

No. 670,019.

Patented Mar. 19, 1901.

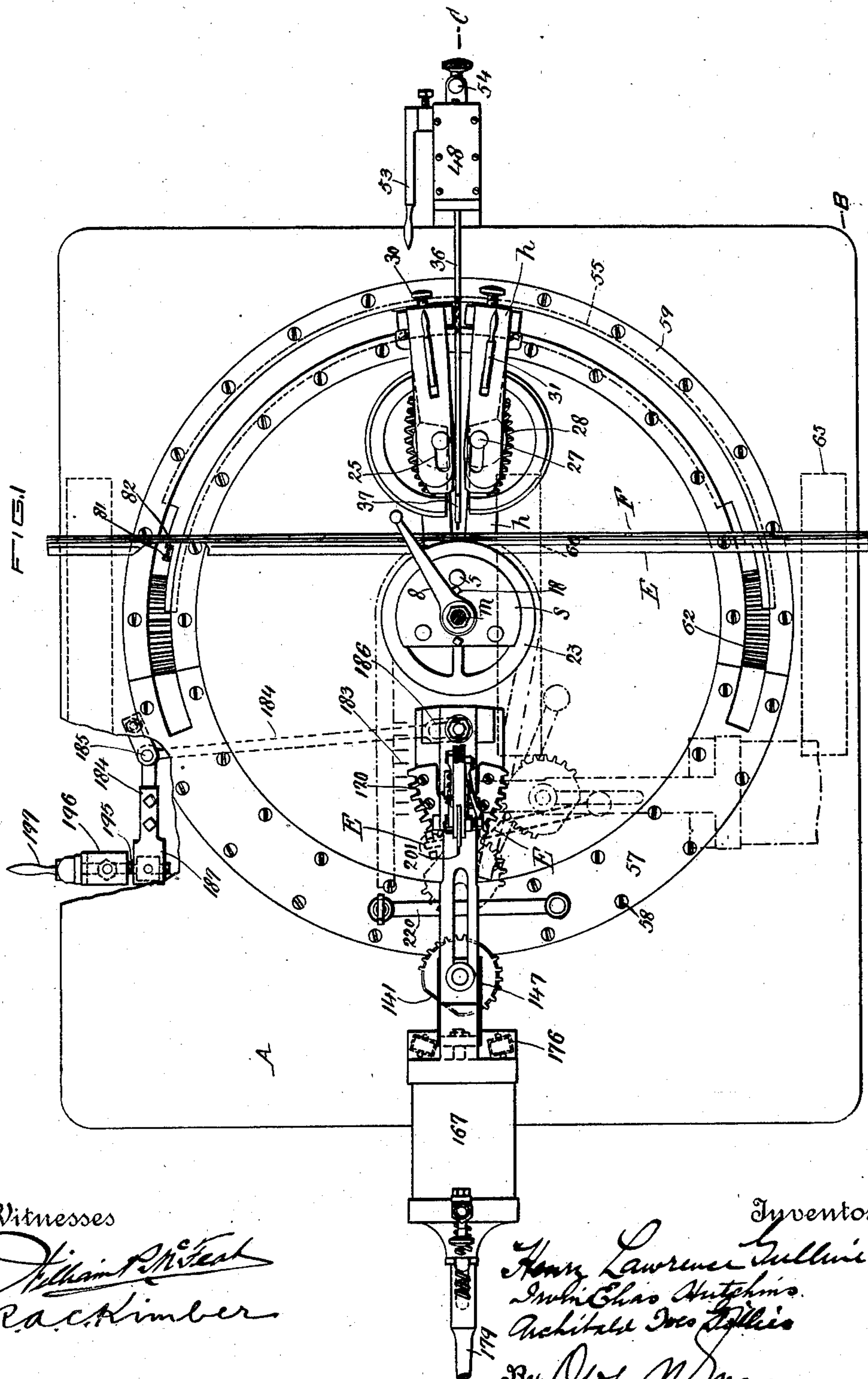
H. L. GULLINE, I. E. HUTCHINS & A. I. GILLIES.

METAL FORMING MACHINE.

(Application filed Apr. 4, 1900.)

(No Model.)

5 Sheets—Sheet 1.



Witnesses

William P. Keat
Rackhamber.

Inventors

Henry Lawrence Sullivan
Irish Chas Hutchins.
Archibald Ross Ellis

By John N. Warr attorney

No. 670,019.

Patented Mar. 19, 1901.

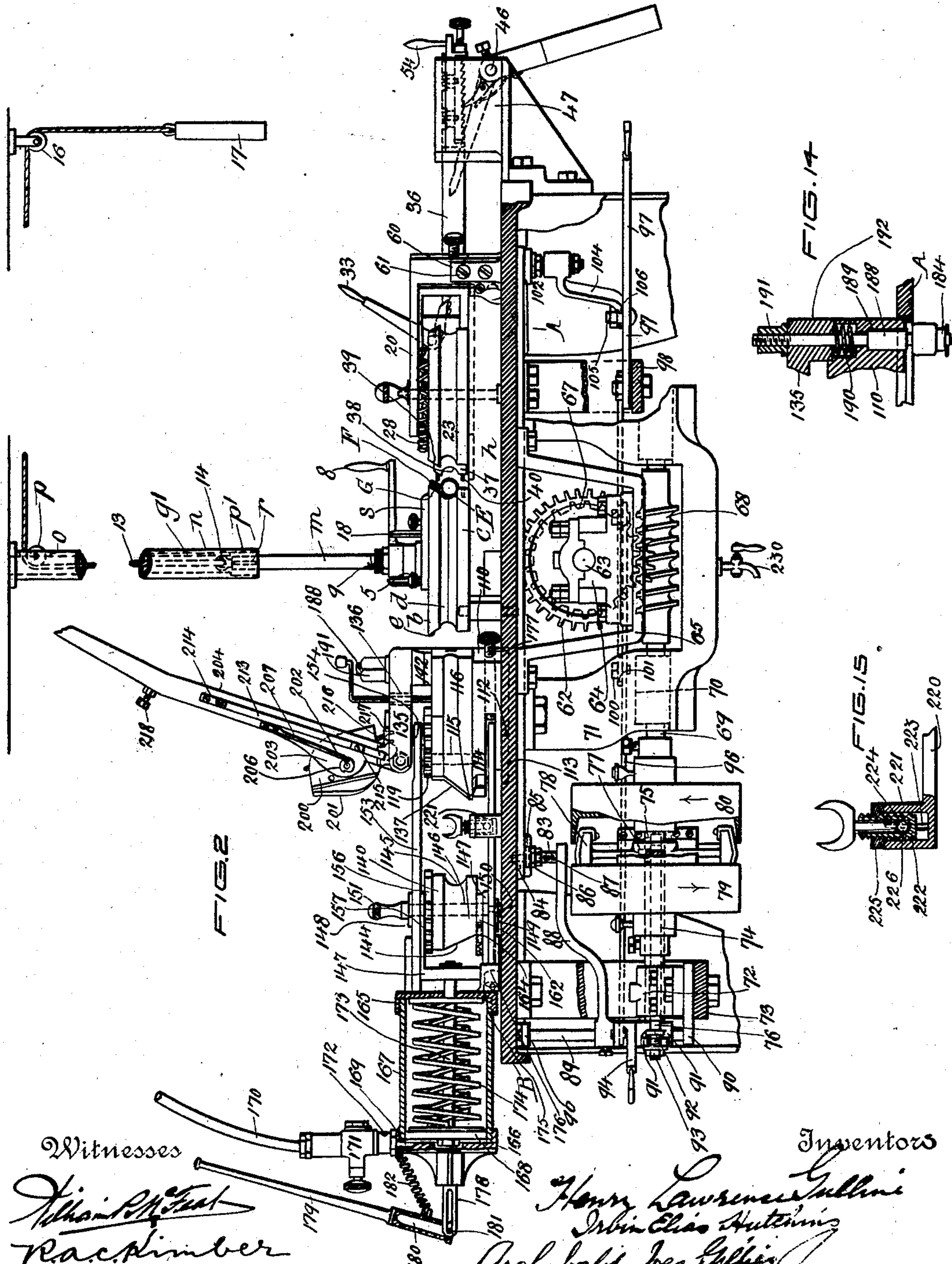
H. L. GULLINE, I. E. HUTCHINS & A. I. GILLIES.

METAL FORMING MACHINE.

(Application filed Apr. 4, 1900.)

(No Model.)

5 Sheets—Sheet 2.



Witnesses
John R. Felt
R. A. Kimber

Inventors
Henry Lawrence Gulline
Irvin Elias Hutchins
Archibald Ios Gillies
By *John N. Wau* Attorney

No. 670,019.

Patented Mar. 19, 1901.

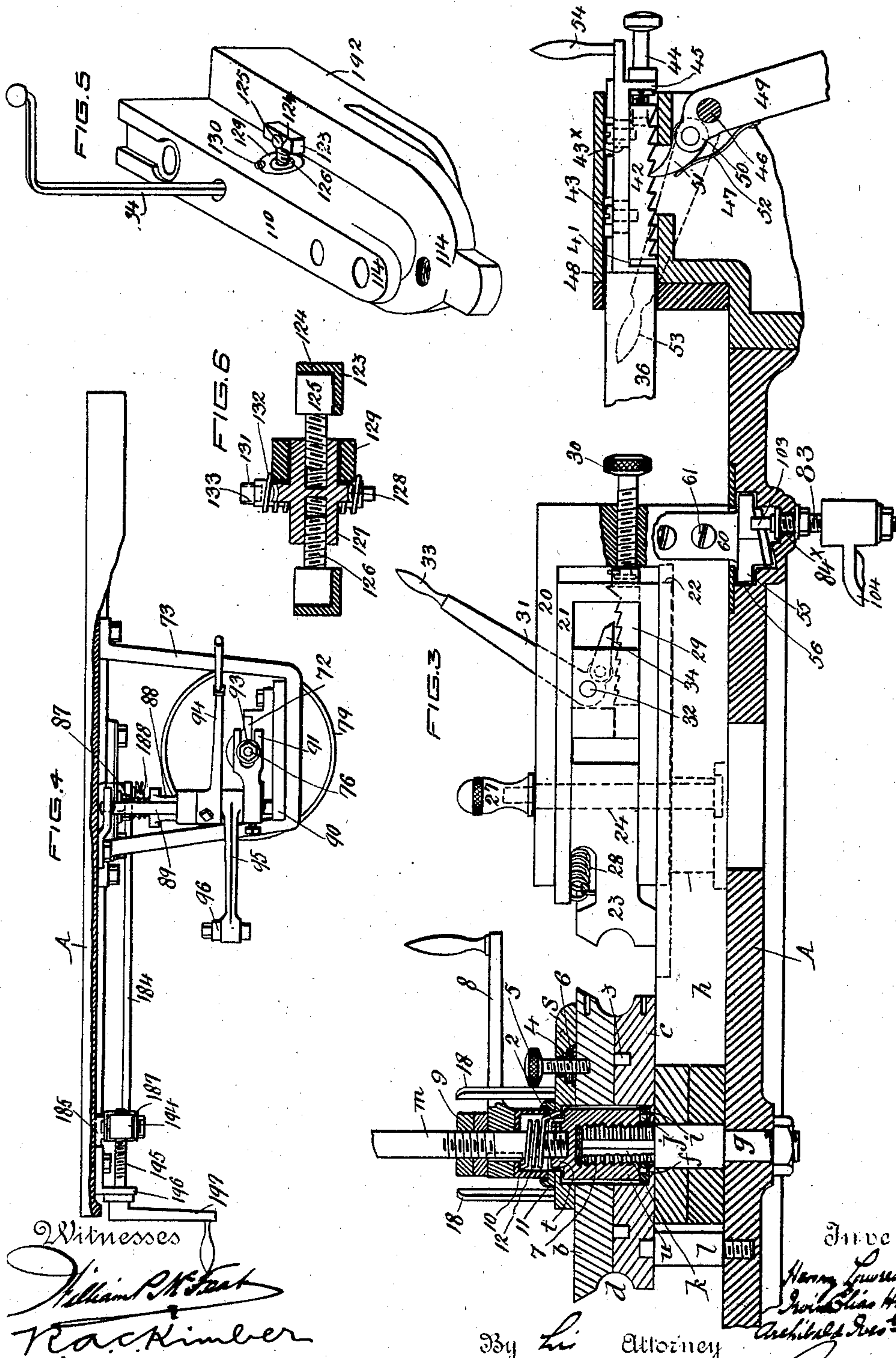
H. L. GULLINE, I. E. HUTCHINS & A. I. GILLIES.

METAL FORMING MACHINE.

(No Model.)

(Application filed Apr. 4, 1900.)

5 Sheets—Sheet 3.



Witnesses
William P. Foster
R. A. Kimber

By *Li* Attorney

Inventors
Harry Lawrence Gulline
Ivin Elias Hutchins
Archibald Ross Gillies
John N. Warr

No. 670,019.

Patented Mar. 19, 1901.

H. L. GULLINE, I. E. HUTCHINS & A. I. GILLIES.

METAL FORMING MACHINE.

(No Model.)

(Application filed Apr. 4, 1900.)

5 Sheets—Sheet 4.

FIG. 7

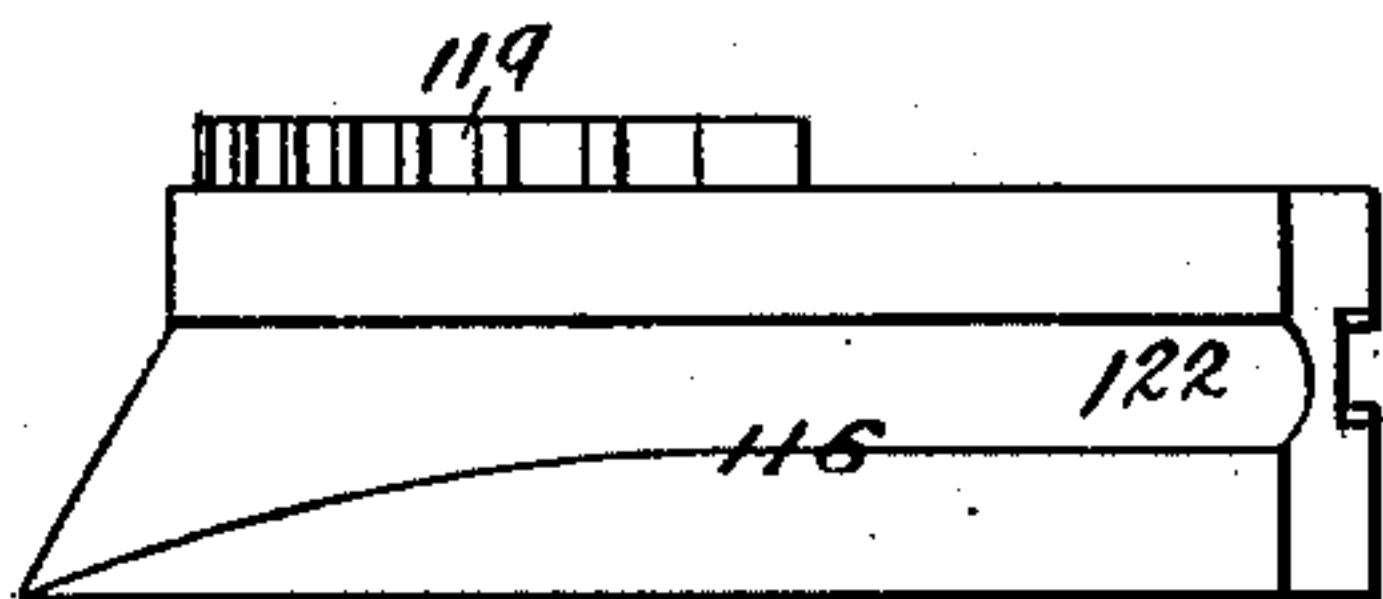


FIG. 8

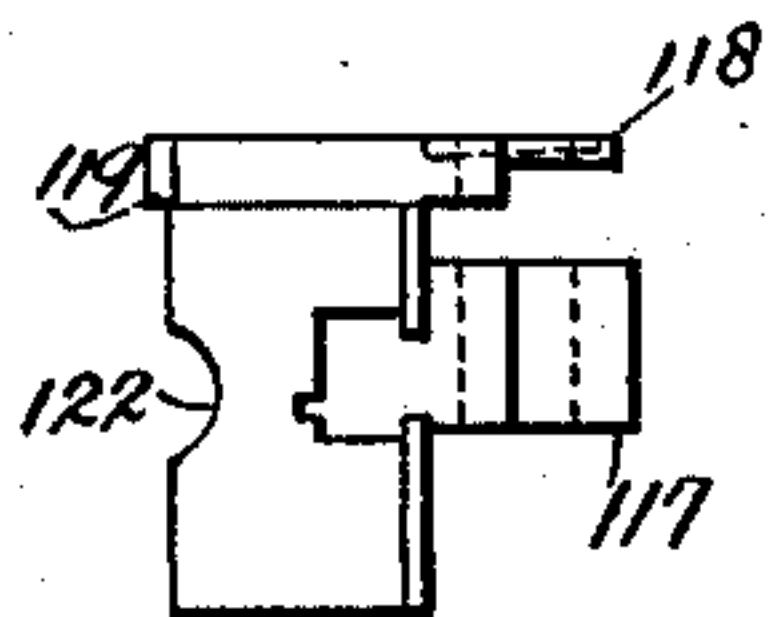


FIG. 9

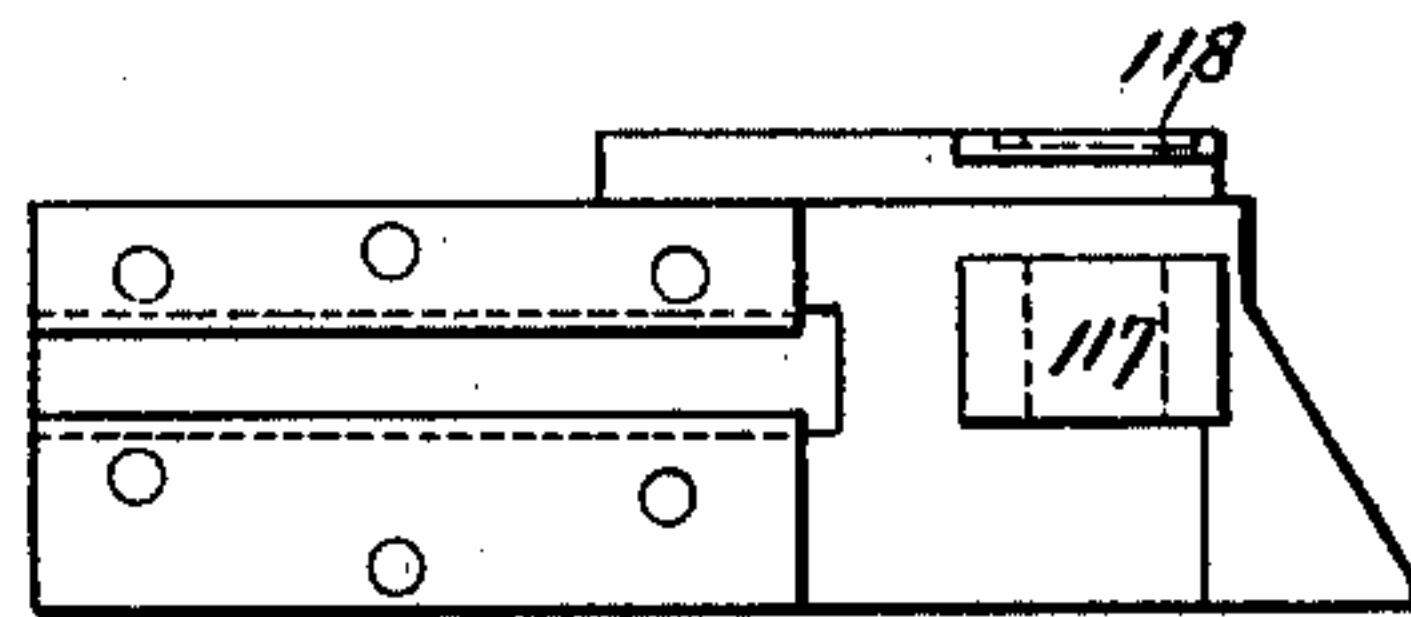


FIG. 10



FIG. 11



FIG. 12

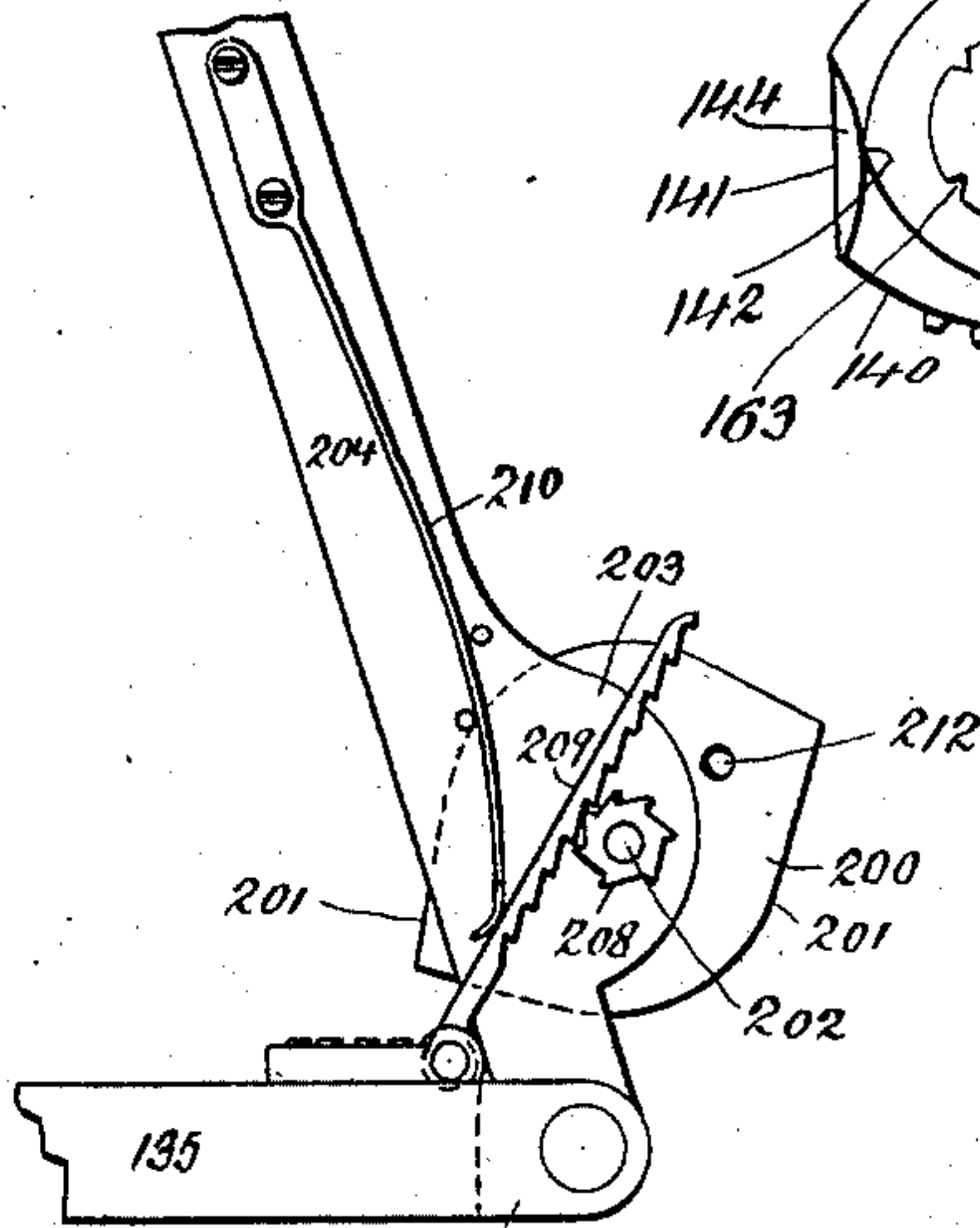
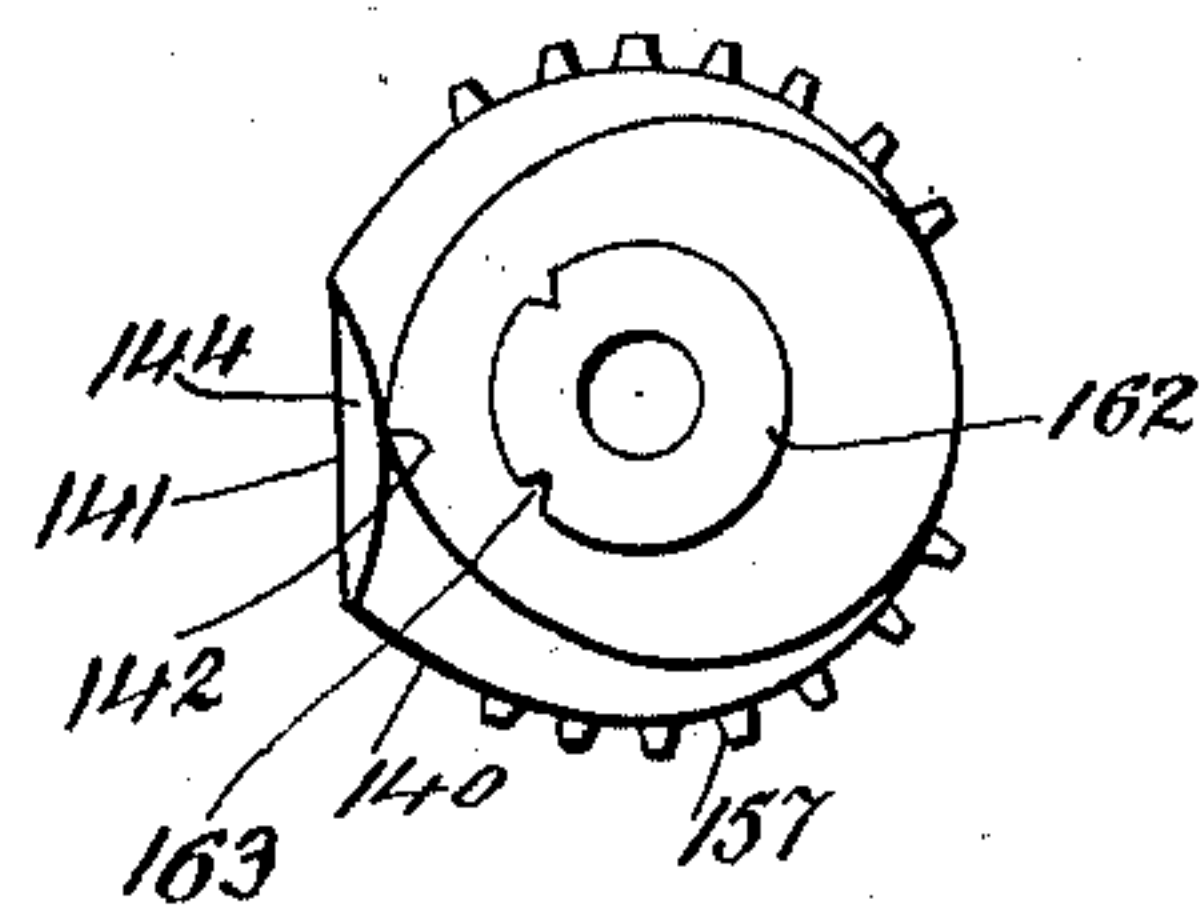


FIG. 13



Witnesses

William H. Felt
R. A. C. Kimber

Inventors

Henry Lawrence Gulline
Irving Elias Hutchins
Archibald Ives Gillies

By *John W. Evans*
Attorney

No. 670,019.

Patented Mar. 19, 1901.

H. L. GULLINE, I. E. HUTCHINS & A. I. GILLIES.

METAL FORMING MACHINE.

(No Model.)

(Application filed Apr. 4, 1900.)

5 Sheets—Sheet 5.

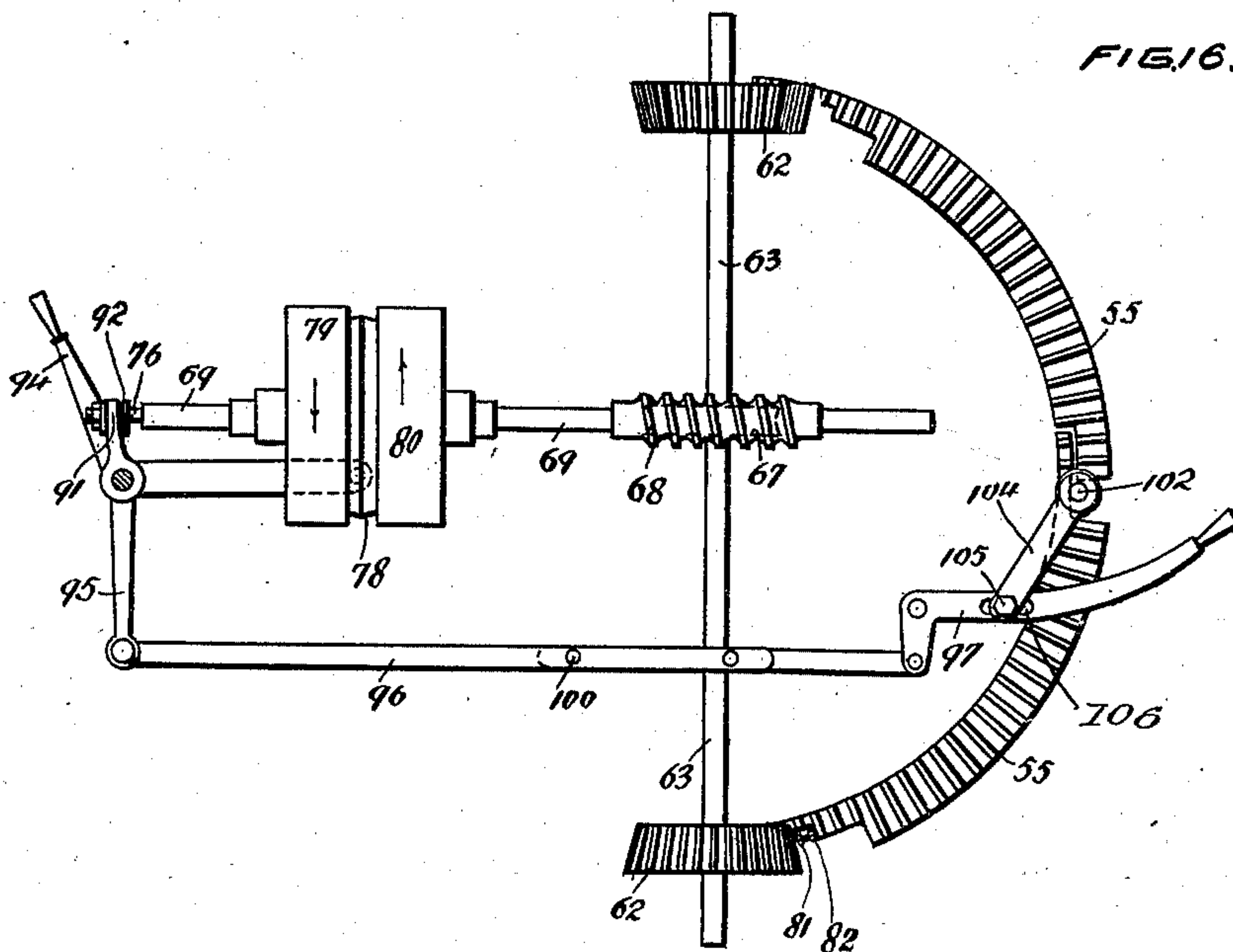
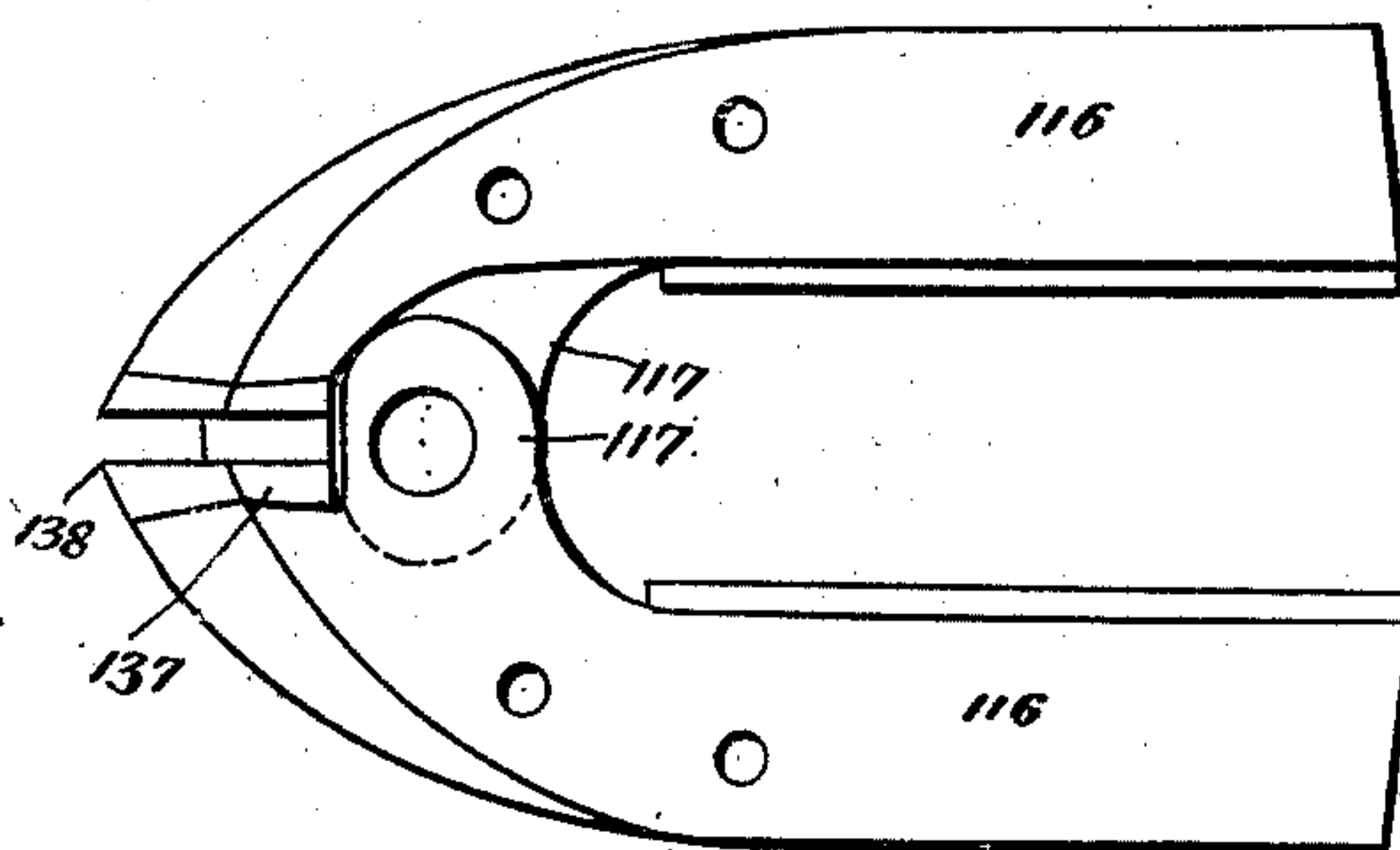


FIG. 17.



Witnesses
Rac Kimber
W. J. Shaw

Henry Lawrence Gulline
Iron Elias Hutchins
Archibald Ives Gillies

Inventors
By *their* Attorney

Oliver W. Brown

UNITED STATES PATENT OFFICE.

HENRY LAWRENCE GULLINE AND IRVIN ELIAS HUTCHINS, OF GRANBY, AND
ARCHIBALD IVES GILLIES, OF SHERBROOKE, CANADA; SAID HUTCHINS
AND GILLIES ASSIGNORS TO SAID GULLINE.

METAL-FORMING MACHINE.

SPECIFICATION forming part of Letters Patent No. 670,019, dated March 19, 1901.

Application filed April 4, 1900. Serial No. 11,557. (No model.)

To all whom it may concern:

Be it known that we, HENRY LAWRENCE GULLINE and IRVIN ELIAS HUTCHINS, of the town of Granby, and ARCHIBALD IVES GILLIES, of Sherbrooke, Province of Quebec, Canada, have invented certain new and useful Improvements in Metal-Forming Machines; and we do hereby declare that the following is a full, clear, and exact description of the same.

Heretofore in the manufacture of horse-collar rims or like frames for other purposes it has been necessary to form the said rims by hand, and this, besides requiring skilled labor, has taken considerable time.

Our invention has for its object to provide a metal-forming machine adjusted to manipulate a length of metal to produce a required shape; and the invention is particularly adapted to form the rims of horse-collars, although the embodiment of the broad principle thereof can be used to advantage in forming all kinds of frames constructed by manipulating a length of metal.

To enable the rims of horse-collars to be made mechanically and in much less time than heretofore and without necessarily employing skilled labor is the main feature of our invention, and we will in this specification set forth and claim that embodiment of our invention which we consider preferable to form horse-collar rims, and in a companion application filed on the 11th of April, 1900, under Serial No. 12,490, we set forth another embodiment of this invention which is particularly adapted to the forming of horse-collar rims of a different pattern.

Our invention, broadly expressed, may be said to consist of a machine for manipulating different lengths of metal of different thicknesses, whether tubular in cross-section or solid, and forming therefrom horse-collar rims or other like forms for other uses of different dimensions.

The invention may be said, more specifically speaking, to consist of a stationary adjustable part of a contour to give the required shape to the rim or frame to be formed and traveling mechanism to travel around and in close proximity to the contour of said station-

ary part, said stationary part and traveling mechanism together imparting the required form to the rim or frame. In this embodiment of our invention the stationary part is preferably divided into throat and peak forming portions adjustable toward and from one another to accommodate different lengths of collars, while the peak-forming portion is expandible and contractible to form different sizes of peaks, and the throat-forming portion is interchangeable with other portions to form different sizes of throats, the traveling mechanism being adjustable to accommodate different sizes of rims.

For full comprehension, however, of our invention reference must be had to the accompanying drawings, forming a part of this specification, in which like symbols indicate the same parts, and wherein—

Figure 1 is a plan view of the improved machine with the parts shown in full lines at rest and in dotted lines with rim metal and the forming parts of the machine in the positions assumed immediately after the throat has been formed and at the commencement of the operation of the peak-former and in dotted lines at the completion of one-half of the peak. Fig. 2 is substantially a side elevation with parts shown in cross-section and illustrating all parts of the machine in their normal positions. Fig. 3 is a longitudinal sectional view taken on line C of the rear half of the machine. Fig. 4 is a rear end elevation of the portion of the machine beneath the bed-plate. Fig. 5 is a detail perspective view of the frame-piece for supporting the stationary peak-forming portions. Fig. 6 is a detail sectional view of the means for adjustably connecting the stationary peak-forming portions to their frame-piece. Figs. 7, 8, and 9 are detail views of the stationary peak-forming portions removed from their frame-piece. Figs. 10 and 11 are detail views of the shearing portion located between the ends of said adjustable peak-forming portion. Fig. 12 is a detail view of the trimming device, illustrating the opposite side thereof to that illustrated in Fig. 2. Fig. 13 is a detail view of the under side of the traveling peak-forming block. Fig. 14 is a detail sectional view

of the frame of the stationary peak-block and a portion of the trimmer-bracket and illustrating particularly the pin for connecting said frame and bracket and the adjustable peak-forming portions rigidly together, and Fig. 15 is a detail sectional view of one end of the bar for supporting the ends of the rim metal. Fig. 16 is a detail plan view of the racks, means for moving the racks, and means for automatically stopping the machine; and Fig. 17 is a detail view of the expansible peak-block.

The metal we prefer to utilize in forming collar-rims is of tubular cross-section E, with a flange F, having perforations G, whereby it can be stitched to the body of the collar.

The stationary portion of the throat-forming mechanism consists of a circular block divided horizontally into upper and lower parts *b* and *c*, respectively, the edges of the adjoining faces whereof are grooved to conjointly constitute a circumferential groove *d*, while the perimeter of the upper part *b* is beveled, as at *e*. The lower part *c* of this block has a concentric boring, which is contracted at its lower end to form a collar *f* and is supported upon a pin *g*, set rigidly in the bed-plate A of the table B at about the middle of said bed-plate. This pin *g* is of sufficient length to provide a fulcrum for a pair of swinging arms *h*, (to be hereinafter described,) and a portion thereof projects above said arms and is diminished to form a shoulder upon which the collar *f* of the part *c* rests, and further diminished and screw-threaded to receive an annular nut *i*. The upper end of this nut is formed with a pair of spanner-holes *j*, whereby it can be turned into or out of place by any approved form of spanner, (not shown,) and the said screw-threaded portion of said pin is formed on diametrical opposite sides with a pair of keyways *k*, while the portion of said lower part *c* of the stationary forming-block, which overhangs the ends of the swinging arms, is supported upon a short standard *l*, diminished at both ends and screw-threaded at its lower end, each end to take into a tapped boring in the table and into a boring in the under side of the said part *c*, respectively. The upper part *b* of this stationary forming-block is carried upon the lower end of a rod *m*, sliding in a vertical tube *n*, secured rigidly at its upper end to the ceiling and slotted, as at *o*, near its upper end, in which a pulley *p* is mounted. The interior of this tube has its lower end enlarged in diameter, as at *p'*, and a keyway *g'* extends longitudinally thereof from said enlargement for a distance within the tube greater than the length of the rod *m*, while said rod has a key *r* near the upper end thereof to, under certain conditions, take into said keyway and retain said rod against rotation, and under other conditions to be located in the said enlargement *p* to allow of the rotation of said rod, as will be presently pointed out. This upper part *b* of the stationary

forming-block has a series of dowel-pins 3 projecting from its under side to take into borings in the upper side of the part *c* and is connected to the lifting-rod *m* by a disk *s*, centrally perforated to take over the hub *t* of a sleeve *u*, rigidly secured through said hub by a pin 2 to the lower end of said rod, said disk when the parts *b* and *c* of the forming-block are separated being supported upon said sleeve *u*. This disk *s* has a series of perforations 4, with diminished upper ends, in which are carried a series of thumb-screws 5, having transverse pins 6 to retain them against complete withdrawal from the said disk, while the upper face of the part *b* of the stationary forming-block has a series of tapped borings, into which said screws take. The interior of the sleeve *u* has a pair of keys 7, with their inner faces screw-threaded, and a handle 8 is keyed upon the rod *m* a short distance above the disk *s*, where it is held against upward displacement by a pair of jam-nuts 9 taking upon the rod, which is screw-threaded at that point. Between this handle 8 and the disk *s* is located a circular box 10, also keyed to the rod *m* and resting upon a washer 11, which in turn rests upon the top of the disk. A retractile helical spring 12 is located within said box and has its ends taking, respectively, into a perforation in the inside of the top thereof and in the disk *s*, while a rope 13 is connected to an eye 14 in the top of said rod and taken upwardly through the tube *n* and over a pair of suitably-mounted pulleys *p* and 16, and has a weight 17 at its end to counterbalance and lift said rod and all the parts connected thereto when the sleeve *u* is free of the pin *g*. To secure the part *b* firmly in place, the sleeve *u* is inserted in the central opening until the parts *b* and *c* come into contact with one another. The handle 8 is then moved toward the left, looking at Fig. 1, thereby through the connection between the screw-threads upon the interior of the keys 7 and the screw-threaded portion of the pin *g* drawing said parts *b* and *c* firmly together and retaining them in place. To disengage these parts, the handle is moved until the keys 7 are located in their keyways in the pin *g*, when the weight will raise the upper part *b*, a pair of rigid stops 18, carried by the disk *s*, limiting the movement of the handle 8 in either direction.

Each of the before-mentioned swinging arms *h* has a bracket 20, formed in one with the top side of the outer end thereof, and each of said brackets serve, with the top of its carrying-arm *h*, as a guideway for a slide 21. These slides 21 are formed on the under sides with feathers 22 to take into a longitudinal groove in the top of each arm, and each slide carries one of a pair of approximately semi-circular blocks 23, each rotatably mounted upon a pin 24, taking through a slot 25 longitudinally of the arms *h* and a slot 25^a in the overhanging bracket 20. Each pin 24 is of sufficient length to project above the top of

its carrying-bracket, and the projecting end is diminished and screw-threaded to form a shoulder slightly above the top of said block to receive a retaining knob-nut 27, while a pair of coiled retractile springs 28 are connected at one end to the blocks 23 and at their outer ends to the brackets 20, as shown in Fig 1. To enable these semicircular blocks 23 to be adjusted toward or away from the stationary block *bc* to accommodate different diameters of tube from which the rims are made, we provide means for adjusting the slides 21. This adjusting means is the same for each slide and consists of a ratchet-bar 29, resting loosely in a slot in the under side of the slide and upon the top of the swinging arm. The outer end of this ratchet-bar is rotatably connected to the inner end of a thumb-screw 30, taking through a tapped boring in the vertical portion of the bracket 21. To enable these semicircular blocks to be moved and locked into close engagement with the rim metal, which is inserted between them and the stationary throat-block, as will be presently shown, a bell-crank lever 31 is fulcrumed, as at 32, in each slide. The end of one arm of this bell-crank lever is elongated and formed with a handle 33, and the end of the other arm has a pawl 34, pivotally connected thereto, and rests in engagement with the teeth of the ratchet-bar 29.

A clamp is provided to hold the rim metal in place when it is first inserted between the stationary and movable parts of the throat-forming mechanism and consists of a flat bar 36, set on edge and having an end piece 37, secured rigidly thereto and formed with a semicircular recess 38 at its end to fit over the tubular portion of the rim metal, and a beveled portion 39, corresponding in angle to the beveled upper portion *b* of the stationary throat-forming block, to fit against the flange of the rim metal, and having a pair of dowel-pins 40, the upper one of which takes through the middle perforation in the flange and the lower one into a guiding-perforation in the lower portion *c* of said stationary throat-forming block. This bar 36 is forced into tight engagement with the rim metal to secure it firmly in place upon the stationary block *bc* by the following means: The outer end of the bar is thickened and formed with a guideway 41, in which an adjustable ratchet-bar 42 is supported by a pair of screws 43 taking downwardly through slots 43^x in said bar and into screw-threaded perforations in said ratchet-bar. The outer end of the ratchet-bar has a tapped boring therein, into which takes the end of a screw 44, rotatably mounted but held against longitudinal movement in a bracket projection 45 upon the under side of said ratchet-bar and constituting the end of the guideway 41. A bell-crank lever is fulcrumed upon a spindle 46, carried in vertically-arranged bearing-plates 47 upon the bed-plate of the machine. These bearing-plates are

in the form of a plate 48, secured in place by screws. One arm 49 of the bell-crank lever is elongated and weighted, and the other arm 50 thereof has a pawl 51 pivotally connected thereto and kept yieldingly in engagement with said ratchet-bar by a bow-spring 52, while a handle 53 is secured upon one end of said spindle 46 and a handle 54 is secured rigidly upon the outer end of the bar 36. The arms *h* are caused to swing upon the fulcrum-pin *g* by means of a pair of quadrantal racks 55, of T cross-section, set in a circular guideway 56, also of T cross-section, in the bed-plate. Half of this guideway is covered by a semicircular plate 57, secured in place by screws 58, and the other half is partially covered by a pair of semicircular strips 59 to retain the racks 55 against vertical displacement and accommodate a vertical bracket-piece 60, formed integrally with one end of each quadrantal rack 55 and rigidly connected to the outer ends of the arms *h* by screws 61. These racks are moved in opposite directions in their guideway 56 by a pair of bevel-gears 62, rigidly mounted upon a shaft 63, arranged transversely of the machine and mounted at each end in bearings 64, supported upon brackets 65, hung from the under side of the bed-plate and about midway of its length in a bearing 66, secured also upon the underside of the bed-plate. A worm-wheel 67 is mounted rigidly upon the transverse shaft and intermeshes with a worm 68, rigidly upon a main driving-shaft 69, bearing adjacent to said worm in bearings 70, supported in a hanging bracket 71, bolted to the under side of the bed-plate, and at one end in a bearing 72, supported in a hanging bracket 73, bolted to the underside of the bed-plate, near the front thereof. This shaft 69 is bored, as at 74, longitudinally from its forward end to a point about midway between said brackets 71 and 73 and is transversely slotted, as at 75. A rod 76 takes into and is movable longitudinally within said boring 74 and is connected by a pin 77 to the hub of a gland 78, movable by means of said rod into engagement with the friction-faces of either of a pair of oppositely-driven loose pulleys 79 and 80. A small adjustable screw-bolt 81 takes into a tapped boring in the inner end of one of the racks 55 and is held against inward movement by a jam-nut 82, and this inner end of the said rack acts through bolt 81 upon a slide connected on its under side to means, to be now described, for shifting said rod 76. The slide consists of a screw-bolt 83, having its head projecting into the T-guideway 56 and constituting a dog 84, and is supported in a slot 84^x in the bed-plate by a washer 85, while a washer 86 and nut 87 retain said bolt against vertical displacement. The lower end of the bolt is threaded into one end of a lever-arm 88, the opposite end whereof is mounted rigidly upon a vertical spindle 89, set in bearings 90 upon the under side of the bed-plate, and the upper side of the bracket 73, hung from said bed-

plate. A lever-arm 91 is connected rigidly at one end to said vertical spindle, near the lower end thereof, and the other end of said arm 91 is forked and straddles the outer end of the rod 76, between a rigid collar 92 and a nut 93 upon said rod. By this mechanism the gland of the clutch will be automatically shifted from one to the other of the pulleys 79 and 80. In order to enable the gland to be shifted by hand and from either end of the machine, a hand-lever 94 is mounted upon said vertical spindle 89, by which the clutch can be shifted from the rear end of the machine. A second lever-arm 95 is also mounted rigidly upon said vertical spindle and connected by a link 96 to a hand-lever 97, of bell-crank form, and fulcrumed to a bracket 98 upon the under side of the bed-plates, whereby the clutch can be shifted from the front of the machine. This link is divided, and its divided ends overlap and are connected together by screws 100 taking into one end through slots 101 in the outer end to allow of its being adjusted.

To automatically shift the gland of the clutch to leave the machine at rest after the swinging arms *h* and the parts connected therewith have assumed their normal positions, a slide 102, similar to that above described, is mounted with its dog 103, corresponding to the dog 84 of said outer slide, projecting in the way of one of the racks 55, and the under side of said slide 102 is connected by a link 104 rigidly to said hand-lever 97 by an adjustable connection, consisting of the screws 105 and slot 106, to accommodate the difference in movement due to the adjustment of link 96.

The stationary peak-forming block, which, with the throat-block *b c*, constitutes the normally stationary rim-forming mechanism, is interchangeable with other blocks of different formation to enable rims of different sizes and of different patterns to be made. The interchangeable blocks for different sizes are of the same construction excepting as to size, and the traveling mechanism working in conjunction therewith to form the peak is the same, except for the bearing part proper, to be presently described, and this part is interchangeable for the sole purpose of allowing other bearing parts of the same construction, but of different size, to be substituted therefor. The stationary peak-forming block, however, for forming a different pattern of peak is of different construction to that to be presently described and requires traveling mechanism of different construction to work in connection therewith. Consequently this co-acting stationary and traveling peak-forming mechanism of different construction forms the subject-matter, in combination with the means which coact therewith to form the throat portion, of an independent application filed on the 11th day of April, 1900, under Serial No. 12,490.

The stationary peak-forming block that we

prefer to have form a part of the present embodiment of our invention and which is illustrated in the accompanying drawings consists of a frame-piece 110, of inverted-T cross-section and formed on its under side with a flange 112 to take into a guideway 113 in the bed-plate. This frame-piece is made with a pair of projecting portions 114 to form bearings for a hinge-pin 115, the upper bearing portion having a boring to receive said pin and the lower bearing portion having a tapped boring to receive the lower screw-threaded end of said pin. This hinge-pin 115 pivotally connects together the adjustable parts 116 of this peak-forming block, which rest upon the horizontal portion of the frame-piece 110 and are formed with perforated lugs 117 to take into the space between said bearing portion 114 and through which said pin 115 takes, while the head of said pin is countersunk in the uppermost of a pair of overlapping lugs 118, formed upon the ends of a pair of segmental gears 119, secured rigidly to the top of said adjustable parts 116 by screws 120. These adjustable parts 116, as is evident, serve to mask the frame 110 and present matrix-faces to coact with a traveling block, to be hereinafter described, to form the peak. The joint exterior of these two masking parts 116 is of a contour to impart the required shape to the peak of the rim, and said exterior is grooved, as at 122, in a line with the groove upon the periphery of the stationary throat-forming block, while the end of this groove 122 opposite to said throat-block shallows until that end of the peak-block is flush throughout its depth, and said groove at this point is extended downwardly in width to accommodate the metal of the rim as it is flattened upon said flush portions, as will be pointed out in the description of the operation. These masking parts 116 are adjustable (to enable peaks of rims of different sizes to be made) by a sliding block 123, set in a T-groove formed in the inside of each of said parts, said sliding blocks being each formed with a transverse slot 124 of almost circular cross-section, into each of which takes the cylindrical head 125 of a screw-bolt 126. These screw-bolts take into the opposite ends, which are oppositely screw-threaded, of a sleeve 127, formed with a worm-wheel 128 about midway of the length thereof and set in a transverse horizontal boring in the web of the frame-piece 110, wherein it is held against displacement by a bushing 129, held in place by a retaining-screw 130. A spindle 131, with a worm 132 formed thereon, is set in a vertical boring in the said web in a position to engage said worm-wheel 128, and the upper end of this spindle 131 is formed with a square socket 133 to receive the squared end of a removable crank 134 to accommodate the trimmer-bracket 135 (to be presently described) has an opening 136. The space between the adjacent ends of the parts 116 is filled by a dovetailed piece 137, interchangeable with other similar pieces

of different sizes to fill this space as it is increased or diminished by the adjustment of the said parts 116. The outer face of this filling-piece 137 is vertically slotted to accommodate the trimmer, hereinafter described, and form shearing edges 138, while the dovetail form enables it to be gripped by the ends of the said parts 116. It is obvious that upon turning the spindle 131 the worm-wheel 128 and sleeve 127 will be rotated, while the screw-bolts 126 will be held by their cylindrical heads 125 against rotation in the sliding blocks 120, and consequently the adjustment of the masking parts 116 toward or away from the web of the frame-piece 110 will be effected and the normally stationary peak-forming block expanded or contracted as rims of larger or smaller dimensions are to be made. The traveling portion of the peak-forming means to coact with this expansible block consists of a cam-block 140, rotatably mounted in a horizontally-swinging frame. The top side of this cam-block is circular in contour, with one side flattened, as at 141, and the underside is of circular contour tapered to a point 142 at the same side as the flattened portion 141, the circular portion being of smaller diameter than that of the top side to present a beveled face 144. The perimeter of this block is formed with a groove 145, corresponding to the groove 122 and which shallows toward the ends thereof that adjoin the flat side 141, and the portions of said perimeter adjacent to said ends not being grooved, but presenting smooth surfaces. A plate 156 is rigidly secured to the top of the cam-block and corresponding in shape to the top thereof and has a portion of its periphery gear-toothed, as at 157. This cam-block is pivotally mounted upon a pin 146, and between the under side of the cam-block and the lower arm of the bracket 147 is located a plate 162, notched, as at 163, while a spring-latch 164 engages either of said notches and yieldingly holds the cam-block against movement. This pin 146 is of sufficient length to project through said block and through the plate 142, the arms of a U-shaped bracket 147, and a washer 148, and the lower end of this pin is diminished and screw-threaded, and this lower end receives a retaining-washer 149 in the form of a fork, the prongs of which straddle it, and a nut 150, corresponding at its greatest diameter to the pin 146, while the upper end of said pin is formed with a knob 151. The object of this arrangement is to enable the pin 146, and with it the nut 150, to be withdrawn through the boring in the cam-block and the washer 148 by unscrewing the nut 150 sufficiently to release the forked washer 149 and then withdrawing said washer. The U-shaped bracket 147 constitutes a slide and is guided between the arms 153 of the before-mentioned swinging frame, which is also of U shape, the pin 146 taking through slots in said arms 153, while the slide is guided by the pin which takes through the slot in the upper arm 153

and a rib 160, formed upon the upper side of the lower arm 153 and taking into a groove in the under side of the slide. The ends of the arms 153 of the swinging frame are pivotally connected to a pin 154, extending through the peak-block about concentrically of the segmental gears 119, and the yoke that connects the outer ends of these arms constitutes one (165) of the heads 165 166 of a cylinder 167, containing a piston 168, while the other head 166 has a port 169 cut therein, with which is connected one end of a compressed-air-supply pipe 170, controlled by a three-way valve 171, having an exhaust-port 172. The piston-rod 173 is connected at its outer end to the slide, and two coiled springs 174—one right and the other left—one within the other, return the piston to its normal position after it has been moved by the compressed air. The head 165 on the inner end of the cylinder has a pair of bearing-brackets 175 cast in one therewith and affording bearings for antifriction-wheels 176, which run on the surface of the table or bed-plate of the machine. As the swinging frame is pivotally connected to the frame 110 of the stationary peak-block and as the traveling cam-block 140 coacts with the adjustable masking parts 116, it is necessary to regulate the extent of travel of the swinging frame to the variable angular position of said masking parts. To this end a pair of screws 177 take through tapped borings in the frame-piece 110 and project into each end of the path of the lower arm in order that by screwing them to project to a greater or less extent into said path the travel of said traveling frame will be limited or increased and the initial angular positions thereof before commencing its travel in either direction be made to correspond to whatever position the masking parts may be adjusted. The outer head 166 of the cylinder has a longitudinally-slotted rod 178 projecting rigidly therefrom, and a handle 179 is formed with a sleeve 180, forked at its end and pivotally connected to said rod by a pin 181 taking through said slot. This construction is to enable the handle to be turned up out of place when not in use, as shown in Fig. 1 and where it is held by a retractile coiled spring 182, and when in use the sleeve 180 takes over said rod 178 and they are made rigid so far as lateral displacement relatively to one another is concerned. The extent of travel of this swinging frame necessary to the formation of peaks of rims of different sizes is governed by a scale 183, marked upon the surface of the table, this scale being so computed as to have its graduations correspond to the sizes of rims to be formed. The whole of this peak-forming mechanism—that is to say, the stationary peak-forming block and the swinging frame and the parts carried by the latter—is adjusted toward or from the throat-forming mechanism to enable rims of different lengths to be made by a bell-crank lever 184, ful-

crumed, as at 185, to the under side of the bed-plate of the machine. The end of one arm thereof is slotted, as at 186, and the end of the other arm being forked, as at 187. The
 5 slotted end 186 takes over the lower end of a pin 188, carried rigidly in the peak-block, as will be presently described, and the forked end 187 has an interiorly-screw-threaded sleeve 194 pivotally mounted between the
 10 prongs thereof. A screw-threaded spindle 195 takes into this pivoted sleeve and is rotatably mounted in a bracket 196 upon the under side of the bed-plate, but retained against longitudinal displacement therein,
 15 and the outer end of this screw-threaded spindle has a crank-handle 197 rigidly mounted thereon. The pin 188 is diminished at its upper and lower ends and screw-threaded at its upper end and takes through a boring 189,
 20 extending through the peak-block frame and increased in diameter at both ends to accommodate at its lower increased end the enlarged portion of the pin 188 and at its upper increased end an expansile coiled spring 190.
 25 The upper end of this pin 188 projects above the top of the peak-block frame 110 and through the bracket 135 for supporting the trimmer and receives a nut 191, which serves to secure the pin rigidly in the said frame-piece 110 of the peak-block and said bracket
 30 135 rigidly to the top of the web of said frame-piece. The under side of the foot 192 of this bracket is formed with a tongue and the upper face of the web with a groove to receive
 35 said tongue and retain the bracket when the nut 191 is tightened against lateral displacement. By turning this crank-handle the normally stationary peak-forming block and all the parts connected thereto can be adjusted
 40 toward or away from the throat-forming mechanism to enable rims of different lengths to be made.

The bracket 135 serves the double purpose of providing a support for the trimmer and
 45 through its foot portion 192 as a clamp to secure the masking portions of the peak-block rigidly in any position to which they may be adjusted.

The trimmer consists of a cutting disk or
 50 blade 200, ground to present oppositely-facing cutting edges 201 and rotatably mounted upon a spindle 202, carried in a pair of wings 203, formed in one with a lever 204, fulcrumed upon a pin set in the prongs of a fork 205,
 55 made in one with the end of the before-mentioned trimmer-bracket 135. The blade 200 is preferably made with its cutting edges 201 facing oppositely. A small disk with two diametrically opposite ratchet-teeth 206 is mounted rigidly upon one end of the spindle 202 and
 60 is engaged by a spring-pawl 207, carried by said lever, and a small ratchet-wheel 208 is mounted rigidly upon the other end of said spindle 202, and a ratchet-toothed rack 209,
 65 pivotally connected to the top of the bracket 135, is yieldingly held in engagement with said last-mentioned ratchet-wheel by a bow-spring

210. The trimmer-blade is perforated, as at 212, at diametrically opposite points, and is firmly locked with either cutting edge in its
 70 cutting position by a latch consisting of a resilient strip 213, secured rigidly at one end to the lever, as at 214, and formed adjacent to its other end with a dowel-pin 215 to take through a perforation in the side of the lever
 75 into either of said perforations 212 in the blade as said blade is rotated by the ratchet-toothed rack 209, as will be set forth in the description of the operation. This latch is
 80 lifted out of engagement with the blade by a wedge-shaped projection 216, cast in one with a plate 217, secured, preferably by screws, to the top of the trimmer-bracket 135, while a set-screw 218, carried by the lever, acts as a
 85 rest for said lever when lowered to its extreme position and limits the extent of said downward movement to prevent the cutting edges of the blade being damaged.

The ends of the rim metal are supported during the formation of the rim in a position
 90 to take into the grooves in the stationary peak-block by a bar 220, resting freely upon the bed-plate of the machine and having a socket 221, with a plane interior, formed at each end, in which an exteriorly-screw-threaded
 95 sleeve 222 is located. The exteriors of these sleeves are formed with longitudinal keyways 223, in which keys 224 upon the interior of the sockets take. A nut 225 takes upon the screw-threaded sleeve and rests upon the
 100 top of each socket, and by means of these nuts 225 said sleeves can be adjusted to different heights. The spindle of a removable fork takes into either of these sleeves and rests therein upon a ball-bearing 226, located at
 105 the bottom thereof. This fork receives and supports the end of the portion of the rim metal being manipulated and can be removed from the socket at one end of its carrying-bar 220 and placed in the socket in the opposite
 110 end, thereby to support the opposite end of the rim metal when the portion contiguous thereto is being manipulated.

The bracket 71 besides serving as a support for the shaft-bearing serves also as a receptacle to catch the lubricant dripping from the worm, worm-wheel, and the bearings 70, from which receptacle it can be drawn off by the drip-cock 230 and again utilized.

The operation of our machine is as follows:
 120 The length of flanged tubular metal is first set in place between the stationary and traveling parts of the throat-forming mechanism and with middle perforation of said tubular length in line with the clamping-bar. This
 125 bar is then jammed by its lever into tight contact with the flange of the rim metal and with the pin on the end of said clamping-bar projecting through the said middle perforation in the flange. The semicircular throat-forming
 130 blocks are then adjusted by their levers into bearing relation with the rim metal, thereby bending the middle portion of the flange to extend at a tangent form from the

tube. Upon the machine being then started said semicircular blocks will roll the rim metal upon the stationary throat-forming block for about one-half of the circumference of said block, at which point the machine will be automatically stopped, thereby leaving the ends of said rim metal projecting on each side of the stationary peak-forming block. The swinging frame of the peak-forming mechanism is then swung by the operator to one side of the stationary peak-block to a position shown in dotted lines in Fig. 1 in line with a portion of the rim metal in contact with or close proximity to the adjacent side of said stationary peak-block in its projection from the throat-forming mechanism. The compressed air is then admitted to the cylinder, and the round side of the cam-block is forced into tight contact with the rim metal upon the said adjacent side of the peak-block and with the gear-teeth on the adjacent side of the top of said cam-block intermeshing with the segmental gear on the top of the adjacent side of the stationary peak-block. The operator then swings the frame to the position shown in full lines in Fig. 1, which will cause said cam-block to roll the rim metal upon the stationary block, thus imparting to the portion of the rim metal operated upon the desired peak formation, while the flat portions of the peak-block and cam-block will flatten out the end of said portion of the rim metal, and the trimmer-lever is then swung down and the flattened end trimmed off. The operator then swings the frame of the peak-forming mechanism to the opposite side of the stationary block and repeats the balance of the operation, after which the semicircular throat-blocks are moved back to their normal positions, the top half of the stationary throat-block released (by moving its handle to the dotted position in Fig. 1) and lifted, and the completed rim removed from the machine.

Although we have illustrated and described in this application the means for shearing the ends of the metal after having been formed, we do not herein claim same, as it forms the subject-matter of a separate application constituting a divisional part hereof and filed under Serial No. 45,490, series of 1900, the 31st of January, 1901.

What we claim is as follows:

1. In a machine for forming or shaping a metallic length, the combination of stationary means consisting of a pair of parts the opposite portions of the contour of each being of the form to conjointly impart the form or shape required; means for retaining said parts against displacement; independent means traveling around the contour of each of said parts, and means for causing said independent means to travel independently and consecutively around the forming contour of a different one of said stationary parts to impress the metallic length thereupon for the purpose set forth.

2. In a machine for forming or shaping a horse-collar rim from a single length of metal, the combination of a stationary throat-forming block a portion of the contour whereof is of the form to impart the required form or shape to the throat portion of the rim, means traveling around said portion of the block and in close proximity thereto; a peak-forming block a portion of the contour whereof is of the form to impart the required form or shape to the peak portion of the rim, and means traveling around said portion of its peak-block and in close proximity thereto, for the purpose set forth.

3. In a machine for forming or shaping a horse-collar rim from a single length of metal, the combination of a stationary throat-forming block a portion of the contour whereof is of the form to impart the required form or shape to the throat portion of the rim means for retaining said metallic length against displacement upon said block; means traveling around said portion of the block and in close proximity thereto; a peak-forming block a portion of the contour whereof is of the form to impart the required form or shape to the peak portion of the rim and means traveling around said portion of its peak-block and in close proximity thereto, for the purpose set forth.

4. In a machine for forming or shaping a horse-collar rim from a single length of metal, the combination of a throat-forming block a portion of the contour whereof is of the form to impart the required form or shape to the throat portion of the rim means for retaining said metallic length at one point against displacement upon said block; means traveling around said portion of the block and in close proximity thereto; a peak-forming block a portion of the contour whereof is of the form to impart the required form or shape to the peak portion of the rim and means traveling around said portion of the peak-block and in close proximity thereto, for the purpose set forth.

5. In a machine for forming or shaping a horse-collar rim from a single length of metal, the combination of a stationary throat-forming block a portion of the contour whereof is of the form to impart the required form or shape to the throat portion of the rim means for retaining said metallic length at one point against displacement upon said block; means traveling around said portion of the block in opposite directions from said retaining means and in close proximity to said block; a peak-forming block a portion of the contour whereof is of the form to impart the required form or shape to the peak portion of the rim and means traveling around said portion of the peak-block and in close proximity thereto, for the purpose set forth.

6. In a machine for forming or shaping a horse-collar rim from a single length of metal, the combination of a stationary expansible throat-forming block a portion of the contour

whereof is of the form to impart the required form or shape to the throat portion of the rim, means traveling around said portion of the block and in close proximity thereto; a peak-forming block a portion of the contour whereof is of the form to impart the required form or shape to the peak portion of the rim, and means traveling around said portion of its peak-block and in close proximity thereto, and means carried by the peak-block for trimming the ends of said metallic length after the rim is formed, for the purpose set forth.

7. In a machine for forming or shaping a horse-collar rim from a single length of metal, the combination of a stationary throat-forming block a portion of the contour whereof is of the form to impart the required form or shape to the throat portion of the rim, means traveling around said portion of the block and in close proximity thereto; a stationary expansible peak-forming block a portion of the contour whereof is of the form to impart the required form or shape to the peak portion of the rim, means for expanding and contracting said stationary peak-block, and means traveling around said portion of its peak-block and in close proximity thereto, substantially as and for the purpose set forth.

8. In a machine for forming or shaping a horse-collar rim from a single length of metal, the combination of a stationary expansible throat-forming block a portion of the contour whereof is of the form to impart the required form or shape to the throat portion of the rim means for retaining said metallic length at one point against displacement upon said block; means traveling around said portion of the block in opposite directions from said retaining means and in close proximity to said block; a peak-forming block a portion of the contour whereof is of the form to impart the required form or shape to the peak portion of the rim and means traveling around said portion of the peak-block and in close proximity thereto, and means carried by the peak-block for trimming the ends of said metallic length after the rim is formed, substantially as and for the purpose set forth.

9. In a machine for forming or shaping a horse-collar rim from a single length of metal, the combination of an adjustable stationary throat-forming block a portion of the contour whereof is of the form to impart the required form or shape to the throat portion of the rim, means traveling around said portion of the block and in close proximity thereto; a peak-forming block a portion of the contour whereof is of the form to impart the required form or shape to the peak portion of the rim, means traveling around said portion of its peak-block and in close proximity thereto, and means for adjusting said stationary peak-block toward and from the throat-block, substantially as and for the purpose set forth.

10. In a machine for forming or shaping a horse-collar rim from a single length of metal,

the combination of an adjustable stationary throat-forming block a portion of the contour whereof is of the form to impart the required form or shape to the throat portion of the rim, means traveling around said portion of the block and in close proximity thereto; a peak-forming block a portion of the contour whereof is of the form to impart the required form or shape to the peak portion of the rim means traveling around said portion of its peak-block and in close proximity thereto, and means for adjusting said stationary peak-block toward and from the throat-block, substantially as and for the purpose set forth.

11. In a machine for forming or shaping a horse-collar rim from a single length of metal, the combination of an adjustable stationary throat-forming block a portion of the contour whereof is of the form to impart the required form or shape to the throat portion of the rim, means traveling around said portion of the block and in close proximity thereto; a peak-forming block a portion of the contour whereof is of the form to impart the required form or shape to the peak portion of the rim, means traveling around said portion of its peak-block and in close proximity thereto, and means for adjusting said stationary peak-block toward and from the throat-block, and means carried by the peak-block for trimming the ends of said metallic length after the rim is formed, substantially as and for the purpose set forth.

12. In a machine for forming or shaping a horse-collar rim from a single length of metal, the combination of an adjustable stationary throat-forming block a portion of the contour whereof is of the form to impart the required form or shape to the throat portion of the rim means for retaining said metallic length at one point against displacement upon said block; means traveling around said portion of the block in opposite directions from said retaining means and in close proximity to said block; a peak-forming block a portion of the contour whereof is of the form to impart the required form or shape to the peak portion of the rim, means traveling around said portion of the peak-block and in close proximity thereto, and means for adjusting said stationary peak-block toward and from the stationary throat-block, substantially as and for the purpose set forth.

13. In a machine for forming or shaping a horse-collar rim from a single length of metal, the combination of a stationary throat-forming block a portion of the contour whereof is of the form to impart the required form or shape to the throat portion of the rim, means traveling around said portion of the block and in close proximity thereto; a peak-forming block a portion of the contour whereof is of the form to impart the required form or shape to the peak portion of the rim, and means traveling around said portion of its peak-block and in close proximity thereto,

and means carried by the peak-block for trimming the ends of said metallic length after the rim is formed, for the purpose set forth.

14. In a machine for forming or shaping a horse-collar rim from a single length of metal, the combination of an adjustable stationary throat-forming block a portion of the contour whereof is of the form to impart the required form or shape to the throat portion of the rim means for retaining said metallic length at one point against displacement upon said block; means traveling around said portion of the block in opposite directions from said retaining means and in close proximity to said block; a peak-forming block a portion of the contour whereof is of the form to impart the required form or shape to the peak portion of the rim means traveling around said portion of the peak-block and in close proximity thereto, and means for adjusting said stationary peak-block toward and from the stationary throat-block, and means carried by the peak-block for trimming the ends of said metallic length after the rim is formed, for the purpose set forth.

15. In a machine for forming or shaping a horse-collar rim from a single length of metal, the combination of a suitably-supported stationary throat-forming block presenting a side of semicircular contour, a pair of semicircular blocks adjustable into contact with the length of metal to press the same firmly upon the semicircular side of said stationary block, means for yieldingly retaining said semicircular blocks against rotation and means for causing said semicircular blocks to roll in opposite directions upon said stationary block, substantially as and for the purpose set forth.

16. In a machine for forming or shaping a horse-collar rim from a single length of flanged tubular metal, the combination of a suitably-supported stationary throat-forming block presenting a side of semicircular contour, said semicircular side being formed with a circumferential groove semicircular in cross-section and said block being divided on a plane extending at right angles to its axis through said groove, means for detachably connecting said parts of the throat-block together, a longitudinally-movable clamping-bar formed at one end with a recess to accommodate the rim metal, means for causing said clamping-bar to bear at its recessed end upon the middle portion of said tubular length and retain same against displacement upon the semicircular side of said stationary throat-forming block, and means traveling in opposite directions from said clamping-bar over the portion of said tubular length adjacent to the middle thereof and pressing the same upon said stationary throat-block substantially as described and for the purpose set forth.

17. In a machine for forming or shaping a horse-collar rim from a single length of flanged tubular metal, the combination of a suitably-supported stationary throat-forming

block presenting a side of semicircular contour, said semicircular side being formed with a circumferential groove semicircular in cross-section and said block being divided on a plane extending at right angles to its axis through said groove, means for detachably connecting said parts of the throat-block together, a clamping-bar formed at one end with a recess to accommodate the rim metal, a ratchet-toothed rack upon the opposite end of said bar, a pawl yieldingly held in engagement with said rack; means for disengaging said pawl from said rack; and means whereby said bar can be moved to bear at said recessed end upon the middle portion of said tubular length and retain same against displacement upon the semicircular side of said stationary throat-forming block, and means traveling in opposite directions from said clamping-bar over the portion of said tubular length adjacent to the middle thereof and pressing same upon said stationary throat-block substantially as described and for the purpose set forth.

18. In a machine for forming or shaping a horse-collar rim from a single length of flanged tubular metal, the combination of a suitably-supported stationary throat-forming block presenting a side of semicircular contour, said semicircular side being formed with a circumferential groove semicircular in cross-section and said block being divided on a plane extending at right angles to its axis through said groove means for detachably connecting said parts of the throat-block together, a pair of swinging arms each pivotally connected at one end concentrically of the circular side of said stationary throat-forming block; means for moving said arms away from one another in opposite directions partially around said stationary throat-block; a slide mounted upon each of said arms, a semicircular block rotatably mounted in each of said slides, means for yieldingly retaining said rotatable blocks in a predetermined position, and means for forcing said semicircular blocks into tight contact with the rim metal upon said stationary throat-block, substantially as described and for the purpose set forth.

19. In a machine for forming or shaping a horse-collar rim from a single length of flanged tubular metal, the combination of a suitably-supported stationary throat-forming block presenting a side of semicircular contour, said semicircular side being formed with a circumferential groove semicircular in cross-section and said block being divided on a plane extending at right angles to its axis through said groove means for detachably connecting said parts of the throat-block together, a pair of swinging arms each pivotally connected at one end concentrically of the circular side of said stationary throat-forming block; means for moving said arms away from one another in opposite directions partially around said stationary throat-

block; a slide mounted upon each of said arms, a semicircular block rotatably mounted in each of said slides, means for yieldingly retaining said rotatable blocks in a predetermined position means for adjusting said semicircular blocks toward and from said stationary throat-block, and means for forming said semicircular blocks into tight contact with the rim metal upon said stationary throat-block, substantially as described and for the purpose set forth.

20. In a machine for forming or shaping a horse-collar rim from a single length of flanged tubular metal, the combination of a suitably-supported stationary throat-forming block presenting a side of semicircular contour, said semicircular side being formed with a circumferential groove semicircular in cross-section and said block being divided on a plane extending at right angles to its axis through said groove means for detachably connecting said parts of the throat-block together, a pair of swinging arms each pivoted at one end concentrically of the circular side of said stationary throat-forming block; means for moving said arms away from one another in opposite directions partially around said stationary throat-block; a slide mounted upon each of said arms, a semicircular block rotatably mounted in each of said slides, means for yieldingly retaining said rotatable blocks in a predetermined position, and a ratchet-toothed rack carried by each of said arms a bell-crank lever being fulcrumed to each slide adjacent to the racks, one arm of each of said levers having a pawl fulcrumed thereto and engaging said racks, and the other arm of each of said levers being in the form of a handle for forcing said semicircular blocks into tight contact with the rim metal upon said stationary throat-block, substantially as described and for the purpose set forth.

21. In a machine for forming or shaping a horse-collar rim from a single length of flanged tubular metal, the combination of a suitably-supported stationary throat-forming block presenting a side of semicircular contour, said semicircular side being formed with a circumferential groove semicircular in cross-section and said block being divided on a plane extending at right angles to its axis through said groove means for detachably connecting said parts of the throat-block together, a pair of swinging arms each pivotally connected at one end concentrically of the circular side of said stationary throat-forming block; means moving said arms away from one another in opposite directions partially around said stationary throat-block; a slide mounted upon each of said arms, a semicircular block rotatably mounted in each of said slides, means for yieldingly retaining said rotatable blocks in a predetermined position means for adjusting said semicircular blocks toward and from said stationary throat-block, and a ratchet-toothed

rack carried by each of said arms a bell-crank being fulcrumed to each slide adjacent to the racks, one arm of each of said levers having a pawl fulcrumed thereto and engaging said racks, and the other arm of each of said levers being in the form of a handle for forming said semicircular blocks into tight contact with the rim metal upon said stationary throat-block, substantially as described and for the purpose set forth.

22. In a machine for forming or shaping a horse-collar rim from a single length of flanged tubular metal, the combination of a suitably-supported stationary throat-forming block presenting a side of semicircular contour, said semicircular side being formed with a circumferential groove semicircular in cross-section and said block being divided on a plane extending at right angles to its axis through said groove means for detachably connecting said parts of the throat together, a pair of swinging arms each having a rigid bracket projection and said arms being pivotally connected at one end concentrically of the circular side of said stationary throat-forming block; means moving said arms away from one another in opposite directions partially around said stationary throat-block; a slide mounted upon each of said arms, a semicircular block rotatably mounted in each of said slides, means for yieldingly retaining said rotatable blocks in a predetermined position and a ratchet-toothed rack located in a guideway in each of said arms, a thumb-screw taking through the bracket projection of each arm and rotatably connected to said racks, a bell-crank lever fulcrumed to each slide adjacent to the racks, one arm of each of said levers having a pawl fulcrumed thereto and engaging said racks, and the other arm of each of said levers being in the form of a handle for forming said semicircular blocks into tight contact with the rim metal upon said stationary throat-block, substantially as described and for the purpose set forth.

23. In a machine for forming or shaping a horse-collar rim from a single length of flanged tubular metal, the combination of a suitably-supported stationary throat-forming block presenting a side of semicircular contour, said semicircular side being formed with a circumferential groove semicircular in cross-section and said block being divided on a plane extending at right angles to its axis through said groove means for detachably connecting said parts of the throat-block together, a pair of swinging arms each pivotally connected at one end concentrically of the circular side of said stationary throat-forming block; a pair of quadrantal racks connected at one end to the outer ends of said arms, a driving-shaft, a train of gears operatively connecting said driving-shaft to said quadrantal racks for moving said arms away from one another in opposite directions partially around said stationary throat-block; a slide mounted upon each of said arms, a

semicircular block rotatably mounted in each of said slides, means for yieldingly retaining said rotatable blocks in a predetermined position, and means for forming said semicircular blocks into tight contact with the rim metal upon said stationary throat-block, substantially as described and for the purpose set forth.

24. In a machine for forming or shaping a horse-collar rim from a single length of flanged tubular metal, the combination of a suitably-supported stationary throat-forming block presenting a side of semicircular contour being formed with a circumferential groove semicircular in cross-section and said block being divided on a plane extending at right angles to its axis through said groove means for detachably connecting said parts of the throat-block together, a pair of swinging arms each having a rigid bracket projection and said arm being pivotally connected at one end concentrically of the circular side of said stationary throat-forming block; a pair of quadrantal racks connected at one end to the outer ends of said arms, a driving-shaft, a train of gears operatively connecting said driving-shaft to said quadrantal racks for moving said arms away from one another in opposite directions particularly around said stationary throat-block; a slide mounted upon each of said arms, a semicircular block rotatably mounted in each of said slides, means for yieldingly retaining said rotatable blocks in a predetermined position, and a ratchet-toothed rack located in a guideway in each of said arms, a thumb-screw taking through the bracket projection of each arm and rotatably connected to said racks, a bell-crank lever fulcrumed to each slide adjacent to the racks, one arm of each of said levers having a pawl fulcrumed thereto and engaging said racks, and the other arm of each of said levers being in the form of a handle for forming said semicircular blocks into tight contact with the rim metal upon said stationary throat-block, substantially as described and for the purpose set forth.

25. In a machine for forming or shaping a horse-collar rim from a single length of flanged tubular metal, the combination of a suitably-supported stationary throat-forming block presenting a side of semicircular contour, said semicircular side being formed with a circumferential groove semicircular in cross-section and said block being divided on a plane extending at right angles to its axis through said groove means for detachably connecting said parts of the throat-block together, a pair of swinging arms each pivotally connected at one end concentrically of the circular side of said stationary throat-forming block; means for moving said arms away from one another in opposite directions partially around said stationary throat-block; means for automatically reversing the direction of travel of said arms at the completion of their movement away from one another, a slide mounted upon

each of said arms, a semicircular block rotatably mounted in each of said slides, means for yieldingly retaining said rotatable blocks in a predetermined position, and means for forming said semicircular blocks into tight contact with the rim metal upon said stationary throat-block, substantially as described and for the purpose set forth.

26. In a machine for forming or shaping a horse-collar rim from a single length of flanged tubular metal, the combination of a suitably-supported stationary throat-forming block presenting a side of semicircular contour, said semicircular side being formed with a circumferential groove semicircular in cross-section and said block being divided on a plane extending at right angles to its axis through said groove means for detachably connecting said parts of the throat-block together, a pair of swinging arms each pivotally connected at one end eccentrically of the circular side of said stationary throat-forming block; means for moving said arms away from one another in opposite directions partially around said stationary throat-block; means for automatically reversing the direction of travel of said arms at the completion of their movement away from one another, means for automatically stopping the machine at the completion of the travel of the arms in the reverse direction; a slide mounted upon each of said arms, a semicircular block rotatably mounted in each of said slides, means for yieldingly retaining said rotatable blocks in a predetermined position and means for forcing said semicircular blocks into tight contact with the rim metal upon said stationary throat-block, substantially as described and for the purpose set forth.

27. In a machine for forming or shaping a horse-collar rim from a single length of flanged tubular metal, the combination of a suitably-supported stationary throat-forming block presenting a side of semicircular contour, said semicircular side being formed with a circumferential groove semicircular in cross-section and said block being divided on a plane extending at right angles to its axis through said groove; means for detachably connecting said parts of the throat-block together, a pair of swinging arms each pivotally connected at one end concentrically of the circular side of said stationary throat-forming block; a pair of quadrantal racks connected at one end to the outer ends of said arms, a driving-shaft, a train of gears operatively connecting said driving-shaft to said quadrantal racks for moving said arms away from one another in opposite directions partially around said stationary throat-block; means for automatically reversing the direction of travel of said arms at the completion of their movement away from one another; means for automatically stopping the machine at the completion of the travel of the arms in the reverse direction; a slide mounted upon each of said arms, a semicircular

block rotatably mounted in each of said slides, means for yieldingly retaining said rotatable blocks in a predetermined position; means for forcing said semicircular blocks into tight
5 contact with the rim metal upon said stationary throat-block, substantially as described and for the purpose set forth.

28. In a machine for forming or shaping a horse-collar rim from a single length of
10 flanged tubular metal, the combination of a suitably-supported stationary throat-forming block presenting a side of semicircular contour, said semicircular side being formed with a circumferential groove semicircular in
15 cross-section and said block being divided on a plane extending at right angles to its axis through said groove; means for detachably connecting said parts of the throat-block together, a pair of swinging arms each having
20 a rigid bracket projection and said arms being pivotally connected at one end concentrically of the circular side of said stationary throat-forming block; a pair of quadrantal racks connected at one end to the outer
25 ends of said arms, a driving-shaft, a train of gears operatively connecting said driving-shaft to said quadrantal racks for moving said arms away from one another in opposite directions partially around said stationary
30 throat-block; means for automatically reversing the direction of travel of said arms at the completion of their movement away from one another; means for automatically stopping the machine at the completion of the travel
35 of the arms in the reverse direction; a slide mounted upon each of said arms, a semicircular block rotatably mounted in each of said slides, means for yieldingly retaining said rotatable blocks in a predetermined position; a
40 ratchet-toothed rack located in a guideway on each of said arms; a thumb-screw taking through the bracket projection of each arm and rotatably connected to said racks; a bell-crank lever fulcrumed to each slide adjacent
45 to the racks, one arm of each of said levers having a pawl fulcrumed thereto and engaging said racks, and the other arm of each of said levers being in the form of a handle for forcing said semicircular blocks into tight con-
50 tact with the rim metal upon said stationary throat-block, substantially as described and for the purpose set forth.

29. In a machine for forming or shaping horse-collar rims, a stationary forming-block
5 constructed in two parts superimposed one upon the other; means for rigidly retaining the lower part against displacement and said lower part being formed with a central opening; a screw-threaded pin within and of less
60 diameter than said opening and formed longitudinally thereof with a keyway; a rotatable lifting-rod located above said pin and yieldingly held a short distance above said pin; a sleeve carried rigidly upon the lower
65 end of said lifting-rod and formed with a screw-threaded key on the interior thereof; a handle for turning said sleeve; a disk car-

ried by the said lifting-rod at the upper end of said sleeve and means for detachably connecting said disk to the upper part of said
70 forming-block and said upper part being formed with a concentric opening to accommodate said sleeve, substantially as described and for the purpose set forth.

30. In a machine for forming or shaping
75 horse-collar rims, a stationary forming-block constructed in two parts superimposed one upon the other; means for rigidly retaining the lower part against displacement and said lower part being formed with a central open-
80 ing; a screw-threaded pin within and of less diameter than said opening and formed longitudinally thereof with a keyway; a rotatable lifting-rod located above said pin and yieldingly held a short distance above said
85 pin; means for holding said rod against rotation in its elevated position; a sleeve carried rigidly upon the lower end of said lifting-rod and formed with a screw-threaded key on the interior thereof; a handle for turning said
90 sleeve; a disk carried by the said lifting-rod at the upper end of said sleeve and means for detachably connecting said disk to the upper part of said forming-block and said upper part being formed with a concentric opening to ac-
95 commodate said sleeve, substantially as described and for the purpose set forth.

31. In a machine for forming or shaping a horse-collar rim from a single length of
100 flanged tubular metal the combination of a suitably-supported stationary throat-forming block presenting a side of semicircular contour, said semicircular side being formed with a circumferential groove semicircular in
105 cross-section and said block being divided on a plane extending at right angles to its axis through said groove; a pair of swinging arms each having a rigid bracket projection and said arms being pivotally connected at one
110 end concentrically of the circular side of said throat-forming block; a pair of quadrantal racks connected at one end to the outer ends of said arms; a driving-shaft; a train of gears operatively connecting said driving-shaft to said quadrantal racks for moving said arms
115 away from one another in opposite directions; means for retaining the lower part of the throat-block against displacement and said lower part being formed with a central opening; a screw-threaded pin within and of
120 less diameter than said opening and formed longitudinally thereof with a keyway; a rotatable lifting-rod located above said pin and yieldingly held a short distance above said pin; means for holding said rod against
125 rotation in its elevated position; a sleeve carried rigidly upon the lower end of said lifting-rod and formed with a screw-threaded key on the interior thereof; a handle for turning said sleeve; a disk carried by the said lift-
130 ing-rod at the upper end of said sleeve and means for detachably connecting said disk to the upper part of said forming-block and said upper part being formed with a concen-

5 tric opening to accommodate said sleeve; a slide mounted upon each of said swinging arms; a semicircular block rotatably mounted on each of said slides; means for yield-
 10 ingly retaining said swinging blocks in a predetermined position and means for forcing said semicircular blocks into tight contact with the rim metal upon said stationary throat-block; means for automatically re-
 15 versing the direction of travel of said arms at the completion of their movement away from one another; and means for automatically stopping the machine at the completion of its travel in the reverse direction, substantially as described and for the purpose set forth.

32. In a metal-forming machine, an expansile forming-block consisting of a frame-piece rigidly secured against displacement;
 20 a pair of masking portions located one upon each side of said frame-piece and means for adjusting said masking portion toward and from said frame-piece and traveling forming mechanism coacting with said expansile
 25 block, substantially as and for the purpose set forth.

33. In a machine for forming or shaping horse-collar rims, the combination with throat-forming mechanism of peak-forming mechanism consisting of a frame-piece; a pair of
 30 masking portions located one upon each side of said frame-piece and pivotally connected together and to the frame-piece at their forward ends, means for adjusting said masking mechanism toward and from said frame-piece and traveling forming mechanism coacting with said expansile block; means for adjust-
 35 ing said frame toward or from said throat-forming mechanism; means for rigidly securing said frame-piece in any position to which it may be adjusted, for the purpose set forth.

34. In a metal-forming machine, an expansile forming-block consisting of a frame-piece rigidly secured against displacement; a pair
 45 of masking portions located one upon each side of said frame-piece; and pivotally connected together and to the frame-piece at their forward ends; a pair of gear-segments secured on the top of each of said masking portions; means for adjusting said masking portions toward and from said frame-piece; a swinging
 50 frame pivotally connected at one end to said frame-piece; a rotatable cam-block mounted in said swinging frame; a pair of gear-segments carried rigidly on the top of said cam-block; means for moving said cam-blocks into close proximity to the expansile block and with one of the segmental gears of the cam-block intermeshing with the corresponding
 55 segmental gear of the expansile block; and means for yieldingly holding said cam-block in such position and means for moving said swinging frame and through said swinging frame, the cam-block around the contour of
 65 said expansile block, substantially as described.

35. In a machine for forming or shaping

horse-collar rims the combination with throat-forming mechanism, of peak-forming mechanism consisting of a frame-piece; a pair of
 70 masking portions located one upon each side of said frame-piece and pivotally connected together and to the frame-piece at their forward ends, means for adjusting said masking portions toward and from said frame-piece; 75
 a swinging frame pivotally connected at one end to said frame-piece; a slide guided in said frame; a rotatable cam-block mounted in said slide; a cylinder carried upon the other end of said swinging frame; a piston within
 80 said cylinder; a piston-rod connected at one end to said piston and at its opposite end to said slide; means for supplying compressed air to and exhausting it from the end of said cylinder opposite to the slide; an expansile
 85 coiled spring located within said cylinder and bearing between the piston and the end of the cylinder adjacent to said slide; a handle for moving said frame around said expansile peak-block; and means for causing said cam-
 90 block to roll upon said expansile block, substantially as described and for the purpose set forth.

36. In a metal-forming machine, an expansile forming-block consisting of a frame-piece
 95 rigidly secured against displacement; a pair of masking portions located one upon each side of said frame-piece; and pivotally connected together and to the frame-piece at their forward ends; means for adjusting said
 100 masking portions toward and from said frame-piece; and traveling forming mechanism coacting with said expansile block; a stationary shearing-section vertically slotted to present shearing edges and located between the
 105 pivoted ends of said masking portions; a bracket-arm upon said frame-piece; a trimming device; consisting of a longitudinally-slotted lever fulcrumed at one end to said bracket-arm; a blade having oppositely-fac-
 110 ing cutting edges and pivoted on a spindle extending transversely through the slot of said lever; and means for automatically rotating said blade to have its edges alternately coincide with the respective stationary shear-
 115 ing edges as the lever is moved substantially as described and for the purpose set forth.

37. In a machine for forming or shaping horse-collar rims the combination of peak-forming mechanism consisting of a frame-
 120 piece; a pair of masking portions located one upon each side of said frame-piece and pivotally connected together and to the frame-piece at their forward ends; means for adjusting said masking portions toward and
 125 from said frame-piece and traveling forming mechanism coacting with said expansile block; means for adjusting said frame toward or from said throat-forming mechanism; means for rigidly securing said frame-piece
 130 in any position to which it may be adjusted; a stationary shearing-section vertically slotted to present shearing edges and located between the pivoted ends of said masking por-

tions; a bracket-arm upon said frame-piece; a trimming device consisting of a longitudinally-slotted lever fulcrumed at one end to said bracket-arm; a blade having oppositely-
5 facing cutting edges and pivoted on a spindle extending transversely through the slot in said lever; a ratchet-wheel on one end of said spindle; a rack pivotally connected to said bracket-arm and yieldingly engaging said
10 ratchet-wheel; a ratchet-wheel mounted on the opposite end of said spindle; a spring-pawl carried by said lever and engaging the teeth of said last-mentioned wheel; a latch carried by the lever and engaging perforations in

said blade; and a wedge-shaped projection 15 upon said bracket-arm to be engaged by and disengage said latch from the blade when the lever is moved in one direction, substantially as described and for the purpose set forth.

In testimony whereof we have affixed our 20 signatures in presence of two witnesses.

HENRY LAWRENCE GULLINE.
IRVIN ELIAS HUTCHINS.
ARCHIBALD IVES GILLIES.

Witnesses:

A. DESLIERRES,
J. A. PORÉ.