which are hinged to each other, diagonal cross-braces secured to said sections, retaining-hooks upon each of said sections, perforated inturned flanges upon the outer edges of said sections through which said retaining-hooks are projected, and means for rigidly attaching said hooks to said sections.

2. The combination in a loose-leaf binder of a sectional back, the sections of which are hinged to each other, diagonal cross-braces secured to said sections, retaining-hooks upon each of said sections, said hooks being integral with a connecting portion arranged parallel to the axis of the hinges, perforated inturned flanges upon the outer edges of said sections through which said retaining-hooks are projected, and means for attaching said hook-connecting portions to said sections respectively.

3. The combination in a loose-leaf binder, of a back formed from curved plates or semicylindrical sections hinged to each other, each of said sections being provided with diagonal cross-braces, retaining-hooks upon each of said sections formed integrally with a connecting portion arranged parallel to the hinge, perforated inturned flanges upon the outer edges of said sections for the reception of said retaining-hooks and clips for attaching said hook-connecting portions to said sections.

4. The combination in a loose-leaf binder, of a back formed from semicylindrical or curved sectional plates hinged to each other, retaining-hooks upon each of said sections formed integrally with a connecting portion arranged parallel to the hinge, perforated flanges upon the outer edges of said sections for the reception of said retaining-hooks, clips for attaching said hook-connecting portions to said sections, a spring-catch for detachably locking said sections in a closed position, covers hinged to the outer edges of said sections, and stops for limiting the inward movement of said covers when the latter are closed.

In testimony whereof I have signed this specification, in the presence of two subscribing witnesses, this 18th day of October, 1902.

THEODOR A. W. TENGWALL.

Witnesses:
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