

J. ROWE.
FEEDER FOR BOOK TRIMMING MACHINES.
APPLICATION FILED MAR. 2, 1912.

1,118,152.

Patented Nov. 24, 1914.

4 SHEETS-SHEET 1.

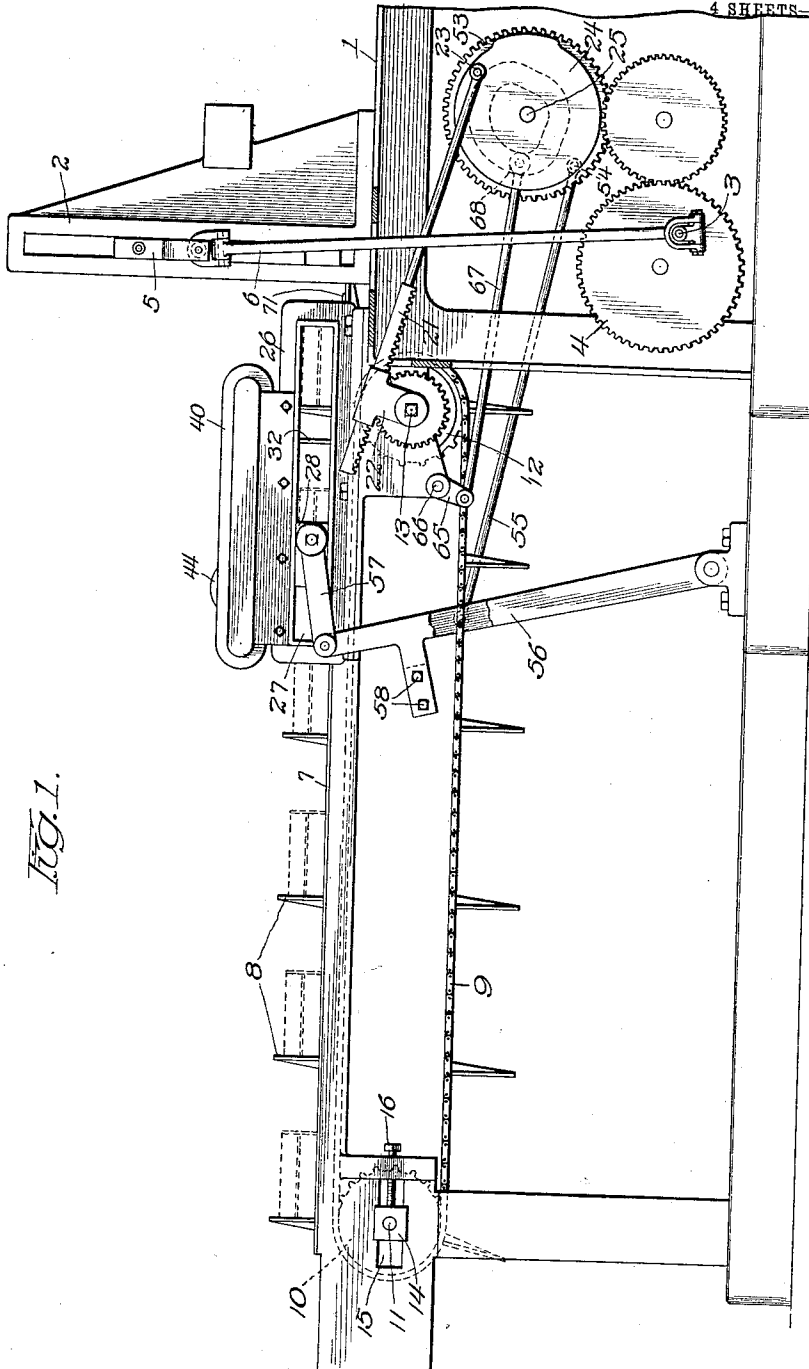


Fig. 1.

Witnesses:

Robert F. Weir
M. M. Boyle

Inventor:

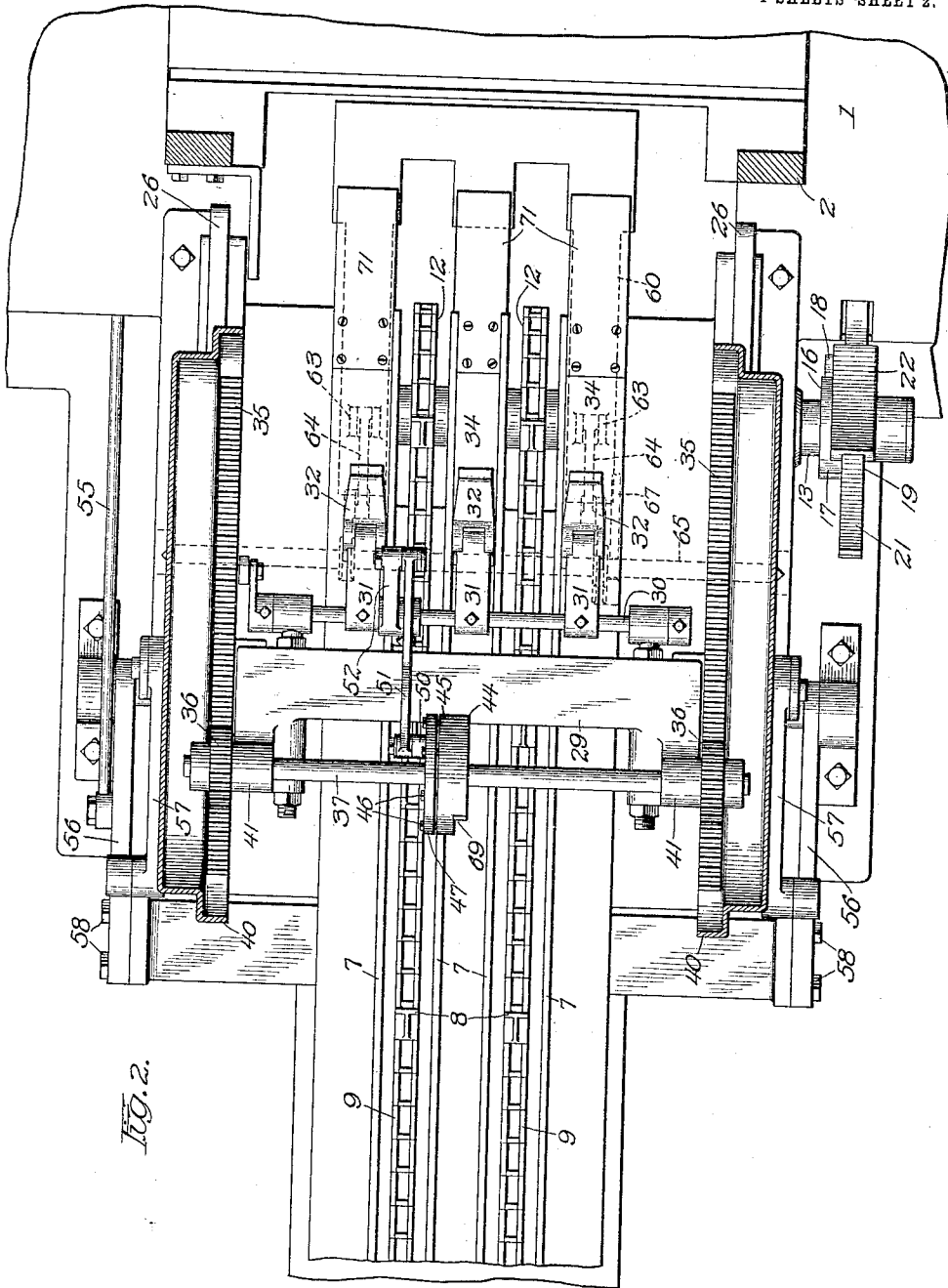
James Rowe
by Rudolph W. Long
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4 SHEETS—SHEET 2.



Witnesses:

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4 SHEETS—SHEET 3.

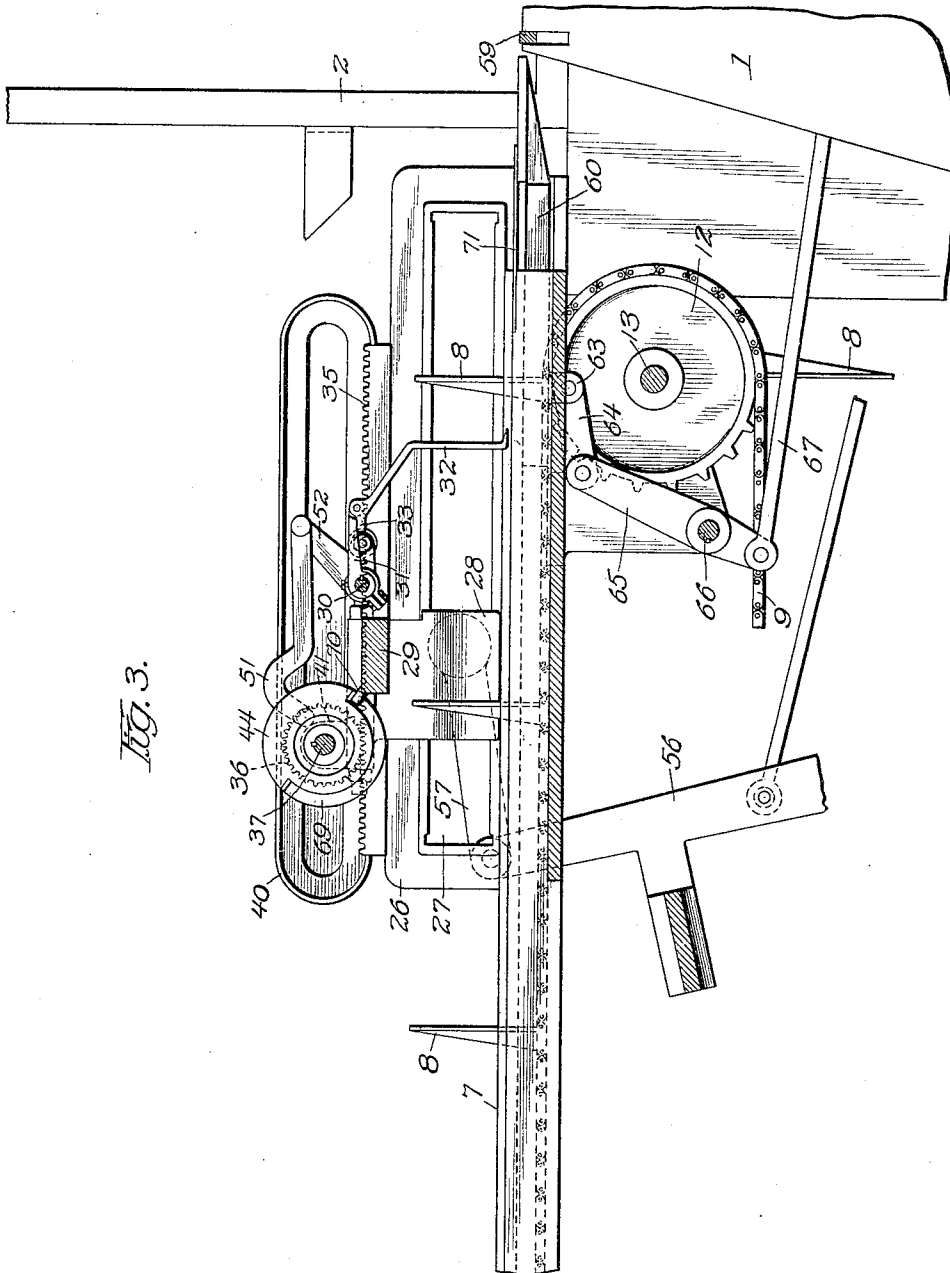


Fig. 3.

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4 SHEETS—SHEET 4.

Fig. 4.

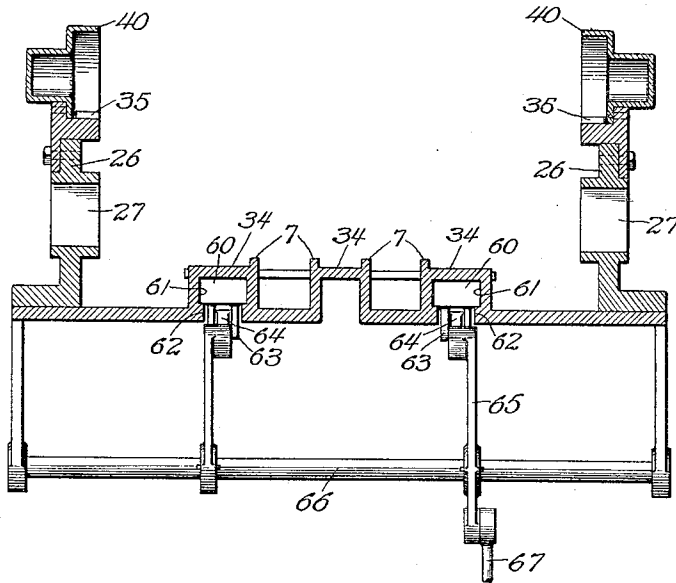


Fig. 5.

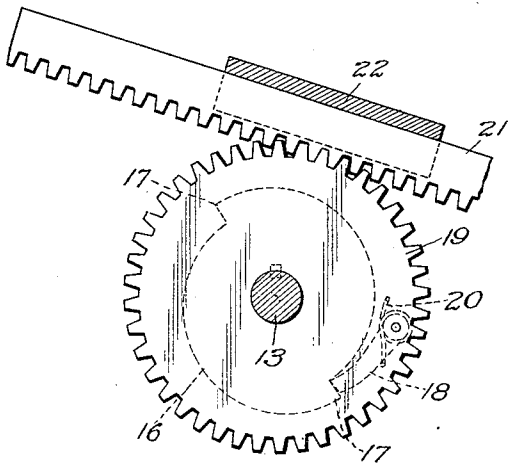
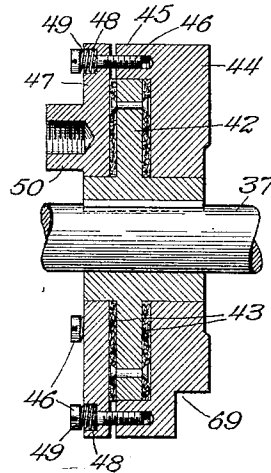


Fig. 6.



Witnesses:

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UNITED STATES PATENT OFFICE.

JAMES ROWE, OF CHICAGO, ILLINOIS.

FEEDER FOR BOOK-TRIMMING MACHINES.

1,118,152.

Specification of Letters Patent.

Patented Nov. 24, 1914.

Application filed March 2, 1912. Serial No. 681,274.

To all whom it may concern:

Be it known that I, JAMES ROWE, citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Feeders for Book-Trimming Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention has for its object to provide an automatic feed mechanism particularly adapted for automatic book trimming machines but which may be applied to other machines wherein material must be fed to devices for cutting or otherwise acting thereon, and which are sources of danger to the operators in feeding the same by hand.

The invention consists in the features of construction and combinations of parts hereinafter fully described and particularly claimed.

In the accompanying drawings illustrating the invention: Figure —1— is a view in side elevation, partly in section, of feed mechanism embodying my invention showing the connection between the same and the book trimming machine to which it is attached and of which it is made a part. Fig. —2— is a plan view of the same partly in section. Fig. —3— is a central vertical longitudinal section of the same. Fig. —4— is a vertical transverse section of the same, certain parts being omitted. Fig. —5— is a detail view in elevation partly in section showing a rack and gear employed for actuating the feed mechanism at regular intervals. Fig. —6— is a detail central longitudinal section of a clutch employed for actuating a part of the feed mechanism.

As previously stated my device is particularly adapted and intended to feed books to be trimmed to automatic book trimming machines for trimming the edges of the book. This is accomplished by means of sharp knives which are a source of danger to operators feeding books to the machines by hand, especially when such machines operate relatively rapidly and require alertness and quick movements on the part of the operator to time the feed to accord with the trimming strokes of the trimming knives. A book trimming machine to which

my said feed mechanism is particularly applicable, and for which it has been more particularly designated, is fully illustrated and described in Letters Patent No. 1003679 issued September 19, 1911, to Thomas C. Welch. The device is also applicable to the machine illustrated and described in the pending application of said Thomas C. Welch for Letters Patent for improvements in automatic continuous book trimming machines, filed February 14, 1910, Serial No. 543843.

The invention may be applied either in the form herein illustrated and described or in a modified form to suit the conditions pertaining in machines of different characters without departing from the invention as defined in the appended claims.

The particular object of the invention is to provide means for feeding books to the trimming machine which are simple, durable and efficient, and which coact with certain parts of the book trimming machine for properly positioning the books in the latter to be trimmed therein.

In the accompanying drawings 1 indicates the frame of a book trimming machine upon which there is mounted the frame 2 in which the trimming knife for trimming the front edge of a book is movable, the said knife being reciprocated by means of the crank pin 3 on the spur gear 4 which is connected with the knife-carrying member 5 by means of the rod or pitman 6, in a well-known manner. In inserting books to be trimmed underneath the said trimming knife, as particularly pointed out in the aforesaid Letters Patent, the rear edges of the books are disposed in contact with gages or stops projecting intermittently above the table of the frame 1 of the book trimming machine. Generally a relatively small amount of material is cut from the front edge of the book and hence in feeding the latter into the machine it is almost essential that the operator must insert his hands in the trimming plane of the knife with consequent obvious danger to him.

The present invention comprises a table upon which the books to be trimmed are adapted to be laid, the same being adapted to rest upon the upper edges of the parallel flanges 7, shown clearly in Fig. —4—, and upon which they are advanced at regular intervals by means of the projections 8 of

an intermittently moving carrier comprising the sprocket chains 9 carrying the said projections 8, and which are trained over the sprockets 10 on a shaft 11 and sprockets 12 on a shaft 13. The shaft 11 is journaled at its ends in bearings 14 which are longitudinally movable in guide slots 15 in vertical flanges of the frame of the feed device and which are adjusted therein to maintain said sprockets 9 taut by means of the set screws 16 in a well-known manner. The said sprockets 9 are disposed parallel with each other and the said projections 8 thereof are arranged in pairs, the book engaging faces of which are disposed flush with each other in a plane exactly perpendicular to the plane of travel of the sprockets and which, during engagement with the books, are disposed exactly perpendicular to the plane of the upper edges of the flanges 7. The said shaft 13 is journaled in bearings rigid with the frame of the feed device and which carries a disk 16 rigid thereon and provided at diametrically opposite points with projections or ratchet teeth 17 which are adapted to be engaged by the pawl 18 pivotally mounted on a spur gear 19 loosely disposed on said shaft 13 and which is maintained normally in peripheral engagement with said disk 16 by means of a spring 20 in the usual and well-known manner. Meshing with said spur gear 19 is a rack 21 movable in a guide 22 pivotally mounted upon said shaft 13, said rack being connected at one end with the crank pin 23 on a disk 24 rigidly mounted on a shaft 25 geared suitably to the drive shaft of the book trimming machine, and which serves to impart reciprocating movement to said rack at intervals so timed relatively to the trimming strokes of the knives as to advance the projections 8 of the sprockets 9 at the proper time relatively to each trimming stroke of the knife for trimming the front edge of the book to insure a book being placed in proper position relatively to said knife to be trimmed.

The reciprocating movement of said rack bar 21 will cause the gear 19 to be rotated alternately in opposite directions through a given arc slightly in excess of one hundred eighty degrees and during each revolution in one direction the said pawl 18 will engage one of the teeth 17 of the disk 16 and impart to the latter a half revolution thereby moving the sprocket chains 9 a distance equal to the distance between two contiguous pairs of said projections 8. The said projections 8 pass downwardly during travel of that portion of the sprocket chains 9 carrying the same over the sprockets 12 on the shaft 13, between the cutting bed 59 of the trimming knife and the contiguous end portion of the feed device and become angularly disposed during such travel. It is, therefore, necessary to provide means for

advancing the books out of engagement and out of the path of the said projections 8 and into trimming relation to the trimming knife by means traveling at greater speed than said projections, and which serve to advance the books at the proper intervals. To accomplish this I have provided very simple and efficient means. These comprise two parallel vertical frames 26 rigidly mounted on the frame of the device and which are provided with horizontal guide slots 27 in which the guide members 28 of a plunger 29 travel. The said plunger 29 or middle portion of a U-shaped member, the arms of which constitute the said plates or guide members 28, carries projections upon which bearings for a rock shaft 30, are disposed, the said projections being adjustable relatively to the plunger 29 to enable the shaft 30 to be set at different distances from the front edge of the same. On said shaft 30 there are mounted three arms 31 rigid therewith and to the free end portions of which there are hinged or pivotally secured fingers 32 which are capable of freely swinging relatively to said arms 31 in one direction, but are prevented from rotating relatively to the latter in the opposite direction by means of projections 33 on each thereof contiguous to its pivot and which engages a free end portion of said arm in a well-known manner. The said fingers project at their free ends into the guide grooves or recesses 34 between and contiguous to the said flanges 7 upon which the books are adapted to travel. Each of said members 26 carries a rack bar 35 with which spur gears 36 on a shaft 37 mesh, the said rack bars 35 being rigid with said members 26 and the frame of the feed device. Contiguous to said rack bars 35 and partly overhanging the same are guide members 40 in which the said spur gears 36 and their hubs are adapted to travel. The shaft 37 is journaled in the bearings 31 carried by the plunger 29 and in traveling over the said rack bars with which they mesh when said plunger 29 is reciprocated, the said spur gears will obviously serve to rotate said shaft. Rigidly mounted on the latter between its ends is a disk 42 which is provided on its opposite faces with raw hide or similar frictional facings 33. The hub of said disk 42 is relatively long and rotatably mounted thereon is a disk 44 having an annular flange 45 which overhangs the peripheral edge of the disk 42 and which is tapped in its vertical face at regular intervals to receive set screws 46. The latter pass through openings in a disk 47 also rotatably mounted on the hub of said disk 42 on the opposite side of the latter from that carrying said member or disk 44. Between the heads of said set screws 46 and the bottoms of recesses 48 in said disk 47 concen-

tric with the openings through which the shanks of said set screws 46 pass, helical compression springs 49 are disposed which serve to compress the disks 44 and 47 against the opposite faces of the disk 42, thus obtaining a frictional hold on the latter whereby relative rotation of said disks 42 and 44—47 is obviously resisted but not prevented. The said disk 47 is provided with a tapped boss 50 adapted to receive the threaded end of a crank pin by means of which one end of a link 51 is pivotally secured to said disk 47, said crank being pivotally connected at its other end with an arm 52 rigidly mounted on the shaft 30 carrying the said arms 31 which in turn carry the fingers 32 before referred to.

Mounted on the shaft 25 of the book trimming machine is a spur gear 53 which carries a crank pin 54 to which one end of a pitman 55 is pivotally secured, the other end of said pitman being pivotally secured to a lever 56 between the ends of the latter. The said lever 56 is pivotally secured at its lower end to the bed plate of the machine and at its upper end is pivotally secured to one end of a link 57 which at its other end is connected with one of said guide members 28 of the plunger 29. Two of said levers 56 are provided which are disposed parallel with each other and are connected together by means of a suitable cross-bar secured thereto by means of the bolts 58. By means of said levers 56 and other parts just above described the said plunger 29 is reciprocated at considerably greater speed than the speed of travel of the sprocket chains 9, as will be apparent.

The table of the feed device supporting the books during travel must normally be so disposed relatively to the cutting bed 59 of the trimming knife as to permit the paper trimmed from the front edge of the book to fall away from said bed, but, at the same time, in order that the books may be fed so as to pass over said cutting bed 59 and against the stops or gages determining their position relatively to the trimming plane, said table must extend relatively closely or contiguous to the cutting bed 59, as will be obvious. In order, therefore, that the book may be properly fed and yet sufficient room left for getting rid of the shavings, the book supporting surface of the feed device includes a reciprocably movable part comprising two members 60 mounted in guides 61 underneath the outer grooves 34 in which the lower ends of the fingers 31 travel, said guides being rectangular and having longitudinal slots 62 in their lower walls through which the projections 63 of said members 60 project. The said projections 63 are connected by means of links 64 with the longer ends of the levers 65 rigidly mounted between their

ends on a rock shaft 66 and one of which is pivotally connected at its other or shorter end with the pitman 67. The latter is equipped at its other end with an anti-friction roller 68 which travels in a cam groove in that face of the disk 24 opposite to the one carrying the crank pin 23, said pitman being adapted to be reciprocated at intervals by said cam to move the said members 60 forward and back at proper intervals for feeding the books and thereafter getting out of the way of the falling shavings trimmed therefrom.

The disk 44 is provided with a peripheral recess 69 extending through an arc slightly greater than one hundred eighty degrees and into which a pin 70 on the plunger 29 projects, said pin being adapted to limit the rotation of said disk 44 in either direction.

The operation of the device is as follows: The books are placed upon the table or supporting flanges 7 thereof in front of the several pairs of projections 8 of the carrier consecutively, and, as said projections are at intervals moved forward, the books are gradually advanced so that their front edges are disposed substantially in vertical alignment with the shaft 13. At this time the plunger 29 is disposed at the rearward limit of its movement and the fingers 32 are raised out of the path of the books. Simultaneously with the travel of said projections 8 to the forward limit of their movement while vertically disposed, the plunger 29 begins its forward movement and such movement causes the gears 36 meshing with the racks 35 to rotate the shaft 37 and the disk 42 mounted thereon; the latter by its frictional contact with the disks 44 and 47 also rotates these disks thereby causing the crank pin on the disk 47 to which the link 51 is secured to move to the position shown in Fig. —3—. This causes the shaft 30 to be rocked to throw the arms 31 to substantially horizontal position whereby the fingers 32 are thrown so that the lower ends thereof travel in the grooves or recesses 34. The disks 44 and 47 are prevented from rotating further by engagement of the pin 70 with the shoulder at one end of the groove 69 in the disk 44 so that further forward movement of the plunger 29 merely serves to keep the link 51 and the parts connected therewith in the position shown in Fig. —3— during the balance of the forward stroke of said plunger. One of the said fingers 32 passes between two of the foremost projections 8 and the other two fingers 32 pass on either side outwardly thereof and the three fingers, moving much more rapidly than the sprockets 9 and projections 8, and continuing to move when the latter have come to a stop at the last-named point, will move the books entirely out of the path of said projections 8 and onto the cutting bed of the trimming knife

5. During the forward movement of the fingers 32 the members 60 of the supporting bed are also moving forward and attaining and retaining the position shown in Fig. 3—until the book has been placed in position against the stops on the book trimming machine whereupon said members 60 recede as does also the plunger 29. Upon beginning its rearward stroke the plunger 29 causes the gears 36 to again rotate the shaft 37 and disk 32 and thereby the disks 44 and 47 so that during the first half revolution of the gear 36 the crank pin to which the link 51 is secured will move rearwardly through an arc of one hundred eighty degrees thereby again throwing the shaft 30 and raising the arms 31 and fingers 32 so that the latter pass freely over the books and become positioned behind the next advancing book or book pad whereupon the aforesaid operation is repeated.

The fingers 32 are free to rotate on their pivots during the rearward movement of the plunger 29 so that in the event that the frictional contact between the disk 42 and the disks 44 and 47 shall be insufficient, from any cause, to raise the arms 31 and fingers 32, the latter may freely ride over a book pad and become positioned behind it preparatory to advancing the same upon the cutting bed of the trimming knife.

As the plunger 60 moves forward and away from the rigid support for the books a free space will obviously be left between the latter and the rear end of said plunger which is spanned by the bridge plates 71 secured at one end to the rigid book support and resting at their other ends on said plunger.

The device is very simple and efficient, and renders perfectly safe the operation of the book trimming machine at a speed which would be extremely dangerous to the operators were the same fed by hand.

I claim as my invention:

1. A feeder for book trimming machines comprising a supporting member for the books, means operating at intervals to move the same on said supporting member and into a trimming plane and stops disposed in the path of said books and coacting with said book-moving means for determining the position of the book relatively to the trimming plane.

2. A feeder for book trimming machines comprising a supporting member for the books disposed substantially in the plane of the cutting bed of a trimming knife of said machine, means operating at intervals for projecting the books from said supporting member upon the said cutting bed and stops disposed in the path of said books and coacting with said book-moving means for determining the position of the book relatively to the trimming plane.

3. A feeder for book trimming machines comprising a rigid supporting member for the books having its supporting surface disposed substantially in the plane of the cutting bed of a trimming knife of said machine, a reciprocable supporting member for the books, and means operating at intervals for projecting the books from said rigid supporting member upon and over said reciprocable supporting member and upon the said cutting bed.

4. A feeder for book trimming machines comprising a rigid supporting member for the books having its supporting surface disposed substantially in the plane of the cutting bed of a trimming knife of said machine, a reciprocable supporting member for the books disposed between said rigid supporting member and said cutting bed, means for imparting reciprocatory movement to said reciprocable supporting member at regular intervals toward and from said cutting bed, and means operating at intervals corresponding to the intervals of movement of said reciprocable member toward said cutting bed for projecting books from said rigid member upon and over said reciprocable supporting member and upon the said cutting bed.

5. A feeder for book trimming machines comprising a rigid supporting member for the books having its supporting surface disposed substantially in the plane of the cutting bed of a trimming knife of said machine, a reciprocable supporting member for the books disposed between said rigid supporting member and said cutting bed, means for imparting reciprocatory movement to said reciprocable supporting member at regular intervals toward and from said cutting bed, and reciprocable means moving substantially in unison with said reciprocable supporting member for projecting the books from said rigid member upon and over said reciprocable supporting member and upon said cutting bed.

6. A feeder for book trimming machines comprising a rigid supporting member for the books having its supporting surface disposed substantially in the plane of the cutting bed of a trimming knife of said machine, a reciprocable supporting member for the books disposed between said rigid supporting member and said cutting bed, means for imparting reciprocatory movement to said reciprocable supporting member at regular intervals toward and from said cutting bed, and reciprocable means moving substantially in unison with said reciprocable supporting member and at greater speed and having a longer stroke for projecting the books from said rigid member upon and over said reciprocable supporting member and upon said cutting bed.

7. In a book trimming machine having a

cutting bed, a rigid supporting member for books having its book supporting surface disposed substantially on a level with said cutting bed, a reciprocable book supporting member disposed between said rigid member and said cutting bed, traveling means for moving the books on said rigid member toward said cutting bed, and reciprocable means adapted to engage the books to project the same from a given point on said rigid member upon and over said reciprocable member and upon said cutting bed.

8. In a book trimming machine having a cutting bed, a rigid supporting member for books having its book supporting surface disposed substantially on a level with said cutting bed, a reciprocable book supporting member disposed between said rigid member and said cutting bed, traveling means for moving the books on said rigid member toward said cutting bed, reciprocable means adapted to engage the books to project the same from a given point on said rigid member upon and over said reciprocable member and upon said cutting bed, and means whereby movement in the same direction is imparted substantially simultaneously to said reciprocable means and said reciprocable member at different speeds.

9. In a book trimming machine having a cutting bed, a rigid supporting member for books having its book supporting surface disposed substantially on a level with said cutting bed, traveling means for moving the books on said rigid member toward said cutting bed, and reciprocable means adapted to engage the books to project the same from a given point on said rigid member upon said cutting bed.

10. In a book trimming machine having a cutting bed, a table having a book supporting surface disposed substantially level with said cutting bed, traveling means for engaging books supported on said table for moving the same toward said cutting bed, and reciprocable means moving at greater speed than said traveling means for projecting the books from a given point on said table upon said cutting bed and out of engaging relation to said traveling means.

11. In a book trimming machine having a cutting bed, a table having a book supporting surface disposed substantially level with said cutting bed, traveling means for engaging books supported on said table for moving the same toward said cutting bed, reciprocable means moving at greater speed than said traveling means for projecting the books from a given point on said table upon said cutting bed and out of engaging relation to said traveling means, and a reciprocable book supporting member disposed between said table and said cutting bed and acting to extend the book supporting surface to a point contiguous to the cutting bed dur-

ing projection of the books by said reciprocable means.

12. In a book trimming machine having a cutting bed, traveling means for advancing books toward said cutting bed, reciprocable means for projecting said books out of engaging relation to the said traveling means and upon said cutting bed and stops disposed in the path of said books and coacting with said book-moving means for determining the position of the book relatively to the trimming plane.

13. In a book trimming machine having a cutting bed, traveling means for advancing books toward said cutting bed, and a plurality of reciprocable devices for projecting said books out of engaging relation to the said traveling means and upon said cutting bed.

14. In a book trimming machine having a cutting bed, a supporting surface for books disposed substantially level with said cutting bed, and reciprocable book engaging means movable in a direction parallel with the book-supporting surface for projecting the books from said supporting surface upon said cutting bed.

15. In a book trimming machine having a cutting bed, a supporting surface for books disposed substantially level with said cutting bed, a reciprocable book supporting member interposed between said surface and the cutting bed, and reciprocable book engaging means coacting with said reciprocable supporting member for projecting the books upon and over the latter and upon said cutting bed.

16. In a book trimming machine having a cutting bed, a supporting surface for books disposed substantially level with said cutting bed, a reciprocable carriage disposed above said supporting surface and traveling in a plane parallel therewith, means for imparting reciprocating movement to said carriage at intervals, a rotatable member on said carriage, a rocking member frictionally engaged therewith, book engaging members on said rocking member adapted to be thrown into and out of engaging relation to books on said supporting surface as said carriage moves in respectively opposite directions, and means for rotating said rotatable member as said carriage is reciprocated.

17. In a book trimming machine having a cutting bed, a supporting surface for books disposed substantially level with said cutting bed, a reciprocable carriage disposed above said supporting surface and traveling in a plane parallel therewith, means for imparting reciprocating movement to said carriage at intervals, a rotatable member on said carriage, a spur gear rigid therewith, a rack on the frame of the machine meshing with said gear and adapted to cause same to

rotate in alternately opposite directions as said carriage is reciprocated, a rocking member frictionally engaged with said rotatable member, means for limiting the movements of said rocking member in opposite directions, and means carried by said rocking member adapted to be alternately thrown into and out of engaging relation to books disposed on said supporting surface as said carriage moves in respectively opposite directions.

18. In a book trimming machine having a cutting bed, a supporting surface for books disposed substantially level with said cutting bed, a reciprocable carriage disposed above said supporting surface and traveling in a plane parallel therewith, means for imparting reciprocating movement to said carriage at intervals, a rotatable member on said carriage, a rocking member frictionally engaged therewith, book engaging members on said rocking member adapted to be thrown into and out of engaging relation to books on said supporting surface as said carriage moves in respectively opposite directions, means for rotating said rotatable member as said carriage is reciprocated, and means whereby the books are successively advanced to a point between the limits of movement of said carriage.

19. In a book trimming machine having a cutting bed, a supporting surface for books disposed substantially level with said cutting bed, a reciprocable carriage disposed above said supporting surface and traveling in a plane parallel therewith, means for imparting reciprocating movement to said carriage at intervals, a rotatable member on said carriage, a spur gear rigid therewith, a rack on the frame of the machine meshing with said gear and adapted to cause same to rotate in alternately opposite directions as said carriage is reciprocated, a rocking member frictionally engaged with said rotatable member, means for limiting the movements of said rocking member in opposite directions, means carried by said rocking member adapted to be alternately thrown into and out of engaging relation to books disposed on said supporting surface as said carriage moves in respectively opposite directions, and means whereby the books are successively advanced into the path of said last-named means for engagement and projection thereby upon said cutting bed.

20. In a book trimming machine having a cutting bed, a supporting surface for books disposed substantially level with said cut-

ting bed, a reciprocable carriage disposed above said supporting surface and traveling in a plane parallel therewith, means for imparting reciprocating movement to said carriage at intervals, a rotatable member on said carriage, a rocking member frictionally engaged therewith, book engaging members on said rocking member adapted to be thrown into and out of engaging relation to books on said supporting surface as said carriage moves in respectively opposite directions, means for rotating said rotatable member as said carriage is reciprocated, means whereby the books are successively advanced to a point between the limits of movement of said carriage, and a reciprocable book supporting member disposed between said cutting bed and said supporting surface and moving toward the former simultaneously with the movement of said carriage in the same direction.

21. In a book trimming machine having a cutting bed, a supporting surface for books disposed substantially level with said cutting bed, a reciprocable carriage disposed above said supporting surface and traveling in a plane parallel therewith, means for imparting reciprocating movement to said carriage at intervals, a rotatable member on said carriage, a spur gear rigid therewith, a rack on the frame of the machine meshing with said gear and adapted to cause same to rotate in alternately opposite directions as said carriage is reciprocated, a rocking member frictionally engaged with said rotatable member, means for limiting the movements of said rocking member in opposite directions, means carried by said rocking member adapted to be alternately thrown into and out of engaging relation to books disposed on said supporting surface as said carriage moves in respectively opposite directions, means whereby the books are successively advanced into the path of said last-named means for engagement and projection thereby upon said cutting bed, and a reciprocable book supporting member disposed between said cutting bed and said supporting surface and moving toward the former simultaneously with the movement of said carriage in the same direction.

In testimony whereof I have signed my name in presence of two subscribing witnesses.

JAMES ROWE.

Witnesses:

RUDOLPH WM. LOTZ,
M. M. BOYLE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."