Sept. 3, 1935. A. W. McCLURE 2,013,416

SNAP RING LOOSE LEAF BINDER

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FIG. 1.

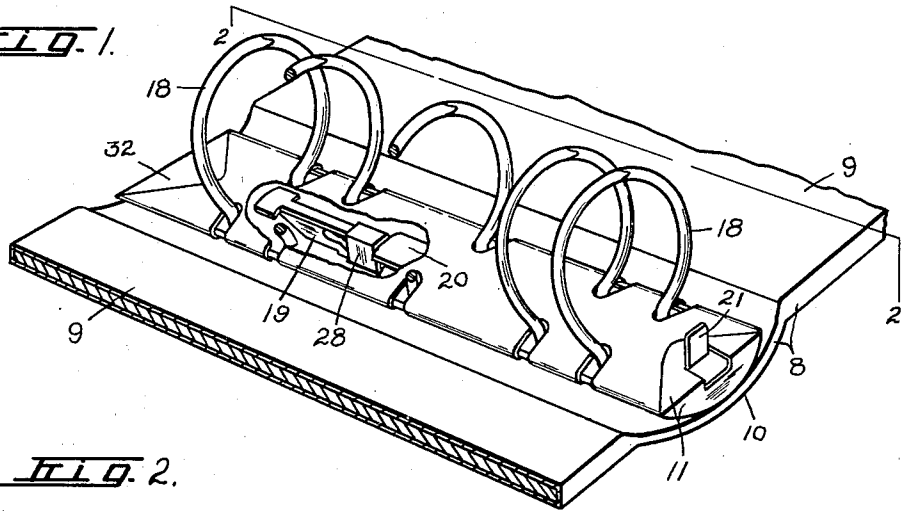


FIG. 2.

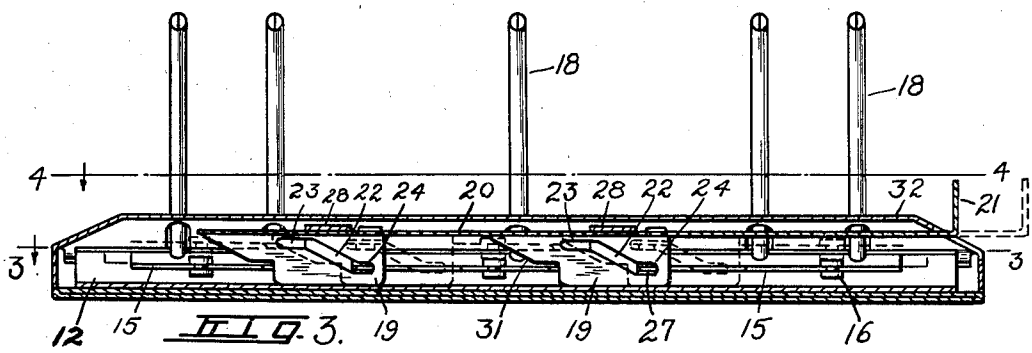
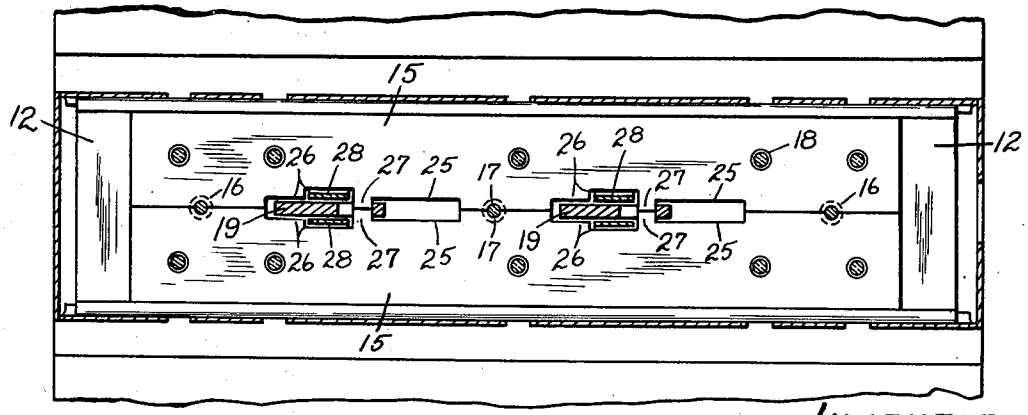


FIG. 3.



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FIG. 4.

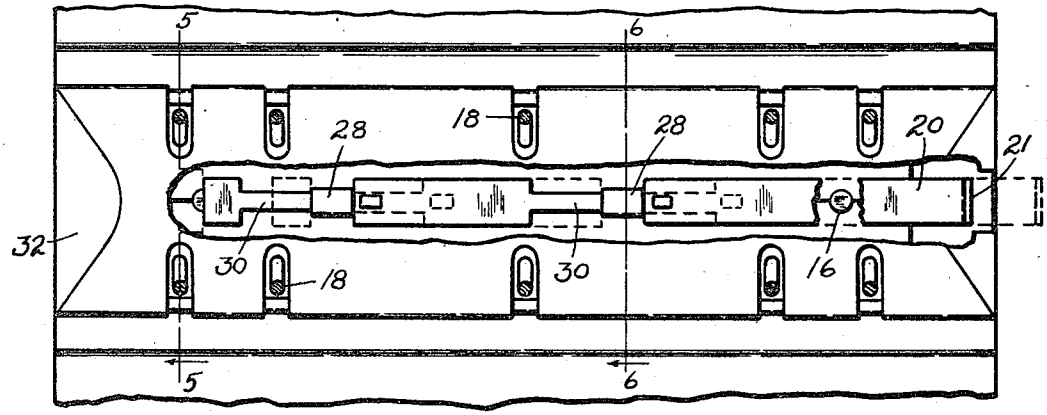


FIG. 5.

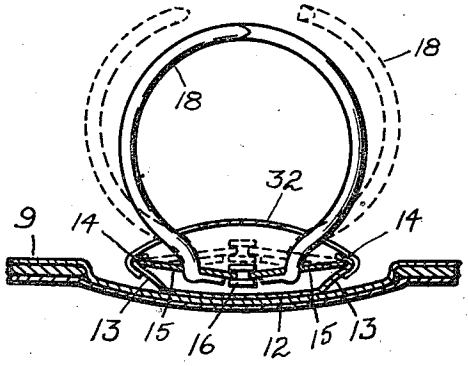


FIG. 6.

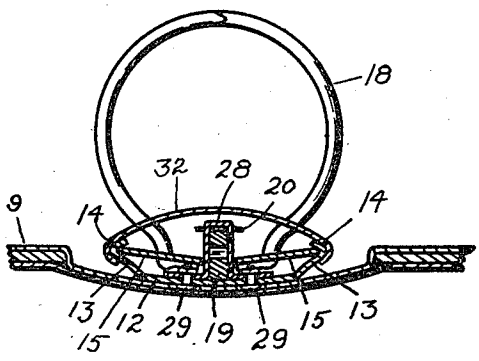
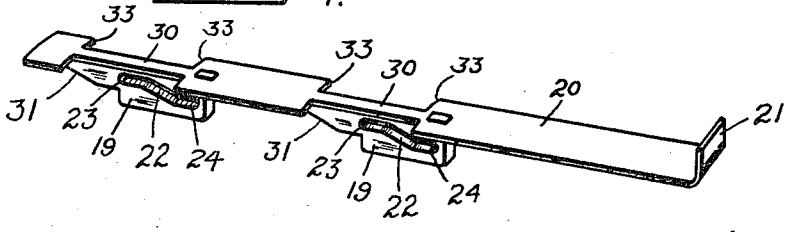


FIG. 7.



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2,013,416

SNAP RING LOOSE LEAF BINDER

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Application May 12, 1934, Serial No. 725,327

2 Claims. (Cl. 129—24)

This invention relates to improvements in loose leaf binders in which the loose leaves are removably locked to the cover and back by hinged prongs, and more particularly, to means for controlling the movement of the prongs.

It is an object of this invention to provide a loose leaf binder having a simple and positive actuating mechanism for opening and closing the prongs.

A further object of the invention is to provide locking means in connection with the prong-actuating mechanism of a loose leaf binder, for locking the prongs in either the open or the closed position.

Other objects and advantages relate to details of the prong-actuating means, and to the arrangement of the various parts thereof, all as will more fully appear in the following description, taken in connection with the accompanying drawings, in which:

Figure 1 is a perspective view showing the loose leaf binder of my invention open, but with the prongs closed;

Figure 2 is a longitudinal sectional view taken along line 2—2 of Figure 1;

Figure 3 is another longitudinal sectional view taken along line 3—3 of Figure 2;

Figure 4 is a sectional view taken along line 4—4 of Figure 2;

Figure 5 is a cross sectional view taken along line 5—5 of Figure 4;

Figure 6 is another cross sectional view taken along line 6—6 of Figure 4; and

Figure 7 is a perspective view of the prong-actuating mechanism.

In the several drawings, like parts are indicated by the same reference characters.

Referring to the drawings, the reference numeral 8 indicates a cover having side portions 9, and a back portion 10. To the back portion 10 may be secured, in any well known manner, a loose leaf binder mechanism generally indicated at 11.

The binding mechanism comprises a spring back plate 12 having slightly arcuate inclined side portions 13, the edges of which are turned inwardly to form two opposed longitudinally extending channels 14. Channels 14 are adapted to receive a pair of prong plates 15 having their inner edges in abutting relation and hingedly connected by a plurality of, in this instance, three double headed buttons 16 each having a shank portion connecting the two heads and adapted to engage opposed notches 17 in the prong plates.

Pressure applied along the channels 14 of spring back plate 12 to prong plates 15 has a tendency to cause the prong plates to buckle either above or below the plane of the supporting channels. On each prong plate 15 is secured, as by welding or in any other convenient manner, a plurality of semi-circular rings or prongs 18 arranged in pairs so that when in the closed position, the ends of each pair are in registration to form a closed ring.

Prong plates 15 are adapted to swing downwardly at their central edges below the plane of their outwardly supported edges when the prongs 18 are closed. When the prongs are in the open position, plates 15 are swung upwardly above the plane of their outwardly supported edges. The limit of upward movement of plates 15 is fixed by the distance between the heads of buttons 16.

The upward and downward swinging movement of prong plates 15 to open and close prongs 18 is effected by means of a pair of slot cam members 19 secured, as by riveting or welding, to an actuating bar 20 having a turned-up end portion 21 to serve as a grip to facilitate the longitudinal movement of the bar. The portions 30 of bar 20 lying adjacent cam members 19 are preferably reduced in width to the thickness of the cam members to permit the assemblage of cam members and actuating bar to be slidably supported upon back plate 12 by suitable saddle brackets 28, which may be secured to back plate 12 by bolts 29. This construction also provides abutting edges 33 adjacent the portions 30 which coact with brackets 28 to limit the longitudinal movement of bar 20.

Cam members 19 are each provided with an inclined slot 22 connected at its ends with short horizontally extending slots 23 and 24. Prong plates 15 are notched along their abutting edges at 25 and 26 so as to provide rectangular openings to allow cam members 19 to project therethrough. The right hand portions of notches 26 are made deeper than the left hand portion so as to provide sufficient clearance between prong plates 15 and brackets 28. The inwardly projecting tongue portions 27 between notches 25 and 26 serve as cam followers, and are adapted to ride in cam slots 22, 23 and 24 of cam members 19.

When the prongs 18 are closed, actuating bar 20 will be in the position shown by the full lines in Figure 2. In this position, cam followers 27 will be in registration with the lower horizontal slot 24 of cam member 19 thereby preventing the upward movement of cam followers 27, and the

opening of prongs 18. If it is desired to open prongs 18, actuating bar 20 is withdrawn to the limit of its movement, as shown in the dotted line position of Figure 2. Moving actuating bar 20 to this position also moves cam members 19 so that cam followers 27 ride out of slot 24 into inclined slot 22, and are forced upwardly along this slot on to the level of and into engagement with the upper horizontal slot 23. The upward swinging movement thus imparted to plates 15 separates prongs 18. In this position, further upward movement of the cam followers is prevented thereby limiting further opening of the prongs. The prongs are also prevented from being closed by hand since the cam followers 27 are confined by the horizontal slots 23, and downward movement is thus prevented.

In closing the prongs by the inward movement of actuating bar 20, cam followers 27 are forced downwardly by cam slot 22, and are again locked in position by horizontal slot 24. In order to prevent excessive wear on cam followers 27, I provide the forward ends of members 19 with a cam surface 31 parallel with cam slots 22 adapted to engage the left hand edges of notches 26 to assist in forcing prong plates 15 downwardly in the closing operation of the prongs.

Although I have shown and prefer to use two cam members for controlling the movement of prong plates 15, it is apparent that a single cam member may be employed with perhaps a sacrifice of smoothness and ease of operation. It is also apparent that it would be an advantage to use more than two such cam members in binders of considerable length, and particularly, in binders employing a stiff back plate spring.

The entire assemblage of prong plate and actuating means, with the exception of actuating grip 21, may be enclosed by a suitable cover plate 32 clamped along its longitudinal edges over the edges of back plate 12. Thus it is seen that by means of a simple slot cam arrangement, I have provided a rugged and effective actuating mechanism for opening and closing the hinged prongs of a loose leaf binder, which, at the same time, provides means for locking the prongs in either the open or closed position.

Although I have shown and described a specific mechanism for controlling the movement of hinged prongs in a loose leaf binder, I do not wish to be restricted to the same, since many changes and modifications may be made by those skilled in the art without departing from the spirit and scope of the appended claims.

I claim:

1. A loose leaf binder comprising a pair of prong plates having leaf-holding prongs thereon, means for hingedly connecting the inner longitudinal edges of said plates together, a spring back plate yieldingly engaging the outer longitudinal edges of said prong plates for holding the same in open or closed position, a cam member mounted on said back plate for reciprocatory movement along the inner longitudinal edges of said plates, and having a cam slot therein, said plates having a plurality of spaced opposed notches along their joined edges to form apertures to permit said cam member to extend therethrough, said notches being spaced longitudinally to provide opposed inwardly projecting tongues adapted to register with said cam slot, and means for reciprocating said cam member to move said plates into either the open or closed position, said cam member locking said plates in either the open or closed position at the limiting positions of its reciprocatory movement.

2. A loose leaf binder comprising a pair of prong plates having leaf-holding prongs thereon, means for hingedly connecting the inner longitudinal edges of said plates together, a spring back plate yieldingly engaging the outer longitudinal edges of said prong plates for holding the same in open or closed position, a cam member mounted on said back plate for reciprocatory movement along the inner longitudinal edges of said plates, and having a cam slot therein, said cam slot comprising an inclined portion joined at each end with a horizontal portion, said plates having a plurality of spaced opposed notches along their joined edges to form apertures to permit said cam member to extend therethrough, said notches being spaced longitudinally to provide opposed inwardly projecting tongues adapted to register with said cam slot, and means for reciprocating said cam member to move said plates into either the open or closed position, said cam member locking said plates in either the open or closed position at the limiting positions of its reciprocatory movement.

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