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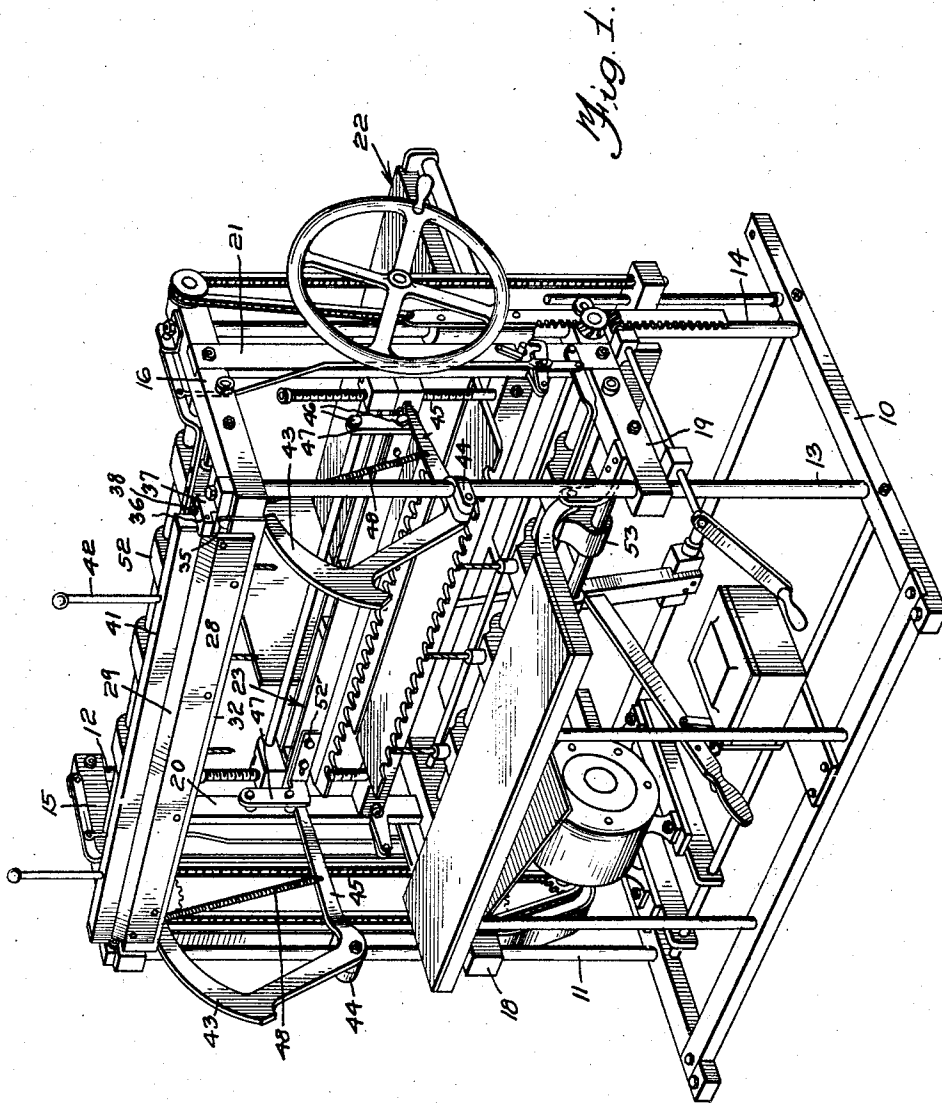
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BOOKBINDING MACHINE

Filed Oct. 6, 1926

4 Sheets-Sheet 1



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4 Sheets-Sheet 2

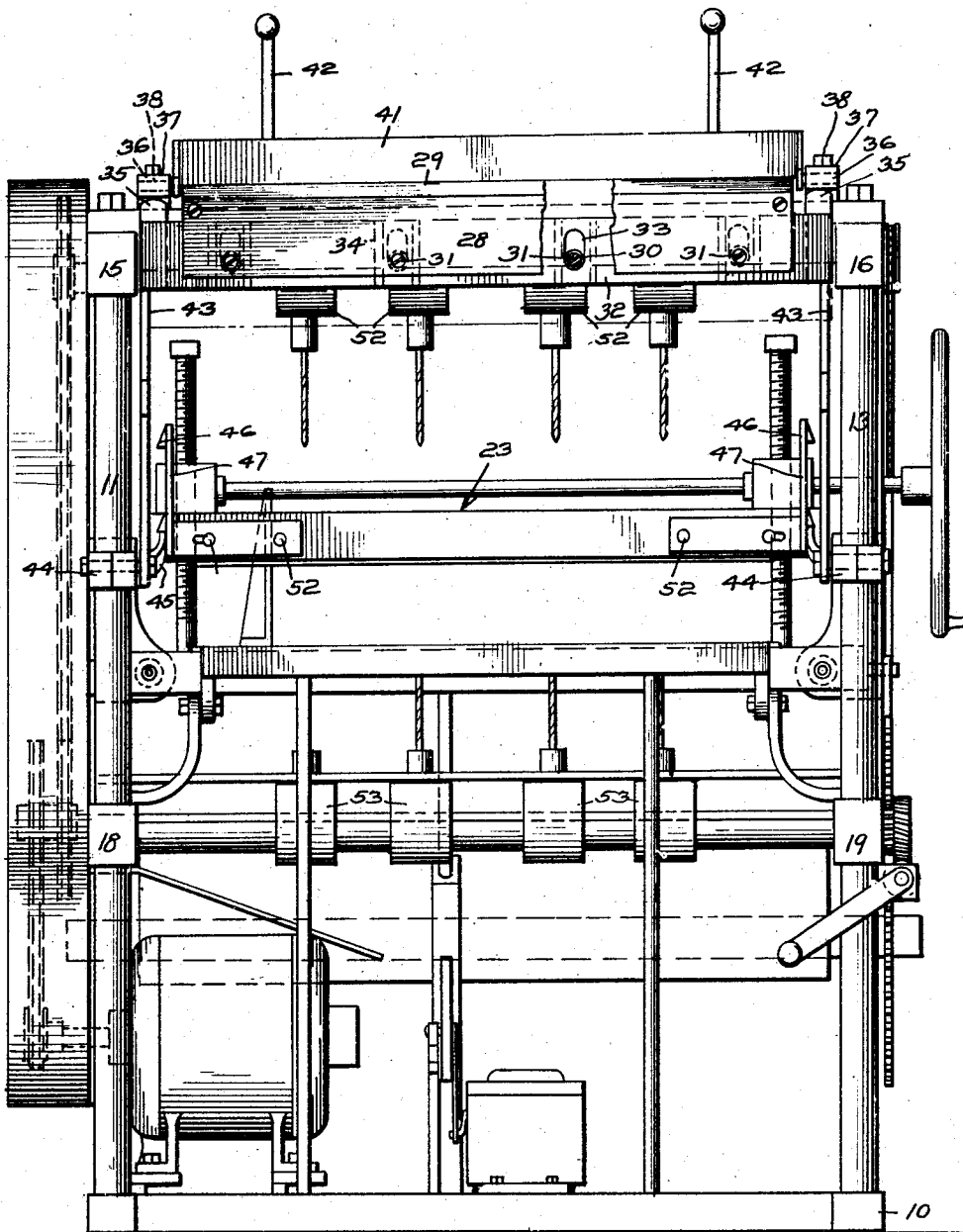


Fig. 2.

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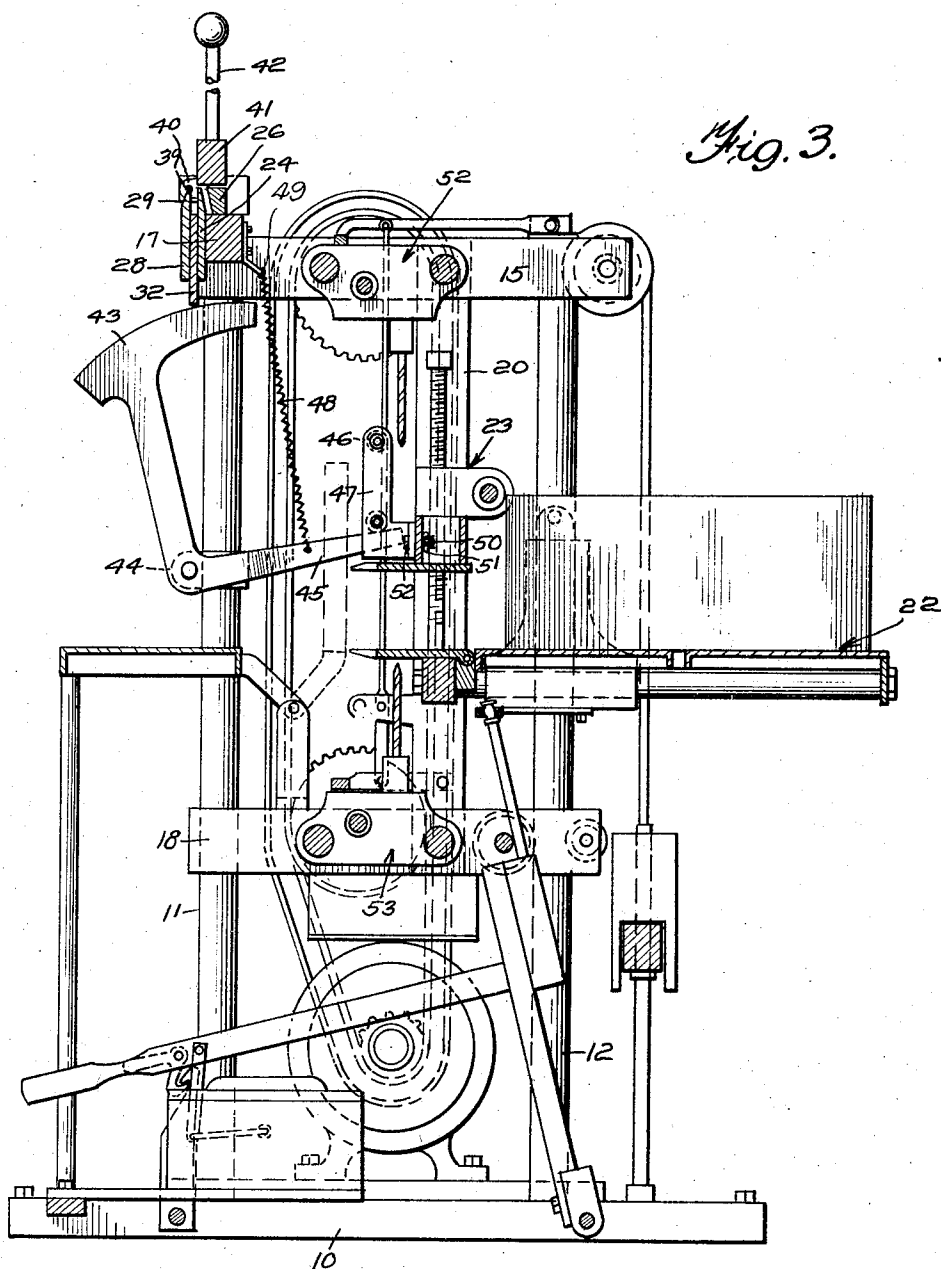
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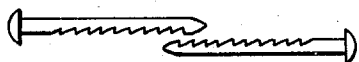
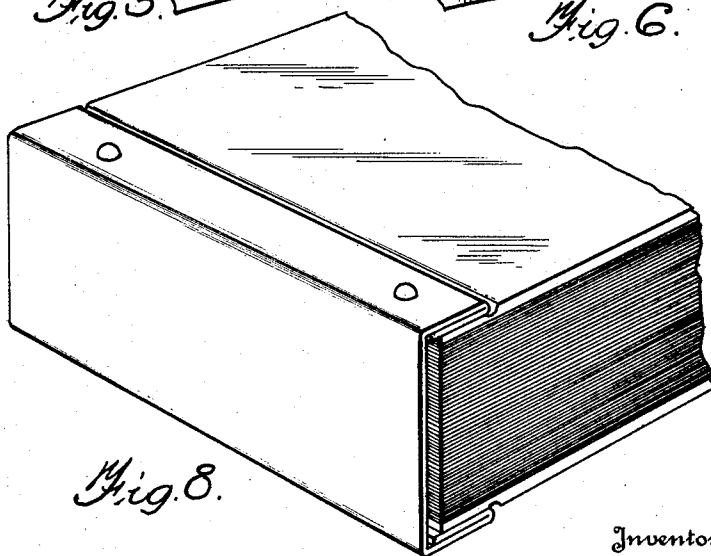
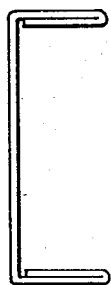
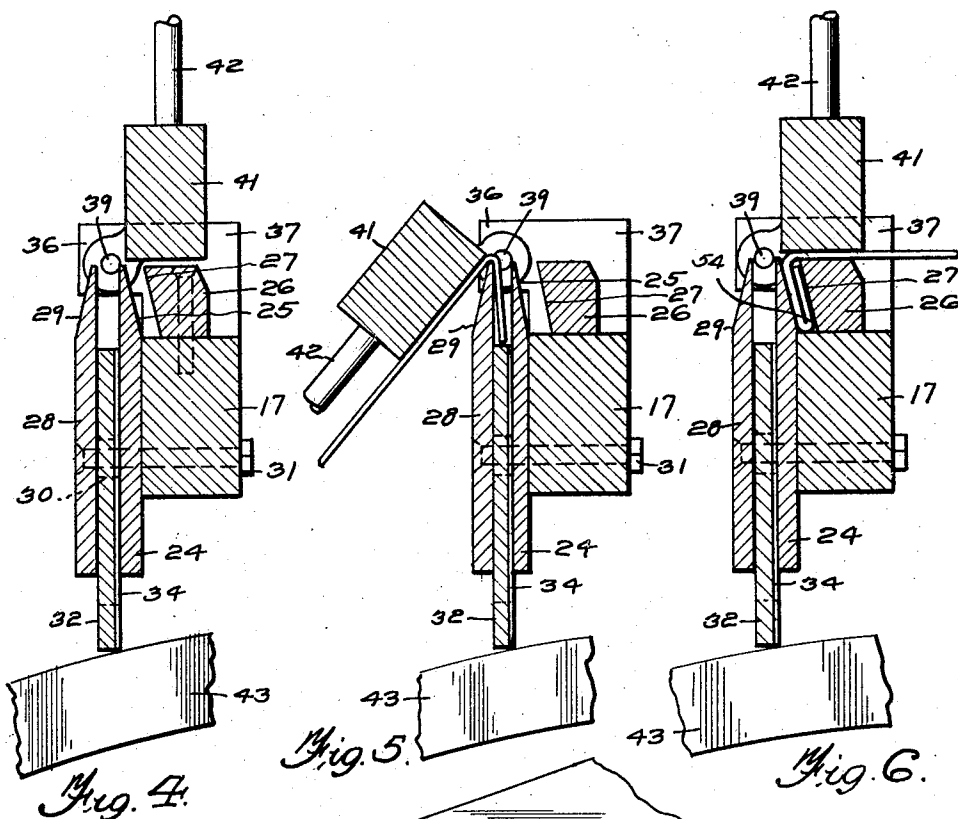
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BOOKBINDING MACHINE

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BOOKBINDING MACHINE

Application filed October 6, 1926. Serial No. 139,799.

This invention relates to book-binding machines, and has particular reference to that type of machine described and claimed in my co-pending application, Serial No. 18,797, filed March 27, 1925.

The structure of the present invention contemplates a means for measuring and shaping a metallic back for a particular volume under construction.

10 An object of the invention is the provision of means whereby the clamping of matter to be bound will automatically set mechanism whereby a stock metal back may be inserted and accurately measured and shaped to fit
15 the volume so clamped.

A further object is the provision of a back measuring and shaping mechanism having means for turning over or flattening on itself a marginal edge on each longitudinal side,
20 accurately taking up excess material of the metallic back, and forming securing flanges to fit over the book to be bound.

Other important objects and advantages of the invention will be apparent during the
25 course of the following description. In the accompanying drawings,

Fig. 1 is a perspective view of a machine embodying the invention;

Fig. 2 is a front elevation thereof;

30 Fig. 3 is a central vertical, longitudinal section thereof;

Fig. 4 is an enlarged vertical section through a measuring and shaping mechanism for the metallic backs;

35 Fig. 5 is a similar view showing the first gauging and bending operation;

Fig. 6 is a similar view illustrating the final shaping of the metal back;

Fig. 7 is an end elevation of a metal back
40 shaped for application to a volume;

Fig. 8 is a perspective view of a completed volume; and

Fig. 9 is an elevation of a pair of interlocking binding nails employed in the bind-
45 ing.

Referring specifically to the drawings, the numeral 10 designates a rectangular base frame member. This base member 10 carries vertical, parallel, supporting, and guide,
50 rods 11, 12, 13 and 14, rigidly secured there-

to. The rods 11 and 12 at their upper ends are connected by a horizontal cross bar 15, and the rods 13 and 14 are connected at their upper ends by a horizontal cross bar 16, both the bars 15 and 16 being rigidly attached to their respective rods. A transverse horizontal bar 17 is bolted, or otherwise attached, to the bars 15 and 16 adjacent their forward ends. This bar 17 forms a part of a measuring and shaping mechanism, to be hereinafter described. The rods 11 and 12, and 13 and 14, carry bars 18 and 19 rigidly secured thereto, and in parallel relation to the bars 15 and 16. Rigidly attached to the bars 15 and 18 is a vertically arranged supporting bar 20, and a similar bar 21 is attached to the bars 16 and 19, both bars 20 and 21 lying parallel to the rods 12 and 14. The structure so far given is for the purpose of outlining generally a supporting frame for an operating mechanism for the back forming means.

The numeral 22 designates a reciprocatory work table generally, upon which the volume to be bound is supported and clamped in position during the binding of such volume. The numeral 23 designates a pressure bar as a whole, movable in a vertical plane toward and from the table 22, for clamping the leaves of the volume under construction. The means for reciprocating the pressure bar 23 has been described and claimed in detail in my co-pending application above identified, and it is not considered necessary to go into detail herein, other than to describe its connection
85 with the back shaping and measuring device.

Means are provided for accurately measuring and shaping the metallic backs to be applied to the volume. These backs comprise a metallic sheet preferably covered by canvas, or other material, cemented thereto. The material of these backs forms no part of the present invention, but as the backs are supplied to the jobber in standard sizes in sheet form, it becomes necessary that the material
95 shall be suitably measured and shaped to fit the particular volume under construction.

Bolted, or otherwise attached, to the bar 17 is a plate 24 extending longitudinally of said bar 17 for approximately its entire
100

length, and parallel therewith. This plate 24 extends above the upper edge of the bar 17, and has its rear face beveled, as at 25. Bolted, or otherwise secured, to the upper face of the bar 17 is a second bar 26, the upper face of which is flush with the upper edge of the plate 24. This bar 26 is spaced from the plate 24, and has its forward face beveled, as at 27, corresponding to the beveled face 25 of plate 24. An outer plate 28 is rigidly held in spaced relation to the plate 24, and is approximately the same size. This plate 28 has its outer upper edge beveled, as at 29, corresponding to the beveled face 25 of plate 24. The plate 28 is held in spaced relation to the plate 24 by spacing washers 30, and the plate 28 is held in position by bolt 31. Mounted between the plates 24 and 28 is a gauge plate 32, slightly longer than plates 24 and 28, and adapted to partake of vertical, reciprocatory, movement between said plates 24 and 28. The gauge plate 32 is provided with a plurality of vertically arranged slots 33 for permitting the movement of said gauge plate 32 about the spacing washers 30. Ribs 34 are formed upon the rear face of the gauge plate 32, to relieve friction and facilitate the sliding movement of said plate. The gauge plate 32 carries stop elements 35 at its opposite ends, for engagement against the lower face of overhanging portions 36 of blocks 37. These blocks 37 are rigidly bolted to the bar 17, as at 38. The overhanging portions 36 carry pivot pins 39, in turn receiving eyes 40 carried by a bending bar 41. This bar 41 is arranged in parallel relation with the bar 17, and its outer face is approximately flush with the outer face of the plate 24. This bar 41 is adapted to swing forwardly and downwardly upon the pivots 39, as clearly shown in Fig. 5. Arms 42 are carried by the upper face of the bar 41 to facilitate the swinging of this bar.

Means are provided for raising and lowering the gauge plate 32, in accordance with the thickness of the volume under construction. This means comprises arcuate cam members 43, pivotally attached to the rods 11 and 13 by means of fixed brackets 44. These members 43 carry rearwardly extending operating arms 45, adapted to be engaged by lugs 46 carried by a plate 47, in turn carried by the pressure bar 23. Springs 48 are attached to the arms 45 and to the bar 17, through the medium of a lug 49. These springs 48 normally tend to urge the arms 45 upwardly against the lugs 46, and thus movement of the pressure bar 23, up or down, will result in the swinging of the arms 45 upon their pivots 44 to cause the cams 43 to rotate against the lower edge of the gauge plate 32, to raise or lower said gauge plate 32. Thus the elevation or depression of the gauge plate 32 is determined by the elevation or depression of the pressure bar 23. The plate 47,

carrying the lugs 46, is normally urged outwardly by means of springs 50 surrounding rods 51 carried by the bar 23, and having pivotal connection with bolts 52', carried by the angular extension of the plate 47 and operating through a slot formed in the pressure bar 23. Thus it will be seen that the plate 47, carrying the lugs 46, may be moved inwardly against the tension of the springs 50 when it becomes necessary for the arms 45 to engage against the upper lugs 46. It will be noted that I have provided an upper and lower set of these lugs 46; the lower set operates under normal conditions, and the upper set under abnormal conditions, as will be hereinafter more fully set out. The purpose of these upper lugs 46 is to enable an operator to measure accurately, and cut off or turn under, surplus material of the metallic back, when it becomes necessary to employ large sheets in the binding of very small volumes. As clearly shown, the lugs 46 are beveled, whereby, when the pressure bar 23 is again elevated, they will permit the passage of the arms 45 to a position beneath the lower lugs 46.

Drilling mechanisms 52 and 53 are located above and below the work table 22, for drilling the volume held upon the said table 22. The mechanism for operating the drills, and for reciprocating the table, has been fully described in my co-pending application above identified, and will not be dealt with in detail herein.

The operation of the back forming mechanism is as follows:

The material to be bound, including suitable hinged covers, is placed and properly positioned upon the table 22, and the pressure bar 23 reciprocated to a position for clamping such material in place. The small portion of the cover adjacent its hinge is equal in width to the binding edges of the back. The volume is now in position for binding, and it is next necessary to form the back therefor.

The pressure bar 23, having been moved to clamping position against the volume, has moved the arms 45 a predetermined distance, and has caused the cams 43 to rotate against the lower edge of the gauge plate 32, thus moving this gauge plate 32 to a predetermined position of adjustment for taking up the excess material of the backs. A sheet of back material is then placed in the space between the plates 24 and 26 and rests upon the upper edge of the gauge plate 32. In this position, the depths to which the material extends correspond to one-half of the excess material to be taken up, in accordance with the thickness of the particular volume under construction. The bar 41 is then swung downwardly, as illustrated in Fig. 5, bending the material over the beveled face 29, as clearly shown. To complete this bending, the bar

41 is raised, the material removed and again placed against the beveled face 29, and the bar 41 brought down a second time, which completes the initial bending. The material is then reversed and the other side bent back upon itself, each bending representing one-half of the excess material, and the two bendings, therefore, taking up all the excess material. These metal backs are of stock sizes, and in furnishing them provision is always made for some excess material, so that there will always be turned over portions on each longitudinal side. This eliminates any rough edges of the steel on the sides of the completed volume.

It now becomes necessary to bend the edges of the back material to a right angular position, as illustrated in Fig. 7. The degree of this bending is the same in all volumes. The bent portion, illustrated at 54, is then inserted in the space between the beveled faces 25 and 27 so that its edge rests upon the top of the bar 17, and the bar 41 is then swung upwardly to the position illustrated in Fig. 6. It is to be understood that these bending operations take place upon both longitudinal edges of the back material. The back is now formed, as shown in Fig. 7, and is ready to be placed with its bent portions over the forward edges of the volume under construction. The volume is now ready to be drilled.

After the volume has been suitably drilled, interlocking binding nails, similar to those illustrated in Fig. 9, are inserted in the holes and forced into locking position.

As before stated, it often becomes necessary to bind unusually thin volumes, and in the absence of back material of the proper size the operator is obliged to employ back material much too large, and it is then a matter of overlapping the excess back material, or of cutting it down to the correct dimensions. To determine the right amount of material to be trimmed off, the operator moves the plate 47 inwardly against the tension of springs 48, allowing the arms 45 to be drawn upward by said springs 48, so that said arms 45 will bear against the upper lugs 46. The pressure bar 23 is then lowered to clamp the material upon the table. The back material is then inserted between the plates 24 and 28, as before described, and the depth to which the material enters between the said plates indicates the amount of excess material to be removed from the back. From this point the measuring and forming of the back is identical with the operation hereinbefore described. The lower lugs 46 are beveled, as shown, the bevel slanting inwardly from the lower edge of the lug. If the pressure bar is again elevated, the arms 45, coming in contact with the beveled edge of the lower lug 46, will automatically pass over the lugs and spring into their normal position below the lugs, the

spring action being controlled by the tension on the spring 48.

It is to be understood that the form of the invention herewith shown and described is to be taken as the preferred one, but it should also be understood that various changes in the shape, size, and arrangement of parts, may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is:

1. In a book binding machine, a back forming device comprising a pressure bar, a measuring mechanism, a movable plate therein, arcuate members pivoted to the body of the machine, one end thereof frictionally engaging the pressure bar and the other end frictionally engaging the movable plate, substantially as shown and described.

2. In a book binding machine employing a pressure bar and a bending bar, a back measuring and shaping device comprising a pair of fixed plates, a movable plate, arcuate eccentric members pivoted to the body of the machine their lower ends being in frictional engagement with the pressure bar and their upper ends being in frictional engagement with the movable plate.

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