Nov. 24, 1936. J. SCHADE 2,061,676

RING BINDER CONSTRUCTION

Filed April 23, 1935 2 Sheets-Sheet 1

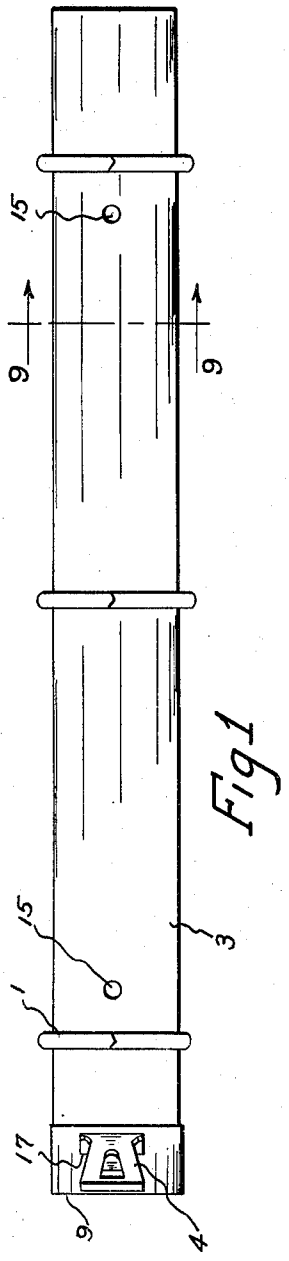


Fig 1

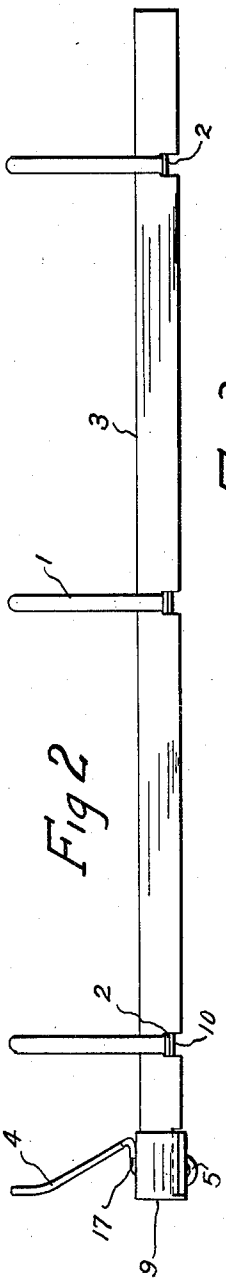


Fig 2

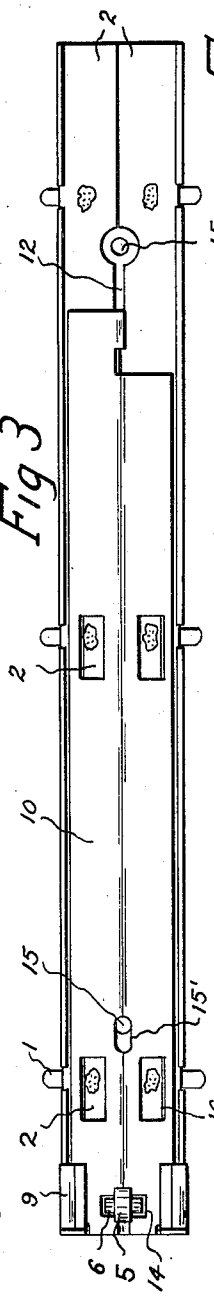


Fig 3

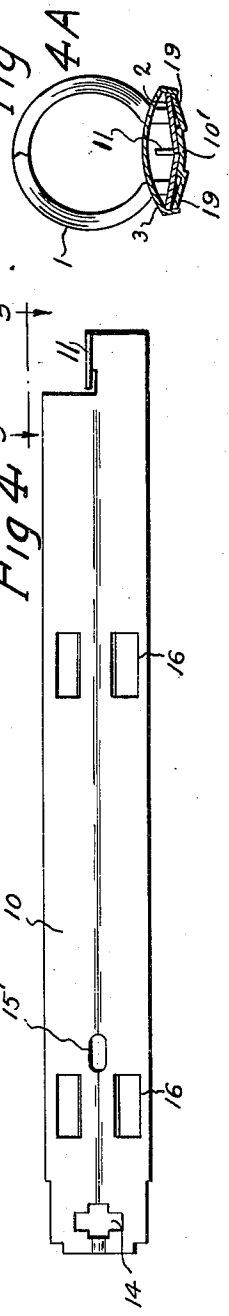


Fig 4

Fig 4A

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Fig 5

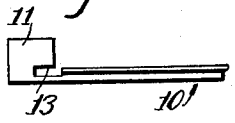


Fig 6

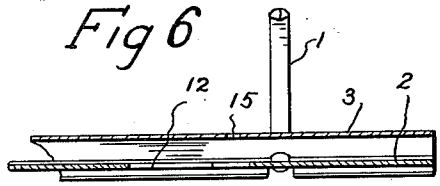


Fig 8

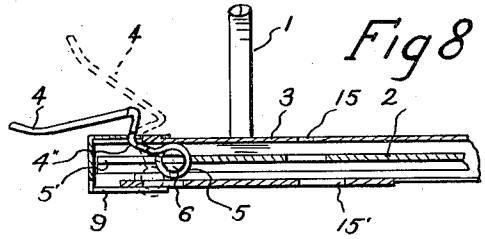


Fig 7

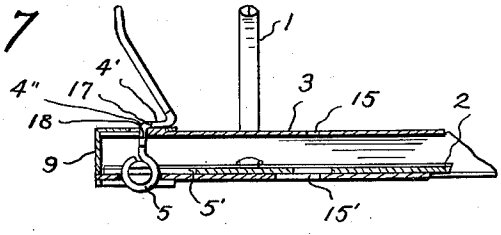


Fig 9

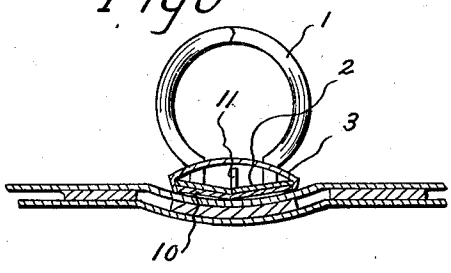
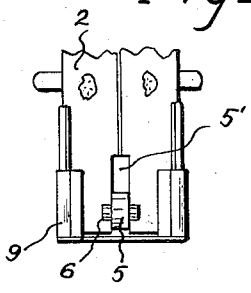


Fig 10



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RING BINDER CONSTRUCTION

John Schade, Holyoke, Mass., assignor to National Blank Book Company, Holyoke, Mass., a corporation of Massachusetts

Application April 23, 1935, Serial No. 17,809

7 Claims. (Cl. 129—24)

This invention is an improvement in ring binder mechanism for loose leaf books. The object is to lock the rings in closed position by a novel mechanism and operating means.

The drawings and description will show the way to put the improvement in use.

Fig. 1 is a top view,

Fig. 2 is a side view, and

Fig. 3 is a bottom view of the ring book mechanism with parts in locked position but before the assembly is attached to the back panel of a book or binding case;

Fig. 4 is a plan view of a plate to act as the connecting means between two spaced locking devices in the binder;

Fig. 4A is a cross-sectional view of a binder mechanism using a modified form of locking plate;

Fig. 5 is a detail side view taken at one end of the plate of Fig. 4 at line 5—5;

Fig. 6 is a detail view of the toggle plate arrangement underlying the plate end shown in Fig. 5;

Fig. 7 is a detail view of the "booster" lever, indicating its pivotal connections with the cover plate and the toggle plates for lever operation of the mechanism, the lever being in the closed and locked position;

Fig. 8 is similar to Fig. 7 but shows the position of the parts with the "booster" in the "ring open" position;

Fig. 9 is a section on line 9—9 of Fig. 1 but with a section of the back panel of the binding case and cover parts hinged to the back panel shown; and

Fig. 10 is a detail bottom view at one end of the mechanism with the plate of Fig. 4 removed.

The mechanism is shown for illustration in the form of a three-ring binder construction.

The ring halves 1 are fastened to the toggle plates 2. The latter are mounted along their outer edges, for pivotal movement at the inturned edges of the spring cover plate 3 and along their inner edges at their meeting line, in the usual manner. When the rings 1 are opened and closed the toggle plates 2 swing upwardly and downwardly respectively (see Fig. 9) while the spring cover plate 3 yields and tends to hold the rings in open or closed position. This construction gives one type of usual ring binder mechanism.

As shown in my copending application Serial No. 6,221, filed February 12, 1935, I may operate the toggle plates to open and close and lock the rings with an improved booster lever mechanism. I have shown the latter incorporated in the present invention. It will be described herein with respect to its operation to perform the functions of my earlier application and in addition with respect to its function in operating the locking means which I have added in spaced relation to the booster location so as to have two spaced locking means, each operated simultaneously by a single operation of the booster lever. This arrangement embodies the best manner I know of to put my present invention into use.

The booster lever 4, as shown, comprises a single, stiff piece of metal. The handle portion for operation extends upwardly from the spring plate 3, see Fig. 7. At the bottom of this portion the lever is bent at an acute angle to provide a portion 4' to overlie the top of the spring plate or a stiffened cap piece 9, which is a stiffened end piece for spring plate 3, better adapted for mounting the booster lever. At the outer end of portion 4' the lever piece 4 is bent downwardly into portion 4'' to make a little more than a right angle with portion 4'. The end of portion 4'' is bent into an eye 5. In this eye I mount a rotatable pin 6. A slot in each end of the pin 6 engages the edge of the adjacent toggle plate 2 with a sliding forked fit. The toggle plates 2, see Fig. 10, are provided with a slotted portion 5' in which the eye 5 of the booster lever 4 may move back and forth with the forked ends of pin 6 engaging the edges of the toggle plates 2 and in sliding relation to said plates. The portion 4'' of lever 4 is slightly narrower than portion 4'. There is an opening or slot (see Fig. 7) in the top of cap piece 9, just wide enough for portion 4'' to pass through but not for portion 4' to do so. The portion 4' is widened out just above the cap piece 9 to make shoulders 17 and portion 4'' is widened just below the cap piece to make shoulders 18. The opening or slot in cap piece 9 through which the booster lever passes is made large enough to install the booster lever diagonally and then squared up to engage shoulders 18. The subsequent connection of lever eye 5 to pin 6 will hold the booster lever in shoulder engaging position. The shoulders 17 and 18 keep portion 4' on top of piece 9. The end of portion 4'' where eye 5 is formed is narrower than where the shoulders are located. The result is that when lever 4 is positioned as in Fig. 7, the rings are closed and locked. They are locked because any strain to open them will strain the toggle plates 2 upwardly, tending to turn lever 4 clockwise, and such movement is prevented by the engagement of shoulders 18 with the bottom of spring plate 3. When lever 4 is pushed down

from the position of Fig. 7 to the full line position of Fig. 8, the lever portion 4'' has been swung counter-clockwise and far enough for pin 6, by its forked engagement with toggle plates 2, to lift the latter above their toggle center line and open the rings 1. The dotted line position of lever 4 in Fig. 8 indicates the position when the rings are unlocked but still in closed condition. It will be clear that lever 4 has a sufficiently loose pivotal bearing on the top of cap piece 9 to work with the sliding pivotal connection with the toggle plates 2, for the lever to operate the toggle plates and rings into the various conditions of the mechanism as stated.

In the operation of the booster lever 4 through a complete cycle of its intended movements as described, it will be seen that eye 5 and pin 6 are moved back and forth a short distance longitudinally of toggle plates 2. This sliding movement of eye 5 in slot 5', see Fig. 10, is used to operate the additional locking means for the toggle plates, which I will now describe.

I provide a single plate 10, seen in the plan view of Fig. 4. Its transverse section is seen in Fig. 9 where it is clear that the toggle plates 2 lie directly against the top of plate 10 when the rings 1 are closed. One end of plate 10 is formed with an integral flat hook portion 11 located in the vertical plane passing through the central line of the plate, see Fig. 5. The toggle plate edges are formed to make a short slot, as at 12 in Fig. 3 to permit the hook portion 11 to pass upwardly between toggle plates 2, see Fig. 9. It will be clear from Figs. 5 and 3 that if plate 10 is moved in the binder so as to position the top edge of hook slot 13 over and overlapping the meeting edges of toggle plates 2 just beyond slot 12 in Fig. 3, said plates cannot be moved upwardly to open the rings 1, and the latter will be locked. While if plate 10 is moved so that the top edge of hook slot 13 is in line with slot 12 in the toggle plates, see Fig. 3, such plates can move upwardly and the rings will be unlocked.

As best shown in Figs. 3 and 4, at the end of plate 10 opposite to the end where hook portion 11 is, there is an opening 14. Within this opening 14 the eye 5 and its pivot pin 6 of the booster lever 4 are adapted to lie. So when the booster lever is moved and its eye 5 on the inner end is moved the plate 10 is moved, as shown by change in position of plate 10 in Figs. 7 and 8, where the ring mechanism is shown in locked and opened positions, respectively. The parts as shown are designed so that the same movement of the booster lever 4 which locks the toggle plates at one end by their engagement with the booster mechanism at that end will also cause movement of plate 10 to position hook portion 11 to also lock the toggle plates at a remote point, spaced from the booster lock by the length of plate 10, by hook portion 11. This double lock avoids the difficulty I have experienced of locking the toggle plates at both ends or only one end. There is ordinarily enough play in the ring mechanism that a lock at one end only will not give the desirable locking effect at a substantial distance away from that end.

As is customary, the metallic ring binder is riveted to the back panel of a binding case through rivet holes as 15, Fig. 3. I provide an elongated slot 15', Fig. 4, in plate 10 to straddle the rivet which would otherwise interfere with the movement of plate 10 in my disclosure. I also provide slots 16 in plate 10 so the latter may lie flat against the toggle plates 2 without interference from the slight protuberances caused by attaching the ring halves to the toggle plates. I may construct the plate 10' with a cross-section as shown in Fig. 4A. In this construction the slots 16 are unnecessary as the ends of the rings lie under the upraised portions 19 of the plate 10'.

One end of plate 10 is formed so as to abut and be guided by the inturned edges of end cap piece 9. Such edges hold that end of plate 10 in good position for reciprocating movement. When the mechanism is riveted to the back panel of the binding case, as indicated in Fig. 9, the plate 10 is held in position over its whole length and the hook portion 11 cannot fall away from its desired relative position with the toggle plates 2 and slot 12.

By the mechanism I have disclosed, the position of the second lock may be selected in different sized binders by merely changing the length of plate 10 and the position of slot 12. In the form shown I have positioned the second lock near enough to the end ring remote from the booster to effectively lock that ring. In the multiple ring binder, when the end rings are each effectively locked the whole binder is effectively locked. There is considerable advantage in combining the double lock mechanism with a booster construction, as I have disclosed it, for the one booster lever can be used to open and close the rings and simultaneously operate the two spaced locking means, all with a one-hand operation while the other hand is free to hold the loose leaf book. But the double lock feature of my disclosure might be used with some advantage without the booster feature for opening and closing the rings. This could be accomplished by merely pushing plate 10 back and forth from an extension at the end of the plate to give a grip and locating two locks spaced on the plate for operation as lock hook 11 operates. I prefer, however, on account of the well known advantage of a booster construction, to combine my improvements broadly for specific operation by the booster mechanism.

Having disclosed my invention, I claim:

1. In a ring binder mechanism of the type in which the rings are manipulated through toggle parts operable to open and close the rings, the combination of means to manipulate and lock said toggle parts near one end of the mechanism, additional means to lock said toggle parts near the other end of said mechanism, and a device connecting said locking means for simultaneous operation of both whenever one is operated, said first mentioned means being operable to both manipulate the toggle movements and lock the parts but the second named means being operable to lock the parts without imparting any movement thereto.

2. In a ring binder mechanism of the type having a booster means with an operating lever for opening and closing the rings, the combination of two locking devices one of which forms part of the booster means, said devices being located at spaced stations and operable to hold the binder mechanism closed, means to connect said two locking devices for simultaneous operation, said means being connected with the booster means whereby the latter may be manipulated to not only open and close the rings but to simultaneously lock and unlock said mechanism.

3. In a ring binder mechanism, the combination of toggle mechanism, rings fastened thereto.

spring means to hold the toggle assembly, a locking means including a booster lever near one end of the toggle mechanism to operate the latter to open and closed position against the tendency of said spring means and a separate locking device spaced from said first locking means and operable to lock said toggle mechanism in closed position, said booster lever being connected to each of said devices, whereby the latter may be simultaneously moved to lock the toggle mechanism by manipulation of a single booster lever.

4. In a ring binder mechanism having a booster lever located outside the space provided for book sheets on the mechanism, the combination of said mechanism with means to open and close the rings by the booster lever movement and releasable means to lock the rings at spaced stations in the mechanism, said locking means being connected for operation by manipulation of the booster lever.

5. In a ring binder mechanism the combination of a spring plate, toggle plates mounted therein, binder rings fastened to said plates, a locking plate lying along said toggle plates and having means near one end to lock said plates, a booster lever with means connected to the toggle plates adjacent said lever to lock said plates, said toggle lever having means engaging with said locking plate to operate the latter, all constructed and arranged for the one booster lever to open and close said mechanism and in addition to lock the same at spaced stations.

6. A ring binder structure with spring plate and toggle operated mechanism, in combination with a booster mechanism having a lever located at one end to open and close the structure and a locking plate extending from said end to a point near the other end with means there to lock the toggle mechanism, said plate being operable by movement of the booster lever to operate the said remote locking means.

7. In a loose leaf structure comprising a spring plate, separable prongs, prong carrying plates hingedly connected at their inner edges and confined at their outer edges within said spring plate, means adjacent one end of said structure operable to engage and move said carrying plates for opening, closing, and locking said prongs, and means spaced apart from said first named means but actuated by it for also locking said prongs by a separated engagement with said carrying plates at a distance from the engagement of the first mentioned means.

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