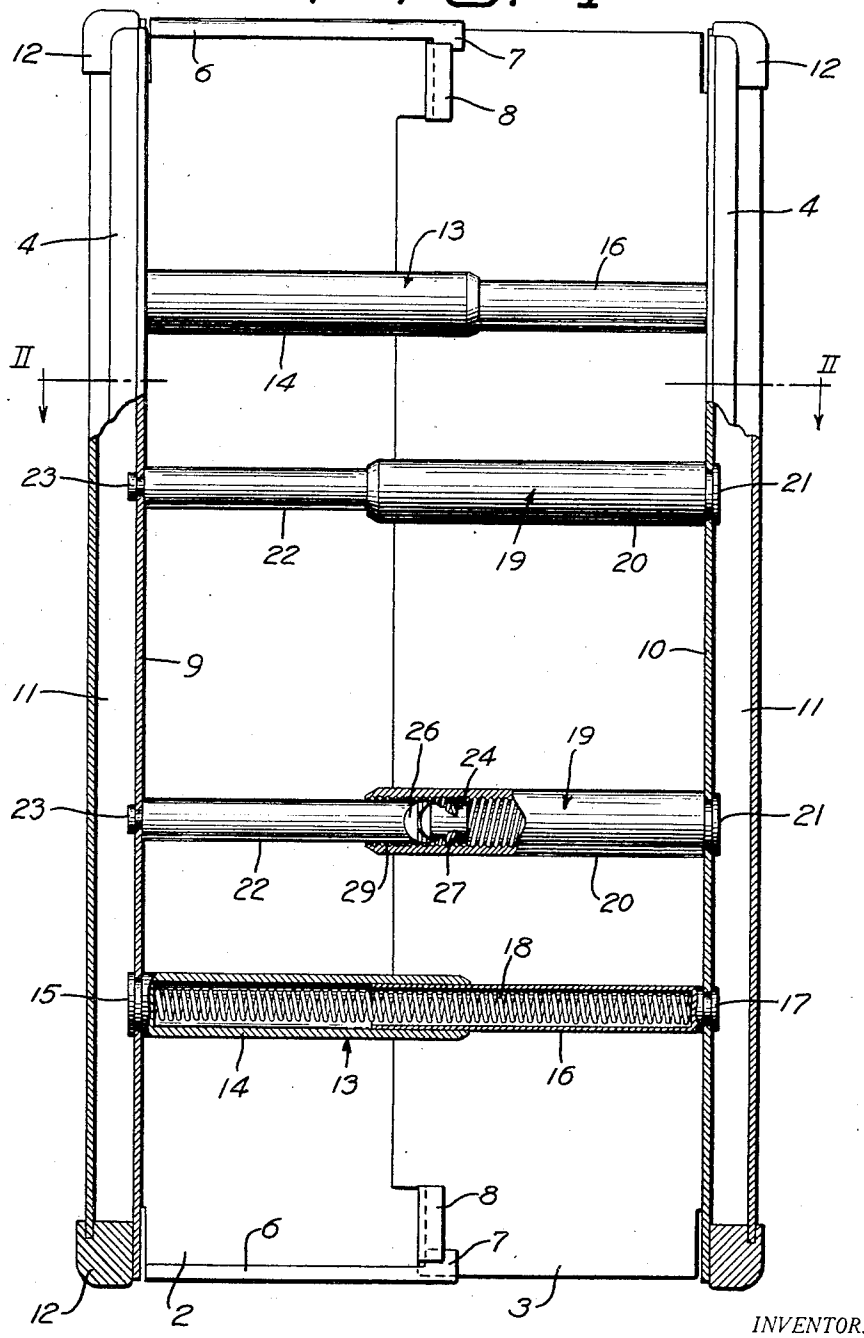
June 30, 1936. P. O. UNGER 2,046,007

LOOSE LEAF BINDER

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FIG. 1



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FIG. 2

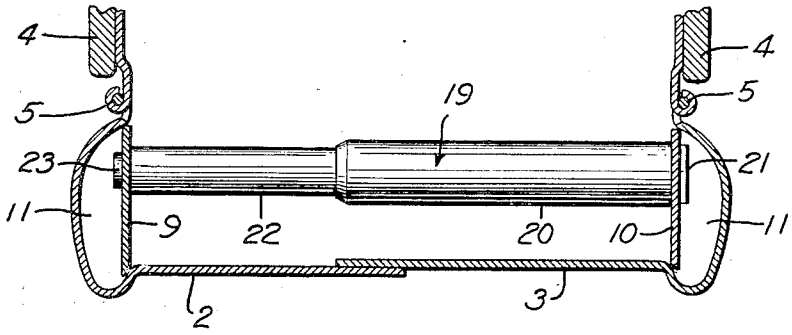


FIG. 6 FIG. 8

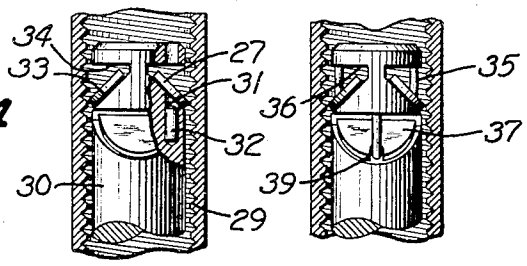


FIG. 3 FIG. 4

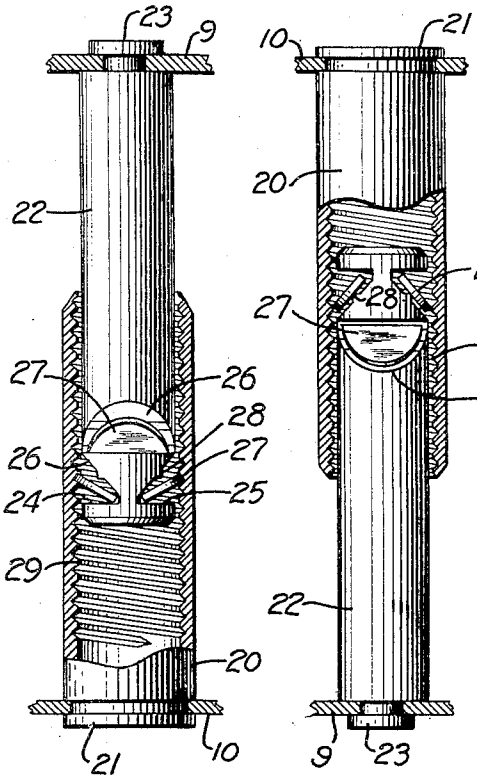
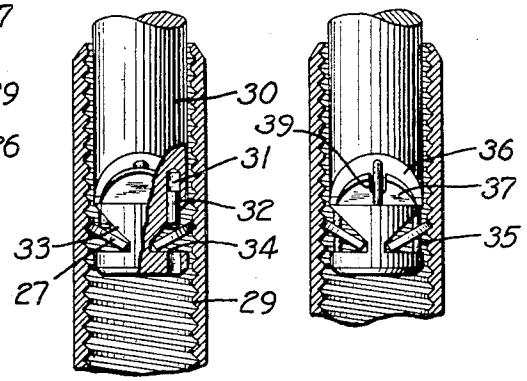


FIG. 5 FIG. 7



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LOOSE LEAF BINDER

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Application September 11, 1933, Serial No. 688,890

8 Claims. (Cl. 129—13)

This invention relates to loose leaf binders, and particularly to a new and improved locking mechanism for the same. In certain types of loose leaf binders, the sides of the binder may be expanded or contracted through the use of telescopic posts. Springs are usually confined in certain posts and are designed for expanding or separating the two binder heads. Locking mechanism is usually provided in other posts for resisting the tendency of the springs to expand the binder. This invention is particularly concerned with the locking means in certain of the telescopic posts for locking the binder heads in their adjusted position.

It is an object of this invention to provide a locking post that is easy to assemble, and is efficient and durable in operation. It is a further object of this invention to provide a locking post in which the action of the locking mechanism is controlled by gravity. It is a further object of this invention to provide a locking post with simple and efficient means to prevent failure of the locking elements to function properly under any conditions. Other objects of this invention will become apparent upon reading the following description taken in conjunction with the accompanying drawings in which:

Figure 1 is a top plan view of the binder back broken away in parts to facilitate illustration;

Figure 2 is a cross sectional view taken upon the line II—II of Figure 1 looking in the direction of the arrows;

Figure 3 is an enlarged sectional view through one of the locking posts illustrated in Figure 1;

Figure 4 is a view similar to Figure 3 showing the locking post in open position;

Figure 5 is an enlarged sectional view through a modified form of locking post showing the post in locked position;

Figure 6 illustrates the locking post of Figure 5 in open position;

Figure 7 is an enlarged sectional view through another modified form of locking post showing the locking post in locked position; and

Figure 8 illustrates the locking post of Figure 7 in open position.

The loose leaf binder to which this invention is applied consists of a pair of clamping or back members 2 and 3 which are movable transversely relative to each other. Cover members 4 are hinged to the back members, as indicated at 5. The ends of the back member 2 are bent over, as indicated at 6, to form guide channels in which the ends of the back member 3 are moved. Interengaging tongues 7 and 8 on the bent over portion 6 and the back member 3, respectively, prevent separation of the back members.

A pair of metal plates 9 and 10 is rigidly secured to the back members 2 and 3 so as to form a tubular compartment 11 adjacent the outer edges of the back members 2 and 3. The compartments 11 extend the length of the binder back and are closed at the ends by end caps 12 of felt or suitable material to prevent the binder from marring any finished surface on which it may be handled. The back members 2 and 3 are connected by a pair of posts 13 each of which consists of a tubular section 14 rigidly secured to the plate 9, as shown at 15, and a second tubular section 16 secured to the plate 10, as shown at 17, and adapted to telescope into the section 14. A coiled spring 18 is contained within the telescopic post 13 and normally tends to expand to separate the back members 2 and 3. The back members 2 and 3 are also connected by a pair of telescopic locking posts 19.

Each locking post 19 consists of a tubular section 20 rigidly secured to the plate 10, as shown at 21, and a solid section 22, rigidly secured to the plate 9, as shown at 23, and adapted to telescope into the tubular section 20. The solid section 22 is provided with a plurality of notches 24 adjacent its inner end. Each notch has one horizontal wall 25 and an inclined wall 26. In my preferred embodiment I have shown four notches arranged in diametrically opposite pairs with one pair at a different level from the other and at right angles thereto. However, it is obvious that the number and arrangement of the notches may be varied at will.

Each notch is provided with a gravity operated locking plate 27. These locking plates are thin metallic wafers having a shape approximately that of a semi-circle. The width of the locking plate measured outwardly, that is the distance from the center of the chord constituting the straight side of the plate to the center of the arc constituting the curved side of the plate, is greater than the radial corresponding width of the horizontal surface 25 of the notch 24, but less than the corresponding width of the inclined surface 26 of the notch. This causes the locking plates 27 to lie adjacent the inclined surface 26 out of holding contact with the tubular section 20 to permit expansion of the binder when the locking post 19 is in the open position illustrated in Figure 4. It will be understood that the expansive force of the coiled springs 18 will continue to hold the locking parts in engagement even when the binder is

reversed from the position shown in Figure 3 to that shown in Figure 4. A slight pressure applied to the top cover member and quickly released will serve to dislodge the locking plates from holding position. When the binder is inverted so that the locking post occupies the position of Figure 3, gravity causes the plates 27 to move toward the horizontal surface 25 into holding contact with the tubular section 20 to prevent expansion of the binder. Although the inclined surface 26 of the notch 24 might be left smooth, I prefer to provide a projection 28 to eliminate any possibility of adhesion of the locking plate 27 to the inclined surface 26 when the locking post occupies the position of Figure 3.

The interior surface of the tubular section 20 of the locking post is roughened to provide a suitable holding surface for the locking plates 27. As shown in Figures 3 and 4, the preferred form of roughened surface consists of the provision of a double thread 29 which extends over substantially the entire interior surface of the tubular section. The double thread is preferred because it allows the locking plates in diametrically opposite notches at the same level to engage the trough of the thread at the same time. The second pair of notches are spaced at right angles to the first pair and are spaced vertically therefrom a distance equal to a multiple of one half the pitch of the thread plus one fourth of the pitch so that the locking plates positioned therein will engage the trough of the thread at the same time as the first pair. This arrangement of parts insures engagement of all four locking plates with the trough of the thread at the same time so that the full benefit of the multiplicity of locking plates is realized.

While in the preferred embodiment of my invention, illustrated in Figures 1 to 4 inclusive, the interior surface of the tubular section 20 of the locking post 19 is roughened, this feature is not essential to the invention as the interior surface may be substantially smooth. In this event the frictional contact of the locking plate 27 will serve to hold the sections of the locking post against expansion.

The modified embodiment of my invention illustrated in Figures 5 and 6 differs from the preferred embodiment only in that the solid section 30 of the locking post is provided with a longitudinal recess 31 in which a gravity operated rod 32 is positioned. When the locking post is in the open position illustrated in Figure 6, the rod 32 lies below the inclined surface 33 of the notch 34 and does not interfere with the expansion of the post. When the binder is inverted so that the locking post occupies the position illustrated in Figure 5, the gravity rods 32 fall against the locking plates 27 to force them into holding contact with the trough of the thread 29.

The modification illustrated in Figures 7 and 8 includes a fixed pin 35 bridging the notch 36. The locking plates 37 are provided with a recess 39 which is adapted to engage the pin 35 so as to guide the locking plate and prevent lateral movement of the locking plate in the notch.

While I have described a few embodiments of my invention in detail, it will be understood that the description thereof is illustrative rather than restrictive, as many details may be modified or changed without departing from the spirit or scope of my invention. Accordingly, I do not desire to be restricted to the exact construction described, except as limited by the appended claims.

I claim:

1. A locking post including a pair of telescopic sections, the inner section being provided with a notch having a substantially horizontal wall and a second wall extending at an acute angle to said first mentioned wall, and a flat locking element positioned with an edge in said notch, the width of said locking element measured outwardly being greater than the corresponding width of said first mentioned wall and less than the corresponding width of said second mentioned wall.

2. In a loose leaf binder, a locking post comprising a pair of telescopic sections, one of said sections being provided with a notch having a substantially horizontal wall and an inclined wall, a locking element positioned in said notch, and a projection on said inclined wall to prevent adhesion of said locking element to said inclined wall.

3. In a loose leaf binder, a locking post comprising a pair of telescopic sections, one of said sections having a notch, a locking element in said notch, a recess in said locking element, and a pin bridging said notch vertically and engaging said recess to guide said locking element.

4. In a locking post for loose leaf binders, an inner section provided with an inclined V-shaped notch, a tubular outer section telescoping over said inner section, and a locking plate positioned in said notch with one edge adjacent the apex of said V-shaped notch, said locking plate being actuatable by gravity to pivot on its inner edge from open to locking position.

5. In a locking post for loose leaf binders, a pair of telescoping sections, the inner section being provided with a V-shaped notch, a locking plate positioned in said notch, one wall of said notch having sufficient length to permit said locking plate to lie thereagainst out of locking engagement with the outer section, the other wall of said notch being shorter than said locking plate so that when the post is inverted and the locking plate approaches parallelism with the shorter wall the locking plate will project beyond the surface of the inner section into locking engagement with the outer section.

6. A locking post comprising a pair of telescoping sections, one of said sections being provided with a notch having an inclined wall, and a locking plate in said notch, said locking plate lying against said inclined wall out of locking engagement when said post is in one vertical position and pivoting in the angle of the notch into locking engagement when said post is inverted.

7. A locking post comprising a pair of telescopic sections, one of said sections having a notch, and a locking plate disposed in said notch crosswise of said section and bearing against the other section for locking said sections together, said locking plate being normally inclined with respect to the post and actuatable by gravity when said post is in a vertical position.

8. A locking post comprising a pair of telescopic sections, the inner section having a notch with one wall inclined with respect to said section and another wall at right angles thereto, and a locking element positioned in said notch, said locking element being approximately the shape of a segment of a circle, the maximum dimension across said locking element perpendicular to the flat edge being less than the corresponding dimension across the inclined wall of said notch and greater than the corresponding dimension across said second mentioned wall.

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