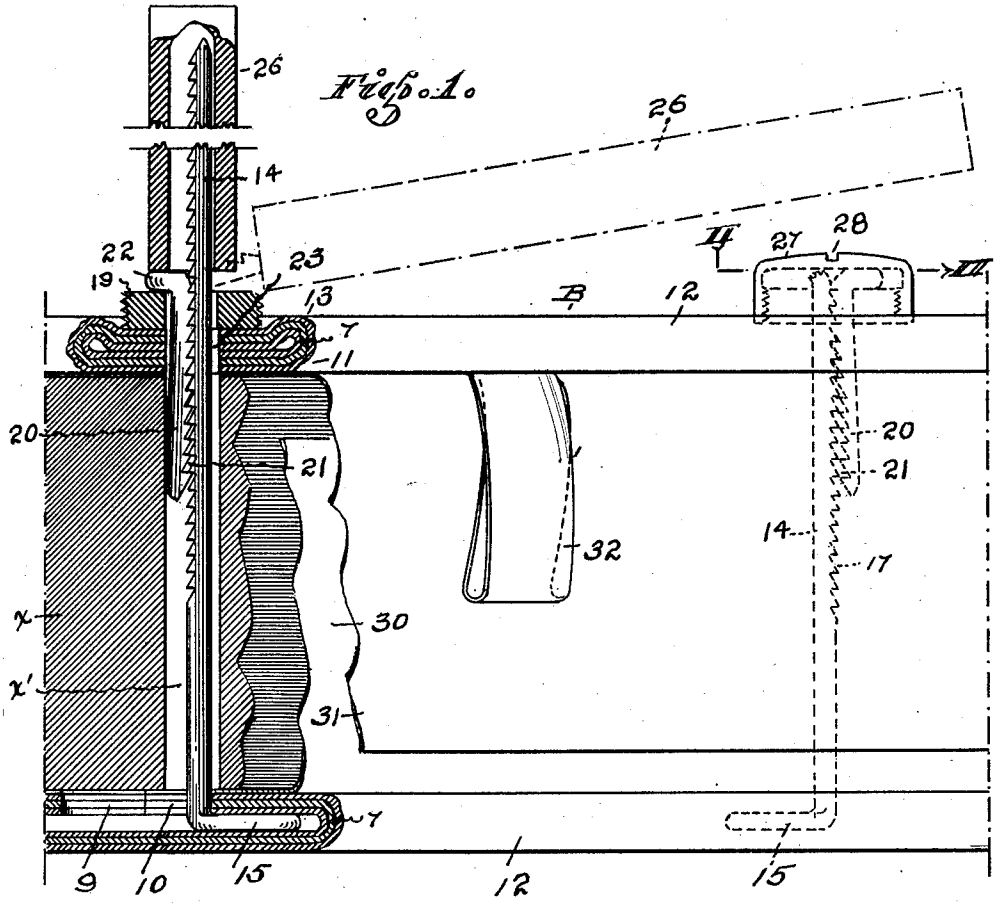
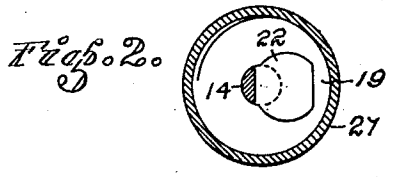
Jan. 19, 1932. W. H. SMITH 1,841,989

WEDGE LOCK BINDER

Filed Nov. 26, 1927





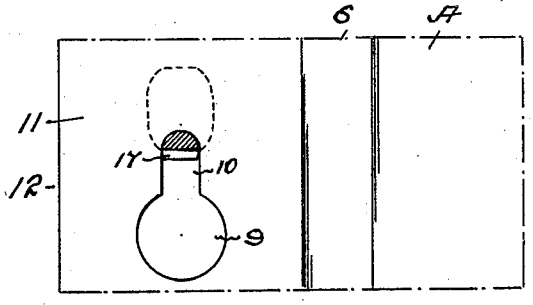


Fig. 4.

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UNITED STATES PATENT OFFICE

WILLIAM H. SMITH, OF SAN FRANCISCO, CALIFORNIA

WEDGE LOCK BINDER

Application filed November 26, 1927. Serial No. 235,842.

This invention relates to improvements in wedge lock binders for loose leaves and more particularly to the construction and arrangement of the binder posts in their engagement with the wedge locks and with the covers, and the method of regulating the length of the binder posts. For further particulars regarding the construction of the cover, reference is made to my co-pending application entitled Binders for loose leaves, bearing Serial No. 126,415, filed August 2, 1926, upon which Patent No. 1,691,257 was granted November 13, 1928. The principal object of the invention is to provide an interlocking post engaging the covers of the binder, of such a construction and nature that it may be easily applied but may not be removed after having been assembled with the binding covers. A further object is to provide a cover and binder post of such a nature that the cover and post may be used for temporary binding of current sheets before the permanent binding means are applied. Another object is to provide a construction so simple, strong, and easily operated, that it may be used with the minimum of mechanical knowledge and the simplest aids. Other objects and advantages will appear as this description progresses.

In this specification and the annexed drawings, the invention is disclosed in the form considered the best, but I do not wish to be understood as limiting it to this form, as it may be embodied in other forms, and it is also to be understood that in any of the claims following the description it is desired to cover the invention in whatsoever form it may be embodied.

In the accompanying one sheet of drawings, Fig. 1 is an enlarged fragmentary end elevation of a loose leaf book bound in accordance with this invention being shown partially in fragmentary longitudinal section to disclose the construction, arrangement and combination of the covers and the binding means combined therewith through the interposed leaves. Fig. 2 is a detail in plan looking down upon the wedge lock top of the binding post with the protective screw cap shown in horizontal section on the line II—II. Fig. 3 is a detail looking at the lateral edge of the lower binder cover showing a portion of the main binder post projecting therefrom. Fig. 4 is a fragmentary plan view in detail of the same showing the manner of inserting the binder post into the channel head of the cover.

In detail the binder comprises a pair of opposed covers similar in construction to that disclosed in Fig. 3 of the drawings. These covers comprise rectangular pieces of backing board 1 of the desired dimensions. These boards are covered with any suitable binding fabric 2, such as leather, leatherette, buckram, duck or the like. This binding fabric is glued to the outer surfaces of the board and lapped over the outer ends as at 3 and folded over the lateral edges of the board as at 4, these folded lateral edges extending beyond the end 5 of the board to form the hinge 6 consisting of the integral piece of binding fabric 2 reinforced by the laterally folded edges as described, to strengthen the hinge. A piece of sheet metal such as 7 is spaced from the end 5 of the board, lying parallel thereto and enclosed within the end 8 of the fabric folded thereover. This flat strip of sheet metal thus enfolded by the fabric glued thereto is inserted under a proper press which punctures the perforations 9, see Fig. 4, these are large enough to pass the head of the binding post and have a lateral extension 10 fitting the stem of the post. After being thus perforated the sheet metal insert is placed in a breaker and folded back upon itself to form an open channel as illustrated in Fig. 3, the inner plate 11 of the channel carrying the perforations 9—10 located inward from the folded head 12 of the cover.

Both covers are similar in construction and differ only in the manner of the perforations. In the top cover B the channel is formed as described, before the perforations are made. The channel head of this cover is then inserted under a suitable press and round holes corresponding to the outside diameter of the posts are punched through both plates 11 and 13 of the channels to freely pass the diameter of the posts and the wedge locks that will hereinafter be more fully described.

The binder posts forming the principal elements of this invention preferably consist of a length of #9 (American Steel and Wire Co., gauge) wire. This is the most popular size of posts. One end of this length of wire is bent over and flattened to form the oblong head 15, see Figures 1 and 3, preferably about one half of an inch long and about one quarter of an inch wide. These posts are cut and headed in an automatic machine similar to a nail machine for heading nails. The posts are then inserted between dies that compress a series of ratchet teeth 17 throughout their length, or in very long posts for a desired portion of their lengths, see Fig. 1, this flattens the rod to a semi-circular diameter of approximately one quarter of an inch. The teeth 17 are approximately a sixteenth of an inch apart. These sizes and dimensions are given for illustrative purposes. It is obvious that the posts may be made of any desired size and their proportions varied to suit circumstances without departing from the spirit of the invention. For the purposes of better illustration the figures of the drawings are shown in the sizes of a popular size of binder.

In assembling the binder the lower cover A is chosen and laid inside up to expose the perforations 9—10 in the channel. The head 15 of the post is inserted in the perforations 9 and pushed laterally along the channel until the stem 14 of the post engages the rounded end of the perforation extension 10. The opening in the channel is preferably slightly less than the thickness of the head 15 so that the channels will have a clamping action on the heads 15 to hold them in adjusted position. The heads 15 are purposely formed entirely on the side of the posts 14 opposite to the teeth 17 to leave the opening of the perforations 10 unobstructed on the ratchet side of the post for the free entrance and passage of the wedge member when it is desired to slide it the length of the post to bind the minimum number of leaves within the binder. It also facilitates the fabrication of the post in forming the head and in embossing the ratchet teeth. These posts are inserted into the perforations in the channels 11 with their heads directed toward each other, see Fig. 1. This exposes the ratchet sides of the posts in opposite directions. This arrangement of the heads is not essential but it is better practice. With the posts thus inserted the lower cover A becomes a current binder to receive the perforated leaves X having the perforations XI therein registering with the post. For the protection of the accumulating current sheets the cover B or a special cover can be removably inserted over the posts without using the wedges.

When the desired number of leaves have accumulated on the cover A it is laid upon a firm foundation such as a table or desk, the cover B is inserted over the posts, see Fig. 2. The binding collars 19 are then dropped over the posts 14 until they rest upon the top of the channel on the cover B. The wedge 20 is of similar construction to the post 14, having teeth 21 to engage the teeth 17 in the post and having the lateral head 22 adapted to be driven against the top of the collars 19. The holes in the collars 19 and the holes 23 in the cover B are of an internal diameter equal to the extradental thickness of the post 14 and the wedge 20, plus the depth of the teeth 17 and 21, so that these teeth may pass each other until ultimately engaged. But these perforations XI may be of any greater diameter, see Fig. 1, since the wedge does not disengage its teeth from the teeth of the post, so long as the collar 19 or the cover B is in position. If the perforations XI are excessively large it permits the leaves to shift relative to each other, before wedging, but in no way reduces the security of the binder.

After the wedges 20 have been inserted and pressed down as far as it is comfortable to do so by hand, a length of tube 26, having an internal diameter freely passing the diameter of the post 14 is placed over the top of the protruding post and brought to rest on top of the head 22 of the wedge 20, see Fig. 1. This tube 26 is then driven down by hammering on its top end so that the leaves X are compressed between the covers A and B to the desired extent, the respective ratchet teeth on the wedge and the post working past each other and engaging after each blow of the hammer until the desired compression is reached. By this driving action the channel attached to the upper cover B is compressed under the collars 19. The reactive resilience of these compressed points in the upper channel tends to force the collars 19 upward against the heads 22 of the wedges and hold the ratchet teeth in engagement and the leaves X under permanent compression.

After the desired compression has been attained by driving down to the wedges as described, the tube 26 is then forced laterally away from the teeth of the post 14, back and forth until the post 14 begins to fracture on a level with the head 22 of the wedge, when it is then bent down into the position shown in dotted lines in Fig. 1, which completely breaks off the protruding end of the post, leaving it substantially flush with the top of the wedge head 22, with burr caused by the fracture overhanging the top of the collar. The binding operation so far as that post is concerned is then permanently completed, the same operation being repeated for each post in the binder.

The heads 15 and 22 of the post and the wedge respectively being directed away from their ratchet faces, enable the wedges to pass down the length of the post, so that the minimum number of leaves desirable may be bound and the post broken off accordingly.

This obviously could not result if the heads overhung the ratchets. Where it is desirable to bind the maximum practical number of leaves, say ten or twelve inches or more, special posts are provided with ratchets only adjacent their upper ends, see Figures 1 and 3 for comparison. This is merely a matter of economy in post production, the combination of parts and mode of operation is the same.

To give a proper finish to the protruding end of the binder means, the periphery of the collar 19 is threaded to receive the internally threaded protective cap 27 having the transverse slot 28 in the top thereof by means of which the cap may be conveniently screwed onto the collar 19. These slots are made of a width to receive the thickness of a penny or dime, by the insertion of which they may be conveniently screwed into place if a screw driver is not available.

To prevent the rotation of the collar 19 when the cap 27 is screwed into place, its under side is knurled or roughened so that it will engage the fabric 2, which effectively locks the collar 19 against rotation.

To provide a proper finish to the volume thus bound, I provide the overlapping backing sheets 30 and 31 respectively attached and adhering to the inside of the covers A and B projecting beyond the end 12 of the channels thereof. These overlapping sheets are gummed on their inner surfaces, the inner surface of the sheet 30 adhering to the end of the sheet body X and the inner surface of the strip 31 adhering to the outer surface of the strip 30.

For convenience in withdrawing the various volumes thus bound when shelved, I provide a loop of strong tape 32, the ends of which extend between the backing sheet 31 and the inner surface of the channel on the cover B to which the tape is glued and the ends of which are extended within the opening in the edge of the channel in the cover B for the greater security of the loop 32.

It will be noted that the heads 15 are within the channels on the cover A and do not protrude through to the outer surface thereof. This construction forms a smooth surface which does not mar the surface of a table or the like upon which the binder may be placed.

It is obvious that the collars 19 could be dispensed with and the wedge head 22 driven down to the cover B and the post 14 broken off at this level, where finish can be sacrificed.

Having thus described this invention what I claim and desire to secure by Letters Patent is:

1. A binder comprising top and bottom covers, a binder post supported upon one of said covers and passing through the other, and having transverse teeth thereon; a wedge member having teeth engaging the teeth on said post and an angular head adapted to clear the teeth on said post throughout its length and engage the adjacent cover.

2. A binder comprising a bottom cover having a channel hinged thereto, the inside plate of said channel being perforated; a top cover having a perforation therethrough; a binder post extending through the perforations in both covers and having a head terminating within said channel; ratchet teeth on said post; a wedge member having ratchet teeth engaging the teeth on said post and an angular head directed away from said wedge teeth and engaging said top cover.

3. A binder comprising a bottom cover having a channel hinged thereto, the inside plate of said channel being perforated; a top cover having a perforated part hinged thereto; a toothed binder post having an angular head directed away from said toothed portion and engaging within said channel, the body of the post extending through the said perforations in both covers; a collar surrounding said post above said top cover; and a wedge member having teeth engaging the teeth in said post and an angular head directed away from said toothed portion and overhanging said collar.

4. A binder comprising top and bottom covers, a binder post engaging said bottom cover and passing through said top cover and having transverse teeth thereon, a collar surrounding said post and resting upon said top cover, said post having its free end adapted to be manually broken off flush with its engagement with said collar, a wedge member having teeth engaging the teeth on said post and a head over-hanging and engaging said collar and a protective covering for the broken end of the post and the head of the wedge.

5. A looseleaf binder comprising a bottom cover and a top cover, a toothed breakable post having one end secured to the bottom cover and its free end passing through the top cover, a collar surrounding said post and engaging said top cover, a toothed locking member having a head and engaging the toothed post, so combined and arranged that said head and the free end of said post, when broken, overhang said collar, and a cap engaging said collar and enclosing the free ends of said post and locking member.

6. A temporary and permanent binder for loose leaves of varying quantities comprising a bottom cover, a top cover, a post secured to said bottom cover and projecting a substantial distance through an aperture provided in said top cover so as to maintain said top cover detachably in place while the loose leaves are gradually assembled upon said post and wedge means adapted to cooperate with said post and said top cover to fasten said top cover permanently to said post to bind the assembled loose leaves permanently between said top and bottom covers.

7. A temporary and permanent binder for loose leaves of varying quantities comprising a bottom cover, a top cover having an aperture therein, a wire post having a bottom portion extending at right angles and secured to said bottom cover and the top portion of said wire post extending through said aperture in said top cover and projecting beyond said top cover so as to maintain said top cover detachably in place while the loose leaves are gradually assembled upon said post and means adapted to cooperate with said wire post and said top cover to bind said top cover, said bottom cover and said loose leaves in permanent assembled relation.

8. A temporary and permanent binder for loose leaves of varying quantities comprising a bottom cover, a resilient top cover having an aperture therein, a post mounted upon said bottom cover and extending a substantial distance beyond said top cover through the aperture therein so as to maintain said top cover detachably in place while the loose leaves are gradually assembled upon said post and means cooperating with said top cover and said post to permanently bind said top cover, said bottom cover and the assembled loose leaves together, said last mentioned means being urged into locking action with said post by the resiliency of said top cover.

9. A temporary and permanent binder for loose leaves of varying quantity comprising a bottom cover, a top cover having an aperture therein, a breakable post having one end secured to said bottom cover and its free end passing through the aperture in said top cover, a collar surrounding said post and engaging said top cover, a locking member having a head and engaging said post, so combined and arranged that said head and the free end of said post, when broken, overhang said collar, and means enclosing said collar and the free ends of said post and locking member.

In testimony whereof I have hereunto affixed my signature.

WILLIAM H. SMITH.