

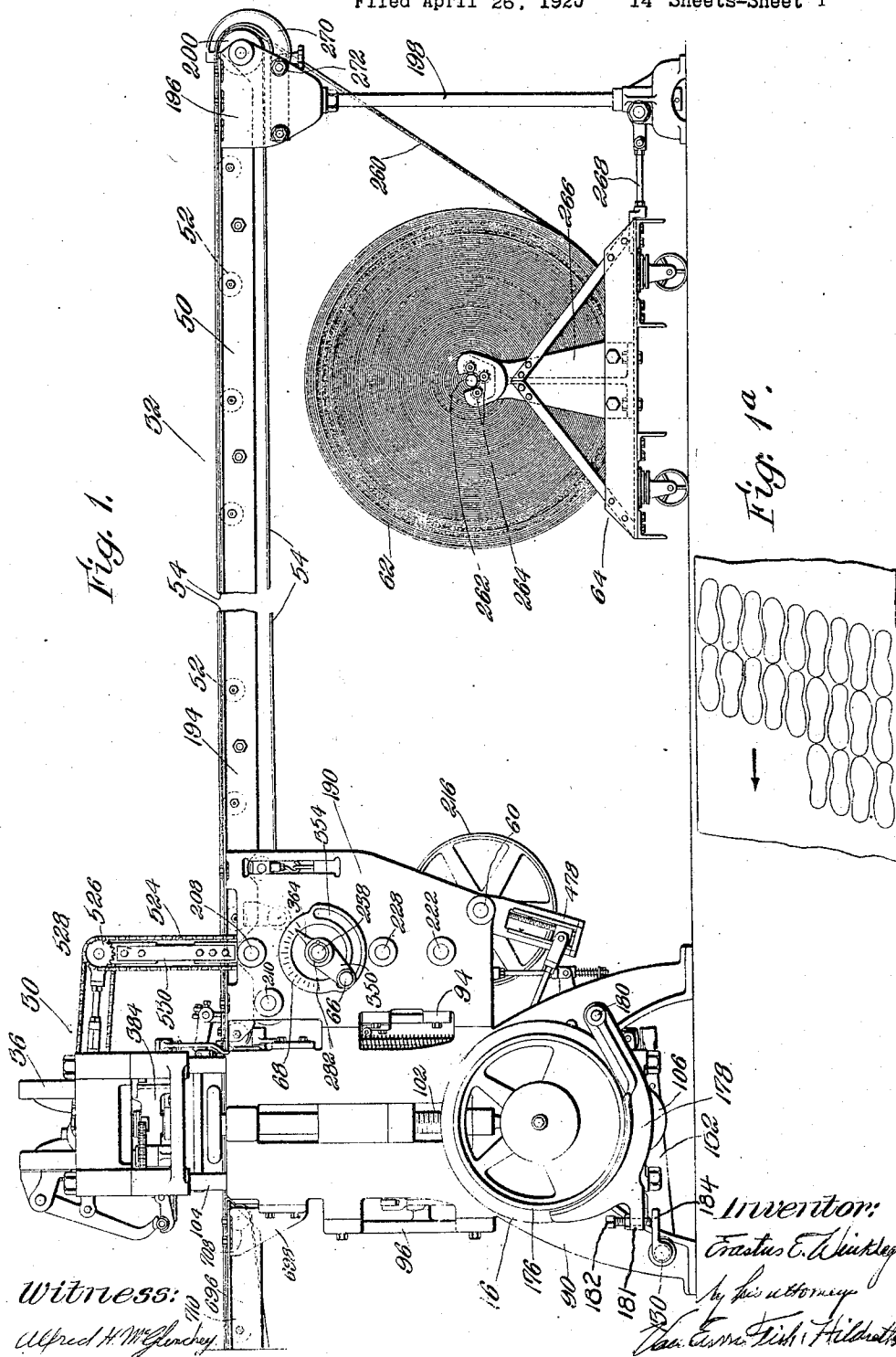
May 6, 1924.

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E. E. WINKLEY

STOCK CUTTING MACHINE

Filed April 26, 1920 14 Sheets-Sheet 1



May 6, 1924.

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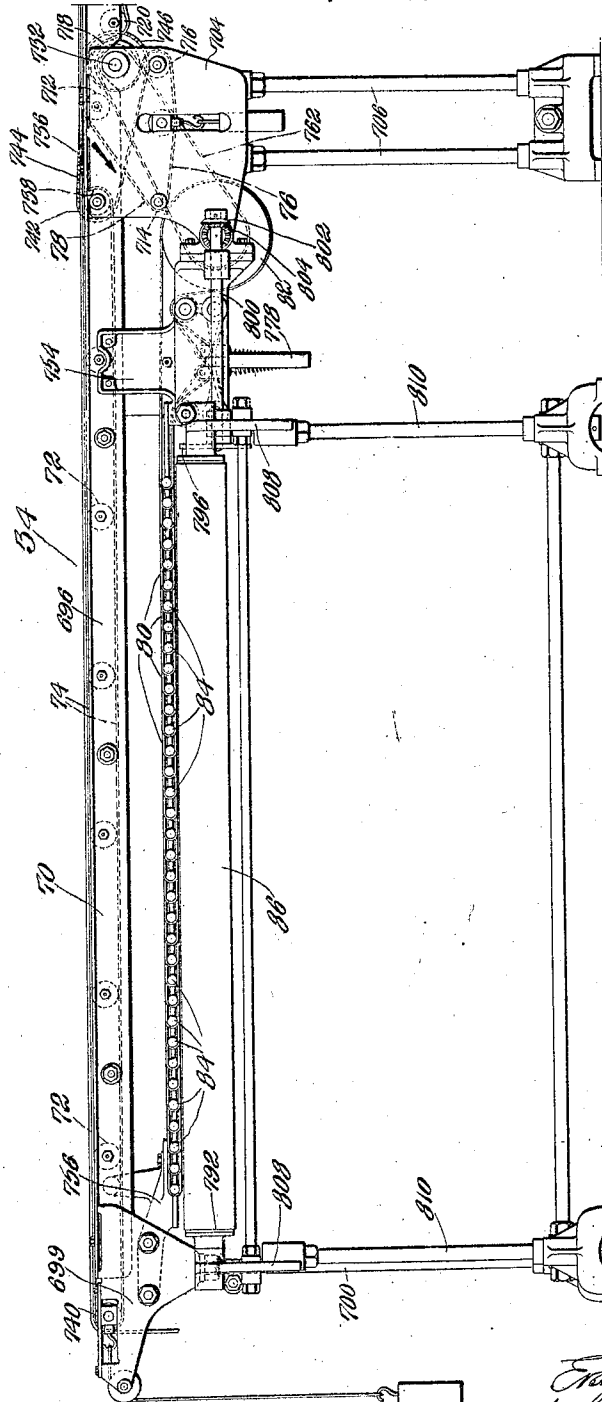
E. E. WINKLEY

STOCK CUTTING MACHINE

Filed April 26, 1920

14 Sheets-Sheet 2

Fig. 2.



Witness:

Alfred H. Winkley

Inventor:

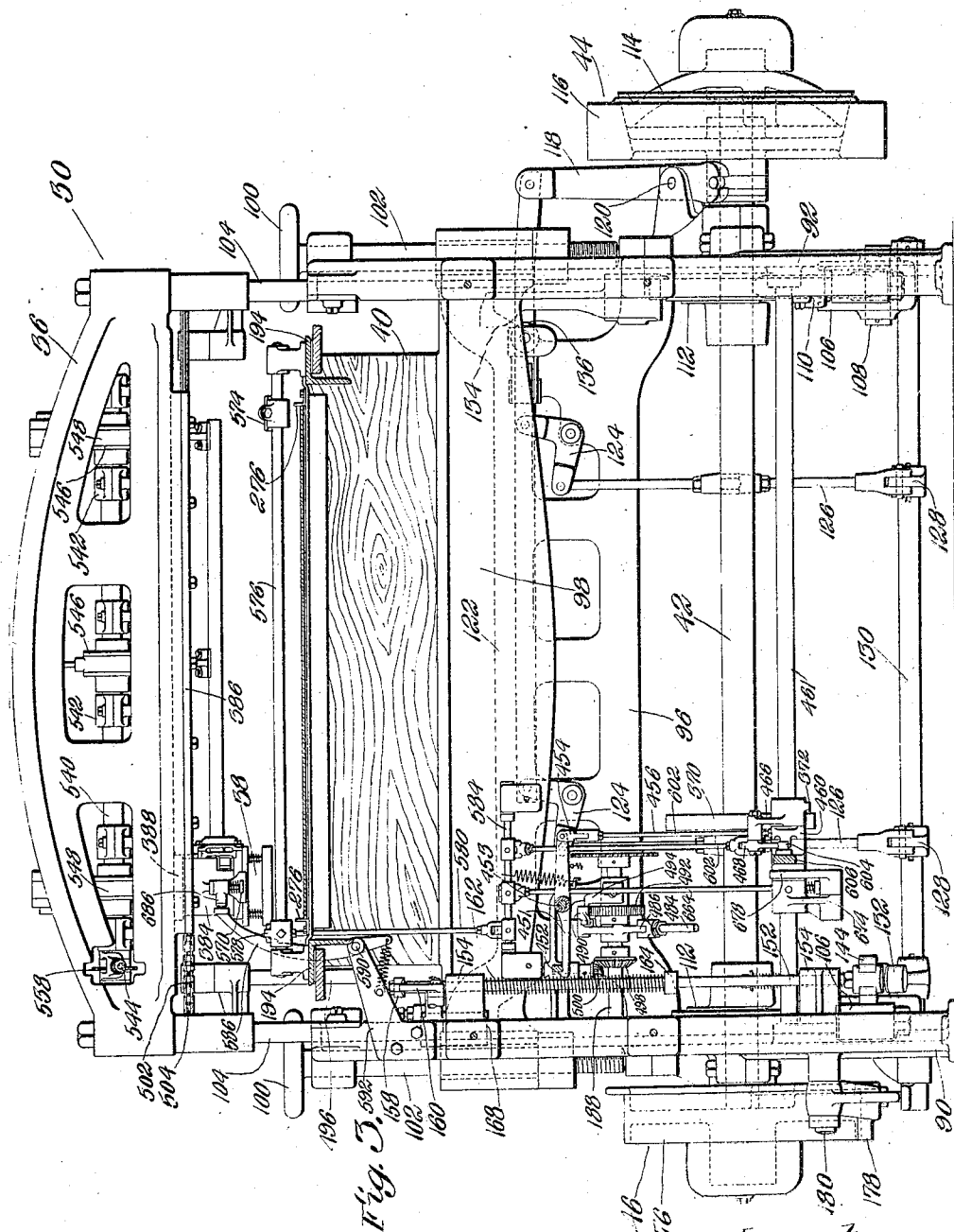
Ernest E. Winkley
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May 6, 1924.

1,493,010

E. E. WINKLEY
STOCK CUTTING MACHINE

Filed April 26, 1920 · 14 Sheets-Sheet 3



Witness:

Alfred H. McGlinchey.

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May 6 , 1924.

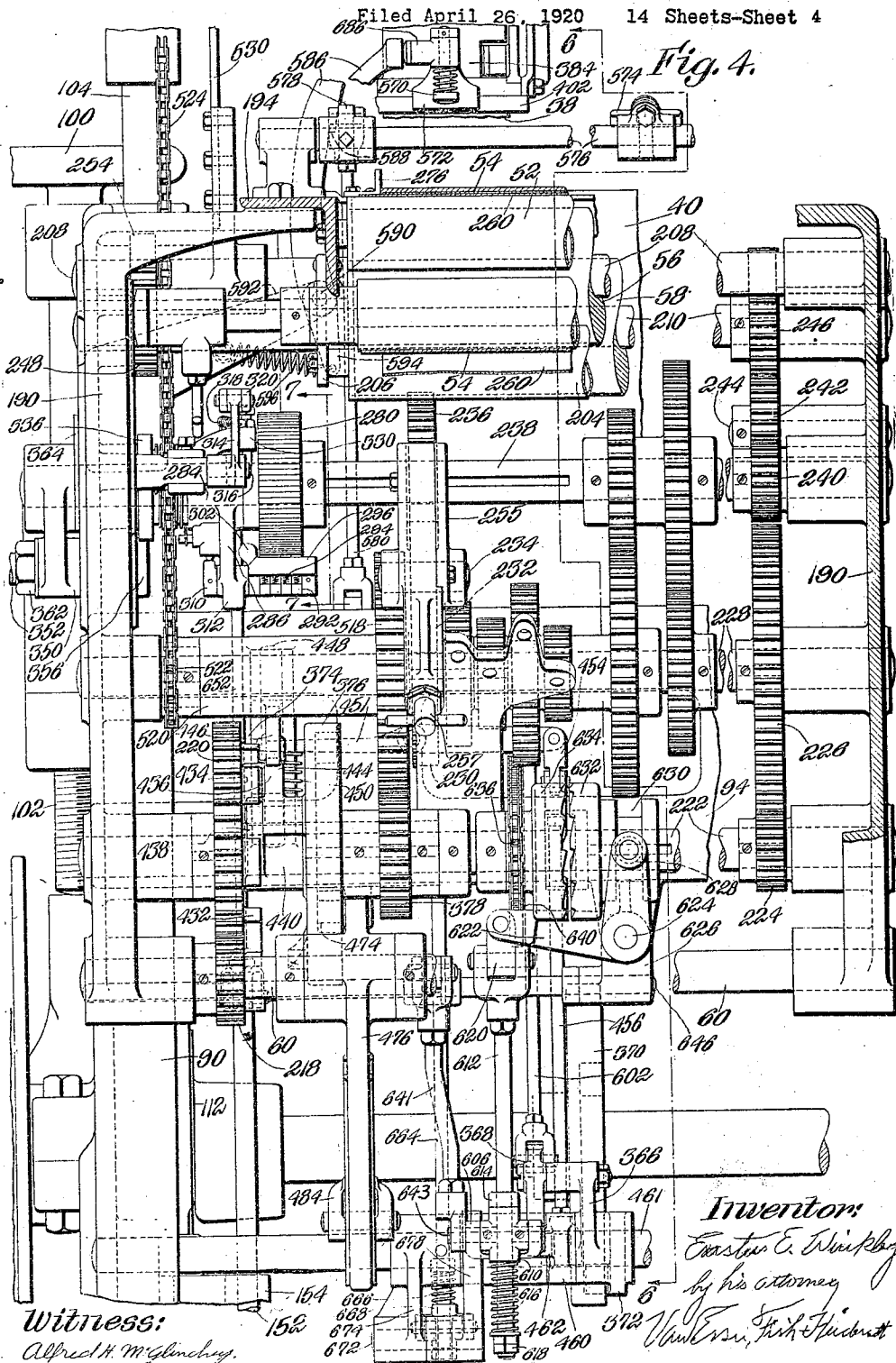
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E. E. WINKLEY

STOCK CUTTING MACHINE

Filed April 26, 1920

14 Sheets-Sheet 4



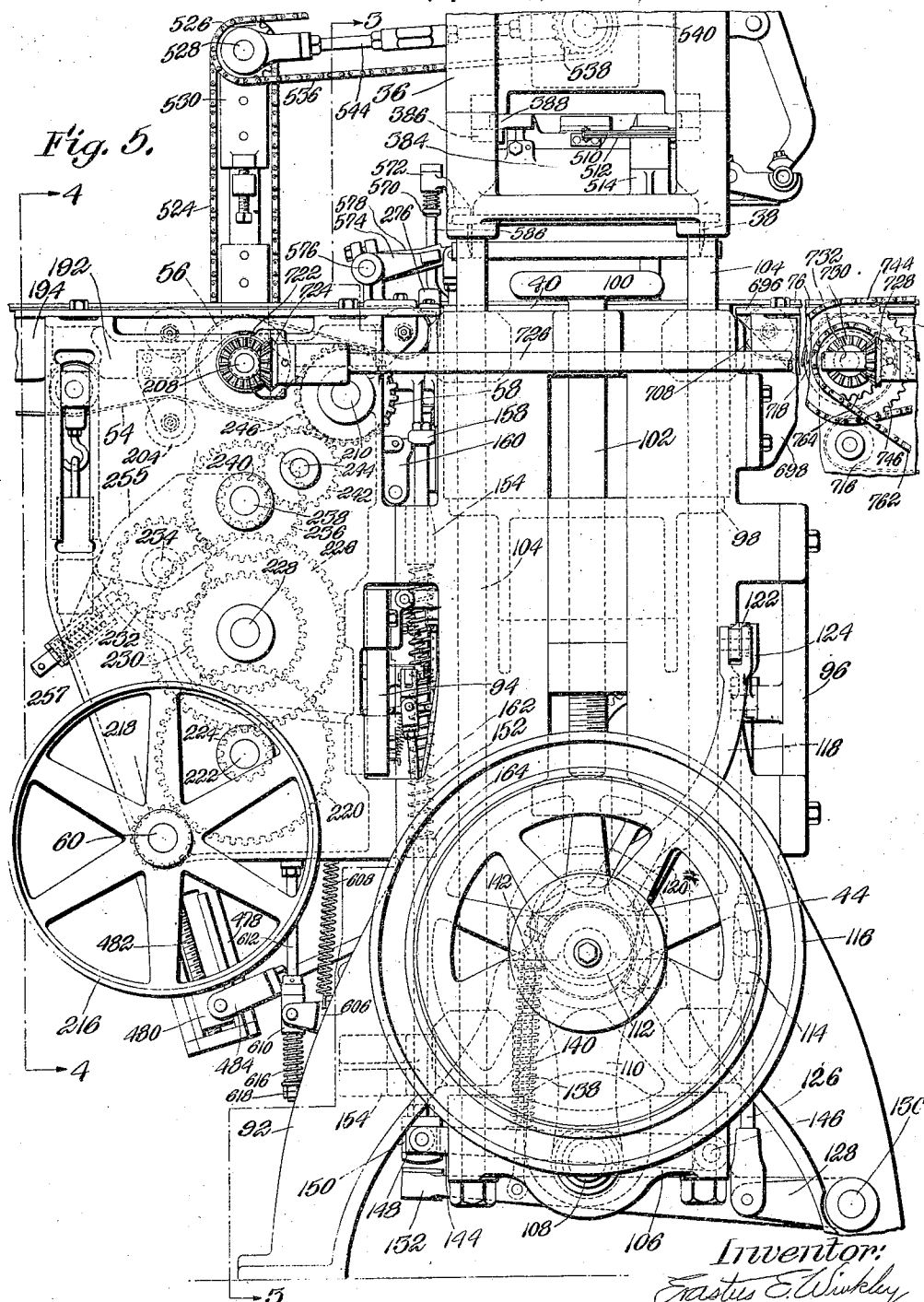
May 6, 1924.

1,493,010

E. E. WINKLEY

STOCK CUTTING MACHINE

Filed April 26, 1920 14 Sheets-Sheet 5



Witness:

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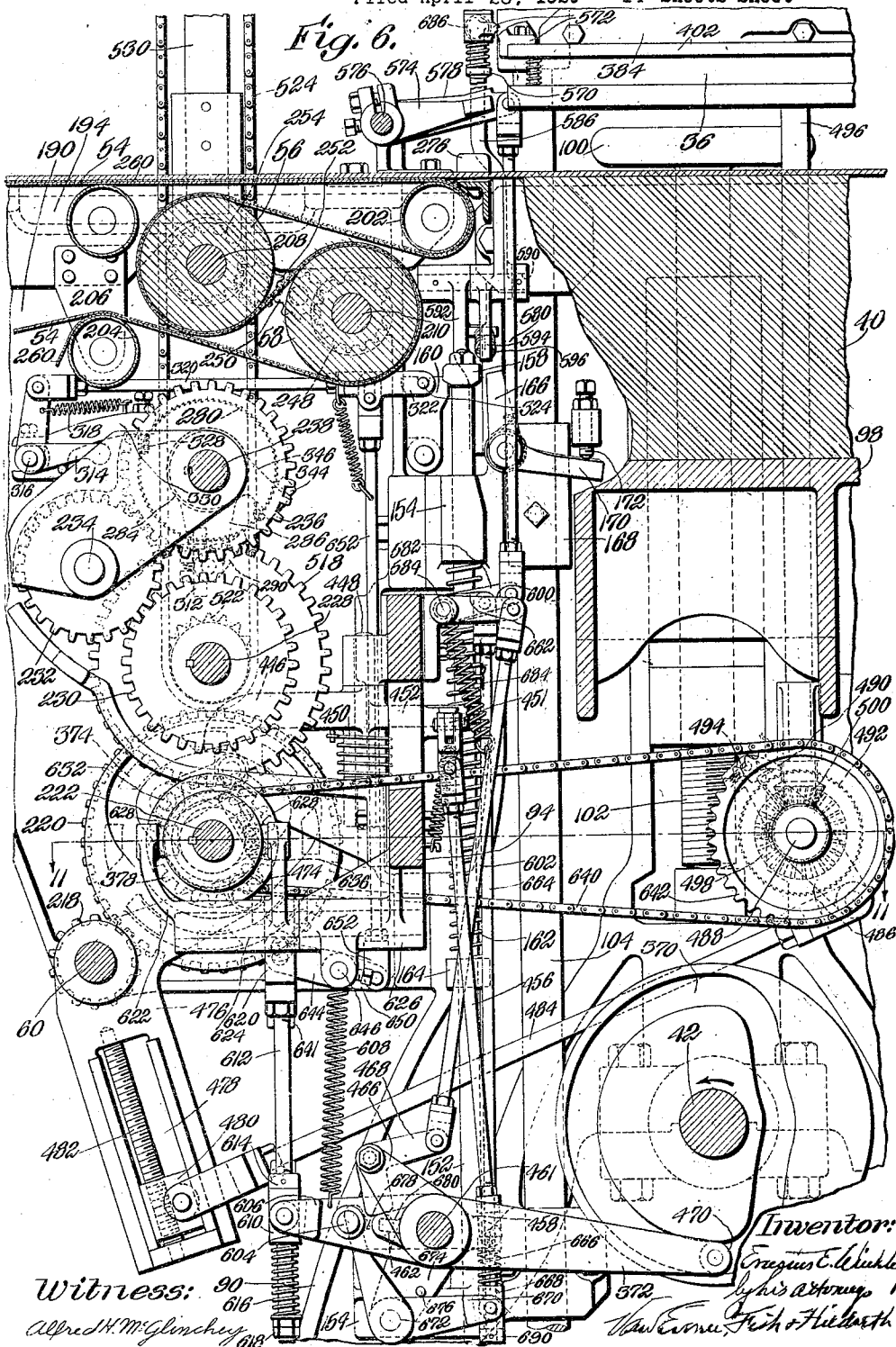
May 6, 1924.

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E. E. WINKLEY

STOCK CUTTING MACHINE

Filed April 26, 1920 14 Sheets-Sheet 6



May 6 , 1924.

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E. E. WINKLEY

STOCK CUTTING MACHINE

Filed April 26, 1920

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Fig. 7.

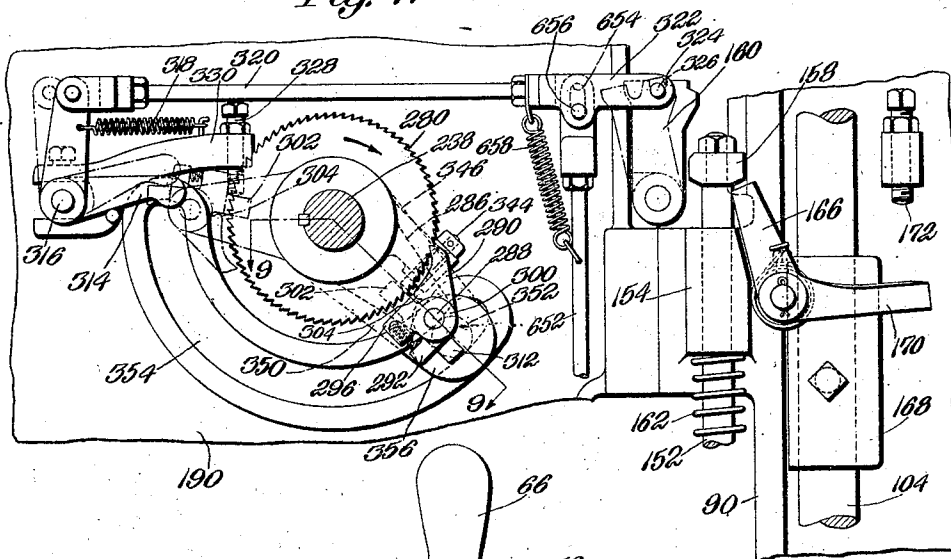
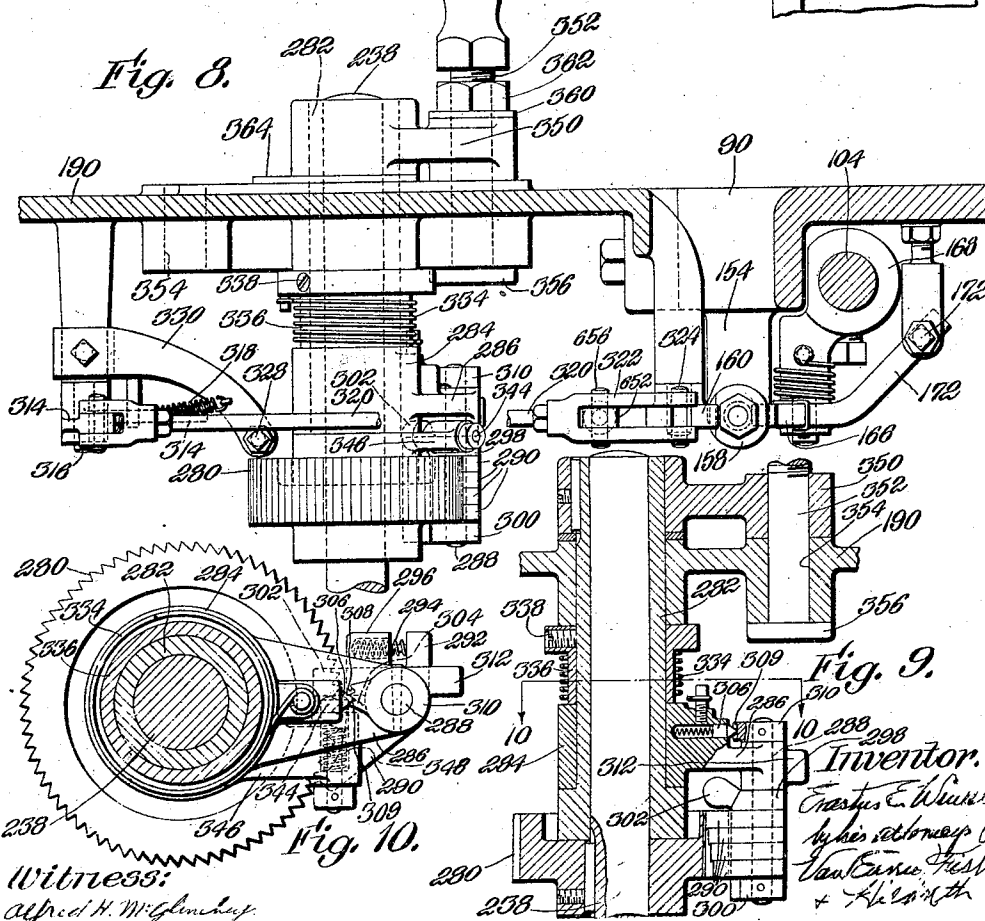


Fig. 8.



Witness:
Alfred H. McGlinchey.

Fig. 9.

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Inventor.

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Van Buren Fish
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May 6, 1924.

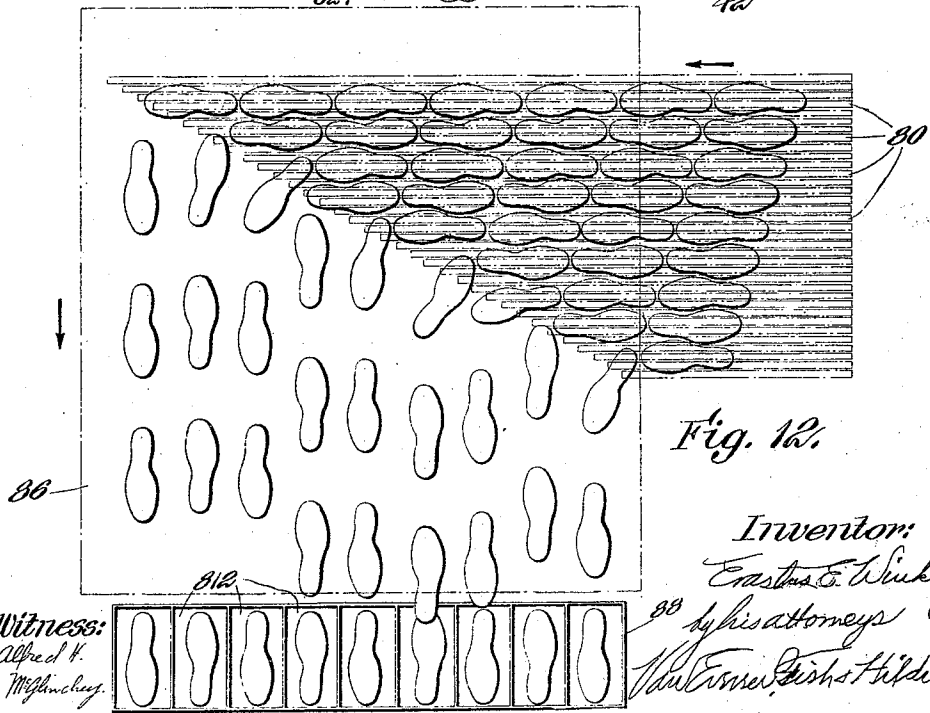
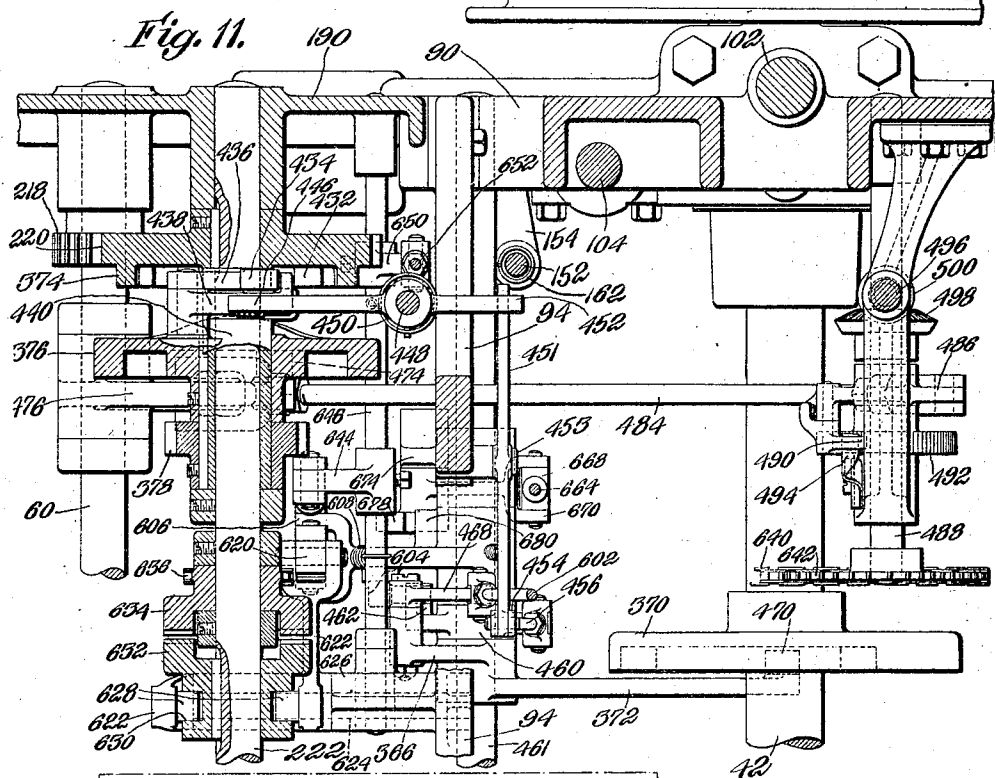
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STOCK CUTTING MACHINE

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14 Sheets-Sheet 8



Witness:
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1,493,010

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STOCK CUTTING MACHINE

Filed April 26, 1920

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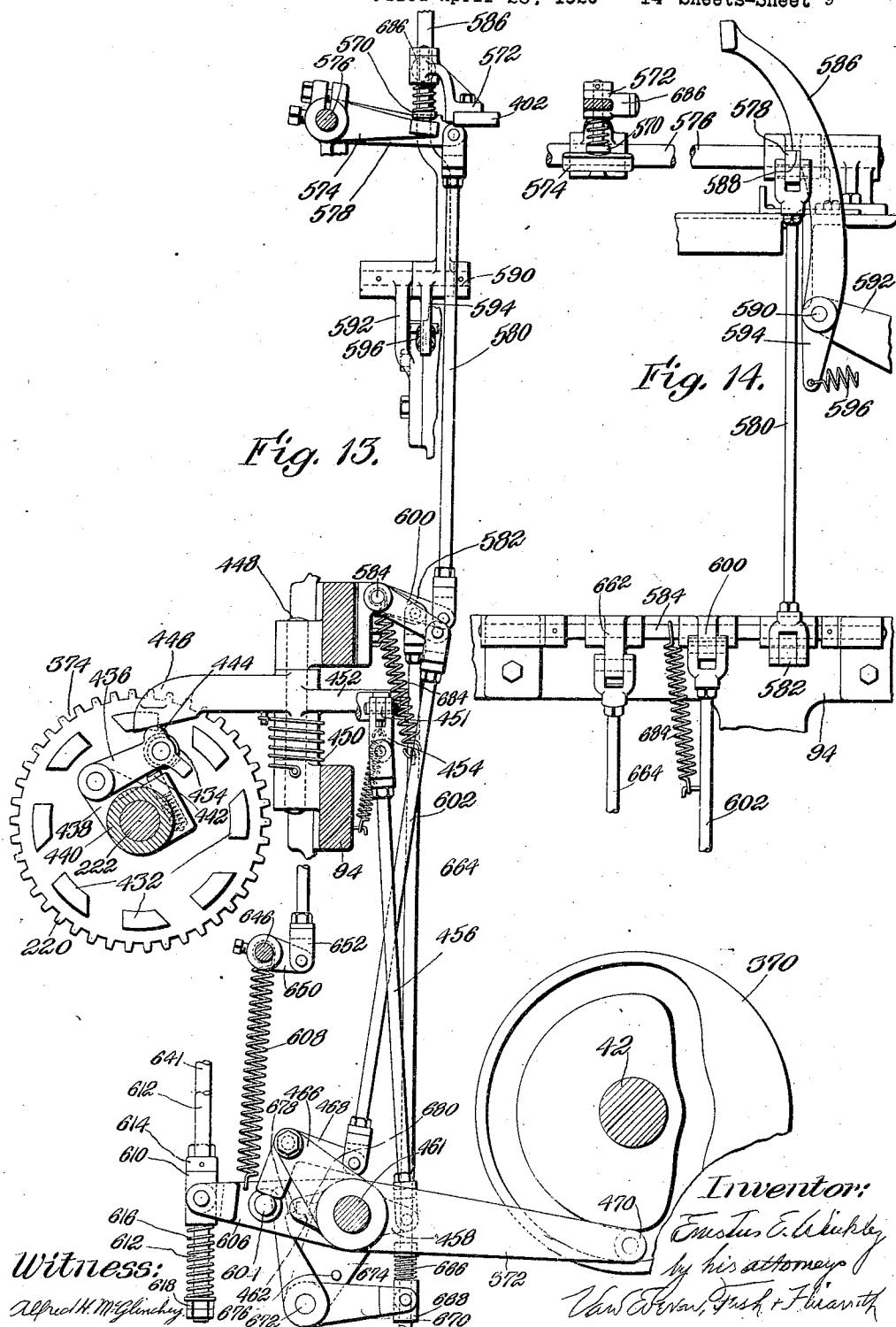


Fig. 13.

Fig. 14.

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Van Doren, Fish & Farnsworth

Witness:

Alfred H. McGlinchey

May 6, 1924.

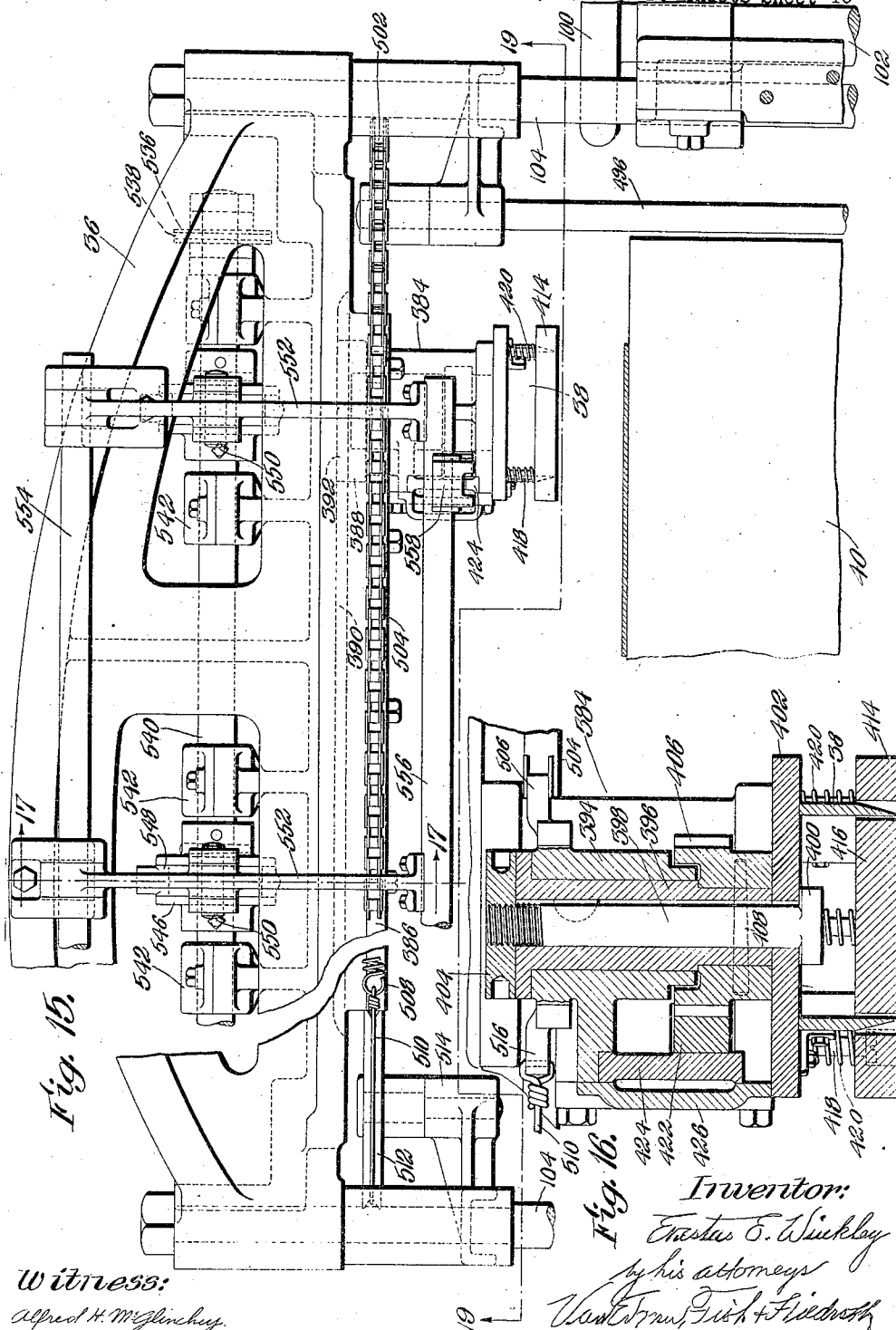
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1,493,010

STOCK CUTTING MACHINE

Filed April 26, 1929

14 Sheets-Sheet 10



Witness:
Alfred H. McGlinchey.

Inventor:
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May 6, 1924.

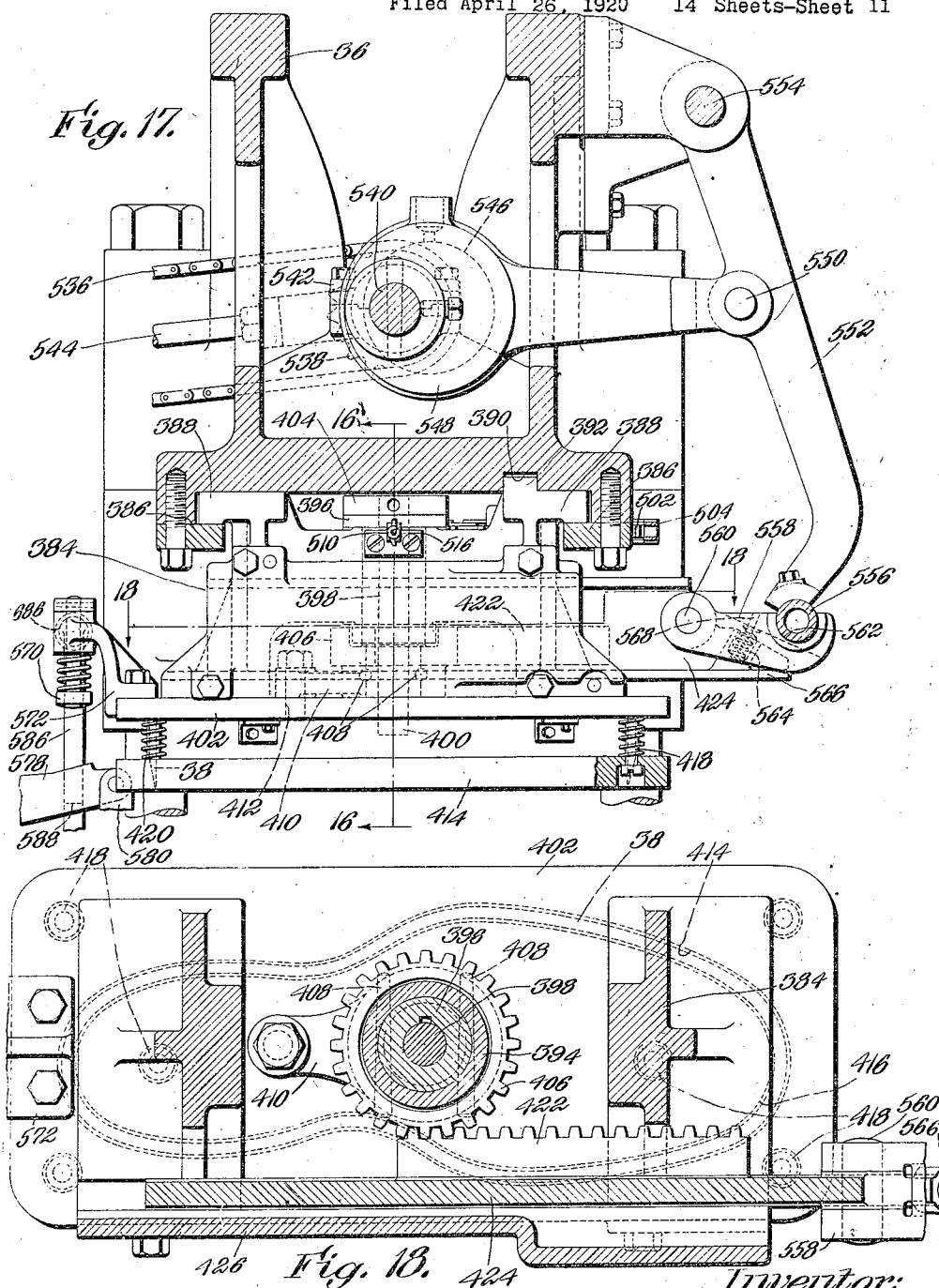
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STOCK CUTTING MACHINE

Filed April 26, 1920

14 Sheets-Sheet 11



Witness:

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1,493,010

E. E. WINKLEY

STOCK CUTTING MACHINE

Filed April 26, 1920

14 Sheets-Sheet 12

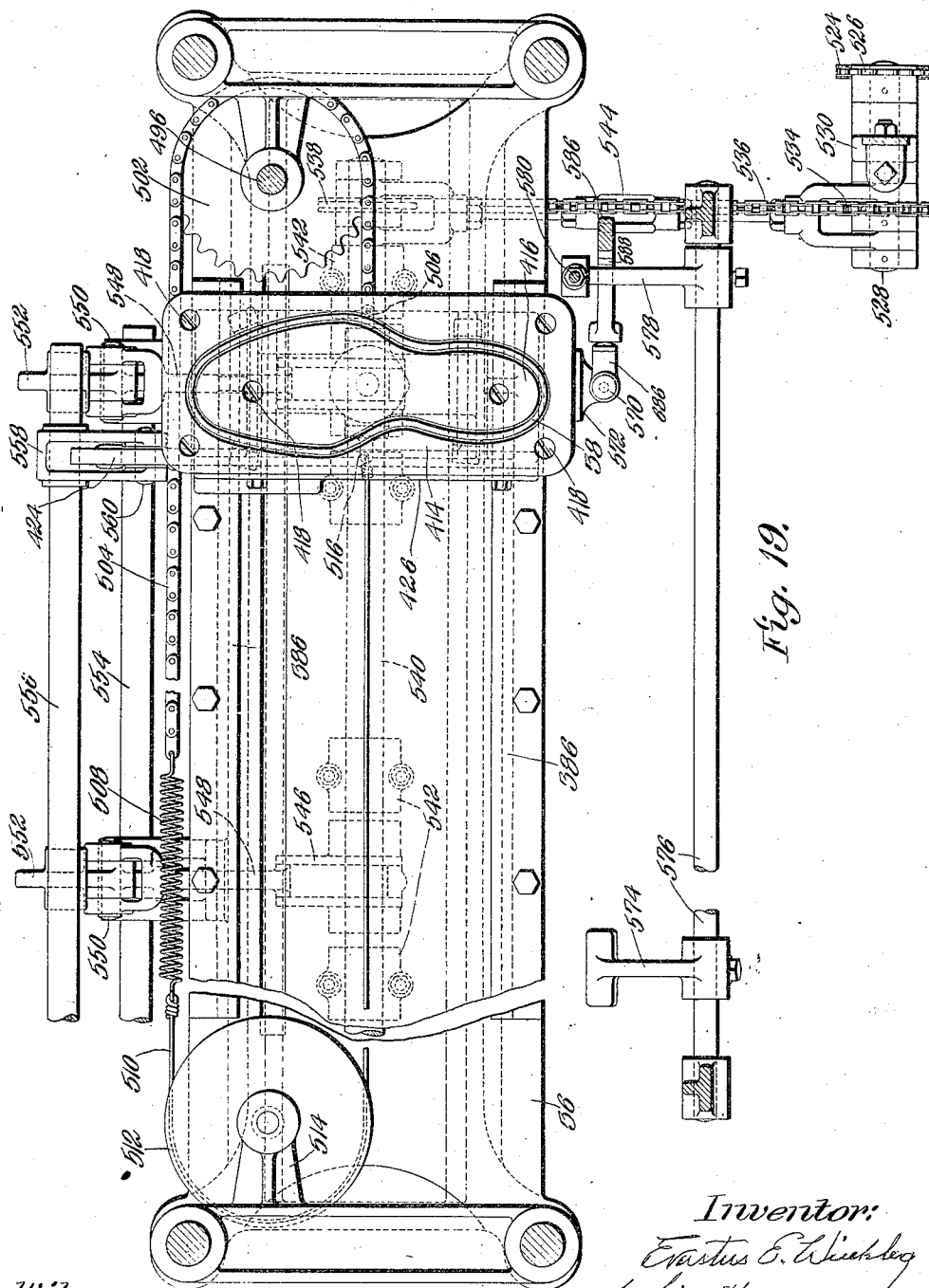


Fig. 19.

Witness:

Alfred H. M. Glinches.

Inventor:

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Van Hornes, Fish & Frinton

May 6, 1924.

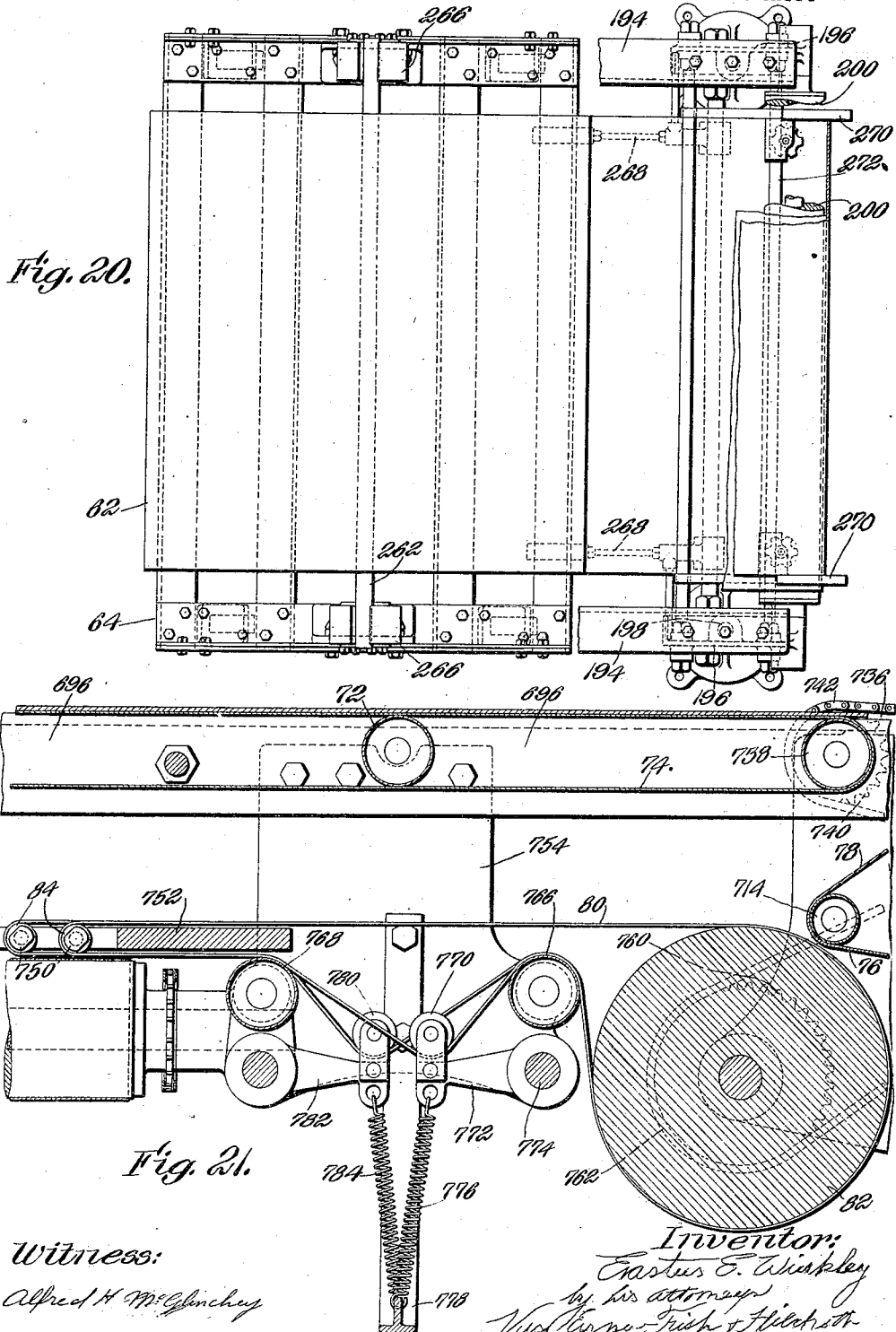
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1,493,010

STOCK CUTTING MACHINE

Filed April 26, 1920

14 Sheets-Sheet 13



May 6, 1924.

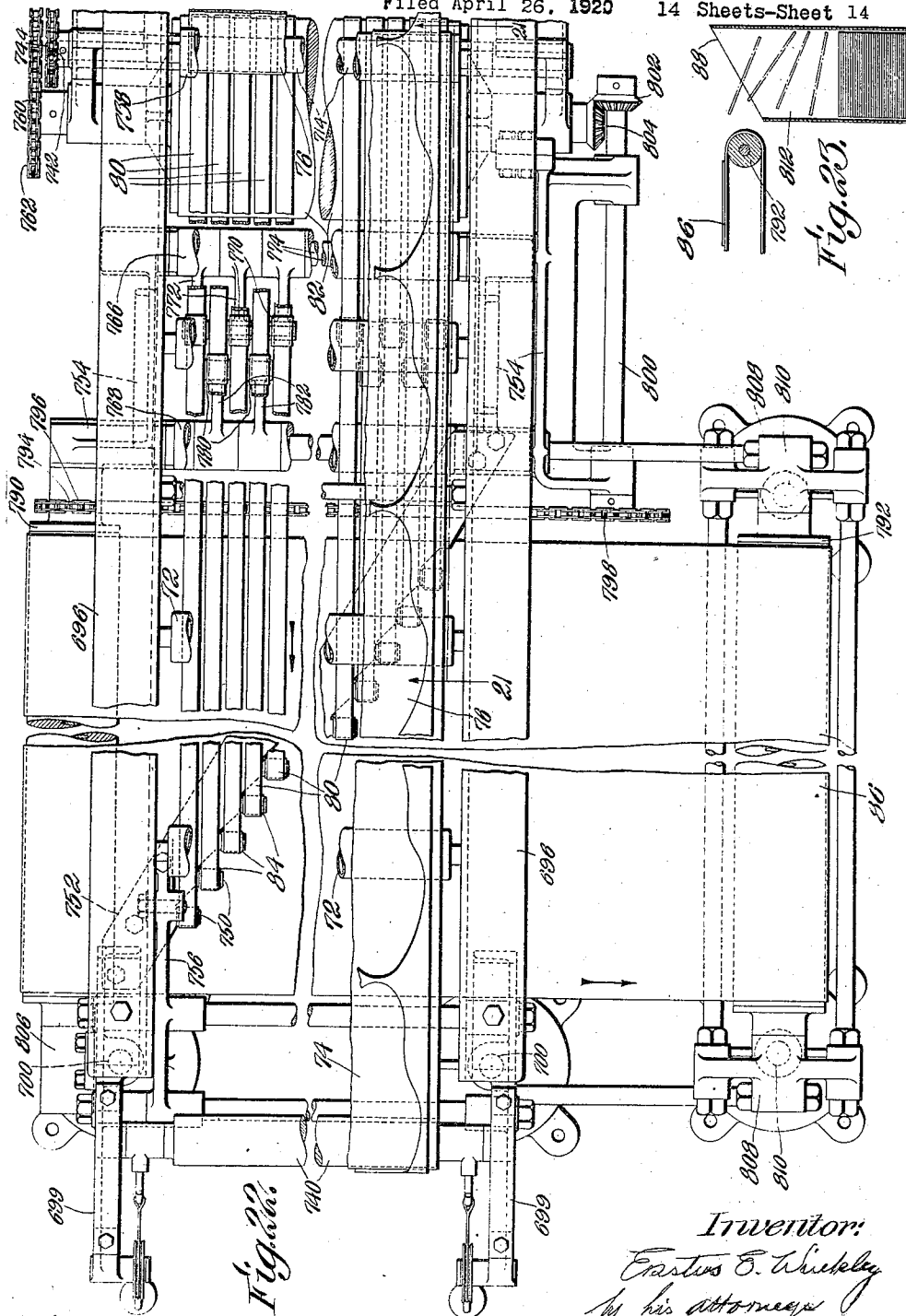
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1,493,010

STOCK CUTTING MACHINE

Filed April 26, 1920

14 Sheets-Sheet 14



Witness:
Alfred H. M. Glinchey

Inventor:
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12-16
Patented May 6, 1924.

1,493,010

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.

Application filed April 26, 1920. Serial No. 376,452.

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, and it has special reference to so-called dinking machines for cutting or dieing-out blanks successively from sheet material of various characters.

One of the objects of the invention is to provide a machine of the above-indicated type which shall be peculiarly adapted by reason of its construction and mode of operation to cut soles or other blanks from a roll of rubber stock or other similar material, and to perform its intended functions with rapidity, efficiency and reliability.

To this end, one feature of the invention resides in a stock-cutting machine of this general class, in which suitable constantly operating feed mechanism is utilized for continuously unwinding and feeding the stock in the form of a roll to the cutting mechanism, which preferably comprises a stationary cutting bed and a reciprocatory dinking beam carrying cutting means of the desired configuration. The reciprocatory cutting mechanism, preferably although not necessarily, is of the single-cycle type, being adapted to come to rest after each cutting operation and being automatically tripped or started into operation periodically in accordance with predetermined feed movements of the stock as determined by measuring apparatus initially adjusted for the desired amount of feed. The operation of the reciprocatory cutting mechanism is very rapid, so much so that the actual cutting action of the cutting means upon the stock is accomplished practically instantaneously, thereby permitting the successful use of a continuous feed of the stock, which is especially desirable as it obviates the inherent sluggishness of action and mechanical strain incident to intermittently unrolling and feeding the roll of stock in a series of steps.

Another object of the invention is to

provide a machine of this general class embodying a single die which shall cut the blanks from the stock with a minimum of waste of material and of consumption of power.

This object is attained through a feature of the invention which contemplates the employment of a single die which is automatically stepped across the reciprocatory beam and turned end-for-end through 180 degrees after each cutting operation. Meanwhile, the stock is continuously advanced so that an angularly disposed row of cuts and blanks are produced across the strip of stock. As soon as the die has traversed the full length of the beam and a full row of cuts has been completed, suitable means operating during the continued feeding movement of the stock is employed for automatically resetting the die to its initial starting position on the beam in readiness to repeat another angularly arranged series of cuts. Means is also provided for preventing the measuring apparatus from automatically tripping or starting the cutting mechanism during the resetting operation.

The use of a single die lends itself towards economies in size, weight and expense of construction of the cutting mechanism as a whole, as well as in the requisite amount of power and cost of operation. Moreover, the structural arrangements and mode of operation described results in cutting the stock to best advantage by reason of the interlocking spacing of cuts in closely adjacent proximity rendered possible by the continued advance of the stock in conjunction with the side-stepping and reversal of the single die after each cutting operation. This economical spacing of the cuts accrues particularly in the use of a die for cutting soles, or possibly other unsymmetrical and irregular forms, inasmuch as a very close interfitting arrangement of cuts is obtainable by positioning the outer flare of the toe portion of one sole in the reentrant curve at the inner shank portion of the adjacent sole cut.

Still another object of the invention is to provide a stock-cutting machine of the above-indicated character in which the cut blanks of each row are segregated from the remnant stock or scrap and automatically deposited in stacked formation in suitable receptacles, and moreover, if the blanks are cut

in closely adjacent interfitting proximity, as just described, to spread them out or space them apart sufficiently to permit the corresponding blanks of each row to be deposited
5 in the same stack.

Accordingly, another feature of the invention resides in the provision of means for feeding the stock away from the cutting mechanism, with the cut blanks still in place,
10 and in means for ejecting or separating the cut blanks from the remnants of the strip. Suitable transferring means, preferably comprising a plurality of cooperating angularly disposed conveyers, is also provided
15 for transferring the segregated blanks, spreading them apart, and stacking them in a plurality of piles in suitable receptacles.

These and other objects of the invention and features by which they are attained will
20 become more apparent from the following detailed description of the preferred form of the invention illustrated in the accompanying drawings, in which:—

Figures 1 and 2 are respectively front elevations of the right and left hand portions of the machine, which taken together constitute the front elevation of the machine as a whole; Fig. 1^A is a plan view of a strip of stock from which a series of angularly disposed rows of blanks have been cut, the blanks being left in position in the stock; Fig. 3 is an enlarged sectional view of the cutting mechanism on line 3—3 of Fig. 5; Fig. 4 is an enlarged sectional view in side elevation of the cutting mechanism, the view being taken on the section line 4—4 of Fig. 5, and certain of the parts being broken away for clearness; Fig. 5 is an enlarged view in rear elevation of the cutting mechanism;
40 Fig. 6 is an enlarged view, partially in rear elevation and partially in section, on the section line 6—6 of Fig. 4 of a portion of the cutting mechanism; Fig. 7 is an enlarged detailed view on the section line 7—7 of Fig. 4 and showing particularly the adjustable measuring apparatus and automatic tripping mechanism; Fig. 8 is a plan view of the mechanism shown in Fig. 7; Fig. 9 is a sectional view on the section line 9—9 of Fig. 7;
50 Fig. 10 is a sectional view on the section line 10—10 of Fig. 9; Fig. 11 is a sectional view on the section line 11—11 of Fig. 6; Fig. 12 is a diagrammatic view illustrating the manner in which the closely adjacent cut
55 blanks are spaced or spread apart in extended rows and delivered in stacked formation into suitable receptacles; Fig. 13 is an enlarged detailed view, partially in section, of the auxiliary clutch mechanism and operative connections therefor by means of which the stepping or cross-feed and the reversal of the die are accomplished; Fig. 14 is a view, looking from right to left, of the apparatus shown in Fig. 13; Fig. 15 is an
60 enlarged view in side elevation of the recip-

rocating beam of the cutting mechanism, looking from left to right in Fig. 1; Fig. 16 is an enlarged sectional view on the section line 16—16 of Fig. 17; Fig. 17 is a sectional view on the section line 17—17 of Fig. 15; Fig. 18 is a sectional plan view on the section line 18—18 of Fig. 17; Fig. 19 is a bottom plan view of the apparatus shown in Figs. 15 and 17; Fig. 20 is an enlarged plan view of a portion of the right hand end of the machine; Fig. 21 is an enlarged sectional view on the section lines 21—21 of Fig. 22; Fig. 22 is an enlarged plan view of the left hand end of the machine; and Fig. 23 is a diagrammatic view illustrating the manner in which the blanks are delivered and stacked into suitable receptacles.
70 75 80

Referring particularly to Figs. 1 and 2, the machine comprises, in general, a cutting mechanism 30, a supply feed mechanism 32 and a delivery feed mechanism 34. The cutting mechanism 30 is located between the respective feed mechanisms 32 and 34 in such manner that the stock is fed to the cutting mechanism by the supply feed mechanism and after a row of blanks has been cut thereby, the cut strip, with the blanks in place, is carried away therefrom by the delivery feed mechanism which also separates the cut blanks from the waste portions of the strip and after spacing or spreading them out in an extended row, delivers them in stacked formation into a suitable receptacle.
85 90 95

The cutting mechanism 30 is of the type disclosed in Letters Patent No. 1,194,379, granted Aug. 15, 1916, to the United Shoe Machinery Corporation as assignee of J. Goldbourn and A. Bates, and, in general, embodies a reciprocating beam 36 carrying a single die 38 which is adapted to be moved along the beam in steps and reversed in position between successive cutting operations. The die 38 cooperates with a stationary cutting block or bed 40 over which the stock is fed and the beam and die are reciprocated periodically through suitable mechanism operated from a main drive shaft 42 having a clutch 44 at one end and a brake 46 at the other. The machine is of the so-called single-cycle type, that is, the operation thereof is arrested after each full cycle of operations. The cutting mechanism is therefore idle under normal conditions and may be intermittently operated through repeated cycles of operation by periodically throwing in the clutch 44, which is automatically accomplished in the manner to be hereinafter set forth.
100 105 110 115 120

The supply feed mechanism 32 embodies, in general, an extended horizontal table or structural frame 50 carrying upon suitable rollers 52 an endless conveyer or belt 54 that is fed by feed rolls 56 and 58 which are driven through suitable mechanism from an auxiliary power shaft 60 that is operated
125 130

continuously at a constant speed. The supply of stock in the form of a roll 62 is rotatably mounted beneath the table 50 upon a truck 64 in such manner that the strip of stock may be continuously unwound and fed to the cutting mechanism 30 by the continuously driven supply feed conveyer 54.

Associated with this supply feed mechanism 32 and constituting a part thereof is a measuring apparatus, the adjustable handle 66 and dial 68 which are shown in Fig. 1. This measuring apparatus may be adjusted to measure or determine any predetermined amount of feed of the stock desired and operates in conjunction with other mechanism for automatically and intermittently tripping the cutting mechanism 30 and throwing in the main clutch 44 thereof intermittently in accordance with successive predetermined feed movements of the stock. The stock, therefore, is fed continuously and at a uniform rate to the cutting mechanism, the operation of which is automatically initiated through the agency of the measuring apparatus and dependent upon the feed of the stock. The cutting mechanism having been thrown into operation reciprocates through a single cycle during which the die 38 cuts a blank from the stock and after which the clutch is disengaged and the cutting mechanism brought to rest until it is again started automatically through the action of the measuring apparatus. As already stated, the die 38 is fed along the beam a single step after each cutting operation and is also reversed in position. Therefore, inasmuch as the stock is fed continuously, an angularly disposed row of blanks is cut by the die by repeated operations of the cutting mechanism, after which the die is reset along the beam to its initial position by suitable mechanism and other similar rows of blanks are cut.

Referring now to Figs. 2, 12 and 22, the delivery feed mechanism 34 comprises, in general, an extended horizontal structural frame or table 70 that carries on a plurality of rolls 72 an endless conveyer or belt 74 that is continuously driven at the same uniform rate as the supply feed conveyer 54 and which serves to carry away and discharge the scrap. Another endless and continuously driven conveyer or belt 76 is provided, one stretch 78 of which is inclined downwardly and serves to separate the cut blanks from the waste or remainder of strip and to carry said blanks to a lower level and deliver them to a plurality of narrow and closely adjacent belts 80 constituting units of a multi-belt conveyer. These belts are carried at one end upon a common drum 82 and at the other end upon a plurality of pulleys 84 which are arranged in a row disposed at an angle of substantially 30 degrees to the length of the belts. Immediately be-

neath the multi-belt conveyer is a relatively wide conveyer 86 that is disposed at right angles to the narrow belts and which is continuously driven at a somewhat faster speed. As the successive rows of cut blanks are fed to the inclined end of the multi-belt conveyer, the leading ends of the blanks drop upon the wide conveyer 86, which by reason of its relatively fast speed of operation, together with the angularity of the end of the multi-belt conveyer, serves in conjunction therewith to turn the blanks through substantially 90 degrees and, in the process of turning, to space or spread out the blanks in an extended row. The belt 86 then feeds the blanks forwardly at a rapid rate and delivers them from its forward end into compartments of a suitable receptacle 88 in which they are stacked in superposed relation.

Having described generally the construction and mode of operation of the machine, a detailed description thereof will now be given. Referring particularly to Figs 1 and 3, the cutting mechanism 30 comprises a main supporting frame embodying a plurality of side frames 90 and 92 which are rigidly connected by cross beams 94 and 96. The side frames carry a table 98 upon which is mounted the cutting block 40 and the table and block are adjustable in position by means of hand wheels 100 and adjusting rods 102, in accordance with well-known practice. Above the block 40 is the reciprocatory beam 36 which is carried at substantially its corners upon four rods 104 that are mounted for vertical sliding movement in suitable bearings carried by the respective side frames 90 and 92. The lower ends of each pair of rods 104 are connected by a cross-yoke 106 (Fig. 5), which is pivotally attached at its mid-point by means of a pin 108 to a depending arm 110 of an eccentric strap. These straps cooperate with eccentrics 112 carried at each end of the main drive shaft 42, whereby reciprocatory movements of the beam 36 and die 38 are effected when the drive shaft 42 is in motion.

Normally, the shaft 42 is at rest but may be connected to a suitable source of power through the agency of the clutch 44 that is mounted upon the rear end of the shaft. This clutch comprises a cone member 114 that is keyed to the shaft and a cooperating clutch member 116 which is provided with an internal cone surface to engage the cone member 114 and which also serves as a pulley to carry a suitable driving belt. The clutch and pulley member 116 is slidably mounted on the shaft 42 and may be moved longitudinally of the shaft and into engagement with the cone member 114 by means of a shipper lever 118 that is pivoted at 120 and has its lower end suitably connect-

ed to the hub of the clutch member 116. The upper end of the shipper lever 118 is pivotally connected to a horizontally extending rod 122 that is carried by and connected to a plurality of bell cranks 124 that are pivotally mounted on the cross beam 94. The other arms of these bell cranks are connected by adjustable rods 126 to arms 128 that are fixed to a rotatable rod 130 carried by the respective side frames. The rod 130 is provided near its front end with an extended arm 132 (Figs. 3 and 5), which by analogy, might properly be considered as a treadle. The treadle 132, when depressed in a manner to be described, operates through the rods 126, bell cranks 124, and connecting rod 122 to actuate the shipper lever 118 to throw in or engage the clutch 44, thereby connecting the drive shaft 44 to the source of power and effecting a reciprocation of the beam 36 and cutting die 38.

Having thus thrown in the clutch and initiated the operation of the machine, a cam 134 carried by one of the vertical rods 104 is brought into position to engage a roll 136 that is suitably carried by the connecting rod 122. Operation of the shipper lever 118 in the opposite direction is therefore prevented until, during the operation of the machine, the beam 36 is raised substantially to its uppermost position when the cam 134 disengages the roll 136 and therefore imposes no further restraint on actuating the shipper lever 118 to disengage the clutch.

When the machine is at rest, the clutch 44 is held in inoperative position by suitable means which operates on the treadle arm 132 to maintain it in its uppermost position. This means comprises a rod 138 (Fig. 5) which is pivotally connected to the treadle arm 132 and is surrounded by a coiled compression spring 140, the upper end of which bears against a nut 142 carried by the rod. The lower end of the spring rests against the upper surface of an arm 144 that is pivotally mounted at 146 upon a lug constituting a part of the treadle arm 132. The outer end of the arm 144 carries a slide block 148 that is held in a slide 150 at the lower end of a vertical rod 152. This rod is mounted for longitudinal sliding movements in bearings 154 in the side frame 90 and its upper end carries a head 158 that is engaged and supported by a latch 160 when the machine is at rest. The treadle arm 132 is therefore normally held in its raised position through the action of the rod 138, the spring 140, arm 144, vertical rod 152 and the latch 160.

This vertical rod 152 also constitutes the actuator for the treadle arm 132 and, in this respect, performs the function ordinarily performed by the operator's foot. For this purpose the rod 152 is surrounded by a

heavy coiled compression spring 162, the lower end of which bears against a collar 164 fixed to the rod and the upper end of which engages the lower end of the upper bearing member 154. This spring is placed under heavy compression during the upward movement of the beam by means of a spring-pressed pawl 166 (Fig. 6), which is pivotally mounted upon a sleeve 168 that is fixed to one of the vertical beam supporting rods 104. During the upward movement of the beam and therefore of the pawl 166, its upper end is brought into engagement with the head 158 on the upper end of the rod 152 and therefore said rod is raised in position, compressing the spring 162, until the beam reaches its uppermost position, whereupon the latch 160 drops into position to engage the head 158 and maintain the rod in raised position against the action of the spring 162. Immediately after the latch 160 assumes its restraining position, a tail piece 170 of the pawl 166 engages an adjustable set screw 172 on the frame, whereby the pawl 166 is released, leaving the rod 152 raised and the spring 162 under compression.

In order to start the operation of the cutting mechanism, it is only necessary to retract the latch 160 to release the rod 152. This is accomplished automatically through the agency of the measuring apparatus associated with the supply feed mechanism 32 as will be hereinafter fully described. Assuming, however, that the latch 160 has been released, the energy stored in the spring 162 is effective in forcibly projecting the rod 152 downwardly and into engagement with the end of the treadle arm 132 which is thereby depressed and through the mechanism already described, serves to throw in the clutch 44 to connect the drive shaft 42 to the source of power. Thereupon, the beam 36 and die 38 are brought downwardly to effect the cutting operation, after which they are again retracted to their uppermost position. During the upward movement of the beam, the pawl 166 serves to raise the rod 152, as already described, and in so doing elevates the arm 144 and through the spring 140 and rod 138 tends to raise the treadle arm 132 to its initial position. This operation, however, is prevented by the engagement of the cam 134 with the roll 136 until the beam substantially occupies its uppermost position, at which time the clutch shipping mechanism is released and the energy stored in the spring 140 serves to raise the treadle arm 132 and consequently to cause the shipper lever 118 to effect the disengagement of the clutch 44.

Immediately upon the disengagement of the clutch 44, the brake 46 is applied to bring the machine to rest at once. This brake comprises a pulley member 176 (Figs. 130

1 and 3), which is secured to the drive shaft 42 and which cooperates with a brake shoe 178 that is pivotally mounted at 180 to the side pedestal 90. The brake shoe is provided
 5 with a lug 181 that carries an adjustable set screw 182, the lower end of which normally rests upon an arm 184 that is secured to the rod 130. Therefore, when the rod 130 is rotated during the operation of disengag-
 10 ing the clutch 44, the arm 184, through the set screw 182 raises the brake shoe 178 into frictional engagement with the brake pulley 176, whereby the machine is brought to rest. The machine is thus automatically arrested
 15 after completing a full cycle of operations and remains at rest until the latch 160 is again released.

The control of the starting operation of the cutting mechanism is automatically effected through the agency of the measuring
 20 apparatus which constitutes a part of the supply feed mechanism 32, as already stated, and which functions to automatically trip the latch 160. A description of this mechanism, therefore, will now be given.

Referring particularly to Fig. 1, the respective side frames 90 and 92 of the cutting mechanism are provided with bracket extensions 190 and 192 between and upon
 30 which the major portion of the driving apparatus is located. These brackets also support a pair of angle irons 194 which extend laterally from the cutting mechanism and constitute the table or frame structure 50
 35 between which the rolls 52 are mounted. The outer ends of the angle irons 194 are supported upon brackets 196 that are carried at the upper ends of a plurality of spaced rods or standards 198 that are suitably
 40 connected to form a rigid unit. The feed conveyer or belt 54 is carried at its outer end upon a roll 200 that is rotatably mounted in the brackets 196 and the upper stretch of the conveyer rests upon the sev-
 45 eral rolls 52. The inner end of the conveyer belt passes over a roll 202 (Fig. 6) and thence around the two feed drums 56 and 58 and over an idle roll 204 to the outer roll 200. The roll 202 is rotatably mounted
 50 between the angle irons 194, the roll 204 between brackets 206 depending therefrom, and the feed drums 56 and 58 are mounted upon shafts 208 and 210 respectively, having bearings in the bracket extensions 190
 55 and 192 as shown most clearly in Fig. 6.

These feed drums are driven continuously at a uniform rate of speed from the constantly driven auxiliary power shaft 60. The power shaft 60 is provided with a pulley
 60 216 (Fig. 5), by which it is driven by a belt (not shown) and the shaft is also provided with a gear 218 that meshes with a gear 220 on a shaft 222, said shaft being provided with a pinion 224 that cooperatively
 65 engages a gear 226 on a shaft 228. This

shaft 228 also carries a gear 230 that meshes with a gear 232 that is mounted upon a stud 234, which gear in turn cooperates with another gear 236 on a shaft 238. Fixed to this
 70 shaft is a pinion 240 having a driving engagement with a gear 242 on a stud 244 which also meshes with a gear 246 that is fixed to the shaft 210 of the feed drum 58. This feed drum is coupled with the feed
 75 drum 56 by means of a gear 248 on the shaft 210, a plurality of idler gears 250 and 252 and a gear 254 that is secured to the shaft 208 of the feed drum 56. The several shafts above referred to are journaled in the
 80 bracket extensions 190 and 192. By means of the gearing just described, both feed drums 56 and 58 are continuously driven at a uniform rate of speed from the auxiliary drive shaft 60 and serve to continuously
 85 and uniformly feed the conveyer or belt 54.

It may be desired, under certain conditions, to change the speed of operation of the feed drums 56 and 58 to vary the rate of feed of the stock, and therefore a suitable gear shift is provided which embodies
 90 a shift lever 255 (Figs. 4 and 5) having a locking handle 257. Any suitable gear shift mechanism may be employed and inasmuch as it forms no material part of the present invention, no description thereof
 95 will be given.

The strip of stock to be operated upon is wound up in the form of the roll 62 with an interposed layer of fabric 260 between the several convolutions in order to prevent
 100 adhesion of the stock, if of rubber material, or the like. The roll 62 is rotatably supported on a shaft 262 which is mounted at its ends upon roller bearings 264 carried by upright brackets 266 forming parts of the
 105 truck 64. This truck is located beneath the table 50 and is rigidly anchored in position by means of connecting rods 268 that are pivoted to the lower ends of the standards 198 and which suitably engage a portion of
 110 the truck.

Prior to starting up the machine for the first time, the ends of the stock and interposed fabric are pulled upwardly and over the roll 200, as shown in Fig. 1, the fabric
 115 being suitably and temporarily secured to the conveyer 54 while the end of the stock is allowed to rest upon the upper stretch of said conveyer. When the feed mechanism is thrown into operation, the feed
 120 conveyer 54 serves to unwind the stock and fabric from the roll until the fabric has passed around the two feed drums 56 and 58 and thence over the idler roll 204, as shown in Fig. 6. The end of the fabric
 125 may then be released from the conveyer belt 54 and, during the further operation of the feed mechanism, allowed to accumulate in a pile on the floor. The fabric therefore serves in a large measure to unwind and
 130

feed the stock, although the weight of the stock upon the conveyer 54 is sufficient, if of rubber material, or the like, to aid materially in the feed operation. The free end of the stock, of course, is not carried around the feed drums 56 and 58 but is fed in the direction of its length across the cutting block 40 of the cutting mechanism 30, being guided in position by adjustable angular guides 276 (Figs. 3 and 6). For the purpose of guiding the stock as it is fed from the roll 62, a plurality of adjustable guides 270 are provided upon a tie-rod 272 that rigidly connects the brackets 196. These guides 270 are curved in form and are slidably and adjustably mounted on the rod 272 so that they may be suitably positioned to engage the edges of the stock and maintain it in proper feeding position.

As the stock is fed continuously and at a uniform rate, an adjustable measuring apparatus is employed to measure or determine any predetermined length of feed and to thereupon function through suitable connections to automatically trip the latch 160, thereby permitting the actuating rod 162 to be projected downwardly by the spring 162 to effect the actuation of the treadle arm 132 by means of which the clutch 44 is thrown into engagement to connect the cutting mechanism to its source of power.

Referring particularly to Figs. 7, 8, 9 and 10, the measuring apparatus comprises a relatively broad ratchet 280 that is keyed adjacent the forward end of the constantly rotated shaft 238. Loosely mounted upon the shaft 238 adjacent the ratchet 280 and extending through the bracket extension 190 is an adjustable sleeve 282, and mounted for rotatable movement upon said sleeve is a collar 284 having a radially projecting arm 286 integral therewith. The outer end of this arm supports a stud 288 extending parallel to the shaft 238 and upon which are mounted a plurality of pawls 290. These pawls are disposed side-by-side and extend the full width of the ratchet 80 and are graduated in length so that one of the pawls shall be in a position to immediately engage a tooth of the ratchet without any substantial lost motion. All of the pawls are provided with tail pieces 292 that are acted upon by coiled springs 294 which are seated in sockets in a member 296 that extends parallel to the stud 288 and which is of yoke form, being provided with arms 298 and 300 at its respective ends by means of which said member is mounted on the stud 288. The arm 300 is pinned to said stud while the arm 298 is provided with an integral inwardly and radially projecting trip lug 302.

This yoke member 296 is adapted to occupy two positions with respect to the pawls, one position, as shown in Fig. 10, in which

the pawls are free to engage the teeth of the ratchet 280, and another position, shown in dotted lines in Fig. 7, in which the member 296 engages bosses 304 on the respective pawls and holds the pawls in inoperative position and out of engagement with the ratchet. These two positions of the yoke member 296 are determined and maintained by means of a position-accentuating device embodying a spring-pressed pin 306 (Fig. 9) that is carried by the collar 284 and which is adapted to engage one or the other of a plurality of notches 308 and 309 provided in an extended portion of a collar 310 that is pinned to one end of the stud 288.

With the yoke member 296 in the position shown in full lines in Figs. 7 and 10, the pin 306 being positioned in the notch 309, the pawls 290 are free to be moved inwardly by their springs 294 into engagement with one of the teeth of the ratchet which is continuously driven in the direction of the arrow in Fig. 7. Under these conditions, the collar 284 on which the pawls are mounted is also driven in the same direction and at the same rate. When the collar 284 and the pawls carried thereby have been rotated in a clockwise direction to their limit of travel, a lug 312 projecting outwardly from the arm 286 is brought into engagement with one end of a bell crank 314 that is pivotally mounted upon a pin 316. The bell crank is thus actuated against the action of a spring 318 and through the medium of a rod 320 pivotally connected to one arm thereof, serves to trip or release the latch 160 which normally sustains the actuating rod 152 of the cutting mechanism when said mechanism is at rest. Thereupon, the main clutch 44 is thrown in and the cutting mechanism started into operation in the manner already described. The outer end of the trip rod 320 is provided with a member 322 carrying a pin 324 that is adapted to rest in a notch 326 in the upper end of the latch 160, whereby an operative connection between the rod 320 and the latch 160 is established.

Immediately after the actuation of the bell crank 314, the trip lug 302 of the yoke member 296 engages an adjustable stop screw 328 carried by an arm 330 that is suitably mounted upon the bracket extension 190, whereupon the yoke member 296 is thrown to its other position where it is maintained by the position-accentuating pin 306 snapping into the other notch 308 of the collar 310. This movement of the yoke member 296 causes it to engage the bosses 304 of the respective pawls which are accordingly withdrawn from engagement with the ratchet 280, as illustrated in dotted lines in Fig. 7.

As soon as the pawls 290 are released from

the ratchet 280, a torsion spring 334 functions to return the loose collar 284 and the pawls carried thereby to their initial positions. The spring 334 surrounds a bushing 5 336 that is adjustably secured to the sleeve 282 by means of the set screw 338, and the respective ends of the spring are secured to the loose collar 284 and the fixed bushing 336. During the measuring feed movement 10 of the pawls, effected by their engagement with the continuously operated ratchet 280, energy is stored in the spring 334 which is available upon the disengagement of the pawls at their limit of travel to return the 15 collar 284 and pawls 290 to their initial positions.

The initial position of the pawls 290, and, therefore, the extent of measuring movement thereof, is determined by the location 20 of an adjustable stop 344 which is preliminarily set or adjusted in accordance with the amount of feed movement of the stock to be measured. This stop 344 comprises a pin that is set in a recess in the end of an arm 346 extending radially from the inner 25 end of the adjustable sleeve 282 that surrounds the shaft 238. Surrounding the pin and enclosed with the recess in the end of the arm 346 is a coiled spring 348 which 30 functions to cushion the pin stop during the resetting operation of the arm 286 and pawls 290. In order to conveniently adjust the position of the stop pin 344 about the shaft 238, the adjustable sleeve 282, by 35 which the stop is carried, is extended through the bracket extension 190 and is provided at its outer end with an arm 350 that is keyed thereto. The outer end of this arm carries a stud 352 which projects loosely 40 through an arcuate slot 354 in said bracket extension and is provided at its inner end with a head 356. The front end of the stud 350 is threaded into the handle 66 and between the handle and the arm 350 is a washer 45 360 and lock-nut 362. After loosening the lock-nut 362, the sleeve 282 and the stop-pin 344 may be adjusted about the shaft 238 to any desired position by suitably moving the handle 66, after which the lock-nut 362 50 may be tightened to positively hold the stop-pin in adjusted position. To assist the operator in setting the stop-pin 344 for any desired amount of feed of the stock to be measured, the handle arm 350 is extended 55 in the form of an index or pointer 364 which is moved over the suitably graduated scale or dial 68 (Fig. 1).

While the ultimate function of the stop-pin 344 is to determine the amount of feed 60 of the stock to be measured, it operates directly upon the trip lug 302 of the yoke member 296 to release the pawls from the inoperative positions which they occupy during the resetting operation of the pawl-carrying arm 286 and to permit the pawls to

engage the continuously operating ratchet 280. After the pawls 290 have been disengaged from the ratchet 280 at the end of their measuring operation by means of the 70 adjustable stop 328, the spring 334 returns or resets the pawl-carrying arm 286 in a counter-clockwise direction until the lug 302 is brought into engagement with the stop-pin 344. The impact against the stop-pin is cushioned by its spring 348 and serves to rotate the yoke member 296 into its inoperative 75 position to permit the pawls to engage the ratchet. During this action the position-accentuating pin 306 snaps into the other notch 308 of the collar 310, thereby holding the yoke member 296 in inoperative position 80 throughout the clockwise measuring movement of the pawls and their carrying arm 286.

With this construction it will be understood that the automatic tripping of the 85 latch 160 of the cutting mechanism 30 may be effected after any predetermined amount of feed as determined by the measuring mechanism, which may be manually set in 90 the manner described.

After the measuring apparatus has functioned to determine any desired predetermined length of feed of the stock and to thereupon release the latch 160, the clutch 95 44 is thrown in to start the cutting mechanism into operation. The reciprocatory beam 36 and die 38 are therefore rapidly lowered to cut a blank from the stock during the continued feed movement thereof. The 100 rapidity of operation of the cutting mechanism causes the actual cutting action to occur practically instantaneously, so that it does not interfere with the continuous feed 105 of the stock. At the most, only a very slight distortion of the stock could occur; which, particularly if the stock is of rubber material, or the like, is so slight as to be practically negligible so far as the operation of the machine is concerned. 110

As the beam and die are returned to their initial upper positions, a cam 370 (Fig. 6) on the main drive shaft 42 operates through a cam lever 372 and other suitable connections to throw in a clutch 374 (Figs. 4, 6, 11 115 and 13) on the shaft 222. The engagement of this clutch 374 serves to connect a cam 376 and a gear 378 to the auxiliary source of power, and this cam and gear respectively operate, when the beam has reached its uppermost position, to actuate the die 38, a 120 single step along the beam and across the strip of stock and to reverse the position of the die, or turn it through an angle of 180 degrees. This stepping or cross-feed of the 125 die and also its reversal take place after each cutting operation, so that as the stock is continuously fed a row of blanks is cut from the stock, which extends angularly across the strip of stock, as shown in Fig. 1A. 130

The use of a single die is important for the reason that it permits of spacing the successive cuts in closely adjacent proximity, thereby reducing the waste and economizing stock, and particularly so if a sole die is employed, since the reversal of the successive cuts permits the outer flaring edge of one sole to be interlocked or fitted into the reentrant angle of the shank portion of the adjacent sole, as indicated clearly in Fig. 1^A. Furthermore, with the use of a single die, the initial cost and maintenance is reduced as compared to the use of a multiple-die or a plurality of dies. Moreover, the power required to force a single die through the stock is much less than if a plurality of dies were employed and therefore, the machine as a whole may be of lighter and more inexpensive construction, while the power consumption and cost of operation is correspondingly reduced.

Before describing the mechanism for laterally shifting the die and effecting its reversal, consideration will be given to the construction and mode of mounting of the die upon the reciprocatory beam 36.

In the machine illustrated, a sole die 38 is employed and this die is suitably attached to a movable carriage 384 which is slidably supported upon ways 386 beneath the beam 36 which is substantially channel-shaped in section (Figs. 15, 16, 17, 18 and 19). The ways 386 extend longitudinally of the beam and support the carriage 384 upon outwardly projecting lugs or feet 388, the lower member of the beam being provided with a longitudinal groove 390 to receive a rib or flange 392 projecting upwardly from the die carriage, for the purpose of maintaining the carriage in definite alinement. The carriage is provided with an enlarged substantially cylindrical central portion 394 having a central recess to receive a bushing 396, through which extends a pin 398 having a head 400 at its lower end for rotatably supporting a plate 402, the upper end of the pin being threaded into a lock nut 404. Surrounding the bushing 396 beneath the central cylindrical portion 394 of the carriage is a gear 406 that is secured to the bushing by means of a plurality of pins 408. The hub of the gear 406 is provided with a laterally extending arm 410 (Fig. 18), the end of which is pivotally connected to the rotatable plate 402 by means of a pin 412. The plate serves as a support for the die 38 which is detachably secured thereto in a well-known manner. The plate 402 also supports an outside stripper 414 and an inside stripper 416, by means of a plurality of bolts 418 that are surrounded by coiled springs 420 in the usual manner. By reason of this construction, the die is rotatably mounted upon the pin 398, and rotative movements thereof may be effected by means of the gear 406 having

its arm 410 pinned to the plate 402, through the agency of a rack 422 which meshes therewith and which is carried by a slide bar 424 suitably mounted in one side of the die carriage and held in position by a side plate 426. When the slide bar 424 and rack 422 are actuated through a predetermined distance, the die 38 is rotated through 180 degrees.

Having obtained an understanding of the construction of the die and die carriage 384, consideration will be given to the means and manner of automatically stepping and reversing the die during the operation of the machine. The power for effecting these movements of the die is derived from the continuously rotating shaft 222 (Figs. 4, 6, 11 and 13) through the agency of the clutch 374, while the time of operation of the clutch is controlled by the cam 370 upon the main drive shaft 42 of the cutting mechanism. The clutch 374 comprises the gear 220 which is fixed to the shaft 222 and which is provided with a plurality of laterally extending lugs 432. When the clutch is thrown in, one of these clutch projections 432 is engaged by a roll 434 carried at the outer end of an arm 436 which is pivotally mounted upon an arm 438 projecting radially from a sleeve 440 that is loosely mounted upon the shaft 222. A spring-pressed pin 442 is carried by the sleeve 440 and operates against the arm 436, tending to swing said arm and the roll 434 into position to engage one of the clutch projections 432. The end of the arm 436, however, is provided with a boss 444 which is normally engaged by a clutch cam 446 and held in inoperative position against the action of the spring-pressed pin 442. Under these conditions, the gear 220 and clutch projections 432 rotate continuously, but the sleeve 440 remains at rest.

The control of the clutch 374 is determined by the position of the clutch cam 446 which is in turn prescribed by the cam 370, in the manner now to be described. The clutch cam 446 is pivotally mounted upon a vertical stud 448 that is suitably supported on the cross beam 94 of the cutting mechanism, and is normally maintained in the position shown in Figs. 11 and 13 against the action of a torsion spring 450 by means of a latch 451, which engages an extended arm 452 of said clutch cam. In order to permit the spring 450 to actuate the clutch cam 446 to allow the clutch to become operative, one end of the latch 451 which is pivotally mounted at 453 is connected by means of a universal connection 454 to the upper end of a rod 456. The lower end of said rod is pivotally connected to a lug 458 of a collar 460 loosely mounted on a fixed rod 461 and having another lug 462 diametrically positioned with respect to the lug first mentioned. The cam lever 372 is pivotally mounted upon the

same fixed rod which carries the collar 460 and is provided with an upwardly inclined integral arm 466 that carries at its upper end a pivotally mounted bell crank 468.

5 Under normal conditions this bell crank occupies the position shown in Fig. 6, with the lower end of one of its arms located above the lug 462 of the collar 460.

10 After the cutting action of the die and during the upstroke thereof, the cam 370 cooperatively engaging a roll 470 at one end of the cam lever 372, rocks said lever in a direction to engage the lower end of the bell crank 468 with the lug 462 and there-
15 after to rotate the collar 460 on the rod 461 and raise the rod 456. The latch 451 is thus released from the extension 452 of the clutch cam 446, thereby permitting the spring 450 to actuate said cam to permit the cam roll
20 434 to be brought into engagement with one of the clutch projections 432, whereby the clutch is rendered operative to drive the sleeve 440, the cam 376 and the gear 378 in unison with the shaft 222.

25 Having thrown the clutch 374 and the cam 376 into operation, the die 38 is advanced a step of predetermined extent along the beam 36, in the following manner. The cam 376 is provided with a cam path in
30 which travels a cam roll 474 (Figs. 4 and 6). This roll is carried on one arm of a bell crank 476 that is pivotally mounted upon the shaft 60, the other arm of the bell crank being provided with a slot 478 in which is
35 mounted a block 480 which is adjustable in position to vary the effective length of the bell crank arm through the agency of a threaded rod 482. To this block 480 is pivotally connected one end of a connecting
40 rod 484, the other end of which is similarly connected to an arm 486 that is pivotally mounted upon a shaft 488 (see also Fig. 3) that is supported by the frame. The arm 486 is extended beyond the shaft 488 and
45 carries at its outer end a spring-pressed pawl 490 that is adapted to engage the teeth of a ratchet 492 which is pinned to said shaft. Normally the pawl 490 is prevented from engaging the ratchet by means of a
50 stationary shield 494 that is adjustably secured to the frame.

During the operation of the cam 376, the pawl 490 is rotated in the clockwise direction, as viewed in Fig. 6, through the con-
55 nections described and, after disengaging the shield 494, said pawl cooperates with a tooth of the ratchet 492. During the continued rotation of the cam 376, the pawl effects a rotative movement of the ratchet
60 and therefore of the shaft 488 through a distance that may be adjusted as desired, by suitably adjusting the position of the block 480 in the bell crank 476. The rotative movement of the shaft 488 is transmitted
65 to a vertical shaft 496 through the agency of

a plurality of beveled gears 498 and 500 that are secured to the respective shafts.

This rotative movement of the shaft 496 is utilized for stepping the die 38 through the agency of a sprocket 502, (Figs. 15 and
70 19) secured to the upper end of said shaft and a chain 504 that is driven thereby. One end of the chain is secured to the die carriage 384 at a point 506, while the other end is attached to one end of a heavy coiled
75 spring 508 having its opposite end secured to a flexible cord or similar member 510. This cord passes around a pulley 512 that is pivotally mounted upon a bracket 514 carried by the beam 36 and its other end
80 is secured to the die carriage at a point 516 located on the opposite side thereof from the point of attachment 506 of the chain. Obviously, as the sprocket 502 is rotated, the die carriage and die are stepped along
85 the beam 36 through a predetermined distance, the spring 508 serving to prevent any lost motion. The amount of stepping movement of the die is determined in advance
90 by the operator and is dependent upon the width and shape of the die, and the number of blanks to be cut in a row from the stock.

As already stated, the die is preferably reversed in position while the stepping operation takes place. This action is effected
95 by the gear 378 (Fig. 11) and the intermediate connections now to be described. The gear 378 meshes with a gear 518, (Fig. 4) which is secured to one end of a sleeve
100 520 that is rotatably mounted on the shaft 228. The opposite end of the sleeve is provided with a sprocket 522 that is fixed thereto and this sprocket carries a chain 524 that extends upwardly and passes over a sprocket
105 526 (Figs. 5 and 19). The sprocket 526 is mounted on a shaft 528 that is mounted at the upper end of an extensible arm 530 having its lower end supported upon the shaft 208, as shown particularly in Fig. 4.
110 The shaft 528 also is provided with a sprocket 534 carrying a sprocket chain 536 which passes over a sprocket 538 that is fixed to a shaft 540 journaled in bearings 542 on the beam 36. In order to firmly
115 maintain the shaft 528 carrying the sprockets 526 and 534 in position, an adjustable arm 544 is employed having its respective ends connected to the shaft 528 and shaft 540. Equally spaced on the shaft 540 is a
120 plurality of eccentrics 546 (Figs. 15, 17 and 19) which cooperate with eccentric arms 548, the ends of which are pivotally connected at 550 to intermediate points in a correspond-
125 ing number of levers 552. These levers are rotatably mounted upon a rod 554 suitably carried by the beam 36 and the lower ends thereof are secured to a tube or rod 556 extending the length of the beam.

This tube or rod 556 serves as the ac- 130

tuator for the slide bar 424 and rack 420 secured thereto, and inasmuch as the slide bar is mounted in the die carriage 384 and is therefore intermittently stepped along the beam at successive cycles of operation of the cutting mechanism, a slidable connection between the slide bar 424 and the tube 556 is provided. For this purpose, an arm 558 is pivotally mounted at 560 on the outer end of the slide bar 424 (Fig. 17), and the free end of said arm is provided with a recess or socket 562 to receive the tube 556 and permit of relative sliding movements. The socketed end of the arm 558 is maintained in engagement with the tube 556 throughout the operation of the levers 552 by means of a spring 564 which is seated in a recess in an extension 566 of the slide bar 424, said spring surrounding a pin 568 carried by the arm 558.

The gearing and connections just described are so designed and proportioned, that the slide bar is actuated a distance to cause its rack 422 to rotate the die 38 through 180 degrees at each cycle of operation of the machine. Thus, following each cutting stroke of the die 38, said die is turned end-for-end or reversed in position, while being stepped across the beam preparatory to the succeeding cutting operation. This manner of operation of the die during the continued feed of the stock results in cutting an angular row of blanks across the strip, the blanks being alternately reversed in position and being located in closely adjacent interlocking or interfitting relation, as shown in Fig. 1A.

When the die 38 has been progressively stepped along the beam until it has traversed the full width of the stock, means is provided for continuously and quickly returning or resetting the die to its initial position during the continued feed movements of the stock. This resetting operation always occurs after an odd number of cuts have been made, irrespective of the width of the stock, in order that the die, when reset to its initial position, shall always occupy a similar initial position. As just stated, the stock is continuously fed during the resetting operation. Therefore, it is necessary to prevent the automatic tripping of the latch 160 by the measuring apparatus until the die has been reset and resumes its initial cutting position.

To this end, a spring-cushioned stop 570 (Figs. 3, 6, 13, 14 and 17) is carried by a bracket 572 on the rotatable plate 402 of the die carriage. When the die has been fed across the beam to its limit of travel, said stop 570, during the last cutting stroke of the die, is brought downwardly into engagement with an arm 574 that is adjustably fixed to a rod 576, extending across the machine and suitably journaled in the frame

thereof. The position of the adjustable arm 574 is dependent upon the number of blanks to be cut in a row. On the front end of the rod 576 is fixed an arm 578 having its outer end pivotally connected to a vertical rod 580. The lower end of said rod 580 has a pivotal connection to an arm 582 that is pinned to a rock shaft 584 rotatably mounted on the cross beam 94.

When the arm 578 is forced downwardly by the stop 570, in the manner indicated, it is locked in its lowermost position by means of a latch 586 having a shoulder 588 which engages the upper surface of the arm 578. This latch 586 is pivotally mounted at 590 upon a bracket 592 and is provided with a tail piece 594 (Fig. 4), to which is attached a spring 596 that functions to hold the latch 586 in restraining engagement with the arm 578. The arm 578 therefore is locked in its lowered position and held therein when disengaged by the stop 570 on its succeeding upward movement.

The downward movement of the rod 580 and the rotative movement of the rock-shaft 584, in the manner described, is utilized to control the tripping apparatus of the cutting mechanism and the resetting mechanism of the die in the following manner. The rock-shaft 584 is provided with another arm 600 which is connected to a vertical rod 602, the lower end of which has a pivotal connection to one arm of the bell crank 468, already referred to. Thus, when the rock-shaft 584 is rotated, the bell crank 468 is swung from the position shown in Fig. 6 to the position shown in Fig. 13, whereby its lower end is brought above a pin 604 projecting laterally from an arm 606 that is loosely mounted upon the shaft 461, said arm being maintained in the position shown by means of a spring 608.

As the beam 36 and die 38 are raised, the cam 370 operates the lever 372 to spring the lower end of the bell crank 468 into engagement with the pin 604 and to lower the arm 606 against the action of the spring 608. The outer end of the arm 606 is pivotally connected to a slide block 610 which is loosely mounted on a rod 612, said slide block being normally held in engagement with a pinned collar 614 thereon by means of a coiled spring 616 surrounding the lower end of the rod between the slide block and a plurality of nuts 618 at the lower end thereof. The downward movement of the arm 606, therefore, acts through the spring 616 to depress the rod 612, the upper end of which has a universal connection 620 (Fig. 4) with one arm of a bell crank 622. This bell crank is pivotally mounted on a stud 624 carried by a bracket 626 and its other arm is bifurcated and carries a plurality of inwardly projecting pins 628 that engage a groove 630 in the hub of a clutch member

632 that is slidably keyed to the continuously rotating shaft 222. The slidable clutch member 632 is therefore yieldingly thrown into engagement with a cooperating clutch member 634 that is loosely mounted on the shaft 222 and which is provided with a sprocket 636.

Upon the engagement of the clutch just referred to, the sprocket 636 is rotated and through the agency of a chain 640 (Figs. 4 and 6) carried thereby, effects a corresponding rotation of another sprocket 642 that is fixedly mounted to the shaft 488 which also carries the ratchet 492 for feeding the die in steps along the beam 36. The shaft 488 therefore is rotated in the opposite direction from which it is advanced in steps by the pawl 490 and ratchet 492, and operates through the vertical shaft 496 geared thereto to actuate the die feeding chain 504 to continuously reset the die 36 along the beam to its initial cutting position. As above described, the pawl is normally held out of contact with the ratchet 492 by the shield 494, thus permitting reverse rotation of the ratchet.

As hereinbefore stated, the strip of stock continues to be fed during the resetting operation. The measuring apparatus also continues to function, preparatory to automatically tripping the cutting mechanism to initiate another cycle of operations thereof. Therefore, since the time required for resetting the die is relatively long, as compared to the measuring operation, it is necessary to provide means for preventing the cutting mechanism from being automatically tripped during the resetting operation.

To the accomplishment of this end, a rod 641 (Figs. 4, 6 and 11) is pivotally connected to the slide block 610 at 643. The upper end of the rod 641 is pivotally connected to an arm 644 that is fixed to a rock shaft 646 suitably journaled in the frame, and toward the front end of said rock shaft an arm 650 is fixed that is pivotally connected to the lower end of a vertical rod 652. This rod is provided at its upper end with a slot 654 (Figs. 6 and 7) that is adapted to receive a pin 656 mounted upon the end member 322 of the trip rod 320. Therefore, as the arm 606 is lowered to throw in the clutch for the resetting operation, the rod 641 is also lowered and operates through the rod 652 to raise the end member 322 of the trip rod 320, thereby disengaging the pin 324 from the notch 326 in the latch 160. A spring 658 connects the rod 652 and the trip rod 320 and serves to maintain a proper operative connection between them during the succeeding actuating movements of the rod 320, which movements are inoperative to trip the latch 160 and initiate the operation of the cutting mechanism.

The cutting mechanism therefore, remains idle during the resetting operation.

As already described, the clutch members 632 and 634 of the resetting mechanism are disengaged and the operative connection between the trip rod 320 and latch 160 is interrupted by the downward movement of the arm 606 effected through the agency of the bell crank 468, the cam lever 372 and the cam 370 on the main drive shaft 42. This operation takes place during the up-stroke of the reciprocating beam 36 and prior to the time when the beam is brought to rest in its uppermost position. During this interval, the cam 370, through the cam lever 372, raises the bell crank 468 to the position shown in Fig. 13, and it is therefore necessary to make provision for latching the arm 606 in its lowered position in order to maintain the resetting clutch operative and the automatic trip mechanism inoperative until the cutting mechanism has completed its cycle of operation and is brought to rest, and throughout the resetting operation.

Throughout the resetting operation, the latch 586 is maintained in locking engagement with the arm 578, whereby the rods 602 and 664 are held in their lowered positions against the action of the spring 684, to the end that the bell crank 468 remains in the position shown in Fig. 13 and the latch 678 is maintained in locking engagement with the lug 680 of the arm 606.

When the die 38 is reset to its initial position, a boss 686 (Fig. 4) on the bracket 572 of the rotatable die holding plate 402 is brought into engagement with the upper end of the latch 586 and disengages its shoulder 588 from the arm 578. Thereupon, the spring 684 becomes operative to rotate the rock-shaft 584 to raise the rods 602 and 664. This action is effective to swing the bell crank 468 to its initial position, as indicated in Fig. 6, and also to release the compression of the spring 666 and cause a collar 690 (Fig. 6) at the lower end of the rod 664 to engage the slide block 668 and release the latch 678. Thereupon, the spring 608 functions to raise the arm 606 to cause the rod 612 to effect the disengagement of the resetting clutch members 632 and 634 and to cause the rod 641, through the connections associated therewith, to drop the pin 324 in the end member 322 of the trip rod 320 into engagement with the notch 326 of the latch 160, thereby re-establishing the operativeness of the automatic trip mechanism. In this manner the die is reset to its initial position in readiness for the next series of operating cycles which are repeated in accordance with the mode of operation already described to cut successive angularly disposed rows of blanks from the strip of stock.

Having described in detail the construc-

tion and operation of the supply feed mechanism 32 and the cutting mechanism 30, through the cooperative action of which successive angularly disposed rows of blanks are cut from the strip of stock during its continuous feed movement, consideration will now be given to the delivery feed mechanism 34 through the agency of which the cut blanks are separated from the remnant of the strip and delivered in stack formation and by means of which the disposal of the scrap or strip remnants is effected.

As the blanks are cut, the stock, with the blanks in place, is continuously fed away from the cutting mechanism upon the extended table 70 through the agency of the conveyer belt 76. The table 70 comprises a plurality of angle irons 696 (Figs. 2 and 22) which are supported at one end upon brackets 698 secured to the side frames 90 and 92 and the outer ends of which are attached to brackets 699 that are mounted upon the upper ends of rigidly connected supporting rods or standards 700. The angle irons 696 are also supported intermediate to their ends upon brackets 704 (Fig. 2) that are carried upon supporting rods or standards 706, also suitably rigidly connected.

The conveyer belt 76 passes over a plurality of idler rolls 708, 710 and 712 that are rotatably mounted between the angle irons 696 and thence, at a downward inclination, represented in Fig. 2 by the inclined stretch 78 of the belt, to and around an idler roll 714, from whence the belt passes around another idler roll 716, over a feed drum 718 and under an idler roll 720 to the roll 708. The rolls 714 and 716 and the feed drum 718 are mounted in the brackets 704 and the idler roll 720 between the angle irons 696.

The conveyer belt 76 is continuously driven in the direction of the arrow in Fig. 2 by means of the feed drum 718 at the same uniform rate at which the stock is fed by the supply feed mechanism. This is accomplished by a driving connection between one of the main supply feed drums 56 and the delivery feed drum 718, which connection comprises a plurality of intermeshing mitre gears 722 and 724 (Fig. 5), that are respectively fixed to the shaft 208 and to a shaft 726 extending lengthwise of the machine on the rear side of the cutting mechanism. The other end of the shaft 726 is provided with a mitre gear 728 that meshes with a similar gear 730 that is fixed on the shaft 732 of the delivery feed drum 718.

As the stock emerges from the cutting mechanism 30, with the cut blanks in place, it is received upon the upper stretch of the conveyer belt 76 and carried away from the cutting mechanism. As the end of the stock is advanced by the conveyer belt 76, it is

led by the operator across a gap 736 (Fig. 2) and placed upon the inner end of the scrap-disposal conveyer 74. This conveyer traverses around a feed drum 738 and an end roll 740 and over the plurality of idler rolls 72 and is driven by the feed drum 738 through the agency of a sprocket 742 that is fixed to the shaft thereof and which cooperates with a chain 744 that cooperates with a sprocket 746 on the shaft 732 of the feed drum 718.

In passing over the gap 736 between the conveyer belts 76 and 74 during the operation of the delivery feed mechanism, the cut blanks adhere to the conveyer 76 and are separated from the scrap or remnants of the stock and carried downwardly upon the inclined stretch 78 of said conveyer, leaving the cut strip, comprising the scrap or waste, to be fed by the conveyer 74 and discharged at the end thereof.

The cut blanks are ultimately to be stacked in separated piles, and inasmuch as they are cut from the stock in closely adjacent interlocking proximity, as illustrated in Fig. 1^A, it is necessary to provide means for spacing or spreading out the blanks of each row in extended dispersed relation in order to permit the corresponding blanks of the several rows to be delivered in separate piles. To the accomplishment of this end, the blanks, separated from the scrap and carried upon the downwardly inclined stretch 78 of the conveyer 76, are delivered upon a multi-belt conveyer comprising the plurality of narrow belts 80 (Figs. 2 and 22), that are arranged in close proximity. The ends of these belts 80 adjacent the cutting mechanism pass over the common feed drum 82, while the opposite ends thereof are carried by the small pulleys 84 that are rotatably mounted on studs 750 projecting in parallel relation from one side of an angularly disposed cross-beam 752. Said cross-beam is secured at one end to a bracket 754, depending from the angle iron 696 on the forward side of the table, and at the other end upon an arm 756 supported by the brackets 699 on the rear side of the table. The belts are of graduated lengths, increasing uniformly from the belt at the front of the machine to that at the rear thereof, and the pulleys 84 are arranged in an angular row disposed at substantially 30 degrees to the length of the belts, as most readily seen in the diagram of Fig. 12 and in Fig. 22. The feed drum 82 is driven continuously at the same uniform speed as the stock by means of a sprocket 760, a chain 762 and sprocket 764, said sprockets being secured to the shafts of the feed drum 82 and feed drum 718 respectively.

The narrow belts 80 are maintained in proper driving tension by means of suitable

belt tightening devices, illustrated particularly in Figs. 21 and 22. These belts, in coming from the under side of the feed drum 82, pass over a pair of idler rolls 766 and 768 that are rotatably mounted in the brackets 754 depending from the angle irons 696. Riding upon the alternate belts 80 between the rolls 766 and 768 are a plurality of pulleys 770 that are pivotally mounted at the ends of arms 772 which are pivoted upon rods 774. Springs 776 are attached to the outer ends of these arms and to a U-shaped bar or bracket 778 that is secured to the bracket 754. The remaining alternate belts cooperate with pulleys 780 that are similarly mounted upon arms 782 and acted upon by springs 784. These springs 776 and 784 therefore function through the arms 772 and 782 and pulleys 770 and 780 to maintain the belts in proper tension.

As the cut blanks are delivered from the downwardly inclined stretch 78 of the conveyor belt 76 to the series of narrow belts 80, they are continuously advanced thereby in the direction of the arrow in Figs. 12 and 22. When the blanks reach the ends of the narrow belts, which ends are collectively arranged at an angle to the lengths of the belts, the leading ends of said blanks are permitted to fall therefrom upon the relatively wide conveyer 86 which is disposed immediately beneath the narrow belts 80 and at substantially right angles thereto. The rear end of this conveyer 86 is carried by a feed drum 790 and the forward end by a drum 792, the feed drum 790 being driven at a relatively fast speed with respect to the driving speed of the narrow belts 80. The driving mechanism for the feed drum 790 comprises a sprocket 794 carrying a chain 796 that extends across and beneath the table and passes over a sprocket 798 that is fixed to one end of a shaft 800. This shaft is rotatably mounted in the forward bracket 754 and its other end is provided with a mitre gear 802 meshing with a mitre gear 804 fixed to the shaft of the feed drum 82. The feed drum 790 is suitably supported at one end in a bracket 806 and at the other by the rear bracket 754, while the drum 792 is journaled in brackets 808 carried at the upper end of supporting rods or standards 810.

As the leading ends of the blanks are successively delivered or fall upon the rapidly moving conveyer 86, the direction of their movement is modified and they are swung through an angle of 90 degrees and fed forwardly by the conveyer 86. During this operation, and by reason of the angular arrangement of the ends of the narrow belts 80, together with the relatively fast speed of operation of the conveyer 86, the cut

blanks are spaced apart or spread out in extended rows, whereby the initial interlocking close proximity of the blanks is broken up and the blanks sufficiently separated to permit them to be delivered and stacked in separate piles. As the blanks in this dispersed spaced relation are fed forwardly at a rapid rate by the conveyer 86, they are delivered or projected from the end thereof, as indicated in Fig. 23, into separate compartments 812 of the receptacle 88, which may conveniently be in the form of a truck that may be suitably positioned to receive the blanks as they are delivered and in which they may be carried away for storage purposes or for immediate use.

Although the invention has been shown and described as embodying more or less specific structural details and arrangements and locations of parts, those skilled in the art will readily understand that the advantages and benefits of certain features of the invention may be obtained by means differing in a large measure from those specifically set forth without departing from the spirit and scope of the invention. Therefore, it should be understood that only such limitations should be imposed as are indicated in the appended claims.

Having thus illustrated and described the preferred embodiment of the invention, that which is claimed as new is:—

1. A stock-cutting machine having, in combination, means for continuously feeding a sheet of stock, and means comprising a hollow die having a cutting edge and operating during the continued movement of the stock for instantaneously cutting a piece therefrom.

2. A stock-cutting machine having, in combination, a periodically operating cutting means including a hollow die having a cutting edge and movable for cutting pieces successively from a strip of stock, and means for continuously feeding the stock to the cutting means.

3. A stock-cutting machine having, in combination, means for continuously feeding a strip of stock at a uniform rate, reciprocating means for cutting successive pieces from the stock, operating means for the cutting means, and means for controlling the reciprocations of the cutting means in accordance with the amount of stock being fed per unit of time.

4. A stock-cutting machine having, in combination, means for continuously feeding a strip of stock at a uniform rate, normally idle cutting means for operating on the stock, and automatic means movable at the same rate of speed as the stock for rendering the cutting means effective when the stock has been fed a predetermined distance.

5. A stock-cutting machine having, in

combination, means for continuously feeding a strip of stock at a uniform rate, normally idle cutting means for operating on the stock, said means being adapted to come to rest after each cutting movement, and means for throwing the cutting means into operation periodically in accordance with the rate of feed of the stock.

6. A stock-cutting machine having, in combination, a cutting block, a normally idle reciprocable cutting die adapted to cooperate therewith, means for continuously feeding a strip of stock across the cutting block at a uniform rate, and means for successively throwing the reciprocable die into operation at points equally spaced in the direction of feed of the stock.

7. A stock-cutting machine having, in combination, reciprocatory cutting means, normally idle means for actuating the reciprocatory cutting means, means for continuously feeding a strip of stock to the cutting means, means for rendering the operating means effective after the stock is fed a predetermined distance, and means for arresting the operation of said operating means after the reciprocatory cutting means has performed a single cutting operation.

8. A stock-cutting machine having, in combination, normally idle reciprocatory cutting means for operating upon stock, means for continuously feeding a strip of stock to be operated upon, and means dependent upon a predetermined length of feed of the stock for rendering the reciprocatory cutting means operative and for disconnecting the operation after a single working stroke thereof.

9. A stock-cutting machine having, in combination, normally idle reciprocatory cutting means for operating upon the stock, means for continuously feeding a strip of stock to be operated upon, measuring means for determining when the stock has been fed a predetermined distance, means dependent upon said measuring means for effecting the operation of said reciprocatory cutting means, and means operated by the movement of said reciprocatory cutting means for discontinuing the operation thereof after said means completes a single cycle of operations.

10. A stock-cutting machine having, in combination, a cutting block, a reciprocatory cutter, normally idle operating means for effecting reciprocations thereof, a normally disengaged clutch for connecting the operating means to a source of power, normally restrained spring-actuated means for throwing in the clutch, means for releasing said spring-actuated means under predetermined conditions to engage the clutch and cause the cutter to be reciprocated, means for resetting the spring-actuated clutch op-

erating means during the reciprocation of the cutter, and means for disengaging the clutch when the cutter has completed a single cycle of operations.

11. A stock-cutting machine having, in combination, normally idle reciprocatory cutting means, a normally disengaged clutch adapted to connect the cutting means to a source of power, normally restrained means for actuating the clutch to effect the operation of the cutting means, said means being reset by the operation of said cutting means, means for disengaging the clutch after a single cycle of operations of the cutting means, and means for controlling the release of said clutch-actuating means.

12. A stock-cutting machine having, in combination, normally idle reciprocatory cutting means for operating upon the stock, said cutting means being constructed and arranged so that when operative it performs a single cycle of operations and is brought to rest, a clutch for connecting the cutting means to a source of power, normally restrained power-actuated means for throwing in the clutch, and means for controlling the release of said clutch-actuating means.

13. A stock-cutting machine having, in combination, a reciprocatory cutter, mechanism for actuating said cutter, a normally disengaged clutch for connecting the actuating mechanism to a source of power, spring-actuated means for throwing in the clutch, means for restraining said spring-actuated means, means for releasing said restraining means to cause the clutch to be actuated to effect the reciprocation of the cutter, and means operative during the return stroke of the cutter for resetting and latching the spring-actuated clutch operating means and for disengaging the clutch when the cutter is restored to its initial position.

14. A stock-cutting machine having, in combination, a reciprocating cutter, means for continuously feeding a strip of stock into position to be operated upon, and means for stepping the cutter across the strip of stock between successive cutting operations to produce a row of cuts extending angularly across the strip of stock.

15. A stock-cutting machine having, in combination, means for continuously feeding a strip of stock at a uniform rate, a reciprocating die for periodically operating upon the stock and cutting blanks therefrom, and means for stepping the die transversely across the stock between successive cutting operations and in accordance with predetermined feed movements of the stock.

16. A stock-cutting machine having, in combination, means for continuously feeding a strip of stock to be operated upon, a normally idle reciprocatory die for cutting blanks from the stock, and means dependent

upon a predetermined feed of the stock for effecting a single cycle of operations of the reciprocatory die and for stepping the die transversely across the strip of stock.

17. A stock-cutting machine having, in combination, a stationary cutting block, a reciprocatory beam, a die carried thereby and adapted to be moved along the beam, means for continuously feeding a strip of stock at a uniform rate across the cutting block, means dependent upon a predetermined length of feed of the stock for effecting a single cycle of operations of the reciprocatory beam and die attached thereto, and means effective during the return stroke of the beam and die for stepping the die along the beam and across the strip of stock.

18. A stock-cutting machine having, in combination, a work support, a die reciprocable toward and from the work support in cutting operations, means for feeding a strip of stock to be operated upon, means for periodically stepping the die across the stock between successive operative strokes of the die, and means for resetting the die to its initial position.

19. A stock-cutting machine having, in combination, a reciprocating beam, a movable die carried thereby, means for intermittently stepping the die along the beam between successive cutting operations, and means rendered operative when the die has been stepped a predetermined distance for resetting the die to its initial position.

20. A stock-cutting machine having, in combination, a reciprocating beam, a movable die carried thereby, means for intermittently stepping the die along the beam between successive cutting operations, means rendered operative when the die has been stepped a predetermined distance for resetting the die to its initial position, and means operated by the die when reset for re-establishing the stepping movements thereof.

21. A stock-cutting machine having, in combination, means for continuously feeding a strip of stock at a uniform rate, a reciprocatory die for cutting blanks successively therefrom, means for stepping the die transversely across the stock after each cutting operation to produce a row of cuts extending angularly across the strip, and means for resetting the die to its initial position by a continuous movement during the continued operation of said feeding means.

22. A stock-cutting machine having, in combination, means for continuously feeding a strip of stock to be operated upon, cutting mechanism comprising a reciprocatory die for cutting blanks from the stock, said die being adapted to come to rest after each single cycle of operations, means for effecting the operation of said die at each successive feed of the stock through a

predetermined distance, means for transversely stepping the die a predetermined distance after each cutting operation so as to produce a row of cuts extending angularly across the stock, and means operable when the die has been stepped a predetermined amount for resetting the die to its initial position by a continuous movement.

23. A stock-cutting machine having, in combination, means for continuously feeding a strip of stock at a uniform rate, normal idle reciprocatory cutting means for operating upon the stock as it is fed, said cutting means being adapted to come to rest after each cycle of operation, means dependent upon a predetermined length of feed of the stock for initiating the operation of said cutting means, means for stepping the cutting means transversely across the stock between successive cutting operations, means operative when the cutting means has been stepped to its predetermined limit of travel for rendering inoperative the means for initiating the operation of said cutting means and for resetting the cutting means to its initial position by a continuous movement.

24. A stock-cutting machine having, in combination, a reciprocatory beam, a movable die carried thereon, means for stepping the die transversely along the beam between successive cutting operations thereof, and means for reversing the position of the die for each stepping operation.

25. A stock-cutting machine having, in combination, a reciprocating beam, a movable die carried thereby and adapted to be rotated end-for-end about a central axis, means for stepping the die transversely along the beam between successive cutting operations thereof, and means for rotating the die through 180 degrees about its axis for each stepping operation.

26. A stock-cutting machine having, in combination, means for feeding a strip of stock to be operated upon, cutting means embodying a reciprocating die for cutting blanks from the stock, means for stepping the die a predetermined distance transversely of the stock after each cutting operation, and means for turning the die end-for-end for each stepping movement thereof.

27. A stock-cutting machine having, in combination, means for continuously feeding a strip of stock at a uniform rate, cutting means embodying a reciprocating die for successively cutting blanks therefrom during the continued movement of the stock, and means for transversely stepping the die and turning it end-for-end between successive cutting operations, whereby an angular row of alternately disposed cuts is produced across the strip of stock.

28. A stock-cutting machine having, in combination, means for continuously feeding a strip of stock at a uniform rate, cut-

ting means embodying a reciprocating die for successively cutting blanks therefrom during the continued movement of the stock, means for transversely stepping the die and
 5 turning it end-for-end between successive cutting operations, whereby an angular row of alternately disposed cuts is produced across the strip of stock, and means operating during the continued feed of the stock
 10 for resetting the die to its initial position in readiness for the initial cut of a similar angular row of cuts.

29. A stock-cutting machine having, in combination, means for continuously feeding
 15 a strip of stock at a uniform rate, a normally idle reciprocatory die for cutting blanks therefrom during the continued feed of the stock, means for automatically effecting the operation of said die in accordance with successive predetermined lengths of feed of the
 20 stock, means for stepping the die transversely of the stock and for reversing the position of the die subsequent to each cutting operation, and means for arresting the operation of the die after each cycle of operations of the machine has been performed.

30. A stock-cutting machine having, in combination, means embodying a source of power and mechanism constantly driven thereby for continuously feeding a strip of
 30 stock at a uniform rate, means comprising a reciprocatory die, a separate source of power and a normally idle clutch for connecting the die to its source of power for
 35 cutting successive blanks from the stock as it is fed, means dependent upon predetermined feed movements of the stock for automatically actuating said clutch to effect the operation of said die, and means for
 40 arresting the operation of the die after each cutting operation and during the continued operation of the feeding means.

31. A stock-cutting machine having, in combination, means for continuously feeding
 45 at a uniform rate a strip of stock to be operated upon, comprising a source of power and continuously operating feed mechanism driven thereby, cutting means for operating upon the stock comprising a reciprocatory
 50 die, a source of power therefor, means dependent upon a predetermined length of feed movement of the stock for connecting the die to its source of power, means for transversely stepping the die across the stock
 55 and reversing the position therefor, and means controlled by the operation of the die for connecting said die-stepping and reversing means to the continuous source of power for said feeding means.

60 32. A stock-cutting machine having, in combination, means embodying a source of power and mechanism constantly driven thereby for continuously feeding a strip of
 65 stock at a uniform rate, means comprising a reciprocatory die, a separate source of

power and a normally idle clutch for connecting the die to its source of power for cutting successive blanks from the stock as it is fed, means dependent upon predetermined feed movements of the stock for automatically actuating said clutch to effect
 70 the operation of said die, means for arresting the operation of the die after each cutting operation and during the continued operation of the feeding means, means for transversely stepping the die across the stock
 75 and for reversing the position thereof, a normally idle clutch for connecting said last-named means to the source of power of said feeding means, and means controlled by the
 80 operation of said die for temporarily actuating the last-named clutch to effect a stepping movement and a reversing movement of the die after each cutting operation.

33. A stock-cutting machine having, in
 85 combination, a cutting mechanism comprising a reciprocatory die for cutting blanks from the stock, a feed mechanism for continuously feeding a strip of stock to the cutting mechanism and for transferring the cut
 90 blanks therefrom, and means for stacking the cut blanks in superposed relation during the continuous feeding movement of the strip of stock.

34. A stock-cutting machine having, in
 95 combination, means for feeding a strip of stock to be operated upon, a cutting mechanism for cutting a substantially transverse row of blanks from the stock, and means for transferring the row of cut blanks away
 100 from the cutting mechanism and subsequently depositing them at separate stations.

35. A stock-cutting machine having, in combination, means for feeding a strip of
 105 stock to be operated upon, a cutting mechanism for cutting successive rows of blanks extending substantially transversely of the stock, and means for transferring the successive rows of cut blanks from the cutting mechanism and subsequently depositing them
 110 in stack formation at separate stations, the construction being such that the correspondingly located blanks of each row are stacked together.

36. A stock-cutting machine having, in
 115 combination, means for continuously feeding a strip of stock at a uniform rate, means operating during the continued feeding movement of the stock for successively cutting blanks from the stock in successive angularly
 120 disposed transverse rows, and means for transferring the cut blanks from the cutting mechanism and stacking the correspondingly located blanks of each row at separate stations.

37. A stock-cutting machine having, in combination, means for feeding a strip of
 125 stock to be operated upon, means for cutting a substantially transverse row of blanks therefrom, the several blanks being disposed
 130

in closely adjacent proximity, and means for transferring the cut blanks from the cutting mechanism, spacing the blanks apart in an extended row and depositing the spaced blanks at separate stations.

38. A stock-cutting machine having, in combination, means for feeding a strip of stock to be operated upon, means for cutting a substantially transverse row of blanks from the stock, the blanks being disposed in closely adjacent proximity, and means for transferring the cut blanks and spacing them apart in an extended row.

39. A stock-cutting machine having, in combination, means for feeding a strip of stock to be operated upon, means for cutting a substantially transverse row of sole blanks therefrom, the alternate blanks being disposed end-for-end to permit of closely adjacent interlocking proximity, and means for transferring the row of cut blanks from the cutting mechanism and spacing the blanks apart in an extended row to break up the interlocking disposition of the blanks.

40. A stock-cutting machine having, in combination, means for continuously feeding a strip of stock to be operated upon, cutting mechanism embodying a reciprocating sole die for cutting blanks therefrom, means for transversely stepping the die and reversing its position between successive cutting operations, said means being constructed and arranged to produce from the stock an angularly disposed row of cut blanks disposed in closely adjacent interlocking arrangement, and means for transferring the cut blanks and spacing them apart in an extended row to permit the blanks to be independently manipulated.

41. A stock-cutting machine having, in combination, cutting mechanism for cutting a substantially transverse row of blanks from stock, said blanks being left in position in the stock, means for feeding a strip of stock to the cutting mechanism and feeding said strip, with the cut blanks in position, away from the cutting mechanism, means for separating the cut blanks from the remainder of the strip, and means for discharging the separated blanks from the machine.

42. A stock-cutting machine having, in combination, a plurality of separate feed mechanisms and a cutting mechanism disposed between them, one of the feed mechanisms being adapted to feed a strip of stock to the cutting mechanism and the other feed mechanism being adapted to feed the stock, with the cut blanks in place, away from the cutting mechanism, means for separating the cut blanks from the remainder of the stock, and means for stacking the cut blanks.

43. A stock-cutting machine having, in combination, means for supporting a strip of stock in the form of a roll, means operat-

ing without intermission for unwinding the roll of stock and feeding the strip to a position to be operated upon, cutting mechanism operating during continued movement of the strip for cutting blanks from the strip, feed mechanism for feeding the cut strip, with the cut blanks in place, away from the cutting mechanism, and means for separating the cut blanks from the cut strip.

44. A stock-cutting machine having, in combination, means for supporting a strip of stock in the form of a roll, means for continuously unwinding the roll and feeding the stock to an operating position, cutting means comprising a reciprocating die for cutting blanks from the stock during the continued feeding of the stock, and means for feeding the cut stock, with the cut blanks in place, away from the cutting mechanism.

45. A stock-cutting machine having, in combination, means for supporting a strip of stock in the form of a roll, means for continuously unwinding the stock from the roll and feeding it at a uniform rate to an operating position, and cutting mechanism embodying a reciprocating die for cutting blanks from the stock during the continued feeding of the stock.

46. A stock-cutting machine having, in combination, means for cutting a row of blanks from a strip of stock, the blanks being disposed in closely adjacent proximity, and means including a plurality of angularly disposed travelling conveyers running at different speeds, for transferring the row of blanks and spacing the blanks apart in an extended row.

47. A stock-cutting machine having, in combination, means for cutting a row of blanks from a strip of stock, the blanks being disposed in closely adjacent interlocking proximity, a travelling conveyer having an angularly disposed end for receiving and transferring said row of blanks, and another relatively wide and fast travelling conveyer disposed below and at an angle to the first conveyer for receiving the blanks as they are delivered from the angularly disposed end of the first conveyer and in conjunction therewith for spacing the blanks apart to break up the initial interlocking disposition thereof.

48. A stock-cutting machine having, in combination, means for cutting a row of blanks from a strip of stock, the blanks being disposed in closely-adjacent proximity, a plurality of closely spaced narrow belts for receiving the row of blanks and transferring them, a common driving drum for one end of each of the belts and a plurality of independent pulleys for the other ends of the respective belts, said pulleys being disposed in an angular row materially inclined to the lengths of the belts, a relatively wide and fast travelling conveyer disposed

slightly below and at an angle to said belts for receiving the row of blanks as they are delivered from the ends of said belts and in conjunction therewith for turning the
5 blanks through a right angle and spacing the blanks apart.

49. A method of cutting stock which includes feeding the stock continuously and successively dieing-out blanks in a direction
10 transverse of the stock during the continued feeding movement thereof.

50. A method of cutting stock which includes continuously unwinding the stock from a roll and feeding it at a uniform rate,
15 and dieing-out blanks step-by-step in a direction transverse of the stock during the continued feeding movement thereof.

51. A method of cutting blanks with a die from a strip of stock which includes
20 feeding the strip of stock at a uniform rate, and intermittently stepping the die across the strip and cutting blanks therefrom during the continued feed of the stock.

52. A method of cutting blanks with a die from a strip of stock which includes
25 feeding the strip of stock at a uniform rate, intermittently reversing and stepping the die across the strip, and cutting a blank therefrom after each reversal and stepping
30 movement of the die.

53. A method of cutting stock which includes continuously feeding a strip of stock, dieing-out an angularly disposed row of
35 closely adjacent blanks therefrom during the continued feed thereof, separating the blanks from the waste stock, and spreading out the blanks in dispersed relation.

54. A method of cutting stock which includes continuously feeding a strip of stock,
40 dieing-out an angularly disposed row of closely adjacent blanks therefrom during the continued feed thereof, separating the blanks from the waste stock, spreading out the blanks in dispersed relation, and stack-
45 ing the blanks in separate piles.

55. A method of cutting stock which includes continuously feeding a strip of stock, dieing-out successive rows of blanks there-
50 from during the continued feed thereof, separating the blanks from the waste strip, and stacking the correspondingly located blanks of each row into separate piles.

56. A method of cutting and operating on blanks obtained from sheet material which
55 comprises cutting a row of closely adjacent blanks which remain in the plane of the sheet material so as to be moved thereby away from the field of cutting operations, and subsequently separating the blanks from
60 the remainder of the sheet and spreading them out to a substantial extent laterally of each other so as to facilitate a subsequent operation on the blanks.

57. A method of cutting and stacking
65 blanks which comprises severing from sheet

material row after row of closely adjacent blanks which remain for a time in the plane of the sheet so as to be moved thereby away from the field of cutting operations, subse-
70 quently separating the blanks from the remainder of the sheet, and then moving the blanks toward stacking position and at the same time spreading them laterally of each other to a substantial extent so that they
75 may be delivered in separate stacks.

58. A method of producing and magazin-
ing blanks which comprises cutting from a sheet of material blanks which remain for a time in the plane of the sheet so as to be
80 moved thereby from the field of cutting operations, subsequently removing the blanks from the remainder of the sheet, and moving the blanks toward the magazines and at the same time spacing them from each other
85 so that they may be distributed properly among the magazines.

59. A method of cutting and stacking blanks which comprises cutting successive
90 rows of blanks from sheet material in such manner as to leave them in position in the sheet, separating the blanks from the remainder of the material as a separate operation, and subsequently stacking the corre-
95 spondingly located blanks of each row in separate piles.

60. In a machine of the class described, means for supporting a strip of stock in the form of a roll, continuously operating means
100 for winding the roll of stock and feeding it into position to be operated upon, cutting mechanism operating during continued movement of the stock for cutting blanks
105 therefrom, and feed mechanism for feeding the stock with the cut blanks in place away from the cutting mechanism, said feeding mechanism operating to separate the cut
blanks from the stock.

61. In a machine of the class described, means for continuously feeding a sheet of
110 stock, and a die movable transversely of the sheet during continued feeding movement thereof and operative for cutting blanks therefrom.

62. In a machine of the class described, means for continuously feeding a sheet of
115 stock, and a die movable step by step across the stock during continued feeding movement thereof for cutting blanks therefrom.

63. In a machine of the class described, means for continuously feeding a strip of
120 stock, normally idle cutting means for operating on the stock, and automatic means movable at the same rate of speed as the stock for rendering the cutting means effective when the stock has been fed a predeter-
125 mined distance.

64. A stock cutting machine, having, in combination, a cutting block, a normally
idle reciprocable cutting die adapted to co-
operate therewith, means for continuously
130

feeding a strip of stock across the cutting block, and means for throwing the die into operation at predetermined intervals.

65. A stock cutting machine, having, in combination, a cutting block, a normally idle reciprocable cutting die adapted to co-operate therewith, means for continuously feeding a strip of stock across the cutting block, and means for throwing the die into operation at intervals determined by the amount of stock being fed per unit of time.

66. In a cutting machine, a reciprocable beam, a movable die carried thereby and adapted to be rotated about a vertical axis, means for stepping the die along the beam between successive cutting operations, and means for rotating the die about said axis for each stepping operation.

67. In a machine of the class described, a conveyor for articles disposed with their major axes parallel with the direction of feed, magazines for the articles, and means for turning all of the articles carried by the conveyor so that they are delivered to the magazines with their major axes pointing in another direction.

68. In a machine of the class described, a conveyor for articles disposed with their major axes parallel with the direction of feed, magazines for the articles, and a second conveyor co-operating with the first conveyor to turn the articles so that their major axes point in another direction before they are delivered to the magazines.

69. In a machine of the class described, a conveyor for articles, a magazine for receiving the articles, and means for rotating each individual article about an axis passing through the article before delivery to the magazine.

70. A machine for operating upon stock having, in combination, work operating means, feed mechanism for advancing stock to the work operating means, continuously acting driving mechanism normally disconnected from the work operating means, and means for automatically connecting said driving mechanism to cause operation of the work operating means.

71. A machine for operating upon stock having, in combination, work operating means, feed mechanism for advancing the

stock to the work operating means, continuously acting driving mechanism normally disconnected from the work operating means, and means for connecting said driving mechanism to cause operation of the work operating means and for automatically disconnecting said driving mechanism from the work operating means.

72. A stock-cutting machine having, in combination, initially idle cutting means, feed mechanism for advancing a piece of stock to the cutting means, means for measuring the feed of the stock, and means controlled by the measuring means for initiating the operation of the cutting means when the stock is properly located for the cutting operation.

73. A machine for cutting stock into blanks having, in combination, feed mechanism for advancing a piece of stock, relatively movable cutting devices for cutting successive blanks from the stock as it is advanced, operating mechanism having continuous movement and arranged to be connected to cause operation of the cutting devices, and means for automatically connecting said mechanism to effect cutting operations on the stock.

74. A machine for cutting stock into blanks having, in combination, feed mechanism for advancing a piece of stock, relatively movable cutting devices for cutting successive blanks from the stock as it is advanced, operating mechanism having continuous movement and arranged to be connected to cause operation of the cutting devices and to be disconnected from said devices to render them inoperative, and means for connecting said mechanism to operate the cutting devices and for automatically disconnecting said mechanism from the cutting devices.

75. In a machine of the class described, a work supporting bed, a beam reciprocable toward and from the bed, and a die movable along the beam to various operative positions and rotatable with respect to work located on the work supporting bed, the construction and arrangement being such that the die performs cutting operations upon reciprocation of the beam.

ERASTUS E. WINKLEY.