May 1, 1956 A. R. GUSTAFSON 2,743,467

BOOK BINDER AND MACHINE FOR ASSEMBLING SAME

Original Filed Feb. 28, 1951 4 Sheets-Sheet 1

Fig. 1

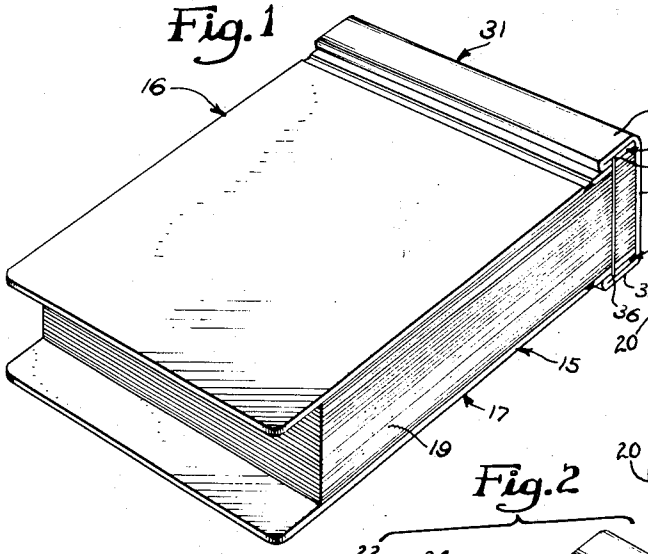



Fig. 4A

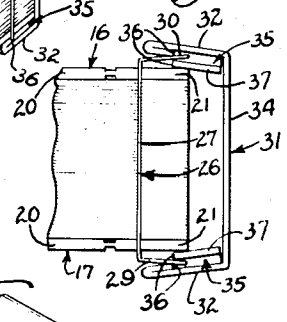



Fig. 3

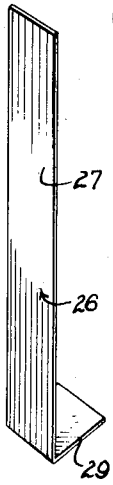



Fig. 2

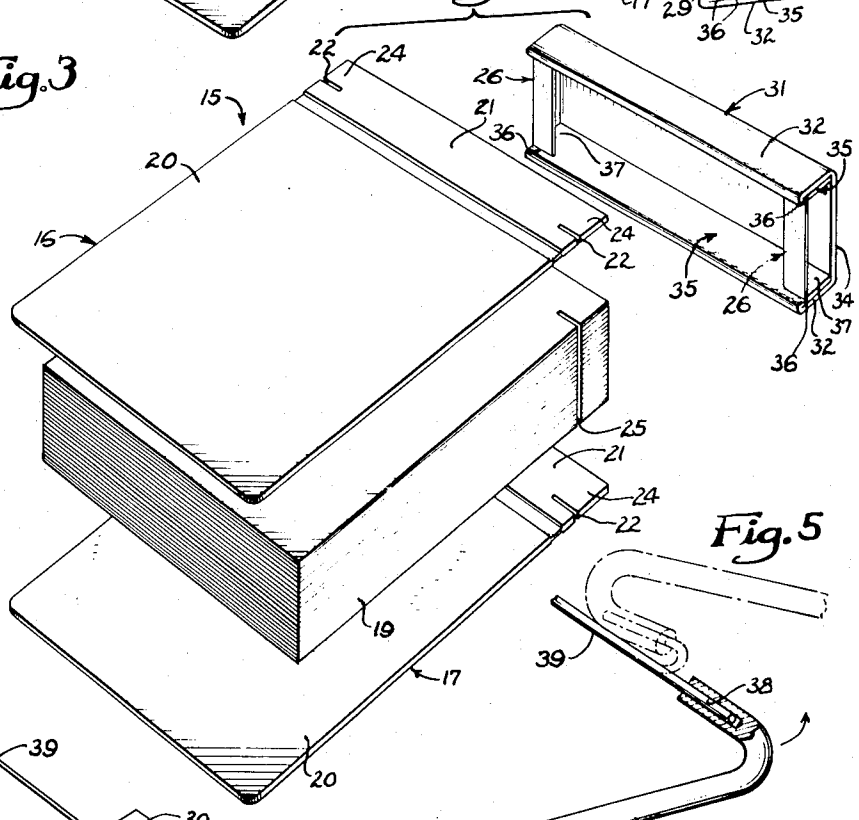
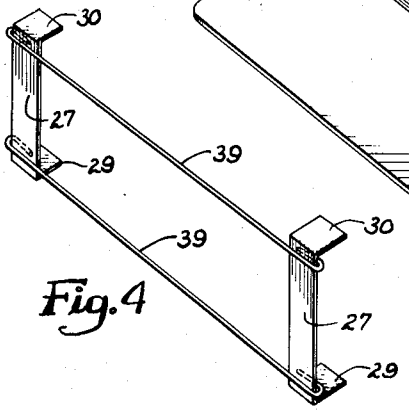



Fig. 5




Fig. 4




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BOOK BINDER AND MACHINE FOR ASSEMBLING SAME

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Fig. 6

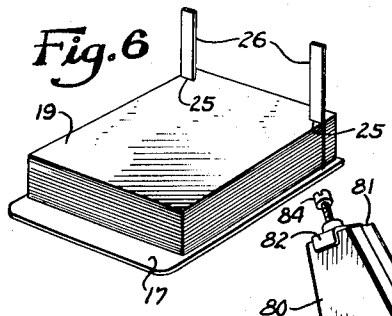



Fig. 7




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BOOK BINDER AND MACHINE FOR ASSEMBLING SAME

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Fig. 8

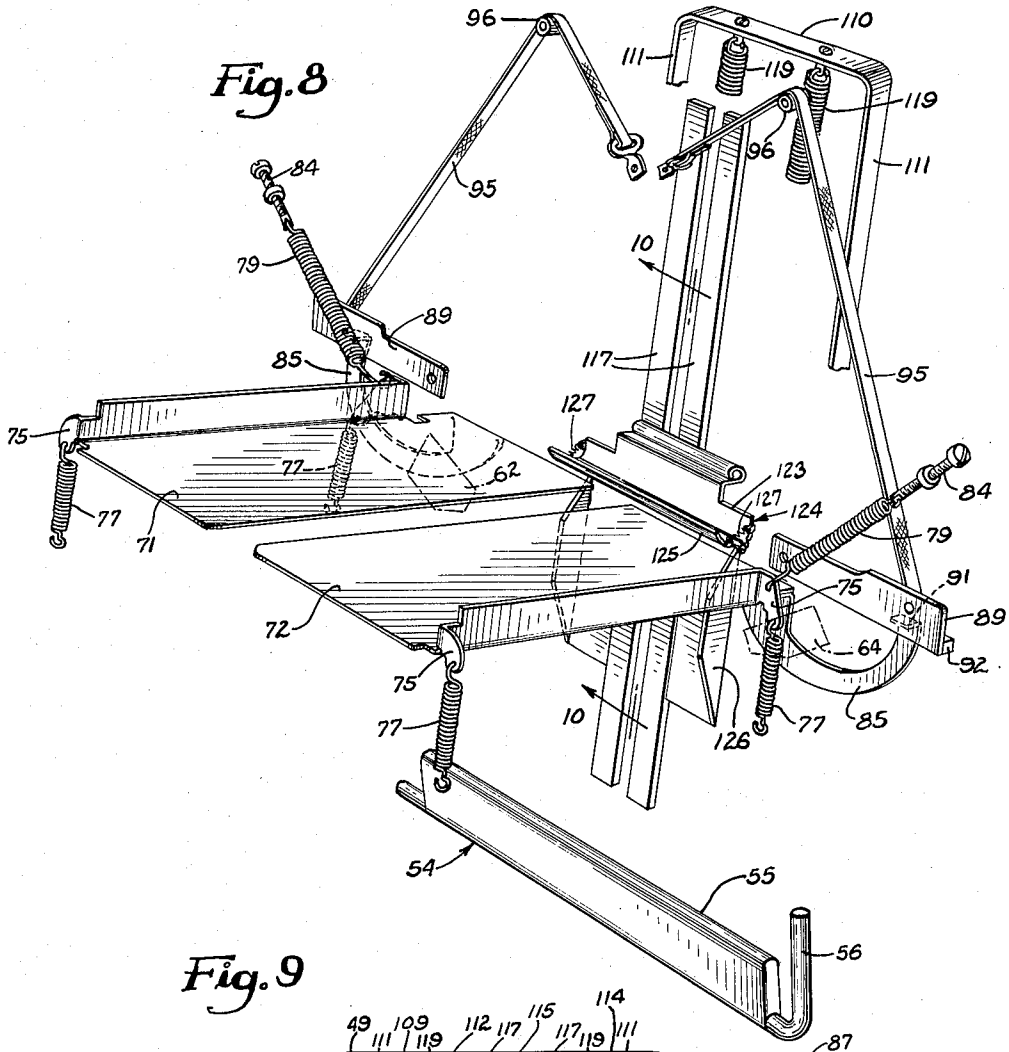
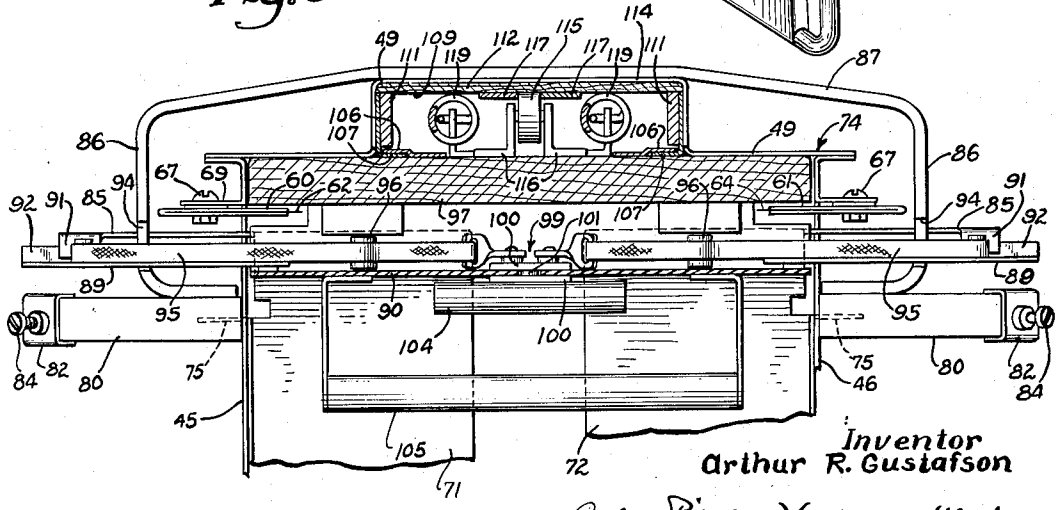



Fig. 9




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BOOK BINDER AND MACHINE FOR ASSEMBLING SAME

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Fig. 10

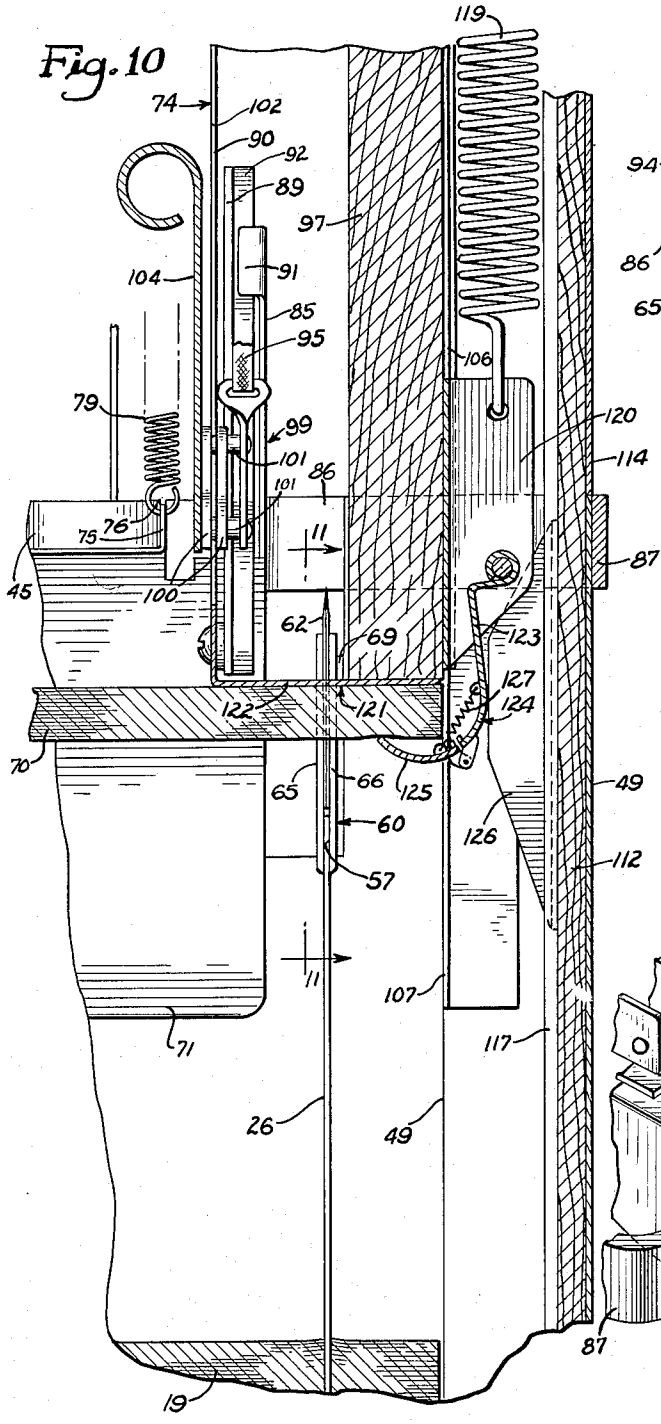



Fig. 11

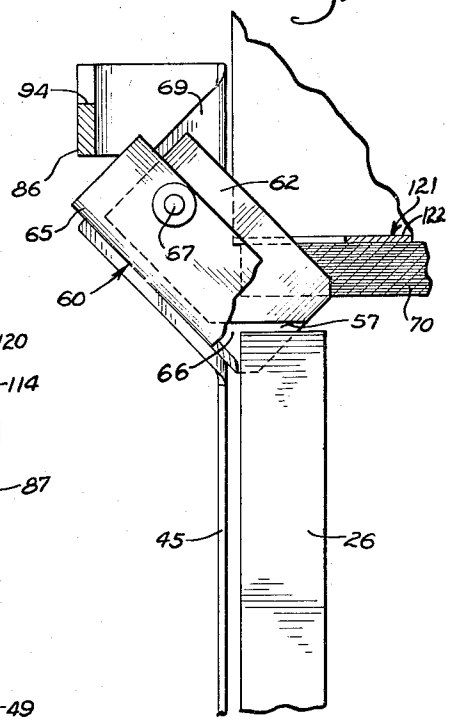
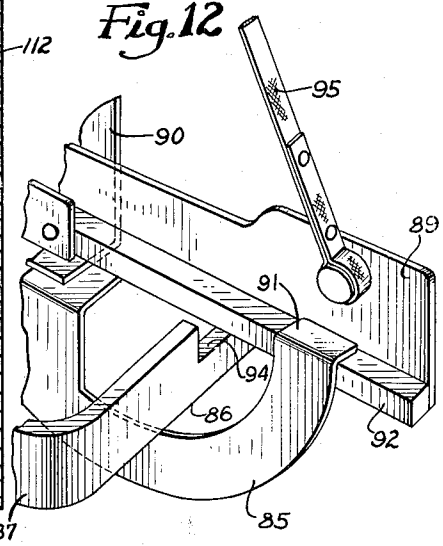



Fig. 12




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United States Patent Office 2,743,467
Patented May 1, 1956



2,743,467

# BOOK BINDER AND MACHINE FOR ASSEMBLING SAME

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Continuation of application Serial No. 213,143, February 28, 1951. This application February 14, 1952, Serial No. 271,585

23 Claims. (Cl. 11—1)

The present invention is directed to the problem of binding into volumes the ever increasing accumulations of records and reports which must be kept on file by modern business concerns, governmental agencies, and the like. Even though such records in many instances are preserved over long periods, they must be readily available for future reference. From the standpoints of handling and storage of the records as well as providing assurance against damage or loss of the records, it is very desirable that they be securely bound into book form. Heretofore, the binding of such records has not only been an inconvenient task but it has involved expenses and outlays of capital which were burdensome and sometimes not justifiable, particularly for some classes of records.

Accordingly, one object of the invention is to provide a novel and improved binder of inexpensive construction which is especially useful for securely binding records and the like into book form and which substantially reduces the cost of binding such papers.

A related object is to provide a novel record binder which can be assembled without special skills.

Another object is to provide a novel machine for preparing records and other papers for binding and for loading them into a binder.

An additional object is to provide a machine of the above character which is simple in operation and therefore well adapted for use by unskilled personnel.

A further object is to provide a binding machine of the type recited which is light in weight and inexpensive in construction, yet durable and dependable in operation.

The objects of the invention thus generally set forth, together with other and ancillary advantages are attained by the construction and arrangement shown by way of illustration in the accompanying drawings, in which:

Figure 1 is a perspective view of the novel binder as used to bind a stack of papers into book form.

Fig. 2 is a partially exploded view of the binder of Fig. 1 showing the construction of the parts in greater detail.

Fig. 3 is a perspective view of one of the binding elements used to hold the book together.

Fig. 4 is a perspective view showing in greater detail the relation of certain binding elements to each other.

Fig. 4A is a fragmentary view showing an intermediate step in the assembly of the binder.

Fig. 5 is a detailed view showing another step in the assembly of the binder.

Fig. 6 is a perspective view showing a stack of papers as initially positioned in a partially assembled binder.

Fig. 7 is a perspective view of a machine used in preparing papers in sections for binding and for loading the individual sections into the binder.

Fig. 8 is a skeleton view showing in perspective the relation to each other of certain working elements of the machine of Fig. 7.

Fig. 9 is a fragmentary horizontal sectional view taken along line 9—9 of Fig. 7.



Fig. 10 is a fragmentary vertical sectional view taken along line 10—10 of Fig. 8.

Fig. 11 is a fragmentary vertical sectional view taken along line 11—11 of Fig. 10.

Fig. 12 is a fragmentary perspective view showing certain blocking pan control elements.

While the invention is susceptible of various modifications and alternative constructions, there is shown in the drawings and will herein be described in detail the preferred embodiment of the binder and an illustrative embodiment of the binding machine, but it is to be understood that it is not thereby intended to limit the invention to the particular embodiments disclosed, but it is intended to cover all modifications and alternative constructions falling within the spirit and scope of the invention as expressed in the appended claims.

Referring more particularly to the drawings, the novel binder 15, Figs. 1 and 2, provided by the invention, comprises two cover boards 16, 17 adapted to be disposed on opposite sides or faces of a stack of papers 19 to be bound into book form. In the present instance, the cover boards are of identical construction and are fabricated from relatively stiff material.

As shown, each of the cover boards 16, 17 is formed by two articulated sections 20, 21. The main sections 20 substantially cover the contiguous faces of the stack 19 and are swingably attached along one edge to the narrow binding sections 21 for movement between open and closed positions. The binding sections 21 on opposite faces of the stack 19 are disposed opposite each other in overlying relation to one marginal edge of the sheets of paper in the stack.

To hold the covers 16, 17 and the stack of papers together to form a bound volume, the opposed binding sections 21 are securely bound to each other by means which also serve to positively lock one marginal edge of each of the paper sheets in position between the binding sections.

To this end, the binding sections 21 are each formed with slots 22 extending inwardly from opposite ends thereof. As showin in Fig. 2, the slots are parallel to the outer edges of the binding sections and are spaced inwardly equal distances from these edges. The depth of the slots and the spacings between the slots and these edges are such as to form sturdy anchoring tab 24 on the outer corners of the binding sections.

By reason of the above construction, the slots 22 at corresponding ends of the opposed binding sections 21 are alined with each other in pairs. As prepared for binding, the papers in stack 19 are formed with slits 25 in opposite edges. The location of the slits in the papers is such that they are disposed in alinement with the paired slots 22 when the papers and cover boards are assembled together, Figs. 1 and 2.

The covers 16, 17 and the stack of papers 19 are directly held in assembled relation by two binding strips 26, Figs. 1 to 4, comprising segments of stock metal band material. The steps involved in binding the parts together by the strips 26 including the bending of each strip into the shape of the letter L, Fig. 3 to have a shank 27 and a toe 29. Then the strips are assembled into the respective slots 22 of the lower binding section 21 in such a manner that the shank or leg 27 of each strip extends upwardly through its associated slot. The toe 29 of each strip is disposed in underlying relation to the lower binding section 21 and extends toward the outer side edge of the section, Fig. 4. After that the papers to be bound are placed on the lower cover in sections, the shanks 27 of the binding strips at the same time being inserted into the slits 25 in the papers.

When sufficient sections have been added to build the stack 19 to the desired height, the top cover 16 is placed

on top of the stack with the shanks 27 extending through the slots 22 in its binding section 21. Finally, the portions of the shanks 27 protruding above the top cover are cut down to lengths corresponding to the length of the toes 29 on the opposite ends of the binding strips. These protruding portions are bent toward the outer side edge of the upper binding section 21 to form second toes 30 substantially identical to the toes 29 as shown in Fig. 4.

At this point an end cap 31 is placed over the binding sections 21 and the contiguous end of the paper stack 19. As shown in Figs. 1 and 2 the end cap is formed from a single sheet of bendable material, such as canvas covered metal. The sheet is bent along parallel straight lines into a generally U-shape to present spaced inwardly extending legs 32 interconnected along their rear edges by an end plate 34. Opposite edges of the sheet are folded inwardly to form panels 35 laying alongside the inner faces of the adjacent legs 32.

The spacing between the panels 35 of the end cap 31 is such that the panels snugly engage the opposed binding sections 21. This spacing will of course vary according to the size of the volume being bound. Such variation of the spacing is provided for through variation of the width of the end plate 34.

Where the end cap 31 is made from a sheet of material of a standardized size, a reduction in the width of the end plate 34 will produce a corresponding surplus in the material needed for the legs 32 and panels 35. To avoid cutting of the sheet this surplus is allowed to become an extension of the panels 35, the legs 32 being kept at a substantially uniform length. In instances where the end plate becomes very narrow resulting in the panels 35 being longer than the legs 32, the panels can be appropriately bent to extend down the inside face of the end plate.

Opposite ends of the panels 35 are provided with slots 36 disposed in position to be alined with the slots 22 in the binding sections 21 when the cap 21 is fully assembled on the end of the volume, as shown in Fig. 1. The cap is slid into assembled position by being moved transversely to the contiguous end of the volume. During this movement of the cap the toes 29 and 30 of the binding strips 26 are inserted through the respective slots 36 to be fitted into position between the panels 35 and the legs 32.

To facilitate the insertion of the toes 29 and 30 into the slots 36, the tabs 37 defined on the panels 35 by the slots are slightly bent inwardly out of the planes of the respective panels, Fig. 4A. To prevent the tabs from catching on the edges of the papers, the legs 32 are temporarily sprung outwardly to a slight degree so that the tabs will clear these edges. As the end cap moves into final position after insertion of the toes 29 and 30 in the contiguous slots, the tabs 37 are forced back into the planes of the respective panels 35 and the legs 32 spring back into original position. The end cap 31 is thus securely held in assembled position by the extension of opposite ends of the shanks 27 of the binding strips 26 through the slots 36.

To prevent the binding strips from working out of their associated slots, they are tied together by two wire tie rods 39. Each rod is initially formed with a hooked end and a straight end. The rods are incorporated into the binder by being forced lengthwise between the panels 35 and legs 32 at opposite sides of the cap 31. The hooked end of each rod is hooked over the contiguous portion of the shank 27 of the binding strip that protrudes through the associated slot 36. The straight ends of the rods are bent into hooking relation with the corresponding portion of the shank of the other binding strip, Fig. 4.

Bending of the straight ends of the rods 39 is effected by a J-shaped assembling tool 40, Fig. 5, having a hollow



bore 38 in the working end of the tool adapted to receive the rod. The tool is sufficiently small in size for its working head to move in between the panels 35 and legs 32 of the end cap to bend the rods around the ends of the tie member shanks 27, Fig. 4.

It will be appreciated that the binder thus provided securely locks each sheet of paper between two protective covers or boards so as to prevent loss of or damage to any of the papers. For this reason, it can be depended upon to preserve important records and reports.

Because of the novel construction and arrangement of the parts of the binder, its total cost is a surprisingly low figure. Its parts consist of two rods of common wire, two short strips of ordinary ribbon steel, a flat rectangular sheet of bendable material, and two cover boards of more or less conventional construction.

Further savings are realized from the versatility of the binder and the ease with which it may be assembled. As previously described, it may be assembled from certain standard parts to bind volumes of different thicknesses. Moreover, the assembly of the binder can be carried out without any special skills right in the offices where the records are kept.

Additional savings in the binding of records and the like are realized when the papers are prepared for binding and placed in the binder by a novel machine 42, Fig. 7, provided by the invention, for this purpose.

The papers are prepared for binding by being blocked or jogged into sections until their edges are even. After that the slits 25 are cut in opposite edges of the papers. Then the sections are individually placed in the binder so that the shanks 27 of the binding strips 26 extend through the slits. It will be seen that all three of these operations are speedily and efficiently performed in the machine 42.

The embodiment of the machine selected for purposes of illustration comprises a main casing 44 formed by two opposed side panels 45, 46 spaced apart from each other and interconnected at their lower edges by a bottom panel 47, Fig. 7. A vertical back panel 49 is connected to the rear edges of the side panels (Fig. 9). The main casing thus formed defines an inner compartment 50 which is open at the front and top sides.

The compartment 50 is designed to receive a binder cover 17 having two binding strips 26 extending upwardly therefrom ready to receive sections of papers to be bound. These binder parts, as prepared for positioning in the compartment, are related to each other as shown in Fig. 6 but without the stack of paper 19 in place.

When inserted into the compartment 50, the binding strips 26 are disposed adjacent the rear of the compartment and the cover 17 rests on a floor pan 51 mounted in the casing 44 some distance above the bottom panel 47. The pan is supported in the casing in such a manner that at least the rear end of the pan and the binder parts resting thereon can be shifted between raised and lowered positions.

In the present instance, the pan 51 is pivotally supported to the casing 44 along the front end of the pan as indicated by numeral 52. The rear end of the pan rests on a support member 54 pivotally disposed in the casing 44. This member is formed with an offset portion 55 (Fig. 8) which is effective upon angular displacement of the member in opposite directions by a handle 56 to shift the pan into raised and lowered positions.

When the partially assembled binder is initially placed in the machine the pan 51 is in its lowered position. The pan is then immediately shifted into raised position by the handle 56. As the pan moves upwardly, the upper ends of the strips 26 slide into vertical guides 57 formed in the lower ends of two thin upright holders 60, 61 disposed over the respective strips and fixed to the opposite side panels 45, 46 of the casing, Figs. 9, 10 and 11.

The casing 44 together with the floor pan 51, which supports the partially assembled binder, and the holders 60, 61 which stabilize the free ends of the strips 26, form

a loading jig for the binder. After the binder parts are positioned in the jig as just described, they are held in readiness to receive sections of papers which are lowered onto the binder cover. As the sections move into place the holders **60**, **61** guide the binder strips **26** into the slits **25** on opposite sides of the papers.

In accordance with one aspect of the invention, the slits **25** are cut into the sections of papers automatically as an incident to the lowering of the sections onto the binder cover. The cutting is effected in this instance by knife blades **62**, **64** mounted in the respective holders **60**, **61** directly over the upper ends of the binding strips **26**. Horizontal sections of paper **70** are loaded into the binder by being moved vertically downward over the knife blades. The blades are followed through the paper by the upper ends of the binding strips **26** disposed just behind the trailing edges of the blade, Fig. 11. With this arrangement of parts it is clear that individual sections of paper can be formed with the necessary slits at opposite sides and loaded into the binder merely through a single downward movement of the sections once they have been positioned above the binder parts.

As to the details of the holders **60**, **61**, any suitable construction may be used. Since the holders are mirror images of each other, only the holder **60** is illustrated in detail. As shown in Fig. 9, 10 and 11, it comprises two straps **65**, **66** disposed on opposite sides of the blade **62** and attached by a bolt **67** to a lateral ear **69** struck from the side panel **45**. From the bolt **67** the straps and blade extend inwardly and downwardly into the casing so that the cutting edge of the blade is inclined relative to the horizontal to provide the most efficient cutting action.

This cutting edge extends inwardly over the underlying end of the contiguous binding strip **26** to slit the papers to a depth commensurate with the width of the binding strip. The inner ends of the straps **65**, **66** which are spaced apart by the blade **62**, extend downwardly below the inner end of the blade to form the previously mentioned guide **57** which receives the upper end of the binding strip to hold it under the blade.

Before the sections of papers to be bound are loaded into the binder contained within the machine, they must be blocked or jogged to make the edges of the papers even with each other. This operation is facilitated in applicant's machine by the provision of two complementary blocking trays **71**, **72** mounted along the upper edges of the side panels **45**, **46** to extend horizontally toward each other, Fig. 7. A section is laid in the trays, as shown, and the edges of the papers in the section may be quickly alined by tapping on the forward edge of the section.

It will be observed that the section **70** after being blocked in the trays **71**, **72** is disposed directly over the binder cover **17**. To load the section into the binder all that is necessary is that it be moved vertically downward over the knives **62**, **64** and binding strips **26** onto the cover.

This loading operation is the function of a vertically movable ram **74** at the rear end of the casing **44**, Fig. 7. The ram is so constructed that it is capable of grasping the inner end of the section **70** and forcing it over the knives into the binder in one operation.

Once the ram has securely grasped the section **70** the blocking trays **71**, **72** are quickly moved out of the way to clear the path of the section as it moves downwardly. For this purpose the trays are hinged to the top of the side panels **45**, **46** to permit them to be quickly shifted or dumped downwardly into vertical position, Fig. 10.

For the present instance the hinged supports for the trays comprise two lateral ears **75** on opposite ends of each tray. As shown in Figs. 7, 8 and 9, each ear extends through a cooperating eye **76** in the contiguous one of the side panels **45**, **46**, and projects a short distance beyond the side panel. The free ends of the ears are hooked downwardly and attached to the upper ends of springs **77** anchored to the side panels below the ears. The downward force of the springs on the ears not only maintains the trays in assembled position but tends to hold them in their horizontal position.

To hold the trays **71**, **72** more firmly in the horizontal position, each tray is provided with a support spring **79** attached to a high point in its rear support ear **75**. As shown in Figs. 7 to 9, the springs **79** extend upwardly and outwardly from the support ears and are anchored at their outer ends to spring horns **80** attached to the opposite side panels **45**, **46** to house the respective springs **79**.

For the purpose of illustration, the horns **80** are fashioned from sheet metal to have a generally flat form presenting a relatively wide base for attachment to the casing side panels. From their wide bases, which house the rear hinge springs **77** of the trays, the horns taper upwardly and outwardly to relatively small apexes **81** which serve as anchorages for caps **82**, Figs. 7 and 10. These caps are threaded to receive anchor screws **84** to which the support springs **79** are attached. Adjustment of the anchor screws **84** in the end caps **82** serves to adjust the supporting tension in the springs **79** which in turn regulates the the firmness with which the trays are held in horizontal position.

To make way for the downward movement of the section **70** under action of the ram **74** provision is made for dumping the trays **71**, **72** downwardly as an incident to the actuation of the ram. The means provided for this purpose comprises lateral control arms **85** attached to the rear ends of the respective trays **71**, **72** and extending outwardly under contiguous sections **86** of a horizontal brace **87**, Figs. 8 and 12. It will be noted that the brace **87** is attached at opposite ends to the spring horns **80** and extends around the back side of the casing **44**.

As shown, the arms **85** are curved upwardly to slidably engage tray control levers **89** pivoted at their inner ends to a vertical plate **90** on the ram **74** and extending outwardly over the brace sections **86**. The slidable connection between each arm and its associated lever **89** is made by a lip **91** on the free end of the arm which engages an elongated rail **92** forming a part of the lever. It is well to note, Figs. 9 and 12, that downward pivotal movements of the levers **89** are limited by engagement of the levers with the bottoms of notches **94** in brace sections **86**. This limits downward movement of arms **85** to locate the trays **71**, **72** in horizontal position under action of their respective control springs.

The levers **89** are pivoted upwardly to dump the trays **71**, **72** by dumping bands **95** connected to the outer portions of the arms, Figs. 7, 8, 9 and 12. From their respective control levers the bands extend over two pulleys **96** mounted on a vertical block **97** of the ram **74**, one pulley being provided for each band.

After passing over the pulleys **96**, the inner ends of the bands **95** are attached to a tray control slide **99**, Fig. 9. In the present instance, this slide comprises two plates or runners **100** disposed on opposite sides of the ram plate **90** which is spaced forwardly on the ram block **97**, Fig. 10. The runners are connected to each other by pins **101**, Fig. 10, which extend through a vertical slot **102**, Fig. 7, in the plate **90** to guide the slide vertically up and down the plate.

Downward movement of the slide **99** is effected by a tray control handle **104**, Figs. 7 and 10, connected to the slide and accessibly located on the forward side of the plate **90**. It will be understood that such downward movement of the slide will actuate the dumping bands **95** to raise the levers **89** and dump the trays **71**, **72**.

At the same time the trays **71**, **72** are dumped the ram **74** is moved downwardly by a handle **105** connected to the plate **90**. The positional relationship of the handle **105** relative to the handle **104** is such that the two can be grasped in one hand by the operator for simultaneous operation, Fig. 7.

As to the detailed construction of the ram **74**, reference to Figs. 9 and 10 will show that it comprises the

previously mentioned block **97** slidably mounted at the rear end of the casing **44** for vertical movement down into the compartment **50** along the inner face of the rear casing panel **49**. The block is guided in its movements into and out of the compartment **50** by two spaced, vertical guide rails **106** attached to the rear face of the block. These rails slidably engage the flanges of companion rails **107** secured to the opposite side walls of a vertical guide chute **109** on the back side of the casing **44**.

The guide chute **109** extends vertically upward from the bottom of the casing **44** to a level substantially above the top of the casing **44**. As shown in Figs. 8, 9 and 10, it is rectangular in cross section and is formed around a frame comprising an upright U-shaped member **110** having spaced legs **111** extending down along opposite sides of the chute. The back side of the chute is formed by a vertical board **112** extending across the legs **111**.

The rear panel **49** of the casing is suitably bent to extend around the external sides of the chute as indicated in Figs. 9 and 10. A U-shaped plate **114** covers that portion of the chute which extends above the casing **44**. It will be noted that the intermediate portion of the horizontal brace **87** extends around and is attached to the rear side of the guide chute.

To prevent lateral shifting of the ram **74** relative to the casing **44** additional guiding means for the ram is provided in the guide chute **109**, Fig. 9. This guiding mechanism is designed to have anti-friction characteristics and comprises a guide roller **115** journaled in and between two brackets **116** fixed to the rear face of the ram block **97**. This roller is arranged to roll up and down the board **112** between two spaced vertical guide rails **117** fixed to the board.

The ram **74** is supported in its raised position, Figs. 7, 8 and 10, by two counterbalancing springs **119** interconnected between the horizontal section of the guide chute frame member **110** and a bracket **120** attached to the back side of the ram block **97** near the lower end thereof. These springs also serve to reduce the strain of raising and lowering the ram.

When a section of papers **70** is loaded into the blocking trays **71**, **72**, the marginal edges of the papers at the back side of the trays extend under a ram head **121** at the lower end of the ram **74**. It will be evident from Fig. 10 that in the present construction, the ram head **74** is formed by a horizontal extension **122** of the vertical plate **90** which protrudes into underlying relation to the lower end of the block **97**.

As the ram **74** moves downwardly but before the trays **71**, **72** are shifted out of supporting relation to the section **70**, the inner end of the section is firmly clamped to the ram head **121** by a clamping hook **124** pivotally supported on the bracket **120**, Fig. 10. At the time the section is placed in the blocking trays to extend under the ram head **121**, the free end **125** of the clamping hook dangles below the inner end of the section.

However, upon slight downward movement of the ram **74** the hook **124** is pivoted forwardly and upwardly through engagement of the back side of the hook with a vertical cam rail **126**. This causes the end **125** of the hook to press firmly against a portion of the section **70** just beneath the ram head **121**. It will be observed that the free end **125** of the hook is pivotally connected to the shank of the hook so that it may give downwardly against the force of springs **127** to accommodate paper sections of different thicknesses. As shown, these springs are interconnected between the free end **125** and the upright shank **123** of the hook **124**.

The hook **124** maintains the inner end of the section **70** firmly pressed against the ram head **121** until the ram **74** has been lowered sufficiently to pass the section over the knives **62**, **64** onto the binding strips **26**, Fig. 10. As the ram **74** moves further down into the compartment **50** to fully load the section **70** into the binder, the hook **124** passes below the lower end of the cam rail **126**. Thus



freed from the action of the cam rail the hook pivots rearwardly of its own accord to shift the hook end **125** out from under the section **70**. Continuing its downward movement the ram **74** places the section **70** on top of the binder cover **17** in the machine or on the stack of papers **19** being accumulated on the cover.

After completion of a downward or loading movement of the ram **74**, it is immediately and automatically raised back to its original raised position by the counterbalancing springs **119**. As it reaches this position the tray support springs **79** automatically return the trays **71**, **72** to their horizontal position. Moreover, the tray control linkages including the handle **104** are automatically returned to their original positions.

After the desired number of sections **70** have been loaded into the partially assembled binder, the support member **54** is actuated by handle **56** to shift the floor pan **51** into its lowered position and move the loaded binder parts downwardly. The upper ends of the binder strips **26** slip out of the guide slots **57** and the loaded binder parts, as shown in Fig. 6, are removed from the machine. The remaining steps in the assembly of the binder are completed outside of the machine in the manner previously described.

It is evident that the machine thus provided can be operated without any special skills or training on the part of the user. Moreover, it is quite fast and efficient in its action.

By way of review, it is clear that the operating procedure begins with the placing of certain binder parts in the machine, a very simple maneuver. Individual sections of paper to be loaded into the binder are merely laid on the block trays **71**, **72** and tapped slightly. After that the handles **104** and **105** are simply moved downwardly substantially simultaneously to slot the edge of the section and load it into the binder. Upon release of the handles the machine parts automatically return to their original positions. After the desired number of sections have been loaded in this manner, the binder parts with the papers assembled thereon are removed from the machine.

It will be appreciated by those skilled in the art that the machine can be adapted for operation by power driven means if desired.

The machine is light in weight and economical to manufacture. Because of its low cost as well as its simplicity in operation it is well adapted for use by offices and business houses of all sizes which have either large or small numbers of records and other papers to be kept on file.

The present application is a continuation of my now abandoned application Serial No. 213,143, filed February 28, 1951.

I claim as my invention:

1. A book binder comprising two generally rectangular covers adapted to be disposed on opposite sides of a stack of papers to be bound into book form, said covers each having two slots extending inwardly from two opposite edges thereof, said slots being spaced inwardly equal and appreciable distances from third edges of said covers so as to define anchoring tabs on the contiguous corners of said covers, said slots in corresponding side edges of said covers being paired in opposing relation to each other, an elongated U-shaped end cap disposed in straddling relation to said third edges of said covers and having two spaced legs thereon extending over the contiguous ends of said respective covers and said slots therein, two elongated panels on said cap integrally formed on said respective legs, said panels being disposed in underlying relationship to the respective legs and in overlying relationship to the respective covers and said slots therein, said panels each having two slots extending inwardly from the opposite ends thereof and individually alined with said cover slots, two U-shaped binding strips each comprising an elongated shank and two lateral toes integrally formed on opposite ends thereof, said strips

being assembled with said covers and said end cap with said shanks extending through said respective pairs of slots in said covers and the contiguous slots in said end cap panels, said binding strip toes being interposed between the contiguous portions of said end cap panels and said end cap legs to extend toward said third edge of the respective covers, two elongated tie rods disposed between said respective legs and their associated panels, said rods having hooks at opposite ends which extend around the adjacent end portions of the binding shanks which protrude through said slots in said end cap panels.

2. A binder for binding into book form a stack of papers having alined slits extending inwardly from two opposite edges to form anchoring tabs on two corners of the papers defined by opposite ends of a common marginal edge of each of the papers, said binder comprising, in combination, two covers of substantially the same general size and shape as the papers and adapted to be disposed in overlying relation to opposite sides of the paper stack, said covers each having two slots extending inwardly from two opposite edges and spaced from a third edge thereof to be alined with the underlying slits in the papers, said slots defining sturdy anchoring tabs on the adjacent corners of the respective covers, an elongated U-shaped end cap disposed in straddling relation to said third edges of said covers and having two spaced legs thereon extending over the contiguous ends of said respective covers and said slots therein, two elongated panels on said cap integrally formed on said respective legs, said panels being disposed in underlying relationship to the respective legs and in overlying relationship to the respective covers and said slots therein, said panels each having two slots extending inwardly from the opposite ends thereof and alined with said cover slots, two U-shaped binding strips each comprising an elongated shank and two lateral toes integrally formed on opposite ends thereof, said shanks being disposed in position to extend through the slits in opposite sides of the stack of papers, opposite ends of said shanks extending through the contiguous cover slots and said panel slots alined therewith, said binding strip toes being interposed between the contiguous portions of said end cap panels and said end cap legs to extend toward said third edges of the respective covers, two elongated tie members disposed between said respective legs and their associated panels, said members having hooks at opposite ends which extend around the adjacent end portions of the binding shanks which protrude through said slots in said end cap panels.

3. A book binder comprising two generally rectangular cover boards adapted to be disposed on the upper and lower sides of a stack of papers to be bound into book form, the upper one of said cover boards having two slots extending inwardly from two opposite edges thereof, said slots being spaced inwardly appreciable distances from a third edge of said upper cover board so as to define anchoring tabs on the contiguous corners of said cover boards, the width of said tabs being limited by the width of the marginal edges of the papers to be bound, an end cap having an end plate extending between said cover boards, a leg connected to the upper edge of said end plate and extending over said third edge of said upper cover board, said leg projecting inwardly over the contiguous end of said upper cover board and said slots therein, an elongated panel connected to said end cap leg and disposed in underlying relationship to said leg and in overlying relationship to the contiguous end of said upper cover board and said slots therein, said panel having two slots extending inwardly from the opposite ends thereof and alined with said cover board slots, two binding strips each comprising an elongated shank and a lateral toe integrally formed on the upper end thereof, said shanks extending upwardly from the lower one of said cover boards through said respective slots in said upper cover board and said alined slots in said end cap panel, said binding strip toes being interposed between the contiguous portions of said end cap panel and said end cap leg to extend toward said third edge of the respective covers, an elongated tie member disposed between said leg and said end cap panel, said rod having hooks at opposite ends thereof which extend around the upper portions of said binding shanks which protrude through said slots in said end cap panel, and fastening means securing the lower side of said end plate and the lower ends of said binding strip shanks to said lower cover board.

4. A book binder comprising two generally rectangular covers adapted to be disposed on opposite sides of a stack of papers to be bound into book form, said covers each having two slots extending inwardly from opposite edges thereof, said slots being spaced inwardly equal and appreciable distances from third edges of said covers so as to define sturdy anchoring tabs on the contiguous corners of said covers, said slots in corresponding side edges of said covers being paired in opposing relation to each other, two elongated outer panels disposed over two opposed marginal edges of said respective covers adjacent said third edges, said outer panels extending over the underlying ones of said slots, two elongated inner panels integrally formed on said respective outer panels, said inner panels being disposed in underlying relationship to the respective outer panels and in overlying relationship to the said marginal edges of said respective covers and said slots therein, said inner panels each having two slots extending inwardly from the opposite ends thereof and individually alined with said cover board slots, two U-shaped binding strips each comprising an elongated shank and two toes integrally formed on opposite ends thereof and extending laterally at substantially right angles to the shank, said shanks extending through said respective pairs of slots in said cover boards and the contiguous slots in said inner panels, said binding strip toes being interposed between the contiguous portions of said inner panels and said outer panels, two elongated toe rod members disposed between said outer panels and their associated inner panel, said rods having hooks at opposite ends which extend around the adjacent end portions of the binding shanks which protrude through said slots in said inner panels.

5. A book binding machine of the class described comprising, in combination, a casing including two opposite side panels and a rear panel defining an open compartment, a movable floor pan disposed in the lower portion of said compartment and pivotally supported along its forward end on said casing, a shiftable support mounted in said casing and disposed in supporting relation to the rear end of said pan, said support being operable to position the rear end of said pan in raised and lowered positions, two holders mounted on said opposite side panels above said pan, said holders projecting inwardly into the rear portion of said compartment, said holders each having a slitting blade therein, said blades being exposed in positions so as to form slits in opposite side edges of horizontal sections of papers moved outwardly over said blades, each of said holders having a binding strip guide in its lower edge adapted to position the upper end of a binding strip directly under its associated blade, two blocking trays pivotally supported on the upper portions of said opposite side panels and positioned above said blades, resilient means interconnecting said trays with their respective side panels so as to bias the trays into horizontal position, a vertical guide chute formed on the rear portion of said casing, a loading ram disposed in the rear portion of said casing, guide means associated with said guide chute and said ram for guiding said ram in vertical movements relative to said casing, counterbalancing springs interconnected between said ram and said chute for facilitating vertical movements of said ram, clamping means on the lower end of said ram for grasping the inner end of a section of paper on

said blocking trays, cam rails in said guide chute for actuating said clamping means, and an actuating linkage on said ram interconnected with said trays for dumping said trays into vertical position as an incident to downward movement of said ram.

6. A machine for assembling a book binder of the class described, said machine comprising, in combination, a casing, a vertically movable binder support in the lower portion of said casing, two spaced cutting members mounted in said casing in overhanging relation to said support, binding strip guide means associated with said cutting members and adapted to receive the upper ends of binding strips to maintain the strip ends in positions directly below said respective cutting members, shiftable support means mounted on said casing in overlying relation to said binder support for supporting a section of paper to be blocked, loading means movably mounted in said casing for pressing upon a section of paper on said support means and forcing the section downwardly over said cutting members toward said binder support, and shifting means for moving said support means out of supporting position as an incident to actuation of said loading means.

7. A book binding machine in the class described comprising, in combination, a casing, a binder support member movably mounted in the lower portion of said casing, an actuator associated with said pan for shifting said pan into raised and lowered positions relative to said casing, two spaced binding strip guides mounted in said casing over said support member, each of said guides having a paper slitting member disposed thereover, a loading member slidably mounted in said casing for vertical movement relative thereto, and means on said loading member operable to grasp a section of paper and force it downwardly over said slitting members and said guides toward said binder support.

8. A book binding machine of the class described comprising, in combination, a casing, a binder support mounted in the lower portion of said casing, shifting means associated with said casing and said support for positioning said support in raised and lowered positions, two spaced cutting members mounted in said casing over said support and adapted to cut slits in two opposite edges of horizontal sections of paper moved vertically downward over the members, guide means disposed under said cutting members and adapted to receive the upper ends of binding strips to maintain the strip ends in positions directly below said respective cutting members so as to follow said cutting members through slits cut in paper sections by said members, blocking trays shiftably mounted in the upper portion of said casing in overlying relation to said binder support and said cutting members for supporting a section of paper to be blocked, a loading ram slidably mounted in one end portion of said casing for vertical movement relative thereto, means on said ram for grasping a section of paper on said blocking trays and forcing the section downwardly over said cutting members and said guide means toward said binder support, and shifting means connected with said trays and operative to move said trays out of supporting position as an incident to actuation of said ram to move a section of paper downwardly.

9. A book binding machine of the class described comprising, in combination, a casing defining a compartment, a binder supporting jig in the lower portion of said compartment, shiftable paper section supporting means mounted in the upper portion of said casing and disposed over said jig, a loading ram slidably mounted on said casing for vertical movement toward and away from said jig, a ram head on the lower end of said ram, a clamp supported on said ram and having a portion thereon adapted to engage one lower marginal edge of a section of papers disposed on said supporting means and press the section against said ram head as an incident to downward movement of said ram, and dumping means associated with said section supporting means and operable to move said supporting means out of supporting position as an incident to lowering of said ram, said ram thus being effective to load sections of papers into binder parts contained within said jig.

10. In a book binding machine of the class described, a loading jig for a partially assembled binder including a cover board having two binding strips extending upwardly therefrom, said jig comprising, in combination, a casing defining an open compartment, a movable binder support disposed in the lower portion of said compartment, shifting means associated with said support and operable to shift said support into raised and lowered positions, two holders mounted on said casing above said support member, said holders projecting inwardly into the rear portion of said compartment in spaced relation to each other, each of said holders having a binding strip guide in its lower edge adapted to receive the upper end of a binding strip upon upward movement of said support member, said holders each having a slitting blade therein, said blades being exposed in positions directly over said respective guides so as to form slits in opposite side edges of horizontal sections of papers moved outwardly over said blades, said jig thus being adapted to prepare sections of papers to be mechanically locked to binding strips disposed within the jig.

11. A bound volume of papers comprising, in combination, a stack of papers, two cover boards having the same general size and shape as the papers and adapted to be disposed on the upper and lower sides of said stack, the upper one of said cover boards having two slots extending inwardly from two opposite edges thereof, said slots being spaced inwardly appreciable distances from a third edge of said upper cover board so as to define anchoring tabs on the contiguous corners of said cover board, the width of said tabs being limited by the width of the marginal edges of the papers to be bound, the papers in said stack being formed with slits in opposite side edges thereof, the slits in corresponding edges of said papers being alined with each other and with said respective slots in said upper cover board, an elongated outer panel disposed over the marginal edge of said upper cover adjacent said third edge, an inner panel connected along one edge to one edge of said outer panel, said inner panel being disposed in underlying relationship to said outer panel and in overlying relationship to the said marginal edge of said upper cover and said slots therein, said inner panel having two slots extending inwardly from the opposite ends thereof and individually alined with said upper cover board slots, two binding strips each comprising an elongated shank and a lateral toe integrally formed on the upper end thereof, said shanks extending upwardly from the lower one of said cover boards through the slits in the papers on the respective sides of said stack, the upper ends of said shanks protruding through said respective slots in said upper cover board and the contiguous slots in said inner panel, said binding strip toes being interposed between the contiguous portions of said outer panel and said inner panel, and fastening means securing the lower ends of binding strip shanks to said lower cover board.

12. A book binding machine comprising, in combination, a support jig for a partially assembled binder of the class described, blocking means for a book signature disposed in alined and spaced relation to said support jig, shiftable loading means movable forwardly across said blocking means toward said jig and retractable from said jig, and signature engaging means on said loading means operable to engage a blocked signature on said blocking means as an incident to said forward movement of said loading means across said blocking means and to move the signature into said jig.

13. A book binding machine comprising, in combination, frame means, a binder support jig mounted on said frame, signature blocking means mounted on said

frame in spaced relation to said jig for shifting movement between signature supporting and dumping positions, signature loading means shiftably mounted on said frame for movement across said blocking means toward said jig, signature engaging means on said loading means adapted to carry a blocked signature from said blocking means into said jig as an incident to shifting movement of said loading means across said blocking means, and interengaging means on said loading means and said blocking means for shifting the latter out of signature supporting position as an incident to said movement of said loading means toward said jig.

14. A book binding machine of the class described, comprising, in combination, frame means, a support jig mounted on said frame means for supporting a partially assembled book binder of the class having a binding strip to bind individual signatures to the binder, a signature loader mounted on said frame means and equipped with clamping means for grasping individual signatures, means on said frame providing for relative movement between said jig and said loading means in a direction generally parallel to the signature binding strip, means for supporting individual signatures with a portion of each of the individual signatures in the path of said clamping means upon relative movement between said jig and said loading means, and means for actuating the said clamping means as an incident to said relative movement, whereby the latter is operable to engage individual signatures and to carry the same from said support means into a binder disposed within said jig.

15. A book binding machine comprising, in combination, frame means, a binder support jig mounted on said frame means and including a binder support and two spaced guard members disposed in spaced relation to said binder support means, said guard members each defining a binding strip socket opening outwardly toward said binder support, two cutter means mounted on said frame in alinement with said respective guard members, a signature loader movably mounted on said frame for movement through a loading cycle including a translation stroke alongside said cutters toward said jig and for retraction therefrom, and clamping means on said loader for grasping a signature and carrying the latter across said cutter means into said jig as an incident to forward translation of said loading means.

16. A book binding machine comprising, in combination, frame means, a support jig on said frame for supporting a partially assembled binder of the class described and including a binder support member and a pair of spaced binding strip receiving sockets disposed in spaced relation to said support member, means for shifting said support member toward and away from said support sockets for expediting the insertion of empty binders into said jig and the removal of filled binders therefrom, blocking means positioned to support a signature on the side of said sockets remote from said binder supporting member, a signature loader movably mounted on said frame means for translation across said blocking means and said sockets toward and away from said binder support member, and signature engaging means on said loading means arranged for picking up a signature on said blocking means and carrying the latter across said socket members into said jig.

17. A book binding machine comprising, in combination, frame means, a binder support jig on said frame member and including a pair of spaced binding strip receiving sockets, a pair of cutter members disposed in alinement with said respective sockets, signature blocking means on said frame disposed in alinement with said cutters, and shiftable signature loading means movably mounted on said frame for translation across said blocking means and said cutter members toward said jig, said loading means being adapted to pick up a signature on said blocking means and carry the same across the cutter into said jig.

18. A book binder of the class described comprising, in combination, two generally rectangular covers adapted to be disposed on opposite sides of a stack of papers to be bound, said covers each having two slots formed in one marginal edge portion thereof, the slots in corresponding marginal edge portions of said two covers being paired in opposing relation to each other, an elongated U-shaped end cap disposed in straddling relation to said marginal edge portions of both covers, portions of said end cap overlying said marginal edge portions of said respective covers defining slots therein individually alined with said respective cover slots, and two U-shaped binding strips each comprising an elongated shank and two lateral toes integrally formed on opposite ends thereof, said strips being assembled with said covers and said end cap with said shanks extending through said respective pairs of slots in said covers and contiguous slots in said end cap, and said toes locking said binding strips against longitudinal movement through said slots.

19. A book binder comprising, in combination, two generally rectangular covers adapted to be disposed on opposite sides of a stack of papers to be bound, one marginal edge portion of each of said covers defining two slots therein, the slots in opposing covers being alined with each other in pairs, an elongated U-shaped end cap disposed in straddling relation to said marginal edge portions of both covers and a stack of papers disposed therebetween, said end cap including two spaced legs overlying the contiguous ends of said respective covers, inturned flap members on said respective legs disposed between said legs and the contiguous portions of said covers in overlying relation to said respective cover slots, said flap members defining slots therein alined with said respective cover slots, two binding strips extending through said respective pairs of cover slots and the contiguous slots in said flap members and forming a positive interlock between said covers and said end cap.

20. A book binder comprising, in combination, a first generally rectangular cover adapted to engage one side of a stack of papers to be bound, one marginal edge portion of said cover defining two slots therein, a second generally rectangular cover adapted to engage the opposite sides of the stack of papers, cap means attached to one end of said second cover and adapted to extend over the corresponding end of the stack of papers to be locked to said marginal edge portion of said first cover, the free end of said cap means having a lateral extension thereon disposed in overlying relation to said first cover marginal edge portion, said extension defining two slots therein disposed in alinement with said first cover slots, and two binding strips extending from portions of said second cover opposite from said first cover slots through said respective slots in said first cover and the contiguous slots in said extension to interlock said extension with said first cover.

21. A book binding machine for loading individual signatures into a partially assembled binder having marginal slits for receiving a binding strip, comprising in combination a frame, a support means on said frame for receiving the binder, a plurality of cutters mounted on said frame in spaced relation to said support means, each of said cutters being positioned in alinement with a marginal slit in the binder, signature loading means mounted on said frame for forward movement alongside and past said cutters toward said support means and for retraction from said support means, means on said loading means for engaging a signature, and coacting means on said frame and said engaging means for actuating said engaging means to engage and retain a signature upon forward movement of said loading means so that the signature is carried by said loading means across and beyond said cutters toward said support means.

22. In a book binding machine for loading individual

signatures into a binder, the combination of a frame, a first support mounted on said frame for a binder, a second support mounted on said frame for individual signatures to be loaded in the binder, said first and second supports being positioned parallel to each other in perpendicularly spaced relation, a plurality of cutters mounted on said frame between said first and second supports for slitting marginal portions of individual signatures, signature shifting means mounted on said frame for movement across said second support in a direction toward and from said first support, signature clamping means on said shifting means for clamping individual signatures to said shifting means, and coacting means on said frame and said clamping means for actuating said clamping means to engage a signature upon movement of said shifting means across said second support and for retaining said signature in said clamping means until said shifting means is moved beyond said cutters.

23. A book binding machine for loading individual signatures into a partially assembled binder having a binding strip for the signatures comprising in combination a frame, a binder support for receiving the binder with the binding strip projecting perpendicularly from said support, a holder mounted on said frame in spaced relation to said binder support, said holder being disposed in alinement with the binding strip and having a socket for receiving the projecting end of the binding strip, signature loading means mounted on said frame for movement across said holder and in a direction parallel to the binding strip, and signature engaging means on said loading means for engaging an individual signature and moving the latter in unison with said loading means across said holder and into the binder on said support.




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