E. E. WINKLEY.

STOCK CUTTING MACHINE.

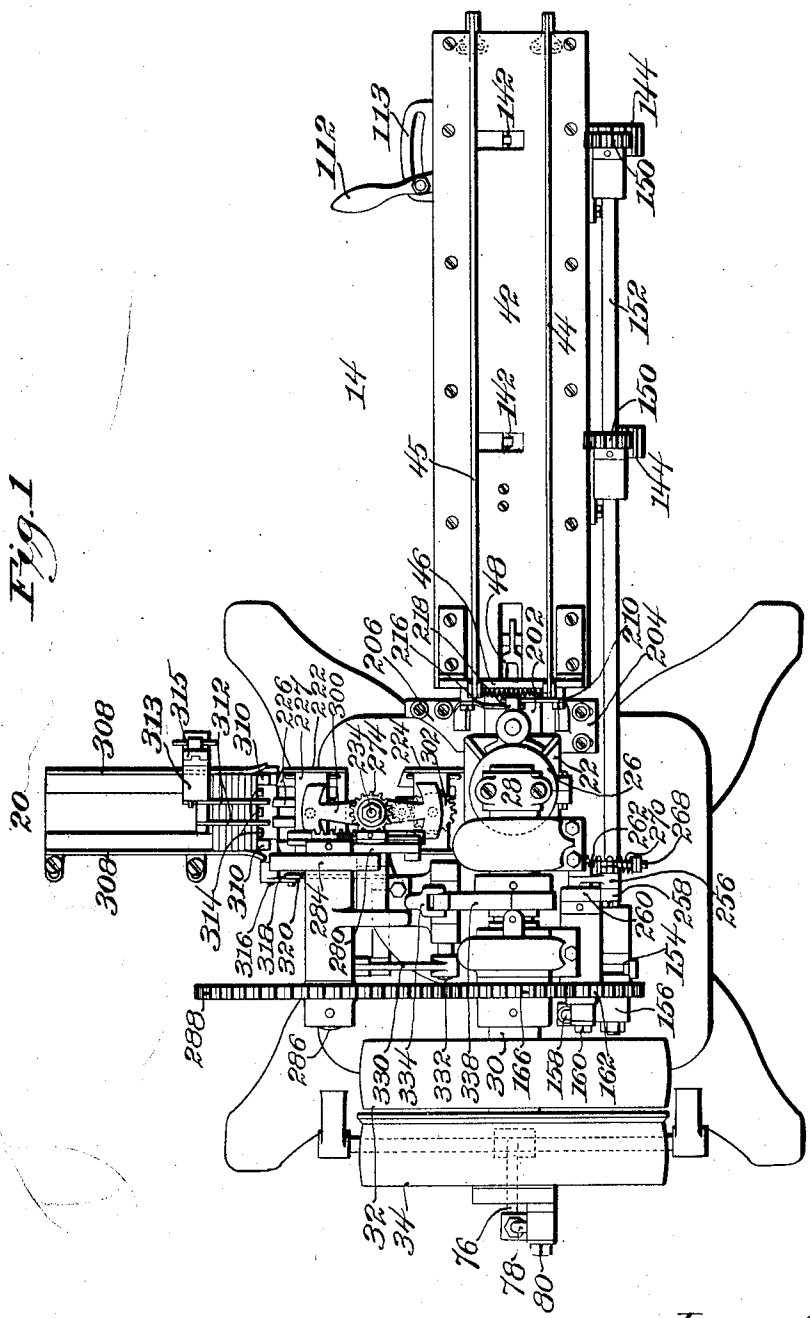
APPLICATION FILED JAN. 22, 1917.

1,352,492.

Patented Sept. 14, 1920.

7 SHEETS—SHEET 1.

Fig. 1



Witness:
Jas. J. Maloney.

Inventor:
Erastus E. Winkley
by his attorneys
Phillips, Van Santen & Fitch

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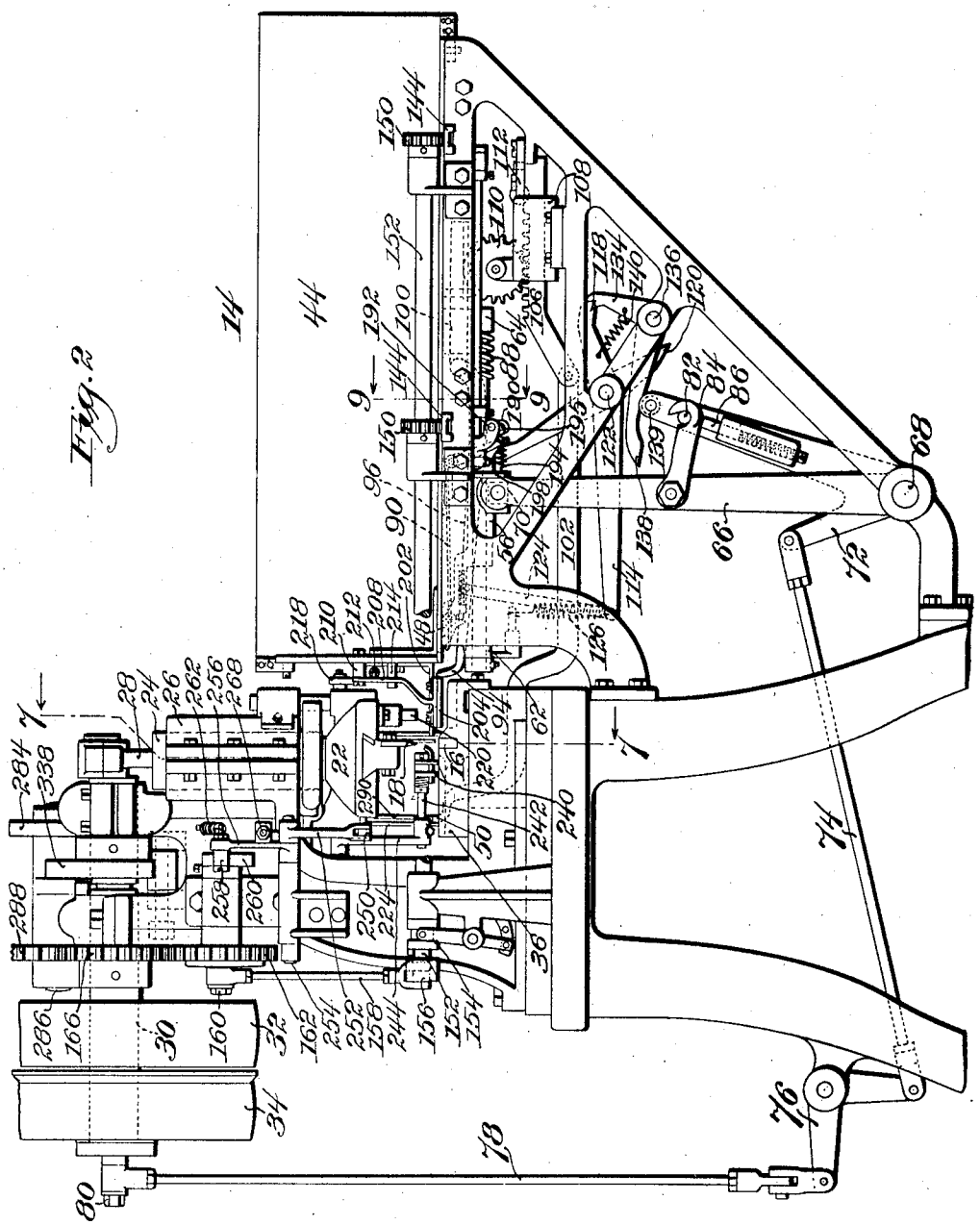
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7 SHEETS—SHEET 2.

Fig. 2



Witness
Jas. J. Maloney

Inventor
Erastus E. Winkley
by his attorneys
Phillips, Van Fleet & Fleet

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7 SHEETS—SHEET 3.

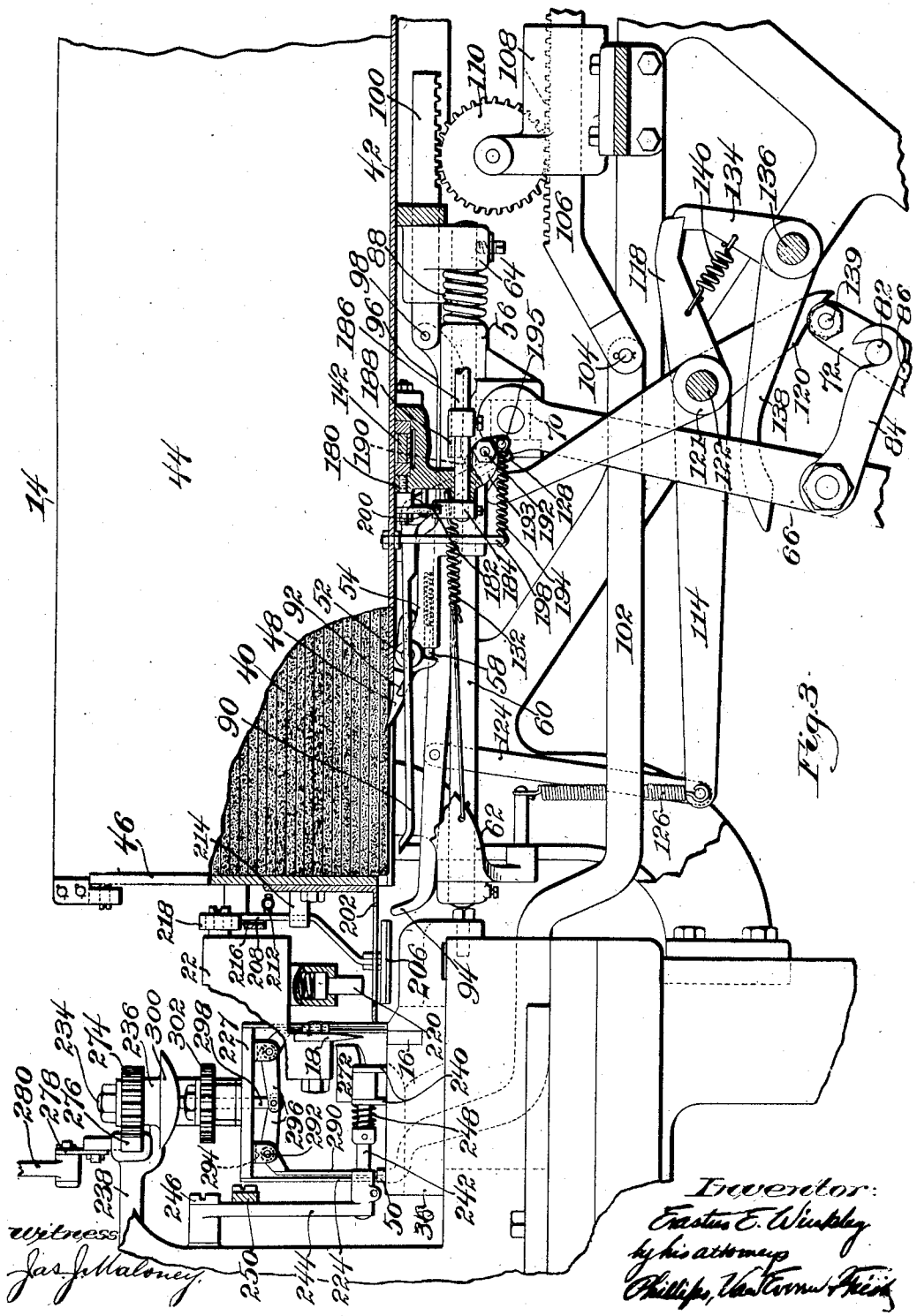


Fig. 3.

Witness
Jas. J. Maloney.

Inventor:
Erastus E. Winkley
by his attorneys
Phillips, Van Fleet & Fleet

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7 SHEETS—SHEET 4.

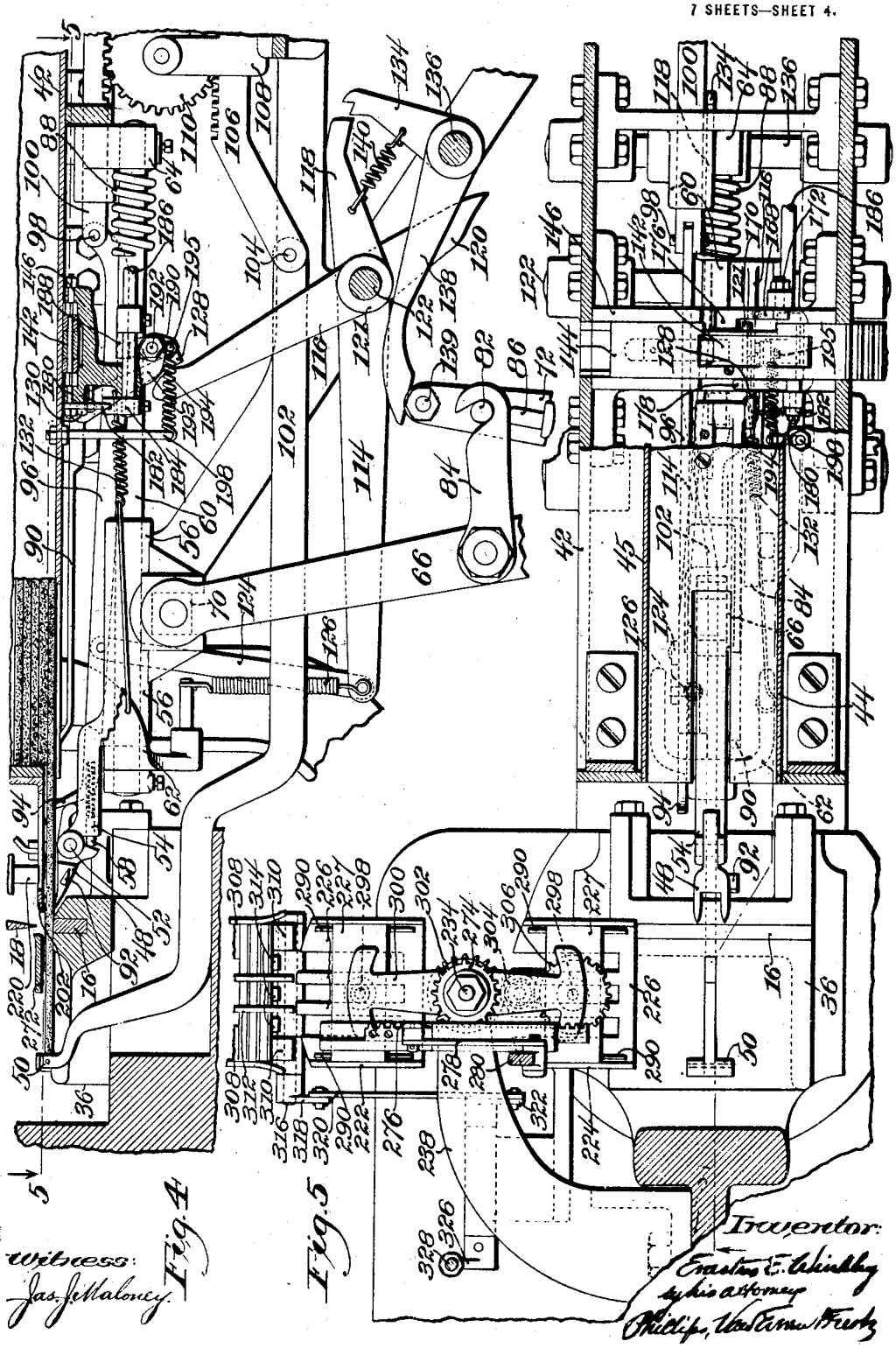


Fig. 4

Fig. 5

Witness:
Jas. J. Maloney.

Inventor:
Ernest E. Winkley
by his attorneys
Phillips, Van Fleet & Fretz

E. E. WINKLEY.

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7 SHEETS—SHEET 5.

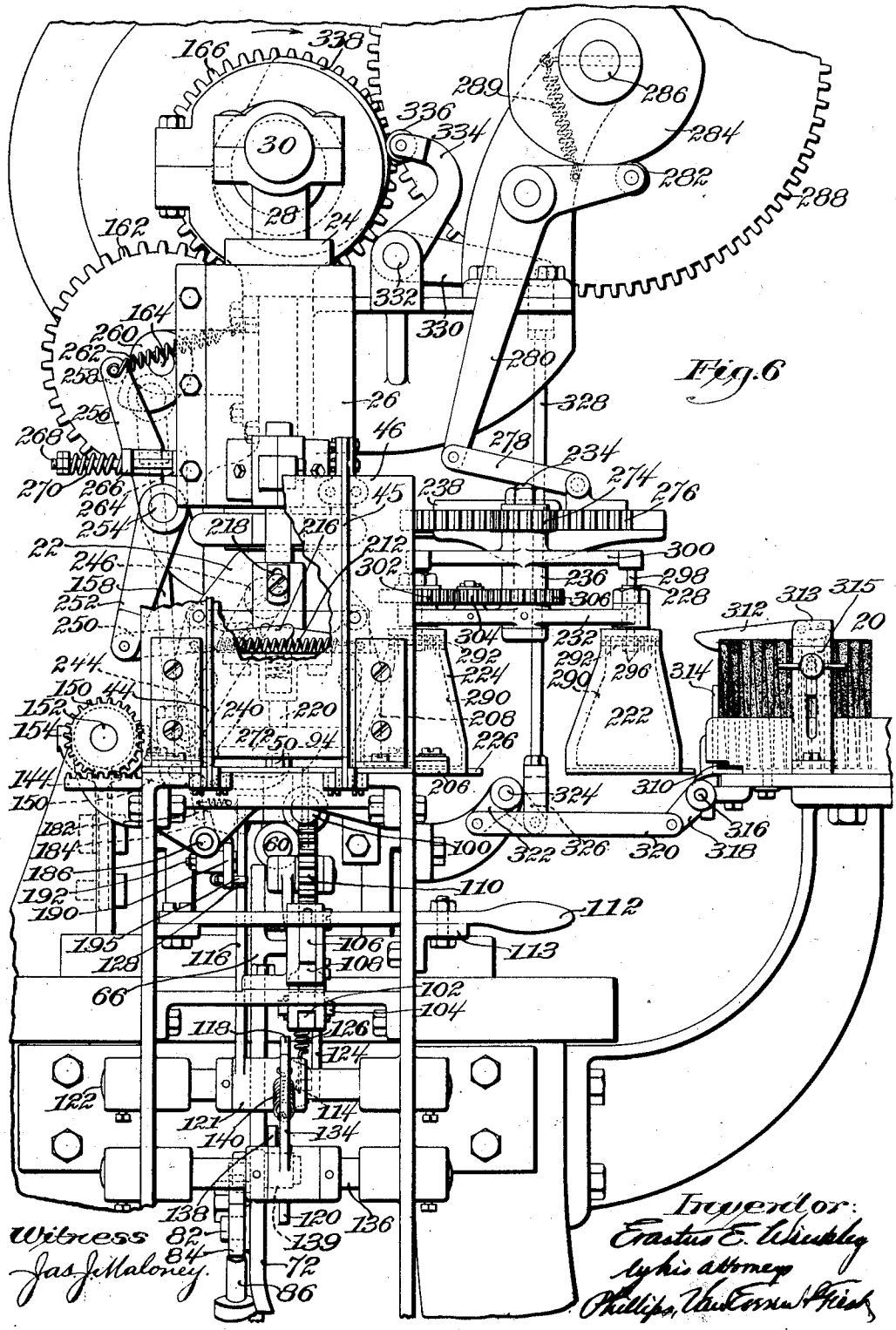


Fig. 6

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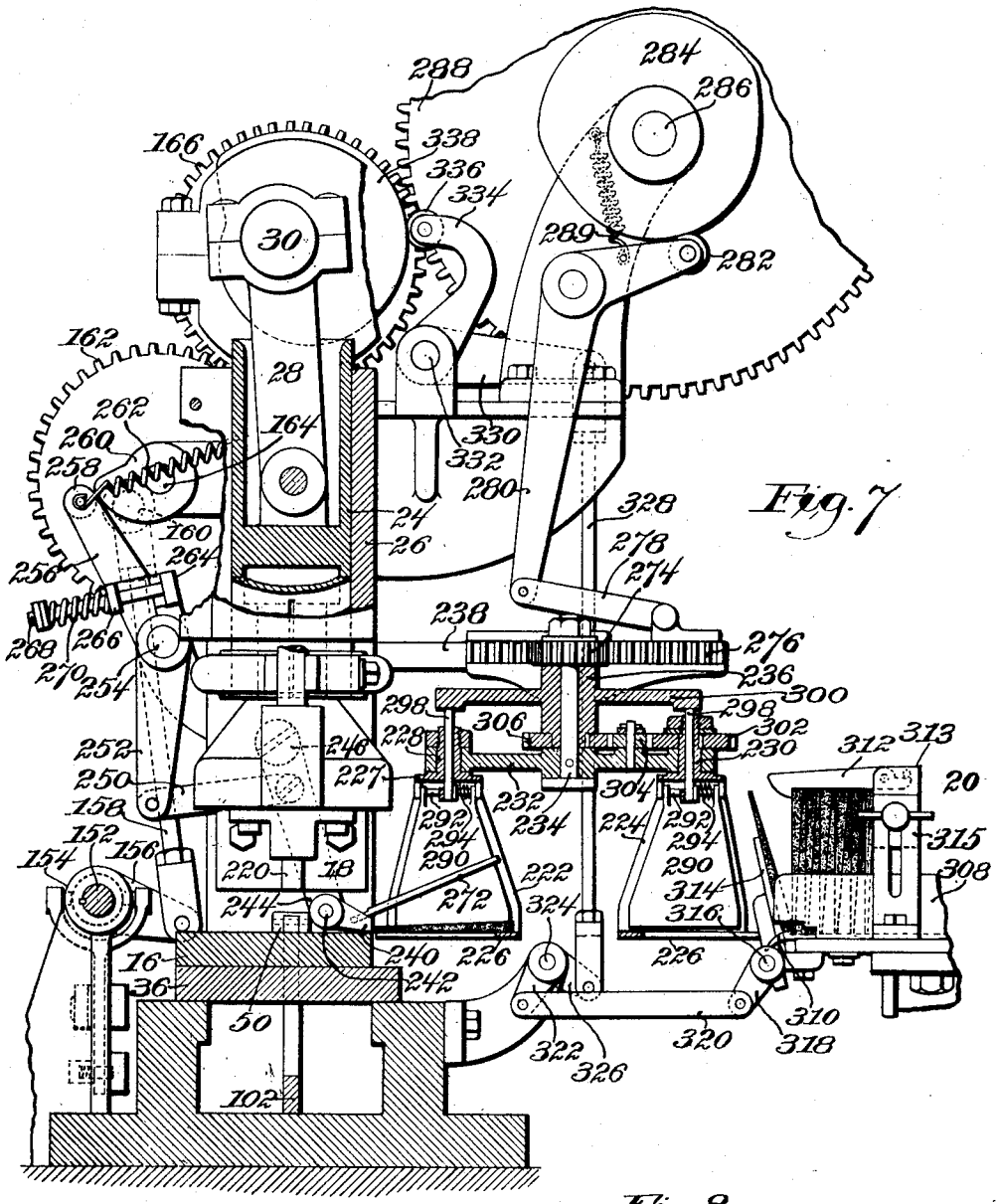
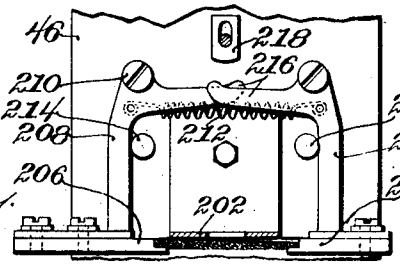


Fig. 7

Fig. 8



Witness
Jas. J. Maloney.

Inventor:
Erastus E. Winkley
by his attorneys
Phillips, Van Tuyl & Reid

E. E. WINKLEY.

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7 SHEETS—SHEET 7.

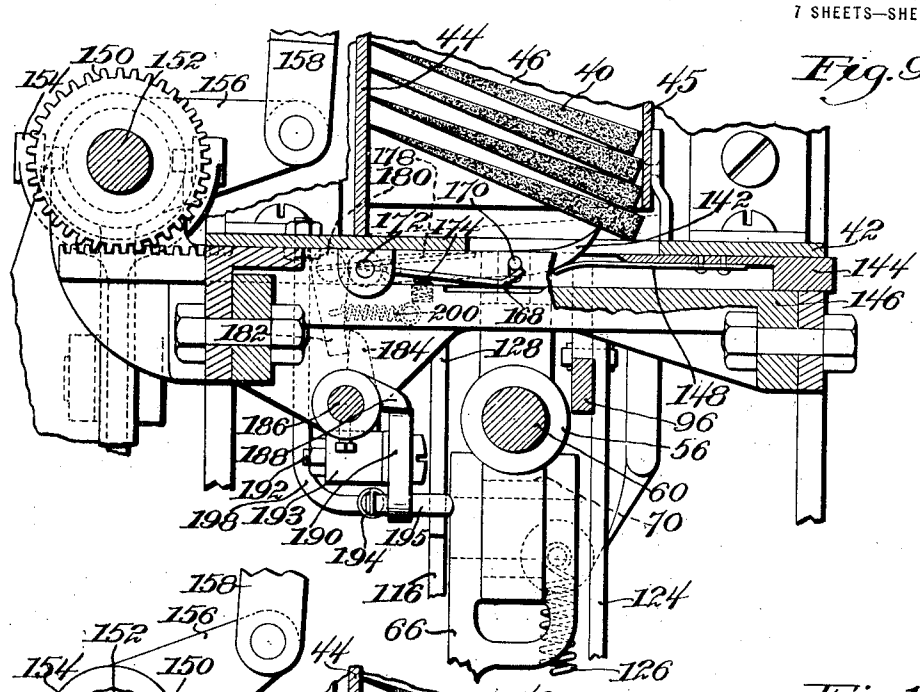


Fig. 9

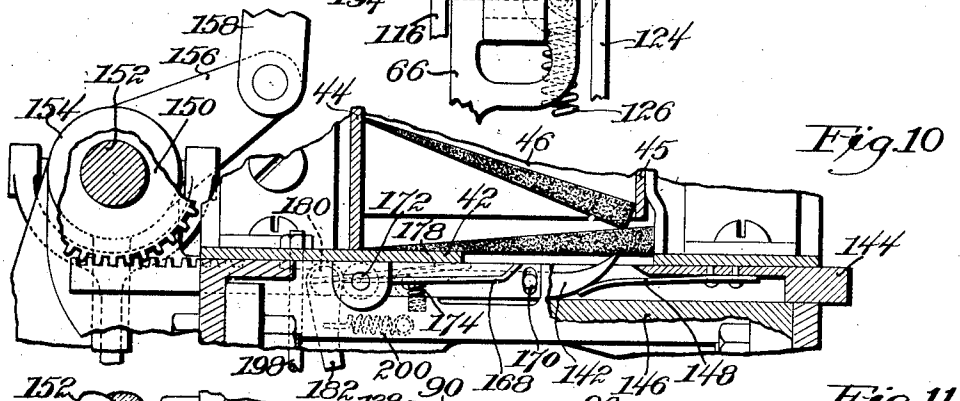


Fig. 10

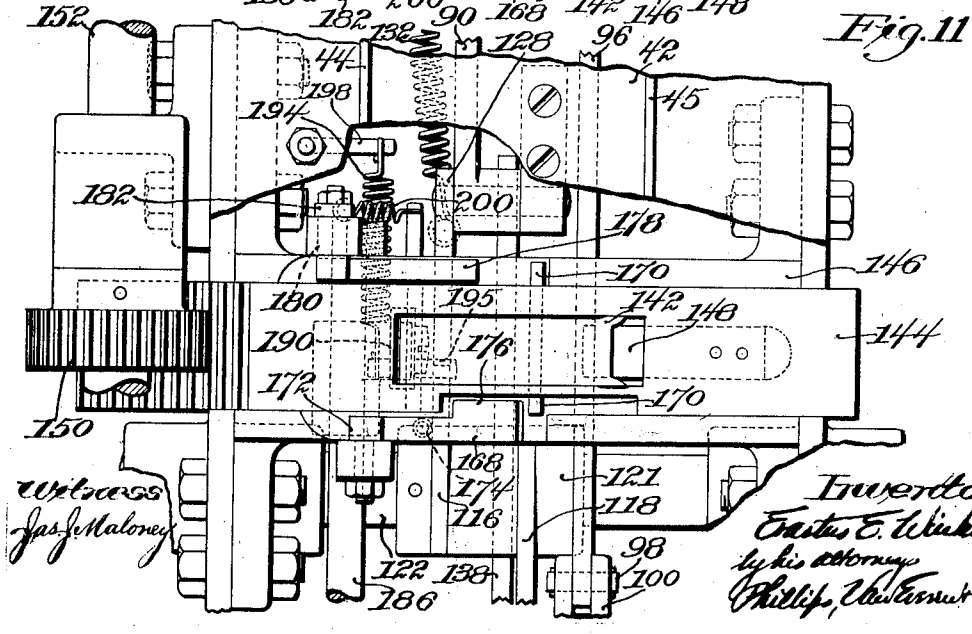


Fig. 11

Witness
Jas. J. Maloney

Inventor:
Eustus E. Winkley
by his attorneys
Phillips, Chesterman & Hirsh

UNITED STATES PATENT OFFICE.

ERASTUS E. WINKLEY, OF LYNN, MASSACHUSETTS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO UNITED SHOE MACHINERY CORPORATION, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

STOCK-CUTTING MACHINE.

1,352,492. Specification of Letters Patent. Patented Sept. 14, 1920.

Application filed January 22, 1917. Serial No. 143,738.

To all whom it may concern:

Be it known that I, ERASTUS E. WINKLEY, a citizen of the United States, residing at Lynn, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Stock-Cutting 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 relates to machines in which pieces or blanks of material, particularly sheet-material, are cut or otherwise operated upon, and delivered in stacked relation, ready for transferal to other machines.

The invention, though not limited to such use, is particularly applicable to machines in which articles of tapering or wedge-like form, such as the wedge-lifts used in the manufacture of shoe-heels, are cut from strips of suitable sheet-material, and are then arranged in stacks for the sake of compactness in storage, or of convenience in handling, or in the subsequent feeding of the articles by the feed-mechanisms of other machines.

Articles which are wedge-shaped or tapering in form will not stack properly when lying loosely one upon another and all in similar positions with respect to their thicker and thinner extremities. They may be stacked, however, if arranged in alternate positions—*i. e.*, with their thicker and thinner extremities alternating. One object of the present invention is to produce a machine by which articles of tapering form may be brought into stacked relation with the adjacent articles in opposite positions, for the purposes aforesaid.

To the foregoing end the invention resides in a machine in which the articles in question are subjected to such relative movements as are necessary to bring them into the desired relative positions and stack them upon or in a suitable receptacle or support.

Certain features of the invention are applicable particularly to machines, for cutting or otherwise operating upon successive portions of strips or sheets of material, in which means are provided for holding a supply of such pieces of material and for supplying the pieces successively, and feeding each piece intermittently, to the operative instrumentalities of the machine. Another object of the invention, accordingly, is to provide a machine of the kind in question, with simple and reliable mechanism for withdrawing the sheets or strips of material, from the supply and feeding them intermittently to the operating instrumentalities.

To the last-mentioned end the invention resides in various features of construction which will be set forth in the following description and defined in the appended claims.

Other objects of the invention, and the features of construction by which they are attained, will be set forth hereinafter, in connection with the description of the illustrated embodiment of the invention.

In the accompanying drawings Figure 1 is a plan-view of a machine embodying the present invention, and adapted particularly to feed a stack of strips of uniform thickness. Fig. 2 is a side-elevation of the machine, with a part of the drive-shaft for the strip-feeding mechanism broken away and the clutch for said shaft disconnected. Fig. 3 is similar to a portion of Fig. 2, but on a larger scale and with parts broken away and other parts sectioned for the sake of clearness. Fig. 4 is similar to a portion of Fig. 3, but with the parts in a different position. Fig. 5 is a partial plan-view, in section approximately on the line 5—5 in Fig. 4. Fig. 6 is a partial end-elevation, looking from the right-hand end in Fig. 2 and illustrating the machine operating upon wedge-shaped strips. Fig. 7 is a partial vertical section, approximately on the line 7—7 in Fig. 2. Fig. 8 is a detail-view, showing in elevation, looking from left to right in Fig. 3, a part of the means for guiding and supporting the strip of stock. Fig. 9 is a partial vertical section, approximately on the line 9—9 in Fig. 2 and illustrating the machine as adapted to operate upon wedge-shaped strips. Fig. 10 is similar to a portion of Fig. 9, but shows the parts in a different position; and Fig. 11 is a fragmentary plan-view of a portion of the mechanism shown particularly in Fig. 9.

The invention is illustrated as embodied in a machine adapted to cut strips of sheet-material, such as leatherboard or leather,

into short pieces suitable for use as heel-lifts. It is provided with a magazine 14 (Figs. 1 and 2) in which a quantity of strips of material are held in a stack. From this magazine the strips are fed automatically to a cutting-bed 16, and a knife 18, co-operating with the bed, acts intermittently to cut pieces from the strips so fed. The cut pieces are then transferred from the cutting-bed automatically to a receiver 20, in which they are arranged and held in stacked relation, and from which they may be removed, still in such relation, for the purpose of introducing them conveniently into the feed-magazine of some other machine.

The knife 18 is fixed to a head 22 (Figs. 2 and 7) at the lower end of a plunger 24 which slides vertically in a slide-guide 26 on the frame of the machine. The plunger is connected, by a pitman 28, with the cranked end of a power-shaft 30 which is journaled horizontally on the frame of the machine. This shaft is provided with fast and loose pulleys 32 and 34, by which it may be belted to a suitable source of power, and the power-shaft is rotated constantly during the operation of the machine.

The cutting-bed 16 is in the form of a strip of soft metal or other material which will not injure the edge of the knife, and it is supported in a recess in a horizontal cutting-table 36 fixed on the frame of the machine.

As illustrated in Figs. 1, 2, 3 and 4 strips 40 of material of uniform thickness are piled directly one upon the other in the magazine 14, and the bottom of the stack rests upon a plate 42 forming the bottom of the magazine (Figs. 1 and 3). The magazine has side walls 44 and 45 which embrace the stack laterally, and its inner end is closed by a vertical end-wall 46, but the lower end of the wall 46 is located sufficiently above the level of the bottom 42 to permit one strip at a time to be ejected longitudinally from the bottom of the stack in the direction of the cutting-table.

The material is fed by the action of a feed-dog 48, (Figs. 3, 4 and 5) which moves beneath the magazine and is provided with two sharp points which are adapted to enter the lower surface of the lowermost strip, and the bottom 42 of the magazine is provided, near its rear end, with a slot through which the feed-dog may engage the strip within the magazine. The feed-dog acts not only to eject the strip from the magazine, but also to advance the end of the strip across the cutting-bed and bring it into contact with a gage 50 which is located beyond the bed at a distance equal to the required length of the pieces to be cut.

The feed-dog is pivoted, at 52, on the end of an arm 54 which projects integrally from a sleeve 56. A spring-pressed plunger 58, engaging a lug upon the feed-dog, tends to swing the dog upwardly so as to maintain its points in engagement with the material.

The sleeve 56 slides on a horizontal guide-rod 60, which is fixed, at its ends, in brackets 62 and 64 on the frame which supports the magazine. The sleeve and the feed-dog are actuated by a lever 66 (Figs. 2, 3 and 4) which is mounted, at its lower end, on a pivot-rod 68 fixed in the frame of the machine. The lever is pivoted, at its upper end, to a slide-block 70 which is embraced by lugs depending from the sleeve 56. The lever 66 is actuated through a bell-crank lever 72 which is pivoted alongside the lever 66 on the rod 68. One of the arms of the bell-crank lever is connected, by a rod 74, with a second bell-crank lever 76, and the lever 76 is connected, by a rod 78, with a crank-pin 80 on the power-shaft 30. By this arrangement the lever 72 is oscillated constantly during the operation of the machine.

A yielding connection is provided between the lever 72 and 66. For this purpose the former lever is provided with a pin 82, which coöperates with a recess in the end of a hook-shaped member 84 pivoted to the lever 66. A spring-pressed plunger 86 normally acts to maintain the hook 84 in operative engagement with the pin, as shown in Fig. 2. Accordingly, movement of the pin 82 in one direction is transmitted positively to the lever 66. In the opposite direction of movement, however, that in which the feed-dog acts to feed the strip of material, when the movement of the dog and of the lever 66 is arrested by engagement of the end of the strip with the gage 50, the pin 82 rides out of the recess in the member 84, owing to the inclination of the left-hand surface of this recess and the yielding action of the plunger 86, and the remainder of the movement of the lever 72 in the direction of feed is idle. Upon the return movement of the lever 72, the pin 82 again slips into the recess in the member 84, so that the lever 66 and the feed-dog are always brought positively to a fully retracted position. To prevent the parts from overrunning in their return movement and again disengaging the hook from the pin, a buffer-spring 88 is coiled around the rod 60 in position to engage and arrest the sleeve 56 at the end of its return movement.

The range of operation of the feed-dog upon a strip of material during the intermittent advancement of the strip, after each piece has been cut from it, is comparatively small. When a strip has been exhausted, however, and it is necessary to supply a new strip from the magazine, a longer movement must be imparted to the strip, and accordingly the mechanism by which the dog is actuated is so constructed as to impart to the dog a movement of this greater range,

and the feed-dog is retracted, after each feeding-operation, to a point beneath the magazine. It is desirable, however, that the feed-dog shall engage only the lower surface of the strip which is being fed. Accordingly, means are provided for tripping the dog and holding it out of operative position during the first part of its advancing movement, except when it is necessary to withdraw a fresh strip from the magazine, so that when a strip has been fed until nearly exhausted the dog may not rise into operative position until it has advanced beyond the rear end of the strip. For this purpose a trip-bar 90 is employed, this bar being located alongside the path of movement of the feed-dog, and having normally the position shown in Fig. 4. The inner end of the bar is inclined, and the dog is provided with a laterally projecting lug 92. Upon the retracting movement of the dog, the lug 92 rides beneath the trip-bar 90 so that the dog is swung downwardly, and upon the subsequent advancing movement of the dog it is held down in inoperative position by the trip-bar until the later part of its movement when the lug 92 disengages the trip-bar and the dog becomes operative. The dog is thus prevented from rising into operative position until it is beneath the end of the strip, even when the strip is nearly exhausted.

When a strip has become entirely exhausted, the trip-bar is thrown out of operative position, and this function is controlled automatically by means of a feeler 94, which is arranged to engage the lower surface of the strip after each feed-movement. The feeler is located at a distance from the cutting-bed 16 equal to the distance from the latter to the stop 50, and the feeler engages the lower surface of the strip. Accordingly, when the strip has been fed so far that the remaining portion is not of a length sufficient to permit a piece to be cut therefrom, the end of the strip will have moved beyond the feeler 94, and the latter, instead of engaging and being arrested by the strip, will rise and throw into operation the mechanism for controlling the action of the trip-bar.

The feeler 94 is formed at the end of a lever 96 which is connected at its outer end, by a pivot 98, with a slide 100 movable horizontally in a bearing on the frame-bracket 64. The gage 50 is supported at the inner end of a rod 102, which is connected, by a pivot 104, with a second slide 106 movable in a bearing-member 108 on the frame of the machine. In order to adjust the machine to produce pieces of different lengths, the gage must be adjusted to different distances from the cutting-bed, and for this purpose the slide 106 is pivotally connected to a hand-lever 112 (Figs. 1 and 6) by which it may be moved in its bearing, this hand-lever being fixed in adjusted position by a bolt and a segmentally-slotted plate 113.

Since the distance of the feeler from the cutting-bed must always be the same as that between the cutting-bed and the gage, means are provided by which the feeler may be adjusted automatically, coincidently with the adjustment of the gage. For this purpose the slides 100 and 106 are provided with rack-teeth, which mesh with a pinion 110 journaled on the bearing-member 108, and owing to this arrangement the slides are moved always in opposite directions and through equal distances by the action of the hand-lever 112.

The mechanism for actuating the feeler 94 and the trip-bar 90 comprises four lever-arms 114, 116, 118 and 120, which all project integrally from a hub 121 arranged to turn loosely on a horizontal rod 122 fixed in the frame of the machine. The arm 114 is connected, by a link 124, with the feeler-lever 96, and a tension-spring 126, connected with the arm 114, tends to swing this arm and the feeler-lever upwardly, from the position shown in Fig. 3 to that shown in Fig. 4. This movement is arrested unless the strip has passed beyond the feeler, in which case the feeler is permitted to rise freely, and the rising movement of the arm 114 turns the hub 121 and thus swings the arm 116 into engagement with an arm 128. This latter arm is fixed to the outer end of the trip-bar 90, and these parts are mounted upon a stationary pivot 130, so that when the arm 128 is swung rearwardly by the arm 116, the trip-bar is swung downwardly, and its inner end is brought below the path of movement of the lug 92. When the arm 116 is disengaged by the arm 128, the trip-bar is raised to and held in its normal position by a tension-spring 132 connected with the arm 128.

The engagement of the feeler 94 with the strip of material is intermittent. The arm 118 is arranged to coöperate with a detent 134, which is pivoted upon a stationary rod 136, and this detent is integral with an arm 138 which coöperates with a stud 139 at the upper end of the lever 72. When the parts are in the position of Fig. 3, the detent is held in engagement with the arm 118 by a spring 140, and in this manner the arm 114 and the feeler are held in depressed position. Upon each feed-movement of the dog, however, the stud 139 is brought into engagement with the downwardly curved left-hand end of the arm 138, so that this arm is raised, thus disengaging the detent 134 from the arm 118, as shown in Fig. 4. This occurs just before the end of the feed-movement, and the feeler thereupon rises and determines whether or not sufficient material remains in the strip

which is being fed to produce another piece of full length. Upon the succeeding return movement of the lever 72, the stud 139 engages the arm 120, and thus rocks the arm 118 upwardly again, so that the detent 134 again can be drawn into coöperative engagement with it by the action of the spring 140.

Whenever the trip-bar 90 has been swung downwardly, by the action of the feeler-controlled mechanism as above described, the lug 92 upon the feed-dog passes over the inner end of the trip-bar during the retracting movement of the feed-dog, so that upon the next advancing movement of the dog, it is free to engage the lower surface of the lowermost strip in the magazine. The dog thus acts throughout its full range of movement, until the strip has been moved from the magazine into engagement with the gage 50. Upon the next engagement of the arm 120 by the stud 139, however, the parts are restored to normal position, with the trip-bar 90 raised into position to coöperate with the lug 92.

The machine hereinbefore described is adapted to operate upon strips of material which are of uniform thickness, and where such strips are employed, the feed-mechanism which has been described is sufficient for all purposes. A feature of the invention resides, however, as has been before stated, in the adaptation of the machine to produce and stack heel-lifts or other articles of a tapering or wedge-like form, and when the machine is so employed the strips 40 have a tapering form in cross-section, as shown in Figs. 6, 7, 9 and 10. In this case special means are required for feeding the strips, owing to the fact that such strips cannot be loosely stacked one upon another in the same way as in the case of strips of uniform thickness.

The particular means employed to adapt the illustrated machine for feeding wedge-shaped strips do not constitute a part of the present invention, except in so far as they are novel in their details of construction and in their coöperation with other parts of the machine, as they are substantially the same as those disclosed in an application for Letters Patent of the United States by Fred V. Hart, filed May 22, 1916, Serial No. 99,259, (Renewal Ser. No. 202,643) to which application reference is herein made with the permission of the applicant. The side-walls 44 and 45 of the magazine are adjusted at a distance from each other which is slightly less than the width of the strips to be stacked, as shown in Fig. 9, and the strips therefore lie with their thicker edges engaged and supported by each other, while their thinner edges are supported independently and spaced apart by engagement with the wall 44. The thicker edge of the lowermost strip rests upon the bottom-plate 42.

In order to bring the lowermost strip into a substantially horizontal position, so that it may be ejected longitudinally beneath the end-wall 46, a slight transverse movement is imparted to the strip, the lower edge of the side-wall 45 being located sufficiently above the bottom-plate 42 to permit this movement. The transverse movement is produced by two dogs 142, having sharpened ends adapted to enter the lower surface of the strip. The dogs, as shown in Figs. 9, 10 and 11, are pivotally mounted in slides 144, which move transversely in guideways 146 beneath the bottom-plate 42, and each dog is pressed upwardly by a spring 148 mounted in the corresponding slide.

In order to actuate the slides, they are provided with rack-teeth which mesh with pinions 150 fixed on a shaft 152 which extends horizontally alongside the magazine. This shaft has an oscillating motion which is imparted to it by mechanism shown particularly in Figs. 1 and 7. An arm 156, pivoted loosely on the shaft 152, is connected thereto by means of a clutch 154 of ordinary form, and the arm is connected, by a rod 158, to a crank-pin 160 fixed to a gear 162. This gear is mounted on a shaft 164 which turns in a bearing on the frame of the machine. The gear is driven constantly by a pinion 166 on the power-shaft 30. The arm 156 is accordingly oscillated, and this results in constant reciprocations of the slides 144.

Except when it is necessary to discharge a fresh strip 40 from the magazine, it is not desirable for the dogs 142 to act, and since the reciprocations of the slides 144 occur at each operation of the cutting-mechanism, means are provided for holding the dogs out of operative position except when their operation is required. For this purpose a trip-finger 168 is associated with each dog (Figs. 9, 10 and 11) the trip-finger being arranged to coöperate with a pin 170 which is fixed in the dog and projects laterally through a slot in the side-wall of the slide 144. The trip-finger is provided with a stud 172, by which it is pivoted in a lug on the guideway 146, and a spring 174 normally holds the trip-finger in the raised position shown in Fig. 10, with the upwardly-bent inner end of the finger pressed against the bottom-plate 42. The portion of the trip-finger which coöperates with the pin 170 is a laterally-extended portion 176, which is somewhat shorter than the path of movement of the pin 170. During the retreating movement of the feed-dog, the pin first engages the end of the trip-finger and then rides beneath the part 176, the dog being thus depressed out of engagement with the strip of material at the bottom of the magazine. Near the end of the retracting movement of the dog, however, the pin

moves beyond the end of the part 176, so that it is free to rise, in so far as the finger 168 is concerned. Such rising movement is normally prevented, however, by a detent-finger 178 which is located on the opposite side of each slide 144, in a position to co-operate with the other end of the pin 170. This detent-finger is fixed in a short rock-shaft 180, which also turns in a lug on the guideway 146.

The detent-finger 178 is normally held depressed, in position to prevent the pin 170 from rising above the part 176 of the trip finger. For this purpose each rock-shaft 180 has a depending-arm 182, which coöperates with a corresponding arm 184. The arms 184 project from a rock-shaft 186, which extends longitudinally below the magazine, being journaled in bearings on the frame of the machine. The rock-shaft 186 is provided also with an arm 188 (Figs. 3 and 9) which rests upon a lever 190. This lever is mounted on a pivot 192 in a bracket 193 which depends from the rear guideway 146. A spring 194, attached to a pin 195 on the lever 190, normally retains the lever in a position in which its upper arm lies beneath and supports the arm 188, thus in turn causing the rock-shaft 186 and the arms 184 to maintain the arms 182 in their outer position, whereby the detent fingers 178 are held depressed. Whenever the mechanism is operated to discharge a fresh strip from the magazine, the trip-bar 90 is swung downwardly, as before described and as shown in Fig. 3. When this occurs, the arm 128, by which the trip-lever is actuated, engages the pin 195 on the lever 190, and rocks the lever as shown in Fig. 3, thus disengaging it from the arm 188, which thereupon falls, and the trip-fingers 178 are thus released and permitted to swing upwadly. They are moved in this direction by springs 200 attached to each of the arms 182. When this occurs the pins 170 are released at the end of the retracting movement of the slides 144, and the feed-dogs 142 swing upwardly in position to engage the lowermost strip in the magazine upon the next advancing movement of the dogs. Before the operation of the feed-dogs can be repeated, however, the parts are again restored to their normal position, the trip-bar 90 being raised by the spring 132, and the lever 190 being restored to operative position beneath the arm 188 by the action of the spring 194, which is connected at one end to the lever 190 and at the other end to a rod 198 fixed in the bottom-plate of the magazine.

The strip is fed from the magazine, and past the cutting-instrumentalities, beneath a plate 202 (Figs. 3, 4 and 8) which projects from the rear end of the magazine. To support the strip when its remaining portion has become so short that it has advanced beyond the bottom-plate of the magazine, two members in the form of plates 204 and 206 are employed, these plates having rabbeted inner edges forming guideways for the lateral edges of the strip. The plates are supported on bell-crank levers 208, which are mounted by pivots 210 upon the end of the magazine.

Whenever the strip has been so far exhausted that the portion which remains, after a piece has been severed by the knife, is insufficient in length to produce another piece of the required length, this fact is detected by the feeler 94 as before described, and the mechanism is thrown into operation to supply a fresh strip. Prior to the feeding of such fresh strip, it is desirable to permit the escape, from the line of feed, of the waste-piece at the end of the preceding strip. This is accomplished by moving the plates 204 and 206 away from each other, upon each downward movement of the cutter-head, so that the remaining material is momentarily deprived of support by these plates. During the normal operation of the machine the material at this time is supported by the engagement of the feeler 94 with its lower surface, but when the end of the strip has moved beyond the feeler the movement of the plates 204 and 206, just described, permits the waste-piece, which is entirely unsupported, to fall from the line of feed and thus be discharged.

The movement of the plates 204 and 206 just described is caused by the movement of the cutter-head 22. For this purpose the bell-crank levers 208 are provided with arms 216 which are located in the path of movement of a block 218 adjustably secured to the front of the cutter-head. Upon the depression of the head, the arms 216 are depressed, and the plates swing outwardly. Upon the rise of the cutter-head the bell-crank levers are swung back to a normal position by a spring 212 which connects them, their inward movement being arrested by stops 214 against which they normally rest.

In case the knife fails, through any fault in its adjustment, to completely sever the waste-piece from the last piece cut from the strip, the waste-piece might fail to fall from the cutting-bed as just described. To insure against such failure, the cutter-head 22 is provided with a spring-pressed plunger 220, which is mounted upon it in position to descend through an opening in the plate 202 and press the waste-piece downwardly at the moment when it is deprived of the support of the plates 204 and 206.

The means for transferring the cut pieces from the cutting-bed to the receiving-table 20 comprise two carriers 222 and 224, formed principally of sheet-metal bent into a stirrup-like shape. The horizontal bottom-plate of each carrier is integral with

the vertical side-walls, and the side-walls are attached, at their upper ends, to a cross-bar 227. The cross-bars are provided, respectively, with stems 228 and 230, which turn in bearings at the end of two integral arms 232 extending in opposite directions from a vertical shaft 234. The shaft turns in a sleeve 236 on the end of a bracket 238 fixed on the frame of the machine.

Each piece cut by the machine is introduced horizontally into one of the carriers, so as to lie upon the bottom thereof as shown in Fig. 7 in the case of the carrier 222. This movement of the piece is produced by a dog 240 which is pivoted on a rod 242 projecting horizontally from the lower end of a lever 244. The lever is mounted, at its upper end, on a pivot 246 on the frame of the machine, so that by the swinging movement of the lever, the rod 242 and the dog 240 are moved transversely above the cutting-table. A spring 248, coiled upon said rod and connected with the dog, acts to swing the dog downwardly into close engagement with the surface of the table, so that the dog may engage and push against the edge of a severed piece.

Movement is imparted to the dog 240 by connections with the power-shaft 30. The lever 244 is connected, by a link 250, with a lever 252 which is mounted on a rock-shaft 254 journaled in a bearing on the frame of the machine. An arm 256 is mounted loosely upon the rock-shaft, alongside the lever 252, and lugs 264 and 266 on the lever and the arm are connected by a guide-rod 268 and a spring 270, in such a manner as to retain the arm 256 normally pressed against the upper arm of the lever 252, (Figs. 6 and 7.) A cam-roller 258, journaled at the upper end of the arm 256, engages a cam 260 fixed on the shaft 164. This cam rotates constantly, and oscillates the lever in timed relation to the movements of the cutter-head. The advancing movement of the dog is produced through the agency of the spring 270, so that if any unusual resistance is encountered by the dog, owing to jamming of the piece of material against which it acts, the spring will yield and prevent breakage of the mechanism.

In order to insure proper engagement of the end of the strip of material with the gage 50 at each feed-movement, a guide-plate 272 is employed, this plate occupying the position shown in Fig. 4 when the movement occurs. The guide-plate is mounted, for convenience, upon the dog 240, so that it is supported in proper position during the feed-movement, while it does not interfere with the movements of the dog.

After a piece is introduced by the dog to one of the carriers 222 and 224, the shaft 234 is given a half-rotation, so as to bring the carrier so loaded to a position adjacent the receiver 20, and replace it with the empty carrier. For this purpose a pinion 274 is fixed on the upper end of the shaft 234, and this pinion meshes with a rack 276 which slides in a bearing on the bracket 238. A lug on the rack is pivoted to one end of a link 278, of which the other end is pivoted to one arm of a bell-crank lever 280 which is pivoted on the frame of the machine. The other arm of the lever carries a roller 282 which engages a cam 284 on one end of a shaft 286. The shaft is journaled on the frame of the machine and is provided, at the rear end, with a gear 288 which meshes with the pinion 166 on the power-shaft. The cam 284 is thus constantly rotated, and it is formed to impart to the shaft 234 a half-rotation after each operation of the dog 240, these half-rotations being alternately in opposite directions. The rack 276 is moved positively in one direction by the cam-mechanism, while its movement in the opposite direction is produced by a spring 289 attached to the lever 280.

In order to maintain the piece of material securely in the carrier during the movement just described, each carrier is provided with two clamp-plates 290 which swing about pivots 292 at the top of the carrier. These plates grasp the piece by its lateral edges. (Figs. 3 and 7.) The plates are swung toward each other, and held in engagement with the piece, by means of springs 294 coiled around the pivots. The clamp-plates also act to center the pieces within the carriers, being connected by horizontally-projecting arms 296, which are pivoted together at their inner ends so as to secure equal opposite movements of the clamp-plates.

When a piece of material is to be introduced to or removed from the carrier it is necessary to swing the clamp-plates out of operative position. For that purpose a plunger 298 is arranged to slide through a central bore in each of the stems 228 and 230, and the lower end of the plunger is pivoted to the inner ends of the arms 296. The plungers coöperate, at their upper ends, with downwardly convex cam-surfaces at the ends of two arms 300 projecting oppositely from the bearing-sleeve 236. These cam-surfaces are so located as to hold the plungers in depressed position in the two opposite positions of rest of the carriers.

The stem 228 is fixed in the member 232, so that the half-rotation of the shaft 234 causes a half-rotation of the carrier 222 and of the piece of material transferred thereby. For reasons which have been pointed out, however, it is desirable that only alternate pieces of material be so turned, and means are therefore provided for preventing rotation of the carrier 224 during its movement of revolution with the shaft 234. For this

purpose the stem 230 is arranged to turn in the member 232, but it is provided with a pinion 302 which meshes with an idler-gear 304 journaled on the member 232. The idler-gear meshes, in turn, with a pinion 306 fixed at the lower end of the bearing-sleeve 236. The pinions 302 and 306 are of the same diameter, and accordingly they act to impart a half-rotation to the stem 230, relative to the member 232, while the latter is making a half-rotation in the opposite direction.

The receiver 20 comprises two members 308 (Fig. 1), in the form of angle-irons comprising horizontal and vertical webs, which extend horizontally so that the pieces of material may be stacked thereon in horizontal extension. In order to retain the pieces so stacked, two resilient detents 310 are mounted at the bottom of the receiver, these detents having beveled ends over which the lower edges of the piece may ride, terminating in shoulders against which these edges may be retained. The upper edges of the pieces are retained by two detents 312, which are pivotally supported on a block 313. This block is mounted upon an upright 315 which is adjustable vertically according to the size of the pieces operated upon.

The pieces of material are removed from the carriers, and added to the stack within the receiver, by means of three lifter-arms 314. These arms are fixed on a rock-shaft 316 which is journaled at the inner end of the receiver. The shaft is oscillated, at proper times in the operation of the machine, by cam-mechanism. For this purpose an arm 318, fixed on the rock-shaft, is connected, by a link 320, with an arm 322 fixed on a rock-shaft 324. The rock-shaft 324 is journaled horizontally on the frame of the machine and is provided with a second arm 326 which is connected, by a rod 328, with an arm 330. The arm 330 is fixed on a rock-shaft 332 which carries a second arm 334. A roller 336 mounted on the arm 334 engages a cam 338 on the power-shaft 30.

During the transferring movement of the carriers, the arms 314 lie in depressed position, but when the carriers come to rest the arms are swung upwardly by the mechanism just described, and they pass through slots in the bottom of the carrier (Fig. 1) so as to engage and lift the piece of material held therein. The arms move to an upright position, thus swinging the piece into engagement with the end of the stack and introducing it between the detents 310 and 312.

The machine has been described in part as particularly adapted to operate upon wedge-shaped strips of sheet-material, such as are employed in the manufacture of wedge-shaped heel-lifts. It will operate with equal success, however, upon strips of uniform thickness. In this case the walls 44 and 45 of the magazine may be adjusted at a sufficient distance apart to accommodate the strips when lying stacked in horizontal position. Since the operation of the dogs 142 is, in this case, unnecessary, the mechanism by which they are actuated may be disconnected from the power-mechanism, by throwing out the clutch 154 which connects the shaft 152 with the arm 156. In this case the carriers 222 and 224 will transfer the cut pieces, just as in the case of the wedge-shaped material, but the function of these carriers, in so far as the rotation of alternate pieces is concerned, will be of no particular utility, although not interfering in any way with the operation of the machine.

It will be apparent that through the operation of the means for imparting half-rotations to the carrier 222 and preventing rotation of the carrier 224, the pieces cut from a wedge-shaped strip will be stacked upon the receiver with their thicker and thinner edges alternating, as shown in Figs. 6 and 7. It will also be apparent that analogous faces of the pieces will all be presented in the same direction; that is, in the case of leather lifts, the grain-sides of the pieces will all be faced in the same direction in the stack. The pieces so stacked may then be removed from the receiver, still in their stacked relation, and conveniently introduced into the magazine of the feed-mechanism of any machine adapted to operate automatically upon such pieces. In this way the labor of stacking the pieces for such feed-mechanism is entirely avoided, it being performed automatically by the present machine. In this aspect the invention is not limited to embodiment in a machine for cutting the pieces from strips, but the mechanism for stacking the wedge-shaped pieces in alternate positions may be used in connection with various other mechanisms for handling or operating upon such wedge-shaped or tapering pieces of material.

The invention is not, in general, limited to the embodiment thereof hereinbefore described and illustrated in the accompanying drawings, but it may be embodied in various other forms within the scope of the following claims.

Having now described the invention and the preferred form of practising it, it is definitely stated in its true scope in the following claims.

What is claimed as new, is:—

1. A machine having, in combination, means for delivering tapering articles successively in similar positions, and means for stacking the articles so delivered with their thicker and thinner extremities alternating and their analogous faces directed the same way.

2. A machine having, in combination, a receiver, and means for stacking tapering articles automatically in the receiver with their thicker and thinner extremities alternating and their analogous faces directed the same way.

3. A machine having, in combination, means for forming tapering articles, and means for assembling such articles in a stack with their thicker and thinner extremities alternating and their analogous faces directed the same way.

4. A stock-cutting machine having, in combination, means for cutting successive pieces from strips of material which are tapering in cross-section, and means for stacking the pieces so cut with their thicker and thinner extremities alternating.

5. A stock-cutting machine having, in combination, means for cutting successive pieces from strips of material which are tapering in cross-section, and means for stacking the pieces so cut with their thicker and thinner extremities alternating and their analogous faces similarly directed.

6. A machine having, in combination, instrumentalities for operating intermittently upon successive portions of a piece of material; means for supporting a second piece of material at a point outside the region of operation of said instrumentalities; a feed-device; and mechanism for actuating the feed-device intermittently between successive operations of said instrumentalities, said mechanism acting automatically to engage the feed-device with the first-mentioned piece alone during the operation thereon, and, upon the exhaustion of the first piece, to cause the feed-device to engage the second piece, and bring it into the region of operation of said instrumentalities.

7. A machine having, in combination, instrumentalities for operating intermittently upon successive portions of a piece of material; means for supporting a second piece of material at a point outside the region of operation of said instrumentalities; a feed-device; and mechanism for reciprocating the feed-device intermittently, between successive operations of said instrumentalities, through a path of movement in which it may coöperate with either the piece being operated on or the second piece, said mechanism operating automatically to engage the feed-device only with the first piece, during the later part of its operative movement, during the operation thereon, but, upon and not until the exhaustion of the first piece, to engage the feed-device with the second piece, at an earlier point in its operative movement, so as to advance the second piece into the region of operation of said instrumentalities.

8. A stock-cutting machine having, in combination, cutting-instrumentalities; means for reciprocating one of said instrumentalities toward and from the other; means for supporting and guiding a strip of material in the cutting-plane of said instrumentalities; means for supporting a stack of strips with the lowermost strip substantially in said plane but beyond the region of operation of said instrumentalities; a feed-dog adapted to coöperate with the lower surfaces of said strips; and mechanism for actuating the feed-dog, said mechanism operating automatically to reciprocate the dog, parallel with the cutting-plane, from a point below the stack-holding means to a point closely adjacent the cutting-instrumentalities, but to hold the dog out of operative engagement with the strips during the first part of its advancing movement during the operation of the cutting-instrumentalities upon one strip and until the exhaustion of said strip, and thereafter to engage the dog with the lowermost strip of the stack during the first part of its advancing movement and thus advance said strip from the stack-supporting means to the region of operation of the cutting-instrumentalities.

9. A machine having, in combination, instrumentalities operable intermittently upon successive portions of a strip of material; a magazine for supporting a supply of such strips in stacked relation, the strips being tapering in cross-section and lying with their thicker edges supported upon each other and their thinner edges leaning against, and independently supported by, a side-wall of the magazine, a dog movable transversely beneath the stack and adapted to engage the lowermost strip and move it in a direction to release its thinner edge from the wall of the magazine so that the strip may fall into horizontal position; means for conveying the strip so released from the magazine to said instrumentalities; and mechanism, for actuating said dog, operating automatically to engage the dog with a strip only at a time determined by the exhaustion of a previous strip upon which said instrumentalities are operating.

10. A machine having, in combination, instrumentalities for operating progressively upon a piece of material; a support for a piece of material at a point outside the region of operation of said instrumentalities; a feeler operating automatically to detect the exhaustion of the piece upon which said instrumentalities are operating; means, for transferring a piece, on said support, to the region of operation of said instrumentalities, including a dog reciprocated constantly adjacent said piece; and means, controlled by said feeler, for holding the dog out of engagement with said piece except upon the exhaustion of the piece upon which said instrumentalities are operating.

11. A stock-cutting machine having, in combination, coöperating cutting-instrumentalities, means for reciprocating one of said instrumentalities toward and from the other; guiding-means, located in advance of the cutting-instrumentalities, for guiding into engagement with them a strip of material; and means, actuated at each cutting operation, for moving the guiding-means out of operative position, to disengage the strip of material.

12. A machine having, in combination, a cutting-table; means for severing pieces of sheet-material from a strip on the cutting-table; a receiver for stacked pieces; two transferring-devices movable alternately between the table and the support; means for discharging each cut piece from the table to one or the other of the transferring-devices; and means for imparting a half-rotation to one, but not the other, of the transferring-devices during movement from the table to the support, to turn alternate pieces into positions opposite the positions of the intermediate pieces, prior to the stacking of the pieces.

13. A stock-cutting machine having, in combination, means for feeding strips of shoe-stock wedge-shaped in cross-section; means for severing the strips into shorter pieces; and means for stacking the severed pieces with their thicker and thinner edges alternating.

14. A stock-cutting machine having, in combination, means for holding strips of material, wedge-shaped in cross-section, stacked in similar positions with respect to their thicker and thinner edges; and means for withdrawing strips successively from the stack, cutting them into shorter pieces, and stacking the cut pieces in opposite positions with respect to their thicker and thinner edges.

15. A stock-cutting machine having, in combination, means for delivering successive wedge-shaped pieces of sheet-material all in the same position; a receiver for a stack of such pieces; and means for transferring the pieces to the receiver successively and turning some, at least, of the pieces, substantially in the planes of their faces, to cause the pieces, as stacked, to be in alternate positions as to their thicker and thinner edges.

16. A machine having, in combination, means acting upon a series of uniformly tapering articles occupying similar positions with respect to their tapers for successively transferring said articles to another position and turning the alternate articles end for end in substantially their own planes during the transfer; and means for stacking the articles so transferred in face-to-face relation with the thicker and thinner ends of the adjacent articles alternating.

17. A stock handling machine comprising means for acting upon a series of articles occupying similar positions for successively transferring said articles to another position and turning the alternate articles end for end in substantially their own planes during the transferal.

18. A stock-cutting machine having, in combination, means for cutting successive pieces from a strip of sheet material; means for successively transferring the cut pieces to a receiving position and turning the alternate pieces end for end in their own planes during the transferal.

19. A machine having, in combination, means for holding a stack of strips of material; means adjacent said stack for operating intermittently upon successive portions of a strip; feeding means for engaging a strip in said stack and feeding it step-by-step between the successive operations of said operating means, and means for causing said feeding means to engage and feed another strip from said stack upon the exhaustion of the strip being operated upon.

20. A machine having, in combination, means for holding a stack of strips of material; means adjacent said stack for operating intermittently upon successive portions of a strip, feeding means disposed beneath said stack and adapted to periodically reciprocate to and from said operating means; and means for causing said feeding means to engage and feed the lowermost strip in said stack to said operating means in a series of steps and to similarly act upon each succeeding strip upon the exhaustion of the immediately preceding strip.

21. A machine having, in combination, means for holding a stack of strips of material; means adjacent said stack for operating intermittently upon successive portions of a strip, feeding means disposed beneath said stack and adapted to periodically reciprocate to and from said operating means; means for causing said reciprocating feeding means to engage and feed the lowermost strip in said stack to said operating means at each working stroke thereof; and means dependent upon the exhaustion of said first strip for causing said feeding means to act similarly upon each succeeding strip in the stack.

22. A machine having, in combination, means for holding a stack of strips of material; means adjacent said stack for operating intermittently upon successive portions of a strip, feeding means disposed beneath said stack and adapted to periodically reciprocate to and from said operating means; means for causing said reciprocating feeding means to engage the lowermost strip in the stack at the extreme of its return stroke and to feed it toward the operating means, and to subsequently engage and

feed said strip at an intermediate point in each of its working strokes whereby the strip is fed step-by-step to said operating means.

23. A machine having, in combination, means for supporting a piece of material; a reciprocating feed device, and automatic means for causing said feed device to engage said piece of material at different points in its working strokes and to feed said strip at each stroke.

24. A machine having, in combination, means for supporting a piece of material; a reciprocating feed device comprising a feed-dog for engaging the surface and feeding said piece; and automatically adjustable means coöperating with said feed-dog for determining the point in the working stroke thereof at which the feed-dog becomes operative.

25. A machine having, in combination, means for supporting a piece of material; a reciprocating feed device having a normal length of stroke; yielding means for permitting shorter strokes; and means for determining the portion of each stroke during which said feed device is operative to engage and feed said piece of material.

26. A machine having, in combination, means for operating upon a piece of stock; means for longitudinally feeding the stock to said operating means; means for detecting the exhaustion of the stock being fed; means for holding a supply of stock; means for transversely feeding a piece of stock from said supply into the path of movement of said longitudinal feeding means; and means controlled by said detecting means for rendering said transverse feeding means operative only when the longitudinally fed piece is exhausted.

27. A machine having, in combination, means for operating upon a strip of stock; means for holding a supply of such strips; longitudinal feeding means located beneath said supply and constantly reciprocating to and from said operating means; constantly reciprocating transverse feeding means located beneath said supply; and automatic means for causing said constantly reciprocating transverse and longitudinal feeding means to become operative to first transfer the lowermost strip of the supply into the path of movement of said longitudinal feeding means and then cause said last means to engage and feed said strip toward said operating means.

28. A machine having, in combination, means for holding a piece of material; means for operating upon said piece of material; means for detecting the presence of the piece being operated upon; feeding means constantly reciprocating to and from said holding means and said operating means and tending to engage and feed said piece of material therein to said operating means; and means controlled by said detecting means for holding the feeding means out of engagement with said piece in said holding means so long as there is a piece being operated upon.

29. A stock-cutting machine having, in combination, a feed-table for supporting a piece of stock as it is fed; cutting means for operating upon the stock; supplemental means disposed between said feed-table and said cutting means for supporting the stock; means for removing said supplemental supporting means at each operation of said cutting means to permit the discharge of any piece of stock supported entirely thereby, and means for positively insuring the discharge of such piece of stock.

30. A stock-cutting machine having, in combination, a feed-table for supporting a piece of stock as it is fed; cutting means for operating upon the stock; supplemental means disposed between said feed-table and said cutting means for supporting the stock; means disposed between said feed-table and said cutting means for detecting the presence of a piece of stock by engagement with its under side; means for removing said supplemental supporting means at each operation of said cutting means to permit the discharge of any piece of stock which is too short to be engaged and supported by said detecting means.

31. A machine having, in combination, means for cutting successive pieces from a sheet of sheet material; rotatable means upon which the cut pieces are placed for transferal to a receiving position, said means being adapted to rotate only the alternate pieces through a half turn in their own planes; and means for stacking the pieces so transferred.

32. A stock-cutting machine having, in combination, means for successively cutting pieces from a piece of sheet material, means for transferring the cut pieces in substantially their own planes to another position; and means for turning the successive pieces into a plane normal to their initial plane and stacking the pieces so turned.

33. A stock-cutting machine having, in combination, means for successively cutting pieces from a piece of sheet material; a rotatable carrier for transferring the cut pieces in substantially their own planes to another position; and yieldable means for successively moving the cut pieces upon said carrier.

34. A machine having, in combination, means for feeding a succession of wedge lifts with their thick ends in similar positions, and means for stacking said lifts in face-to-face relation with their thick and thin ends alternating and their analogous faces directed the same way.

35. A machine having, in combination, means for feeding a succession of wedge lifts with their thick ends in similar positions, means for reversing the position of every alternate lift with respect to its taper, and means for stacking said lifts with their thick and thin ends alternating and their analogous faces directed the same way.

36. A machine having, in combination, means for cutting lifts from a transversely tapering strip of sheet material, and means for progressively stacking said lifts as they are cut in face-to-face relation with their thick and thin ends alternating.

37. A machine having, in combination, means for intermittently and longitudinally advancing a transversely tapering strip of sheet material, means for successively cutting wedge lifts therefrom, and means for progressively manipulating said lifts to bring them into stacked relation with their thick and thin ends alternating.

38. A machine having, in combination, means for cutting lifts from a transversely tapering strip of sheet material, and means for progressively stacking said lifts as they are cut in face-to-face relation with their thick and thin ends alternating, and their analogous faces directed the same way.

39. A machine having, in combination, means for feeding a succession of wedge-lifts with their thick ends in similar positions, means for successively transferring said wedge-lifts to another position and turning the alternate lifts end for end in substantially their own planes during the transferal, and means for stacking the transferred lifts with their thick and thin ends alternating.

40. A machine having, in combination, means for supporting a piece of material, means having a predetermined normal feeding movement for advancing the piece of material by successive steps, and automatic means for varying the point in the feeding movement of said advancing means at which said means becomes operative.

41. A stock-cutting machine having, in combination, means for holding a stack of transversely tapering strips of sheet material, means operating successively upon the strips for withdrawing them from the stack and feeding them intermittently to an operating position, means for cutting successive pieces from the ends thereof, and means for stacking the cut pieces progressively with their thick and thin ends alternating.

ERASTUS E. WINKLEY.