No. 868,683. PATENTED OCT. 22, 1907.

L. M. MORDEN.

LOOSE LEAF BINDER.

APPLICATION FILED JAN. 3, 1906.

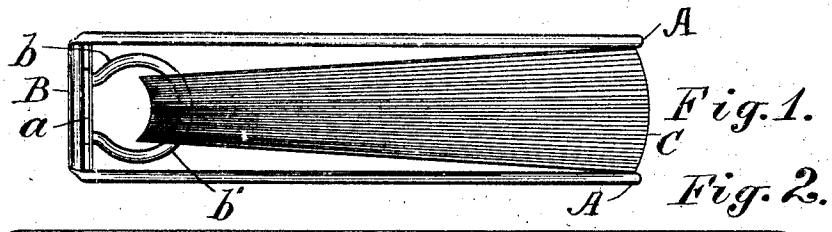

Fig. 1.

Fig. 2.

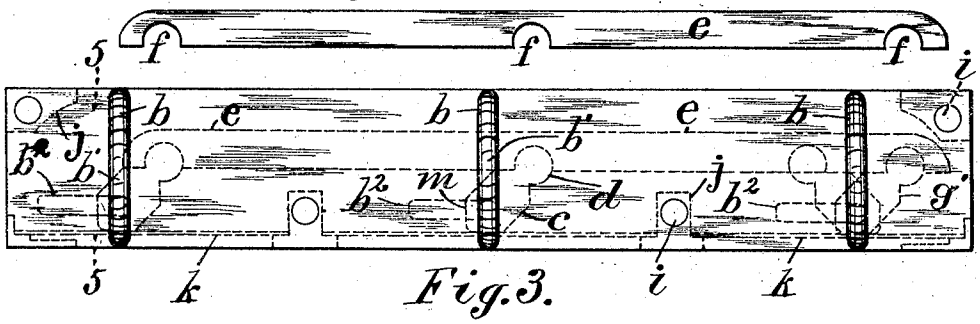

Fig. 3.

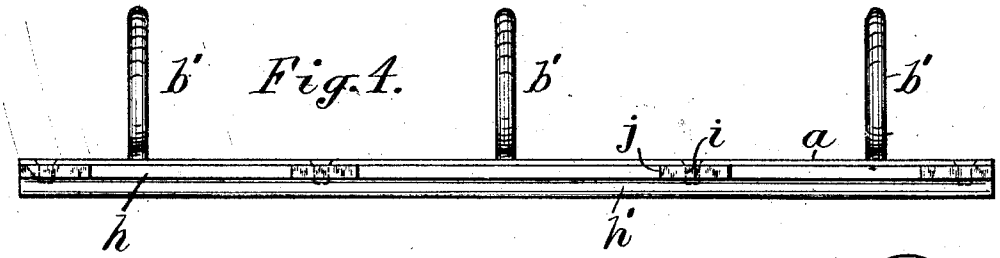

Fig. 4.

Fig. 7.

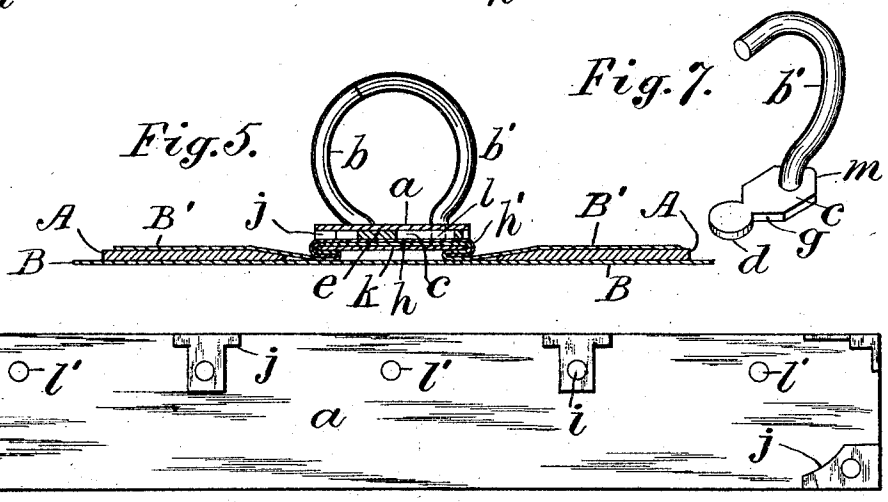

Fig. 5.

Fig. 6.

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UNITED STATES PATENT OFFICE.

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LOOSE-LEAF BINDER.

No. 868,683. Specification of Letters Patent. Patented Oct. 22, 1907.

Application filed January 3, 1906. Serial No. 294,481.

To all whom it may concern:

Be it known that I, LUCENA M. MORDEN, a citizen of the United States, of 59 Grand street, Waterbury, county of New Haven, and State of Connecticut, have invented certain new and useful Improvements in Loose-Leaf Binders, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

The present invention relates to that class of loose leaf files or binders in which a series of perforated leaves is held together removably by a series of rings.

The invention embodies the combination with a suitable base-plate and back-plate with means for spacing them apart, of rings each divided into two parts, one part having its lower extremity connected rigidly to the base-plate, and the opposite part having a shank extended through the base-plate to the back-plate, crank-arms attached to such shanks and formed with flat circular heads, and the heads connected by a link formed with circular notches in the edges, the notches fitting over the circular heads and forming a jointed connection therewith so as to turn all of the crank-arms and movable ring parts simultaneously when any one of such parts is moved by hand.

The invention will be understood by reference to the annexed drawing, in which

Figure 1 is an end view of a loose leaf file provided with covers; Fig. 2 is a plan of the connecting link; Fig. 3 is a plan of the base and divided ring fixtures; Fig. 4 is an edge view of the same; Fig. 5 is a cross section of the base-plate adjacent to the middle ring in Fig. 3 at the left hand side of such ring. Fig. 6 is a plan of the base-plate inverted; and Fig. 7 is a perspective view of the movable ring part and its lever-arm.

In Fig. 1, the binder file is shown provided with covers A connected by a flexible portion B which is attached to the ring-holding fixtures and forms the hinges for the covers. The fixtures described herein are adapted for various other kinds of binders.

The base-plate *a* is shown with the ring part *b* connected rigidly thereto, and the movable ring part *b'* having a shank *l* extended through the base-plate and provided upon the under side of such plate with a crank-arm *c*. (See Fig. 5.) The crank-arms are formed, as shown in Figs. 3 and 7, with a flat circular head *d*, and such crank-arms are connected to turn together by the connecting link *e* formed of flat sheet-metal and having circular notches *f* formed in its edge to fit the circular heads *d*.

The centers of the notches *f* are spaced at the same distance as the rings upon the base-plate *a*, and the link thus operates to hold all the rings in their closed or open position, and to move all the rings simultaneously when any of them is turned. The direct connection of the movable parts of the rings by crank-arms and a link, obviates the necessity of operating the rings by a slide or any handle upon the base-plate separate from the movable parts *b'*. To check the movement of the parts *b'* when turned by hand into coincidence with the parts *b*, as shown in Fig. 3, a shoulder *g* is formed upon one side of each crank-arm to form a stop of suitable shape to contact with the adjacent side of the link *e*, and a shoulder *g'* is formed upon the opposite side of each crank-arm to form a corresponding stop to check the movement of the parts *b'* when turned entirely open, as indicated by the dotted lines b^2 in Fig. 3. These dotted lines are shown at right angles to the position of the parts *b'*, indicated in full lines, and the shoulders *g'* are formed to permit a movement of each crank-arm through about ninety degrees.

A back-plate *h* with inwardly bent flanges *h'* at the edges is shown secured to the base-plate by screws *i*, with spacing-pieces *j* between the two to leave room for the crank-arms and link. The spacing-pieces are formed to support leaf-springs *k*, one of which is shown supported adjacent to each of the crank-arms, the heel of such arm being provided with two oppositely inclined seats *m* against which the spring presses to hold the divided ring either closed or opened.

The inclined seats *m* are formed to hold the crank-arms in the respective positions in which the arms are arrested by the operation of the stops *g* and *g'*.

As the crank arms are coupled together by the link *e*, it is obvious that a spring applied to one of the crank-arms would operate to hold all of them in the desired positions, and it is therefore immaterial whether or not a spring be applied to each crank-arm, as shown in Fig. 3.

The back-plate is shown with inwardly and backwardly turned flanges *h'* to facilitate connection with a piece of flexible fabric for connection with the covers of a file. A piece of fabric B' can be readily locked within such flanges by a locking-plate *k*, and secured to the inner sides of the covers A; while the cloth applied to the exterior of the covers may be extended over the outer side of the back-plate so as to conceal the same, as shown at B in Fig. 5. The back-plate does not need to be flanged except for the purpose just described, but may be made of any form suited for application to a base-board or other element required to make a complete file or temporary binder of the desired form.

A great advantage is secured by forming the connecting link with notches to engage circular heads upon the ends of the crank-arms, as this construction places the link and crank-arms in the same plane, so that the base-plate and back-plate may be brought very close together. In similar constructions it is common to connect crank-arms by a link extended over the sides of the crank-arms, and thus requiring an additional separation of the base-plate and back-plate by the thickness of such connecting link; but in the present

construction the spacing-pieces *j* may be made of the same thickness as the crank-arms, as the application of the link to the crank-arms does not require any additional space.

Where the connecting link is formed with the circular notches *f*, the crank-arms are necessarily projected all at the same side of their pivots, and the movable parts *b* of the rings are all moved simultaneously in the same direction.

Where divided arches have been heretofore connected to turn in the same direction, they have been combined with a handle extended beyond the end of the base-plate, and the arches could not be opened without manipulating such handle. Such handles are commonly held in place by friction, and to operate such a frictionally held handle, it is necessary to grasp the binder or file with one hand and to use the other hand to pull out or push in such handle.

In the present construction, no handle is required to move the divided rings simultaneously, as the movable part *b'* upon any ring may be turned by one hand to open or close the entire series.

In Fig. 5, the shank *l* of the movable ring-part *b'* is shown extended through the base-plate and journaled in a bearing *l'* therein.

The crank-arm is secured rigidly upon the inner end of such shank, and is fitted snugly between the base-plate and back-plate, so that the pivoted ring part cannot be tipped in any direction. Such pivoted part is thus held firmly, independently of its journal-bearing in the base-plate, and is prevented from becoming loose in its bearing by wear. I have therefore claimed the crank-arm fitted snugly between such plates to operate in this manner.

So far as the spacing apart of the plates *a* and *h* is concerned it is obviously immaterial how the spacing is effected, and longitudinal flanges upon the plate *a* or plate *h* of the same height as the spacing pieces *j* would obviously hold the two plates separated the same as the spacing pieces, and would in effect be pieces that spaced the plates apart. I have therefore claimed spacing pieces irrespective of their form.

Having thus set forth the nature of the invention, what is claimed herein is:

1. In a loose leaf binder, the combination, with the base-plate *a*, back-plate *h* and means for spacing the plates apart, of rings each divided into the two parts *b* and *b'*, the part *b* having its lower extremity connected rigidly to the base-plate *a*, and the opposite part *b'* having shank *l* extended through the base-plate to the back-plate *h*, crank-arms attached to such shanks, such arms fitting snugly between the plates *a* and *h* and having flat circular heads *d*, and a flat sheet-metal connecting link *e* provided with the circular notches *f* in its edge fitted movably to the edges of such heads, for turning all the parts *b'* simultaneously.

2. In a loose leaf file, the combination, with the base-plate *a*, back-plate *h* and means for spacing the plates apart, of rings each divided into two parts, the part *b* having its lower extremity connected rigidly to the base-plate *a*, and the opposite part *b'* having shank *l* extended through the base-plate to the back-plate *h*, crank-arms upon the pivoted parts *b'*, such arms having circular heads, a connecting link with circular notches fitted to such heads, and a spring arranged and operated upon one of the crank-arms to hold all of the divided rings open or closed.

3. In a loose leaf file, the combination, with a suitable base-plate, of a series of divided rings, one part of each fixed rigidly to the base-plate, and the other part pivoted thereon, crank-arms upon such pivoted parts beneath the base-plate and having circular heads, a connecting link with circular notches, fitted to such heads, inclined shoulders upon the crank-arms forming stops in contact with the connecting link, and oppositely inclined seats upon the heel of one of the crank-arms with a spring operating to hold the crank-arm in opposite positions, as and for the purpose set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

LUCENA M. MORDEN.

Witnesses:
JOHN O. ENGVALL,
CLARA L. DODGE.