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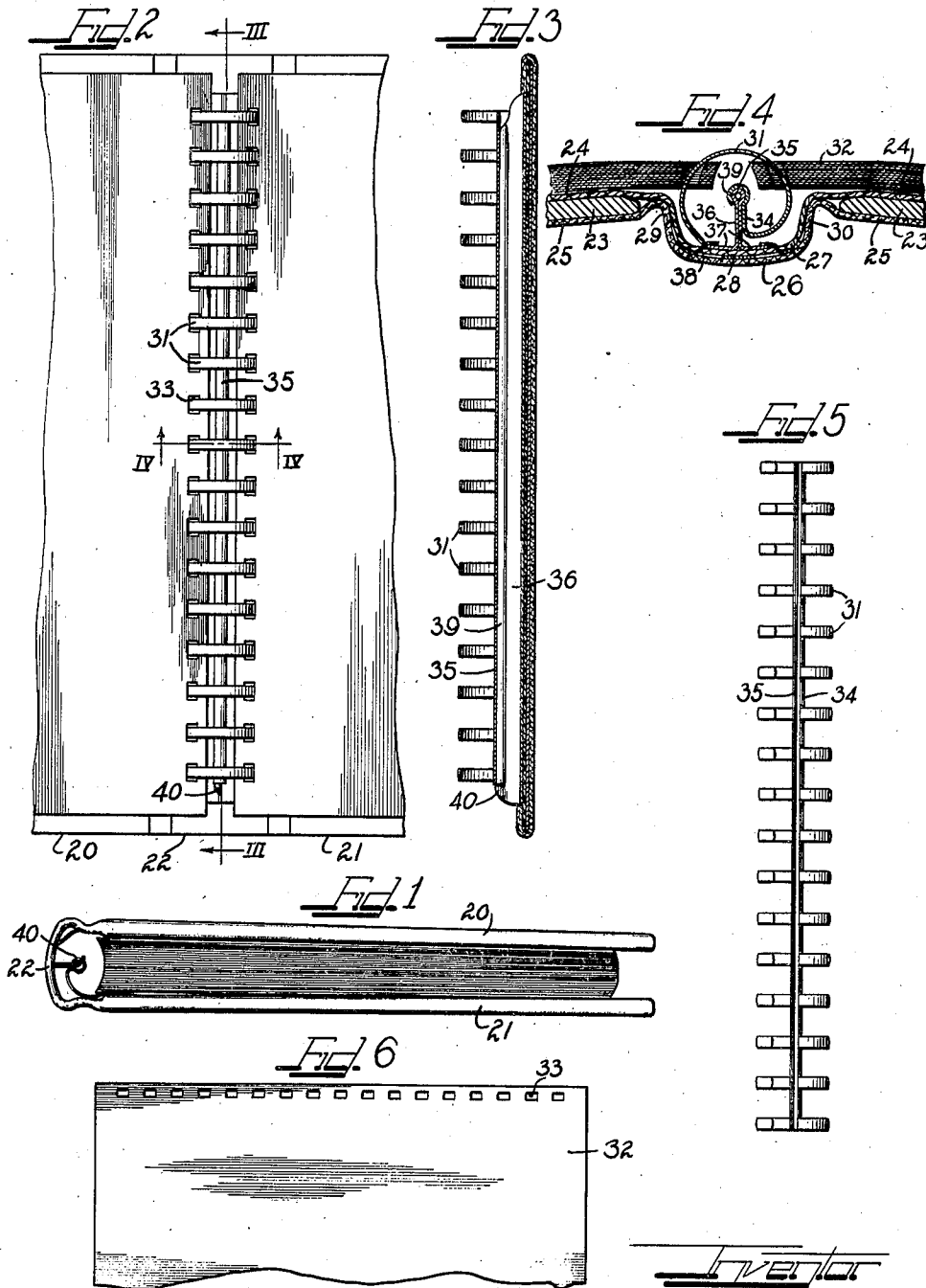
E. A. TRUSSELL

2,269,495

BINDER

Filed June 27, 1938

3 Sheets-Sheet 1



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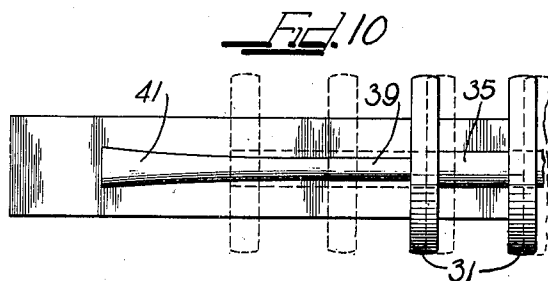
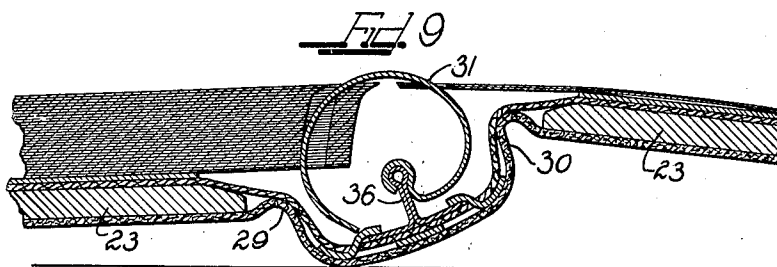
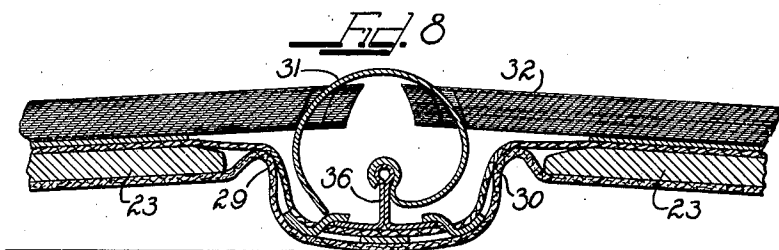
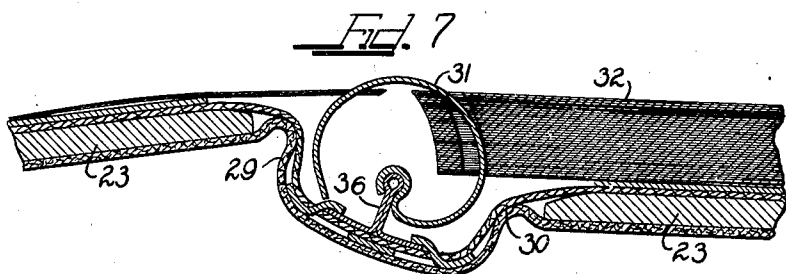
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BINDER

Filed June 27, 1938

3 Sheets-Sheet 2



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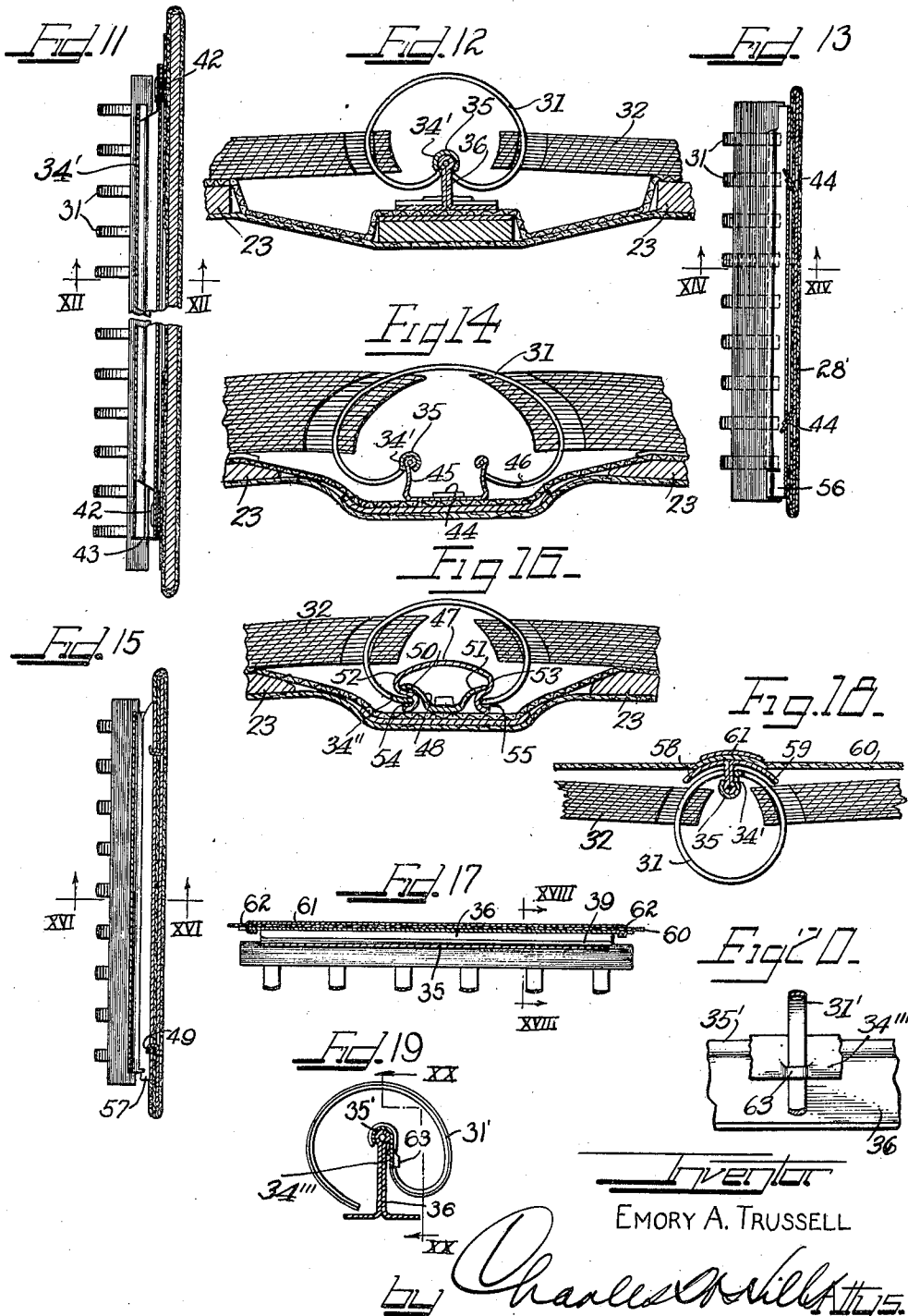
E. A. TRUSSELL

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BINDER

Filed June 27, 1938

3 Sheets-Sheet 3



UNITED STATES PATENT OFFICE

2,269,495

BINDER

Emory A. Trussell, Milwaukee, Wis.

Application June 27, 1938, Serial No. 215,999

19 Claims. (Cl. 129—1)

The present invention relates in general to loose-leaf or temporary binders and is particularly concerned with improvements in means for removably securing the leaf retaining mechanism in association with suitable covers to form a book.

It is a primary object of the invention to provide an improved binder in which a plurality of leaves may be detachably connected to the back of a book or other suitable means of support so that the leaves when desired may be simultaneously removed and filed away in suitable file covers. In other words, a rather expensive cover may be provided for normal use and a less expensive cover, which is more suitable for permanent filing of the leaves may be provided.

A further object of the invention is to provide an improved arrangement in a temporary binder for slidably connecting the leaf receiving rings to a book back, wherein this slide connection will be disposed inside of the rings so as to bring the rings into closer proximity to the book back or other support to which the rings are secured.

A further object of the invention is to provide an improved ring type binder for leaves, which may be utilized to connect the leaves to a suitable cover or may be used separately as a binder, the arrangement being such that when used separately the leaves may be disposed with the outermost leaves back to back.

A further object is to provide in a binder improved leaf receiving rings of novel shape.

Another object is to provide in a binder of the character described improved means for temporarily securing the leaves against removal while associated with the back of the book or other support, but which, when the rings are removed from the support, permit removal of the leaves from the leaf receiving rings.

Still another object is to provide an improved construction for securing the leaf receiving rings to a supporting bar or carrier.

A still further object of the invention is to provide in a binder of the character described improved means for rocking the book back as the leaves in an open book are transferred from superposed position over one cover to superposed position over the other cover, whereby the exposed leaves will be maintained in substantially the same plane adjacent the uppermost portion of the leaf receiving rings, irrespective of the number of leaves superposed above either of the cover members.

Other objects and features of the invention will more fully appear from the following de-

tailed description taken in connection with the accompanying drawings, which illustrate several embodiments thereof, and in which:

Figure 1 is an elevational view of a binder embodying the features of the present invention secured to the back of a pair of book covers, the book covers being in closed position;

Figure 2 is a plan view of the same with the covers in opened position, this view showing details of one form of construction of the binder;

Figure 3 is a longitudinal section through this form of construction of the binder mechanism, taken substantially on line III—III of Figure 2;

Figure 4 is an enlarged transverse sectional view through the binder and associated book covers, taken substantially on line IV—IV of Figure 2;

Figure 5 is a detailed view showing the construction of the leaf receiving rings of the binder;

Figure 6 is a fragmentary view of a leaf arranged to be used with the binder;

Figures 7, 8 and 9 are views similar to Figure 4 showing the rocking feature of the binder due to the movement of leaves from a superposed position over one of the covers to a superposed position over the other cover;

Figure 10 is a fragmentary detailed view showing stop means for limiting sliding movement of the ring structure when attaching it to the book back or other support;

Figure 11 is a view similar to Figure 3 of a modified binder construction;

Figure 12 is a transverse sectional view of the same, taken substantially on line XII—XII of Figure 11;

Figure 13 is a longitudinal sectional view of still another modification;

Figure 14 is a transverse sectional view of the same, taken substantially on line XIV—XIV of Figure 13;

Figure 15 is a longitudinal sectional view of a further modified construction;

Figure 16 is a transverse sectional view of the same, taken substantially on line XVI—XVI of Figure 15;

Figure 17 is a longitudinal sectional view of another modification;

Figure 18 is a transverse sectional view through the same, taken substantially on line XVIII—XVIII of Figure 17;

Figure 19 is a detailed view, partly in section, showing an alternate arrangement for securing the loose-leaf receiving rings to a common carrier; and

Figure 20 is a vertical sectional view of the

same, taken substantially on line XX—XX of Figure 19.

As shown on the drawings:

As illustrative of the present invention, there is shown in Figure 1 one form of my improved binder which is associated with a pair of book covers 20 and 21 furnished with a connecting back 22.

While the book covers and back may be constructed in various ways, for purposes of illustration I have disclosed the covers as comprising pieces of heavy book board or binder board 23 having inner facings 24 and outer facings 25 of suitable material. The outer facings of the covers may be ornamental fabric, plain or decorated leather, or the like, and this material of the facings extends from one cover to the other to form the outer surface 26 and inner surface 27 of the back 22 between the covers. In the construction shown, the back is reinforced by means of an intermediate piece 28 which is preferably made of suitable metal and is transversely curved to form a back construction which may be laterally rocked for a purpose which will be explained later in detail.

It will be noted that the inner margins of the covers are spaced from the lateral margins of the intermediate member 28 and that the facings on each side of the back are in surface engagement to form flexible joints 29 and 30 to enable hinge movement of the covers. Moreover, with the book in open position, it will be noted that the margins of the covers adjacent the back are retained in elevated position so as to permit the back under certain conditions to be rocked.

The binder comprises a plurality of split rings 31 for receiving leaves 32 thereon. The leaves 32 are provided along one edge with a plurality of spaced openings 33 for respectively receiving the split rings therethrough.

In the construction shown in Figures 4 and 5, the rings 31 are secured at one set of their corresponding ends to a carrier bar 34 which extends inwardly on the rings and is provided at its innermost edge with an open bead 35 forming a channel extending longitudinally thereof. The other set of corresponding ends of the rings 31 are spaced from the carrier bar 34 so as to permit threading of the leaves onto the rings.

For attaching the rings to the back of the book, there is provided an elongate upstanding track member 36 having oppositely extending base flanges 37 which are adapted to be anchored and secured to the book back by means of struck up fingers 38 provided on the intermediate member 28.

The uppermost edge of the track is provided with a beaded edge 39 which is arranged to be inserted in an endwise direction into the channel formed by the open bead 35 of the carrier bar and enables longitudinal sliding movement of the carrier bar with the rings thereon onto the track. When the carrier bar is slid onto the beaded edge of the track, the carrier bar with its associated split rings is retained against radial removal from the track and thus the rings and leaves thereon are retained in proper position within the book, but may be readily detached therefrom by sliding the carrier bar from the track as explained above.

It will be noted that when the rings are positioned in the book, the track operates to close the space between the respective ends of each ring so that the leaves cannot be removed in this form of the invention so long as the rings

are secured to the back of the book, but upon the rings being removed as a unit, the space between the ends of the rings is opened, so that in the removed position of the rings the leaves may be removed or added, as desired. Such construction leaves the portions of the rings which form the leaf tracks free of the usual obstructions encountered in rings having the leaf threading opening in the leaf track.

An important feature of the foregoing construction is that the track extends between the ends of the rings and is slidably connected to the ring carrier bar within the confines of the ring. Such construction brings the rings into closer proximity to the back and does not necessitate their projecting an undesirable distance. This feature has been found to be very advantageous in binders of this type.

In order to limit the movement of the carrier bar when sliding it onto the track, so that the rings and leaves thereon will be properly positioned within the cover, the track bead at one end is flattened and deflected, as shown at 40, to form an abutment.

An alternative abutment arrangement is shown in Figure 10, wherein the bead, instead of being flattened at one end and deflected, as shown at 40, is expanded to form an end tapered portion 41 of increasing diameter. With this arrangement, the open bead 35 of the carrier bar, when riding onto the enlarged or tapered end 41 will be frictionally engaged and held in position against ready sliding movement in the opposite direction.

Referring now to Figures 7, 8 and 9, it will be noted in Figure 7 that with all but a few of the leaves disposed above the right-hand cover, the back of the book will be rocked in a clockwise direction so as to lower the right-hand cover and raise the left-hand cover. This action operates to maintain the exposed leaves substantially in the same plane and adjacent the top portions of the leaf receiving rings so that there is little or no obstruction between the leaves formed by the exposed portions of the rings.

Figure 8 shows the leaves equally distributed over each cover, in which position the back will be at the mid-position of its rocking movement and the track will extend vertically to the plane of the support on which the book is opened.

As shown in Figure 9, when most of the leaves are disposed over the left-hand cover, the back will be rocked in a counterclockwise direction to maintain the exposed leaf substantially in the same plane and at the uppermost portions of the leaf receiving rings. This feature is advantageous in binders of this type and is a novel departure from the usual arrangements.

An additional feature of the construction just described, resides in the fact that the rings may be supported so that they project below the hinge connections of the covers, thus leaving smaller portions of the rings to extend above the covers when they are in opened position. It will be apparent by reference to Figures 7, 8 and 9 that the effective leaf receiving portions of the rings adjacent each cover are of such length as to receive only a portion of the entire number of leaves in the binder. That is, as shown in Figure 8, when the track is disposed so as to extend substantially vertical with reference to the plane of the supporting surface of the book, the ring portions adjacent each cover will receive approximately one-half of the total number of leaves in the binder.

However, as the rings are tilted, when leaves

are moved from one cover to the other, greater effective leaf receiving portions are automatically provided on the side to which the leaves are being transferred. This is due to the fact that the portions on opposite sides of the ring have smaller radii of curvature than the radius of curvature of the top or an intermediate portion of the ring. This arrangement prevents the projection of a very great portion of the ring above the uppermost sheets and thus eliminates obstructions which are usually present in the ordinary arrangement. This shape of ring has been found to be particularly advantageous in binders of larger capacity.

While it is not desired to restrict the rocking movement described above to any particular theory of operation, it appears that when the front cover of the book is opened, as shown in Figure 7, the pressure of the leaves is applied to the right-hand portions of the rings which, as previously noted, have the relatively small radii of curvature. This pressure maintains the rings tilted towards the right.

Now, as the leaves are turned to the left, the pressure of the leaves on the left-hand cover will correspondingly increase on the ring portions of small radii of curvature on this side. As the applied pressures acting on the two sides approach equilibrium, the ring member will approach its mid-rocking position, as shown in Figure 8.

Continuing the leaf turning, the pressure increases on the left-hand side and decreases on the right-hand side until, with all the leaves disposed on the left side, the ring will be tilted to the left, as shown in Figure 9.

There will be more or less drag of the leaves on the intermediate portion of the rings as the sheets are transferred from one side to the other. This is due to the larger radius of curvature in the intermediate or top portion of the ring. It will be noted that the drag effect is in a direction to aid the rocking.

In addition to the above, there are other factors contributing to the rocking movement. It will be noted that the principal movement of the leaves lying within the portions of the rings having the small radii of curvature, with reference to the binding element, is merely that of changing angles, each having moved through a considerable arc with reference to a given line across the axis of the rings. The perforations in the leaves being somewhat wider than the thickness of the rings permits a considerable initial change of angle before any slippage of the leaves is induced. Thus the rotation in the sheets disposed in the smaller ring portions occurs without hindrance.

Figures 11 and 12 disclose a slightly different construction wherein the split rings, instead of having their ends spaced apart as shown in the construction of Figure 4, have the sheet receiving ends disposed adjacent the bead 35 which in this case serves as a carrier bar 34'. With this arrangement, the leaves are not removable from the rings as in the previous arrangement, when the ring assembly structure is removed from its associated track, and the ring ends must be sprung apart before leaves may be placed on or removed from the rings. As shown in Figure 11, the upstanding portion of the track at its ends is cut back and the track is secured to the back of the book by means of rivets 42. Moreover, in this arrangement, instead of utilizing a deflected portion of the track to provide a fixed abutment, an

abutment is formed by providing an angular piece 43 at one end of the track, one leg of this angle being disposed between the base of the track and the back of the book, and held in place by the adjacent securing rivet 42. The other leg of this angle member projects upwardly into line of movement of the carrier bar so that when the carrier bar is in position in the book, one end abuts against this member.

The modification shown in Figures 13 and 14 discloses a track of different construction. In this instance, the track is in the shape of a channel bar which is mounted with its bridging portion downwardly. The bar is secured in position by struck-up fingers 44 on the intermediate back member 28'.

One leg of the track, for example, as shown at 45, is provided with a beaded edge similar to that of the track in the construction shown in Figure 4, for sliding engagement with the bead of the carrier bar. The other leg of the track is deflected to define a longitudinally extending groove 46 for receiving therein the free ends of the split rings when the ring assembly is attached to the track. It will be noted in this construction that when the ring assembly is associated with the track, the track closes the spaces between the ring ends so that the leaves may not be removed. However, when the ring assembly with the leaves thereon is removed from the track, the ends are in spaced relation and the leaves may be removed.

The modified structure shown in Figures 15 and 16 is somewhat similar to the construction shown in Figures 13 and 14. Referring to Figure 16, it will be noted that in this construction, instead of attaching the ring assembly directly to the track, the ring assembly is first attached to a bridging bar 47, this bridging bar in turn being arranged for sliding connection with the track.

The track in this case is arranged with a longitudinally extending centrally depressed portion which defines a central groove 48 which is secured at its bottom by deflected fingers 49 struck up from the intermediate member of the back construction. The track has lateral edges 50 and 51 which are arranged to slidably receive thereover the bridging bar. This bar is formed with a transversely curved body portion which is rearwardly deflected toward the center line of the bar to define lateral confronting grooves 52 and 53 for respectively receiving the edges 50 and 51 of the track. The marginal edges of the bridging bar are then outwardly deflected to form longitudinally extending grooves 54 and 55 for receiving in the one case the carrier bar 34' interconnecting the split rings, and in the other case, the free ends of the split rings.

With this arrangement, the ring assembly with the bridging bar associated therewith may be removed as a unit from the back of the book cover construction. After removal, the space between the ring ends is maintained closed by the bridging bar so that the leaves cannot be removed as long as the bridging bar is in position closing the ends of the rings. However, if it should be desired to remove the leaves, all that is necessary is to slidably remove the bridging bar to open the rings and permit removal of the leaves. In both of the constructions disclosed in Figures 14 and 16, movement of the ring assembly onto the track is limited by providing a deflected portion of the track, as shown at 56 in Figure 13 and 57 in Figure 15.

The construction shown in Figures 17 and 18

is particularly adapted for books of relatively small construction, such as small notebooks having the covers and backs constructed of a single sheet of flexible material, such as leather or the like. In general, the ring assembly of this construction is similar to that shown in Figure 12, and the ring ends must be sprung apart before leaves may be placed on or removed from the rings. The track in this case, instead of being provided with a base for mounting on a flat surface, is provided with curved laterally extending base portions 58 and 59 which are disposed on the inner surface of the cover material 60. This material at the back of the book is held against the portions 58 and 59 by means of a curved bar 61 overlying the outer surface of the material and having end fingers 62 which are deflected, pass through the cover material, and clamp around the respective ends of the track.

With further reference to the ring assembly shown in Figures 12, 17 and 18, it will be noted that this assembly may be used as a complete binder when detached from the book back. As a separate binder, it is well suited for students' notebooks, stenographers' notebooks, catalogs and the like, and since there are no obstructions projecting beyond the peripheries of the rings, the leaves may be freely turned, will lie flat when opened, and may be reversed with the outermost leaves back to back. When thus used as a separate binder, front and back protective sheets of heavier material may be threaded on the rings.

In Figure 5, the ring assembly shows the rings as being integrally formed with the carrier bar. This construction is preferably utilized in the various binder constructions described heretofore. However, it is not necessary to have the rings integrally formed with the carrier bar, and the ring assembly may be constructed as shown in Figures 19 and 20. In this construction, the carrier bar 34'' is formed from a separate strip, this strip being provided with the open bead 35' at one edge, as in the preferred construction.

At spaced intervals along the other edge of the carrier bar, the material is deformed to form loop portions 63. One end of each split ring 31' is threaded through a loop 63 and is conformed to the bead 35', so as to intimately engage the same. This arrangement holds the split rings in position on the carrier bar.

The shape of the ring in general, as shown in Figure 19, is the same as that utilized in the constructions shown in Figures 4, 7, 8 and 9, except that the lineally extending end for threading the leaves onto the ring is terminated in closer proximity to the juncture of the associated track base and web portions. This shape, especially with the higher track, effects maximum leverage for the pressure applied by the sheets on the portions of the ring having the smaller radius of curvature, provides a maximum length of ring outside the portion forming the leaf or sheet track to facilitate the insertion of leaves, affords a maximum opening for the passage of leaves when threading onto the rings, and provides a reliable stop to safeguard the rings against distortion in case of undue pressure on them in any direction. Ring assemblies embodying the features just described may be utilized in lieu of the previously described similar arrangements, if desired.

From the foregoing description, it will be apparent that the present invention provides an improved temporary binder construction which enables removal of the leaf receiving rings as a

unit with the leaves thereon and permits the ring structure to be mounted on another support which may constitute binding covers including a back adapted to receive the ring unit; which embodies an improved slide connection between the rings and the back of suitable covers, the slide connection being disposed inside the rings; a binder which secures the leaves against removal when in the book covers, but enables removal when the binder is removed from the covers; which includes a novel ring assembly which may be separately used as a binder or may be connected to suitable book covers; which embodies a novel ring construction for receiving the leaves; which includes improved means for securing the leaf receiving rings to a supporting bar or carrier; and in which the binder is so constructed that the back of the book may be rocked in such a way as to maintain the uppermost leaves disposed over the opened covers in substantially the same plane and at the top of the leaf receiving rings, and in which the rocking of the rings is effective to present greater effective leaf receiving portions of the rings on the side adjacent the cover to which the leaves are being transferred.

It is, of course, to be understood that although I have described in detail several embodiments of my invention, the invention is not to be thus limited, but only insofar as defined by the scope and spirit of the appended claims.

I claim as my invention:

1. In a temporary binder, a guide rail having an upstanding portion defining an elongate beaded edge, and sheet connecting means comprising a plurality of aligned split rings having one set of their corresponding ends secured to an elongate strip, this strip having a turned marginal edge arranged for axial sliding movement onto and from said beaded edge, but retained against lateral movement from the bead, whereby the sheets may be selectively associated with the guide rail or simultaneously removed from the guide rail and retained in connected relation by said rings.

2. In a binder, a strip having a longitudinally extending open bead, a struck up portion of said strip adjacent said bead, a split ring having one of its end margins anchored under said portion and deflected into intimate engagement with said bead, whereby the ring is rigidly secured to said strip.

3. In a binder, an elongate strip having an open bead along one edge, a plurality of struck up portions forming spaced loops along the other edge of the strip, and a plurality of sheet receiving rings secured to said strip, each of said rings extending under one of the loops and being conformed to intimately engage the outer surface of said bead.

4. A binder for a plurality of leaves arranged to be slidingly attached to and detached from a cover back and when detached from said back to bind the leaves and permit their being fully opened with the outermost leaves back to back, said binder comprising a plurality of leaf receiving rings, and an elongate member connecting said rings, said member defining a longitudinally extending channel slideway extending inwardly of the peripheries of said rings.

5. A binder for leaves comprising a plurality of open-ended leaf receiving rings, and means interconnecting said rings and defining an elongate open slideway channel extending transversely of the planes of said rings with its opening

facing generally in the same direction as the openings of said rings.

6. A binder for leaves comprising a plurality of leaf receiving rings, and a ring connecting member extending transversely of the planes of said rings, said member defining a channel slide-way having portions at the respective rings lying within the ring areas.

7. A binder for leaves comprising a plurality of interconnected leaf receiving open split rings, and aligned groove forming portions at each ring cooperatively defining a slideway opening in the same general direction as the openings of the rings.

8. In a temporary binder, an elongate guide rail having an upstanding portion arranged at its base for securing to a cover back and terminating at its uppermost edge margin in a bead, and sheet connecting means comprising an elongate strip having a turned marginal edge arranged for axial sliding movement onto and from said beaded edge, but retained against lateral movement from the bead, and a plurality of aligned spaced apart split rings having one set of their corresponding ends secured to said strip, the secured ends of the rings being connected to extend at an angle to the strip body, whereby the strip body may engage the upstanding portion of the guide rail and retain the rings against rotative movements in one direction.

9. In a binder for leaves, an elongate strip having one edge margin deflected to form an inwardly opening bead, a plurality of aligned leaf receiving split rings spaced apart along said strip with said bead disposed substantially at their centers, each of said rings having one of its ends deflected to conform to said bead, the deflected ends of said rings and said bead being disposed in nested relation, and means anchoring the respective rings adjacent their deflected ends to said strip.

10. In a binder for leaves, an elongate strip having one edge margin deflected to form an inwardly opening bead, a plurality of aligned leaf receiving split rings spaced apart along said strip with said bead disposed substantially at their centers, each of said rings having one of its ends conformed to and overlying said strip and bead thereon, and means adjacent the other edge margin of the strip for anchoring the adjacent portion of each ring thereto.

11. In a binder for leaves, an elongate strip having one edge margin deflected to form an inwardly opening bead, a plurality of aligned leaf receiving split rings spaced apart along said strip with said bead disposed substantially at their centers, each of said rings having one of its ends conformed to and overlying said strip and bead thereon, and strip portions adjacent the other marginal edge of the strip for anchoring the adjacent portion of each ring.

12. In a binder for leaves, an elongate strip having one edge margin deflected to form an inwardly opening bead, a plurality of aligned

leaf receiving split rings spaced apart along said strip with said bead disposed substantially at their centers, each of said rings having one of its ends conformed to and overlying said strip and bead thereon, and loop forming portions adjacent the other marginal edge of the strip for respectively receiving the rings therethrough.

13. In a binder for leaves, an elongate strip having one edge margin deflected to form an inwardly opening bead, a plurality of aligned leaf receiving split rings spaced apart along said strip with said bead disposed substantially at their centers, each of said rings having one of its ends conformed to said strip and bead thereof, said one end of each ring extending through an opening in the other marginal edge portion on the strip.

14. In a binder for leaves, a strip having a longitudinally extending open bead, and an open split ring having one of its ends deflected to form an open bead, the said beads being rigidly secured in intimate nested relation and having their openings similarly disposed and generally facing that of the ring.

15. In a binder for leaves, a strip having a longitudinally extending open bead, and an open split ring having one of its ends rigidly secured to said strip, said open bead and split ring having their openings facing in the same general direction.

16. In a binder for leaves, a longitudinally extending open bead, and an open split ring having a mating open bead at one of its ends, the said open beads being rigidly secured in intimate nested relation and having their openings similarly disposed with that of the ring.

17. In a binder for leaves, a longitudinally extending open bead, and a plurality of spaced open split rings carried by said bead, the said bead having its opening similarly facing with those of the rings.

18. In a binder for leaves, an open split ring having one end inwardly turned and cooperating with the other ring end to define a sheet threading opening, a ring carrier at the inwardly turned end of the ring, and a support member extending through the sheet threading opening and having a slide connection only with said carrier.

19. In a binder for leaves, an elongate back cover reinforcing member, an inner cover facing member on the reinforcing member, an elongate track member overlying the facing member adapted to removably support a leaf carrying assembly, and spaced fingers struck up on the lateral margins of the reinforcing member extending through the inner facing member and clampingly engaging the lateral margins of the track member, whereby said reinforcing member, facing member and track member are secured in assembled intimate relation along the back length.

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