Feb. 27, 1940. A. N. HANNA 2,191,886

LOOSE LEAF BINDER

Filed July 17, 1937

Fig. 1.

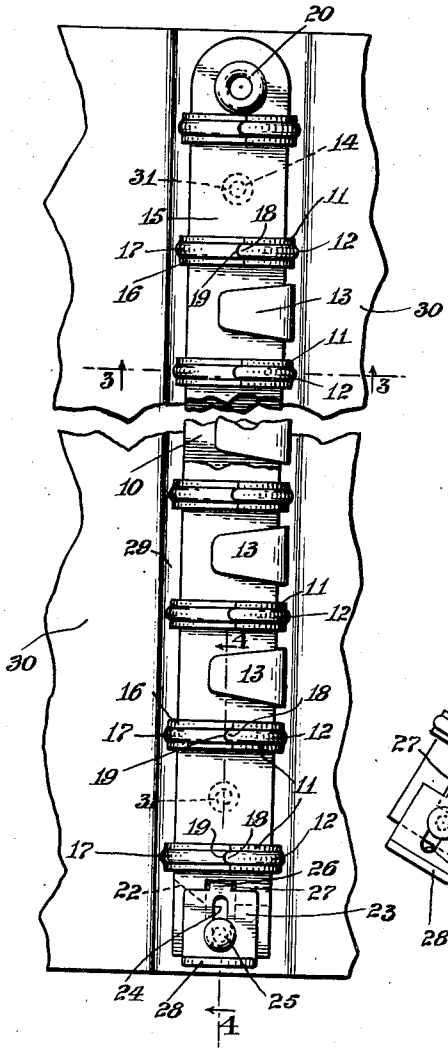


Fig. 2.

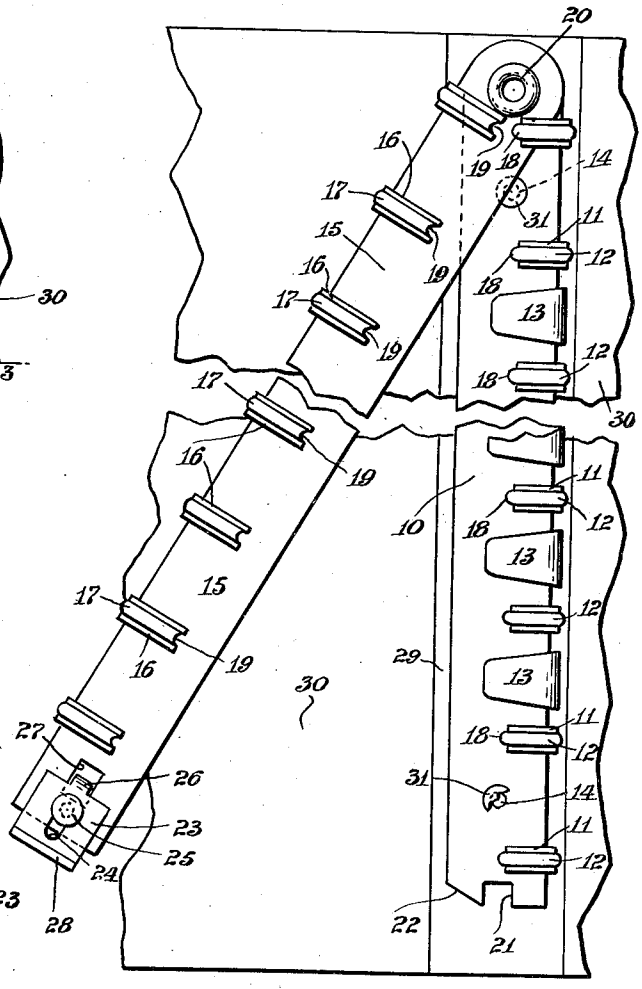


Fig. 3.

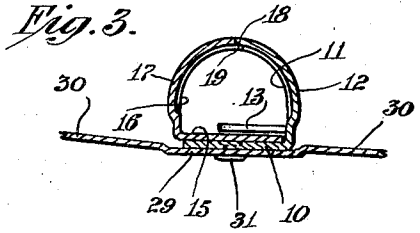
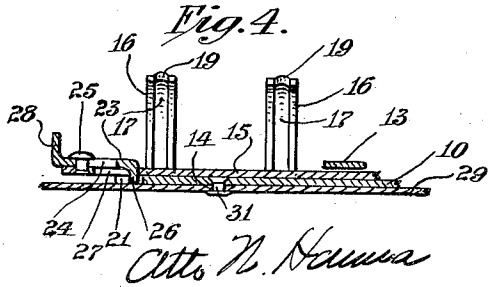


Fig. 4.



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LOOSE LEAF BINDER

Atto N. Hanna, Newark, N. J.

Application July 17, 1937, Serial No. 154,173

4 Claims. (Cl. 129—10)

The invention relates to loose leaf binders, and more particularly to a binder of the type in which separable arcuate post carrying members are superimposed one upon the other, and so connected as to permit the simultaneous separation of all of the posts for the purpose of inserting or removing sheets from different parts of the pile collected upon the loops formed by said posts.

The general type of binder above referred to is old and well known in the art, the invention relating to structural characteristics imparting such rigidity to the structure as a whole when the post carrying members are in the closed position, as to preclude displacement of the complementary post parts upon one member in relation to those upon the other member to an extent to cause tearing of the sheets when turning the leaves upon the posts. Such separation of the posts may occur either as a result of the lifting of the sheets or of stresses substantially radially of the portion of the posts adjacent the strip carrying same.

The structure is such as to permit the economical production and assembly of the post carrying members, these members being formed from sheet metal by dies, thus not only ensuring extreme accuracy in the various parts entering into a binder, but rapidity in the assembling of the parts, since the different members may be made in large volume and each member may be accurately assembled with its co-operating member without any readjustment or fitting of parts.

In a binder embodying the invention, when closing the posts the metal strips carrying the posts are so tied together as to provide a unitary structure resisting displacement of one of the post carrying strips in relation to the other, from any of the strains to which the posts are subjected, and may be locked by a simple positive locking mechanism in a manner to prevent the accidental opening of the posts when handling the binder. The locking mechanism also preferably is made of sheet metal. This locking mechanism also is so constructed that it may be utilized as a finger hold in opening and closing the posts, thus facilitating this operation in the binder.

The invention consists primarily in a loose leaf binder embodying therein a sheet metal base strip, a plurality of arcuate posts formed integrally with, and projecting upwardly from, one edge of, and part way across, said base strip, a plurality of tongues formed integrally with, and projecting from the same edge of said base strip as said posts, said tongues overlaying, being parallel with and being spaced from said base strip, a movable sheet metal strip having a plurality of arcuate posts complementary to the posts upon said base strip and formed integrally with and projecting upwardly from one edge of said movable strip, said movable strip being of a thickness to be superimposed upon said base strip and to closely fit the space between same and said tongues, whereby said movable strip will be firmly held in close abutting relation to said base strip, turning movement of said strip in one direction is limited, lifting of the arcuate posts upon said movable strip in relation to the arcuate posts upon said base strip is prevented, said tongues are interposed between said movable strip and the leaves of a book, and both strips contribute towards the rigidity of the binder, and means adjacent one end of said strips permitting pivotal movement of said movable strip; and in such other novel features of construction and combination of parts as are hereinafter set forth and described, and more particularly pointed out in the claims hereto appended.

Referring to the drawing,

Fig. 1 is a plan view of a fragmentary portion of a binder in the open position with the arcuate post carrying members in the closed position;

Fig. 2 is a similar view with the arcuate post carrying members in the open position;

Fig. 3 is a section on the line 3—3 of Fig. 1; and

Fig. 4 is a section on the line 4—4 of Fig. 1.

Like numerals refer to like parts throughout the several views.

A loose leaf binder embodying the invention, as illustrated in the accompanying drawing, consists of a base member 10 consisting of a strip of sheet metal having formed up, along one edge thereof, a plurality of posts 11 which are in substantially arcuate form excepting where they merge into the strip 10, there being a short, substantially straight portion at this point as shown clearly in Fig. 3 of the drawing. These posts 11 are formed integrally with the strip 10 and are transversely arched, as shown at 12, to afford not only a stiffening rib for the posts, but a rounded outer surface ensuring a smooth running of sheets of paper along the posts and at the same time giving increased thickness to the posts.

Also carried by and formed integrally with the base strip 10 are a plurality of tongues 13 which overlay the base strip and are spaced therefrom a distance to form a sequence of pockets adapted to receive and engage a co-operating pivotal strip mounted upon said base strip 10.

The number of the tongues 13 will, of course, vary with the length of the strip, these tongues being positioned intermediate the posts 11 so as to provide metal stock sufficient to form both the posts and the tongues. No tongues 13 are positioned between the two posts adjacent each end of the strip, thus providing space for open-

ings 14 adapted to receive rivets in attaching the base strip to the back of a binder book or case.

In conjunction with the base strip 10, I provide a movable strip 15 having a sequence of posts 16 corresponding in position with the posts 11 upon the base strip 10. These posts are also arched transversely, as indicated at 17, and have a length and are so formed as to complement the posts 11 in forming a continuous, semi-circular holder for sheets or cards.

The ends of the arcuate portions of the posts 11 and 16 are so formed that one overlaps the other, and thus minimizes likelihood of the formation of a gap between the posts when the strip members are in the closed position. In the form of the invention shown, the posts 11 each have a projecting end 18 adapted to enter a recess 19 in the end of the complementary post 16.

The two strips 10 and 15 are pivoted together, as by means of the hollow rivet 20, this point of pivotal connection being adjacent one end of the strips.

The tongues 13 are spaced from the base strip 10 a distance substantially equalling the thickness of the metal in the strip 15, so that when said strip 15 is moved to engage the posts 16 with the posts 11 to form continuous arched members extending from the base strip 10 to the movable strip 15, the flat portion of the strip 15 will pass below the tongues 13 and be frictionally gripped between these tongues and the base strip 10.

To preclude all possibility of accidental movement of the strip 15, I provide co-operating locking means at the end of said strips, remote from the pivot 20, so as to place the strip 15 under positive restraint, except when it is desired to open the posts for the purpose of adding or removing leaves from the binder.

In the form of the invention shown, this locking mechanism comprises a socket 21 in the end edge of the strip 10, a bevel 22 being provided at one side of and leading into this socket so as to prevent blocking of the bolt member co-operating with the socket with movement of the strip 15 upon the strip 10 in engaging the posts 16 and 11. The bolt member is carried by the strip 15.

This bolt member comprises a plate 23 having an elongated slot 24 therein and slidably mounted on the strip 15 by means of a guide stud 25 secured to the strip 15 and passing through said slot. The plate 23 is provided with a downwardly projecting lug 26 movable in a slot 27 in the strip 15, which is adapted to register with the socket 21 when the two strips 10 and 15 are brought in superimposed relation one to the other in a manner to engage the ends of the posts 11 and 16.

A finger hold 28 is upwardly projected from the plate 23 to provide means for sliding the plate 23 to engage or disengage the lug 26 from the socket 21 and at the same time afford a suitable abutment or instrumentality for imparting pivotal movement to the strip 15 when opening and closing the binder.

The plate 23 has dimensions permitting it to be produced from the waste material of the sheet metal from which the strip 15 is made.

The base strip 10 is secured to the back 29 of the book or binder 30 by means of countersunk rivets 31 passing through the openings adjacent the opposite ends of said strip.

Since the movable strip 15 occupies a plane parallel with the fixed base strip 10, it is obvious that the height of the posts 16 must vary in proportion to that of the posts 11 so as to secure the desired abutting relation between the ends of the posts forming complementary portions of the continuous loops.

By the construction described, the strip 15, while superimposed upon the base strip 10, may have limited movement relative to said base strip controlled by the connection between said strips as well as by the tongues 13.

The operation of the herein described binder is substantially as follows:

When the strips 10 and 15 are in the closed position, as shown in Fig. 1, the movable strip 15 is confined between the base strip 10 and the tongues 13 so as to be incapable of separation, one from the other.

While the parts are in this position, the lock plate 23 is in a position to position the downwardly projecting lug 26 thereof in the socket 21 of the base strip 10. With this condition, the strip 15 is incapable of having any movement sufficient to separate the contiguous arcuate ends of the posts 11 and 16, either by a vertical or a horizontal separation thereof. The width of the strip 15 imparts sufficient strength thereto to prevent flexing of the strip upon a horizontal plane, and the tongues 13 prevent flexing thereof upon a vertical plane. By forming the posts with a transverse arcuate portion, flexure of these posts is prevented.

By providing the posts 11 and 16 with overlapping sections in the same horizontal plane, no gaps which will permit the escape of a sheet of paper between the ends of these posts can be formed. Consequently, succeeding sheets of paper may run freely from one set of posts to the other set of posts without likelihood of escape from the loops or tearing of the paper because of engagement with the ends of one set of posts.

When it is desired to separate the arcuate portion of the posts to permit the insertion or removal of sheets from the binder, it is merely necessary for the user to grasp the finger hold 28 and move the lock plate 23 outwardly, longitudinally of the strips and along the guide stud 25, the slot 21 permitting and limiting this movement of the lock plate. By this movement of the plate, the downwardly projecting lug or bolt 26 is moved out of the socket 21 so as to permit a free movement of the strip 15 in a manner to separate the posts 11 and 16 in the manner illustrated in Fig. 2.

After sheets have been inserted in or removed from the binder, the strip 15 may be returned to its closed position, passing under the various tongues 13.

Since the two strips 10 and 15 are of substantially the same width, and since the posts 11, the posts 16 and the tongues 13 are drawn up from one edge of said strips respectively, it is obvious that by merely closing the strips in superimposed relation to each other, the engagement of the edge of the strip 15 with the posts 11 and the bend of the tongues 13 will ensure accuracy in the positioning of the two strips.

The bevel portion 22 acts as a striker to impart outward movement to the lock plate 23 if this plate does not occupy its outermost position during the closing movement of the two strips. When the strips have been accurately alined, it is merely necessary to push the lock plate 23 inwardly of the two strips, so as to engage the lug or bolt 26 in the socket 21.

Each of the strips 10 and 15 and their appurtenant parts is formed by means of dies integrally of sheet metal stock, as is the lock plate 23, thus ensuring exactitude in the dimensions of all parts produced and avoiding the necessity for any fitting during the assembling operation.

The metal fitting forming a part of a binder must be produced at extremely low cost, and the binder of the invention is so constructed as to not only be capable of a rapid and economical production of parts, but inexpensive material such as cold rolled, half hard steel or other metal having the characteristics thereof may be used.

It is not my intention to limit the invention to the precise details of construction shown in the accompanying drawing, it being apparent that such may be varied without departing from the spirit and scope of the invention.

Having described the invention, what I claim as new and desire to have protected by Letters Patent, is:

1. A loose leaf binder embodying therein a sheet metal base strip, a plurality of arcuate posts formed integrally with, and projecting upwardly from, one edge of, and part way across, said base strip, a plurality of tongues formed integrally with, and projecting from the same edge of said base strip as said posts, said tongues overlaying, being parallel with and being spaced from said base strip, a movable sheet metal strip having a plurality of arcuate posts complementary to the posts upon said base strip and formed integrally with and projecting upwardly from one edge of said movable strip, said movable strip being of a thickness to be superimposed upon said base strip and to closely fit the space between same and said tongues, whereby said movable strip will be firmly held in close abutting relation to said base strip, turning movement of said strip in one direction is limited, lifting of the arcuate posts upon said movable strip in relation to the arcuate posts upon said base strip is prevented, said tongues are interposed between said movable strip and the leaves in the binder, and both strips contribute towards the rigidity of the binder, and means adjacent one end of said strips permitting pivotal movement of said movable strip.

2. A loose leaf binder embodying therein a sheet metal base strip, a plurality of arcuate posts formed integrally with, and projecting upwardly from, one edge of, and part way across, said base strip, a plurality of tongues formed integrally with, and projecting from the same edge of said base strip as said posts, said tongues overlaying, being parallel with and being spaced from said base strip, a movable sheet metal strip having a plurality of arcuate posts complementary to the posts upon said base strip and formed integrally with and projecting upwardly from one edge of said movable strip, said movable strip being of a thickness to be superimposed upon said base strip and to closely fit the space between same and said tongues, whereby said movable strip will be firmly held in close abutting relation to said base strip, turning movement of said strip in one direction is limited, lifting of the arcuate posts upon said movable strip in relation to the arcuate posts upon said base strip is prevented, said tongues are interposed between said movable strip and the leaves in the binder, and both strips contribute towards the rigidity of the binder, means adjacent one end of said strips permitting pivotal movement of said movable strip, and co-operating locking means carried by said strips adjacent the other end thereof.

3. A loose leaf binder embodying therein a sheet metal base strip, a plurality of arcuate posts formed integrally with, and projecting upwardly from, one edge of, and part way across, said base strip, a plurality of tongues formed integrally with, and projecting from the same edge of said base strip as said posts, said tongues overlaying, being parallel with and being spaced from said base strip, a movable sheet metal strip having a plurality of arcuate posts complementary to the posts upon said base strip and formed integrally with and projecting upwardly from one edge of said movable strip, said movable strip being of a thickness to be superimposed upon said base strip and to closely fit the space between same and said tongues, whereby said movable strip will be firmly held in close abutting relation to said base strip, turning movement of said strip in one direction is limited, lifting of the arcuate posts upon said movable strip in relation to the arcuate posts upon said base strip is prevented, said tongues are interposed between said movable strip and the leaves in the binder, and both strips contribute towards the rigidity of the binder, means adjacent one end of said strips permitting pivotal movement of said movable strip, and locking means for said movable strip comprising an end socket in said base strip, a bevel adjacent and leading into said socket, a plate carried by and slidably mounted upon said movable strip, a downwardly projecting lug carried by said plate and adapted to co-operate with said bevel and said socket, guiding means for said lug, and a finger hold upon said plate.

4. A loose leaf binder embodying therein a sheet metal base strip, a plurality of arcuate, transversely arched posts formed integrally with, and projecting upwardly from, one edge of, and part way across, said base strip, a plurality of tongues formed integrally with, and projecting from the same edge of said base strip as said posts, said tongues overlaying, being parallel with and being spaced from said base strip, a movable sheet metal strip having a plurality of arcuate, transversely arched posts complementary to the posts upon said base strip and formed integrally with and projecting upwardly from one edge of said movable strip, said movable strip being of a thickness to be superimposed upon said base strip and to closely fit the space between same and said tongues, whereby said movable strip will be firmly held in close abutting relation to said base strip, turning movement of said strip in one direction is limited, lifting of the arcuate posts upon said movable strip in relation to the arcuate posts upon said base strip is prevented, said tongues are interposed between said movable strip and the leaves in the binder, and both strips contribute towards the rigidity of the binder, means adjacent one end of said strips permitting pivotal movement of said movable strip, and locking means for said movable strip comprising an end socket in said base strip, a bevel adjacent and leading into said socket, a plate carried by and slidably mounted upon said movable strip, a downwardly projecting lug carried by said plate and adapted to co-operate with said bevel and said socket, guiding means for said lug, and a finger hold upon said plate.

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