Patented May 15, 1923.

UNITED STATES PATENT OFFICE.

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

STOCK-CUTTING MACHINE.


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 stock-cutting machines in which the stock is cut into pieces or blanks and the pieces are delivered in stacked relation ready for transfer to other machines. More particularly, the invention relates to machines in which articles of tapering cross-sectional form, such as the wedge lifts used in the manufacture of shoe heels, are cut from strips of suitable sheet material and are then stacked face to face with their thick and thin edges alternating, in order that the lifts may be compactly stored, or conveniently handled, or acted upon by the feed mechanisms of other machines.

A co-pending application, Serial No. 208,443, filed December 22, 1917, by the present applicant, discloses an automatic heel building machine that is constructed and operated to build heels in which wedge lifts are employed. As described in said application, a supply of lifts is contained in a series of lift magazines, one of which contains wedge lifts that are alternately or reversely stacked, and means is provided for successively removing the lifts from the magazines and progressively superimposing the one upon the other in a predetermined sequence at successive assembling stations to produce heels of any desired form. The commercial success of a machine of this character depends upon the facility with which the lifts, and more particularly the wedge lifts, can be cut and stacked in the required relationship preparatory to being supplied to the magazines of the machine.

One object of the present invention is to provide a stock-cutting machine of improved construction for producing dinked or die-out articles and delivering them in stacked relation.

To the accomplishment of this object, one feature of the invention comprises a machine having a die for cutting pieces of sheet material and means for removing the pieces from the die as they are cut and assembling them progressively in stacked formation.

Another object of the invention is to provide, in a stock-cutting machine embodying the feature above specified, means whereby pieces cut from sheet material of tapering cross-sectional form may be assembled in a stack with their thick and thin edges alternating.

To the last mentioned end another feature of the invention resides in mechanism for turning alternate pieces end-for-end after they have been cut and removed from the die.

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

Figure 1 is a view in front elevation of a machine constructed in accordance with the present invention; Fig. 2 is a detail view of a friction clutch constituting part of the mechanism for rotating the lift picker; Fig. 3 is a top plan view of the machine; Fig. 4 is a view in side elevation of the machine looking from right to left in Fig. 1; portions of the supporting frame being broken away to disclose parts of the operating mechanism otherwise hidden from view; Fig. 5 is a detail view, partially in front elevation and partially in section, showing the actuating mechanism for the strip feeding devices; Fig. 6 is a sectional view of the machine taken substantially on the line 6—6 of Fig. 4; Fig. 7 is a sectional view taken substantially on the line 7—7 of Fig. 6; Fig. 8 is a view in front elevation and on an enlarged scale of a portion of the machine showing particularly the main operatingcams and cooperating levers, the supporting frame being indicated by dot and dash lines; Fig. 9 is an enlarged plan view of a portion of the front of the machine, the top cover plate being broken away to disclose the mechanism beneath; Fig. 10 is an enlarged view, partially in front elevation and partially in...
section, of the mechanism shown in Fig. 9; Fig. 11 is a plan view on an enlarged scale, partially in section, of the central portion of the machine with the strip-supporting table removed; Fig. 13 is a view in side elevation and on an enlarged scale of the central portion of the machine, looking from the right, certain portions of the frame being broken away for the sake of clearness; Fig. 15 is a sectional view taken on the line 13—13 of Fig. 3; Fig. 14 is a sectional view taken on the line 14—14 of Fig. 13, showing the lift-picker and the lift-ejector in different positions; Fig. 15 is a view in side elevation of the central and front portion of the machine, the strip-supporting table being shown in section and the supporting brackets therefore removed for the sake of clearness; Fig. 16 is a view partially in elevation and partially in section, the section being taken substantially on the line 16—16 of Fig. 14; Fig. 17 is a detail view illustrating particularly the main feed mechanism and also a portion of the mechanism for automatically supplying a new strip to the feed platform and effecting the removal of the waste-end of the preceding strip; Fig. 18 is a perspective view illustrating particularly the main and auxiliary strip-feeding mechanisms; Fig. 19 is a plan view, partially in section, of portions of the mechanism shown in Fig. 17; Fig. 20 is a detail plan view, partially in section, of mechanism for adjusting the die-stripping devices and mechanism for rendering the lift-picker inactive; Fig. 21 is a view in front elevation and on an enlarged scale illustrating particularly the lift-stacking mechanism; Fig. 22 is a sectional view taken substantially on the line 22—22 of Fig. 21; Fig. 23 is a view, partially in elevation and partially in section, of a portion of the mechanism for rotating the lift-picker, the section being taken substantially on the line 23—23 of Fig. 9; Fig. 24 is a view, partially in elevation and partially in section, of a part of the mechanism shown in Fig. 23, together with certain other mechanisms associated therewith, the section being taken substantially on the line 24—24 of Fig. 9, and the supporting frame being indicated by dot and dash lines; Fig. 25 is a detail view showing an escapement device for controlling the rotation of the lift-picker; and Fig. 26 is a detail perspective view of the cutting-block and the cutting-block holder.

Referring to the drawings, the machine comprises, in general, a frame 30 (Figs. 1, 3 and 4) for supporting the various component elements embodied in the machine; a stationary removable die 32 (Figs. 3, 13 and 14) which is mounted in the upper portion of the frame and is arranged with its cutting edge disposed in a vertical plane and directed rearwardly; a horizontally reciprocating rectangular cutting-block 34 for cooperating with the die to cut lifts from strips of stock introduced between the block and the die; a stationary feed platform 36 (Figs. 1 and 15) across which a strip which is to be operated upon is fed lengthwise to the die, the strip being supported in a vertical plane with its thicker longitudinal edge resting on said platform; a pivotally mounted strip-supporting bar or plateform 38 (Figs. 16 and 17) located beneath the die and normally aligned with the stationary feed platform 36 so as to support the leading end portion of the strip which is opposite the die, and which is displaced forwardly with said portion of the strip as the latter is forced against the die by each advance of the cutting-block and held in its forwardly displaced position, after the last cutting operation has been performed on each strip, to permit the escape of the waste-end of the strip from the line of feed of a succeeding strip; a table or shelf 40 (Figs. 3, 4 and 15) at the top of the front of the machine, upon which a supply of strips are piled flatwise, one upon another, within easy reach of the operator; means disposed at the rear of the supply table 40 including a plurality of fingers 42 (see also Figs. 15, 17 and 18) for supporting one of said strips at a time as it is presented flatwise and in a vertical plane to said means by the operator and adapted to be automatically retracted from strip-supporting position to drop the strip edgewise onto the feed platform 36; a main feed mechanism embodying a feed dog comprising a pair of gripper jaws 44 and 46 for closing upon opposite sides of the stock and advancing it step-by-step to the cutting mechanism; an end-stop or gage 48 (Figs. 11, 14 and 16) adjacent the farther side of the die against which the stock is fed and which serves to determine the length of the feed movements; a die-stripper 50 (Figs. 3 and 11); a reciprocating and rotatable picker 52 (Figs. 13 and 14) for removing the lifts forwardly through the die and for turning alternate lifts 180° so that the lifts may be stacked in straight column formation and in close contact with each other throughout their width; an ejector 54 which engages the rear side face of the lift after it has been seized by the picker 52 and forces the lift together with the picker forwardly through the die to remove the lift therefrom; a receiving rack or magazine 56 (Figs. 4 and 13) disposed at the front of the machine below the plane of the die for receiving the successive lifts; a plurality of oscillatory stacking fingers 58 (Figs. 15, 21 and 22) for advancing the lifts in stacked formation through the magazine 56; control mechanism including a feeler 60 (Figs. 14, 16 and 19) located beneath the end-stop 48 for detecting the presence or ab-
sence of the stock and controlling the actuation of the lift-picker 52 accordingly; an auxiliary feed device including a pair of pusher fingers 62 (see also Fig. 18) which engage the rear edge of the strip of stock to continue its advancement toward the die after it has become exhausted to such an extent that it no longer extends from the die to the field of operations of the main feeding mechanism; and a feeler 64 (Figs. 11, 14, 17 and 18) for determining when the strip has become so far exhausted that insufficient material is left to produce another complete lift, and when such condition occurs for causing the movable strip-supporting bar 38 to be locked in its forwardly displaced position so as to permit the waste-end of the strip to drop out of the path of the succeeding strip and be discarded, and to effect the retraction of the strip-supporting fingers 42, thereby delivering a new strip onto the feed platform 36.

Referring particularly to Figs. 1, 3, 4, 6 and 7, the frame 30 upon which the component parts of the machine are mounted, comprises a head 70; a substantially rectangular casing or frame 72 which supports the head 70 and encloses the cams and certain portions of the associated operative mechanism; a base 74 upon which the frame 72 rests, and a pedestal 75 rising from the base 74, which supports the strip-feeding mechanisms and to which is secured a bracket 76 that supports the outer end of the supply table 40. The picker mechanism is enclosed and protected by a small rectangular casing 77 (see also Figs. 9 and 10) which is secured to the top of the head 70, at the front of the machine, and is provided with a cover plate 78.

A frame member 79 rises from the top of the casing 72, on the right side of the magazine 55, for the purpose of supporting the inner end of the supply table 40 and providing bearings for various parts of the operating mechanism.

A main shaft 80 is journaled in bearings 82 in the head 70 and two cam shafts 84 and 86 are carried in suitable bearings in the casing or frame 72. The main shaft 80 is provided with a fast pulley 88 and a loose pulley 90 with which a belt 92 (Fig. 3) is adapted to cooperate. The belt 92 may be shifted from one pulley to the other by means of a belt-shifter 94 which is carried at one end of a horizontal rod 96 that is mounted at the rear of the machine for longitudinal sliding movement in bearings 98 on the frame 72. In order to prevent the belt-shifter rod 96 from turning in its bearings 98, the belt-shifter is further supported by means of a pin 100 which projects outwardly from the frame 72 through a bearing lug 102 which extends forwardly from the belt-shifter. The belt-shifter rod 96 is operatively connected by a link 104 with a rocker arm 106 which is fixed on a rock shaft 108 that extends forwardly at right angles on the rod 96 and is adapted to turn in bearing brackets 110 on the side of the frame 72. The front end of the shaft 108 is provided with an operating crank 112. The crank 112 is adapted to swing in a slot 114 that is formed between segments 116 on the front bearing bracket 110, its movement in opposite directions being limited by suitable stops at the opposite ends of the segments. A manually releasable detent 118 is provided to lock the crank 112 in position to hold the belt in engagement with the loose pulley 90.

The cam shaft 84 extends transversely across the frame 72 and is driven continuously during the operation of the machine, from the main power shaft 80, through a train of gearing comprising a spur gear 120 (Figs. 4 and 6) that is fastened to said shaft, a pair of intermeshing idler gears 122 and 124 that are journaled on studs projecting from the frame of the machine, and a spur gear 126 that is fast on the cam shaft 84. The cam shaft 86 is disposed at right angles to the cam shaft 84 and is driven therefrom through intermeshing bevelled gears 128 and 130 on the shafts 84 and 86 respectively. A plurality of cams 132 and 134, which are secured to the cam shaft 84, and 136, 138, 140 and 142, which are secured to the cam shaft 86, actuate the various component mechanisms of the machine in the proper timed relation with each other as will be hereinafter set forth. The various levers which cooperate with the several cams for actuating the component mechanisms of the machine are mounted upon the frame 72 and the head 70.

The stock is cut by means of the die 52 which is mounted with its cutting edge disposed in a vertical plane and directed toward the rear of the machine in order that it may cooperate with the horizontally reciprocating cutting-block 34 as the latter moves forwardly. The rear end of the die is open to permit the material cut by the die to be carried forwardly through the die by the cooperative action of the picker 52 and the ejector 54. The die is mounted in a die-carrier 146 (Figs. 13, 14 and 16) which is substantially annular in shape, the rear edge of the die being seated against an annular shoulder 148 that is formed substantially midway between the front and rear faces of the carrier and the rear portion of the die is surrounded by the die-carrier. The die is arranged in the die-carrier with the breast of the die uppermost and horizontally disposed and the die is firmly secured in place by a plurality of clamping-screws 150 which extend radially through the die-carrier at points equi-distant from each other, and engage the outer face of the die. Dies of various sizes may be accommodated in the
die-carrier by adjusting the clamping-screws 150 inwardly or outwardly in the carrier. The outer periphery of the die-carrier is reduced in diameter at its rear side and the reduced portion thereof is received within a supporting-ring 152 that is mounted on the die-carrier and is provided with a semi-annular groove 154 on its inner peripheral face, that is adapted to receive a corresponding portion of an annular rib 156 that is formed on the outer peripheral face of the reduced portion of the die-carrier. The supporting-ring 152 comprises upper and lower half sections 158 and 160, respectively, the lower section 160 being rigidly secured to the rear face of a hollow cylindrical portion 162 of the head 70 and the upper half section 158 being hinged at one end upon a pivot screw 164 in the head, for swinging movement in a vertical plane toward and from the lower half section 160 to permit the ring to be opened up for the removal or insertion of the die-carrier. The upper section of the supporting ring is held in closed position to securely hold the die-carrier by means of a wing nut 166 (Figs. 11 and 16) on a bolt 168 that is pivotally mounted on the lower section of the ring to permit it to be swung into and out of a slot in the upper section thereof. A dowel pin 170 projects upwardly from the lowermost inner periphery of the supporting ring and serves, by entering a hole 172 in the die-carrier to locate the latter radially within the supporting ring with the breast of the die horizontally disposed.

The rectangular cutting-block 34 is mounted in a holder 176 (Figs. 11, 13 and 26) that is carried at one end of a hollow plunger 178. The plunger 178 is connected by means of a pitman 180 (Figs. 3 and 4) with an eccentric portion 182 on the main shaft 80, the eccentric portion serving to reciprocate the plunger 178 at the top of the machine to move the cutting-block into and out of co-operative cutting relation with the die. The cutting-block 34 is prevented from turning by means of a horizontal guide-rod 186 which projects rearwardly from the cutting-block holder and is guided in a bearing 188 which is secured to the top of the forward bearing 184. The front end of the hollow plunger 178 is internally threaded to receive an externally threaded stem 190 (Fig. 13) projecting rearwardly from a cutting-block holder support 191. By turning the cutting-block holder support 191 so as to screw the stem 190 in or out of the hollow plunger 178, the cutting-block may be adjusted toward or from the die-holder in order that the cutting-block may be adapted to co-operate with dies of different depths. The plunger 178 is split at 192 so that the cutting-block holder may be clamped in adjusted position. To effect this clamping action a split ring 194 surrounds the split portion of the plunger 178, and extending outwardly from this ring 194, adjacent the opening through its circumference, are two lugs 196 (Figs. 11 and 13) which are connected by a bolt 198 by means of which the ring may be contracted to force the split portion of the plunger into clamping relation with the stem of the cutting-block holder. The lugs 196 of the split ring 194 embrace the guide-rod 186 to prevent the turning of the plunger relatively to the cutting-block holder.

As shown in Figs. 11, 14 and 26 the opposite vertical edges of the cutting-block are bevelled and are adapted to be engaged by correspondingly bevelled faces 200 and 202, the face 200 being formed at one side of an integral flange 204 on the cutting-block holder 176 while the face 202 is formed upon a clamping plate 206 which is hinged to the cutting-block holder and is adapted to be swung into the position shown in Fig. 26 to permit the removal or insertion of the cutting-block 34, and to be held in clamping position by means of a bolt 208 (Fig. 11) which extends through a slot in the clamping plate 206 and is screwed into the cutting-block holder. A groove 210 extends horizontally at the rear of the cutting-block and is adapted to receive a dowel pin 212 which projects forwardly from the cutting-block holder for the purpose of preventing upward or downward displacement of the cutting-block. The cutting-block and the cutting-block holder are centrally apertured to permit the passage therethrough of the lift ejector 54 which co-operates with the picker 52 to remove each lift from the die immediately after it has been cut.

The strip of stock which is to be operated upon extends horizontally and is maintained in a vertical plane with its thicker longitudinal edge downward, said edge resting upon the stationary feed platform 26 which extends horizontally at one side of the die. The strip is advanced lengthwise across the platform 26 by a series of successive feed movements, each of which advances the leading end of the strip to the further edge of the die and causes it to overlap the die sufficiently to insure the cutting of a perfect lift. The leading end portion of the strip from which a lift is immediately to be cut is supported by the movable strip-supporting bar or platform 38 which is located beneath the die and which is moved forwardly with the stock by each advance of the cutting-block, and is temporarily locked in its forwardly displaced position after the strip has been exhausted to a predetermined extent, so as to permit the remnant of the strip to be discarded upon the return of the cutting-block. The two platforms 36 and 38 are each adjustably supported for movement in
vertical planes in order to support strips of different widths in proper positions with relation to the die.

As shown in Figs. 1, 3 and 4, the stationary feed platform 36 consists of a long and narrow bar which is pivotally supported at points near its opposite ends upon the substantially horizontal arms of a pair of bell-crank levers 214. The bell-crank levers 214 are severally fulcrumed on studs 216, one of which projects from the rear of a bracket 218 that is secured to the under side of the supply table 40, while the other stud 216 projects from the rear of a bracket 220 which is secured to the pedestal 75. In order to maintain the horizontal position of the platform 36 as it is raised or lowered, the two bell-crank levers 214 are constrained to move in unison by means of a rod 222 which connects the upwardly extending arms of the levers. The bracket 218 is constructed in the form of a yoke, one arm of which depends from the supply table 40 at the front side of the feed platform 36 while the other arm rises at the rear of the platform. The brackets 220 and 76 each have yoke portions which are similar in shape to the bracket 218 and which also embrace the feed platform 36. A strip of stock resting upon the feed platform 36 is confined in a guideway formed between the arms of the three brackets just described and is thereby prevented from being displaced from the feed platform and is maintained at all times in a substantially vertical plane.

The movable strip-supporting bar or platform 38 is normally maintained in alignment with the stationary feed platform 36 and is located in the path of movement of the cutting-block 34. In order that the movable strip-supporting platform 38 may be moved forwardly beneath the die to permit the advance of the cutting-block, said bar is supported at the upper ends of a pair of arms 226 (Fig. 16) which are journaled on a stud 228. The stud 228 is supported between the arms 226 by an arm 230 which is pivotally mounted upon a stud 222 that is fixed in the head 70 of the machine. By means of this construction the arm 230 may swing upwardly or downwardly to permit the raising or lowering of the platform 38.

In order that the platforms 36 and 38 may be adjusted upwardly or downwardly in unison, said platforms are connected by means of an arm 234 (Figs. 15, 16 and 17) which rises from the stud 228 and is secured to a guiding plate 226 that is secured to the inner end of the platform 36 and serves to guide the strip of stock as it passes from one platform to the other. The platform 36 is actuated upon by a spring 240 (Fig. 3), one end of which is secured to the link 224 and the opposite end to a fixed part of the machine, the spring tending to rock the bell-crank lever 214 so as to raise the platform 36. By means of the connecting arm 234 the platform 38 will be raised simultaneously with the platform 36 until a finger 242 (Fig. 16) which projects laterally from the arm 234, engages a stop-screw 244 which is threaded into the bottom of the die-holder 146, said stop-screw occupying the lower part of the recess containing the lowermost of the clamping bolts 150. The amount of projection of the stop-screw 244 is made to vary with the size of the die employed in order to vary the location of the platforms 36 and 38 vertically with respect to the die. The stop-screw 244 is adjusted when the die is clamped in the die holder so that the screw will project from the holder the amount required to properly position the platforms 36 and 38. A spring 246 (Figs. 16 and 17) which is coiled about the stud 228 tends to hold the platform 38 in its normal position in line with the platform 36. A guiding rib 248 at the forward side of the movable platform 38 serves to prevent the leading edge of the strip from striking the near cutting edge of the die as it is advanced.

The strips to be operated upon are manually removed one at a time from the supply table 40 and each strip is positioned in a vertical plane with its thicker longitudinal edge resting upon the strip-supporting fingers 42 so that the strip extends horizontally and is located above and in line with the stationary feed platform 36. The strip thus positioned is confined between an upwardly turned vertical flange 250 that is formed at the rear of the supply table 40 and a vertical wall 252 that is spaced a short distance away from the flange 250 and is supported in parallelism therewith by the brackets 215, 220 and 76. The strip is automatically released by the retraction of the strip-supporting fingers 42 and is permitted to fall edgewise onto the feed platform 36. As will be hereinafter explained, these fingers 42 are retracted to deliver a new strip to the feed platform 36 after the performance of the last cutting operation upon the preceding strip.

After being deposited upon the feed platform 38, the strip of stock is advanced through a series of step-movements which are imparted to it by means of the reciprocating gripper jaws 44 and 46 of the feed dog which constitutes part of the main feeding mechanism. Each step-movement yieldingly advances the leading end of the strip across the die and into engagement with the end-stop 48 which determines the length of the feed movement and locates the leading end of the strip so that it just overlaps the farther cutting edge of the die.

As shown particularly in Figs. 17 and 18, the gripper jaws 44 and 46 are arranged on opposite sides of the feed platform 36 and
are adapted to be closed upon the opposite faces of the strip of stock so as to grip the strip firmly between them before starting to move toward the die, and are opened to release their hold upon the strip before being retracted from the die preparatory to performing their next feed movement. To this end the gripper jaws are pivotally mounted with provision for sliding movement upon a stationary horizontal shaft 256, the outer end of which is secured in the bracket 220 on the pedestal 75 (Fig. 1). Referring again to Figs. 17 and 18, the gripper jaw 44 extends upwardly in front of the feed platform 36 from a sleeve 258 which is mounted with provision for turning and sliding movements on the shaft 256 and the jaw is provided with a horizontal portion (Fig. 18) terminating in a strip engaging surface 260. The gripper jaw 46 extends upwardly at the rear of the feed platform 36 from a hub which is free to turn and slide upon the shaft 256, the jaw terminating in a strip engaging surface 262. The hub of the gripper jaw 46 is connected by means of a laterally offset arm 264 extending beneath the sleeve 258 with a collar 266 which is free to slide with the gripper jaws on the shaft 256. Sufficient space is left between the collar 266 and the sleeve 258 to permit the introduction of an actuating arm for reciprocating the said members without interfering with their turning movements, as will be hereinafter described.

In order that the gripper jaws 44 and 46 may be opened and closed, said jaws are actuated in opposite directions by means of a pair of operating arms 268 and 270 which extend the jaws below the shaft 256, each arm being disposed on the opposite side of said shaft from that occupied by the jaw connected therewith so that the jaws may be actuated by said arms after the manner of a pair of scissors. The gripper jaws are closed upon the strip by means of the action of a spring 272 upon a rod 274, one end of which is pivoted to the lower end of the arm 268. The rod 274 extends loosely through a bearing block 276 which is carried by the lower end of the arm 270 and the outer end of the rod projects beyond the bearing block and is surrounded by the spring 272 which is interposed between the bearing block and a pair of nuts 278 that are threaded on to the end of the rod. The gripper jaws are opened against the action of the spring 272 by means of a toggle consisting of a link 280 which is pivoted to the lower end of the arm 268 and links 282 which are pivoted to the lower end of the arm 270, the toggle links being pivotally connected together at 284.

In order that the toggle may be actuated to effect the opening and closing of the gripper jaws, the link 280 is provided with an arm 286 which is slotted at 288 to receive a toggle actuating bar 290. The bar 290 is supported at its opposite ends by means of arms 292 extending downwardly from a sleeve 294 which is mounted for oscillatory movement on a shaft 296 that is secured to fixed portions of the frame. The toggle actuating bar 290 is confined in the slot 288 by means of a plate 298 which closes the end of the slot. The length of the actuating bar 290 is sufficient to permit the reciprocation of the gripper jaws for the purpose of feeding the strip of stock and the bar serves to guide the jaws as they are reciprocated on the shaft 256 and to maintain the jaws in their upright positions thereon. The sleeve 294 is oscillated to raise or lower the actuating bar 290 by means of an arm 300 which projects rearwardly from the sleeve 294 and is connected by a link 302 (Fig. 18) with one arm of a bell-crank lever 304 (Figs. 4 and 8) which is pivoted at 306 to the frame 73. The bell-crank lever 304 is provided at the lower end of its other arm with a cam roll 308 which rides in a groove in the cam 134 on the cam shaft 84.

When the gripper jaws are open, as shown in Fig. 17, the toggle actuating bar 290 is held in its uppermost position by the cam 134 and the toggle is straightened, relieving the bar and the shaft 256 from the stress caused by the action of the spring 272 on the actuating arms of the gripper jaws and reducing the resulting friction which tends to resist the sliding feed movement of the gripper jaws. The toggle actuating bar 290 is swung downwardly by the cam 134 before the gripper jaws are advanced toward the die, to break the toggle and permit the spring 272 to expand and close the gripper jaws upon the strip.

The gripper jaws 44 and 46 are reciprocated in unison toward and from the die by means of an arm 310 which is pivotally mounted upon a rod 312 that is supported by a portion of the frame. At its upper end the arm 310 carries a cam roll 314 which is received in the space between the sleeve 288 that carries the gripper jaw 44, and the collar 266, that is connected with the gripper jaw 46 (see also Fig. 18). The arm 310 is oscillated by means of a segment 316 which is pivotally mounted on the rod 312 alongside the arm 310 and is connected with the latter by means of a yielding coupling in such a manner that the arm may be actuated yieldingly in the direction of feed and positively in the opposite direction. To this end the periphery of the segment 316, which is concentric with the axis of oscillation of the arm 310, is provided with a V-shaped notch 318 that is adapted to be engaged by a spring-pressed plunger 320 on the side of the arm 310. The segment 316 is further pro-
vided with a lug 322 which projects into the plane of oscillation of the arm 310 and through which a screw 324 is threaded and adjusted as to engage one side of the arm 310 when the plunger 320 is in the notch 318.

The feed-mechanism, above described, is arranged to have an amplitude of movement as great as may be necessary in the case of the largest lift desired to be produced, and, in cases where the machine is to be used for the production of smaller lifts the end-stop 48 is employed to arrest the feeding movement of the strip when just enough material has been fed for the particular size desired. When the leading end of the strip which is being advanced across the die engages the end-stop 48, the plunger 320 rides out of the notch 318, thus disengaging the yielding coupling, and the remainder of the movement of the segment 316 in the direction of feed is idle. Upon the oscillation of the segment in the opposite direction, however, when the notch 318 comes into position beneath the plunger 320, the side of the arm 310 is engaged by the screw 324 and further movement of the segment in this direction is transmitted positively through the screw 324 to the arm 310 to return the gripper jaws to their retracted position.

The segment 316 is actuated by means of an arm 326 (Fig. 5) which extends therefrom at such an angle that the segment and the arm constitute, in effect, a bell-crank lever. The arm 326 is connected by means of a link 328 with an arm 330 that is secured to a rock-shaft 332 that is journaled in bearing brackets on the frame 72, as shown in Figs. 7 and 8. Secured to the rock-shaft 332 is a downwardly extending arm 334 carrying a cam roll 335 which rides in a groove in the cam 336 on the cam shaft 86.

The link 328, as shown in Figs. 5 and 8, is constructed in two sections comprising an eye-bolt 336 and a yoke 338. The upper end of the eye-bolt 336 is pivoted to the arm 326 while the shank of the bolt extends loosely through the upper and lower arms of the yoke 338. The upper arm of the yoke 338 is pivotally connected with the bell-crank lever 330. The lower end of the bolt 336 is screw-threaded and provided with nuts 340 and 342, arranged respectively above and below the lower arm of the yoke. By adjusting the nuts 340 and 342 the length of the link 328 between the arm 326 and the bell-crank lever 330 may be conveniently adjusted.

The maximum length of stroke of the gripper jaws of the main feed mechanism and the location of gripper jaws with respect to the die, are such that the first feed movement imparted thereby to a strip of stock advances the leading end of the strip to a point short of the die and there is no possibility of cutting scrap into the die.

The strip is then advanced yieldingly until it is fed completely across the die and its leading end comes into contact with the end-stop or gage 48 which prevents further advance of the strip.

As shown in Figs. 14, 16 and 20, the end-stop or gage 48 is located at the side of the die farthest from the feed mechanism and is normally disposed in the path of movement of the strip and also in the path of movement of the cutting-block 34 as the latter advances to co-operate with the die. In order that the end-stop 48 shall not interfere with the operation of the cutting-block, provision is made for permitting the end-stop 48 to be displaced forwardly by the advance of the cutting-block. To this end the end-stop is carried by a slide 344 which is mounted in ways formed in a support 345 that is secured to the head 70, the ways extending substantially parallel to the plane of the beveled face of the die adjacent its cutting edge. A roller 346 (Fig. 11) is mounted at one side of the cutting-block holder 176 so as to engage the rear edge of the end-stop upon the advance of the cutting-block and move the former out of the path of the latter. Normally the end-stop 48 is held in operative position by means of a spring 348, one end of which is secured to the support 345 and the opposite end of which is secured to a pin projecting from the slide 344 through a slot 350 in the support 345. The spring 348 expands to permit the end-stop to be displaced forwardly by the advance of the cutting-block and contracts upon the return of the cutting-block to restore the end-stop into operative position in the path of the strip so that it may operate to position the strip relatively to the die for the next cutting operation. As the end-stop is displaced forwardly by the roller 346 upon the advance of the cutting-block it is also moved to one side by reason of the angular disposition of the ways in which the slide 344 is mounted so that the end-stop is prevented from striking against the side of the die.

In order to permit the end-stop 48 to be adjusted into operative relation with dies of different sizes so that the length of feed of the stock will be varied in accordance with the size of the die employed, the support 345 is mounted with provision for sliding movement toward and from the axis of the die-carrier. To this end the support 345 is formed with an offset portion 354 which is adapted to slide in ways formed in a bracket 354 that is secured to the head 70. To facilitate the process of adjusting the end-stop 48, the support 345 is pivotally connected with one end of an arm 356 which
is secured to a vertical rock-shaft 357 (Figs. 1 and 20) that is journaled in the head 70. An arm 358 extends forwardly from the rock-shaft 357, below the arm 256, and carries a roll 359 which is received in a transverse groove 360 in the upper side of a sleeve 361 that is threaded onto a horizontal adjusting shaft 362. The shaft 362 (Figs. 1, 3 and 14) extends horizontally across the front of the head 70 of the machine and is adapted to turn in suitable bearing brackets 363 that are secured thereto. At the right-hand end of the shaft 362, a hand-wheel 364 is provided for turning the shaft so as to shift the sleeve 361 and rock the lever 356 to adjust the end-stop 48. A second sleeve 365 (Fig. 14) is threaded on the shaft 362 near the hand-wheel 364 and carries a pointer 366. As the shaft 362 is turned by means of the hand-wheel 364 the sleeve 365 is moved to the same extent as the sleeve 361, carrying the pointer 366 across a scale 367 that is secured to the head 70 below the shaft 362. The proper adjustment of the end-stop for dies of different sizes may be conveniently determined by the position of the pointer 366 relatively to the graduations of the scale 367.

The strips of stock which are to be operated upon are frequently warped or distorted in the direction of their length so that their longitudinal edges are more or less curved. If the thicker edge of the strip, which is the edge that rests on the stationary feed platform 36 and on the movable strip-supporting bar or platform 38, is convexly curved, the leading end portion of the strip is liable to rise somewhat above the lower cutting-edge of the die as the strip is fed across the movable strip-supporting platform 38 with the result that an imperfect lift is produced by the succeeding cutting operation. In order to prevent the cutting of imperfect lifts from this cause, a presser foot 368 (Figs. 11 and 16) is provided which is adapted to engage the upper longitudinal edge of the strip just before it reaches the die and to force the leading end portion of the strip downwardly against the movable platform 38. To this end the presser foot 368 extends lengthwise above the stationary platform 36 and is provided at its outer end with a laterally offset ear 369 that is pivoted on a horizontal stud 370 which projects rearwardly from a portion of the head 70 and is adjustably secured in a vertical slot therein in order that the presser foot may be adjusted to operate upon strips of different widths.

A spring 371 is called about the stud 370 and forces the presser foot downwardly. The downward movement of the presser foot is limited by the engagement of a shoulder (Fig. 16) on the ear 369 with a stop pin 377 projecting from the head 70. The outer end of the presser foot which is engaged first by the advancing strip is curved upwardly to insure the passage of the strip beneath the presser foot.

In addition to being distorted in the manner above described, the strips of stock are often warped or twisted laterally so that the end of the strip which is to be fed across the die may be bent so far toward the rear of the machine and away from the die that said end of the strip may pass beyond the end-stop 48 and accordingly the feed movement of the strip will not be arrested at the proper time. In order that the leading end portion of a laterally warped strip shall be held close to the cutting edge of the die as it is fed so as to insure that it will engage the end-stop, the upper or strip supporting face of the movable platform 38 is grooved longitudinally to provide a shallow trough 372 (Figs. 13, 17 and 18) to receive the lower longitudinal edge of the strip. The pressure of the presser foot 368 serves to prevent the strip from riding out of the trough 372 as the strip is advanced and the rear side of the trough serves to hold the strip in a plane closely adjacent to the cutting edge of the die.

When the feed movement of the strip is arrested by the end-stop 48, the leading end of the strip is properly positioned with relation to the die for the cutting operation which then takes place. In order that the leading end of the strip may be stripped from the die immediately upon the return of the cutting-block so as to permit the stock to be fed into position for the next cutting operation, the die-stripper 50 is mounted on the side of the die opposite the end-stop.

The die-stripper 50 (Figs. 11 and 16) is located closely adjacent the cutting edge of the die and acts upon the front face of the stock to force the stock rearwardly away from the die after a lift has been cut therefrom. Referring also to Fig. 18, the die-stripper 50 comprises a vertical stripping blade, the upper portion of which is offset laterally away from the die and terminates in a yoke 373 the arms of which are pivotally mounted on a vertical post 374 that is fixed in the frame of the machine. The die-stripper is actuated by a spring 375 which surrounds the post 374 and tends to hold the stripper in its normal position, with its inner end somewhat to the rear of the plane of the cutting edge of the die. The normal position of the die-stripper is determined by means of a curved stop-arm 376 which is adapted to engage the rear face of the strip supporting wall 252. As the cutting-block 34 advances to co-operate with the die after the leading end of the strip has been fed across the die, the die-stripper 50 is forced forwardly with the strip, and upon the re-
turn of the cutting-block, the die-stripper follows it rearwardly until the stop arm 376 engages the wall 252 when the leading end of the stock will be stripped from the die so that it is free to be fed another step.

In order that the die-stripper 50 may be adjusted so as to bear the same relation to dies of different sizes, the post 374, upon which the die-stripper is pivoted, is carried by one arm of a bell-crank lever 378 that is fulcrummed at 380 on a bracket secured to one of the bearings 184. The other arm of the bell-crank lever 378 is connected by means of a link 382 to an arm 384 which is secured to the upper end of a vertical rock-shaft 386 that is suitably journalled at one side of the forward bearing 184. An arm 387 at the lower end of the rock-shaft 386 is connected by a rod 388 (see also Fig. 20) with an arm 380 that is secured to the rock-shaft 387. The die-stripper may thus be adjusted concurrently with the end-stop 48 by the manipulation of the hand wheel 384 and the various connecting parts are so proportioned that the required movement of the die-stripper will be obtained. Inasmuch as the post 374 upon which the die-stripper is pivotally mounted is swung through an arc of a circle, as the stripper is adjusted, the portion of the rear face of the strip-supporting wall 252 that is engaged by the stop arm 376 is made somewhat concave, as indicated at 392 in Fig. 11, to insure that the stripper will move rearwardly through the same distance irrespective of its adjusted position, so as to properly strip the die.

After a lift has been cut from the stock, the picker 52 is projected rearwardly through the d’e to seize the lift. The lift is then carried rearwardly through the die by the co-operation of the picker 52 and the ejector 54 to a position above the receiving end of the rack or magazine 56 where the lift is released and permitted to fall by gravity into the magazine.

The picker, as shown in Figs. 13 and 14, comprises a disk-shaped head that is carried at the inner end of a pair of parallel horizontal rods 396 the outer ends of which are rigidly secured to a spool 398, through which they extend in a direction parallel to the axis thereof. The spool 398 is mounted for longitudinal sliding movement on a central horizontal shaft 400 which is journaled near its outer end in a supporting bar 402 within the casing 77, while at the inner end of the shaft a bearing disk 404, which is secured thereto, is journaled in a bearing 406 that is formed in rearward extension of the casing 77. The rods 396 which carry the picker are adapted to slide longitudinally through openings extending axially through the bearing disk 404, on opposite sides of the shaft 400, so that the rods are free to slide relatively to the shaft but are constrained to rotate about the axis of the shaft as the shaft turns. The picker disk 52 is provided with two prongs 408 which project axially from diametrically opposite points on the rear face of the disk, the prongs being long enough to impale the lift, but not long enough to extend through it.

The means for reciprocating the picker 52 comprises an arm 410 (Figs. 9 and 14 and 24) one end of which is secured to a vertical rock-shaft 412 that is journaled in the frame member 79, while the opposite end of the arm carries a cam roll 414 (see also Fig. 13) which is received in the annular groove formed between the flanges at opposite ends of the spool 398. The rock shaft 412 extends downwardly into the frame or casing 72 and at its lower end is provided with an arm 416. The arm 416 is connected by a link 418 with one arm of a cam lever 420 (Figs. 7 and 8) which is fulcrummed upon a stud 432 projecting from the frame 72 and carries at the end of its other arm a cam roll 424 which rides upon the side of the cam 140 on the cam shaft 80. A spring 426 which is secured at one end to the arm 420 and at the opposite end to a portion of the frame 72 tends to hold the roll 424 against the cam 140.

After a lift has been cut and before the cutting-block is retracted from the die, a notch in the cam 140 permits the spring 426 to suddenly drive the picker rearwardly so that the lift is impaled upon the prongs 408.

The ejector 54, which co-operates with the picker 52 to carry the lift forwardly through the die, consists of a rod which extends axially through the hollow horizontal plunger 178 (Fig. 13) and the cutting-block 34, and is adapted for longitudinal sliding movement in bearings in the cutting-block holder 176 and in the stem 190 of the cutting block holder support 191 and in the interior of the hollow plunger. As shown in Figs. 3 and 4, the ejector 54 is reciprocated by means of an arm 430 which is secured to a horizontal rock-shaft 432 that is journaled in bearings in the head 70. The arm 430 is forked at its upper end to straddle the plunger 175 and is operatively connected with a pair of pins 434 projecting from opposite sides of the ejector 54 through longitudinal slots 436 that are formed in opposite sides of the hollow plunger 178. The rock-shaft 432 is actuated by a downwardly extending arm 438 which is secured thereto and is connected by a link 440 with one arm of a cam lever 442 which is fulcrummed on a stud 443 projecting from the frame 72. The other arm of the cam lever 442 carries a cam roll 444 which rides in a
groove in the cam 132 on the cam shaft 84 and a spring 446 acts upon the arm 458 tending to advance the ejector toward the die. As the cam 132 rotates in the direction of the arrow in Fig. 4, the ejector is advanced positively into engagement with the rear face of the lift which is held by the picker, returning the picker and the lift impaled thereon against the action of the spring 446 and thus ejecting the lift from the die.

The lift is moved in this manner until it reaches the position in which it appears in Fig. 13. Thereafter the ejector ceases to be advanced positively but after a short dwell, during which alternate lifts are turned by the picker, the ejector is permitted by a notch 123 in the cam 132 shown by dotted lines in Fig. 4, to be momentarily further advanced under the influence of the spring 446 to bring the front face of the lift into contact with, and hold it yieldingly against, a vertical face 448 that is formed at the rear of the extension 407 of the casing 7. Approximately at this time the cam 140 operates to positively retract the head of the picker into a recess 450 in the rear wall of the extension 407. As the head of the picker is retracted into the recess 450, the face 448 strips the lift from the picker prongs 408. The ejector 54 is then retracted by the cam 132, releasing the lift which falls by gravity into the magazine 56.

The invention broadly considered, is not limited to the details of construction of the picker mechanism herein illustrated and described, nor to the particular mode of operation thereof, as above set forth, inasmuch as various types of pickers may be employed for the purpose of removing the lifts from the die, either with or without the co-operation of an ejector. An example of a type of picker, which might be utilized in the present machine is disclosed in an application. Serial No. 59,031, filed Nov. 1, 1915, (renewal Serial No. 266,018, filed Dec. 7, 1918) by the present applicant.

In order that the lifts may be stacked in the magazine 56 with their thick and thin edges disposed in alternate relation and their analogous faces directed toward the same end of the stack, alternate lifts are turned 180° substantially in their own planes by the rotation of the picker 52. This rotation occurs after alternate lifts have been advanced positively by the ejector to the plane occupied by the lift shown on the picker in Fig. 13, the ejector being prevented from moving longitudinally by a dwell in the cam 342 during the turning of the lift.

The rotation of the picker is effected by means of the coiled torsion spring 452 (Figs. 9 and 13). The spring 452 is interposed between an escapement wheel 454 (see also Fig. 25) which is secured to the shaft 400, and a gear wheel 456 which is secured to a horizontal shaft 458 that is centrally journaled in a bearing at the front of the casing 77, the bearing supporting the shaft 458 in axial alinement with the shaft 400. The opposite ends of the spring 452 are secured to the escapement wheel 454 and to the gear wheel 456, respectively, the coils of the spring surrounding the hubs of said members. In the course of two successive cycles of operations of the machine the gear wheel 456 is rotated so that the spring 452 is wound up sufficiently to store up motive power for rotating the picker and the lift carried thereby the required 180° during the latter part of the second cycle. At the proper time the escapement wheel is released and permitted to make a half a revolution thereby imparting a similar revolution to the picker.

The means for rotating the gear wheel 456 and winding up the spring 452 is illustrated particularly in Figs. 9 and 10. As shown, the gear wheel 456 is connected by means of compounded idler gears 460 with a gear 462, the latter having an elongated hub which is loosely mounted on a horizontal shaft 466 (see also Figs. 23 and 24). The shaft 466 is journaled in suitable bearings in the frame 72 and is driven continuously during the operation of the machine from the cam shaft 86. The driving connections between the shaft 466 and the cam shaft 86 comprise an intermediate shaft 468 which extends at right angles to the shafts 466 and 86 and is journaled in suitable fixed bearings; a pair of intermeshing bevel gears 470, one on the shaft 466 and one on the intermediate shaft 468; and a pair of intermeshing bevel gears 472 (Fig. 1), on the intermediate shaft and one on the cam shaft 86.

In order to insure that the torsion spring 452 will be wound up by means of the rotation of the gear 456 only sufficiently to provide the required amount of motive power for imparting a half turn to the picker, the gear 462 is adapted to be driven from the shaft 466 by means of a one revolution friction clutch 473 (Figs. 2, 9, 10, 23 and 24), the operation of which is controlled by the reciprocations of the picker. The ratio of the gearing connecting the shafts 466 and 458 is such that each revolution of the former shaft will produce one quarter revolution of the latter. Accordingly, the shaft 458 will be rotated through half a revolution by two complete revolutions of the shaft 466, and the spring 452 will accordingly be wound up just enough to supply the required energy for imparting a half turn to the picker.

The clutch 473 comprises a driving member 474 which is secured to the shaft 466,
and a driven member 476 which is secured to the hub of the gear 462. The driving clutch member 474 (Fig. 24) comprises a hub which is pinned to the shaft 466 and from which projects a radial arm 478 to the outer end of which is pivoted a lever 480 carrying a driving pin 482. The driven clutch member 476 (Figs. 2, 9 and 10) comprises a disk which is provided with a rounded peripheral projection 484 and which, together with another disk hereinafter described, is pinned to the inner end of the hub of the gear 462 and is adapted to rotate upon the shaft 466. The driving pin 482 projects laterally from the lever 480 and the side of the pin is held yieldingly against the periphery of the driven clutch member 476 by means of a spring-pressed plunger 486 which is mounted in the hub 474 of the driving clutch member and acts against the lever 480 upon the opposite side of its fulcrum from the driving pin 482.

When the side of the driving pin 482 comes into contact with the projection 484 on the driven clutch member, the movement of the pin away from the shaft 466 is resisted with sufficient force to cause the driven clutch member 476 to be rotated if it is free to rotate at that time. Means is provided, however, for normally restraining the rotation of the clutch member 476 and this means is automatically operated, as the picker starts its movement toward the lift in the die, to release the clutch member and permit it to rotate, and upon the return of the picker to arrest the rotation of the clutch member after it has made one complete revolution.

The means for restraining the rotation of the driven clutch member 476 comprises a pawl 488 which is pivotedly mounted on a horizontal shaft 490 that is supported above the shaft 493. The pawl 488 is hooked at its free extremity to engage a shoulder in the periphery of the disk 492 which is secured, together with the driven clutch member 476, to the hub of the gear 492. A tail 494 extends from the pawl 488 on the opposite side of the shaft 490 and a spring 496 acts upon the tail of the pawl in a direction to disengage the hooked end of the pawl from the shoulder of the disk 492. Normally the pawl is held in position to restrain rotation of the disk 492 by means of a dog 498 (Figs. 13 and 24) which is pivoted to the side of the casing 77 and is provided with a curved arm 500 extending forwardly beneath a lateral extension 502 on the tail of the pawl 488 and a second curved arm 504 which is lowered downwardly into the path of the spool 398 on the shaft 490. When the picker is in its retracted position, the dog 498 is positioned by the spool 398 so that the pawl 488 is maintained in operative position against the action of the spring 496. Upon the rearward movement of the picker the spring 496 lifts the pawl 488 and permits the disk 492 and the gear 492 to rotate. A return movement of the picker, however, positions the hooked end of the pawl 488 in the path of the shoulder of the disk 492 in time to stop the rotation of the disk after it has made one complete revolution. A pawl 506, which is pivoted alongside the pawl 488 on the shaft 290, is adapted to co-operate with a shoulder formed on the perimeter of an annular flange 508, projecting from the inner end of the hub of the gear 462, to prevent rotation of the gear under the influence of the spring 452, in a direction opposite to that in which it is driven by the clutch 473.

The escapement wheel 454, as shown particularly in Figs. 18 and 25, is constructed of two disks that are pinned together and are secured to the shaft 400. Each disk is formed with a shoulder 509 upon its periphery, which is adapted to co-operate with the opposite ends of a pallet 510 (Figs. 9, 10 and 25) which is secured upon the shaft 490 above the escapement wheel and is adapted to be rocked alternately in opposite directions to control the rotation of the picker. The two disks constituting the escapement wheel are assembled in the shaft 490 with the two shoulders 509 so positioned radially with respect to each other that a half revolution will be imparted to the picker at each actuation of the pallet.

The means for rocking the shaft 490 to actuate the pallet 510 comprises an arm 512 (Figs. 1 and 10) which is secured to the outer end of the shaft and is connected by a pitman 514 with an eccentric 516 on the outer end of the shaft 498. Each time the position of the pallet 510 is shifted, the picker is turned 180° by the torsion spring 492 and by reason of the driving connections between the shaft 496 and 498, herebefore described, the rotation of the picker is permitted to occur only upon alternate retractions thereof, so that alternate lifts only will be turned.

If the picker is permitted to operate irrespective of whether or not a lift has been cut into the die, it may happen, after one or more idle operations of the picker, that the sequence of the lift-turning operation and the feed movement of the stock will become such that when a new lift is seized by the picker and withdrawn from the die, the lift will be turned or will fail to be turned, as the case may be, so that when delivered to the magazine 38 it will be improperly positioned therein, i.e. its thick edge will be opposite rather than alternating with the thick edge of the lift at the end of the stack. In order to prevent the sequence of the lift-turning and strip-feeding operations from
being thus disturbed, means is provided for preventing the driven clutch member 476 from being released so that the torsion spring 452 will not be wound up nor the escapement wheel 454 released if the stock has not been fed across the die into position for the cutting of a lift.

The means for preventing the release of the clutch member 476 comprises a stop finger 520 (Figs. 9 and 14) which is pivoted on a portion of the frame 72 for oscillation in a horizontal plane, and is normally maintained with its forward end behind the spool 398 so as to prevent the spool from being driven by the spring 426 away from the dog 498 and thus permitting the pawl 488 to be raised. Normally the stop-finger 520 is automatically retracted from the path of movement of the spool 398 upon the advancement of a piece of stock into position for the cutting operation so that the picker may be advanced to seize the lift cut from the stock. The retraction of the finger 520 from its normal relation with the spool 398 is controlled by means of the feeder 60.

The feeder 60 (Figs. 11, 14, 16 and 20) comprises an elongated and downwardly offset bar which is located directly beneath the end-stop 48 and projects a short distance beyond the end-stop into the path of feed of the stock. The feeder 60 is supported and guided by a pin 523 which projects upwardly from the feeder and extends through a longitudinal slot 524 in the end stop 48, permitting the feeder to be moved in the direction of feed of the strip through a distance equal to the amount which the feeder projects beyond the end of the end-stop 48. In order that the movement of the feeder caused by the advance of the stock may be utilized to swing the stop-finger 530 out of the path of movement of the spool 398, the feeder 60 is connected with the finger 520 in the following manner. The downwardly offset outer end of the feeder 60 is pivoted on a pin 526 which rides upon the flat head 530 of a horizontal rod 532 which extends forwardly from the head 530 at right angles to the feeder 60 and is mounted to slide longitudinally through a bearing 534 on the frame 72. The head 530 is of sufficient area to insure contact between the head and the roller 528 whatever the adjustment of the support 345 with relation to the die. The rod 532 extends through the bearing 534 and the forwardly projecting end of the rod is operatively engaged by an arm 536 that is secured near the upper end of the vertical rock-shaft 538 which is disposed at one side of the rod 532 and turns in bearings on the head 70. At its lower end, the rock-shaft 538 is provided with an arm 540 projecting forwardly therefrom at substantially at right angles to the arm 536 and this arm is connected by a link 542 with the stop-finger 520. A spring 544 (Fig. 10) tends to rotate the rock-shaft 538 in a direction to maintain the feeder 60 and the stop-finger 520 in their normal positions, as indicated by full lines in Fig. 14, the finger 520 serving to prevent the spool 398 from moving rearwardly on the shaft 400 so that the picker cannot be reciprocated. When the stock has been fed across the die into position for the cutting operation, the feeder 60, the finger 520, and the connecting parts are moved into the positions indicated by dotted lines in Fig. 14, and the spool 398 and the picker 52 are free to be driven toward the lift.

In Fig. 11 the feeder 60 and the end-stop 48 are shown in the positions they occupy when the cutting-block is in co-operative relation with the die. It will be apparent from examination of this figure that as the end-stop 48 is pushed laterally toward the front of the machine by the roller 346 upon the advance of the cutting-block, the movement of the end-stop is transmitted through the pin 522 to the feeder 60 swinging the inner end of the feeder forwardly about its pivotal connection with the support 345 into the position shown without moving the stop-finger 520 out of its normal position in the path of the spool 398. As the end stop 48 is returned to normal position by the spring 346 upon the return of the cutting-block, its movement is transmitted through the pin 522 to the feeder 60 so that the feeder is also returned to normal position. In returning to normal position the feeder performs the function of a die-stripper as it strips the scrap at the leading end of the stock from the die.

As each lift is released after being carried forwardly through the die by the co-operative action of the picker and the ejector, the lift falls by gravity into the magazine 56 which is located in the head 70 beneath the picker mechanism. The magazine is constructed and arranged to support the lifts delivered thereto in a horizontal column extending perpendicularly to the direction in which the strips are fed across the die. Each lift falls in an edgewise direction into the rear end of the magazine 56 in front of the stacking blades 58 which are operated to push the lift laterally a short distance toward the front end of the magazine in order to move it out of the way of succeeding lifts as they drop into the magazine and to bring it into stacked relation with lifts previously delivered thereto so that a horizontal stack is progressively built up from the rear. It is to be understood that the present in-
vention is not restricted to the delivery of the lifts to the magazine 56 through the agency of gravity inasmuch as positively actuated transfer mechanism may be employed for this purpose.

As shown in Figs. 13, 15, 21 and 22, the magazine comprises a horizontal platform 550 which supports the lower edges of the lifts and a pair of vertical side-walls 552 and 554 for guiding and aligning the lateral edges thereof. The platform 550 extends transversely of the machine directly beneath and parallel to the shaft 400 of the picker mechanism, and the side-walls 552 and 554 comprise a pair of oppositely disposed horizontally extending strips, the faces of which are disposed in vertical planes in order that lifts of different sizes may be accommodated and properly supported and guided in the magazine 56. The side-walls 552 and 554 are supported in the head 70 with provision for concurrent adjustment toward and from each other and the platform 550 is supported with provision for vertical adjustment to vary its relation to the side walls.

The side wall 552 is supported by a pair of arms 556 (Figs. 15 and 21) the upper ends of which are severally pivoted to a pair of lugs 557 projecting from the outer face of the side wall 552, while the lower ends of the supporting arms 556 are severally secured to a rock shaft 558 which is journaled at its opposite ends in suitable bearings formed respectively in the head 70 and in a rectangular frame 560 that is secured to the head 70 at the front thereof. The side wall 552 is adapted to be adjusted inwardly or outwardly by means of a lever 562 which is fulcrumed on a stud 564 projecting from the frame 560, the upper end of the lever being pivotally connected to an extension of one of the lugs 557 on the side wall. The lower end of the lever 562 is connected by a link 566 to the upper end of an arm 568 which is secured to a rock-shaft 570 that is journaled in bearings in the head 70. The rock-shaft 570 is actuated by an arm 572 which is secured thereto and connected at its lower end by a link 574 with the sleeve 360 on the adjusting shaft 362 so that the side wall 552 may be adjusted, by means of the hand wheel 364 on the shaft 362, concurrently with the end-stop 48 and the die-stripper 50. In order that the side wall 554 may be adjusted concurrently with the side-wall 552, and to a corresponding extent, the side-wall 554 is supported by a pair of upright arms 576, the upper ends of which are severally pivoted to a pair of lugs 578 projecting from the outer face of the side wall. The lower ends of the supporting arms 576 are pivotally mounted on studs 580 one of which projects from the head 70, while the other projects from the frame 560. The arms 576 are connected by means of a cross-bar 582 so as to operate in unison. The side wall 554 is adjusted inwardly and outwardly by means of a lever 584 which is fulcrumed on a stud 586 on the head 70, the upper end of the lever being pivotally connected to an extension of one of the lugs 578. The lower end of the lever 584 is connected by means of a bent link 588 with a downward extension 590 of the arm 568 on the rock-shaft 570.

The horizontal platform 550 which supports the lower edges of the lifts in the magazine 56 is carried at the upper ends of a pair of vertical posts 592 which are mounted with provision for longitudinal sliding movement in guideways 594 in the head 70. In order that the posts 592 may be raised or lowered in their guideways to adjust the elevation of the platform 550, a pair of arms 596 which are formed integrally with the arms 566, extend from the rock-shaft 570 to points beneath the platform 550. Each arm 596 is provided at its inner end with a stud 598 and each stud 598 is received between the annular flanges of one of a pair of spools 600 that are severally secured to the posts 592 between the platform and the respective guideway 594. Thus the adjustment of the platform is effected concurrently with the adjustment of the sidewalls of the magazine and also concurrently with the adjustment of the end-stop 48 and the die-stripper 50.

As a lift falls into the magazine 56, it assumes the position shown by dash lines in Fig. 13 and is then moved forwardly in the magazine by means of the stacking-fingers 58 which deliver the lift in a forwardly inclined position, as indicated at 602 in Fig. 13, in order to prevent the lift from falling backwardly in the magazine upon the return of the stacking fingers. The stacking fingers 58 extend upwardly on opposite sides of the platform 554 from a sleeve which is journaled at the upper ends of a pair of supporting arms 604 upon a rod 606 carried by said arms. The supporting arms 604 rise from a sleeve that is mounted to oscillate upon a fixed horizontal rod 608.

In order that the stacking fingers 58 may be actuated to move the lift forwardly in the magazine and tilt it into a forwardly inclined position, the fingers are swung forwardly by the oscillation of the supporting arms 604 about the rod 608 and during this movement they are also swung independently about the pivot rod 606. To this end an arm 610 extends forwardly from the sleeve connected by stacking fingers 58 and is pivoted to the upwardly extending arm of a bell-crank lever 612 that is fulcrumed on a fixed rod 613. The outer arm of the bell-crank lever 612 is connected by a link 614 with one end of a rocker arm 616 (Figs. 14, 15, 21 and 22).
8 and 12) that is pivoted on a stud 617 projecting from a fixed part of the frame 72 and the front end of which is connected by a link 618 with an arm 620. The arm 620 is secured to the rock-shaft 332 (see also Fig. 7) to which is also secured the arm 334 which is actuated by the cam 130. Inasmuch as alternate lifts are given a half rotation in their own planes before being released by the picker and allowed to drop into the magazine, it will be apparent that they will be stacked therein with their thick and thin edges alternating, as shown in Fig. 13.

In order to provide lateral support for the lift at the forward end of the stack in the magazine 56, a block 628 (Fig. 13) is provided on the platform 550. The rear of the lift supporting face of the block 628 is inclined downwardly and rearwardly so as to support the lifts at the required angle and the block is mounted to slide on the platform 550 so that it may be advanced step by step as the stack increases in length.

In order to further insure against possibility of the lifts falling backwardly in the magazine 56 after they have been actuated upon by stacking fingers 68, a pair of lift retaining paws 630 (Figs. 13, 21 and 22) are provided for positively maintaining the lifts in stacked relation. These paws 630 are pivotally mounted at their forward ends in longitudinal slots in the side-walls of the magazine and are provided near their rear ends with lugs 632 which normally project into the magazine in the path of the lifts as they are moved forwardly between the paws by the stacking fingers. The paws 630 are yieldingly pressed inwardly by means of leaf springs 634, the extent of inward movement of the paws being limited by the engagement of the rear extremities thereof with the side walls adjacent the rear of the slots in which paws are mounted. As the lifts are pushed forwardly by the stacking fingers 55 the lateral edges of the lifts engage cam faces 636, severally formed on the lugs 632, causing the lugs to yield outwardly to permit the lifts to pass beyond them. The paws 630 are then forced inwardly by the spring 634 and the shoulders which are formed at the forward edges of the lugs 632 prevent the return of the lifts.

The lifts thus stacked in the magazine may be removed therefrom, still in their stacked relation, and conveniently introduced into the magazine of an automatic heel-building machine such, for instance, as the machine disclosed in the co-pending application, Serial No. 208,443, hereinafter referred to, or other machines adapted to operate automatically upon the lifts.

The strip of stock which is being operated upon finally becomes exhausted to such an extent that, although there is still enough stock left to produce one more complete lift, the remnant of the strip does not extend from the die to the gripper jaws 44 and 46 of the main feed mechanism when these jaws are at the limit of their movement away from the die. When this condition occurs, the main feed mechanism cannot be relied upon to advance the remnant of the strip completely across the die since the cutting-block is not retracted far enough to permit the gripper jaws to approach into close proximity to the die. In order that such a remnant of stock shall be fed completely across the die, so as to insure the cutting of a complete lift therefrom, the auxiliary pusher fingers 62 are provided.

As shown in Figs. 11, 16 and 18, auxiliary pusher fingers 62 extend horizontally at the forward side of the strip which is being operated upon and are arranged respectively above and below the gripper jaw 44 of the main feed mechanism. These auxiliary pusher fingers project from a hub 638 that is pivotally mounted upon a slide 640 (Fig. 1) that is mounted to reciprocate toward and from the die in ways 641 (Fig. 18) formed beneath the supply table 40. The stock engaging ends of the auxiliary pusher fingers are adapted to be yieldingly pressed against the front face of the strip by means of a spring-pressed plunger 642 (Fig. 11) that is carried by the slide 640 and acts against an arm 644 projecting forwardly from the hub 638. During the normal operation of the main feed mechanism, the auxiliary pusher fingers 62 are reciprocated idly toward and from the die across the front face of the strip. When, however, the strip has been so far exhausted that it fails to extend from the die to the gripper jaws 44 and 46 it is desired to produce one more complete lift, the auxiliary pusher fingers are moved laterally behind the rear edge of the strip as they reach the limit of their movement away from the die, and upon their next movement toward the die they advance the strip across the die until its leading end strikes the end-stop 48.

The auxiliary pusher fingers 62 are reciprocated by an arm 646 (Figs. 1 and 5) which is mounted for oscillatory movement on the rod 312 at the opposite side of the segment 316 from the arm 310 which actuates the main feed jaws, said arm being operatively connected at its upper end with the slide 640. The arm is oscillated by means of the segment 316 with which it is connected by means of a yielding coupling comprising a spring-pressed plunger 648 (Fig. 5) on the side of the arm 646, the plunger being adapted to engage a V-shaped notch 650 in a periphery of the segment 316. As the segment 316 is oscillated in the di-
rection of feed, the auxiliary pusher fingers are yieldingly advanced toward the die to feed the remnant of the strip of stock against the end-stop 48 through the yielding connections just described. Inasmuch as the arm 646 is longer than the arm 310, which reciprocates the gripper jaws 44 and 46, the auxiliary pusher fingers will be given a longer feed stroke than the gripper jaws, and the difference in length of the two arms is sufficient to insure that the remnant of the strip will be advanced completely across the die. As the segment 316 oscillates in a direction opposite to the direction of feed, a screw 652 that is threaded through a lug on the side of the segment 316 engages the adjacent longitudinal edge of the arm 646 and positively returns the arm and the pusher fingers 62. A lug 654 on the upper pusher finger 62 is adapted to engage a portion of the die-ripper 50 upon the advance of the pusher fingers to limit the advance of the fingers and thus prevent the possibility of the fingers coming into contact with the die. In order to prevent the pusher fingers 62 from rubbing against the front face of the strip upon their return movement and thus tending to move the strip backwardly, an arm 656 (Fig. 18) rises from the sleeve 258 that is connected with the main feed jaw 44 and is adapted to engage the lower pusher fingers 62 as the main gripper jaws are opened and swing the pusher fingers forwardly to hold them clear of the strip during their return movement.

When the remnant of a strip becomes too short to produce another complete lift, this fact is detected by the stock-feeder 64 which controls the operation of the strip-supporting fingers 42 which are thereupon retracted rearwardly to automatically supply a new strip to the stationary feed platform 38. This occurs before the cutting-block is retracted from the die and while the movable strip-supporting platform 38 is held in its forwardly displaced position. In order to permit the waste piece at the end of the strip to be discarded, provision is made for locking the movable platform 38 so as to prevent it from returning to normal position immediately upon the retraction of the cutting-block. The waste piece then being unsupported, falls into a chute 693 and is discarded.

Referring particularly to Figs. 1, 3, 12 and 18, the strip-supporting fingers 42 are secured to a rock-shaft 658 which is journaled in suitable bearing brackets on the rear of the vertical wall 292. As shown in Figs. 12 and 18, an arm 693 which is secured to the rock-shaft 658 is connected by a link 662 with one arm of a lever 664 that is fulcrumed at 666 on a fixed part of the frame and by means of which the rock-shaft 658 is actuated. The other arm of the lever 664 is connected through a rod 668, a bell-crank lever 670 (Figs. 17 and 19) and a link 672 with the lower end of a cam lever 674. The cam lever 674 is fulcrumed on a stud 676 projecting from the frame and at its upper end carries a cam roll 678 which is adapted to ride on the side of the cam 138 on the cam-shaft 86. A spring 680 which enjorces the link 668 between a fixed portion of the frame and a collar that is secured to the link tends to hold the cam roll 678 against the cam 138. The side of the cam 138 has a recess 139 (Fig. 17) and at the proper moment in the cycle of operations of the machine the cam roll 678 encounters this recess and the spring 680 tends to actuate the cam lever 674 and retract the strip supporting fingers 42. Provision is made, however, as will shortly be described, for preventing the actuation of the cam lever 674 until it is necessary to supply a new strip of stock to the feed platform 36.

The operation of the cam lever 674 under the influence of the cam 138 also effects the locking of the movable strip-supporting platform 38 in its forwardly displaced position, so as to permit the waste end of the strip to be discarded. To this end an arm 652 projects forwardly from the cam lever 674 and is connected by a link 654 with the forwardly extending arm of a bell-crank lever 686 that is fulcrumed on a fixed pivot 688. The upwardly extending arm of the bell-crank lever 686 is provided with a roller 690 which is adapted to engage an arm 692 projecting downwardly from one of the arms 226 which support the movable platform 38. When the cam lever 674 is actuated the upwardly extending arm of the bell-crank lever 686 is swung rearwardly, into the position shown in Fig. 17, so that the roller 690 engages the arm 692 and locks the movable feed platform 38 in its rearwardly displaced position. Upon the return of the cutting-block, after the remnant of the strip is cleared from the die by the die-ripper, it is unsupported by the platform 38 and falls below the die into a scrap chute 693 (Figs. 13, 14 and 16). The chute 693 guides the scrap to one side of the machine where it is discarded. The means for normally preventing the actuation of the cam lever 674, and thus rendering inoperative the mechanism for retracting the strip-supporting fingers 42 and locking the strip-supporting platform 38 in its displaced position, comprises an arm 694 (Figs. 17 and 19) which is pivotally mounted upon a stud 696 projecting from the frame of the machine. This arm 694 is provided at its free end with a shoe 697 and is normally positioned, as shown by dotted lines in Fig. 17, so that the shoe
697 engages an abutment 698 that is carried by a forward extension of the link 672. In this way the arm 694 holds the cam lever 674 in such a position, against the force of the spring 680, that the cam roll 675 is prevented from entering the recess 139 in the cam 138. The movement of the arm 694 is controlled by the stock-feeler 64, the arm being swung downwardly to the full line position of Fig. 17 to permit the cam lever 674 to be operated by its cam when the strip of stock which is being fed across the die has reached the critical stage of exhaustion hereinafter described.

As shown particularly in Figs. 14 and 17, the stock-feeler 64 comprises a bent rod extending rearwardly from a horizontal slide 700 which is adapted for movement toward and from the front side of the strip of stock on the feed platform 36. To this end, the slide 700 is mounted in guideways formed in a supporting block 702, which is mounted in the upper part of the frame member 79 just beneath the supply table 40.

The rear extremity of the locator is located at a distance from the cutting edge of the die equal to the width of the die in the direction of feed of the strip, in order that it may effect the retraction of the strip-supporting fingers 42 and the locking of the strip-supporting platform 58 in its rearwardly displaced position upon the exhaustion of the strip to such an extent that there is not sufficient material left to produce one more complete lift. The supporting block 702 is adapted for sliding movement transversely to the direction of the reciprocation of the feeder 64 and the slide 700 so as to permit adjustment of the feeler laterally toward and from the die in accordance with the size of the die employed.

The feeler 64 is moved toward the rear of the machine after each feeding operation to ascertain whether the strip which is being operated upon is long enough to produce another complete lift and if not, to render operative the mechanism for supplying a new strip of stock to the feed platform 36 and for discarding the waste end of the old strip. The means for actuating the feeler comprises a pair of arms 704 (Figs. 12, 14 and 16) rising from a rockshaft 706 and carrying between their upper ends an actuating rod 708 which is received in a notch in the under side of the feeler slide 700. The actuating rod 708 is of sufficient length to operatively engage the slide 700 in the various positions of adjustment of the feeler 64. An arm 710 on the rockshaft 706 is connected by a rod 712 with one arm of a bell-crank lever 714 (Figs. 8 and 17) that is pivoted on the stud 696 alongside of the arm 694 with which it is operatively connected as will be described later. The bell-crank lever 714 carries at the end of its upright arm a cam roll 715 which is adapted to ride upon the side of the cam 142. A spring 716, which encircles the rod 712 between a fixed portion of the frame and a collar secured to the rod tends to hold the cam roll 715 against its cam. The side of the cam 142 has a recessed portion 144 (Fig. 17) and at the proper moment in the cycle of operations of the machine the cam roll 715 encounters this recess and the spring 716 moves the feeler 64 rearwardly. If the strip of stock which is being operated upon is long enough to produce another complete lift, it will extend across the end of the feeler 64 and prevent the feeler from completing its rearward movement and the mechanism for supplying a new strip and effecting the discharge of the waste end of the old strip will remain inoperative. When, however, the stock has been exhausted so that there is not enough left to produce another complete lift, the next rearward movement of the feeler will not be arrested by the stock and consequently the cam roll 715 will enter the recess in the cam 142, as the bell-crank lever is actuated by the force of the spring 716, and the strip supplying and waste-end discarding devices will become operative.

The connections between the bell-crank lever 714 and the arm 694 are as follows: At its pivoted end the arm 694 is provided with an upwardly extending lug 717 in which is secured a forwardly projecting stud 718 that extends through an aperture in a lug 720 on the adjacent side of the upright arm of the bell-crank lever 714. A spring 722 is coiled about the stud 718 between the lug 720 and a pair of nuts 724 that are threaded onto the outer end of the stud. The movement of the bell-crank lever 714 as the roll 715 enters the recess in the cam 142, is transmitted positively, through the lug 720, to the said lever and the lug 717 on the arm 694, to lower said arm out of the path of the abutment 698 which is then moved above the shoe 697 by means of the cam 138, into the position indicated in Fig. 17. The yielding connection, comprising the spring 722, between the bell-crank lever 714 and arm 694, permits said lever to be moved in the opposite direction by its cam before the abutment 698 is retracted from above the shoe 697 through the operation of the cam 138. Upon the subsequent retraction of the abutment 698 the spring 722 restores the arm 694 into its raised position and the mechanism for retracting the strip-supporting fingers 42 and locking the strip supporting platform 38 again becomes inoperative.

In order that the stock-feeler 64 may be adjusted laterally toward and from the die in accordance with the size of die employed,
the supporting block 702 is mounted to slide in ways 726 (Figs. 12 and 15) on the upper part of the frame member 79 which extend parallel to the direction of feed of the strip.  

The supporting block 702 is adapted to be adjusted concurrently with the adjustment of the end-stop 48, the die-stripper 50 and the lift supporting platform and side walls of the lift magazine 56. To this end the supporting block 702 is adapted to be shifted in ways 726 by means of an arm 728 (Figs. 1, 12 and 15) the upper end of which is pivotally connected with the supporting block, while the lower end thereof is secured to the rear of a horizontal rock-shaft 730 that is journaled in the frame member 79. Secured to the forward end of the rock-shaft 730 is an arm 752 which extends downwardly therefrom and is provided with a roller 734 that is received in a vertical groove 736 (Fig. 14) in the rear of the sleeve 365 on the adjusting shaft 362. Throughout the operation of the machine, whenever a strip of stock has become exhausted, the feeler 64 causes the retraction of the strip-supporting fingers 42 and the locking of the strip-supporting platforms 35 in its displaced position, so that a fresh strip of stock is supplied, to the feed platform 36 and the waste end of the old piece is discarded. As long as the strips are properly supplied by the operator to the strip-supporting fingers 42, the machine will continue to operate automatically, cutting lifts, removing them from the die and progressively stacking them in automatic relation for convenient handling or transferal to other machines.  

While the particulars of construction herein set forth are well suited to one form of the invention, it is not to be understood that these particulars are essential since they may be variously modified within the skill of the artisan without departing from the true scope of the actual invention as defined by the following claims.

The invention having been described, that which is claimed as new is:

1. A stock-cutting machine having, in combination, means including a die for cutting pieces of sheet material, and means for removing the freshly cut pieces from the die prior to the cutting of other pieces and for assembling them progressively in stacked formation.

2. A stock-cutting machine having, in combination, means including a die for cutting pieces of sheet material, a magazine for the cut pieces, and means for removing the freshly cut pieces successively from the die prior to the cutting of other pieces and for delivering them to the magazine.

3. A stock-cutting machine having, in combination, means including a die for cutting pieces of sheet material, means for feeding said material to the cutting means, means for removing each freshly cut piece from the die prior to the cutting of each succeeding piece, and means for assembling the cut pieces progressively in stacked relation.

4. A stock-cutting machine having, in combination, means including a die for cutting successive pieces from a strip of material of tapering cross-section, and means for removing the pieces from the die as they are cut and assembling them in a stack with their thick and thin edges alternating.

5. A stock-cutting machine having, in combination, means including a die for cutting successive pieces from a strip of material of tapering cross-section, means for removing the pieces from the die as they are cut, turning alternate pieces to transpose their thick and thin edges, and delivering the pieces successively in stacked relation with their thick and thin edges alternating.

6. A stock-cutting machine having, in combination, means including a die for cutting pieces from a strip of material of tapering cross-section, means for seizing the successive pieces as they are cut, removing them from the die, and turning the alternate pieces end-for-end, and means for successively releasing the pieces from the seizing means and delivering them in stacked relation.

7. A stock-cutting machine having, in combination, means for cutting successive pieces from a strip of material, a magazine for receiving the pieces, means for seizing cut pieces, removing them to a point above the magazine and turning alternate pieces end-for-end, means for releasing the pieces from the transferring means so that they may be delivered to the magazine, and means operating upon the pieces as they are received in the magazine for bringing them into stacked relation with other pieces therein.

8. A stock-cutting machine having, in combination, means including a die for cutting pieces of sheet material, means for seizing the pieces as they are cut and removing them from the die, and means for releasing the pieces from the seizing means after they have been removed from the die.

9. A stock-cutting machine having, in combination, means for cutting pieces of sheet material, a magazine for receiving the pieces, means for seizing the pieces as they are cut, transferring them from the cutting means to a point above the magazine, and releasing them so that they may be delivered to the magazine.

10. A stock-cutting machine having, in combination, means including a die for cutting successive pieces from a strip of stock, a magazine for receiving the pieces, co-operating means for engaging the opposite faces of the pieces as they are cut into the die,
transferring them to a point above the magazine and releasing them so that they may be delivered to the magazine.

11. A stock-cutting machine having, in combination, a cooperating die and a reciprocating cutting-block for cutting pieces of sheet material, a longitudinally movable impaling picker disposed coaxially with said die and block, and means operable when the cutting-block is in operative position for advancing the picker towards the cutting-block to impale the cut piece within the die, and for subsequently retracting the picker to remove the cut piece from the die.

12. A stock-cutting machine having, in combination, a cooperating die and a reciprocating cutting-block for cutting pieces of sheet material, a longitudinally movable impaling picker disposed coaxially with said die and block, means operable when the cutting-block is in operative position for advancing the picker towards the cutting-block to impale the cut piece within the die, and for subsequently retracting the picker to remove the cut piece from the die, means for stripping the cut pieces from the impaling picker, and means for assembling said pieces in stacked relation.

13. A stock-cutting machine having, in combination a cooperating die and a reciprocating cutting-block for cutting pieces of sheet material of tapering cross-section, a longitudinally movable impaling picker disposed coaxially with said die and block, and means operable when the cutting-block is in operative position for advancing the picker towards the cutting-block to impale the cut piece within the die, and for subsequently retracting the picker to remove the cut piece from the die and rotating the picker to turn alternate pieces end-for-end, means for stripping the cut pieces from the impaling picker and means for assembling said pieces in stacked relation with their thick and thin edges alternating.

14. A stock-cutting machine having, in combination, means for cutting pieces of sheet material comprising a co-operating hollow die and cutting-block, and independent means for moving the successive pieces as they are cut away from the cutting edge of the die and withdrawing them through the rear end of the die.

15. A stock-cutting machine having, in combination, means for cutting pieces of sheet material comprising a co-operating hollow die and cutting-block, and means for pushing each successive freshly cut piece away from the cutting edge of the die and out through the rear end of the die.

16. A stock-cutting machine having, in combination, means for cutting pieces of sheet material, comprising a co-operating hollow die and cutting-block, and an ejector reciprocating axially through the cutting-block for ejecting the successive pieces from the die as they are cut.

17. A stock-cutting machine having, in combination, means for cutting pieces of sheet material comprising a co-operating hollow die and cutting-block, and means comprising a picker for seizing the successive pieces as they are cut and removing them through the rear end of the die.

18. A stock-cutting machine having, in combination, means for cutting pieces of sheet material comprising a co-operating hollow die and cutting-block, an impaling picker adapted for longitudinal and rotary movements, and means for actuating said picker to impale a cut piece, remove it from the die and turn it through a predetermined angle.

19. A stock-cutting machine having, in combination, means including a die for cutting pieces of sheet material, and co-operating devices engaging the opposite faces of the pieces as they are cut for removing them through the rear end of the die.

20. A stock-cutting machine having, in combination, means including a die for cutting pieces of sheet material, and means for removing the pieces from the die as they are cut, said means including a reciprocating picker movable axially within the die toward one face of a piece which has been cut to seize the piece, and a reciprocating ejector movable toward the opposite face of the piece to force the piece and the picker out of the die.

21. A stock-cutting machine having, in combination, means including a die for cutting pieces of sheet material, a picker movable toward the plane of the cutting edge of the die for seizing the pieces as they are cut, and means co-operating with the picker to remove the pieces from the die.

22. A stock-cutting machine having, in combination, means including a die for cutting pieces of sheet material, means for removing the pieces from the die as they are cut including a picker, means for co-operating therewith for seizing the pieces and forcing them through the die; and means for rotating the picker to turn alternate pieces end-for-end after they have been removed from the die.

23. A stock-cutting machine having, in combination, means for cutting successive pieces from a strip of stock of tapering cross-section, a reciprocating picker movable in one direction to seize a piece as it is cut, and means for rotating the picker upon alternate return movements in a plane normal to the direction of its reciprocation to turn end-for-end the piece carried thereby.

24. A stock-cutting machine having, in combination, means including a die for cutting successive pieces from a strip of stock, a reciprocating picker adapted to advance
A stock-cutting machine having, in combination, means including a die for cutting successive pieces from a strip of stock; a magazine for receiving the pieces, a picker movably axially through the die to seize a piece cut thereby, an ejector movable in the opposite direction to force the picker with the piece held thereon through the die and transfer the piece to a point above the magazine, means for retracting the picker beyond the point to which it is removed by the ejector, and means for releasing the piece from the picker during said retraction of the latter so that the piece may be delivered to the magazine.

A stock-cutting machine having, in combination means for cutting pieces of sheet material, means for removing the cut pieces comprising a picker for seizing the pieces, a rod carrying the picker and adapted to slide in a bearing member toward and from the cutting means, means for reciprocating the rod, and means for rotating the bearing member to turn the picker and the piece seized thereby.

A stock-cutting machine having, in combination means for cutting pieces of sheet material, means for removing the cut pieces comprising an impaling picker, and means for projecting the picker suddenly into impaling relation with the piece to be removed and for subsequently withdrawing the picker.

A stock-cutting machine having, in combination, means including a die for cutting pieces from a strip of stock, feed mechanism for advancing the stock to the cutting means, a picker for removing the cut pieces from the die, and means for preventing the operation of the picker upon failure of the stock to be advanced into position to be cut.

A stock-cutting machine having, in combination, means including a die for cutting pieces from a strip of stock, feed mechanism for advancing the stock to the cutting means, a picker for removing the pieces from the die, a feeler normally located in the line of feed and adapted to be displaced by the stock as it is fed into position to be cut, and means controlled by the feeler for preventing the operation of the picker upon the failure of the strip to be advanced into position to be cut.

A stock-cutting machine having, in combination, means including a die for cutting pieces of sheet material, means comprising a picker for removing the pieces from the die, means including a spring for rotating the picker to turn alternate pieces end-for-end after they have been removed from the die, an escapement device for releasing the spring, and means for restoring the tension of the spring.

A stock-cutting machine having, in combination, means including a die for cutting pieces of sheet material, feed mechanism for advancing the stock to the cutting means, a picker for removing the pieces from the die, means including a spring for rotating the picker to turn alternate pieces end-for-end after they have been removed from the die, an escapement device for releasing the spring, means for restoring the tension of the spring, and means for preventing the rotation of the picker upon failure of the stock to be advanced into position to be cut.

A stock-cutting machine having, in combination, means for cutting successive pieces from a strip of stock of tapering cross-section, means for feeding the stock to the cutting means, means comprising a reciprocating picker for removing the cut pieces, means normally operating to rotate the picker upon alternate reciprocations to transport the thicker and thinner edges of the piece carried thereby, and means for preventing the rotation of the picker whenever a strip of stock fails to be advanced by the feeding means into position to be cut.

A stock-cutting machine having, in combination, means for supporting a strip of stock of tapering cross-section, intermittently actuated feed mechanism for imparting step-by-step movements to the strip, means comprising a die and a reciprocating cutting-block for cutting a piece from the strip at each feed movement thereof, a picker normally reciprocating after each actuation of the feed mechanism for removing the pieces as they are cut, said picker adapted to rotate on alternate reciprocations to turn end-for-end the piece carried thereby, and means rendered operative by the failure of the strip to be advanced into position to be operated upon by the cutting means for preventing the operation of the picker.
for detecting the presence of stock in position for the cutting operation and adapted to be displaced by each advance of the cutting-block and to perform the function of a die-stripper upon its return movement, and means controlled by the feeder for preventing the operation of the picker upon the failure of the strip to be advanced into position to be operated upon by the cutting means.

35. A stock-cutting machine having, in combination, means including a die for cutting pieces of sheet material, means comprising a picker adapted to advance through the die toward one face of a cut piece to seize the piece and an ejector movable in the opposite direction to engage the other face of the piece and push it through the die, a spring for moving the picker into engagement with the piece in the die, means for positively moving the ejector into engagement with said piece and ejecting the piece and the picker from the die, means for positively retracting the picker with the piece carried thereby after said piece has been ejected from the die, and a stripping member for stripping the piece from the picker during said positive retraction of the latter.

30 A stock-cutting machine having, in combination, means for cutting pieces from a strip of sheet material of tapering cross-section, and means for assembling the cut pieces with their thicker and thinner edges alternating, the material being maintained throughout the cutting and assembling operations in a substantially vertical plane.

37. A stock-cutting machine having, in combination, means for supporting and feeding in a vertical plane a strip of material of tapering cross-section, means for removing the pieces from the strip as it is fed, means for turning alternate pieces in their own planes to transpose their thicker and thinner edges, and means for stacking the pieces while maintaining them substantially in a vertical plane.

35 A stock-cutting machine having, in combination, stock-cutting means, means for feeding a strip of stock thereto, a movable platform for normally supporting said strip adjacent the cutting means, said platform being displaced from its normal supporting position at each operation of the cutting means, and mechanism for locking the supporting platform in its displaced position to permit the discharge of the waste end of the strip.

39. A stock-cutting machine having, in combination, a die arranged with its cutting edge in a vertical plane, a cutting-block adapted to co-operate with the die to cut successive pieces from a strip of stock, a movable feed platform normally positioned to support the strip in position for the cutting operation and adapted to be displaced from normal strip-supporting position by the operative movement of the cutting-block and to return to normal position on the return of the cutting-block, means for advancing the strip across the die, a feeder periodically operating to detect critical exhaustion of the strip, and means controlled by the feeder for locking the platform in its displaced position to permit waste portions of the stock to fall from the field of operations of the feeding means.

40. A stock-cutting machine having, in combination, means for cutting pieces from a strip of stock, comprising a stationary die arranged with its cutting edge in a vertical plane and a reciprocating cutting-block, a stationary feed platform for supporting the strip to be operated upon, a movable feed platform for supporting the leading end portion of the strip opposite the die adapted to be moved laterally with said portion of the strip as the latter is forced against the die by the cutting-block, means for adjusting the elevation of one of the feed platforms, and means for normally maintaining the two platforms in alignment.

41. A stock-cutting machine having, in combination, one of a plurality of interchangeable dies of different sizes arranged with its cutting edge in a vertical plane, a cutting-block adapted to co-operate with the die to cut successive pieces from the strip of stock, a movable feed platform normally positioned to support the strip in position for the cutting operation and adapted to be displaced from normal strip-supporting position by the operative movement of the cutting-block and to return to normal position upon the return of the cutting-block, means for feeding the strip across the platform, and means adapted to be set in accordance with the size of the particular die employed for determining the position of the platform with respect to said die.

42. A stock-cutting machine having, in combination, stock-cutting means, including one of a plurality of interchangeable dies of different sizes, two strip-supporting platforms normally in alignment with each other, one of said platforms adapted to be operated to effect the discharge of the waste piece at the end of the strip, means adapted to be set in accordance with the size of the particular die employed to adjust the position of one of the platforms with respect to the die, and interconnecting means between the two platforms for maintaining them in alignment.

43. A machine having, in combination, a feed platform, means for feeding a piece of stock across the feed platform, means for operating upon the stock as it is fed,
for supporting a second piece of stock above
the piece on the feed platform, and means
operating after said piece of stock has been
exhausted to a predetermined extent for re-
tracting said supporting means to deliver
the second piece of stock to the feed plat-
form.

44. A stock-cutting machine having, in
combination, a feed platform, means for
maintaining a strip of stock in a substanc-
tially vertical plane on said platform, means
for feeding the strip across the plat-
form, means for cutting successive pieces
from the strip as it is fed, a movable
strip-supporting finger normally main-
taining a second strip in a substantially
vertical plane above the strip on the feed
platform, and means operating upon ex-
haustion to a predetermined extent of the
strip being operated upon to withdraw the
supporting finger to permit the second strip
to fall onto the feed platform.

45. A stock-cutting machine having, in
combination, stock-cutting means, and me-
chanism for intermittently advancing the
stock into a definite relation to the cutting
means, comprising a stop, main and auxiliary
feeding devices including a coupling between
each feed device and the source of power
adapted to be disconnected when the stock is
advanced into engagement with the stop.

46. A stock-cutting machine having, in
combination, stock-cutting means, and me-
chanism for intermittently advancing the
stock into a definite relation to the cutting
means comprising a main feed device for
engaging the stock, an auxiliary feed device
normally operating idly and adapted to ad-
vance the stock for the last cutting opera-
tion, a common actuating member for said
devices, a yieldable coupling between each
feed device and the actuating member for
connecting the member with said feed de-
vices, and a stop which is rigid in the line
of feed for determining the position of the
stock.

47. A stock-cutting machine having, in
combination, stock-cutting means recipro-
cating feed mechanism for intermittently ad-
vancing the stock to the cutting means, a
reciprocating auxiliary feed device normal-
ly adapted to move idly across the stock in
the direction of feed and after the stock has
been exhausted to a predetermined extent to
engage the stock and advance it to the cut-
ing means.

48. A stock-cutting machine having, in
combination, stock-cutting means, main feed
mechanism for intermittently advancing the
stock to the cutting means, auxiliary feed
mechanism including a reciprocating finger
arranged normally to move idly across the
stock in the direction of feed and adapted
after the stock has been exhausted to a
predetermined extent to engage the rear end
of the stock to the cutting means, and means
for preventing said finger from rubbing
against the stock upon the return movement
of the finger and thus tending to move the
stock backwardly.

49. A stock-cutting machine having, in
combination, stock-cutting means including
one of a plurality of interchangeable dies
of different sizes, feed mechanism for yield-
ingly advancing the stock to the cutting
means, a stop rigidly positioned in the line
of feed to limit the extent of the feed move-
ment, and means including a scale for ad-
justing the stop in a predetermined posi-
tion according to the size of the die em-
ployed.

50. A stock-cutting machine having, in
combination, stock-cutting means including
one of a plurality of interchangeable dies of
different sizes, a die-stripper and means in-
cluding a scale for adjusting the stripper
in a predetermined position according to the
size of the die employed.

51. A stock-cutting machine having, in
combination, stock-cutting means including
one of a plurality of interchangeable dies of
different sizes, feed mechanism for yield-
ingly advancing the stock to the cutting
means, a stop rigidly positioned in the line
of feed to limit the extent of the feed move-
ment, a die-stripper, and means for concur-
rently adjusting the stop and the die-stri-
pper according to the size of the die em-
ployed.

52. A stock-cutting machine having, in
combination, cutting means including one
of a series of interchangeable dies of differ-
ent sizes, feed mechanism for yieldingly ad-
vancing a strip of stock to the cutting means,
an adjustable stop for limiting the extent
of the feed movement, an adjustable die-
stripper, an adjustable magazine for receiv-
ing the pieces cut from the strip, and means
for concurrently adjusting the end-stop and
the die-stripper to bring them into operative
relation with dies of different sizes and at
the same time adjusting the size of the mag-
zine to accommodate the pieces cut by the
die.

53. A stock-cutting machine having, in
combination, stock-cutting means, feed
mechanism for intermittently advancing a
strip of stock to the cutting means, a maga-
zine adjustable to receive and accommodate
cut pieces of different sizes, a feeler for de-
tecting automatically the exhaustion of a
strip, means controlled by the feeler for ef-
flecting the removal of the waste piece at the
end of the strip, and means for concurrently
adjusting the position of the feeler and the
size of the magazine in accordance with the
size of the pieces to be cut.
54. A stock-cutting machine having, in combination, stock-cutting means, feed mechanism for advancing the stock to the cutting means, a magazine for receiving the cut pieces comprising an adjustable platform for supporting the lower edges of the pieces and adjustable side walls for aligning the lateral edges of the pieces, means for concurrently adjusting said platform and side walls to accommodate pieces of different sizes, and means acting upon the pieces for transferring them to the magazine.

55. A stock-cutting machine having, in combination, cutting means, means for feeding a strip of stock to the cutting means, means engaging the leading end portion of one of the longitudinal edges of the strip for guiding the strip as it is fed into the field of operations of the cutting means, and means for holding said portion of the strip in engagement with said guiding means.

56. A stock-cutting machine having, in combination, cutting means including a die arranged with its cutting edge in a vertical plane, a platform upon which a strip of stock is supported substantially in said vertical plane, means for advancing the stock across the platform to bring it into the field of operations of the cutting means, and means for holding the bottom edge of the stock at the leading end of the strip against the platform as the strip is fed.

57. A stock-cutting machine having, in combination, cutting means including a die arranged with its cutting edge in a vertical plane, a platform upon which a strip of stock is supported substantially in said vertical plane, means for advancing the stock across the platform to bring it into the field of operations of the cutting means, and a presser foot adjacent the die engaging the upper edge of the strip for holding the lower edge at the leading end of the strip against the platform as the strip is fed.

58. A stock-cutting machine having, in combination, cutting means including a die arranged with its cutting edge in a vertical plane, means constructed and arranged to receive the lower longitudinal edge of the strip and hold the leading end portion of the strip in the plane of the cutting edge of the die, and means for advancing the stock across the die.

59. A stock-cutting machine having, in combination, cutting means including a die arranged with its cutting edge in a vertical plane, a platform upon which a strip of stock is supported substantially in said vertical plane, the platform having a groove to receive the lower longitudinal edge of the strip and hold the leading end portion of the strip in the plane of the cutting edge of the die, means for advancing the stock across the die, and means for holding the lower edge of the strip at its leading end in the groove as the strip is fed.

60. A stock-cutting machine, having, in combination, means for cutting blanks from pieces of sheet material, a receiver for the cut pieces, means for transferring the cut pieces to the receiver one at a time, and an oscillating stacking finger for engaging each successive piece in the receiver for stacking the pieces in the receiver.

61. A stock-cutting machine having, in combination, means for cutting pieces of sheet material, a magazine for receiving the pieces, means for transferring the pieces from the cutting means to the magazine, and an oscillating stacking finger for operating upon each piece after it has reached the magazine to bring it into horizontal stacked relation with the other pieces therein in such manner that all pieces have their upper edges tilted toward the leading end of the stack.

62. A stock cutting machine having, in combination, means including a die for cutting pieces from sheet material, and means for removing each freshly cut piece away from the cutting edge of the die in the direction of the rear end of the die prior to the cutting of another piece by the same die.

63. In a cutting machine, means including a die for cutting pieces from sheet material, a magazine for the cut pieces, and means for removing each freshly cut piece away from the cutting edge of the die in the direction of the rear end of the die prior to the cutting of another piece by the same die whereby the pieces travel separately toward the magazine.

64. In a machine of the class described, means including a die for cutting pieces of sheet material, and means for pushing each freshly cut piece away from the cutting edge of the die in the direction of the rear end of the die prior to the cutting of another piece by the same die.

65. In a machine of the class described, means for cutting pieces of sheet material comprising a co-operating hollow die and cutting block, and an ejector movable into the die through the plane of the cutting edge thereof for ejecting the cut pieces from the die.

66. In a cutting machine, means for cutting blanks from sheet material, means for successively seizing the blanks to remove them from the cutting means, and means for releasing the blanks from the seizing means after they have been removed from the cutting means.

67. In a machine of the character described, a co-operating die and cutting block for cutting blanks from sheet material, a picker disposed in alignment with the die and block, and means operable when
the cutting block is in operative position for advancing the picker toward the cutting block to impale the blank within the die and for subsequently retracting the picker to remove the blank from the die.

68. In a machine of the character described, means including a die for cutting blanks from sheet material and co-operating devices for engaging opposite faces of the blanks while in the die for removing them through the rear end of the die.

69. A stock cutting machine having, in combination, means including a die for cutting blanks from sheet material, and co-operating devices arranged to enter opposite ends of the die to engage opposite faces of the blanks to remove them from the die.

70. A stock cutting machine, having, in combination, stock cutting means, means for feeding a strip of stock thereto, a movable member normally operative to support the strip adjacent the cutting means, said member being displaced from its normal supporting position at each operation of the cutting means, and means for holding the supporting member in its displaced position a sufficient length of time to provide for the discharge by gravity of scrap or waste pieces before the movable member returns to operative position.

71. In a machine of the class described, means for cutting sheet material, means for advancing the sheet material into the plane of cutting operations, an abutment located directly in the line of feed of the sheet material, an auxiliary feeding device for feeding the last end of the sheet material after it has passed from the first mentioned feeding means, and couplings between both the feeding means and the auxiliary feeding means and the source of power for each constructed to be disconnected when the stock is advanced into engagement with the abutment.

72. In a machine of the character described, means for cutting blanks from sheet material, feed mechanism for advancing the sheet material to the cutting means, means for removing the blanks from the cutting means, and a feeler for controlling the blank removing means so that the latter will not be operated in case of failure of the sheet material to be advanced to cutting position.

73. In a machine of the character described, means including a die for cutting blanks from sheet material, feed mechanism for advancing the sheet material to the die, a stop for positioning the material with respect to the die, a picker for removing the blanks from the die, and a feeler associated with the stop for controlling the picker so as to prevent operation of the latter upon failure of the sheet material to be advanced into position to be cut.

74. In a machine of the character described, means including a die for cutting blanks from sheet material, feed mechanism for advancing the sheet material to the cutting means, a picker for removing the blanks from the die, means for rotating the picker at predetermined intervals to position certain of the blanks with their major axes disposed differently from those of others of the blanks, and means for controlling the rotating means so that the picker is not rotated upon failure of the sheet material to be advanced into position to be cut.

75. In a machine of the character described, means including a die for cutting blanks from sheet material, feed mechanism for advancing the sheet material to the cutting means, a picker for removing the blanks from the die, means for rotating the picker at predetermined intervals to position certain of the blanks with their major axes disposed differently from those of others of the blanks, and a feeler arranged to be controlled by the sheet material and operative to prevent rotation of the picker upon failure of the sheet material to be advanced into position to be cut.

76. In a machine of the character described, means including a die for cutting blanks from sheet material, feed mechanism for advancing the sheet material to the die, a movable member for normally supporting the sheet material adjacent the die, said movable member being displaced from its normal supporting position at each operation of the cutting means, and a feeler spaced from the die a distance equal to the width of the die and operative to control said movable member in such manner that the latter is not returned to supporting position unless material sufficient for a blank is fed into position for the cutting operation.

77. In a machine of the character described, a cutter for cutting blanks from sheet material, a movable member for supporting the material adjacent the cutter, feed mechanism for advancing the sheet material across the movable member in position for a cutting operation, a movable member for supporting a second piece of sheet material ready for introduction into the machine, and a member arranged to be controlled by the sheet material as it is fed to the cutter for controlling both of the said movable members to effect the discharge of a waste piece at the end of the sheet material being operated upon and for operating the second movable member to effect the introduction of a fresh sheet of material.

78. In a machine of the character described, a cutter for cutting blanks from sheet material, feed mechanism for advancing the sheet material to cutting position with respect to the cutter, a movable mem-
ber for supporting the sheet material adjacent to the cutter, and a feeler arranged to engage the sheet material as it is fed and operative to control the movable supporting member so that it is held out of operative position to effect the discharge of the waste piece at the end of the sheet material.

79. In a machine of the class described, a cutter for cutting blanks from sheet material, a stop for locating the material for cutting operations, a stripper for removing waste material from the cutter, a magazine for receiving the blanks, said magazine comprising side walls and a blank supporting platform, adjustable with respect to each other to accommodate blanks of various sizes, and a single means for simultaneously adjusting the side walls and supporting platform of the magazine and also the stop and die stripper.

80. In a cutting machine, means including a die for cutting blanks successively from a strip of material of tapering cross-section, and means for removing the blanks from the die and assembling them in a stack with their thick and thin edges alternating.

81. In a cutting machine, means including a die for cutting blanks successively from a strip of material of tapering cross-section, means for removing the blanks from the die, turning alternate pieces to transverse their thick and thin edges, and delivering the blanks successively in stacked relation with their thick and thin edges alternating.

82. In a cutting machine, means including a die for cutting blanks from a strip of material of tapering cross-section, means for seizing the successive blanks, removing them from the die and turning the alternate pieces end for end, and means for successively releasing the blanks from the seizing means and delivering them in stacked relation.

83. In a cutting machine, means including a die for cutting pieces from sheet material, and means operating independently of the die for removing the cut pieces through the rear end of the die.

84. In a cutting machine, means for cutting pieces of sheet material comprising a co-operating open die and cutting block, and positively operable means movable through the die for removing the cut pieces.

85. In a cutting machine, means for cutting pieces of sheet material comprising a co-operating open die and a cutting block, and means mounted independently of the die for moving the cut pieces away from the plane of the cutting edge of the die.

86. In a machine of the class described, a magazine for receiving the blanks, said magazine comprising side walls and a blank supporting platform adjustable with respect to each other to accommodate blanks of various sizes, and a single means for simultaneously adjusting the side walls and supporting platform of the magazine with respect to each other.

87. In a machine of the class described, a magazine for receiving the blanks, said magazine comprising side walls and a blank supporting platform adjustable with respect to each other to accommodate blanks of various sizes, and a single means for simultaneously adjusting the supporting platform and one of the side walls of the magazine.

88. In a machine of the class described, a magazine for receiving the blanks, said magazine comprising side walls and a blank supporting platform adjustable with respect to each other to accommodate blanks of various sizes, said side walls having pivotal supports located below the platform, and a single means for simultaneously adjusting the side walls with respect to the supporting platform of the magazine.

89. In a cutting machine, means including a die for cutting pieces from sheet material, and means operating independently of the sheet material for removing the cut pieces through the rear end of the die.

ERASTUS E. WINKLEY.