Feb. 24, 1953 P. O. DERRINGER ET AL 2,629,224

LINK POST CONSTRUCTION FOR BINDERS

Filed Dec. 21, 1949

Fig. 1.

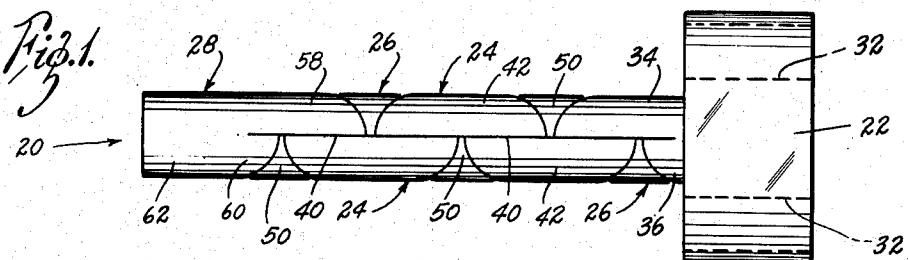


Fig. 2.

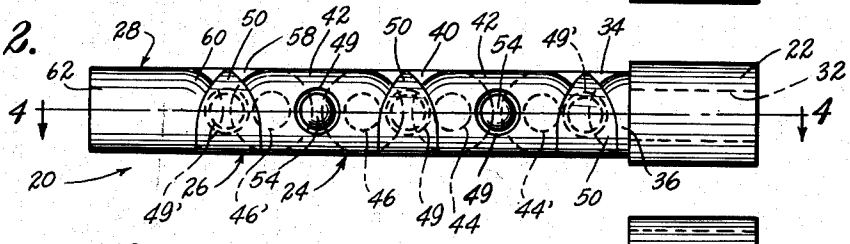


Fig. 3.

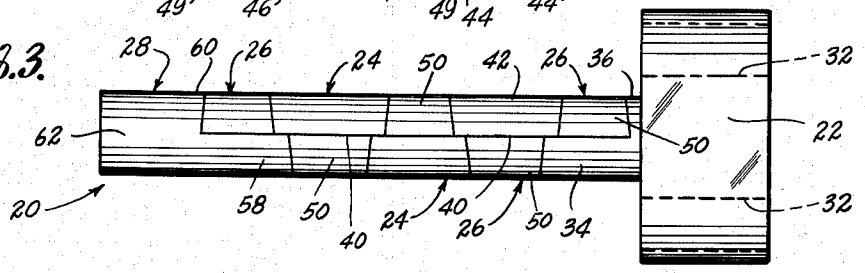


Fig. 4.

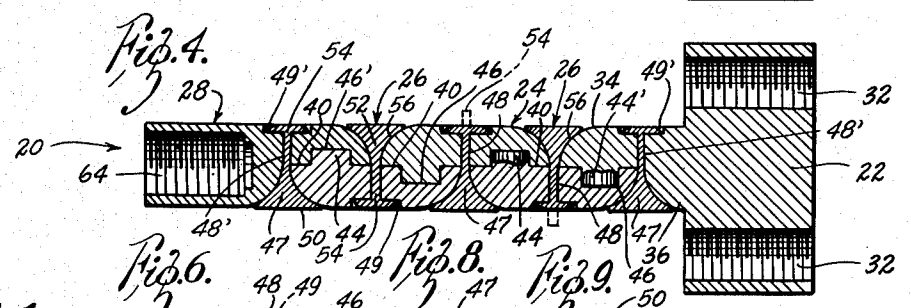


Fig. 5.

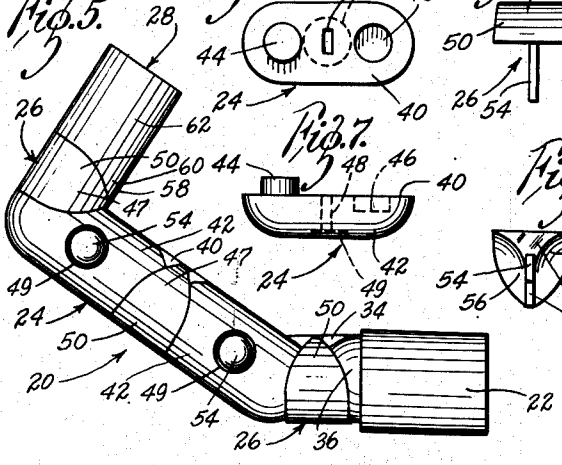


Fig. 6.

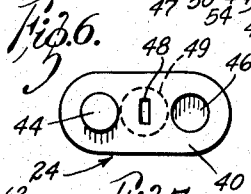


Fig. 7.

Fig. 8.

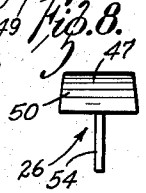


Fig. 9.

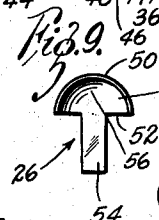


Fig. 10.

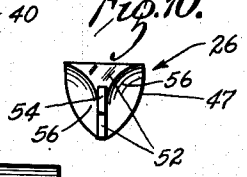
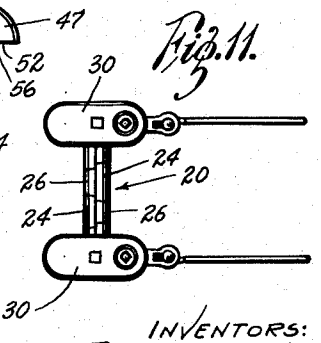


Fig. 11.



INVENTORS:
ROONEY W. DAVIS,
PETE O. DERRINGER,
BY Rogers & Egan,
ATTORNEYS.

Patented Feb. 24, 1953 2,629,224

UNITED STATES PATENT OFFICE

2,629,224

LINK POST CONSTRUCTION FOR BINDERS

Pete O. Derringer, St. Louis, and Rooney W. Davis, Webster Groves, Mo., assignors to Loose Leaf Metals Co., St. Louis, Mo., a corporation of Missouri

Application December 21, 1949, Serial No. 134,280

14 Claims. (Cl. 59—78)

1

The present invention relates generally to loose leaf binders, and more particularly to a novel link post construction forming an improvement over the link post construction shown in the Newman Patent No. 2,200,364.

Briefly, the present novel link post construction comprises interlocked, die-cast zinc elements. A zinc die-cast rider block having an integral projection extending from one side forms one end of the present link post construction. A plurality of half beans or links and interlocking retainer caps form the main body of the post and are interlocked to provide a ninety degree bend at each retainer cap. An attachment end member completes the construction.

Therefore, an object of the present invention is to provide a novel die-cast zinc link post construction which combines simplicity and sturdiness.

Another object is to provide a novel zinc die-cast link post construction which incorporates a plurality of pivotally associated links or half beans which are cut along their longitudinal axis and connecting interlocking retainer caps which are so associated that a ninety degree bend is provided in one direction, but very little bend is provided in the opposite direction.

Another object is to provide a novel link post construction which incorporates a die-cast rider nut or block which includes as an integral part a projection in the form of end portions of a half bean.

Another object is to provide a novel zinc die-cast link post construction which has a greater tensile strength than the presently employed link post constructions formed of machined metal, and in which the rivets normally used in standard construction are entirely eliminated.

Other objects are to provide a novel zinc die-cast link post construction which is simple to form as to its component parts and which is readily assembled for use, which is inexpensive to cast and to fabricate, which has a high tensile strength thereby reducing to a minimum breakage and subsequent repair, which is formed of identical half beans, which includes relatively few parts, and which finds wide adaptation in the loose leaf binder field.

The foregoing and other objects and advantages are apparent from the following description taken with the accompanying drawing, in which:

Fig. 1 is a plan view of a zinc die-cast link post construction incorporating the teachings of the present invention;

2

Fig. 2 is a side elevational view thereof;

Fig. 3 is a bottom plan view thereof;

Fig. 4 is a horizontal cross-sectional view taken on substantially the line 4—4 of Fig. 2;

Fig. 5 is a side elevational view thereof, showing the attaching end member bent at ninety degrees to the connected link and an interior link bent at less than ninety degrees;

Fig. 6 is a side elevational view of a half bean;

Fig. 7 is a plan view thereof;

Fig. 8 is a bottom plan view of a retainer cap;

Fig. 9 is a side elevational view thereof;

Fig. 10 is an end elevational view thereof, looking toward the stem; and

Fig. 11 is an end view of a book binder incorporating the present link post construction.

Referring to the drawing more particularly by reference numerals, 20 indicates generally a link post construction formed in accordance with the teachings of the present invention. Broadly, the link post construction 20 includes a rider block or nut 22, half beans or links 24, retainer caps 26, and an attaching or connecting member 28.

The block 22 is a zinc die-cast member of generally rectangular form rounded at the ends as shown adapted for reciprocative movement within a closed case 30, details of such mounting and movement being more particularly shown in the above-identified Newman patent and which form no part of the present invention. The block 22 includes oppositely threaded through openings 32 for reception of the usual threaded shafts likewise disposed in the case 30 (not shown). Half bean portions 34 and 36 are formed integral with the block 22 and extend outwardly from one side thereof as is clear from the drawing. The half bean portion 34 extends beyond the half bean portion 36 and is in opposed relation thereto, the former including a boss 44' toward the free end extending from the flat surface thereof and an opening 48' terminating in a well 49'.

Each half bean 24 is of the configuration clearly shown in Figs. 6 and 7, having a flat surface 40 and a generally flattened half-oval surface 42. Concentric with one end of the half bean 24 and extending from the flat surface 40 is a cylindrical boss 44, and concentric with the other end is an annular well 46 of a depth substantially equal to the height of the cylindrical boss 44. A rectangular opening 48 extends through the half bean 24 between the boss 44 and the well 46 terminating in a shallow well 49 in the surface 42. It is to be noted that the half bean portions 34 and 36 are of the same configu-

rations as the just described half bean 24, being, in effect, portions thereof.

The retainer cap 26 is of the configuration clearly shown in the drawing, and includes a main cap portion 47 having a convex outer surface 50 converging to a point, as is clear from Figs. 2 and 5 taken with Fig. 10. A flat surface 52 opposes the convex surface 50 which is interrupted by an integral stem 54 extending vertically therefrom. Identical concave surfaces 56 are formed between the flat surface 52 and the convex surface 50. It is to be noted that the concave surfaces 56 are formed to receive the rounded end of a bean 24 as is more particularly described below.

The connecting member 28 is of the configuration clearly shown in the drawing, and includes bean portions 58 and 60 formed at one end of a main body portion 62 of cylindrical form. The main body portion 62 has a threaded well 64 for receiving a stationary member located in one case 30 (not shown). The bean portion 58 includes a well 46', and a rectangular opening 48', the latter terminating in a well 49'.

The assembly of the link post construction 20 merely requires disposing half beans 24 in opposed relation with each other and with the bean portion 34 of the block 22 and with the bean portion 58 of the connecting member 28, and then locking the several elements together for the required pivotal movement by use of the retainer caps 26. It is to be noted that the stem 54 is of a length to extend beyond the bean 24 through which it is inserted, so that anchoring requires merely the riveting or peening over of the free end thereof from the dotted position shown in Fig. 4 to the solid line position. Specifically, a bean 24 is disposed with its well 46 housing the boss 44' of the bean portion 34 of the block 22. A retainer cap 26 is disposed through the opening 38' of the bean portion 34 and the stem 54 thereof is riveted to substantially fill the well 49'. Thereafterwards, additional beans 24 are similarly secured in position one to the other until the desired length is obtained for the link post construction 20, the over-all length to include the connecting member 28.

The configuration of the retainer cup 26 is such that it permits a bending action of the post construction 20 in one direction at each end of each half bean 24, as is indicated in Fig. 5. The converging lines defining the convex surface 50 are so formed that each engages a half bean 24 to permit a ninety degree bend, but no greater, in one direction. Bending of the elements in the opposite direction is reduced by the configuration of the half beans 24 and the retainer caps 26 to a permissible minimum, bend in this other direction not being required completely eliminated for completely satisfactory operation of the link post construction 20.

In the present link post construction 20, rivets are entirely eliminated, the retainer caps 26 performing the function of retaining the elements in operative position. Anchoring or securing of the linkage to the block 22 is eliminated, since the half bean portions 34 and 36 are cast integral with the block 22 and form parts thereof. This adds strength to the construction and renders the post construction 20 less expensive. Such also facilitates formation of the post construction 20.

It is manifest that a link post construction of high tensile strength has been provided, since the pull is distributed through the bosses 44 and 44'. Very little, if any, shearing effect is transmitted to the stems 54 of the retainer caps 26. All of the elements of the present link post construction 20 are zinc die-cast members. Sturdy elements are thereby provided which require no machining.

It is manifest that there has been provided a link post construction which fulfills the objects and advantages sought therefor.

It is to be understood that the foregoing description and the accompanying drawing have been given by way of illustration and example. It is also to be understood that changes in form of the elements, rearrangement of parts, and substitution of equivalent elements, which will be obvious to those skilled in the art, are contemplated as within the scope of the present invention which is limited only by the claims which follow.

What is claimed is:

1. Link post construction comprising, in combination, a rider block, a plurality of "half bean" links which include a flat surface and a flattened half oval surface, the peripheries of said two surfaces being identical, said links cut along their longitudinal axis, positioned in two opposed rows with the flat sides contiguous and with the links of opposed rows overlapping, and retainer caps securing said links to each other and to said rider block, there being a retainer cap between each end to end pair of links anchored in the opposed link, said links being pivotally connected and secured chainwise to each other to prevent any sliding action of the "half bean" links relative to one another other than a relative rotation through said pivotal connection and to said rider block.

2. Link post construction comprising, in combination, a rider block, a plurality of "half bean" links which include a flat surface and a flattened half oval surface, the peripheries of said two surfaces being identical, said links cut along their longitudinal axis, positioned in two opposed rows with the flat sides contiguous and with the links of opposed rows overlapping, and retainer caps securing said links to each other and to said rider block, there being a retainer cap between each end to end pair of links anchored in the opposed link, said links being pivotally connected and secured chainwise to each other to prevent any sliding action of the "half bean" links relative to one another other than a relative rotation through said pivotal connection and to said rider block, said retainer caps comprising the only securing means.

3. Link post construction comprising, in combination, a rider block, link portions formed integral with said rider block and extending therefrom, "half bean" links which include a flat surface and a hemicylindrical surface having ends which are spherical in nature, the peripheries of said two surfaces being identical, said links cut along their longitudinal axis, positioned in two opposed rows with the flat sides contiguous and with the links of opposed rows overlapping and pivotally connected and secured to each other and to one link portion to prevent any sliding action of the "half bean" links relative to one another other than a relative rotation through said pivotal connection and thereby forming a linkage, and retainer cap securing said links against removal from each other and from said one link portion, there being a retainer cap between each end to end pair of links anchored in

the opposed link and between said rider block link portion and the adjacent end to end link.

4. Link post construction comprising, in combination, a rider block, link portions formed integral with said rider block and extending therefrom, "half bean" links which include a flat surface and a hemicylindrical surface having ends which are spherical in nature, the peripheries of said two surfaces being identical, said links cut along their longitudinal axis, positioned in two opposed rows with the flat sides contiguous and with the links of opposed rows overlapping and pivotally connected and secured to each other and to one link portion to prevent any sliding action of the "half bean" links relative to one another other than a relative rotation through said pivotal connection and thereby forming a linkage, and retainer caps securing said links against removal from each other and from said one link portion, there being a retainer cap between each end to end pair of links anchored in the opposed link and between said rider block link portion and the adjacent end to end link, said links and retainer caps being formed so that each retainer cap forms a closed housing contiguous with the ends of the adjacent links on one side of said retainer cap and is open at the other side to permit a bend of ninety degrees at the end of each link in one direction and to substantially restrict bending in the opposite direction.

5. Link post construction comprising, in combination, a zinc die-cast rider block, link portions formed integral with said rider block and extending therefrom, zinc die-cast "half bean" links which include a flat surface and a flattened half oval surface, the peripheries of said two surfaces being identical, said links cut along their longitudinal axis and pivotally connected and secured to each other and to one link portion to prevent any sliding action of the "half bean" links relative to one another other than a relative rotation through said pivotal connection and thereby forming a linkage, and zinc die-cast retainer caps securing said links against removal from each other and from said one link portion.

6. Link post construction comprising, in combination, a rider block, link portions formed integral with said rider block and extending therefrom, "half bean" links which include a flat surface and a flattened half oval surface, the peripheries of said two surfaces being identical, said links cut along their longitudinal axis and pivotally connected and secured to each other and to one link portion to prevent any sliding action of the "half bean" links relative to one another other than a relative rotation through said pivotal connection and thereby forming a linkage, and retainer caps securing said links against removal from each other and from said one link portion in a direction normal to said linkage, said retainer caps comprising the only securing means in said direction.

7. Zinc die-cast linkage comprising opposed zinc die-cast "half bean" links which include a flat surface and a hemicylindrical surface having ends which are spherical in nature, the peripheries of said two surfaces being identical, said links cut along their longitudinal axis and pivotally connected and secured to each other to prevent any sliding action of the "half bean" links relative to one another other than a relative rotation through said pivotal connection, and zinc die-cast elements securing said links together, each including a portion disposed between abutting links and a portion extending through and anchored in an opposed link.

8. Zinc die-cast linkage comprising opposed zinc die-cast "half bean" links which include a flat surface and a hemicylindrical surface having ends which are spherical in nature, the peripheries of said two surfaces being identical, said links cut along their longitudinal axis and pivotally connected to each other, each link having an annular boss and an annular well serving as the pivotal connection, and zinc die-cast elements securing said links together, each including a portion disposed between abutting links and a portion extending through and anchored in an opposed link.

9. A zinc die-cast link including a flat surface, a flattened half oval surface, the peripheries of said two surfaces being identical, a well in said flat surface near one end of said links, and a boss extending outwardly from said flat surface near the other end of said link.

10. A zinc die-cast retainer cap for securing links together comprising a main body portion having a convex surface converging from a maximum width at one end to substantially a point at the other end, said body portion also including identical concave surfaces and a flat surface separating the same, and a stem extending vertically from said flat surface.

11. Link post construction comprising, in combination, at least three "half bean" links which include a flat surface and a flattened half oval surface, the peripheries of said two surfaces being identical, said links cut along their longitudinal axis, at least three retainer caps, two of said links being in end to end relation and said third link being disposed midway of said two links with its flat side against the flat sides of said two links, and separate means pivotally connecting and securing said two links to said third link to prevent any sliding action of the "half bean" links relative to one another other than a relative rotation through said pivotal connection, one of said retainer caps being disposed between said two links and anchored to said third link, a second retainer cap being disposed adjacent one end of said third link and anchored in one of said two links, and the third retainer cap being disposed adjacent the other end of said third link and anchored in the other of said two links.

12. The link post construction of claim 11 in which said retainer caps include a convex outer surface and opposed concave inner surfaces, each of said concave inner surfaces being formed to receive a portion of the convex end of a "half-bean" link and to permit relative movement in one direction only from a substantially straight line relationship.

13. Link post construction comprising, in combination, a rider block, a plurality of "half bean" links which include a flat surface and a hemicylindrical surface having ends which are spherical in nature, the peripheries of said two surfaces being identical, said links cut along their longitudinal axis, a connecting member, one link being pivotally connected to said rider block and one link being pivotally connected to said connecting member, said links between said rider block and said connecting member being disposed in two flat-side opposed end to end rows, the links of opposed rows being positioned so that a single link of one row spans substantially two half portions of the links of the opposed row, said links being pivotally connected and secured one to another to prevent any sliding action of the

"half bean" links relative to one another other than a relative rotation through said pivotal connection and thereby forming a chain, and a plurality of retainer caps, one of said retainer caps extending between each pair of end to end links and anchored in the opposed link, a retainer cap being disposed between said rider block and the link to which the same is pivotally connected and being anchored in said rider block, and a retainer cap being disposed between said connecting member and the link to which the same is pivotally connected and being anchored in said connecting member.

14. The link post construction of claim 13 in which each retainer cap includes a head portion forming part of the cylindrical chain post, each

retainer cap between end to end links being formed to permit pivotal movement of the links in one direcion only from a substantially straight line arrangement.

PETE O. DERRINGER.
ROONEY W. DAVIS.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,997,886	Newman	Apr. 16, 1935
2,362,383	Lindinara	Nov. 7, 1944