May 20, 1930. P. O. UNGER 1,759,426

LOCK FOR LOOSE LEAF BINDERS

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FIG. 1.

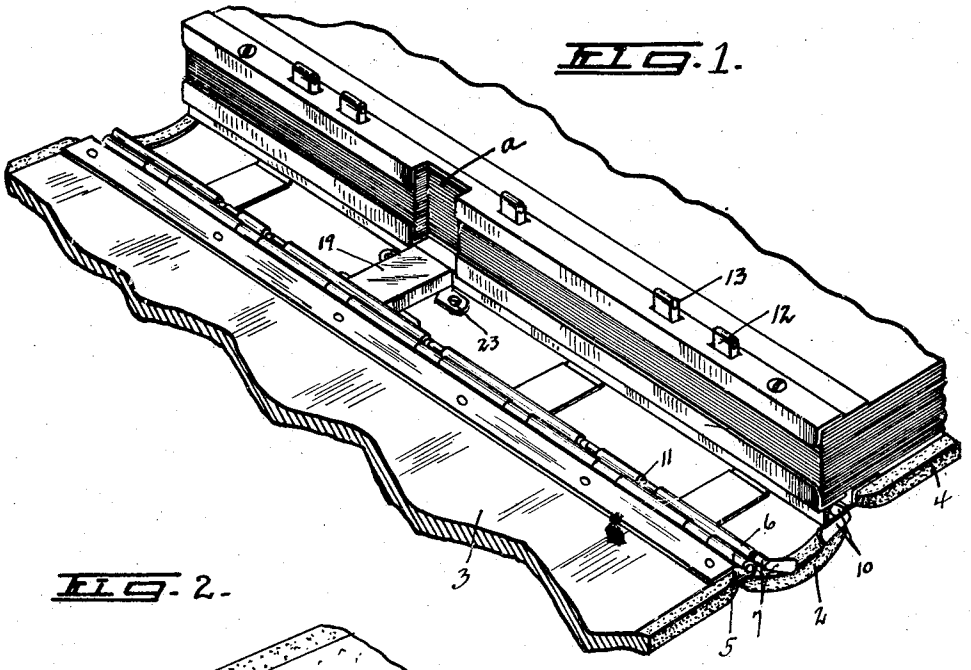

FIG. 2.

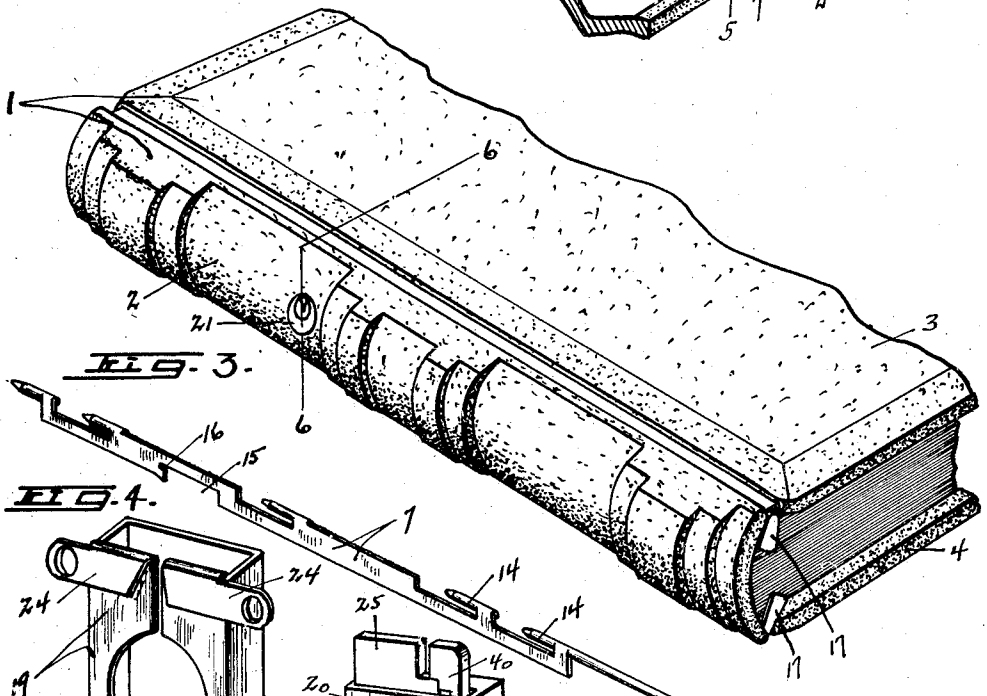

FIG. 3.

FIG. 4.

FIG. 5.

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Fig. 6.

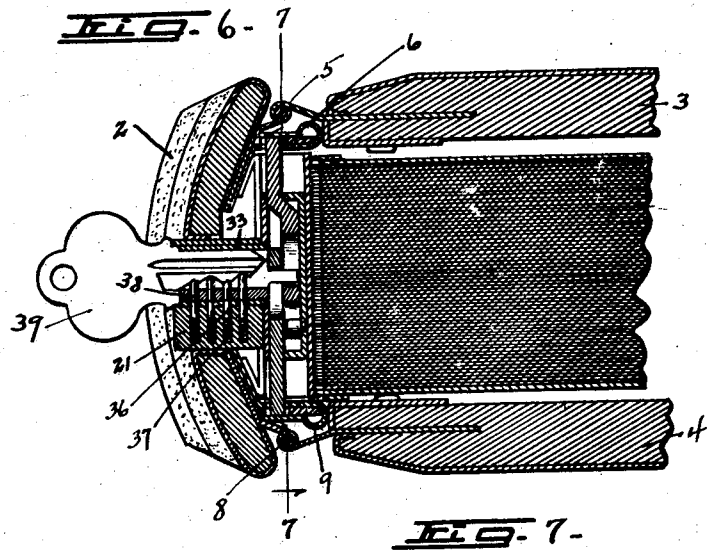


Fig. 7.

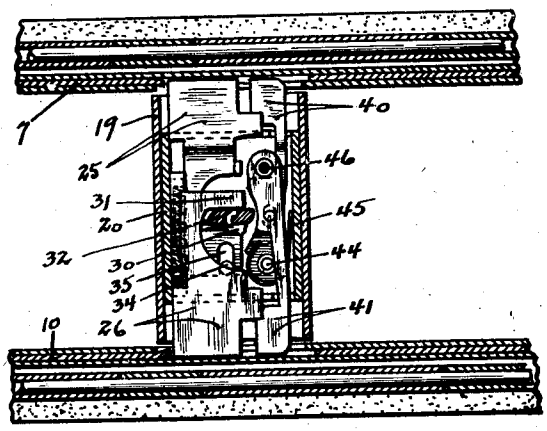


Fig. 8.

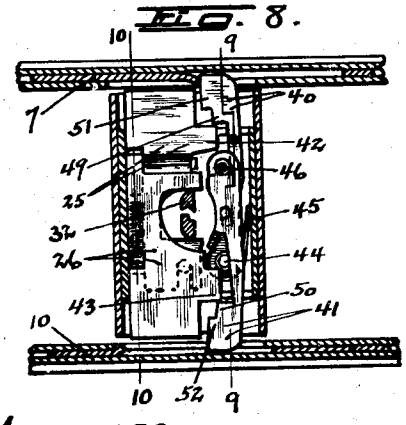


Fig. 9.

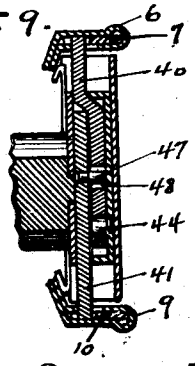
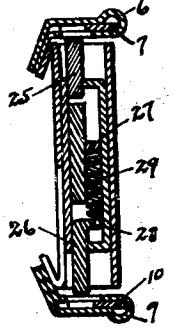


Fig. 10.



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UNITED STATES PATENT OFFICE

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LOCK FOR LOOSE-LEAF BINDERS

Application filed October 13, 1928. Serial No. 312,258.

This invention relates to a new and improved lock for loose leaf binders and is particularly well adapted for use with the type of binder which is usually called a post binder.

In binders of this type in which the leaves are retained in the binder by virtue of the fact that they are provided with apertures through which the posts of the binder extend it is necessary that some means be provided whereby the posts will be releasably held in position in the housings of the binder so that when desired they may be released therefrom to permit the insertion or withdrawal of leaves.

In the use of binders of this type it is frequently desirable to have a positive locking means for the posts so that they may not be withdrawn from the housing except by the use of a key so that it will be impossible for an unauthorized person to change the leaves in the binder.

It is also desirable in binders of this character to have them so constructed that either of the ends of the posts may be released from their respective housings as desired, and the main object of my invention is to provide a locking means for a post binder which by a single device will lock in position in their housings both ends of the posts but which is of such a design that when it has been unlocked either ends of the posts may be withdrawn as desired, leaving the opposite ends locked in position.

Another object of my invetion is to provide a locking device which may be placed in the unlocked position by means of a key but which will remain in such unlocked position after the withdrawal of the key. It is also desirable in binders of this character to provide a means which will automatically lock the posts in position when they have been placed and secured in the housing without the necessity of a further manipulation of the lock by means of the key, and another object of my invention is to provide a locking means which will automatically return to the locked position when the ends of the posts which have been removed from a housing are again placed in position in the housing.

Other objects and advantages relate to the size, shape and arrangement of parts all as will more fully appear from the following description taken in connection with the accompanying drawings, in which:

Figure 1 is a perspective view, partially broken away, of a binder embodying my device with the posts released from one housing and with leaves in position on the posts.

Figure 2 is a perspective view, partially broken away, of the back end of a binder in the closed position showing the location of my lock.

Figure 3 is a perspective view of a pintle carrying slide which is used to secure the posts in a housing.

Figure 4 is a perspective view of the casing in which my lock is positioned.

Figure 5 is a perspective view of my lock.

Figure 6 is a section, partially broken away, on a larger scale on line 6—6 of Figure 2 showing a key in position in my lock.

Figure 7 is a section on line 7—7 of Figure 6 showing my lock in the locking position.

Figure 8 is a section similar to Figure 7 showing my lock in the unlocked position.

Figure 9 is a section on line 9—9 of Figure 8.

Figure 10 is a section on line 10—10 of Figure 8.

For the purpose of explaining the construction and operation of my improved lock for loose leaf binders I have here shown a binder 1 having a back member 2 with a cover 3 hingedly connected to one longitudinal edge thereof and with a second cover 4 hingedly connected to the other longitudinal edge thereof. Adjacent the hinge 5 which connects cover 3 to back 2 I provide a housing 6 for a pintle carrying slide 7 and adjacent hinge 8 which connects cover 4 to back 2 I provide a similar housing 9 for a pintle carrying slide 10. Housings 6 and 9 are secured to back 2 by rivets or other convenient means, not shown, and are provided with a plurality, in this case shown as five, of apertures 11, such apertures being shown only in housing 6, see Figure 1. Apertures 11 are provided for the reception of the ends of posts 12, such posts 12 being provided with

apertures 13 into which pintles 14 on pintle carrying slides 7 and 10 are positioned for the purpose of securing the opposite ends of posts 12 in housings 6 and 9.

I have shown in Figure 3 the construction of pintle carrying slide 7 and inasmuch as pintle carrying slide 10 is similar in construction a description of pintle carrying slide 7 will also be a description of pintle carrying slide 10. Pintle carrying slide 7 carries on one edge a plurality, in this case shown as five, of pintles 14, the ends of pintles 14 being spaced from the body of pintle carrying slide 7 a sufficient distance to receive between such ends and such body the ends of posts 12 when the pintle carrying slide 7 is in the retracted position. I provide on the opposite edge of pintle carrying slide 7 a slot 15 having at one end an outwardly extending tongue 16. The function of slot 15 and tongue 16 will be hereinafter described. Pintle carrying slide 7 is provided with a handle or tab 17 extending outwardly from housing 6 to facilitate the manual manipulation of pintle carrying slide 7. When pintle carrying slides 7 and 10 are in the retracted position the apertures 11 in housings 6 and 9 will be out of registration with pintles 14 to permit the entrance therein of the ends of posts 12. When the pintle carrying slides 7 and 10 are then moved inwardly to the locking position pintles 14 will enter apertures 13 in posts 12 to prevent removal of posts 12 from housings 6 and 9.

In order to prevent the retraction of pintle carrying slides 7 and 10 for the purpose of permitting the removal of posts 12 from either housing 6 or housing 9 I provide a lock 18. For the purpose of securing lock 18 in position in the binder I provide a casing 19 in which lock 18 is positioned. Lock 18 is positioned in casing 19 with its main case 20 enclosed in casing 19 and with its lock mechanism retaining barrel 21 extending outwardly from casing 19 through an aperture in the back 2 so that the outer edge of barrel 21 carrying the key slot 22 is flush with the outside surface of back 2, as may be seen in Figure 2. Casing 19 carrying lock 18 is positioned on the inner surface of back 2 and is secured thereon by screws 23 positioned in outwardly extending tabs 24 formed on casing 19. The length of casing 19 is such that the opposite ends thereof are in registration with housings 6 and 9, such opposite ends of casing 19 being open and in registration with apertures in housings 6 and 9. The relation of parts is such that when pintle carrying slides 7 and 10 are in the normal or locked position slot 15 will be in registration with an open end of casing 19 and a similar slot in pintle carrying slide 10 will be in registration with the opposite open end of casing 19.

The relation of parts is such that when the locking bolts 25 and 26 of lock 18 are in the locking position they will extend outwardly through the opposite open ends of casing 19 through apertures in housings 6 and 9 and into engagement with slots 15 in pintle carrying slides 7 and 10 to prevent the retraction of pintle carrying slides 7 and 10 in housings 6 and 9 with the result that pintles 14 cannot be withdrawn from apertures 13 in posts 12.

To permit the closing of the binder with casing 19 in position on back 2 the leaves used in the binder are provided with slots as shown at —*a*— in Figure 1 to permit casing 19 to extend upwardly therein when the binder is in the closed position.

As perhaps may best be seen from Figures 7 and 8 my locking mechanism consists of a casing 20 in which are slidably mounted bolts 25 and 26. Bolt 25 has a rearwardly extending lug 27, see Figure 10, and bolt 26 has a corresponding rearwardly extending lug 28 between which is positioned a coil spring 29 to normally force the ends of bolts 25 and 26 outwardly from casing 19 into housings 6 and 9 respectively and into engagement with slots 15 in pintle carrying slides 7 and 10.

Bolt 25, see Figures 7 and 8, has a laterally extending shoulder 30 and bolt 26 has a corresponding laterally extending shoulder 31 in spaced relation, the distance therebetween, when bolts 25 and 26 are in the locking position, permitting the entrance therebetween of the cam shaped end 32 of cylinder 33 rotatably mounted in barrel 21.

For the purpose of holding bolts 25 and 26 in alinement bolt 26 is provided with a pin 34 slidably mounted in a slot 35 in bolt 25.

As perhaps may best be seen from Figure 6 cylinder 33 is rotatably mounted in barrel 21 and is normally held against rotation due to the fact that barrel 21 is provided with a plurality, in this case shown as four, of pins 36 backed by springs 37 and normally extending upwardly into apertures in cylinder 33 to prevent the rotation of cylinder 33 with respect to barrel 21. For the purpose of permitting the rotation of cylinder 33 in relation to barrel 21 I provide in each of the apertures in cylinder 33 into which pins 36 normally extend pins 38 of different lengths which extend upwardly into key slot 22. When a properly shaped key 39 is inserted into key slot 22, pins 38 will be placed in engagement with corresponding pins 36 and will force the same into barrel 21 a sufficient distance so that they will be out of engagement with cylinder 33 and cylinder 33 may then be rotated in barrel 21 which will cause the cam end 32 of cylinder 33 to rotate between shoulders 30 and 31 to force the same apart into the position shown in Figure 8 which will cause bolts 25 and 26 to move out of engagement with slots 15 in pintle carrying slides 7 and 10.

For the purpose of retaining bolts 25 and 26 in the retracted or unlocked position when cylinder 33 is then returned to the normal position to permit the withdrawal of key 39, I provide a pair of pivoted detents 40 and 41 adapted to engage shoulders 42 and 43 on bolts 25 and 26 respectively. Detent 40 is pivotally mounted in case 20 by means of a pin 44 and is spring pressed towards bolt 25 by a spring 45 interposed between the pivoted end of detent 40 and a side of casing 20. Detent 41 is similarly pivotally mounted in case 21 by a pin 46. Detent 40 is provided with a stud 47 which extends into a slot 48 in detent 40 so that the movement of detent 40 about its pivot 41 towards bolt 25 will cause a corresponding movement of detent 41 about its pivot 46 towards bolt 26. Detents 40 and 41 being spring pressed towards bolts 25 and 26 respectively when such bolts are retracted in the manner just described, a shoulder 49 on detent 40 will engage shoulder 42 on bolt 25 and a shoulder 50 on detent 41 will engage shoulder 43 on bolt 26 to releasably hold bolts 25 and 26 in the retracted position.

The length of detent 40 is such that it extends at all times into casing 6 and into one end of slot 15 in pintle carrying slide 7. Similarly the length of detent 41 is such that it extends at all times into casing 19 and into one end of slot 15 in pintle carrying slide 10.

The relation of parts is such that when bolts 25 and 26 are in the retracted or unlocked position and pintle carrying slide 7 is retracted to release pintles 14 from apertures 13 in posts 12 to permit the removal of posts 12 from housing 6, the tongue 16 will contact with the end of detent 40 to force the same outward against the action of spring 45 and release shoulder 42 from shoulder 49 thereby permitting spring 29 to force bolt 25 through casing 19 and against pintle carrying slide 7 so that when pintle carrying slide 7 is moved inwardly to the locking position bolt 25 will be automatically spring pressed outwardly into slot 15 to lock pintle carrying slide 7 in position. The outward movement of detent 40 from engagement with bolt 25 will cause, through pin 47 and slot 48, a similar outward movement of detent 41 so that shoulder 43 on bolt 26 will be released from shoulder 50 on detent 41 and bolt 26 will then be spring pressed outwardly into housing 9 and into engagement with slot 15 in pintle carrying slide 10.

Similarly if the ends of the posts 12 which are in housing 9 are released by the retraction of pintle carrying slide 10 the tongue 16 on pintle carrying slide 10 will engage detent 41 to move the same out of engagement with bolt 26 which will result in the movement of detent 40 out of engagement with bolt 25. That is to say, when the mechanism is in the unlocked position and one end of posts 12 are released in the housing in which they were positioned the locking mechanism will by such action be placed in a position for automatically locking the binder when the parts are returned to the normal position irrespective of which end of the posts 12 are released.

For the purpose of limiting the outward movement of bolts 25 and 26 I provide on detent 40 a second shoulder 51 which engages shoulder 42 on bolt 25 when the same is moved outward to the locking position, and I provide a similar shoulder 52 on detent 41 which engages shoulder 43 on bolt 26 when the same is moved outward to the locking position.

It will be understood that my locking device for loose leaf binders may be changed in order that the same may be adapted to be used with different types of binders without departing from the spirit of my invention, for altho I have shown and described a specific structure and form of part as an exemplification of my invention I do not desire to restrict myself to the exact size, shape or relation of parts as various changes may be made within the scope of the appended claims.

I claim:

1. In a device of the class described, a back member, a pair of opposed covers hingedly connected thereto, a pair of opposed housings secured to the back member, a plurality of leaf retaining posts adapted to have their opposite ends positioned in the housings, means for securing one end of the posts in one housing and additional means for securing the other end of the posts in the other housing, a means for locking both such securing means in position, key actuated means for moving such locking means to the unlocked position, and means for retaining such locking means in the unlocked position after the removal of the key.

2. In a device of the class described, a back member, opposed covers hingedly connected to the back member, a pair of opposed housings secured to the back member, a pintle carrying slide slidably mounted in each housing, a plurality of leaf retaining posts adapted to have their opposite ends positioned in said housings in engagement with the pintles on the pintle carrying slides, means for locking the pintle carrying slides in the housings, key actuated means for moving such locking means to the unlocked position whereby the pintle carrying slides are simultaneously released, and means actuated by the movement of a pintle carrying slide for causing the locking means to engage the other pintle carrying slide in the locking position.

3. In a device of the class described, a back member, opposed covers hingedly connected thereto, opposed housings secured to the back member, a pintle carrying slide positioned in each housing, a plurality of leaf retaining posts having their opposite ends posi-

tioned in the housings in engagement with the pintles on the pintle carrying slides, means for locking the pintle carrying slides in the housings, key actuated means for simultaneously withdrawing the locking means from engagement with the pintles to permit the movement of a selected pintle in its housing, and automatic means for engaging the locking means with the last named pintle after a return movement of such pintle in its housing.

4. In a device of the class described, a back member, a pair of opposed covers hingedly connected thereto, a pair of opposed housings secured to the back member, a plurality of leaf retaining posts having their opposite ends positioned in the housings, means for securing one end of the posts in one housing and separate means for securing the opposite ends of the posts in the other housing, a key actuated locking means positioned in the back member for locking both the securing means in position, said locking means having a key receiving slot extending through the back member to the rear face thereof.

5. In a device of the class described, a back member, opposed covers attached to the back member, a pair of opposed housings secured on the back member, a plurality of leaf retaining posts having their opposite ends positioned in the housings, means in each housing for releasably securing the ends of the posts in the housing, automatic means for locking said securing means in the securing position, means for holding the locking means in the unlocking position, and means actuated by the securing means for returning the locking means to the locking position.

6. In a device of the class described, a back member, opposed covers hingedly connected to the back member, opposed housings secured to the back member, a plurality of leaf retaining posts adapted to have their opposite ends positioned in said housings, a securing means in each housing adapted to engage the ends of the posts, a locking means positioned between said housings and having opposed bolts normally spring pressed towards opposed housings for engagement with the securing means positioned therein, and means for moving the bolts away from the housings.

7. In a device of the class described, a back member, opposed covers hingedly connected to the back member, opposed housings secured to the back member, a plurality of leaf retaining posts adapted to have their opposite ends positioned in said housings, a securing means in each housing adapted to engage the ends of the posts, a locking means positioned between said housings and having opposed bolts normally spring pressed towards opposed housings for engagement with the securing means positioned therein, means for moving the bolts away from the housings, and means for releasably holding the bolts away from the housings.

8. In a device of the class described, a back member, opposed covers hingedly connected to the back member, opposed housings secured to the back member, a plurality of leaf retaining posts adapted to have their opposite ends positioned in said housings, a securing means in each housing adapted to engage the ends of the posts, a locking means positioned between said housings and having opposed bolts normally spring pressed towards opposed housings for engagement with the securing means positioned therein, means for moving the bolts away from the housings, and means for releasably holding the bolts away from the housings, said means comprising pivoted detents operatively connected together and spring pressed toward the bolts whereby a detent will engage a bolt.

9. In a device of the class described, a back member, opposed covers hingedly connected to the back member, opposed housings secured to the back member, a plurality of posts having their opposite ends positioned in the housings, a pintle carrying slide in each housing adapted to engage the ends of the posts, a locking means positioned between said housings and having opposite bolts normally spring pressed towards opposed housings and into engagement with the pintle carrying slides, means for moving the bolts away from the housings, means for releasably holding the bolts away from the housings, said means comprising pivoted detents operatively connected together and spring pressed towards the bolts whereby a detent will engage a bolt, and means on the pintle carrying slides for moving a detent out of engagement with a bolt.

In witness whereof I have hereunto set my hand this 9th day of October, 1928.

PAUL O. UNGER.