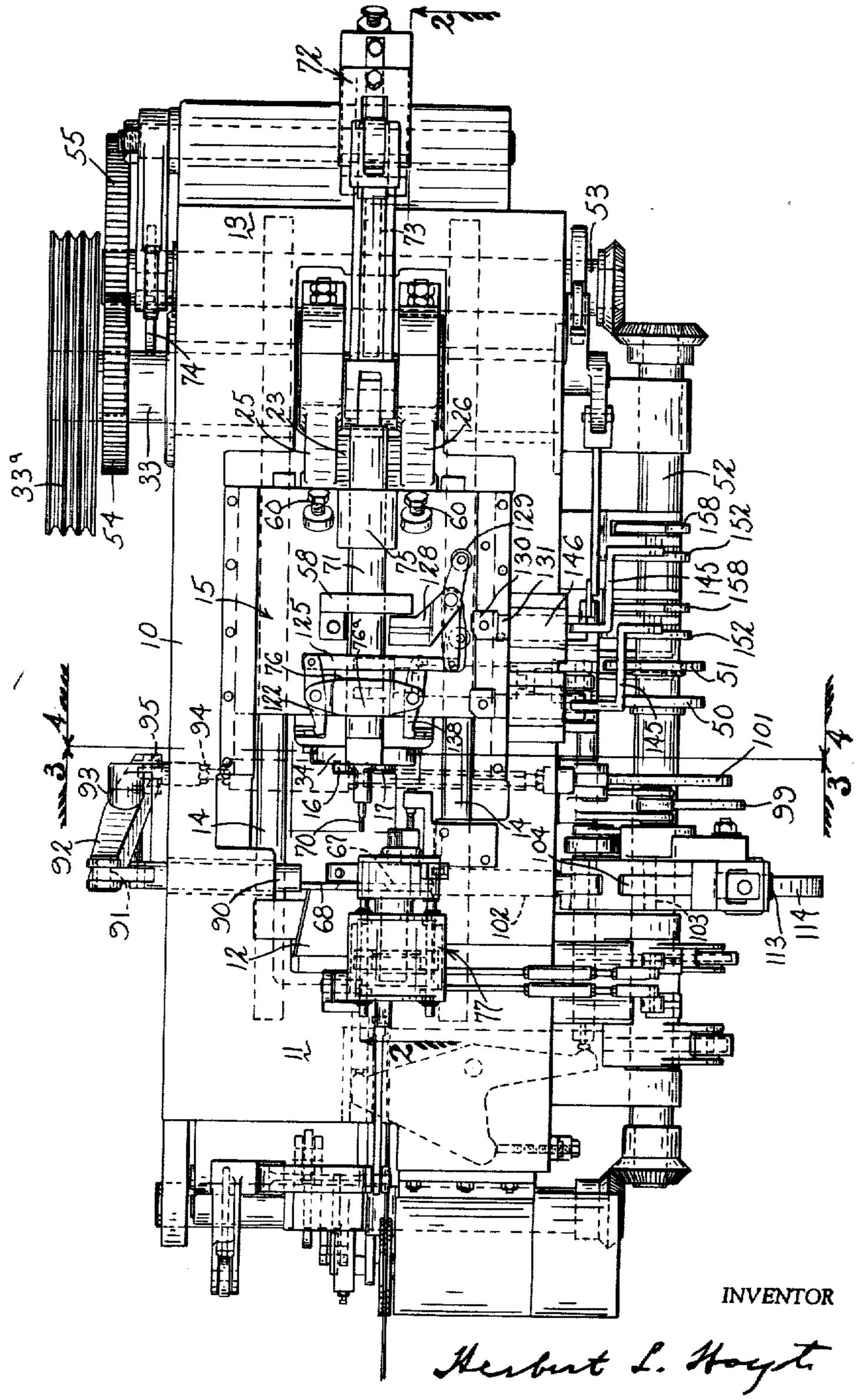
Aug. 27, 1963 H. L. HOYT 3,101,632

MACHINE FOR FORMING METAL ARTICLES

Filed Dec. 9, 1957 8 Sheets-Sheet 1

Fig. 1.



INVENTOR

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BY

Rockwell & Rockwell

ATTORNEYS

Aug. 27, 1963 H. L. HOYT 3,101,632

MACHINE FOR FORMING METAL ARTICLES

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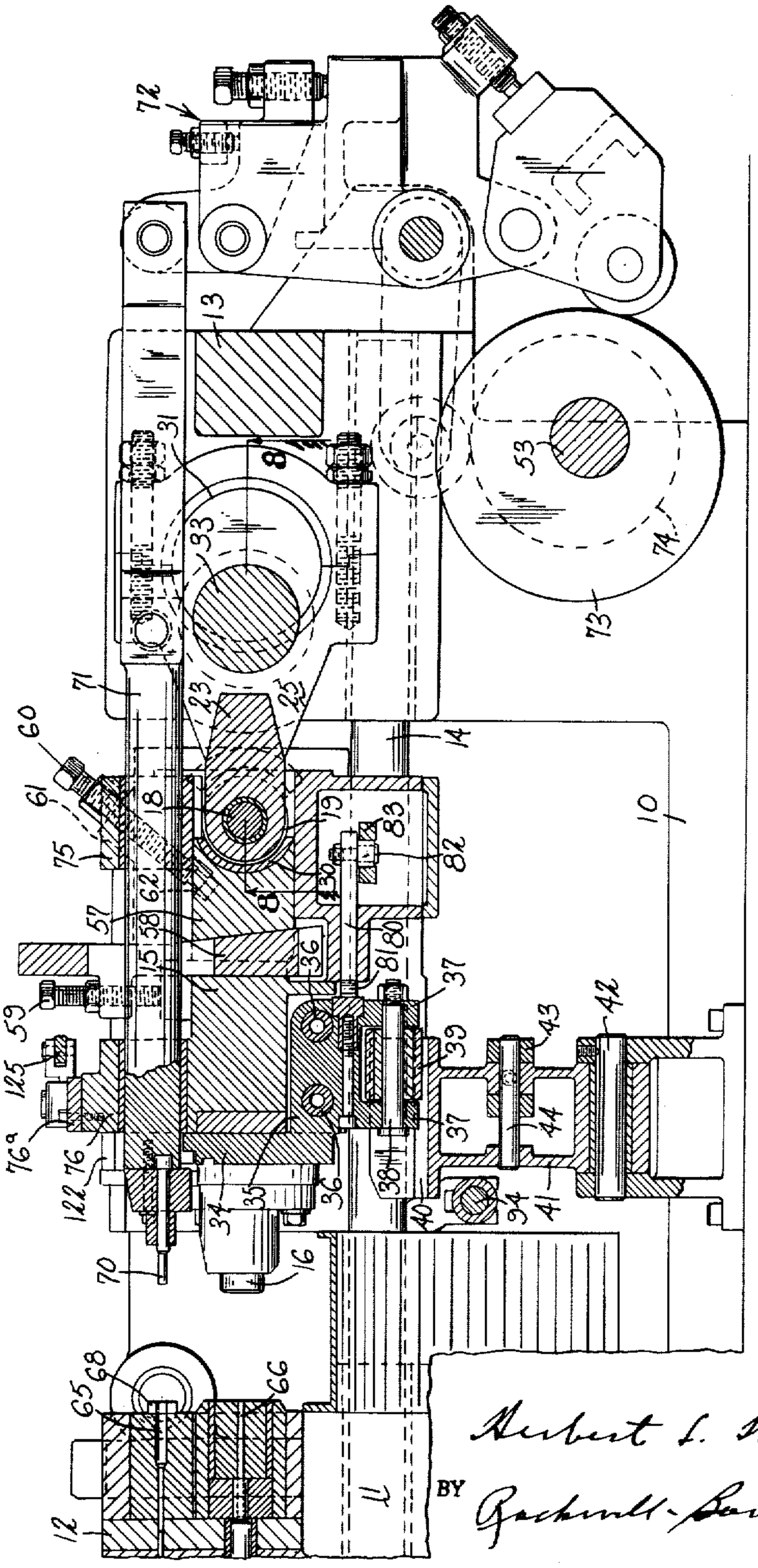
Fig. 2.



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Aug. 27, 1963 H. L. HOYT 3,101,632

MACHINE FOR FORMING METAL ARTICLES

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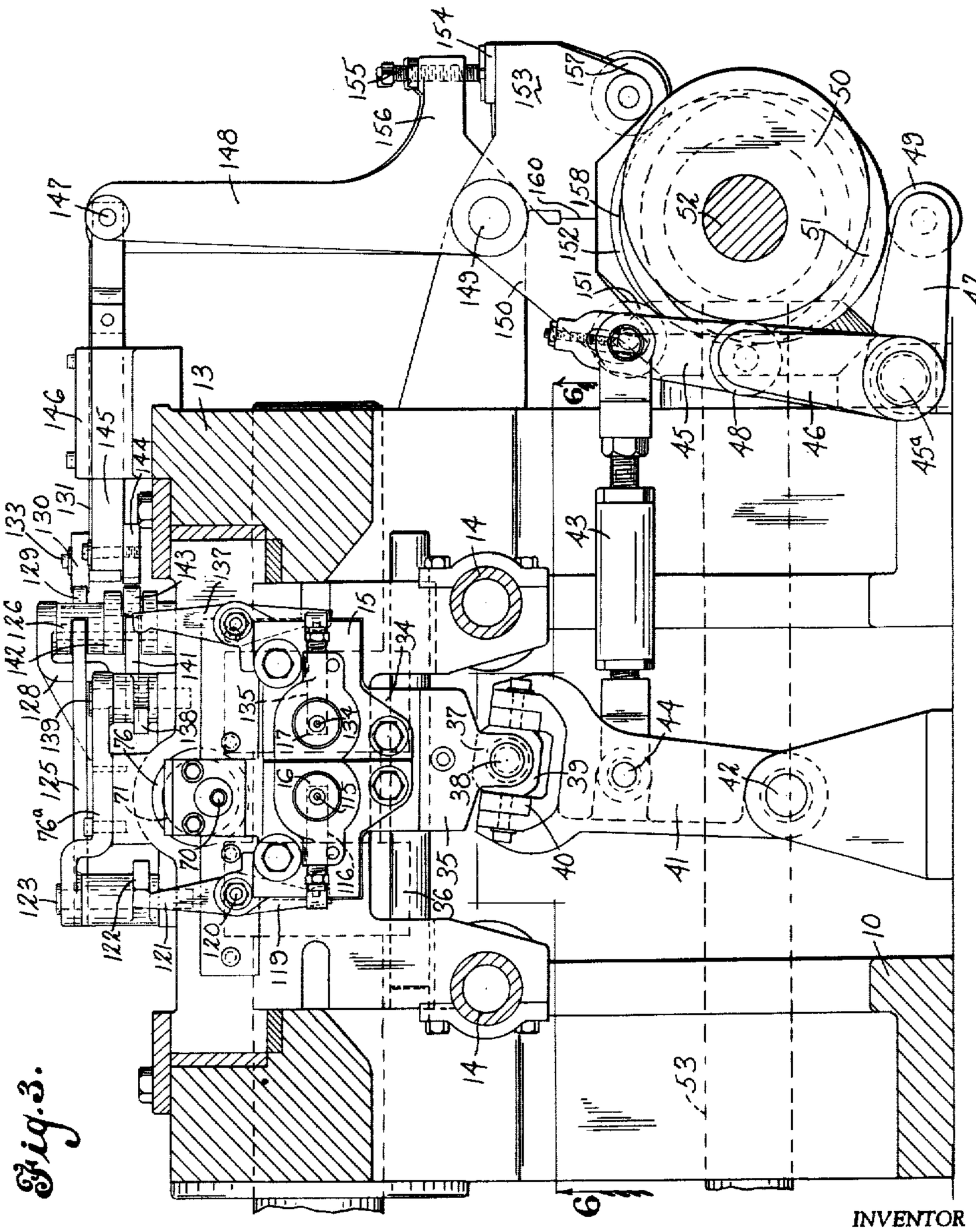

Fig. 3.

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MACHINE FOR FORMING METAL ARTICLES

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Fig. 4.

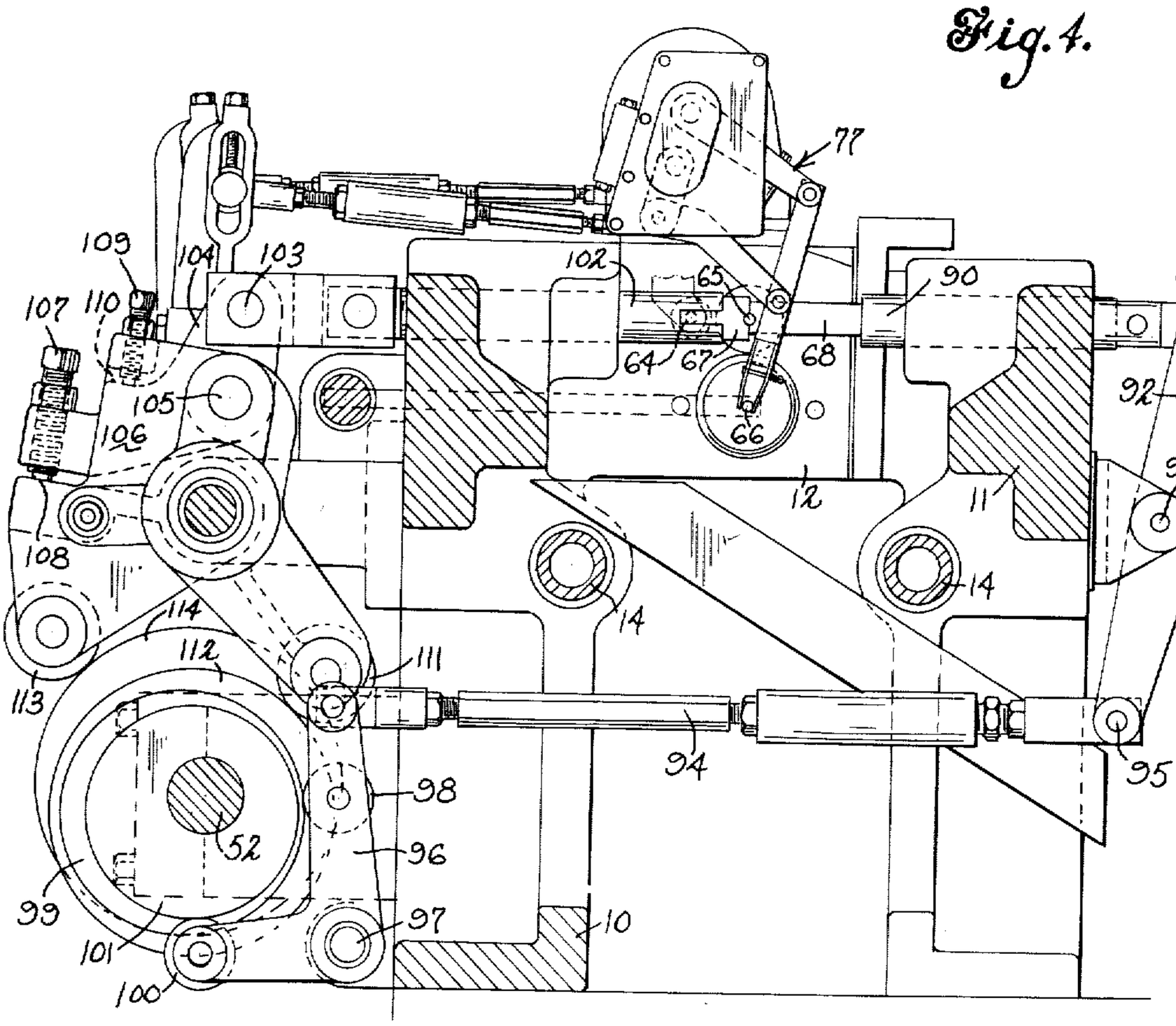
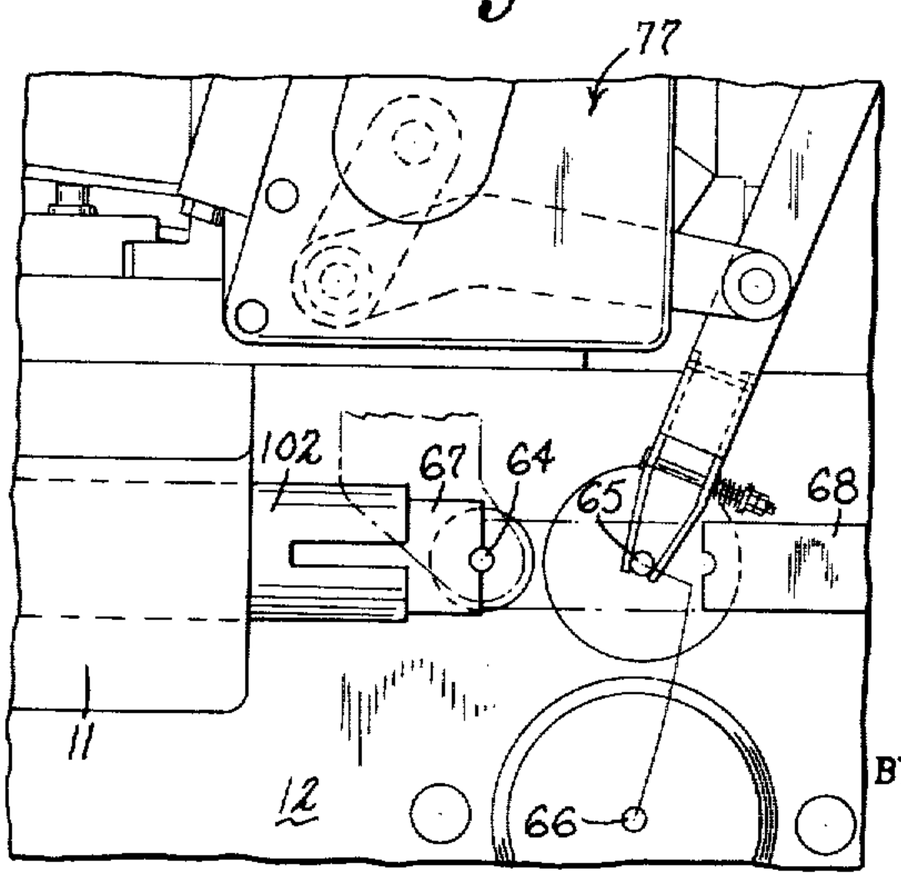


Fig. 5.



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MACHINE FOR FORMING METAL ARTICLES

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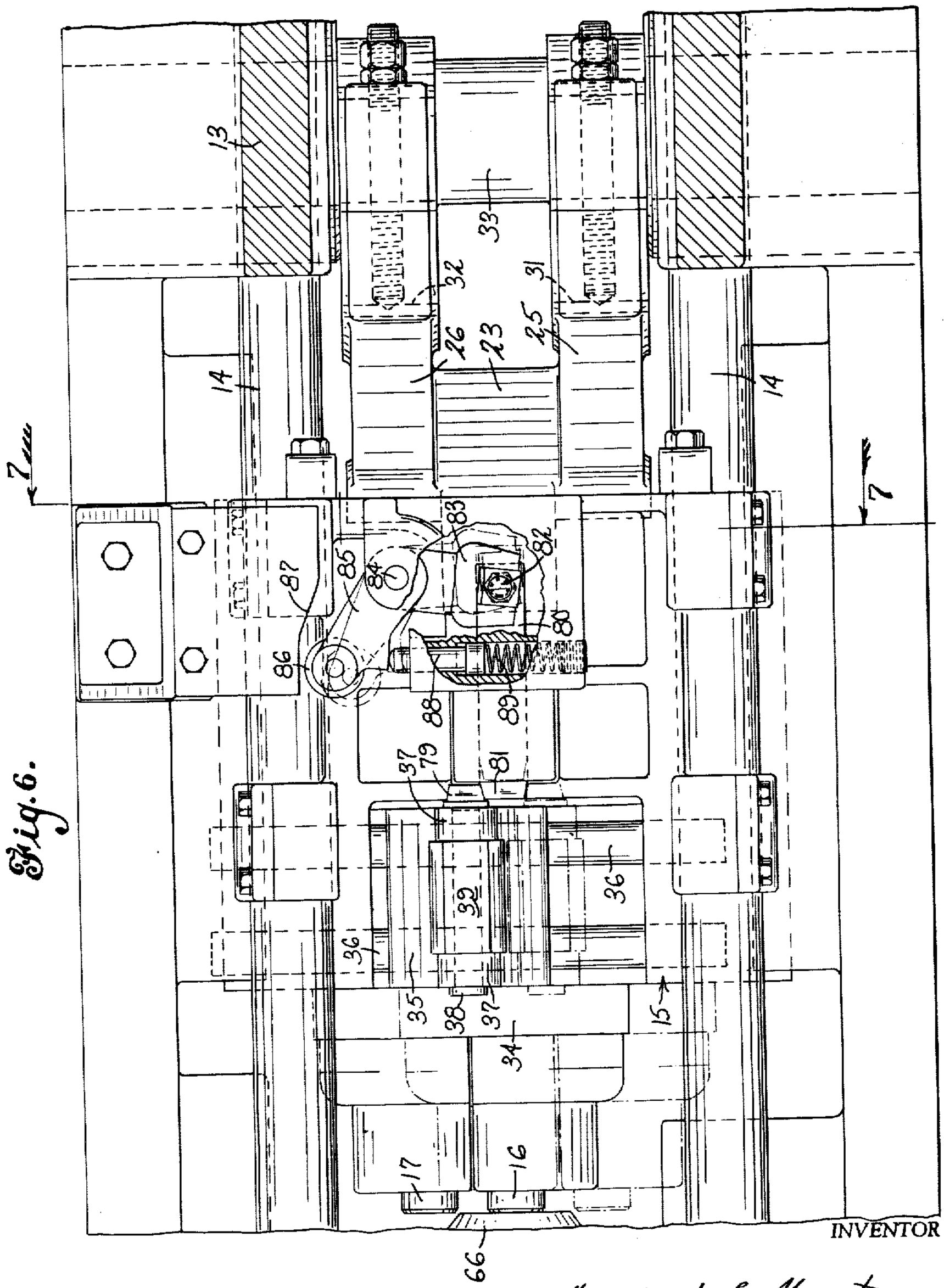

Fig. 6.

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Fig. 7.

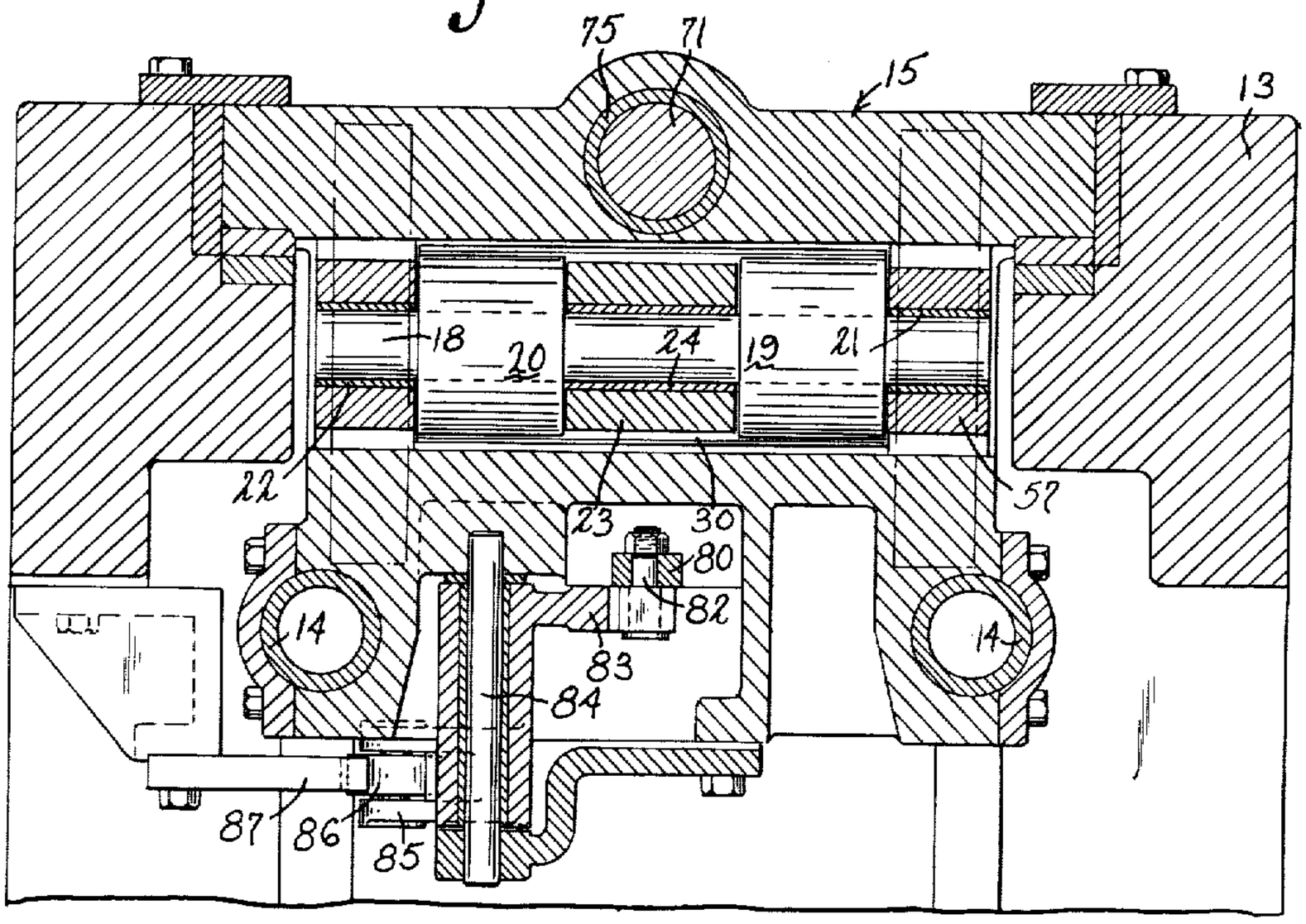
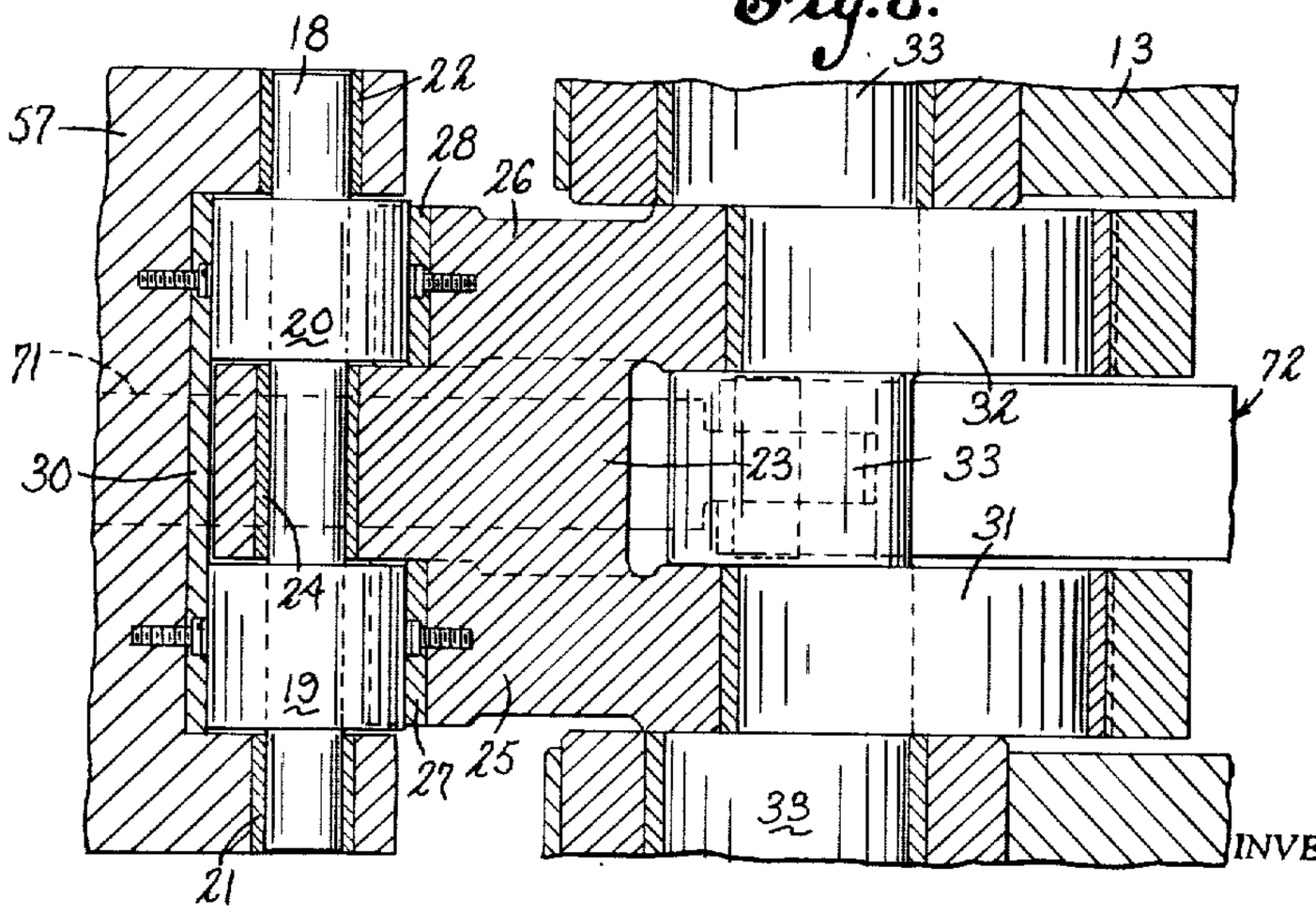


Fig. 8.



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MACHINE FOR FORMING METAL ARTICLES

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Fig. 9.

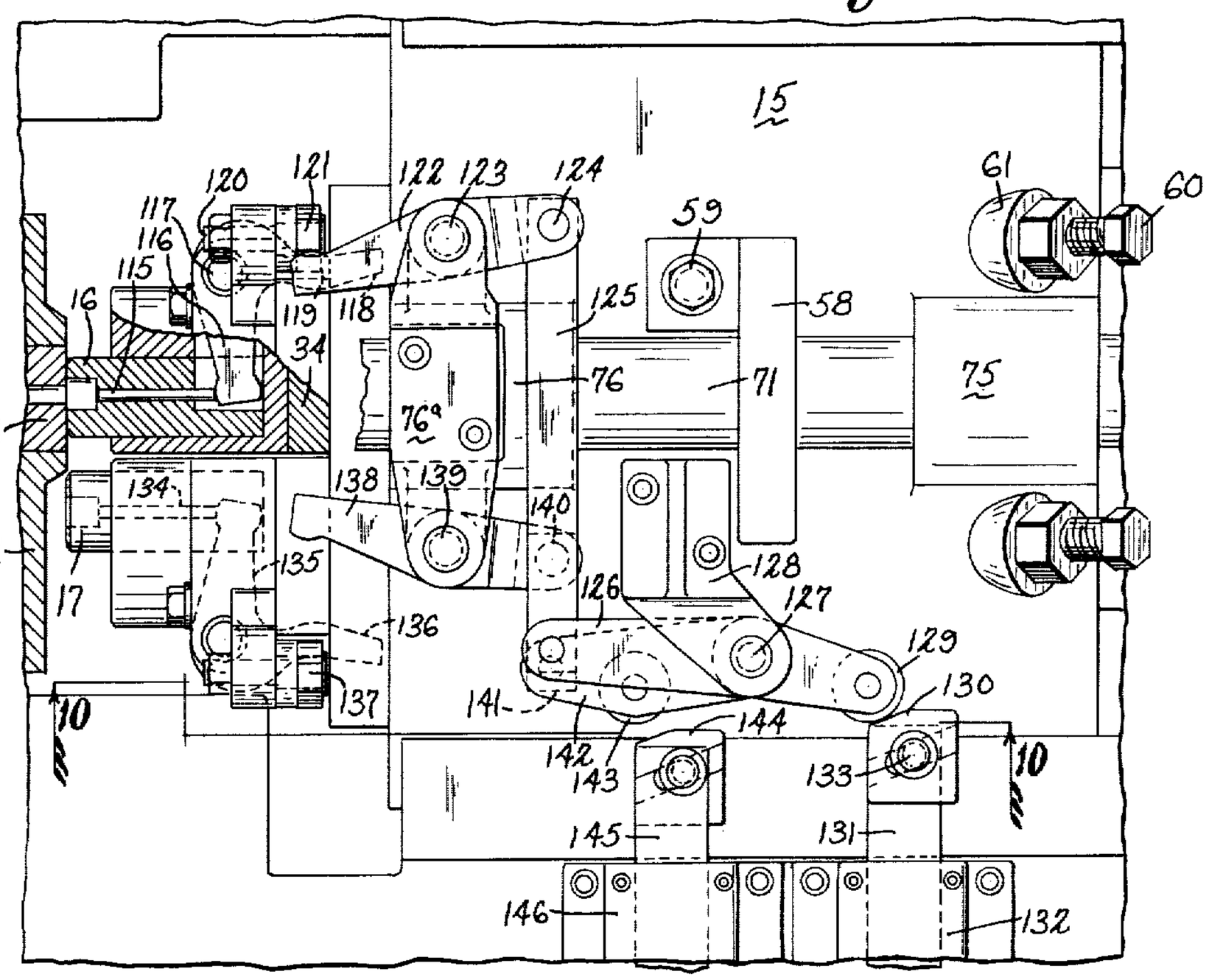
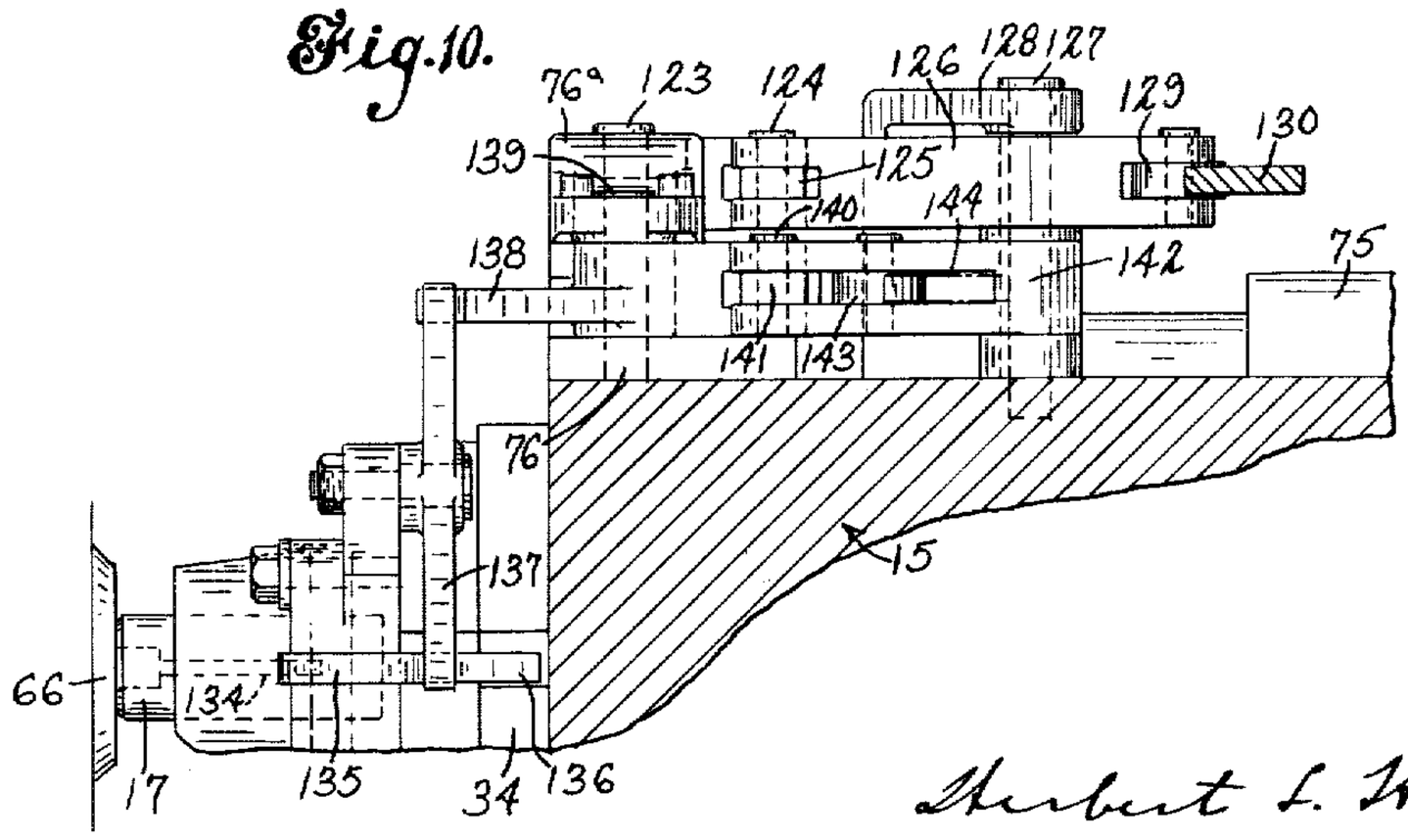


Fig. 10.



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MACHINE FOR FORMING METAL ARTICLES

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Fig. 11.

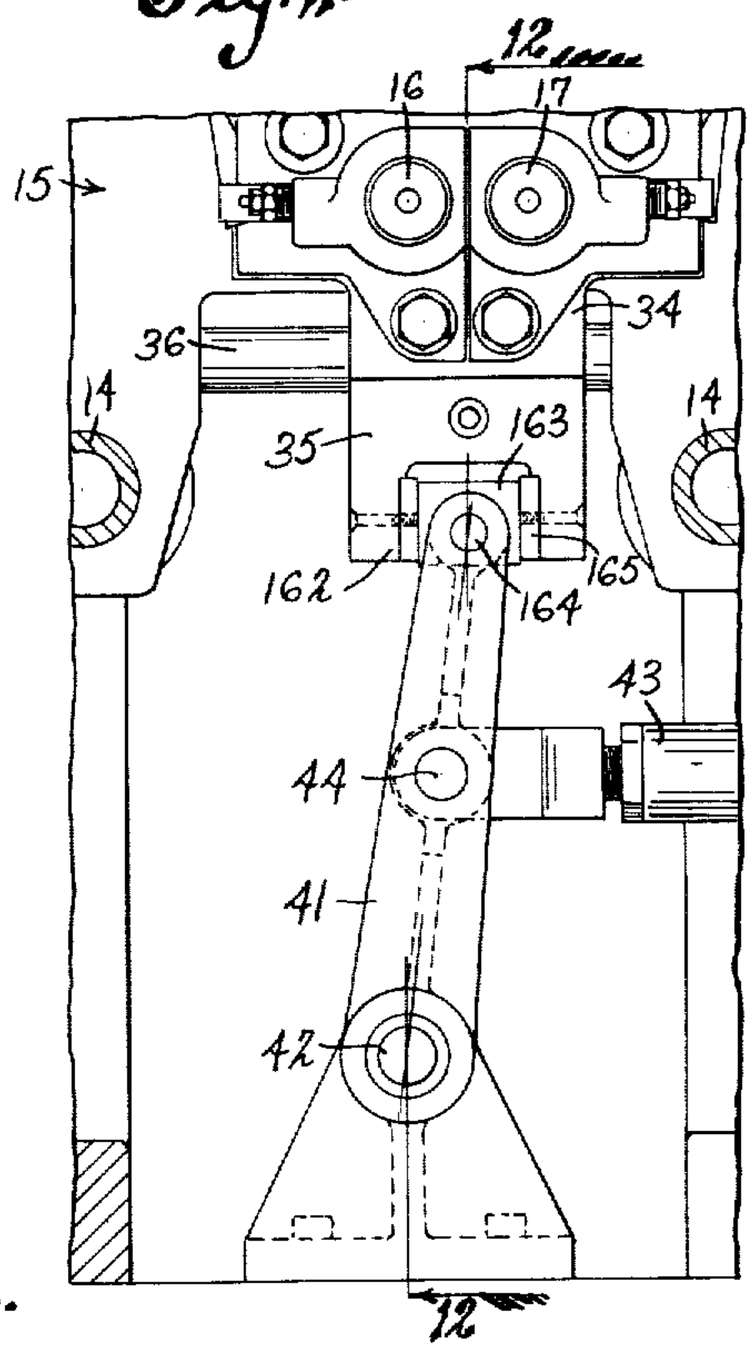
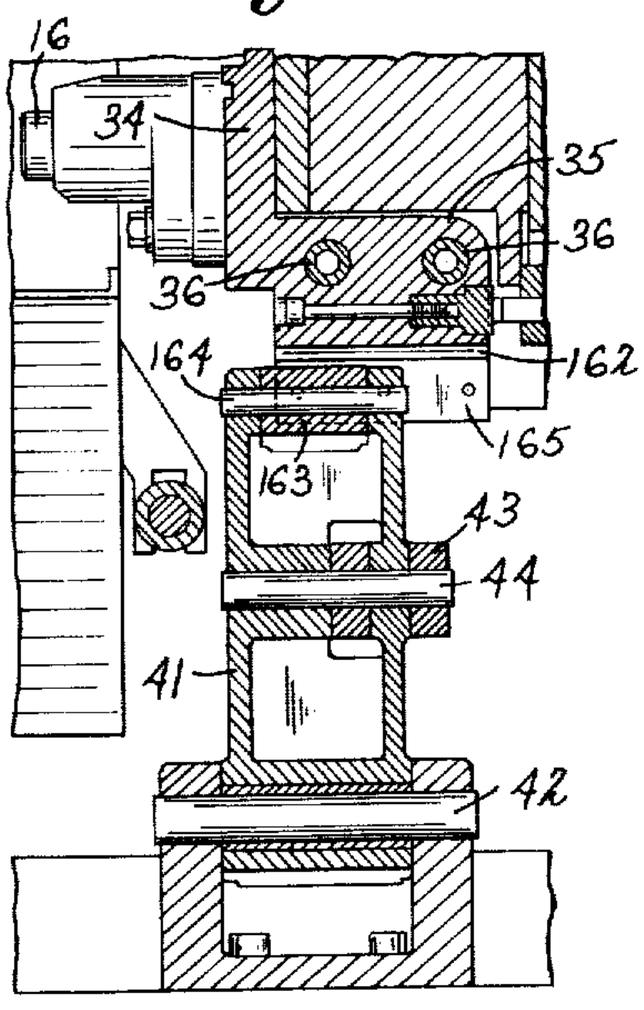


Fig. 12.



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United States Patent Office

3,101,632
Patented Aug. 27, 1963

3,101,632

MACHINE FOR FORMING METAL ARTICLES

Herbert L. Hoyt, Waterbury, Conn., assignor, by mesne assignments, to Textron Industries, Inc., a corporation of Delaware

Filed Dec. 9, 1957, Ser. No. 701,490
9 Claims. (Cl. 78—17)

This invention relates to a machine for forming metal articles and particularly to a machine of this type known as a heading apparatus wherein a workpiece is cut from a length of wire stock and thereafter headed by the cooperative action of punches and dies. While the particular apparatus illustrated and described herein relates to what is usually called a "two-blow" header, it will be understood that the principles of the invention may be employed in other relations.

In a heading apparatus of the character illustrated there is usually provided a die bed having one or more dies therein and a reciprocating gate carrying punches or forming tools to cooperate with the die. A length of stock is fed through a cut-off die from which a workpiece is severed by a moving knife or shear member, and this workpiece is carried to a working or processing die or dies in which the heading operation is effected. Where a single heading die is employed the reciprocating gate carries a plurality of punches, usually two in a two-blow header, which cooperate with the single die upon alternate strokes of the gate. To this end the punches are movably mounted upon the gate and are shifted between the reciprocations thereof so that first one and then the other will be in position to cooperate with the die in performing work upon the workpiece or blank.

In the present instance the gate is operated from a crank shaft by means of a pitman which connects the crank shaft to the gate. As illustrated herein a double-armed pitman is employed in that the pitman is provided with two spaced arms which embrace two spaced crank portions on the crank shaft to provide for efficient and evenly balanced actuation of the gate.

Novel means are also provided to shift the punches upon the gate between advancing movements of the latter in order that this shifting may be accomplished with certainty and efficiency to the proper positions so that each of the punches will properly cooperate with the single die. Also means is provided to lock the punches in the positions to which they are shifted so that they will be securely fixed in position to register with the die.

In machines of this character it sometimes occurs that the work is adapted to stick to the punch and be drawn out of the die when the gate is retracted. Novel and efficient means are provided herein to eject the workpiece from the punches upon the withdrawal of the gate so that the workpiece will remain in the die for operation thereon by the second punch or so that it can be properly ejected from the die after the final operation. This ejector mechanism is properly timed with the withdrawal of the punches so that, as each punch withdraws, the workpiece will remain in the die opening and be prevented from clinging to the punch.

Also in the present application novel means are provided for cutting or severing the workpiece from the blank, gripping the workpiece so severed and carrying it to the next working station for a processing operation. It will be understood that, while as disclosed in the present application an extruding die and punch are provided for performing an extruding operation thereon so as to reduce the cross-sectional size of the shank of the final article, the improvements herein claimed are not to be limited to a header provided with extruding mechanism but are of broad application to headers of other types and other machines for forming metal articles.

One object of the invention is to provide a new and improved heading mechanism for heading metal blanks.

A further object of the invention is the provision of a heading mechanism having a die bed carrying a processing die and a reciprocating gate carrying punches shiftably mounted thereon to cooperate with the die, and new and improved means for reciprocating the gate.

Still another object of the invention is to provide an apparatus of the character described with a crank shaft and a pitman connecting the crank shaft to the reciprocating gate, the pitman being of novel construction in that it is provided with a plurality of arms embracing a plurality of crank portions on the crank shaft.

Still another object of the invention is to provide a heading apparatus having a die and reciprocating gate carrying punches to cooperate with the die with improved means for shifting the punches carried by the gate from one position to another on the gate so that each will be in position to cooperate with the die upon the advance of the gate.

Still another object of the invention is to provide a heading mechanism of the character previously described wherein means are provided for locking the punches in the position to which they are shifted so that each of the punches upon alternate strokes of the gate will be securely held in position to register with the die.

Still another object of the invention is to provide a new and improved ejector mechanism for preventing the workpieces or blanks from clinging to the punches upon the withdrawal thereof in a direction away from the die.

Still another object of the invention is the provision of a heading mechanism of the character described wherein the means for ejecting the workpieces from the punches or preventing them from clinging to the punches is properly timed with the operation of the gate.

A still further object of the invention is the provision of a new and improved means for severing the workpiece from a length of wire or rod stock and transferring this workpiece to a working die station upon the machine.

To these and other ends the invention consists in the novel features and combinations of parts to be hereinafter described and claimed.

In the accompanying drawings:

FIG. 1 is a top plan view of a heading mechanism embodying my invention;

FIG. 2 is a longitudinal sectional view of a portion of the apparatus taken on line **2—2** of FIG. 1;

FIG. 3 is a transverse sectional view on line **3—3** of FIG. 1 looking in the direction of the arrows;

FIG. 4 is a transverse section on line **4—4** of FIG. 1 looking in the direction of the arrows;

FIG. 5 is an enlarged elevational view of a portion of the die bed showing the faces of the dies therein and a portion of the transfer mechanism;

FIG. 6 is a sectional view on line **6—6** of FIG. 3;

FIG. 7 is a sectional view on line **7—7** of FIG. 6;

FIG. 8 is a horizontal sectional view through the double-armed pitman taken on line **8—8** of FIG. 2;

FIG. 9 is an enlarged plan view of a portion of the gate showing the means for ejecting the blanks or workpieces from the punches;

FIG. 10 is a sectional view on line **10—10** of FIG. 9;

FIG. 11 is a detail view similar to FIG. 3, showing a modification of the connection of the punch shifter mechanism with the punch carrier; and

FIG. 12 is a sectional view on line **12—12** of FIG. 11.

To illustrate a preferred embodiment of the invention there is shown in the drawings a heading or upsetting de-

vice comprising a bed or frame **10** having an upstanding portion **11** upon which is carried a die block **12** and an upstanding portion **13** adjacent the rear end of the frame. In the members **11** and **13** are slidably supported a pair of rods **14** (FIGS. 2 and 3), to which rods are secured the gate **15**. Upon this gate are supported a pair of heading punches **16** and **17**, which punches are mounted for sliding movement transversely of the direction of travel of the gate as will be later explained.

A pivot rod **18** is mounted in a block member **57** (to be described hereinafter) adjustably mounted in the gate **15**, to which rod is secured a double-armed pitman (FIGS. 2, 7 and 8). Spaced rollers **19** and **20** are provided upon this rod between its end bearings **21** and **22** in the block.

The pitman comprises a central body **23** having a bearing **24** surrounding the intermediate portion of the pivot rod **18** whereby, when the pitman is actuated, the gate will be withdrawn away from the die bed or toward the right, as shown in FIG. 8. The pitman is also provided with a pair of rearwardly extending arms **25** and **26** which, as illustrated, are formed integrally with the body portion **23**. Wear plates of arcuate shape **27** and **28** are provided at the forward ends of these arms, which wear plates bear against the rollers **19** and **20** on the pivot pin **18**. As the pitman is actuated, the wear plates **27** and **28** will bear against the rollers **19** and **20** on the pivot rod **18** and push the gate forwardly in its operative stroke toward the dies. Thus two spaced areas of contact are provided between the arms **25** and **26** of the pitman and the block **57** on the operative stroke of the latter, and these areas are of relatively large extent as compared with the size of the pivot pin **18**. A wear plate **30** may be secured to the block **57** to take the thrust of the rollers **19** and **20** and thus relieve the strain on the pivot pin **18**.

The arms **25** and **26** of the pitman extend rearwardly and are provided with openings which embrace crank portions **31** and **32** on a crank shaft **33** rotatably mounted in the portion **13** of the bed. These crank portions are also of enlarged size with respect to the size of the crank shaft. As will be seen from FIG. 2, this shaft has a portion of normal size between the crank portions **31** and **32**. Upon the return or inoperative stroke of the gate the force applied by the pitman is taken by the portion of the pivot rod **18** between the rollers **19** and **20**.

As shown in FIG. 1, the crank shaft **33** may be driven by the pulley **33a** which may be turn be driven from any suitable source of power.

As illustrated, the heading operation may be performed in two stages as is usual in the well-known two-blow header and, therefore, the two heading punches **16** and **17** may cooperate with a single die to be hereinafter described. Provision is made, therefore, for shifting the heading punches on the gate in a direction transverse to the direction of travel of the gate. To this end the punches are mounted upon a punch carrier **34** (FIGS. 2 and 3) secured, by a bracket **35**, to transverse rods **36** which are slidably mounted in the gate **15** so that the punches are slidably mounted on the gate. This bracket member is provided with spaced ears **37** by which is carried a pin **38**, and a slide **39** is mounted upon this pin.

The slide **39** is adapted to reciprocate longitudinally of the frame in a guide member **40** provided at the upper end of a rocker **41** pivoted at **42** to the frame, which guide member has an outwardly facing channel. A link **43** (FIG. 3) is pivoted at **44** to this rocker member at one end and the other end of the link is pivoted to an upstanding lever **45** pivoted to the frame at **45a** and having arms **46** and **47**, rigid therewith, carrying cam follower rollers **48** and **49** to cooperate with cams **50** and **51** secured upon a side shaft **52**, which cams will serve to reciprocate the link **43** and, therefore, shift

the punches **16** and **17**. The shaft **52** is driven from a transverse shaft **53** (FIG. 1) which in turn is driven from the crank shaft **33** by means of a gear **54** on the crank shaft which meshes with a gear **55** on the shaft **53**. The relationship of these gears is such that the shaft **52** is driven at one half the rotational speed of the crank shaft.

With the above arrangement it will be seen that upon rotation of the cam shaft **52**, the punches will be shifted first in one direction and then the other, these shifts occurring upon alternate receding movements of the gate. The slide **39** secured to the punch carrier will move to and fro in the guide member **40** secured to the shifting lever **41** during reciprocation of the gate.

In order to adjust the connection of the pitman with the gate, the pivot rod **18** is mounted in a block **57** slidably mounted on the gate and adjustable with respect thereto. A wedge member **58** carried by the gate lies between the block **57** and the body of the gate and may be adjusted in a vertical direction by the adjusting screw **59**. The gate may be locked in a position against this wedge member by means of the locking screws **60** (FIGS. 1 and 2) threaded into bosses **61** upon the gate, the inner ends of these screws bearing against an inclined surface **62** on the block **57**. This screw will, therefore, hold the block firmly against the adjacent surface of the wedge **58**. It will be noted that the abutting surfaces of the wedge and block are inclined, as shown in FIG. 2.

As shown in FIG. 4 the die bed **12** is provided with a cut-off die **64**, an extruding die **65** and a heading die **66**. Reciprocable or sliding cutters **67** and **68** are provided to sever a blank at the cut-off station **64** and carry it to the extruding die **65** (FIGS. 2, 4 and 5). The actuating mechanism for these cutters will be described hereinafter. When the blank arrives at the extruding die or extruding station **65**, it is ejected from the cutters into the die by an extruding punch **70** (FIG. 2) carried by a plunger **71**. This plunger is operated by mechanism designated generally by the numeral **72** actuated from cams **73** and **74** on the shaft **53**. As this extruding punch and associated mechanism is not claimed in the present application, no further description thereof is required. It may be noted, however, that the extruding punch is slidably carried in bearings **75** and **76** on the gate and is positioned between the arms **25** and **26** of the pitman which actuates the gate.

Also suitable transfer mechanism designated generally by the numeral **77** (FIGS. 4 and 5) is provided to carry the blank from the extruding die **65** to the heading die **66**, and, as this transfer mechanism is likewise not claimed in the present application, no further description thereof or of its operating means is necessary.

As shown more especially in FIGS. 2 and 6, means are provided to lock the punches in the positions to which they are shifted laterally on the gate during reciprocation of the latter. To this end the bracket **35** on the punch carrier **34** is provided with a rearward projection **79** and a plunger **80** is slidably mounted in the gate, the nose **81** of which cooperates with this projection. To the rear end of this plunger is pivoted at **82** one arm **83** of a bell crank lever pivoted to the gate at **84**. The other arm of this lever **85** carries a cam follower roller **86** adapted to engage the face of a cam plate **87** secured to the main frame of the machine. It will be apparent that, as shown in FIG. 6, as the gate withdraws from the dies or moves to the right, the roller **86** will ride upon the cam face **87** and rotate the bell crank lever in a counterclockwise direction about the pivot **84**. This will withdraw the nose **81** of the plunger **80** away from the projection **79** and permit the punch holder to move from the full-line position shown in FIG. 6 toward the dotted-line position shown in this figure. When the gate returns toward the dies upon its operative stroke, the roller **86** will ride off the cam face **87**, as shown in full lines in FIG. 6 and the bell crank lever will be moved in a clockwise

direction by means of a plunger **88** slidably mounted upon the gate and urged forwardly by the spring **89**. This will return the locking plunger **80** to its forward position in which its nose **81** engages the projection **79** on the punch carrier bracket so as to lock the carrier in position at the operative stroke of the gate.

Referring to FIG. 4, the knife **68** is slidably mounted in the frame of the machine and carried by a plunger **90** pivoted at **91** to the upper end of a lever **92** pivoted at **93** to the frame. One end of a link **94** is pivoted at **95** to the lever **92**, the other end of this link being carried by a bell crank lever **96** pivoted to the frame at **97**. Upon one arm of the bell crank lever **96** is provided a cam follower roller **98** to cooperate with a cam **99**, while the other arm of the bell crank lever carries a cam follower roller **100** which is likewise engaged by the peripheral surface of a cam **101**. The cams **99** and **101** are secured to the side shaft **52** previously referred to. Therefore, when the shaft **52** is rotated, the member **68** will be positively moved in both directions in timed relation to the movement of the gate.

The knife **67** is carried by a plunger **102** slidably mounted in the die bed, the outer end of this plunger being pivoted at **103** to a lever **104** which is in turn pivoted at **105** to an oscillating bracket **106**. An adjusting screw **107** is threaded in the lever **104** and bears against a shoulder **108** on the bracket, while an adjusting screw **109** is threadedly mounted in the bracket **106** and bears against shoulder **110** on the lever **104** so that the latter may be adjusted in either direction about its pivot **105** and held rigidly in such adjusted position.

The bracket **106** is provided with a cam follower roller **111** adapted to engage the periphery of a cam **112** and is also provided with a cam follower roller **113** adapted to engage the periphery of a cam **114**. Both cams **112** and **114** are provided upon the side shaft **52**, as shown in FIG. 1.

Thus the severing members **67** and **68** (the latter being principally a gripping member) are operated independently as is desirable in order that the knife **68** may be retracted toward the left, as shown in FIG. 7, and be compelled to dwell in its retracted position in order that the stock from which the blank is cut may be fed past the knife while the other operations of the device are being carried out. Also the cooperating knife or gripping member **68** may be moved to the right, as shown in FIG. 4, so as to be out of the way of the transfer mechanism when the workpiece is delivered to the latter after being ejected from the extruding die **65**. It will be noted that two cams **112** and **114** are provided, each moving the member **67** in one direction, while two cams **99** and **101** are provided, each moving the member **68** in one direction so that movement of the two members **67** and **68** in each direction is independently controlled and the cams may be so shaped as to bring about any desired movement and dwell thereof.

In heading devices of this kind it sometimes occurs that the blanks are inclined to cling to the punches and be carried away from the dies with the withdrawal of the gate. In order to prevent such an occurrence, timed ejector mechanism is provided to eject the work from the punch cavities as the gate is withdrawn.

Referring to FIG. 9, an ejector pin **115** is slidably mounted in the punch **16** and engaged by one arm of a lever **116** pivoted to the punch carrier at **117**. The other arm **118** of this lever is adapted to be engaged by a vertical lever **119** pivoted at **120** (FIGS. 3 and 9) on the punch carrier. The upper arm **121** of this lever is adapted to be engaged by one end of a lever **122** pivoted at **123** to a bracket **76** carried by the gate **15**. To the other end of the lever **122** is pivoted at **124** one end of a link **125**, the other end of which is pivoted to one arm of a lever **126** pivoted at **127** to a bracket **128** carried by the gate. At the other end of the lever **126** is a cam follower roller **129** adapted to be engaged by a cam **130**

mounted upon the end of a slide bar **131** slidably mounted upon the frame of the machine in brackets **132**. The cam member **130** may be slotted and a screw **133** passing through this slot adjustably secures the cam to the slide **131**.

Similar structure is provided in connection with the punch **17** in which an ejecting pin **134** is slidably mounted and adapted to be actuated by a lever **135** similar in construction to the lever **116** previously described. The tail **136** of the lever **135** is adapted to be engaged by the lower end of a vertical lever **137** (FIG. 3) similar to the lever **121**, while the upper end of the lever **137** will at the proper time be engaged by the adjacent end of the lever **138** pivoted at **139** to the bracket **76ª** (FIG. 9). The other end of the lever **138** is pivoted at **140** to a short link **141** seen in FIG. 9 behind the link **125**, and the link **141** is in turn pivoted to a lever **142** also pivoted at **127** to the bracket **128** and carrying a cam follower roller **143** adapted to cooperate with a cam member **144** carried by the slide **145**, which cam member and slide are similar to the cam member **130** and slide **131** previously described. The slide **145** is mounted on the frame of the machine in a bracket **146**.

As is understood, when two punches are provided upon the gate as in the present instance, each is in position to cooperate with the die upon alternate strokes of the gate. Hence the ejector or knock-out pins **115** and **134** are only required to operate upon every alternate reciprocation of the gate, and means are provided to move the slide members **131** and **145** at the proper time to move the cam members **130** and **134** into and out of operative position. As the means for each of the slide members is identical with that of the other, one only need be shown and described as illustrated on FIG. 3, where the means for operating the slide **145** is shown. It will be understood that the operating means for the slide **131** stands directly to the rear.

As illustrated, the outer end of the slide **145** is pivoted at **147** to the upper end of a lever **148** pivoted to the frame at **149**. This lever also comprises a lower arm **150** carrying a cam follower roller **151** to cooperate with a cam **152** on the side shaft **52**, it being understood that the arms **148** and **150** are rigid with each other. Thus rotation of the cam **152** will effect movement of the lever arm **148** in a clockwise direction and thus move the slide **145** outwardly or to an inoperative position with respect to the cam follower **143**.

In order to move the slide **145** and cam **144** in the other direction to its operative position, a second lever **153** is pivoted to the frame at **149**. To this lever is secured a frangible breaker plate **154** against which bears an adjustable screw **155** threaded in a third arm **156** of the lever **148**. Carried by the lever **153** is a follower roller **157** adapted to be engaged by the cam member **158** also carried by the shaft **52**. It will be seen that rotation of the cam **158** will move the lever **153** in a counterclockwise direction and, therefore, move the slide **45** and cam **144** inwardly so as to be in position to engage the roller **143** at the proper time in the reciprocation of the gate. It may be noted that the lever **153** and the lever arm **150** abut along the line **160**, being held in this relationship by pressure of the screw **155** against breaker plate **154**.

The cam members **152** and **158** are timed to move the slides **131** and **145** to their operative positions at the proper time. As shown in FIG. 9, the punch **16** is in its operative position against the face of the die **66**, and it will be noted that upon withdrawal of the gate to the right to withdraw the punch from the work, the cam follower **129** will engage the cam **130** and actuate the lever **116** and the ejecting pin **115** so that the work will not follow the retreating punch. When the gate again moves forwardly, the punch **17** will be shifted to a position opposite the die, and the tail **136** of the lever **135** will be moved to position to be engaged by the lever **138**. Also the slide **145** will be moved inwardly to its operative position and

the slide **131** withdrawn outwardly so that upon the next withdrawal of the gate the cam follower **143** will engage the cam **144** and actuate the ejecting pin **134** associated with the punch **17**.

In FIGS. 11 and 12 of the drawing there is shown a modified form of connection between the punch shifter mechanism and the punch carrier. In this modification the bracket member **35** which is formed integrally with the punch carrier **34** is provided with a guide member **162** similar in form to the guide member **40** shown in FIG. 2. In this instance, however, the open end of the guided member faces downwardly to receive the block **163** secured by a pin **164** to the upper end of the rocker **41** which in turn is pivoted at **42** to the frame as before. The guide member **162** may be provided with wear plates **165** between which the block **163** moves.

The link **43** which is actuated, as shown in FIG. 3, is pivoted to the rocker member at **44**. Upon reciprocation of the link **43** the rocker **41** will be rocked about its pivot **42** to move the punch carrier **34** transversely of the frame from one position to another. At the same time the punch carrier being mounted upon the gate will be moved in a longitudinal direction which is permitted by sliding movement of the guide member **162** on the block **163**.

It will be understood that ejector mechanism of the usual form will be provided for ejecting the workpieces or blanks from the dies.

While I have shown and described some preferred embodiments of my invention, it will be understood that it is not to be limited to all of the details shown, but is capable of modification and variation within the spirit of the invention and within the scope of the claims.

What I claim is:

1. Means for reciprocating the gate of a header or like apparatus having a frame upon which the gate is reciprocably mounted and a die on the frame with which cooperates a punch carried by the gate, said means comprising a crank shaft having a pair of spaced crank portions thereon, a double-armed pitman pivoted at its forward end to the gate and having spaced rearwardly extending arms, each of which is engaged with one of said crank portions, and a plunger carrying said punch and slidably mounted on the frame in a position disposed between the arms of the pitman.

2. Means for reciprocating the gate of a header or like apparatus having a frame upon which the gate is reciprocably mounted and a die on the frame with which cooperates a punch carried by the gate, said means comprising a crank shaft having a pair of spaced crank portions thereon, a double-armed pitman having spaced rearwardly extending arms, each of which is connected to one of said crank portions, a pivot rod carried by the gate, the forward end of the pitman intermediate said arms being pivotally connected to said pivot rod, and a plunger carrying said punch and slidably mounted on the frame in a position disposed between the arms of the pitman.

3. Means for reciprocating the gate of a header or like apparatus having a frame upon which the gate is reciprocably mounted and a die on the frame with which cooperates a punch carried by the gate, said means comprising a crank shaft having a pair of spaced crank portions thereon, a double-armed pitman pivoted at its forward end to the gate and having spaced rearwardly extending arms, each of which is engaged with one of said crank portions, means for adjusting the position of the pivot of the pitman to the gate in the direction of movement of the latter, and a plunger carrying said punch and slidably mounted on the frame in a position disposed between the arms of the pitman.

4. A header or like mechanism having a frame, a die bed supported on the frame, a die carried by the die bed, a gate reciprocably mounted on the frame for movement toward and from the die, means for reciprocating the gate, a punch carried by the gate having an opening therein, an ejecting pin movably mounted in said opening, and means, actuated by reciprocation of the gate on the frame, for advancing said pin in timed relation to the reciprocation of the gate, said means including cam-actuated mechanism carried by the gate, a cam mounted on the frame to cooperate with said mechanism, and means for moving said cam into and out of position to engage said cam-actuated mechanism.

5. A header or like mechanism having a frame, a die bed supported on the frame, a die carried by the die bed, a gate reciprocably mounted on the frame for movement toward and from the die, means for reciprocating the gate, a punch carried by the gate having an opening therein, an ejecting pin movably mounted in said opening, means, actuated by reciprocation of the gate on the frame, for advancing said pin in timed relation to the reciprocation of the gate, said mechanism comprising a lever mounted on the gate to move said pin, and a cam member on the frame to engage and actuate said lever during reciprocation of the gate, said cam member being movable to and from a position to engage said lever, and means to move said member to and from such engaging position.

6. A header or like mechanism having a frame, a die bed supported on the frame, a die carried by the die bed, a gate reciprocably mounted on the frame for movement toward and from the die, means for reciprocating the gate, a punch carried by the gate having an opening therein, an ejecting pin movably mounted in said opening, means for advancing said pin in timed relation to the reciprocation of the gate, said mechanism comprising a lever mounted on the gate to move said pin, a cam member on the frame to engage and actuate said lever during reciprocation of the gate, said cam member being movably mounted on the frame, and means for moving said cam member to an inoperative position.

7. A header or like mechanism having a frame, a die bed supported on the frame, a die carried by the die bed, a gate reciprocally mounted on the frame for movement toward and from the die, means for reciprocating the gate, a punch carried by the gate having an opening therein, an ejecting pin movably mounted in said opening, means for advancing said pin in timed relation to the reciprocation of the gate, said mechanism comprising a lever mounted on the gate to move said pin, a cam member on the frame to engage and actuate said lever during reciprocation of the gate, said cam member being movably mounted on the frame, and rotatable cam means to move said cam member to a position in which it is inoperative to engage said lever.

8. A header or like mechanism having a frame, a die bed supported on the frame, a die carried by the die bed, a gate reciprocably mounted on the frame for movement toward and from the die, means for reciprocating the gate, a punch carried by the gate having an opening therein, an ejecting pin movably mounted in said opening, means for advancing said pin in timed relation to the reciprocation of the gate, said mechanism comprising a lever mounted on the gate to move said pin, a cam member on the frame to engage and actuate said lever during reciprocation of the gate, said cam member being movably mounted on the frame, and means operating in timed relation to the reciprocation of the gate to move said cam member in opposite directions, to, and from, a position in which it is operative to engage said lever.

9. A header or like mechanism having a frame, a die bed supported on the frame, a die carried by the die bed, a gate reciprocably mounted on the frame for movement toward and from the die, means for reciprocating the gate, a plurality of punches carried by the gate each having an opening therein, an ejecting pin movably mounted in each of said openings, means actuated by reciprocation of the gate on the frame for advancing each of said pins in timed relation to the reciprocation of the gate, said mechanism comprising levers pivotally mounted on the gate each operatively associated with one of said pins, a cam-actuated mechanism on the gate associated with each of

said levers, cam members on the frame each associated with one of said cam-actuated mechanisms to engage and actuate the latter, said cams being movably mounted on the frame, and means to move each of said cams into and out of position to engage the associated cam-actuated mechanism.

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UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,101,632 August 27, 1963

Herbert L. Hoyt

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 3, line 49, for "be", first occurrence, read -- in --; column 5, line 70, for "76" read -- 76a --; column 6, line 57, for "45" read -- 145 --.

Signed and sealed this 11th day of February 1964.

(SEAL)
Attest:

ERNEST W. SWIDER
Attesting Officer

EDWIN L. REYNOLDS

Acting Commissioner of Patents