Oct. 19, 1937. W. E. THOMSON 2,096,701

LOOSE LEAF BINDER

Filed Dec. 20, 1934 2 Sheets-Sheet 1

FIG. 1.

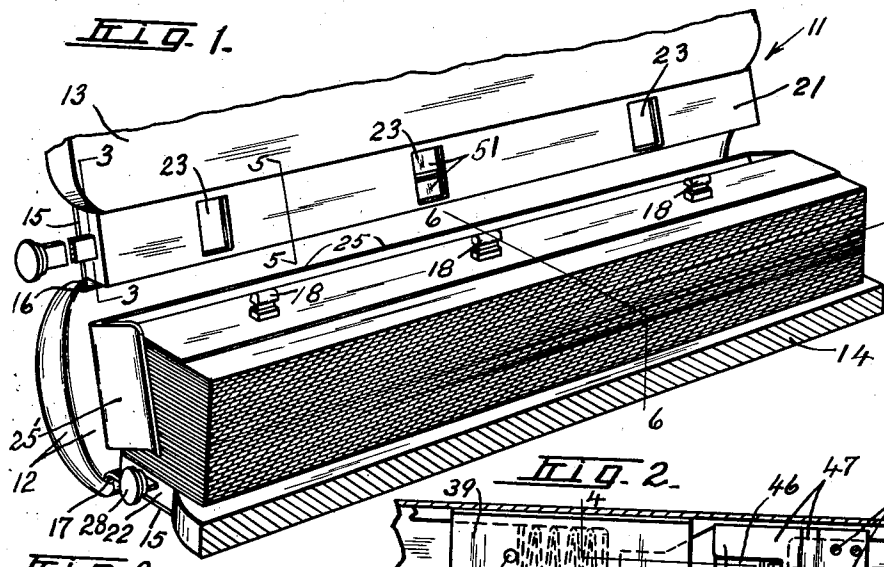


FIG. 2.

FIG. 3.

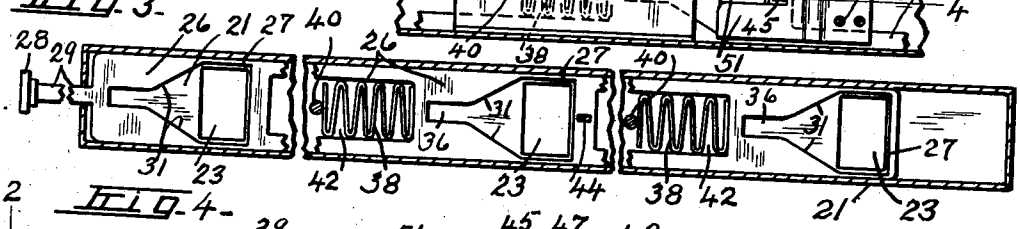


FIG. 4.

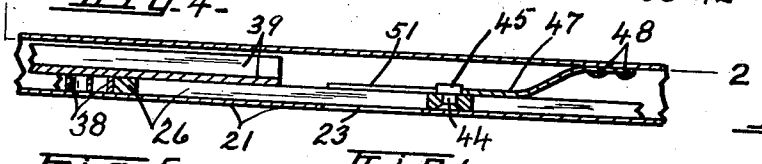


FIG. 7.

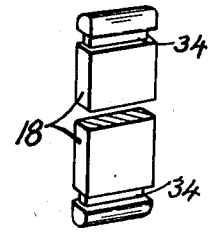


FIG. 5.

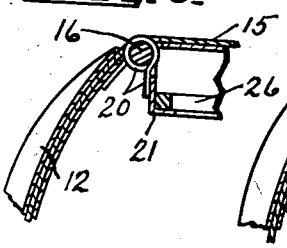
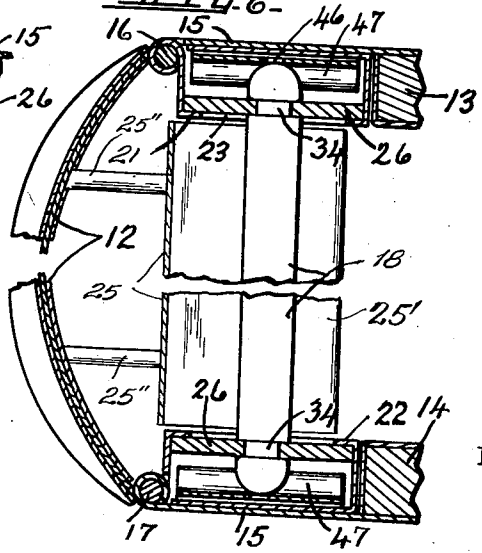


FIG. 6.



WITNESS

J. T. Mains

INVENTOR

BY Winslow E. Thomson

Hoyt, Keay & Caulfield

ATTORNEYS

Oct. 19, 1937. W. E. THOMSON 2,096,701

LOOSE LEAF BINDER

Filed Dec. 20, 1934 2 Sheets-Sheet 2

FIG. 8.

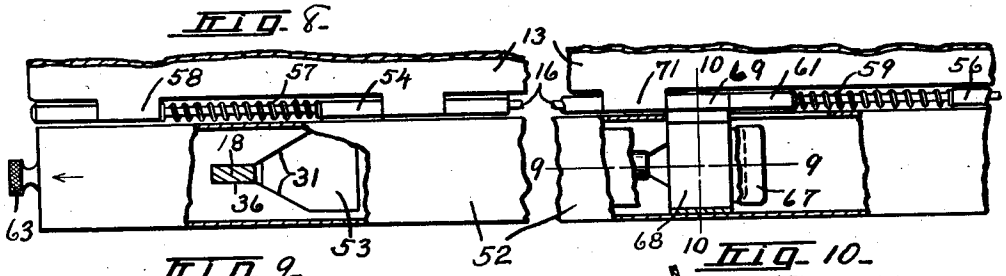


FIG. 9.

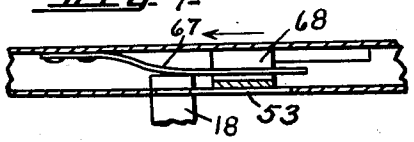


FIG. 10.

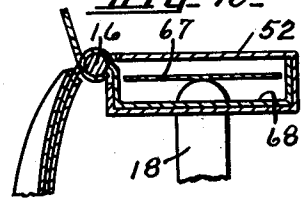


FIG. 11.

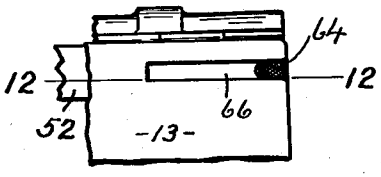


FIG. 12.

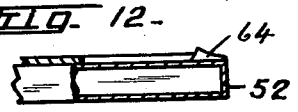


FIG. 14.

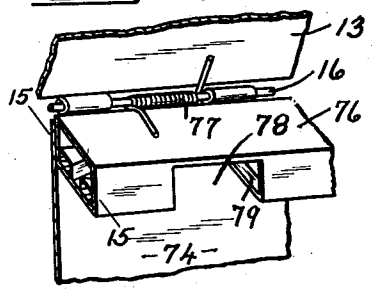


FIG. 13.

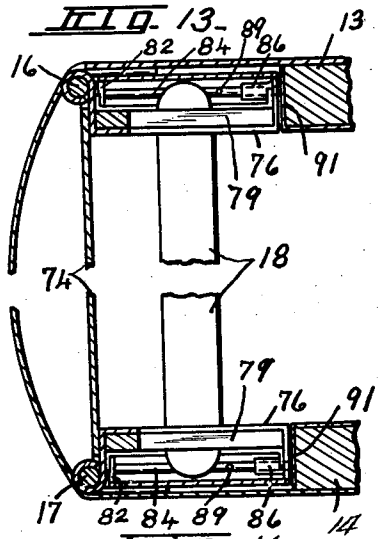


FIG. 15.

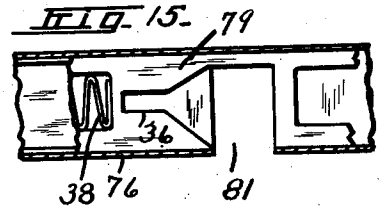
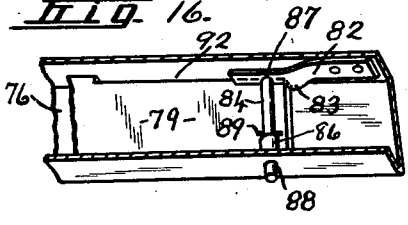


FIG. 16.



INVENTOR

Winslow E. Thomson

BY

Hoyt, Keay & Campbell

ATTORNEYS

WITNESS

J. J. Mains

Patented Oct. 19, 1937 2,096,701

UNITED STATES PATENT OFFICE

2,096,701

LOOSE LEAF BINDER

Winslow E. Thomson, Syracuse, N. Y., assignor to McMillan Book Company, Syracuse, N. Y., a corporation of New York

Application December 20, 1934, Serial No. 758,369

11 Claims. (Cl. 129—23)

This invention relates to loose leaf binders and more particularly to automatic loose leaf binders in which the binder covering is automatically secured to the posts during the reassembly of the binder as disclosed, for example, in Harold C. Lenhart application Serial No. 613,905, filed May 27, 1932, and Arthur W. McClure application Serial No. 672,844, filed May 25, 1933.

In the Lenhart type of automatic loose leaf binder, a housing, rigidly carried by the back member of the binder covering, has mounted therein a pintle carrying slide, the pintles of which are adapted to be automatically projected through openings in the leaf impaling posts when the slide is tripped during the closing of the cover. In the Lenhart construction, when the binder covering is free from one end of the posts so that the back and the covers are lying on the table in substantially the same plane, because the secured ends of the posts are free to rotate about the pintles, it is very difficult to retain the posts in alinement during the process of inserting or removing sheets of paper from the binder. It will, therefore, be apparent that it is necessary in the Lenhart binder to provide some means for bringing the posts back into alinement before the pintle slide is tripped, otherwise the pintles will not enter the openings in the posts if the posts should be out of alinement. In the Lenhart construction, a post-alining device, such as that shown in the Unger Patent No. 1,909,320, is used.

This method of alining the posts is, however, not entirely satisfactory because when the posts are badly out of alinement, it is necessary for the operator to push on the front edges of the stack of paper to bring the posts into approximate alinement before the alining edge, which is mounted on the cover, is capable of striking the posts to bring the posts into accurate alinement. Because of the necessity of bringing the posts accurately into alinement before releasing the slide, a careless operation is very likely to cause the pintles to become bent and some difficulty has been encountered in the commercial structure of the Lenhart applications due to bent pintles.

In automatic loose leaf binders of the type disclosed in the McClure application above referred to, the same difficulty of retaining the posts in alinement is encountered. In the McClure construction, however, the housings which carry the post latches are hinged to the back of the binder and during reassembly of the binder the openings in the housings are swung over the tops of the posts. Upon closing the cover the weight thereof is exerted on the top of the housing which cams the posts into the openings in the housing to enable the latches to engage the ends of the posts. However, because the posts must be approximately in alinement before they will enter the openings in the housing, it is usually necessary for the operator to manually push the posts into appropriate alinement by pressing on the front edges of the stack of paper.

An object of the present invention is to eliminate the difficulties encountered in the above-mentioned automatic loose leaf binders and provide a binder of the automatic loose leaf type in which means are provided for retaining the posts vertical and in alinement with each other when the binder covering is free from one end of the posts for the purpose of inserting or removing sheets of paper.

A further object of the present invention is to provide an automatic loose leaf binder in which the impaling posts are rigidly maintained in a substantially vertical position and substantially in alinement with each other when the binder is in condition to enable the insertion or removal of sheets of paper.

A further object of the present invention is to provide a loose leaf binder of the automatic type in which the binder covering may be released from either end of the posts to enable the insertion or removal of sheets of paper and the provision of means adapted to grasp the posts in a manner such that they are prevented from turning and getting out of alinement with each other whereby the posts are always maintained substantially in alinement so that the cover, during reassembly of the binder, may be thrown to a closed position and the binder covering automatically secured to free ends of the posts.

Still another object of my invention is to provide an automatic loose leaf binder in which the housing carrying the post latching means is provided with enlarged openings so that the posts will readily enter the openings in the housing; the provision of post latching means within the housing capable of bringing the cover and back into the proper relationship with the posts upon the posts entering the openings in the housings; and the provision of means for locking the binder covering in such position.

Further objects and advantages pertaining to the details of my invention will be apparent from the following description taken in connection with the accompanying drawings in which:

Figure 1 is a perspective view of a portion of

my automatic loose leaf binder with the binder covering free from one end of the posts;

Figure 2 is a view taken on line 2—2 of Figure 4;

Figure 3 is a view taken on line 3—3 of Figure 1;

Figure 4 is a view taken on line 4—4 of Figure 2;

Figure 5 is a view taken on the line 5—5 of Figure 1;

Figure 6 is a view taken substantially on the line 6—6, Figure 1, with the binder in assembled condition;

Figure 7 is an enlarged view of an impaling post suitable for use with my binder construction;

Figure 8 is a partial view illustrating a modified form of the automatic loose leaf binder shown in Figures 1 to 6 inclusive;

Figure 9 is a view taken on the line 9—9 of Figure 8;

Figure 10 is a view taken on the line 10—10 of Figure 8;

Figure 11 is a view showing a means for moving the slide;

Figure 12 is a view taken on the line 12—12 of Figure 11;

Figure 13 is a partial sectional view showing another modified form of my invention;

Figure 14 is a perspective view of a portion of the structure shown in Figure 13;

Figure 15 is a view taken on the line 15—15 of Figure 14; and

Figure 16 is a view showing the means for releasing the slide of the structure shown in Figures 13, 14 and 15.

As illustrated in the drawings, the structure of my invention comprises a binder covering generally indicated by the numeral 11 consisting of a back member 12 and a pair of covers 13 and 14 which are hinged to the back member 12 through metallic plates 15 by means of hinge pintles 16 and 17. The metallic plates are substantially flush with the tops of the covers and the difference in thickness between the metallic plates and the covers forms a pair of recesses for receiving the mechanisms for securing the binder covering to the opposite ends of a plurality of impaling posts indicated by the numeral 18.

The impaling posts 18, of which there may be any number dependent upon the type and intended use of the book, are adapted to retain a quantity of paper 19 in position by placing the post-receiving openings in the sheets of paper over the posts and locking the ends of the posts to the binder covering. If desired, although not entirely necessary in connection with my invention, a plate 25 may be secured to the back member and held in abutting relationship against the rear edge of the stack of paper by rivets 25''. The plate may be provided with side portions 25' adapted to aid in keeping the paper in the proper position.

Preferably at the same hinge points to which the covers are hinged to the back member, a pair of housings 21 and 22 are hinged to each longitudinal edge of the back member 12. The housings 21 and 22 are thus capable of movement relative to the cover about the hinge pintles 16 and 17 but when either of the covers are open and the corresponding housing is released from the posts, the housing associated with the open cover is retained against its associated metallic plate, in the recess formed in the cover, by a spring 20. When the binder covering is secured to both ends of the posts, the covers may be opened about the hinge posts 16 and 17 independently of the housings 21 and 22. The construction thus far described is essentially the same as that described in the co-pending McClure application above referred to. Since the housings 21 and 22 and the mechanism contained in each are the same, a description of one of the housings and its associated parts will suffice.

The housing 21 is provided with a plurality of openings 23 which are adapted, when the cover is moved from the position shown in Figure 1 toward a closed position, to move over the tops of the posts to enable means inside the housing to engage the free ends of the posts whereby to secure the binder covering to the ends of the posts. While the width of the housing is limited by practical considerations it is desirable in my invention for reasons later set forth, that the openings 23 be as wide as possible and extend substantially the entire width of the housing 21.

Mounted in the housing 21 is a slide 26 provided with openings 27 therein adapted, when the binder covering has been released from one end of the posts, to overlie the openings in the housings as shown in Figures 1 and 2. The slide 26 is provided with a finger piece 28 which is secured to a portion 29 of the slide which extends through an opening in the housing. Each of the openings 27 in the slide 26 is of peculiar shape and is provided with inclined cam surfaces 31 which terminate in straight-sided locking portions 36. Each of the posts has at each end thereof a notch 34 which is formed around the complete periphery of the post but which may, if desired, consist of two notches formed only on the opposite longitudinal sides of the posts. The locking portions 36 of the slide are adapted when the binder covering is closed to engage the notches 34 in the ends of the posts to lock the binder covering to the ends of the posts. The post notches are slightly wider than the thickness of the metal of the slide so that the locking portions 36 of the slide will freely enter the post notches. The edges of the post notches may, if desired, be beveled as shown so that the locking portions 36 will move readily into the notches.

The slide 26 is normally pressed by means of a spring towards a position such that the locking portions 36 of the slide 26 will engage the notches 34 on the posts, or, if desired, for this purpose two springs 38 may be used. The springs are retained in position by retaining plates 39 which are secured in any suitable manner to the housing 21. One end of each of the springs abuts against a pin 40 secured to the housing while the other end of the spring abuts against a portion of the slide, the slide being cut out as at 42 to accommodate the springs.

Means are provided for retaining the slide in the unlatched position, such means including a pin 44 secured to the slide and provided with a latch head 45. When the slide is moved toward a position to release the binder covering from the ends of the posts, the latch head engages the end of a slot 46 formed in a spring latch member 47. The spring latch member 47 extends substantially the entire width of the housing and is secured to the top of the housing 21 by means of rivets 48. An extension 51 of the spring latch member 47 projects over one of the openings in the housing and over one of the openings in the slide when the slide is in the retracted position. In this position, the extension is adapted to be engaged by the end of a post as the post enters

the openings in the housing and slide to unlock the latch member 47 and enable the slide to move toward locking position under the action of the springs.

In operation, after the binder has been opened to enable the insertion or removal of sheets of paper and is lying on a table or other stand so that the covers and back extend substantially in a plane, during reassembly of the binder, the operator grasps the cover and shifts it so that the back member 12 moves about the hinge pintle 17 and the cover 13 moves about the hinge pintle 16 until the openings 23 in the housings 21 are approximately over the tops of the posts. At this point the cover may be released and permitted to swing of itself, or, if desired, when the cover and back reach about the position shown in Figure 1 the cover may be given a slight flip to carry the openings or housings over the posts. Upon release of the cover the posts will enter the openings in the housings and since the slide is retained by the latch members 45, 47 in a position such that the openings in the slide are in alinement with the openings in the housing, the posts will freely enter both openings. As the posts enter the housing the particular post associated with the spring latch 47 will engage the extension 51 thereof. Further movement of the cover toward closed position will cause the spring latch to be raised and upon being tensioned sufficiently, it will spring away from the latch head 45 and release the slide. Upon disengagement of the latch members, the springs will automatically project the slide in a direction such that the notches 34 in the posts will be engaged by the locking portions 36 of the openings in the slide.

One of the important advantages of my invention resides in that when the binder covering is free from one end of the posts, during the process of inserting or removing sheets of paper, the posts cannot get out of alinement because the other ends of the posts are substantially rigidly held by the locking portions 36 of the associated slide. Because the posts are held at one end on both longitudinal sides thereof, they cannot turn transversely of the binder covering, as in the pintle type, except to the very limited degree necessitated by the allowance of clearance between the slide and the notches in the posts. If the posts should become slightly out of alinement due to the necessary allowance of clearance between the slide and notches in the post, upon release of the slide as the cover is being closed, the cam surfaces 31 will straighten up the posts and bring them back into accurate alinement with each other.

A further advantage of the loose leaf binder of my invention is that because of the construction of the slide, the openings in the housing may extend substantially the entire width of the housing. The large size of the openings in the housing as compared to the cross sectional area of the posts insures entry of the posts into the openings in the housing unless the operator throws the cover toward closed position in a very careless manner. If the posts do not enter the center of the openings in the housing, upon release of the slide the inclined surfaces 31 of the slide will cam the cover and back into position and center the slide with relationship to the posts so that the locking portions 36 of the slide will engage the notches in the posts.

In Figures 8 to 12 inclusive I have shown a modified form of the structure shown in Figures 1 to 6 inclusive. In the loose leaf binder shown in these figures, the housing 52 itself constitutes the slide and has openings 53 therein adapted to register with the posts 18 when the binder covering is free from the ends of the post and the housing retracted. The openings 53 are provided with cam surfaces 31 and with straight-sided locking portions 36. The housing 52 is hinged to the hinge pintle 16 through hinge eyelets 54 and 56 which are slidable on the hinge pintle 16. A spring 57 is interposed between the hinge eyelet 54 and a hinge eyelet 58, secured to the cover, while a second spring 59 is interposed between the hinge eyelet 56 and a collar 61 rigid with the hinge pintle 16.

The housing 52 may be pulled toward the left, from the position as viewed in Figure 8, against the tension of the springs 57 and 59 by a knurled finger piece 63 secured to the housing. Provision may be made to enable the housing to be pushed from the opposite end of the binder, such means comprising a finger piece 64 secured to the housing 52 and projecting through a slot 66 formed in the cover 13. When the housing is pulled or pushed to the extreme left so that the posts are in the enlarged portions of the openings in the housing, the cover may be raised and the latch spring 67 will snap into position behind a stop 68 so as to retain the housing in the disengaged position. The stop 68 is pivoted through hinge eyelet 69 to the hinge pintle 16 and is held against movement along the hinge pintle by the collar 61 and a hinge eyelet 71 of the cover so that the housing is slidable longitudinally of the binder with respect to the stop. It will, therefore, be apparent that the stop 68 which is adapted to fit within the casing remains stationary except that it is movable with the casing about the hinge pintle as a center.

Following the insertion or removal of sheets of paper during reassembly of the binder, the cover and back may be moved toward closed position and the cover swung so that the posts enter the openings 53 in the housing and one of the posts strikes the spring latch 67 and raises it out of engagement with the stop 68 so as to permit the springs 57 and 59 to move the housing 52 until the notches on the posts are in engagement with the locking portions of the openings in the housing.

In Figures 13 to 16 inclusive, I have illustrated another modified form of my invention in which a back plate 74 extends between the hinge pintles 16 and 17 and the housings 76 are retained in perpendicular relationship to the back plate 74 by means of springs 77. In this construction the forward side of the housing 76 is cut away at 78 as well as the bottom portion of the housing.

A pintle slide 79, mounted in substantially the same manner as that illustrated in Figures 1 to 7 inclusive, has its forward edge cut away as at 81 so that the housings may be moved sidewardly into operative position with relation to the posts instead of over the tops of the posts as in the structure of Figures 1 to 6.

In this construction, a slightly different slide stop mechanism is employed which comprises a spring stop member 82 having a latch portion 83 which engages the slide. The slide release mechanism comprises a pin 84 slidable in a bearing 86 which has one end fixed to the stop member 82 as at 87 and the other end projecting through an opening in the housing as at 88. The pin 84 is provided with a stop 89 which limits the outward movement of the pin. When the binder is being reassembled, the back is swung about the

lower hinge pintle 17 and the top cover is swung about the hinge pintle 16 toward closed position. As the housing 76 is held perpendicular to the back plate 74 by the spring 77, the posts enter the side openings in the housing and upon the cover 13 being dropped to closed position the pin 88 is pressed inwardly by the rear edge 91 of the cover until the stop portion 83 of the stop member 82 is pushed past the end of the slide 79. The slide 79 has a recessed portion 92 adapted to accommodate the stop portion 83 of the stop member. The stop member is thus retained against the side wall of the housing by the slide. Upon release of the slide the springs 38 urge the slide so that the locking portions 36 of the slide engage the notches in the posts and secure the binder covering to the ends of the posts.

Although I have shown and described specific structures illustrating my invention, it will be understood that the same is for the purpose of illustration, and that many changes and modifications may be made in the automatic binder structure illustrated without departing from the spirit or scope of the appended claims.

I claim:

1. In a loose leaf binder, a binder covering comprising a back member and a pair of covers hinged along the longitudinal edges of the back member, a plurality of impaling posts for retaining a quantity of paper, said impaling posts each having a pair of grooves at each end along the sides of the posts and extending in a direction longitudinally of the binder covering, means carried by the binder covering at both longitudinal edges of the back and extending into the grooves in the posts for retaining the binder covering to the posts at both ends thereof, means for releasing the binder covering from the posts at either end thereof, and means for automatically securing the binder covering to the free ends of the posts when one cover is closed during reassembly of the binder.

2. In a loose leaf binder, a binder covering comprising a back member and a pair of covers hinged with relation to the back member, a plurality of impaling posts for retaining a quantity of paper, means for securing one set of ends of the posts to the binder covering, a housing carried by the binder covering having openings therein for the reception of the other ends of the posts, a slide movable in said housing, said slide having means in connection therewith for securing the housing to the said ends of the posts, means for moving said slide to a position such that the housing is free from said ends of the posts to enable the insertion or removal of sheets of paper, and means for automatically securing the housing to said ends of the posts during the reassembly of the binder, said slide having means in connection therewith for straightening up the posts during the closing of one cover.

3. In a loose leaf binder, a binder covering comprising a back member and a pair of covers hinged with relation to the back member, a plurality of impaling posts for retaining a quantity of paper normally secured at the same ends thereof to the binder covering, a housing having openings therein secured to the binder covering, means in connection with the housing for securing the housing to the other ends of the posts, said housing being manually movable to release the housing from the ends of the posts to enable the insertion or removal of sheets of paper, and means for automatically securing the housing to the ends of the posts during reassembly of the binder.

4. In a loose leaf binder, a binder covering comprising a back member and a pair of covers hinged with relation to the back member, a plurality of impaling posts for retaining a quantity of paper, means for securing the binder covering to one end of the posts, a housing operatively associated with the other ends of the posts and hinged to the binder covering, said housing having side and bottom openings therein for the reception of the posts, means in said housing for securing the binder covering to said ends of the posts, means for releasing the binder covering from said ends of the posts to enable the insertion or removal of sheets of paper, spring means for retaining the housing in a position such that when one cover and the back are moved toward a closed position the housing is moved sidewardly toward the posts so that the side openings in the housing are moved into registry with the posts, and means for automatically locking the binder covering to said ends of the posts when one cover is completely closed.

5. In a loose leaf binder, a binder covering comprising a back member, hinges secured along the longitudinal edges of the back member and a pair of covers secured to said hinges, a plurality of impaling posts for retaining a quantity of paper, means carried by the binder covering for securing the binder covering to the same ends of the posts, and means when the binder covering is free from the other ends of the posts for automatically securing the binder covering to said other ends of the posts when the associated cover is thrown toward a closed position, released and dropped to a closed position, said last-mentioned means having means associated therewith for drawing the back and said cover over into proper relation with the other cover when said cover is thrown toward closed position inaccurately.

6. In a loose leaf binder, a binder covering comprising a back member, hinges secured to the longitudinal edges of the back member and covers secured to said hinges, a plurality of impaling posts for retaining a quantity of paper, means for releasably securing the binder covering to the ends of the posts whereby the binder covering may be released from either end of the posts to enable the insertion or removal of paper, said releasable securing means during reassembly of the binder when the free cover is closed being automatically secured to the free ends of the posts without further manual operations, and said releasable securing means having portions thereof formed so as to draw the cover and back over into proper relationship with the posts during such operation.

7. In a loose leaf binder, a binder covering comprising a back member, hinges secured to the longitudinal edges of the back member and covers secured to said hinges, a plurality of impaling posts for retaining a quantity of paper, means for releasably securing the binder covering to the ends of the posts whereby the binder covering may be released from either end of the posts to enable paper to be inserted or removed from the binder, said releasable securing means at the secured ends of the posts being formed so as to retain the posts rigidly vertical and in alignment when the binder covering is free from the other ends of the posts, and said securing means for said other ends of the posts being automatically engagable with the corresponding ends of the posts when the corresponding cover is closed, and said securing means having means associated

therewith for drawing the said cover and the back over into proper relationship with the posts during the closing operation.

8. In a loose leaf binder, a binder covering comprising a back member, hinges secured to the longitudinal edges of the back member and covers secured to said hinges, a plurality of impaling posts for retaining a quantity of paper, a pair of housings secured to the binder covering, each of said housings having openings therein for the reception respectively of the opposite ends of the posts, releasable means in said housings for securing each housing to its corresponding post ends, either of said securing means being manually releasable to enable the binder covering to be opened for the insertion or removal of sheets of paper, and means during the binder reassembly operation for automatically engaging said securing means with the free ends of the posts when the cover is thrown toward a closed position, is released and permitted to drop to a closed position, said openings extending substantially the width of the housing and being considerably wider than the posts to enable the posts to readily enter the openings during said binder reassembly operation, and means in connection with said securing means for drawing the cover and back over into the proper position with respect to the posts when the free cover is inaccurately thrown and the ends of the posts enter the openings improperly.

9. In a loose leaf binder, a binder covering comprising a back member, hinges secured to the longitudinal edges of the back member and covers secured to said hinges, a plurality of impaling posts for retaining a quantity of paper, a pair of housings secured to the binder covering, each having openings therein extending substantially the width of the housing and being considerably wider than the posts whereby the posts may readily enter the openings in the housings during assembly of the binder, releasable means in connection with each housing for securing each housing respectively to its corresponding post ends, either of said securing means being manually releasable to enable the binder to be opened for the purpose of inserting or removing sheets of paper, said releasable securing means and said post ends being so shaped that the post ends are held rigidly vertical and in alignment at the secured ends of the posts, and means for automatically engaging said releasable securing means to the free ends of the posts when the corresponding cover is thrown to a closed position, said securing means having means in connection therewith for drawing the cover and back over into proper relationship with the posts if the cover is thrown inaccurately and the ends of the posts enter the openings improperly.

10. In a loose leaf binder, a binder covering comprising a back member, hinges secured to the longitudinal edges of the back member and a pair of covers secured to said hinges, a plurality of impaling posts for retaining a quantity of paper, said posts having notches in the sides thereof extending longitudinally of the binder, a pair of releasable means carried by the binder covering for securing the binder covering to both ends of the posts, each of said releasable securing means including a slide so constructed and arranged that when it is in engagement with the posts, portions of the slide lie in said notches so as to intimately grasp the posts on opposite sides to retain the posts rigidly vertical and in alignment with each other when the binder covering is free from the other ends of the posts, and means for automatically securing the binder covering to the free ends of the posts when the free cover is moved toward a closed position, released part way in its movement and permitted to drop to a closed position.

11. In a loose leaf binder, a binder covering comprising a back member, hinges secured to the longitudinal edges of said back member and a pair of covers secured to said hinges, a plurality of impaling posts for retaining a quantity of paper, said posts having notches in the sides thereof extending longitudinally of the binder, a pair of releasable means carried by the binder covering for securing the binder covering to both ends of the posts, each of said releasable securing means including a slide having openings therein substantially larger than the ends of the posts and having cam portions formed at the margins of portions of said openings, portions of said slide lying in said notches so as to intimately grasp the posts on opposite sides to retain the posts rigidly vertical and in alignment when the binder covering is free from the other ends of the posts, and means for automatically securing the binder covering to the free ends of the posts when the free cover is moved toward a closed position, released part way in its movement and permitted to drop to a closed position, said cam portions of the slide serving to pull the back and free cover over into proper relationship with the posts during said closing operation.

WINSLOW E. THOMSON.