

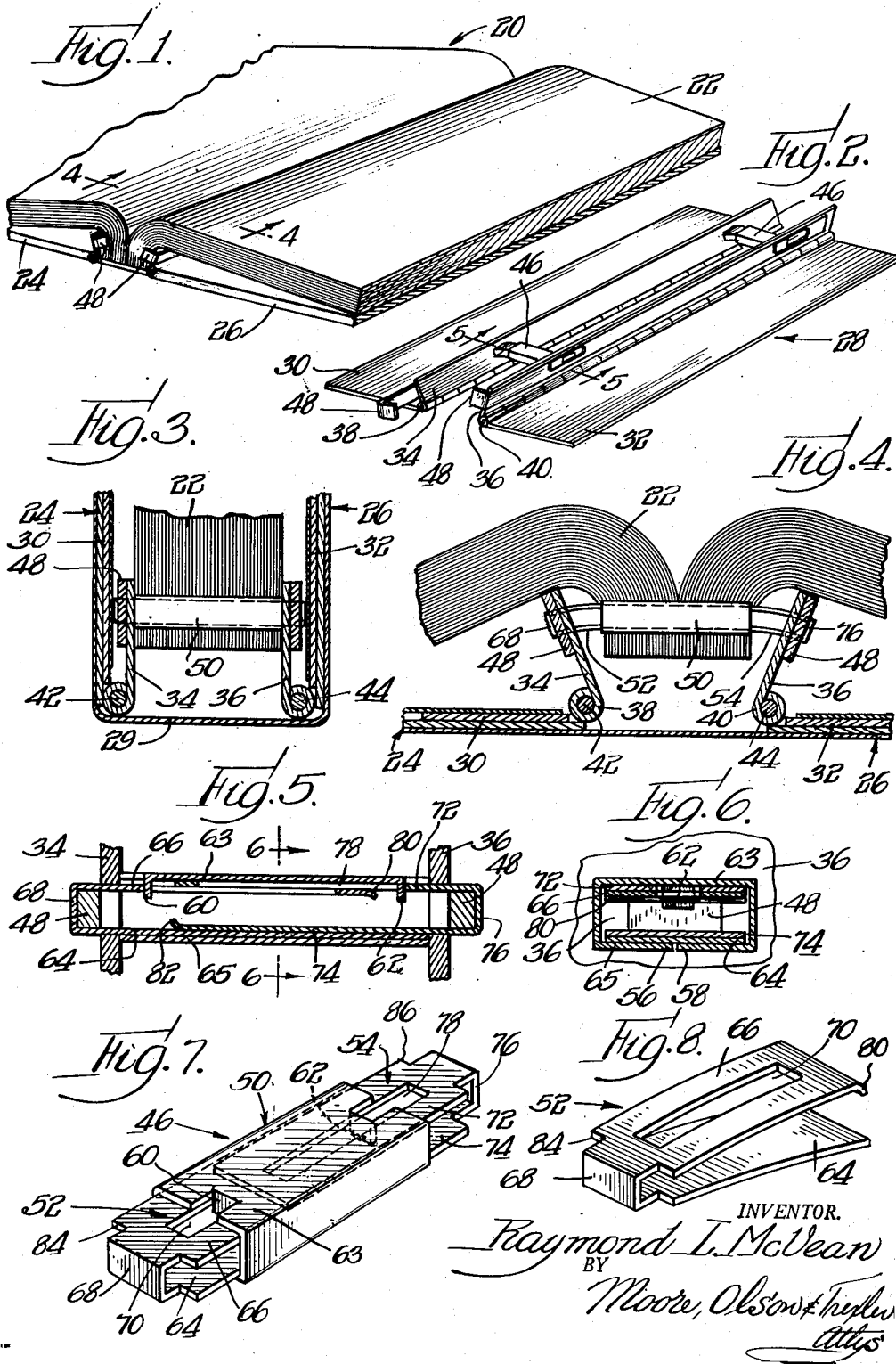
Feb. 9, 1954

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LOOSE-LEAF BINDER

2,668,542

Filed March 16, 1950

2 Sheets-Sheet 1



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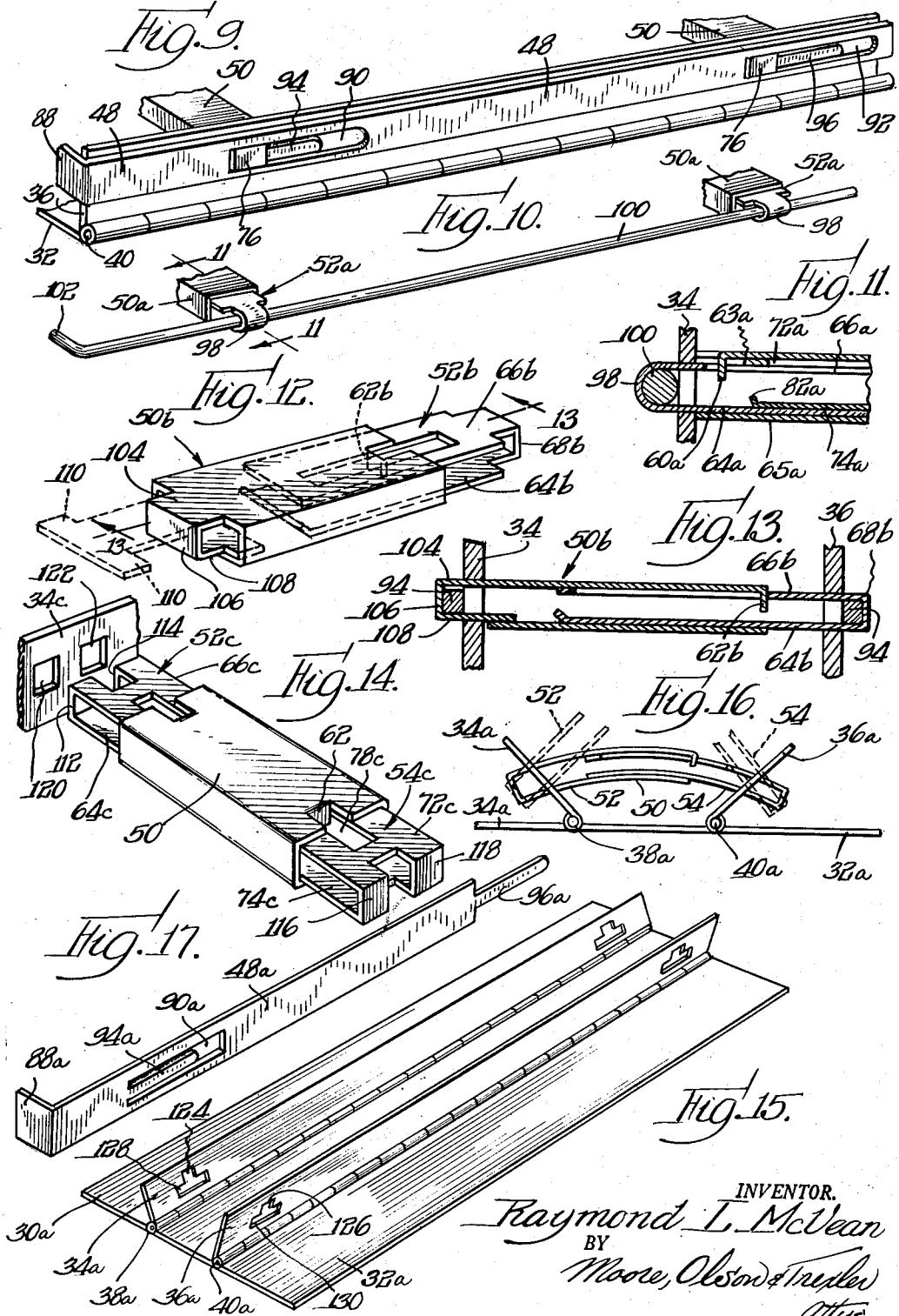
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# UNITED STATES PATENT OFFICE

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## LOOSE-LEAF BINDER

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5 Claims. (Cl. 129-24)

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The present invention relates to binders, and more particularly to binders for loose leaf materials such as binders for corporation minute books.

Many and various forms of binders have been used heretofore to releasably bind loose leaf materials. These binders are generally constructed to grasp the sheets to be bound along one edge thereof and are adapted to be assembled and disassembled to insert new sheets of material or remove old and worn sheets of material. The binders of this type which have been used heretofore have possessed certain disadvantages. For example, the bound pages when opened do not lie flat and hence necessitate spreading of the pages by hand while the pages are being read and usually necessitates the use of a wide margin along the bound edge of the sheets being bound. The use of relatively wide margins necessarily increases the thickness of the bound volume needed to contain a given amount of material. Furthermore, the mechanism for locking the sheets in the binder used heretofore are relatively difficult to operate and tend to cause injury to the fingers and fingernails of the user when inserting or removing sheets from the binder.

An important object of the present invention is to provide an improved loose leaf binder in which the leaves lie relatively flat when the leaves are spread for the purpose of reading.

Another object of the invention is to provide a loose leaf binder of the type described in which narrower margins can be used on the sheets being bound whereby to reduce the size of the bound volume necessary to contain a given amount of information.

A further object of the invention is to provide a loose leaf binder having an improved and simplified structure for locking the loose leaf sheets in place in the binder.

Yet another object of the invention is to provide an improved binding post for loose leaf binders; more specifically, it is an object to provide an improved expandable binder post.

A still further object of the invention is to provide an expandable binder post for loose leaf binders, which post has means formed thereon to limit the amount of expansion thereof.

Still another object of the invention is to provide a loose leaf binder of the type set forth above which is economical in construction and which may be made by standard fabrication steps.

These and other objects and advantages of the invention will appear from the following speci-

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cation when taken in conjunction with the accompanying drawings wherein like reference numerals have been used to indicate like parts throughout:

Figure 1 is a partial perspective view of a loose leaf binder made in accordance with and embodying the principles of the present invention;

Figure 2 is a perspective view of the loose leaf binder shown in Figure 1 with the bound sheets and the cover thereof removed;

Figure 3 is an enlarged view in cross section of the binder shown in Figure 1, the binder being shown in the closed position;

Figure 4 is an enlarged view of the binder shown in Figure 1 substantially as seen in the direction of the arrows along the line 4-4 thereof;

Figure 5 is an enlarged partial cross sectional view of the binder elements shown in Figure 2 substantially as seen in the direction of the arrows along the line 5-5 thereof;

Figure 6 is a cross sectional view of the binder post shown in Figure 5 substantially as seen in the direction of the arrows along the line 6-6 of Figure 5;

Figure 7 is a perspective view of the binder post shown in Figures 1-6, the binder posts being shown in the expanded position;

Figure 8 is a perspective view of one of the binder links shown in Figures 1-7;

Figure 9 is an enlarged partial view illustrating one preferred form of a locking bar used in the present invention;

Figure 10 is a view similar to Figure 9 showing a modified form of binder link and the locking bar used with this modified form of link;

Figure 11 is an enlarged partial view in cross section of the modified form of binder post shown in Figure 10 substantially as seen in the direction of the arrows along the line 11-11 thereof;

Figure 12 is a perspective view of another form of binder post embodying the principles of the present invention, this form comprising two post elements;

Figure 13 is a cross sectional view of the binder post shown in Figure 12, the binder post being shown assembled in a binder structure;

Figure 14 is a perspective view of another binder post made in accordance with the present invention and a section of the hinge member associated therewith;

Figure 15 is a partial perspective view of a modified form of hinge plate, particularly adapted for use with the present invention;

Figure 16 is a diagrammatic view illustrating

the manner in which the hinge plate of Figure 15 cooperates with a binder post made in accordance with the present invention; and

Figure 17 is a perspective view of another preferred form of locking bar suitable for use in the present invention.

Referring now to the drawings and particularly to Figures 1-8, there has been shown a loose leaf binder made in accordance with the present invention, a corporation minute book being shown for purposes of illustration. The finished book generally designated by the numeral 20 comprises a plurality of loose sheets or pages 22 which are provided with perforations at one edge thereof to receive binder posts, a pair of book covers 24 and 26, and a binder generally designated by the numeral 28 and best seen in Figure 2. The cover hinge plates 30 and 32 receive and are preferably embedded in covers 24 and 26 respectively. The covers 24 and 26 are joined by a back member 29 which also serves to conceal the binder 28.

Binder 28 includes a pair of cover hinge plates 30 and 32 which are hingedly connected to hinge members 34 and 36 respectively as at 38 and 40. More specifically hinge rods 42 and 44 extend the length of the hinged junctions 38 and 40 respectively to form a pair of so-called "piano hinges." Hinge members 34 and 36 are provided with a pair of apertures through which extend identical binder posts 46. The binder posts 46 are adapted to extend through the perforations in pages 22 whereby to hold these pages assembled in book form between the hinge members 34 and 36. A pair of identical locking bars 48 serve to hold the binder and the sheets therein in assembled position.

Referring now more particularly to Figures 5-8 there are shown the details of the improved binder post 46 of the present invention. This form of binder post comprises three elements: a cylinder 50, and a pair of binder links 52 and 54 which telescopingly slide within cylinder 50 and within each other. Cylinder 50 in the form shown has a rectangular cross section and is formed from a sheet of relatively thin gauge material, preferably metal, by folding into the shape shown. As a result of its method of formation, cylinder 50 has a pair of longitudinally extending edges 56 and 58 which meet along one side thereof. It is to be understood, however, that a cylinder having a continuous periphery can be provided by forming the cylinder from an extruded tube. As may be best seen in Figure 7, cylinder 50 has a pair of retaining ears 60 and 62 which are formed from the body of the cylinder on side 63 and extend inwardly toward the opposite side 65 in a direction substantially perpendicular to the longitudinal axis of the cylinder.

One binder link 52 has been shown in detail in Figure 8 and will be used for purposes of illustration since binder link 54 has substantially the same construction as binder link 52. Binder link 52 is preferably formed of a resilient material such as light gauge metal and comprises a substantially imperforate plate member 64, a second plate member 66 and a bight portion 68 interconnecting plate members 64 and 66. In the form shown in Figure 8 the bight portion 68 is substantially plane and extends perpendicularly with respect to plate members 64 and 66. Plate members 64 and 66 are substantially rectangular and have a width which is slightly less than the width of cylinder 50, and bight por-

tion 68 has a width slightly less than the depth of cylinder 50 whereby to allow binder link 52 to be slidably inserted within cylinder 50. Plate member 66 has a rectangular aperture 70 formed therein which extends substantially the length thereof. Aperture 70 is adapted to receive the ear 60 formed on cylinder 50 when link 52 is inserted within cylinder 50. Ear 60 in cooperation with aperture 70 serves to limit the distance link 52 can be withdrawn from cylinder 50.

Binder member 54 comprises a plate member 72 and an imperforate plate member 74 which are joined by a bight portion 76. Plate member 72 has an aperture 78 formed therein which corresponds to aperture 70 in plate member 66 of link 52 and is adapted to receive ear 62 of cylinder 50.

As may be best seen in Figure 5 the apertured plate member 72 of link 54 is disposed against the inner wall of top side 63 of cylinder 50 and the apertured plate member 66 of link 52 is disposed beneath and bears against the apertured plate member 72 of link 54. On the other side of cylinder 50 the imperforate plate member 64 of link 52 lies against the lower side 65 of cylinder 50 and the imperforate plate member 74 of link 54 lies above plate member 64. The end of the plate member 66 of link 52 is turned downwardly and inwardly as at 80 and the end of plate member 74 of link 54 is turned upwardly and inwardly as at 82. Turning ends 80 and 82 inwardly facilitates assembly of the binder links 52 and 54 within cylinder 50 since these upturned ends will tend to ride over the ends of the adjacent plate members during assembly.

Referring now to Figures 4, 5 and 9 it will be seen that the bight portions 68 and 76 of the end members 62 and 64 respectively extend through substantially rectangular apertures in their associated hinge members 34 and 36. Means is provided to limit the extent that the bight portions can extend outwardly through hinge members 34 and 36 in the form of shoulders such as the shoulders 84 on binder link 52 and the shoulders 86 on link 54.

The binder links and their associated hinge members are held in assembled position on a locking bar 48 in a manner best illustrated in Figure 9. Locking bar 48 comprises a substantially rectangular sheet of relatively inflexible material preferably made of metal which has a portion bent out of the plane thereof to form a handle portion 88. A pair of apertures 90 and 92 are formed in locking bar 48 and have a width greater than the thickness of the links 52 and 54. Formed integral with and lying in the plane of the body portion of locking bar 48 is a pair of locking pins 94 and 96 which extend into apertures 90 and 92 in a direction substantially parallel to the axis of locking bar 48. The width of pins 94 and 96 is slightly less than the inner width of bight portions 68 and 76 whereby the locking pins can fit within these bight portions. Pin 96 is preferably formed slightly longer than pin 94 whereby pin 96 is inserted in its associated link before pin 94 is associated in its associated link. This construction enables the pins 94 and 96 to be inserted substantially independently of each other whereby to simplify assembly of the binder.

If it is desired to permanently bind the material within the cover, the handle portion 88 may be removed by bending with a suitable instrument such as a pair of pliers as has been customary heretofore.

Referring now to Figure 4, there is shown in detail the manner in which the present binder post facilitates opening of the bound volume. When opening the volume, the book covers 24 and 26 are preferably laid flat as is customary in the position shown in Figures 1 and 4. The pages 22 are opened to the desired place, and the weight of the open pages tends to spread the upper ends of hinge members 34 and 36 apart by pivoting these hinge members about the hinge points 38 and 40 respectively. As the upper ends of hinge members 34 and 36 move away from each other, the binder links 52 and 54 are withdrawn from cylinder 50, the amount of withdrawal being limited by the contact between retaining ears 60 and 62 with the ends of apertures 70 and 78. The binder links as stated above are formed of a resilient springlike material which allows the binder links to be slightly curved when the pages are opened as is shown in Figure 4. Preferably the binder links are slightly curved when formed, as may be seen in Figure 8, whereby to facilitate this last described action. When the volume is closed, the book covers 24 and 26 serve to urge the binder links 52 and 54 inwardly to the position shown in Figure 5.

There is shown in Figures 10 and 11 a modified form of binder link and the locking bar which is used with this modified form of binder link. The binder link 52a is similar in construction to binder link 52 but differs therefrom in that the bight portion 98 is rounded as may be best seen in Figure 11 as contrasted with the substantially square bight portion 68 of binder link 52. The locking bar 100 used with binder link 52a is circular in cross section and has such a diameter as to fit within the bight portion 98. A handle portion 102 is formed at substantially right angles with respect to the remainder of the locking bar 100. It will be seen that this arrangement also allows insertion of the locking bar in each binder link independently of the remaining binder links.

Another form of binder post is shown in Figures 12 and 13. This binder post is a two-piece post as compared with the three-piece binder post shown in Figures 5-8. The cylinder 50b is provided with a slot and retaining ear 62b at one end thereof as does cylinder 50 of Figure 7, but the other end has an integral link portion 104 extending therefrom. Link portion 104 is narrower than the width of cylinder 50b and is preferably of the same width as the bight portion 68b on the binder link 52b which cooperates with cylinder 50b. The link portion 104 is bent downwardly to form a bight portion 106 and is bent again inwardly to form a second link portion 108 which fits within the body of cylinder 50b. The link portion 108 is provided with laterally extending ears 110, the overall width of which is slightly less than the width of cylinder 50b whereby they fit within cylinder 50b and aid in holding link portions 104 and 108 in the proper assembled position.

Binder link 52b is similar to binder link 52 and differs therefrom only in that the end of plate member 66b is not bent inwardly as is plate member 66. The end of plate 64b is bent upwardly to allow it to pass over ears 110. The operation and use of the binder post shown in Figures 12 and 13 is substantially the same as the binder post shown in Figures 5-8.

Yet another form of binder post is shown in Figure 14. This binder post comprises three members, namely, a cylinder 50 which is identical with the cylinder shown in Figure 7 and a pair

of binder links 52c and 54c. The binder links 52c and 54c are similar to binder links 52 and 54 but are provided with another form of bight portion. Instead of being provided with shoulder portions such as shoulder portions 24 and 36 on binder links 52 and 54 respectively, a notch is formed in the center of the bight portion whereby to, in effect, provide a pair of bight portions 112 and 114 on link 52c and a similar pair of bight portions 116 and 118 on binder link 54c.

A modified form of hinge member 34c is used in conjunction with the modified binder links of Figure 14. Instead of a single aperture, a pair of apertures 120 and 122 are provided to receive the bight portions such as the bight portions 112 and 114 on link 52c. This construction also positively prevents binder link 52c from passing through hinge member 34c and makes possible the assembly of these parts by means of a locking bar. The other parts of the binder are of the same structure as the corresponding parts of the binder shown in Figure 2. The operation and application of the binder post shown in Figure 14 is substantially the same as that of the binder post shown in Figures 5-8.

There is shown in Figures 15 and 16 another form of hinge member which is particularly adapted to be used in the present invention. These hinge members 34a and 36a are similar in construction to hinge members 34 and 36 shown in Figure 2 and differ therefrom only in the shape of the aperture which receives the bight portion of the binder links. The aperture in hinge members 34a and 36a have a portion 124 and 126 which are only slightly wider than the width of the bight portions and are of the same width as the apertures in hinge members 34 and 36. The width of the apertures 124 and 126 is increased on the side thereof adjacent the hinge points 38a and 40a as at 128 and 130. The width of the aperture at 128 and 130 is slightly greater than the greatest width of the shoulder portions such as the shoulder portions 24 and 36 of binder links 52 and 54 respectively. This modified form of aperture in the hinge members 34a and 36a facilitates the operation of the expandable binder post.

Referring now to Figure 16 there is shown in diagrammatical form a comparison of the action of hinge members 34-36 and 34a-36a. There is shown in dotted lines a pair of binder links 52 and 54 in a position which they would assume if used with the hinge members 34 and 36. It is seen that due to the connection between the hinge members and the binder links the binder links 52 and 54 are disposed at substantially right angles with respect to the hinge members. With this form of connection the extent to which the hinge members can be rotated outwardly away from each other is limited by the resiliency and bendability of the binder links.

Also shown in Figure 16 in solid lines is the manner in which the binder links coast with the modified hinge members 34a and 36a. As the hinge members are rotated outwardly away from each other, the plate members disposed toward the hinge points move through the widened apertures at 128 and 130 whereby to, in effect, allow the binder links to rotate and assume the position shown in Figure 16 instead of being disposed perpendicularly with respect to the hinge members. Due to this construction the upper end of hinge members 34a and 36a can be spread farther apart whereby to allow the pages 22 to lie more nearly flat.

In Figure 17 there is shown a modified form of locking bar 48a. This locking bar is similar to locking bar 48 and differs therefrom in that the locking pin 96a is not surrounded by material as is the locking pin 96 of locking bar 48. The remaining parts of the locking bar 48a are identical in construction with the corresponding parts of locking bar 48. The form of locking bar shown in Figure 17 in certain applications renders the operation of the locking bar more easy.

Although it has been stated above that light gauge metal is a preferred material of construction for the elements forming the binder post, it is to be understood that other suitable materials of construction may be used. In particular certain plastics have the necessary desirable characteristics, and may be used to form these parts.

There has been provided a binder structure which fulfills all of the objects set forth above. More specifically, a binder has been provided in which the leaves bound therein lie more nearly flat when the leaves are spread, whereby to make use of the binder more easy. The structure of the present invention is mechanically simple, easily operated, and economical in construction.

Certain preferred embodiments of the invention have been set forth for purposes of illustration. It is to be understood that various changes and modifications can be made therein without departing from the spirit and scope of the invention. The invention therefore is to be limited only as set forth in the following claims.

The invention is hereby claimed as follows:

1. A binder post comprising a cylinder, a U-shaped link including a pair of plate members and a bight portion joining said plate members at one end thereof, said plate members being telescopically and slidably disposed within said cylinder, and means formed on said cylinder and one of said plate members to limit the distance that the link can be withdrawn from the cylinder.

2. A binder post comprising a rigid cylinder and a resilient link, said cylinder including a pair of rectangular side members joined along the longitudinally extending sides thereof, a link including a pair of spaced apart plate members and a bight portion joining said plate members at one end thereof, the width of said plate members being slightly less than the width of said side members, said plates being telescopically and slidably positioned within said cylinder with the bight portion extending away from said cylinder, a longitudinally extending slot formed in one of said plate members, and a projection formed on one of said side members and extending through said slot toward the other side member, said projection and slot cooperating to limit the distance which the link can be withdrawn from the cylinder.

3. A binder post comprising a cylinder and a link, said cylinder including a pair of rectangular side members joined along the longitudinally extending sides thereof, a link including a pair of spaced apart plate members and a bight portion joining said plate members at one end thereof, said bight portion having a notch formed therein providing two connecting portions having shoulders therebetween, the width of said plate members being slightly less than the width of said side members, said plates being telescopically and slidably positioned within said cylinder with the bight portion extending away from said cyl-

inder, a longitudinally extending slot formed in one of said plate members, and a projection formed on one of said side members and extending through said slot toward the other side member, said projection and slot cooperating to limit the distance which the link can be withdrawn from the cylinder.

4. A binder comprising a pair of hinge members, means interconnecting said hinge members along one edge thereof, a binder post interconnecting said hinge members at a point spaced from said one edge, said binder post including a rigid cylinder having a pair of side members joined along the longitudinally extending edges thereof and a resilient link having a pair of spaced apart plates and a bight portion joining said plates at one end thereof, means interconnecting one end of said cylinder to one of said hinge members, said plates being telescopically and slidably disposed within the other end of said cylinder with the bight portion extending outwardly away from said cylinder, means interconnecting said bight portion and the other of said hinge members, and means formed on said cylinder and said link to limit the distance that said link can be withdrawn from said cylinder.

5. A binder comprising a pair of hinge members, means interconnecting said hinge members along one edge thereof, a binder post interconnecting said hinge members at a point spaced from said one edge, said binder post including a cylinder having a pair of side members joined along the longitudinally extending edges thereof and a link having a pair of spaced apart plates and a bight portion joining said plates at one end thereof, means interconnecting one end of said cylinder to one of said hinge members, said plates being telescopically and slidably disposed within the other end of said cylinder with the bight portion extending outwardly away from said cylinder, said bight portion having a notch therein providing two connecting portions having shoulders therebetween, an adjacent pair of apertures formed in the other of said hinge members to receive said two connecting portions, said shoulders abutting against said other hinge member to limit the distance that said bight portion extends into said apertures, means positioned between the inner surface of said connecting portions and said other hinge member to connect said link to said hinge member, and means formed on said cylinder and said link to limit the distance that said link can be withdrawn from said cylinder.

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