A. J. TINGLEAF.

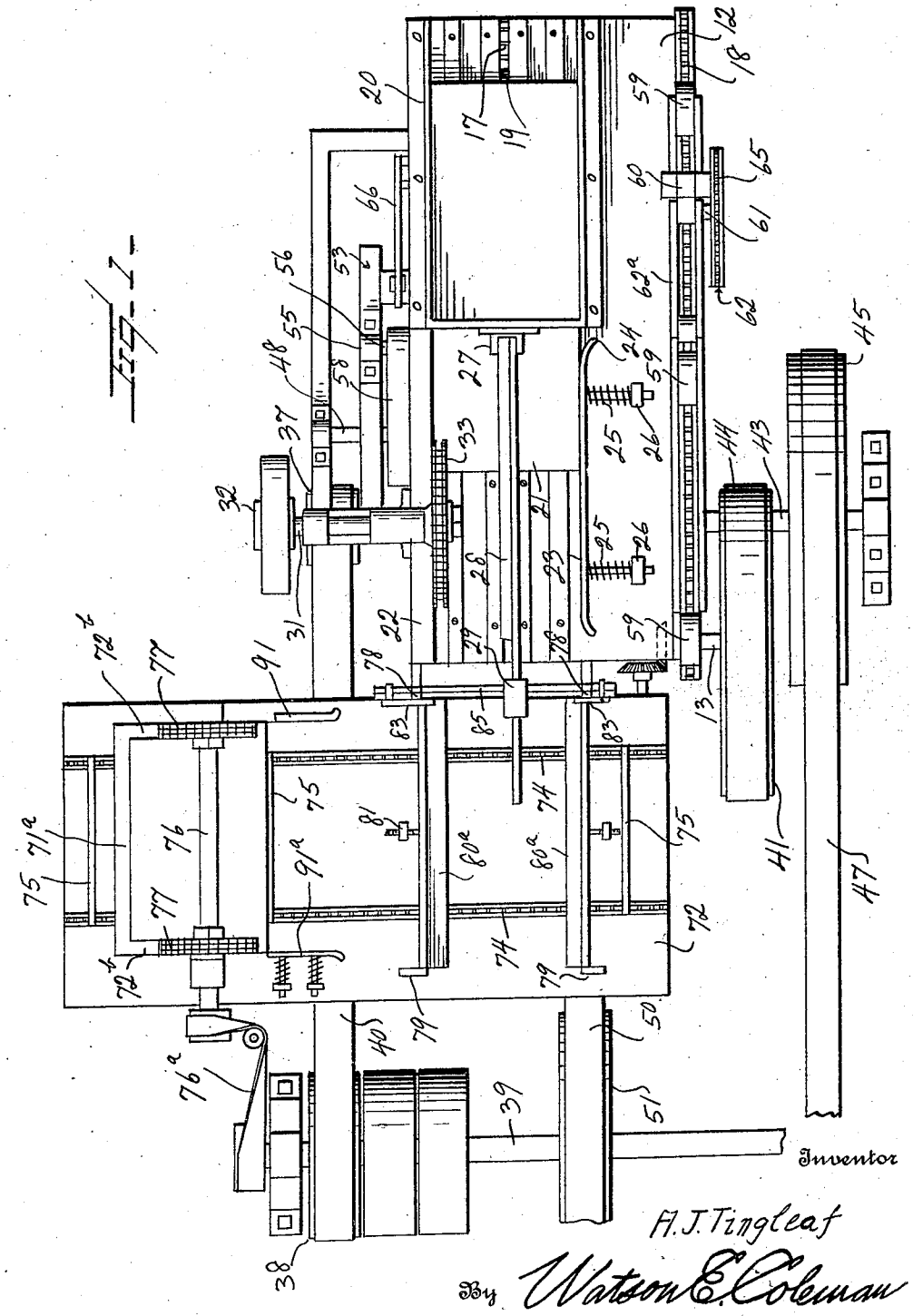
RABBETING MACHINE.

APPLICATION FILED OCT. 2, 1920.

1,413,201.

Patented Apr. 18, 1922.

5 SHEETS—SHEET 1.



Inventor

A. J. Tingleaf

By Watson E. Coleman

Attorney

A. J. TINGLEAF.

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5 SHEETS—SHEET 2.

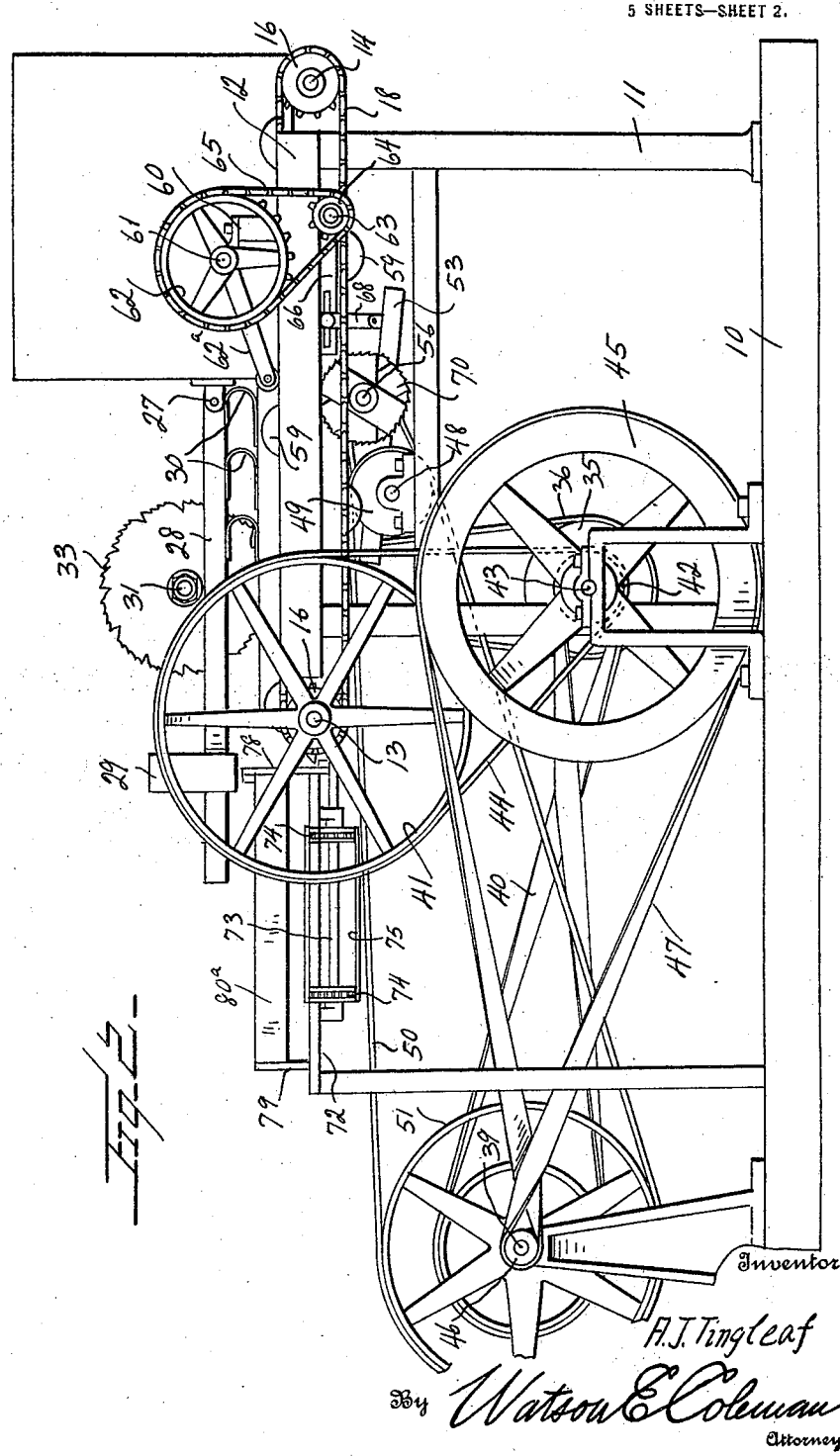


Fig. 2.

Inventor

A. J. Tingleaf

By Watson E. Coleman

Attorney

A. J. TINGLEAF.

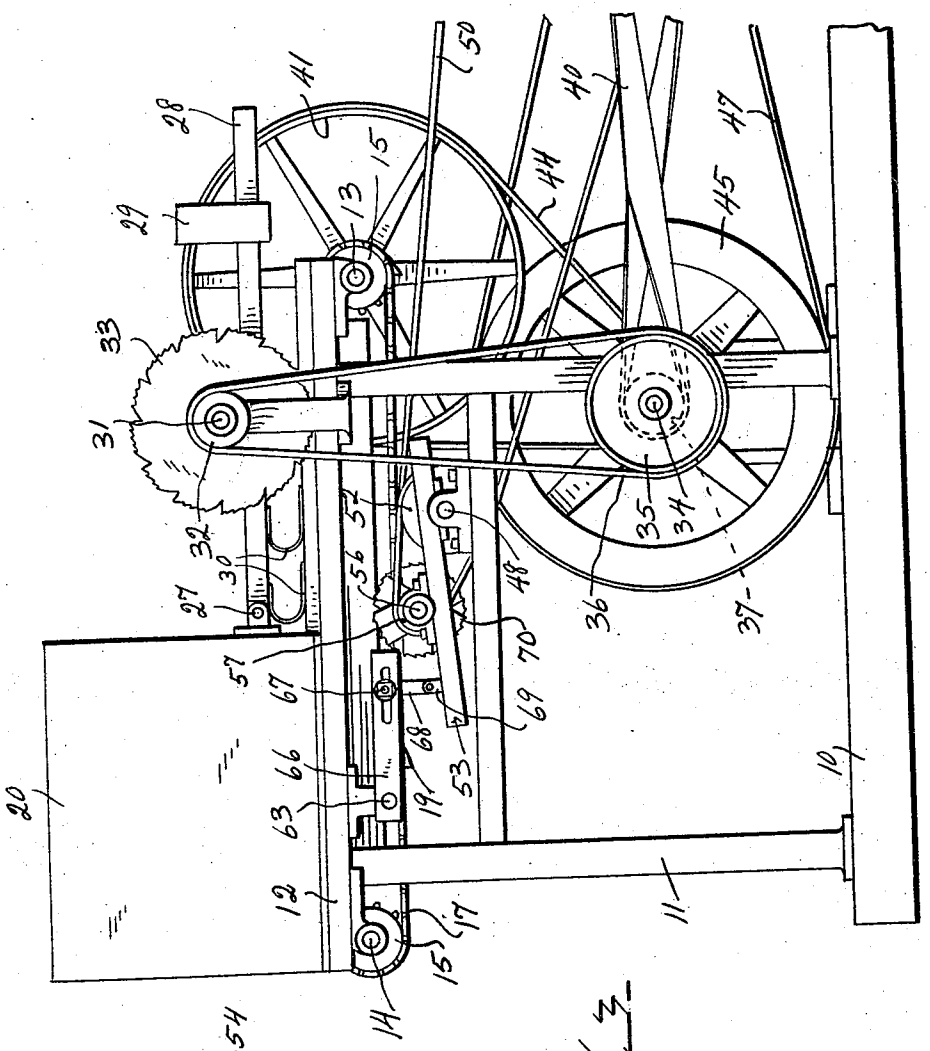
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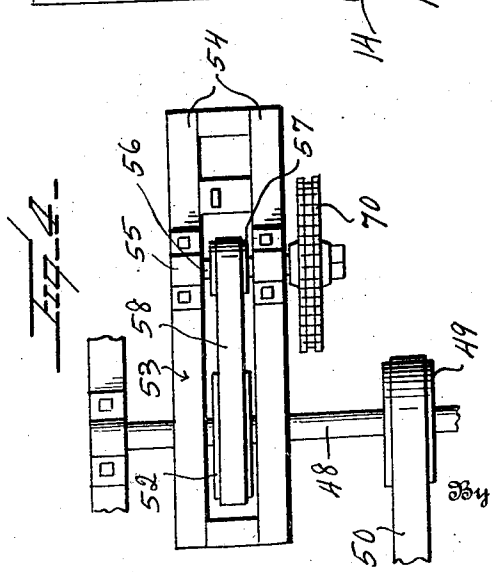
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5 SHEETS—SHEET 3.







Inventor

A. J. Tingleaf

By Watson E. Coleman

Attorney

A. J. TINGLEAF.

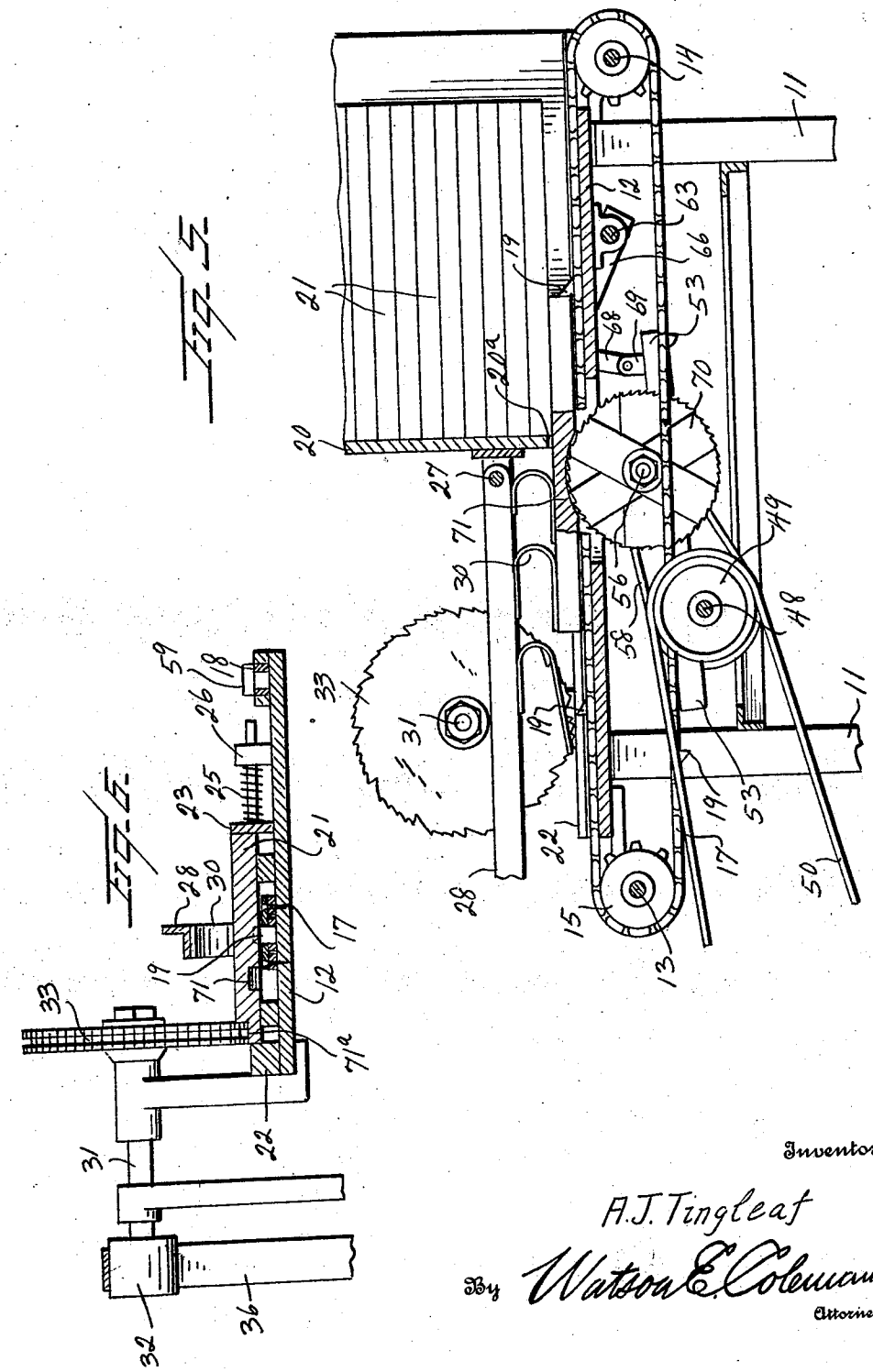
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5 SHEETS—SHEET 4.



Inventor

A. J. Tingleaf

By Watson E. Coleman

Attorney

A. J. TINGLEAF.

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5 SHEETS—SHEET 5.

Fig. 7.

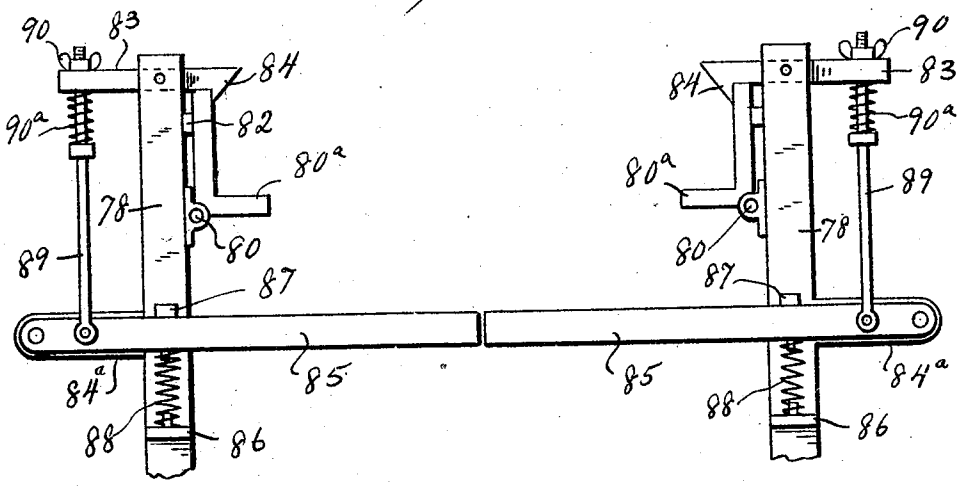


Fig. 8.

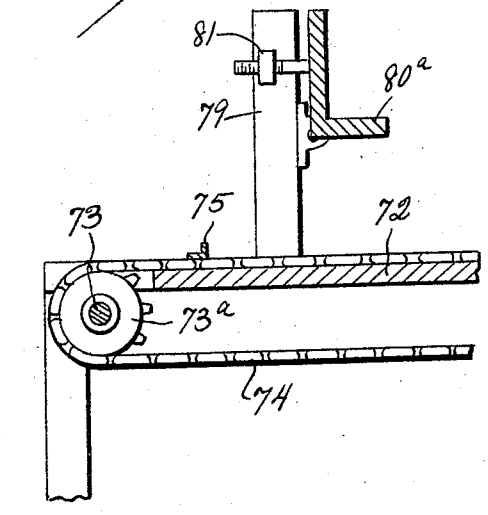
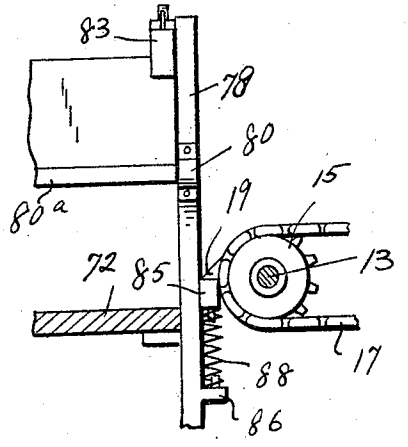


Fig. 9.



Inventor

A. J. Tingleaf

By Watson E. Coleman

Attorney

UNITED STATES PATENT OFFICE.

ALBERT J. TINGLEAF, OF RIVERSIDE, CALIFORNIA.

RABBETING MACHINE.

1,413,201. Specification of Letters Patent. Patented Apr. 18, 1922.

Application filed October 2, 1920. Serial No. 414,239.

To all whom it may concern:

Be it known that I, ALBERT J. TINGLEAF, a citizen of the United States, residing at Riverside, in the county of Riverside and State of California, have invented certain new and useful Improvements in Rabbeting Machines, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to improvements in rabbeting machines and more particularly to machines of this character adapted for the formation of side and end boards for bee hives.

An important object of the invention is to provide means whereby a board, which has been previously cut to required rectangular dimensions, may be simultaneously provided with the usual rabbet by means of which the honey boards are positioned within the hive and with the handhold by means of which the hive is handled.

A further object of the invention is to provide means whereby in manufacturing end boards similar in character to those previously designated, with the exception of the fact that they are provided in their sides with shiplap grooves which are utilized in assembling the hive, this may be constructed in one continuous operation and without handling by the operator of the machine other than the handling necessary to place the same in the machine and to withdraw the completed article therefrom.

A further object of the invention is to provide a novel transferring mechanism whereby the end boards may be transferred from one table performing one operation thereon to a second table performing a second operation thereon.

A further object of the invention is to provide means whereby the above operations may be carried out efficiently and continuously and with a minimum amount of attention from the operator.

Other objects and advantages of the invention will become apparent throughout the course of the following description.

Referring now more particularly to the drawings, wherein for the purpose of illustration is shown a preferred embodiment of my invention and wherein like reference characters designate like parts throughout:

Figure 1 is a plan view of apparatus constructed in accordance with my invention.

Figure 2 is a side elevation thereof.

Figure 3 is a side elevation of that portion of the machine used in the formation of hand holds and top rabbets in the boards.

Figure 4 is a detached plan view of the hand hold forming mechanism.

Figure 5 is a longitudinal sectional view taken through the mechanism illustrated in Figure 3.

Figure 6 is a fragmentary sectional view illustrating the mounting and construction of the rabbet forming mechanism.

Figure 7 is a front elevation of the track mechanism employed in transferring the boards from one table to another.

Figure 8 is a fragmentary sectional view showing the method of returning the tracks to normal position, and

Figure 9 is a fragmentary sectional view illustrating the manner of tripping the tracks to release the boards in the transferring operation.

In the construction of my invention I preferably employ a base 10 having extending upwardly therefrom supporting legs 11 provided at their upper ends with a table 12. This table 12 has mounted for rotation at the ends thereof horizontal transversely extending shafts 13 and 14. Each of the shafts 13 and 14 is provided with a sprocket 15 arranged approximately centrally of the table and a sprocket 16 arranged at one side of the table, these sprockets 15 and 16 being alined. The sprockets 15 are connected by the sprocket chain 17 and the sprocket 16 by the chain 18. The chain 17 is provided at spaced intervals with carrier lugs 19 projecting upwardly from the links thereof.

Mounted adjacent the rear or entrance end of the machine, upon the table 12, is a magazine 20 adapted to receive boards 21 which have previously been cut to the proper shape and length. This magazine is provided in its forward end, at the bottom thereof, with an opening 20ª of sufficient size to allow removal of the boards therefrom. The carrier lugs 19 are of the same height as, or of slightly less height than, the thickness of the boards 21 and are spaced apart upon the sprocket chain a distance slightly greater than the length of these boards.

Mounted adjacent one side of the table is a longitudinal plate 22 forming a guide. A tension guide 23 is provided having its rear

end 24 curved outwardly to permit ready reception of the ends of the board. This plate is tensioned by means of springs 25 extending intermediate the plates and lugs 26 extending upwardly from the face of the table 12. It will be seen that when the shaft 13 is rotated the carrier lugs 19 passing through the magazine 20 will engage the ends of the boards 21 causing the boards to pass outwardly from the magazine through the opening 20ª. The spring guide 23 will open sufficiently to permit the entrance of the board due to the curved end 24 thereof and will hold the board firmly against the guide plate 22.

Pivotally connected to the forward end of the magazine, as at 27, is a bar 28, having adjustably mounted upon the free end thereof a counterweight 29. This bar is provided upon its under surface with spring fingers 30 curved in the direction of movement of the boards 21 in leaving the magazine and is for the purpose of holding the boards firmly upon the table. It will be noted that the pressure exerted in holding the boards upon the table may be readily adjusted by means of the counterweight 29.

A shaft 31 is mounted in suitable journals carried by the table 12 and extending thereabove. This shaft extends transversely of the table above and is provided upon its outer end with a small pulley 32 and has its inner end or that end thereof disposed above the table with the cutter head 33, this cutter head being so positioned that the outer face thereof is positioned adjacent the guide plate 22. A shaft 34 is rotatably mounted in journals carried by the legs 11 and is provided with a large pulley 35 which is connected with the pulley 32 of the shaft 31 by means of the belt 36. The shaft 34 is likewise provided with a second pulley 37 which is relatively small and which is connected with a relatively large pulley 38 secured to the countershaft 39 by means of the cross belt 40.

The shaft 13 is provided with a relatively large pulley 41 which is connected with a small pulley 42 upon a shaft 43, rotatably supported by the legs 11, by means of a belt 44. The shaft 43 is likewise provided with a second pulley 45 which is relatively large and which is connected with a small pulley 46 mounted on the shaft 49 by means of the cross belt 47.

Rotatably mounted beneath the table 12 in any suitable manner, is a shaft 48 which carries the pulley 49 which is connected, by means of a belt 50, with the relatively large pulley 51 secured to the counter shaft 39. Mounted securely on the shaft 48 is a second pulley 52. Mounted for oscillation about the shaft 48 is a yoke 53, embodying spaced arms 54 extending on opposite sides of the pulley 52 and suitably apertured to receive the shaft 48. The arms 54 of the yoke 53 are provided with journals 55 rotatably receiving the shaft 56 which is provided intermediate the arms with a pulley 57 alined with the pulley 52 and connected therewith by means of a belt 58. It will be seen that rotation of the shaft 39 will cause rotation of the shafts 48 and 56.

The sprocket chain 18 which connects the sprocket 16 is provided at spaced intervals with cams 59 projecting upwardly from the links thereof. These cams are spaced apart on the sprocket chain a distance similar to the distance between the carrier lugs 19 and are staggered with relation thereto, being arranged approximately centrally with relation to the plates 19. As the sprocket chains 17 and 18 are of the same length and are driven by the same source these chains will constantly remain in fixed relative position.

Mounted in a bracket 60 carried by the table 12 adjacent the chain 18 is a shaft 61 having secured thereto a relatively large sprocket gear 62. This shaft has likewise secured thereto a radial arm 62ª the end of which engages the sprocket chain 18 and is adapted to be shifted by the cams 59 thereof.

Rotatably mounted beneath the table 12 extending transversely thereof is a shaft 63 having secured to the end thereof adjacent the sprocket 62 a relatively small sprocket 64 connected with the sprocket 62 by means of a sprocket chain 65. It will be seen that elevation of the arms 62ª by the cams 59 will cause a corresponding oscillation of the sprocket gear 62, which oscillation is transmitted to the sprocket gear 64 by the chain 65. Mounted upon the opposite end of the shaft 63 and secured against rotation with relation thereto is a radial arm 66. This arm has secured thereto for adjustment longitudinally thereof as at 67, a link 68, which is pivotally connected at its lower end to a stud 69 on the free end of the yoke 53. The shaft 56 carried thereby is provided with a cutter head 70 for a purpose presently to appear.

My device, in so far as described, is that portion of the apparatus necessary for forming hand hold openings and top rabbet grooves in the side boards of bee hives, or of any equivalent box like structure. The operation thereof is as follows:

Power being supplied to the shaft 39 and the magazine 20 being provided with ready cut boards 21, the rotation of the shaft 13 causes the sprocket chains 17 and 18 to travel longitudinally toward the front or discharge end of the machine and as each carrier lug 19 passes below the magazine 20 it engages a board 21 drawing the same outwardly through the opening 20ª. As the board is moved outwardly and at the time when the board is correctly positioned to form the

hand hold 71 centrally thereof the cam 59 engages the rocker arm 62ª elevating the same and causing oscillation of the sprocket gear 62. This oscillation as previously described is transmitted to the shaft 63 and thus through the arm 66, link 68 and the yoke 53, the free end of which is elevated, causing the cutter head 70 to momentarily project upwardly from the table 12 to engage the board 21 and cut the hand holds therein. As will be seen by inspecting the drawings this operation preferably takes place immediately beneath the forward end of the magazine 20 in order that the upward thrust of the cutter head 70 may not vertically displace the boards and result in a miscut. Continuing, the board is pushed by carrier plate 19 beneath the cutter head 33 on the shaft 31 which is revolving at a relatively high rate of speed in the direction opposite to the direction of movement of the board, with relation to the engaging portions of the cutter head and board. At this point any tendency to vertical displacement which may be caused by the engagement of the cutter portions of the cutter head 33 in the end grain of the board is effectually counteracted by the spring fingers 30.

Arranged transversely of the forward or discharge end of the table 12 is a second table. This table is arranged slightly below the level of the table 12 and is provided at each end thereof with a shaft 73 embodying sprockets 73ª connected by a sprocket chain 74. These chains are connected at intervals by carrier plates 75. Rotatably mounted above the table 72 is a shaft 76 embodying spaced cutter heads 77 which are adjustably mounted thereon. This shaft is connected with the shaft 39 as at 76ª, to be driven thereby.

Arranged at opposite sides of the table 72 in alinement with the table 12 are supports 78 and 79 arranged in pairs as shown, the supports 78 being secured to the table 12 and the supports 79 to the table 72. Each pair of supports has pivotally mounted therebetween as at 80, a track 80ª preferably formed of angle iron or the like. These tracks are counterweighted as at 81 in order that they may normally maintain a vertical position, pivotal movement thereof being limited by stops 82 carried by the supports 78 when the horizontally disposed portions of the tracks are in proper alinement with the table 12. These tracks are arranged at the same level as, or slightly below the level of the table 12 and are adapted to receive the boards therefrom as they are discharged from the forward end of this table. The tracks are held in elevated position by means of latches 83 pivotally mounted upon the supports 78 and embodying a nose piece 84 which engages the vertical portion of the track.

Pivotally mounted upon extensions 84ª, carried by the supports 78, are levers 85 having their ends projecting adjacent the sprocket chain 17 to be engaged by the carrier lugs 19 thereof. These levers 85 are normally held in elevated position by means of a lug 86 extending outwardly from the support 78 below the lever and a stop lug arranged above the lever to limit the upward movement thereof and a spring 88 extending intermediate the lug 86 and the lever 85. A link 89 is pivotally connected to the lever 85 intermediate its ends and engages the free end of the latch 83 at its opposite end. Adjustment of the free end of the latch 83 upon the link 89 is obtained by means of an adjusting nut 90 and spring 90ª.

The operation of this portion of my device is as follows:

The boards provided upon the table 12 with a rabbet 71ª and hand holds 71 are discharged upon the tracks 80ª by the chain conveying mechanism 17. The carrier lug 19 which projected the board by engagement therewith after delivery of the board upon the tracks 80ª trips the levers 85 releasing the latches 83. The counterweight 81 is of such size that the boards 21 when placed upon the tracks will overbalance the same when the latches are released and cause the tracks to rotate, permitting the boards to drop upon the table 72. The carrier plates 75 of the table 72 are so spaced that the release of the board occurs just when the board is positioned intermediate two of these plates. The board is pushed by the carrier plate 75 intermediate the guides 91 and 91ª. The guide 91 is stationary and the guide 91ª is adjustable and serves to position the board for engagement by the cutter heads 77. As the board passes beneath these cutter heads it is provided upon the opposite surface thereof from the hand holds 71 and in the edges thereof, angularly disposed to the edge provided with the groove 71ª, with rabbet grooves 72ᵇ. Each board is carried by the carrier bars 75 to the end of the table where a suitable receptacle (not shown) may be provided.

It will be understood that the various driving mechanisms employed in the operation of my machine are subject to many changes as are the arrangements of the delivery mechanism and the remaining parts. I do not, accordingly, limit myself to the particular construction or arrangement of the various parts herein shown but may make any changes which do not depart from the spirit of the invention or the scope of the sub-joined claims.

Having now described my invention, what I claim is:

1. In apparatus for forming side and end boards for hives, a table, means associated with said table for causing the side and end

boards to travel longitudinally thereof, means associated with said table for engaging said boards during the travel thereof and forming in one side thereof a hand hold and in the opposite side at the top edge thereof a rabbet, a second table disposed transversely of the discharge end of said first named table, tracks arranged above said second named table and disposed in the path of travel of the boards upon said first named table to receive the boards when discharged therefrom, conveyor members associated with said second named table and traveling longitudinally thereof, spaced carrier plates associated with said conveyor members and means associated with said first named table for tripping said tracks to deposit the board carried thereby upon said second table intermediate the carrier plates thereof.

2. In apparatus for forming side and end boards for hives, a table, means associated with said table for causing the side and end boards to travel longitudinally thereof, means associated with said table for engaging said boards during the travel thereof and forming in one side thereof a hand hold and in the opposite side at the top edge thereof a rabbet, a second table disposed transversely of the discharge end of said first named table, tracks arranged above said second named table and disposed in the path of travel of the boards upon said first named table to receive the boards when discharged therefrom, conveyor members associated with said second named table and traveling longitudinally thereof, spaced carrier plates associated with said conveyor members, means associated with said first named table for tripping said tracks to deposit the board carried thereby upon said second table intermediate the carrier plates thereof, rotatable cutter heads carried by said second named table and disposed upon opposite sides of said conveyor members and means intermediate said tracks and said cutters for alining the boards with said cutters.

3. In apparatus of the type described, a table, means for causing boards to travel longitudinally of said table and be discharged at one end thereof, a second table arranged transversely of the discharge end of said first named table, pivoted tracks arranged above said second named table to receive the boards discharged from said first named table, said tracks being adapted when oscillated to release the board carried thereby and deposit the same upon said second named table, latches associated with said tracks to prevent oscillation thereof and means associated with said means causing the boards to travel longitudinally of the first named table for tripping said latches and releasing said tracks for oscillation.

4. In apparatus of the type described, a table, means for causing boards to travel longitudinally of said table and be discharged at one end thereof, a second table arranged transversely of the discharge end of said first named table, pivoted tracks arranged above said second named table to receive the boards discharged from said first named table, said tracks being adapted when oscillated to release the board carried thereby and deposit the same upon said second named table, latches associated with said tracks to prevent oscillation thereof and means associated with said means causing the boards to travel longitudinally of the first named table for tripping said latches and releasing said tracks for oscillation, conveying mechanism associated with said second table, rotatable cutter heads arranged upon opposite sides thereof and guides arranged intermediate said cutters and said tracks.

5. In a rabbeting machine, a work table, means for feeding boards over the work table uninterruptedly, a second work table at right angles to the first work table, means for receiving boards from the first work table and supporting them above the second work table, means controlled by the feeding means on the first work table to automatically release the supporting means for discharging the boards upon the second work table, means associated with the first work table for cutting a continuous rabbet in one side of the board, and means associated with the second work table for cutting a rabbet in one side of the board at right angles to the first rabbet.

In testimony whereof I hereunto affix my signature.

ALBERT J. TINGLEAF.