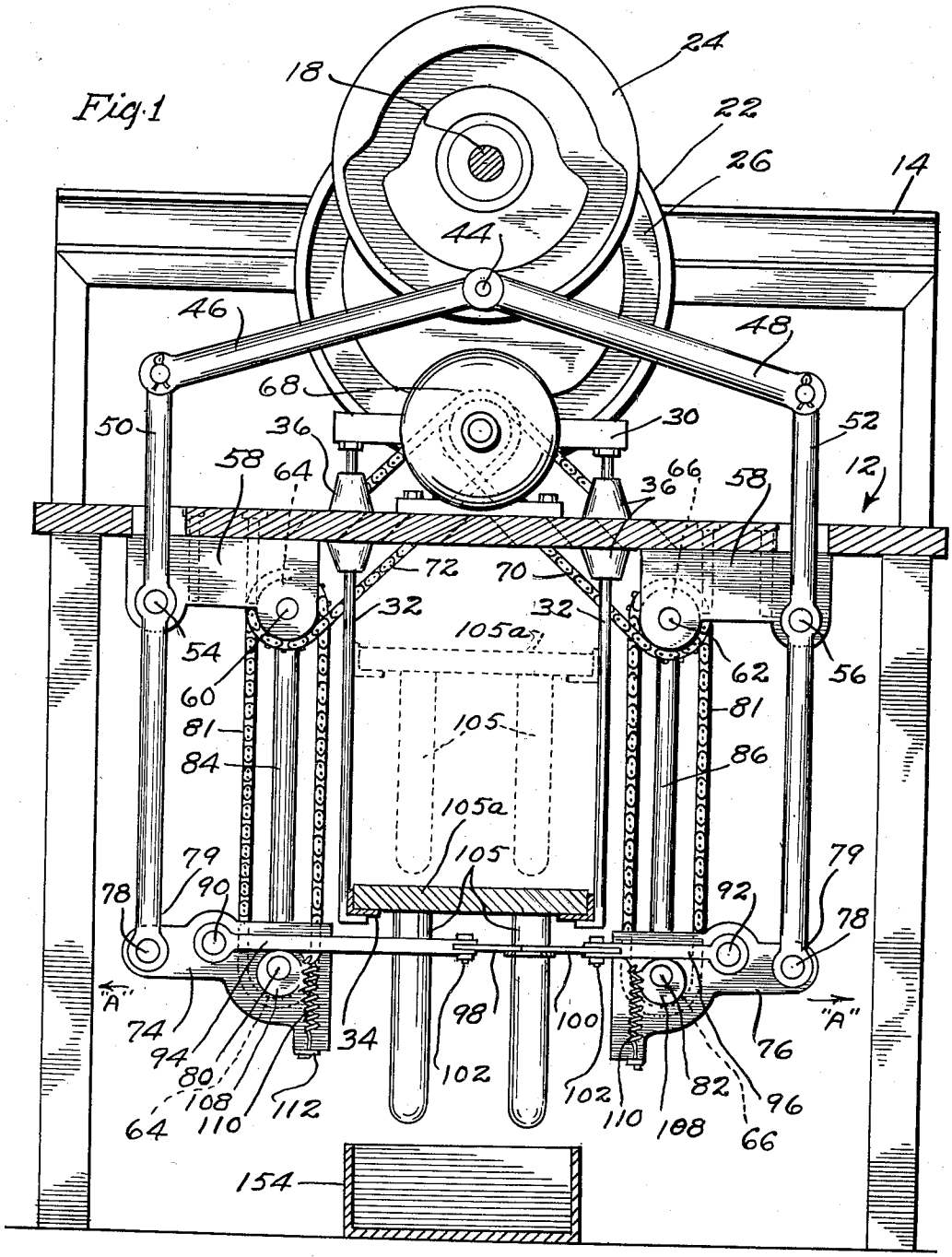
April 25, 1939. S. S. MILLEN 2,155,977

STRIPPING MACHINE

Filed April 16, 1938 3 Sheets-Sheet 1

Fig. 1



INVENTOR.
Stanley S. Millen

BY Robt. C. Wooley

ATTORNEY.

April 25, 1939. S. S. MILLEN 2,155,977

STRIPPING MACHINE

Filed April 16, 1938 3 Sheets-Sheet 2

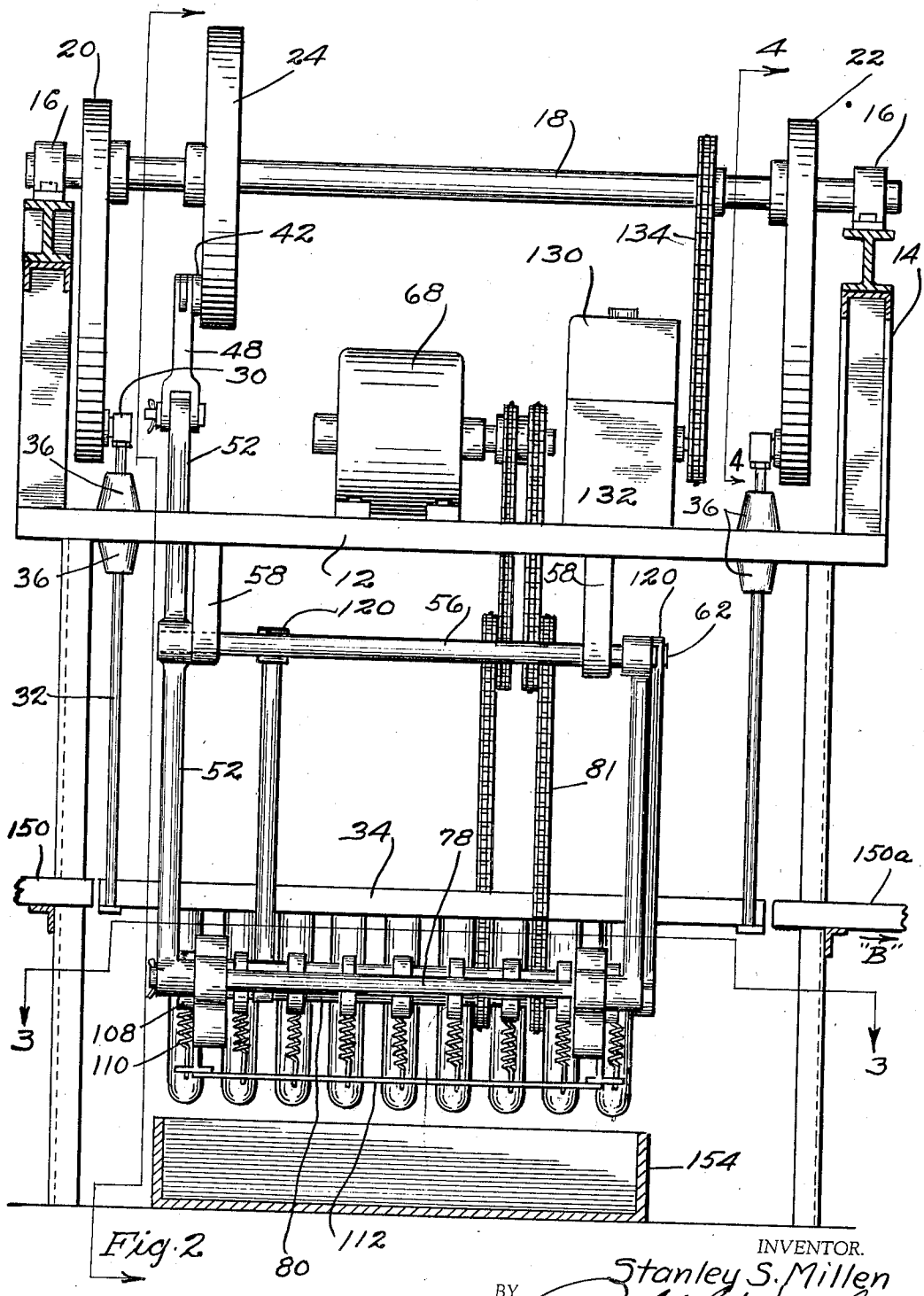


Fig. 2.

INVENTOR.
Stanley S. Millen
BY Robt. L. Wooley
ATTORNEY.

April 25, 1939. S. S. MILLEN 2,155,977

STRIPPING MACHINE

Filed April 16, 1938 3 Sheets-Sheet 3

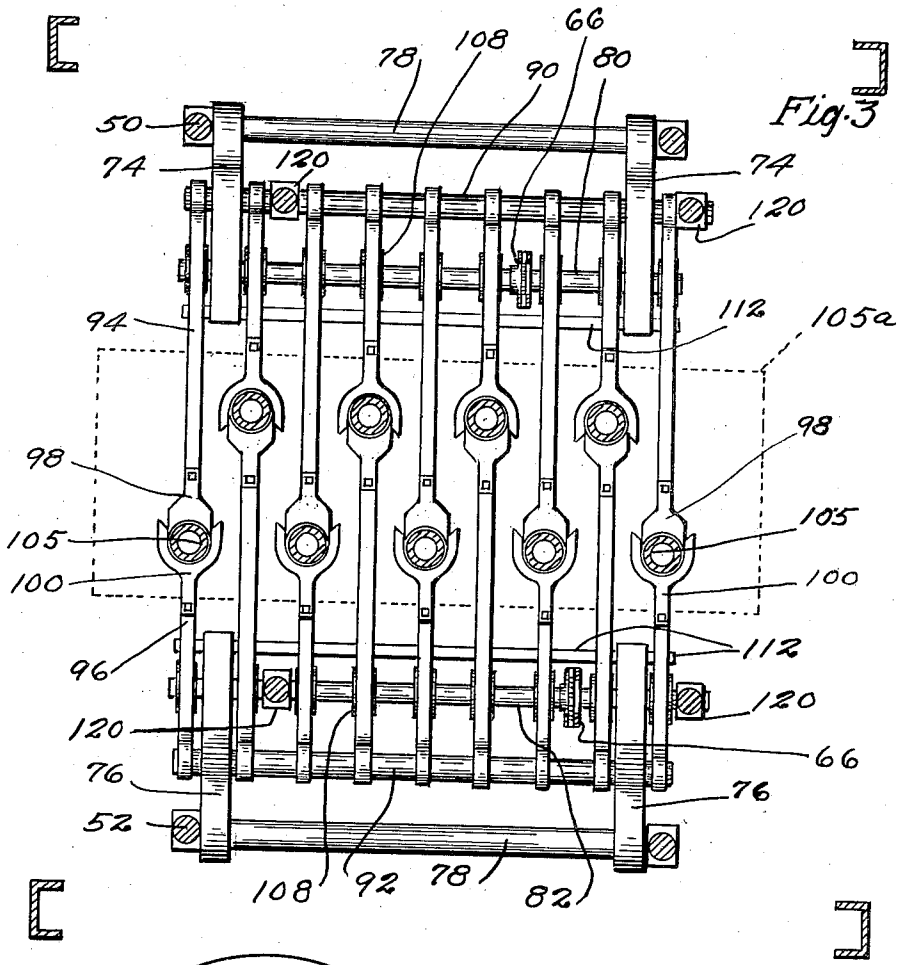


Fig. 3

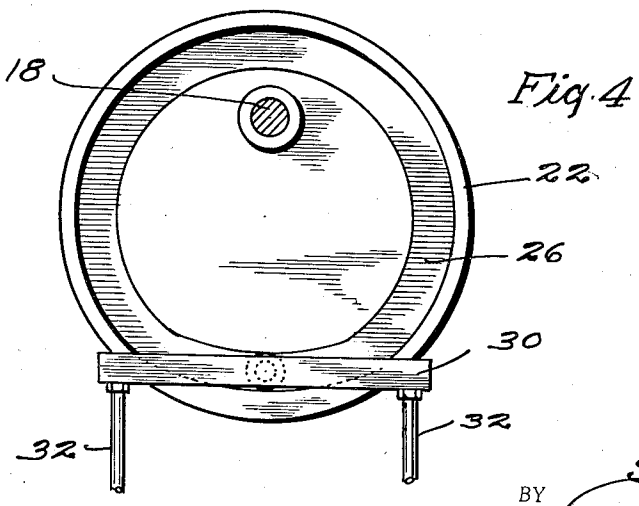


Fig. 4

INVENTOR.
Stanley S. Millen
BY Robt. F. Woolsey
ATTORNEY.

Patented Apr. 25, 1939 2,155,977

UNITED STATES PATENT OFFICE

2,155,977

STRIPPING MACHINE

Stanley S. Millen, Glendale, Calif., assignor to Julius Schmid, Beverly Hills, Calif.

Application April 16, 1938, Serial No. 202,494

7 Claims. (Cl. 18—2)

The machine of this invention relates to means to strip thin rubber articles from their supporting form.

Numerous rubber articles are formed by dipping forms in a suitable solution of liquid rubber. After a suitable rubber or rubberized coating has been builded upon the forms, the forms with their coating are placed in a machine which forms an annular bead or ring at one end of the article so formed. After the beading operation is completed, the forms with the article thereon, is placed in a vulcanizing chamber to cure the article so formed. After vulcanization the forms together with the articles thereon are dipped in a suitable liquid which tends to release the article from its form, but of course does not remove such article from its form.

Manufacture of articles of the character contemplated is a continuous process, hence it is necessary that provision be made to handle great quantities of such articles in the simplest, easiest and quickest way available.

It is accordingly a prime object of the present invention to provide a stripping machine for thin rubber articles which is of relatively low cost to manufacture, a machine which is simple in operation, and reliable and efficient in use.

The foregoing, together with other objects, features, and advantages may be observed from the accompanying drawings, the specification, and the appended claims.

In the drawings of which there are three (3) sheets:

Figure 1 is an end elevation, partially in section, taken approximately on line 1—1, of Figure 2, showing the general arrangement of structural detail.

Figure 2 is a side elevation of the machine of this invention, showing additional detail of construction.

Figure 3 is a view in section, the view being taken substantially on line 3—3, Figure 2.

Figure 4 is a view in elevation, the view being taken on line 4—4, Figure 2, showing the form of cam used in the instant application of the invention to effect vertical movement of the forms and their articles for the purpose of stripping the articles from their forms.

Reference to the drawings will show that the operating elements of the machine of this invention are mounted upon a table 12. A superstructure 14 of suitable form is adapted to support bearings 16 within which a shaft 18 is journalled, while cams 20 and 22, and 24 are keyed to the shaft 18 and are adapted to rotate therewith.

The cams 20 and 22 are formed with a suitable groove 26 within which rollers 28, mounted upon cross-bars 30, are adapted to operate to effect vertical movement of the cross-bars 30 and rods 32 which are adjustably secured thereto. The opposite end of the rods are welded or otherwise fixed to a longitudinally extending track 34 which of course moves with the rods 32 and bars 30 in proportion to the throw of the cam grooves 26. Bushings 36 extending above and below the table 12, or otherwise suitably positioned, forms a means to guide the rods 32 as they move upwardly and downwardly in response to rotation of cams 20 and 22.

Cam 24, previously mentioned, is also formed with a groove 40, so laid out as to cause a roller 42 journalled upon a pin 44 which is additionally used to form a hinged connection between divergently extending arms 46 and 48.

The outer ends of the arms 46, 48 are pivotally or hingedly connected to vertically inclined bars 50 and 52 which are fulcrumed, at points intermediate their ends, upon horizontally extending shafts 54 and 56, in fixed relation thereto, which shafts are journalled in bearings 58, secured to the underside of the table 12.

The bearings 58 are also adapted to journal a pair of horizontally positioned shafts 60 and 62 upon which sprocket gears 64 and 66 are keyed, and which sprocket gears are driven by means of a motor 68 and interposed chains 70 and 72.

Bearing blocks 74 and 76 are swingably supported upon bosses or pins 78 pivotally secured in the otherwise free ends 79 of bars 50 and 52. Horizontally positioned shafts 80 and 82, are also journalled in the swingable bearing blocks 74 and 76. Vertically positioned links 84 and 86 are interposed between shafts 60 and 62, and 80 and 82 in such manner as to permit free rotation of the said shafts, yet to support the weight of the swingable bearing blocks 74 and 76.

A third pair of shafts 90 and 92 are journalled in the swingable bearings 74 and 76 and are adapted to form the fulcrum point of a plural number of fingers 94 and 96 which extend inwardly in substantially a horizontal position, as may be clearly seen by reference to Figure 1. The inner ends of the fingers 94 and 96 are each provided with complementary forks 98 and 100 which are relatively adjustable with respect to their supports, that is, the fingers 94—96, by reason of the bolted connection as indicated at 102.

The forks 98 and 100 are each formed curved segments 104 and 106, which when brought together as shown in Figure 3, substantially encompass the forms 105.

The shafts 80—82 are provided with cams 108, of which there is one cam for each of the fingers 94—96, and are so positioned with respect thereto, that the fingers normally rest upon the cam and are adapted to be alternately raised by the lobe of the cam and returned to a position which may be termed normal, by means of springs 110 which are attached to the under side of the fingers, at their one end, while being secured to a horizontally positioned bar 112 at their other end. The bar 112 is shown as being attached to the swingable bearings 74—76, although it will be apparent that other suitable means to attach the springs 110 to effect a return movement of the fingers may be employed.

Reference has been previously made to the fact that the bearings 74—76 are supported by the bars or levers 50—52, and links 84—86, the latter being provided with bearings 120 which permit free rotation of the shafts 60—62, and shafts 80—82. A sprocket chain drive 81 is used to effect rotation of shafts 80—82 concurrently with rotation of shafts 60—62, thereby rotating the cams 108 against the tension of springs 110 to effect an oscillatory movement of the forks 98—100, the rapidity of which will of course be dependent upon the speed of the motor 68.

Before going into the description of operation, reference will be first made to the fact that the shaft 18 used to rotate cams 20—22 and 24 are driven by a motor 130 and associated speed reducer 132, and the interposed sprocket chain 134, thereby obtaining a vertical movement of the grouped forms, and an outward and inward movement to the bearings 74—76 and associated parts which are synchronously timed with respect to the interval required to strip the articles from the forms, as will be now described.

Reference has been previously made to the fact that the machine of this invention is adapted to handle a continuous supply of articles to be stripped from their form. In manufacturing articles of the character contemplated, i. e. dipped rubber goods, the forms are usually grouped in gangs upon so-called form boards 105*a*, and while we are not concerned herein with the method of treatment used to create the articles to be stripped, it may be said that the articles after manufacture, are delivered to the stripping machine over a track or other conveyor 150 to the machine of this invention and are subsequently removed therefrom over track 150*a*, or rather the form boards are so removed, the articles themselves having been stripped from the forms and being permitted to fall into a suitable receptacle or drawer 154.

Due to construction of the cam 24 and the throw thereof the arms 46—48 and bars 50—52 are oscillated to throw the bearings 74—76 outwardly in the direction of the arrows "A", thereby also carrying the fingers 94—96 and all apparatus associated therewith to a point in clearance of the forms 105 to permit placement of the boards 105*a* and forms 105 in such alignment as will permit the forks 98 and 100 to subsequently engage the forms substantially as shown in Figure 3 following rotation of cam 24 to the approximate position shown in Figure 1.

Concurrently with the above set forth outward and subsequent inward movement of the fingers 94—96, the fingers are being oscillated in vertical directions by means of the cams 108 and springs 110 which action literally drives or pounds the articles from their supporting forms, for while the fingers are being oscillated, the form boards, forms, and the articles thereon are being lifted by cams 20 and 22, together with the associated cross-bars 30 and rods 32, which movement continues until the articles are removed from the forms, or to the approximate position shown in dotted lines in Figure 1.

The movement of the cams 20—22, and 24, together with oscillation of fingers 94—96 is such, that, by the time the form board has been lifted to the approximate position shown in dotted lines in Figure 1 and then is returned to the point of beginning, the fingers are swung outwardly in clearance of the forms, thereby enabling the form board to be advanced upon the conveyor 150*a* in the direction of arrow "B", preparatory to relieving the machine for placement of the next subsequent batch of work.

The foregoing description is inclusive of all of the essential elements involved in stripping dipped rubber goods from their form, however it is conceivable that various specific changes and modifications and variations may be made in practicing the invention in departure from the particular showing of the drawings and description as given, without however, departing from the true spirit of the invention as defined by the scope of the appended claims.

I claim:

1. The combination in a machine to strip dipped rubber goods from supporting forms, of pairs of forked fingers for each of said forms, said forked fingers being of semi-circular section on their inner ends to substantially encircle said forms, shafts to oscillatably support said fingers, means to oscillate said fingers, means to lift and lower said forms, and means to swing all of said fingers from and to position to substantially encircle said forms, all of said actuating means being operable in predetermined timed relation.

2. In a machine to strip dipped rubber goods from supporting forms, a machine structure comprising in combination with a conveyor track to move work to and from said machine, forks, said forks being adapted to substantially encircle said forms, means to oscillatably support said forks, means to move said forks from and to a position to encircle said forms, means to oscillate said forks to strike said goods upon their upper edges, and concurrently operating means to lift said forms during oscillation of said forks.

3. A machine to strip dipped rubber goods from cylindrical forms nested upon boards, forked fingers to engage said forms, each of said fingers being adapted to engage the half diameter of said forms, cam actuated arms to move said forked fingers to and from engagement of said forms, means to oscillate said forked fingers to strike the upper edge of said goods, and concurrently operating means to lift said goods against the pressure exerted by said oscillating fingers.

4. A machine to strip dipped rubber goods from cylindrical supporting forms nested upon a board, forked fingers adapted to engage the half diameter of said forms, cam actuated arms to move said fingers from and to engagement with said forms, a power driven cam for each of said forked fingers to oscillate the same whereby consecutive blows are delivered upon the top edge of said goods, and synchronously timed cam op-

erated means to lift said board and goods oppositely to the direction of impaction of the blows directed upon said goods by said forked fingers.

5. A machine to strip dipped rubber goods from forms nested upon a board, fingers having forked ends of semi-circular transverse section to engage and release said forms, cam operated means to vary the period of finger engagement and release of said forms, cam actuated means to oscillate said fingers to strike blows upon the upper edge of said goods, and means to lift said board and forms oppositely to the direction of delivery of blows upon said goods by said forked fingers.

6. In a machine to strip dipped rubber goods from cylindrical supporting forms nested upon a board, forked fingers, means to oscillatably support said fingers, a pair of fingers adapted to substantially encircle each of said forms, power driven cams to oscillate said fingers while in encirclement of said forms, means to lift said board and forms upwardly whereby said goods are moved against said oscillating fingers, and intermittently operating means to move all of said fingers laterally in clearance of said forms.

7. A machine to strip dipped rubber goods from supporting forms nested upon a board, said machine comprising a table, bearings supported by said table, a pair of horizontally positioned shafts in each of said bearings, a power shaft, a cam on said power shaft, an oscillatable bar fulcrumed in each of said bearings and in fixed relation to one of the shafts in each of said bearings, arms joining said bars and adapted to be actuated by said cam, a link pendently supported upon one of the shafts in each of said bearings, bearing blocks, horizontally positioned shafts in each of said bearing blocks, certain of said last mentioned shafts being hingedly connected to said bars and said links, oscillatable fingers having forked ends of semi-circular section, said fingers being fulcrumed to the other of said last mentioned shafts, cams on certain of said last mentioned shafts to lift said fingers, spring means to return said fingers after being lifted, said first mentioned cam being adapted to intermittently swing said fingers from and into contact with said forms, and other cams on said power shaft, said last mentioned cams being adapted to lift and lower rods whereby said board and forms may be lifted and lowered synchronously with intermittent movement of said fingers from and into contact with said forms, and in clearance of said forms.

STANLEY S. MILLEN.