BOOK ROUNding AND BACKING MACHINE.

To all whom it may concern:

Be it known that I, ARTHUR CRAWLEY, a citizen of the United States, residing at Arlington Heights, in the county of Hamilton and State of Ohio, have invented new and useful Improvements in Book Rounding and Backing Machines, of which the following is a specification.

My invention relates to book rounding and backing machines, its object being to increase the capacity of such machines by enabling two books to be operated upon simultaneously.

The class of machines to which my invention is applicable is illustrated in Letters Patent No. 572,129 for book rounding and backing machines, issued October 25, 1887, to Edwin Crawley, of Newport, Kentucky, and my present invention may be regarded as an improvement thereon.

The invention consists in structural changes and improvements in certain hereinafter described and claimed parts and features of the machine, whereby the capacity for work to be performed in a given time is practically doubled, while preserving the capacity for individual adjustment as to each book undergoing treatment.

These improvements relate, first, to the feeding-platen, which I provide with a center-guide for the two books placed at opposite sides of the same to insure their proper angular position in relation to the rounding-rolls, gripping-vice, backing-bar, &c., and having also the function of separating the books a suitable distance apart to insure a proper centering relation to these parts of the machine; second, to the duplication and structural features of the spring-holders and mode of fastening, whereby they may be truly centered in relation to the books, and, third, to the backing-bar, which I provide with two independently-adjustable backing-plates, whereby the exact and proper degree of pressure at either end of each book may be attained and perfect results of rounding and backing produced.

My invention is illustrated in the accompanying drawings, in which Figure 1 is the plan view of parts of a book rounding and backing machine in their relative position of general operative relation and showing my improvements attached; Fig. 2, a side elevation showing the same parts and features; Figs. 3 and 4, partial plan views of the guide members in closed and open relations, respectively, showing the means of adjusting and securing the parts; Figs. 5 and 6, cross-sections at the lines x y x y of Fig. 3. Fig. 7 is a front elevation of the spring C and its adjuncts. Fig. 8 is a sectional view on the line 1 1 of Fig. 7; Fig. 9, a partial perspective view of the backing-bar and plates, showing my improvement; Fig. 10, a perspective view of a portion of the backing-bar and one of the backing-plates detached; and Figs. 11 and 12, a cross-section through the backing-bar and one of the plates, showing the relation of the retaining-bolt and the adjusting-screw, respectively, to the backing-plate.

Referring now to the drawings in aid of the description, it will be observed that only so much and such parts of the book rounding and backing machine are shown as exhibit my improvements, for the reason that my improvements introduce no new mode of construction of the machine itself as a whole, but only of certain parts for the purpose stated, these parts being the platen A, the center-guide B, the adjustable springs C C, operating in connection with the rounding-rolls and the backing-bar D, and plates D D, all of which are shown in relative position in Figs. 1 and 2.

The object being to pass two books into the machine at once, a fore-and-aft center-guide B is provided upon the platen, having the functions of guiding the book to the rounding-rolls and back-stop in proper angular relations thereto, and also to separate the books the required distance apart, so as to center the same in relation to the backing-plates and the springs C C, acting in cooperation with the rounding-rolls and the backing-bar D. The guide B is divided longitudinally into two members B B, preferably L-shaped in cross-section and adjustable in constantly-parallel relations to and from each other. The means for this adjustment are toggle connections, each con-
sisting of a double crank-head \( b' \), pivoted on a fixed stud \( b \), secured to the platen \( A \), and pivoted links \( b' b' \), connected to opposite sides of the crank-head and to the members \( b' b' \), respectively. The double crank-head \( b' \) is finished as a "thumb-nut" for convenience of rotation on its pivot to set the members \( b' b' \) together or apart, as desired. The members \( b' b' \) are guided in the proper line of movement and secured in ultimate positions by a telescopic device consisting of a tubular socket \( b' \), rigidly attached at right angles to one member, as \( b' \), and a corresponding close-fitting stem \( b' \), rigidly attached to the other member, as \( b' \). A set-screw \( b' \) in the socket part \( b' \) bears against the stem \( b' \) and enables these parts to be locked and held at any limit of adjustment. Two of the telescopic devices and two of the adjustment devices are employed, arranged near the ends of the guide \( B \), respectively, and, as will be observed, the entire guide device \( B \) is held to the platen \( A \) by the two fixed studs \( b \), which are screwed into the platen. Upon removing these two screws the entire device can be removed leaving the platen free for the use of the machine on a single book.

The function of the spring \( C \) is to prevent the book from "cocking up" behind the rolls when undergoing the action of the rolls. It is necessary, therefore, that it should act as nearly as possible at the center of the book. In modifying the structure to accommodate two books this spring is duplicated; but the position of the center lines of the books upon the platen will vary according to the size of the books being treated. It is necessary to vary the lateral position of the springs \( C \) to suit the work. To this end my invention involves not only the duplication, but the construction and mode of fastening of the springs adjustably to the cross-bar \( c \), which extends between the roller-yokes \( r^2 \). The improved construction consists in providing the forward plate or leaf \( e' \) of the spring \( C \) with a bend or flange \( e' \), turned under the guide-bar \( e' \), as shown in Fig. 8, and providing the bar \( e' \) with a horizontal slot \( c' \), enabling the spring \( C \) to be secured to the cross-bar \( c' \) by means of a thumb-screw \( e' \) in such manner as to be adjustable laterally within the limits of the slot \( c' \), as may be desired. The bend or shoulder \( e' \) assists in preserving the proper alinement of the spring in relation to the cross-bar \( c' \).

The backing-bar \( D \) in my improvement is provided with two backing-plates \( d' d' \), engaging tandem or arranged end to end. Each of these is held by bolts \( d' \) at each end, passing through the backing-bar and having an angular adjustment in relation to the latter by means of one or more adjusting-screws \( d' \). The head of each bolt \( d' \) engages in an undercut slotway of the backing-plate, and acts to hold the backing-plate to the backing-bar, while the adjusting-screws \( d' \) bear against the under side of and hold the backing-plate away from the backing-bar, as shown in Figs. 11 and 12.

The mode of operation is as follows: The first adjustment is that of the guide \( B \), whose members \( b' b' \) are distanced apart according to the page size of the books to be treated, in order to center them respectively in relation to the backing-plate \( d' d' \), and to the springs \( C \). The backing-plates \( d' d' \) are adjusted angularly in relation to the backing-bar \( D \) to individually accommodate the conditions of the books under treatment. All these adjustments being made, the general operation of the machine is the same as usual, except that it acts upon two books at once instead of one at a time successively.

The improved parts are detachable, and in case a single larger book is to be operated upon the platen-guide \( B \) is removed, one of the springs \( C \) is removed, and the other placed at the center of the bar \( c \). The two backing-plates \( d' d' \) are removed and replaced by the usual single backing-plate. The machine is then in the normal condition for a single book.

I claim as my invention and desire to secure by Letters Patent of the United States:

1. In a book rounding and backing machine in combination with the feeding-platen, a central fore-and-aft guide comprising two separable members adjustable toward and from each other, substantially as specified.

2. In a book rounding and backing machine in combination with the feeding-platen, a central fore-and-aft guide comprising two separable members adjustable toward and from each other and provided with a telescopic guide device, substantially as specified.

3. In a book rounding and backing machine in combination with the feeding-platen, a central fore-and-aft guide comprising two separable members adjustable laterally toward and from each other, and provided with telescopic guide means, and set-screws operating in connection with said guide means to secure the same in the positions of adjustment, substantially as specified.

4. In combination with the feed-platen and the central double guide, the fixed studs, the crank-heads rotateabile thereon and the pivoted links connecting the crank respectively with the members of the double guide, substantially as specified.

5. In a book rounding and backing machine, the combination of the rounding-rollers, the platen, a central fore-and-aft guide comprising separable members movable toward and from each other, the cross-bar, and two springs adjustably secured to said bar whereby they may be moved laterally.

6. In a book rounding and backing machine, the combination of the rounding-rollers; the platen; a central fore-and-aft guide composed of separable members movable toward and from each other; a cross-bar; a set-bolt seat-
ed in said bar; and a detachable spring having a holding-arm adjustably secured to the cross-bar by said bolt.

7. In a book rounding and backing machine, in combination with the backing-bar, two backing-plates engaging tandem thereon, provided with undercut sockets at or near each end, and with bolts having heads engaging in said sockets and shanks extending through the backing-bar, substantially as specified.

8. In a book rounding and backing machine, in combination with the backing-bar, two backing-plates engaging tandem thereon and adjustable to parallel or inclined relations therewith, substantially as specified.

9. In book-rounding machines, in combination with the backing-bar, two backing-plates engaging tandem thereon bolts engaging the same adjustably with the backing-bar, and set-screws threaded through the backing-bar and bearing against the under faces of the backing of the backing-plates to determine their angular adjustment substantially as specified.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

ARTHUR CRAWLEY.

Witnesses:

WALTER A. KNIGHT,

JOS. R. GARDNER.