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3,205,896

MECHANISM FOR A LOOSE-LEAF BOOK

Filed Oct. 18, 1962

2 Sheets-Sheet 1

FIG. 1

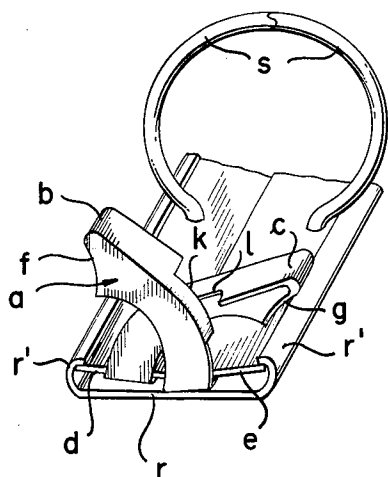


FIG. 2

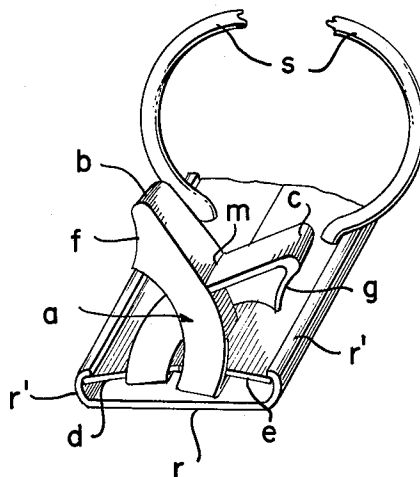


FIG. 3

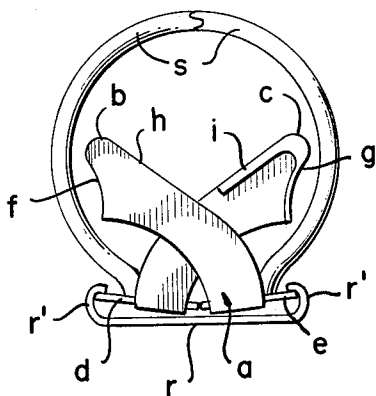
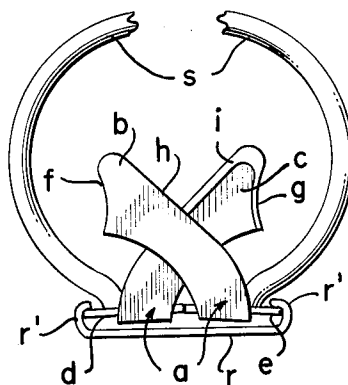


FIG. 4



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FIG. 5

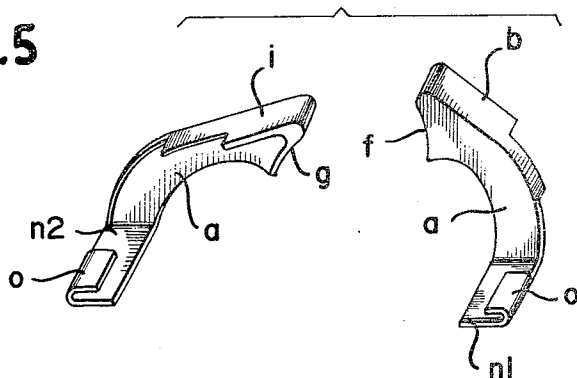


FIG. 6

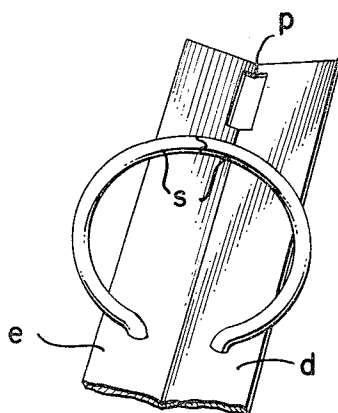
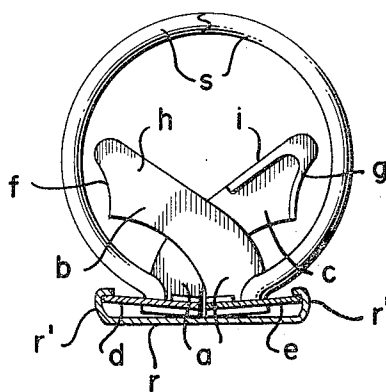


FIG. 7



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MECHANISM FOR A LOOSE-LEAF BOOK

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3 Claims. (Cl. 129—24)

This invention relates to a mechanism for a loose-leaf book comprising two smooth continuous bars provided at each end with a crossed lever and held by a spring plate.

There are known crossed lever arrangements which perform only a single operation, either opening or closing the ring parts. Therefore, two completely different sets of levers are usually required. The known one-sided levers performing the opening and closing operations in combination, however, possess the disadvantage that the operation is performed either with great difficulty by means of levers of different shapes, or unequal pressures are required in the case of levers of different size. There is also a known opening system having one-sided handle-like levers whose opening and closing operations can be performed only by grasping the handle levers with both hands. Any known lever system presents disadvantages and delays when employed. The levers are attached to ring bars either by riveting or by spot welding. These are time consuming and costly operations. The width of the ring opening is often determined by flanges (flaps) located on the inner side of bars for limiting the angle of deflection or by the direct hitting of the bars against the lower side of the cover. Until now it has not been possible to produce operational mechanisms without supporting flanges or without cover impact.

An object of this invention is to eliminate many of the disadvantages of the prior art arrangements. A handy engagement portion of the lever, wide at the side, makes possible a smooth and easy single-handed operation for opening the rings, the closing operation being accomplished in a novel manner by means of finger pressure vertically from above upon the levers. The bars carrying the rings are moved downward by the cross-like shearing movement of the levers sliding partially on each other. Since both lever pressing arrangements are at the same level, they make possible the use of equally small forces, so that an easy and uniform operation is provided even in the case when the mechanism is under strong tension. The levers are provided with tabs (small plates) on the base plates; the tabs are pushed upon the inner recesses of the ring bars and support each other on the back during operation. Therefore, the assembly can easily be performed manually. The width of opening of the rings is determined by the levers. On opening, as soon as the bars pass the dead-center and the levers reach the widened free ends, they interlock and are held fast and limited at an equal (constant) angle.

The invention is illustrated in the drawing in which:

FIG. 1 shows the closed position of levers with lateral engagement portions visible;

FIG. 2 shows the open position of levers illustrating the points of application of vertical closing pressure, which places a limit on the raised positions of the bars and thus determines the opening angle of the ring parts;

FIG. 3 shows the closed position of levers;

FIG. 4 shows the open position of levers;

FIG. 5 illustrates the cross levers with tabs provided on the base plates;

FIG. 6 illustrates the ring bars with inner recesses; and

FIG. 7 shows the mechanism with levers and their tabs in cross-section.

The lever *a* consists of its arm parts *b* and *c* which cross each other so that the left-hand arm *b* is joined to

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the right toggle plate member *e* and the right-hand arm *c* is joined to the left side toggle member *d*, both toggle plate members *d* and *e* being held within the side flanges *r'* of the spring-like back plate *r*. Coacting ring halves *s* are respectively carried by the toggle plate members *d* and *e*. Both arm parts *b* and *c* are provided on their outer sides with lever engagement portions *f* and *g*. In the area of their inner sides *h* and *i*, provided as finger pressure surfaces for the vertical closing pressure, both arm parts pass like scissors along each other during operation, along the recesses *k* and *l*, so that both levers have a common width *m* serving simultaneously as a stop as illustrated in FIG. 2. Since the pressure points *f* and *g* (centers) of the opening operation and *m* of the closing operation are at the same level, the forces to be applied are likewise similar.

The lever parts *a* have a tab *o* in the base plate *n1* and *n2*, which tabs are inserted in an inner recess *p* of the ring toggle plate members *e* and *d*, and support each other in the spring-like back plate after the ring toggle plate members *e* and *d* are brought together, so that a firm connection is established.

The widened free ends that meet at the closing point *m* interlock when the opening movement is completed, so that bars *d* and *e* cannot fall apart.

While there is herein shown and described the preferred embodiment of the invention, it is nevertheless to be understood that minor changes may be made therein without departing from the spirit and scope of the invention as claimed.

What is claimed is:

1. A loose leaf book mechanism comprising an upwardly opening, spring-like back plate including upwardly and inwardly directed, opposed free marginal flanges forming opposed grooves, and a pair of elongated toggle plate members freely pivoted along adjacent inner longitudinal edge portions and freely pivoted at outer edge portions in said opposed grooves, said toggle plate members each respectively including a vertically extending ring half fixed thereon pivotally movable with said plate members and projecting between said marginal flanges, said ring half of one toggle plate member being in transverse alignment with and terminally engageable with said ring half of the other toggle plate member to limit pivotal movement of said toggle plate members when said plates converge toward said back plate to define a closed position and being spaced apart when said plate members converge upwardly away from said back plate to define an open position, said plate members including at one adjacent end thereof upwardly projecting integral levers extending in sliding crossed relation at substantially central portions thereof for pivoting said plate members above and below a dead-center toggle point of said plate members, each of said levers including an abutment portion disposed above said central portions in the pivotal path of each other which abut in said open position of said ring halves to limit the pivoting movement of said plate members in the open position, said levers extending substantially the width of said ring halves when closed and having opposed enlarged finger-engageable portions at upper and side portions thereof to facilitate opening and closing of said ring halves, said side portions being substantially vertical in closed position and disposed along the outer edges of said levers and said upper portions in said open position diverging upwardly from said central portions to substantially the tops of the levers at an angle sufficiently large to receive a finger of a hand so that pressing downwardly with the finger on said upper portions forces said portions apart to move the ring halves to the closed position, said levers being disposed at a greater angle when said halves are in said closed position than when said ring halves are in said

open position to eliminate accidental opening of the ring halves, said levers including substantially planar opposed side surfaces in sliding engagement with each other and said abutment portions including said finger-engaging portions projecting laterally from said planar surfaces toward each other from an adjacent lever. 5

2. The structure of claim 1 in which said levers include a lower, laterally projecting mounting plate and overlying tab, said plates including notched portions extending into said adjacent longitudinal edge portions and receiving said tabs therein. 10

3. The structure of claim 1 in which said levers include a substantial width extending transversely of said toggle plates from the inner pivotal edges of said plates for affording substantial torque when said levers are operated to open and close said ring halves. 15

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