

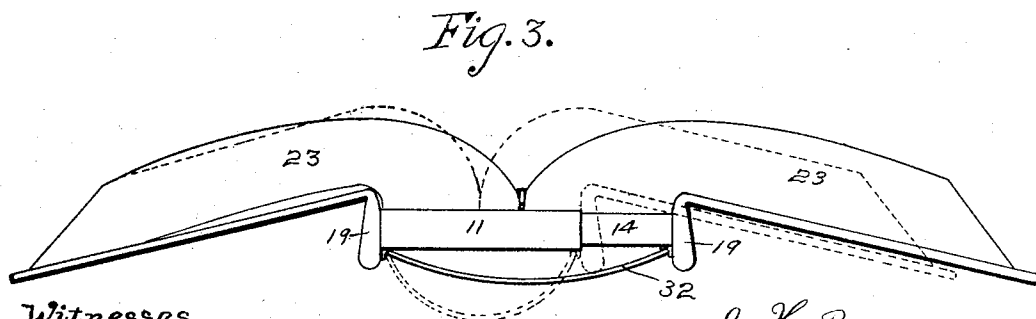
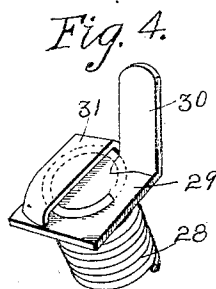
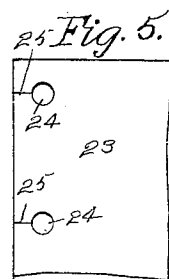
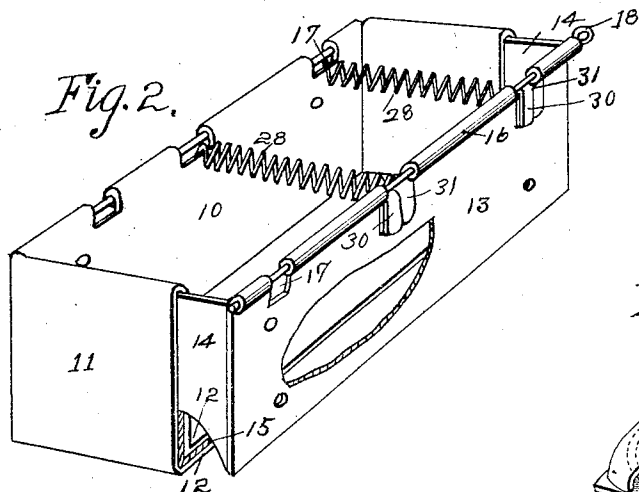
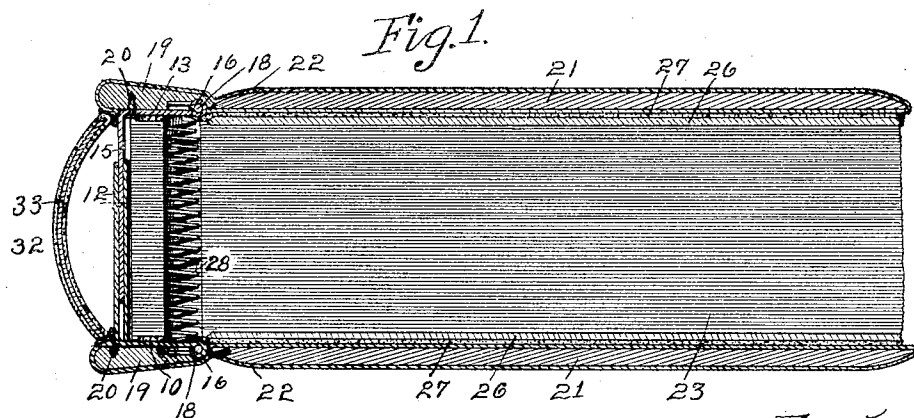
No. 777,798.

PATENTED DEC. 20, 1904.

G. H. MANGER.
LOOSE LEAF BOOK.

APPLICATION FILED JAN. 19, 1904.

NO MODEL.



Witnesses
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UNITED STATES PATENT OFFICE.

GEORGE H. MANGER, OF DES MOINES, IOWA.

LOOSE-LEAF BOOK.

SPECIFICATION forming part of Letters Patent No. 777,798, dated December 20, 1904.

Application filed January 19, 1904. Serial No. 189,779.

To all whom it may concern:

Be it known that I, GEORGE H. MANGER, a citizen of the United States, residing at Des Moines, county of Polk, and State of Iowa, have invented certain new and useful Improvements in Loose-Leaf Books, of which the following is a specification.

The objects of my invention are to provide a loose-leaf book of simple, durable, and inexpensive construction, and, further, to provide a book of this class in which the book may be opened at any point and both exposed leaves will lie comparatively flat, and, further, to provide a book of this class in which any leaf or any number of leaves may be easily and quickly detached or replaced and yet the leaves will be firmly bound between the covers and held against becoming loose when the book is subjected to ordinary usage, and, further, to provide a book of this class in which the cover may be removed entire from the book and the book will remain firmly bound and in good condition to be stored, the cover afterward being susceptible of use in connection with a new book.

My invention consists in certain details in the construction, arrangement, and combination of the various parts of the book by which the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which—

Figure 1 shows a central transverse sectional view of the complete book. Fig. 2 shows a perspective view of the expansible metal frame for inclosing the back of the book, parts thereof being broken away to show certain details of construction. Fig. 3 shows an end elevation of the book in its open position ready for use. The dotted lines in said figure indicate the position that the leaves and frame assume before the frame is extended. Fig. 4 shows a detail perspective view of a part of one of the springs provided with the detachable sheet-metal head, one part of the sheet-metal head shown in a raised position to illustrate its structure; and Fig. 5 shows a plan view of a part of one of the leaves.

Referring to the accompanying drawings, I shall first describe the metal frame to inclose

the inner ends of the leaves. This frame is composed of two members telescopically connected. One member comprises a sheet-metal side 10, double sheet-metal ends 11, spaced apart, and doubled sheet-metal back 12, the parts of which are spaced. The other member comprises a sheet-metal side 13, ends 14, and bottom 15. The ends 14 and bottom 15 are inserted between the parts of the ends 11 and back 12. In this way I provide a rectangular sheet-metal frame having sides, ends, and back, the sides being adjustable relative to each other. At the upper edge of each side I have provided a sleeve 16, formed by bending the edges outwardly and then inwardly. Each of the sleeves 16 is notched at a number of points, said notches being indicated by the numeral 17 for purposes herein-after made clear, and a rod 18 is provided for each sleeve of a length corresponding to the length of the side 13.

The covers of the book are alike and each is composed of a rigid longitudinal strip 19, secured by screws 20 to the adjacent side of the expansible frame. The remainder of each cover is composed of a board 21, of a size sufficient to cover the leaves of the book, and a hinged joint is provided between the strip 19 and the board 20 by a flexible leather cover passed around both the strip and the board, forming a joint at the point where the strip and board meet. In this way one cover is fixed to each member of the expansible frame.

The leaves of the book are indicated by the numeral 23, and each leaf is provided with a number of round holes 24 near the inner edge thereof, and the paper is cut at 25 from each hole to the inner edge of the sheet.

I have also provided an auxiliary cover for the leaves of each book, which is especially designed for the protection of the leaves after they have been removed from the cover. These auxiliary covers comprise two pasteboard sheets 26 and a flexible cover 27, joined to the pasteboard sheets and extended beyond the edges of the sheets 26 to a point near the rear edges of the leaves of the book, and these flexible covers 27 are provided with holes corresponding to the holes 24 in the sheets. These auxiliary covers are placed upon the leaves

after the leaves have been removed from the book; but, if desired, they may be placed on the inside of the cover, as shown in Fig. 1.

For holding the leaves together and securing them in the book I have provided a number of contractile coil-springs 28, of a size to readily pass through the holes 24 and of a length corresponding approximately to the thickness of the book to be used. These springs are connected with the opposite sides of the expansible frame, as follows: On each end of each spring is a cap composed of a flat sheet-metal part 29, made of pliable material and provided with two lugs 30 and 31, formed integral with one edge thereof, to connect the cap with the end of the spring. The end coil of the spring is inserted above the top of the plate 29, and then the lugs 30 and 31 are bent downwardly to overlap and cover this top coil, thus securely connecting the cap to the coil and permitting of the removal of the cap only by twisting the spring until the entire end coil moves away from the lugs 30 and 31 and the plate 29, thus providing caps that may be readily and easily detached from the springs and yet are secured to the springs firmly enough for all ordinary purposes. I attach the spring to the frame sides by inserting the ends of the spring in the notches 17 with the caps thereof adjacent to the outer faces of said side, and I firmly lock these springs in this position by passing the rods 18 through the sleeves 16, as clearly shown in Fig. 2, in such manner that the springs cannot be removed from the sides except by a removal of the rods 18.

I have provided means for automatically expanding the sides of the frame when the book is placed in its open position resting on its back, as follows: This expander comprises a sheet-metal back 32, segmental in cross-section and of same length as the book and made of pliable non-springing metal. This expander is inclosed in a leather cover 33 and is of such size that when the expansible frame is at its inner limit of movement the edges of the expander will engage the inner faces of the rear ends of the strips 19 and the contour of the expander will be that of a segment of a comparatively small circle, and when the sides of the frame are expanded to their limit of movement the edges of the expander will still engage the strips 19; but the contour of the expander will be that of a segment of a comparatively large circle, as clearly illustrated in Fig. 3.

In practical use I first screw the sides of the cover to the sides of the expansible frame, and I then place the leaves of the book in position between the sides and with their rear edges in the expansible frame, as shown in Fig. 1. I then pass the springs 28 through the openings 24 of the leaves and permanently connect the ends of the springs with the sides of the expansible frame by means

of the caps of the springs and the rods 18, as before explained, or, if desired, the springs may first be connected to the side of the frame and the leaves may be placed in position a few at a time by bending the paper at the point where it is cut at 25, so as to admit the springs into the holes 24, and the expander 32 may be added after the leaves are in the covers. When the book is closed, the springs will hold the sides of the expansible frame in engagement with the outer leaves of the book. If the book is placed in position resting on top of the expander 32—that is to say, on its back—the operator may press downwardly upon it, thus forcing the sides of the expansible frame apart by increasing the curvature of the segmental expander, as shown in the dotted lines of Fig. 3. When this is done, the central portions of the springs will of course move outwardly and assume an arched position, so that the rear edges of the leaves that are on top will be elevated more than the rear edges of the other leaves, and, furthermore, as the sides of the frame are expanded these upper leaves will spread apart from each other, so that they will lie comparatively flat. Furthermore, when in this position the lower edge of each spring will have the coils of the spring forced close together even though the upper parts of the coil will spread apart, so that the leaves will not enter between the coils of the springs. Assuming that it is desired to remove one or more of the leaves this may be readily done when the book is in its open position, as shown in Fig. 3, by the operator inserting his fingers between the adjacent ends of the top leaves, thus spreading the leaves at this point. Then one or more of the leaves may be readily removed by simply pulling them upwardly, allowing the parts of the leaves to spread at the point where they are cut at 25, and they can be easily removed, because the adjacent leaves do not touch them or cause them to bind in the book. These leaves may be replaced very easily by separating the leaves at the part of the book where they are to be inserted and then placing said leaves flat upon the adjacent leaf and pressing downwardly upon the inner edge of the leaves to be inserted on both sides of each spring. New leaves may of course be inserted in the same way. Assuming that it is desired to remove the leaves of the books bodily and substitute a new book in the same cover, then the operator removes the rods 18 and releases the ends of the springs from the sides of the frame, and then the book may be removed bodily from the cover, after which, if desired, the operator may place an auxiliary cover and 27 on the book and pass the springs through the book with the caps on the ends of the springs engaging the outer faces of the parts 27, thus leaving a book securely bound together and protected. The whole

cover may then be used for a new book by providing new springs, which are quite inexpensive.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States therefor, is—

1. In a book, the combination of a frame having sides movable to and from each other, springs fixed to said sides normally holding them toward each other and a number of leaves between the sides of the frame having said springs passed through them and a segmental expander with its edges in engagement with the opposite sides of said frame.

2. In a book, the combination of an expandable frame comprising two parallel sides each having ends and back pieces telescopically connected, a number of contractile coil-springs fixed at their ends to said sides, a number of leaves inserted between the sides and having the springs passed through them and a segmental expander having its edges in engagement with the opposite sides of said frame.

3. An improved book, comprising a rectangular sheet-metal frame having parallel sides movable from and to each other, the edges of said sides notched and formed with sleeves, a number of contractile coil-springs, caps de-

tachably secured to the ends of the springs, said springs being inserted in said notches, rods passed through the sleeves holding the caps in position in the notches and leaves inserted between the sides and having said springs passed through them.

4. An improved book, comprising a rectangular sheet-metal frame having parallel sides movable to and from each other, the edges of said sides notched and formed with sleeves, a number of contractile coil-springs, caps detachably secured to the ends of the springs, said springs being inserted in said notches, rods passed through the sleeves holding the springs in position in the notches, leaves inserted between the sides and having said springs passed through them, a strip secured to the outer face to each of said sides, a board hinged to each strip and a segmental expander with its edges against the inner faces of said strips forming a back for the book, arranged and combined substantially as and for the purposes stated.

GEORGE H. MANGER.

Witnesses:

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