

(No Model.)

2 Sheets—Sheet 1.

R. J. GOOD.
MACHINE FOR DRAWING SHEET METAL.

No. 564,990.

Patented Aug. 4, 1896.

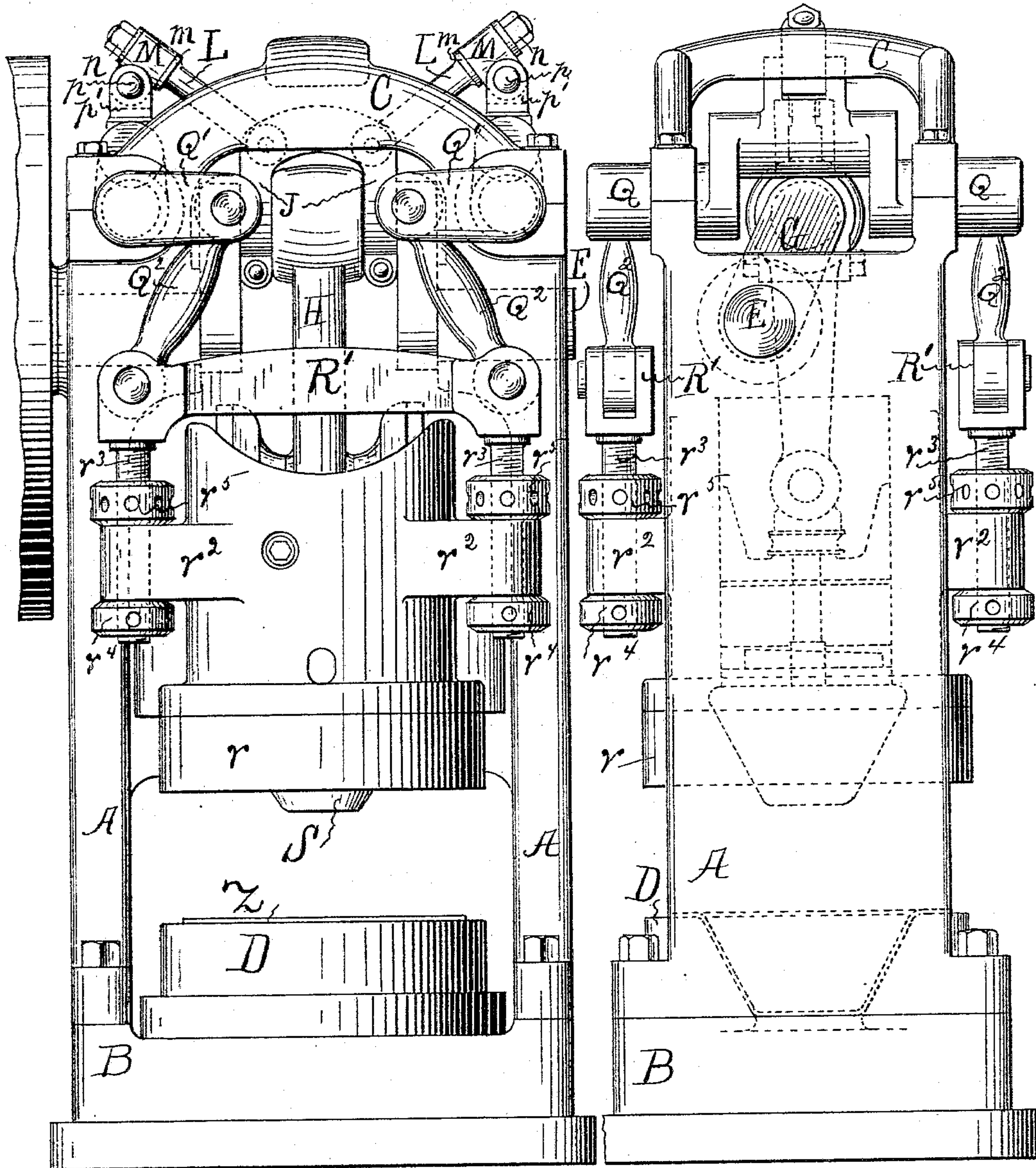


Fig. 1.

Fig. 2.

WITNESSES:

Henry V. Brown.
Bernard J. Necke.

INVENTOR

Robert J. Good

BY

Walter Brown
his ATTORNEY

(No Model.)

2 Sheets—Sheet 2.

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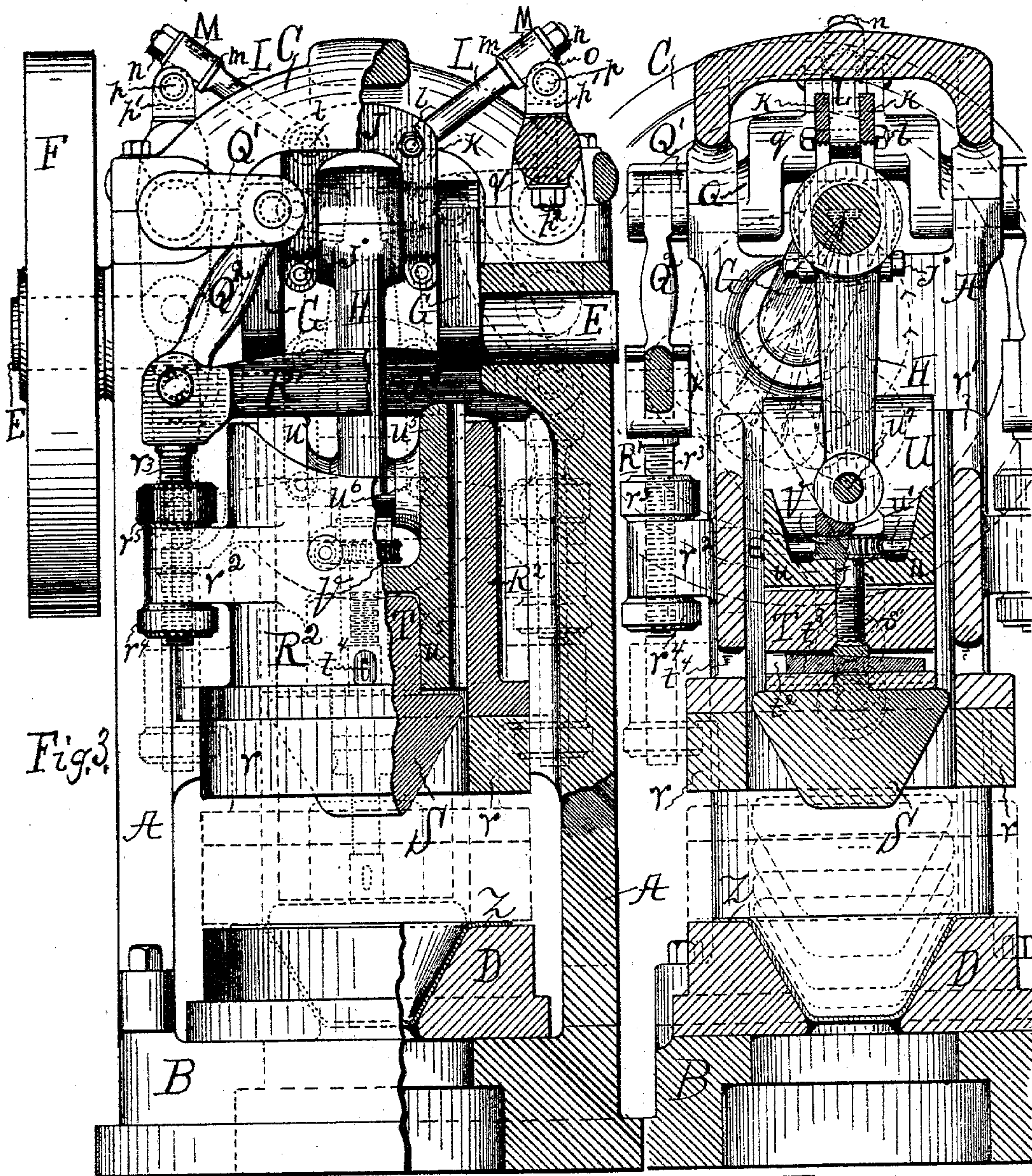


Fig. 3.

Fig. 4.

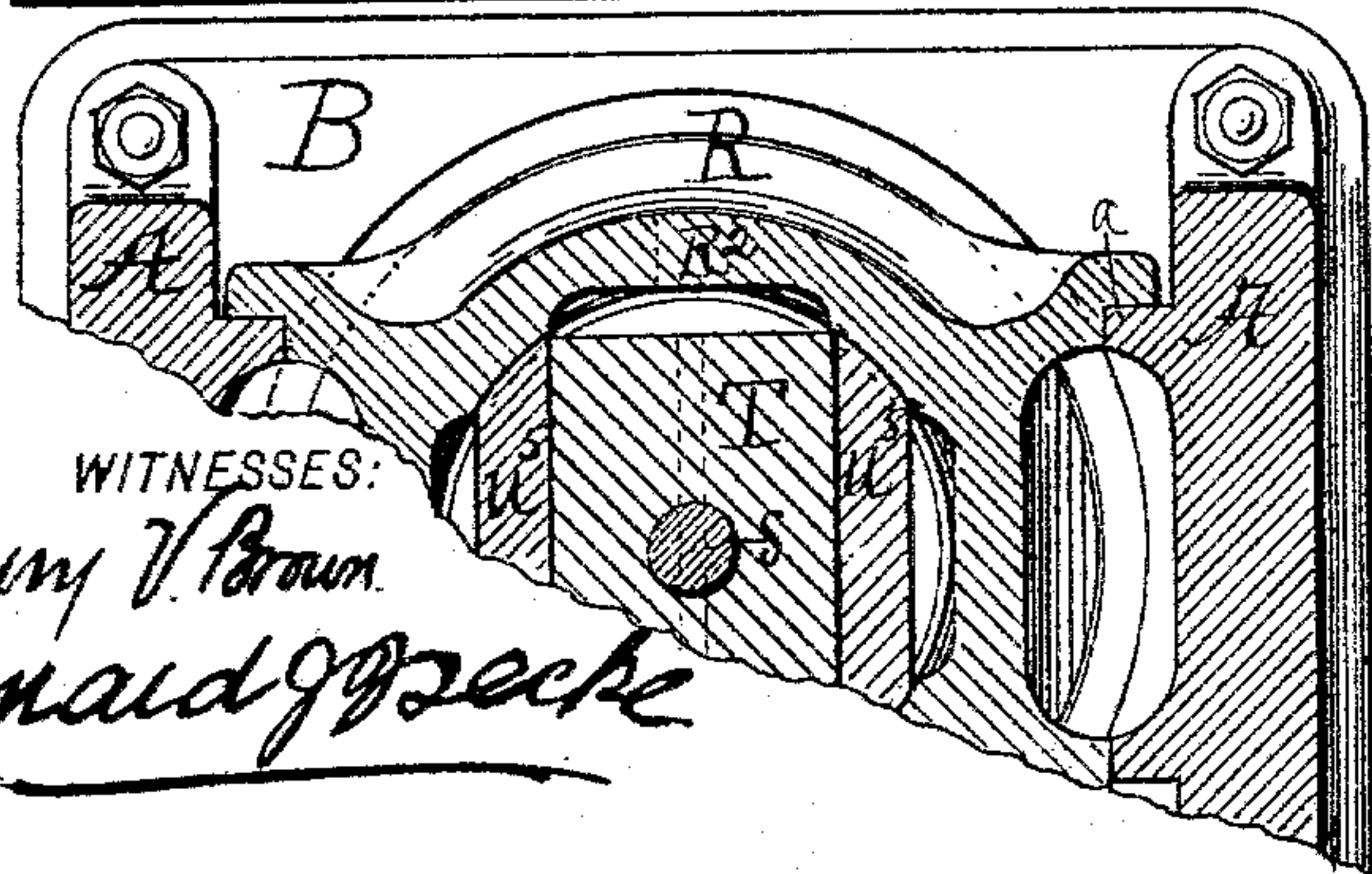


Fig. 5.

WITNESSES:
Henry V. Brown
Kernard G. Secke

INVENTOR
Robert J. Good

BY *Walter Brown*

ATTORNEY

UNITED STATES PATENT OFFICE.

ROBERT J. GOOD, OF BROOKLYN, NEW YORK.

MACHINE FOR DRAWING SHEET METAL.

SPECIFICATION forming part of Letters Patent No. 564,990, dated August 4, 1896.

Application filed December 14, 1895. Serial No. 572,154. (No model.)

To all whom it may concern:

Be it known that I, ROBERT J. GOOD, a citizen of the United States, and a resident of the city of Brooklyn, Kings county, New York, have invented certain new and useful Improvements in Machines for Drawing Sheet Metal, of which the following is a specification.

My invention relates to improvements in machines for drawing sheet metal.

The essence of the invention consists in the combination, with a suitable female die and a reciprocating plunger (or male die) cooperating therewith to draw the metal, of a driver for actuating the plunger, a reciprocating blank-holder for holding the metal sheet in position during drawing, and a driver therefor so cooperating with the driver of the plunger that the blank-holder shall descend upon the blank in order to hold the same in position and shall then "dwell," while the plunger shall continue to move past or through the blank-holder, in order to draw the metal, and that, when the drawing is completed, the blank-holder shall rise far enough to permit the article to be removed from the die.

Referring to the drawings which accompany the specification to aid the description, Figure 1 is a front, and Fig. 2 a side, elevation. Fig. 3 is a partly broken and sectioned front, and Fig. 4 a similar side, view of the machine, Fig. 5 being a broken horizontal section taken about midway of the height of the machine.

A A are standards tied below by the skeletonized casting B, to which they are bolted, and above by the arched and skeletonized cap-piece C.

D is the female die, secured on the casting B.

E is the main shaft, turning in its bearings in the standards A, and provided with a pulley F and crank G. H is the connecting-rod or pitman for actuating the plunger S. Said crank and pitman constitute the plunger-driver, as will be more fully hereinafter explained.

The U-shaped pieces J are yokes, two in number, and working on the crank-pin. The lower part of each yoke is shaped to an arc to fit on said crank-pin, and they are held in position by the bolts j. The upper ends of the yokes are formed into ears k, connected

by the bolts l, which bolts form a pivotal connection between said yokes and the rods L. Said rods L are swiveled in sleeves M, being held therein by shoulders m and nuts n. Lugs o of said sleeves M are pivotally connected by pins p with posts p', which are swiveled by the pins p² on the cranks q of the rock-shafts Q. Said rock-shafts Q, being two in number, are perpendicular to the main shaft E, turn in bearings on the upper part of the standards A, and have arms Q', connected by connecting-rods Q² with the cross-heads R' of the blank-holder R. The arrangement of the yokes J, swiveled rods L, sleeves M, and their pivoted and swiveled connections as described constitute a universal connection between the crank G and rock-shafts Q, whereby the rotation of the main shaft E produces a certain oscillation of the rock-shafts Q, in such a manner that said rock-shafts with the blank-holder R come practically to rest just as the crank G and pitman H have caused the plunger S to begin drawing the metal, while said plunger S continues to move until the drawing is completed. The said rock-shaft Q, arm Q', and connecting-rods Q² constitute the driver of the blank-holder R. Said blank-holder R consists of a hollow cylindrical block r, fixed at the bottom of and carried by the cylinder R², which is cast, forged, or made in any other suitable manner and with a part of the shell cut away at the top, as at r', to permit of the oscillation of the pitman H. Said blank-holder R reciprocates on guides a on the standards A, and is provided with four vertically-perforated lugs r², through which pass with easy fit long screws r³, positioned by the nuts r⁴ r⁵. The upper ends of said screws are secured to the ends of the aforesaid cross-heads R' and afford means for adjusting the blank-holder R.

The plunger mechanism is made up of the plunger proper, S, which is made of any desired shape and constitutes the male die, the block T, and the frame or chair U. A shank s projects from the center of the top of plunger S into the block T, and has an eye, through which is placed a key t³, by way of the slot t² in the block T and hole t⁴ in the shell of the blank-holder. Thus the plunger S is connected with

the block T. A bolt s' , threaded in the block T, passes with easy fit through a hole in the web u of the chair U, and has a worm-gear V on its upper end, engaged by a worm-shaft u' , carried by the chair U. Said worm-shaft u' projects beyond the shell of chair U and is provided with a head adapted to be engaged by a proper tool. Any upward thrust of the bolt s' is taken up by the shoulders u^6 on the sides u^5 of the chair U. The plunger S is adjusted by turning the bolt s' by means of the worm-shaft u' .

It will be seen from the drawings that the chair U is guided in a right line through the blank-holder R, and that the block T fits freely in the space between the aforesaid sides u^5 of said chair U below the web or partition u . The pitman H is pivotally connected with said chair U by the pin u^7 , held in holes in the bosses u^6 on the sides of the chair.

The machine is so organized that the vertical plane through the pin u^7 , which is to say, the plane of reciprocation of both the blank-holder and the plunger, passes through the swiveled pin of the posts p^2 , but that the main shaft E is in advance of this plane, the crank G revolving in the direction of the arrow, Fig. 4. This relative position of the crank G and the plane of reciprocation is important, for, taken in connection with the arrangement of the universal connection between the crank G and rock-shafts Q, it insures that, as the said crank reaches the position indicated by X in Fig. 4, the blank-holder R, having till then moved with the plunger S, and having arrived very nearly hard upon the metal blank Z, shall dwell—that is, come to rest, or practically to rest, the little motion beyond this point, if there is any, being of no importance—while the plunger S is drawing the metal blank through the die D. After the drawing, the plunger S having retreated from the die D, the blank-holder R will be retracted to the position of Fig. 3, so that the article that was formed can be removed from the die.

Now, having described my improvements, I

declare that what I claim as my invention, and desire to secure by Letters Patent, is—

1. In a machine for drawing sheet metal, the combination of a plunger for drawing the metal, a blank-holder adapted to hold the blank during drawing and also to recede therefrom after drawing, a crank for actuating the plunger, a rock-shaft for actuating the blank-holder, arranged substantially at right angles to the plane of the crank for actuating the plunger and a universal connection between said crank and said rock-shaft, whereby the blank-holder dwells at a desired limit and the plunger continues to move to the end of its stroke.

2. In a machine for drawing sheet metal, the combination of a reciprocating plunger, for drawing the metal, a crank for actuating the plunger having its axis of rotation in advance of the line of reciprocation of said plunger, a blank-holder adapted to hold the blank during drawing and release it after drawing, a rock-shaft for actuating the blank-holder, and a universal connection between said crank and said rock-shaft, whereby the blank-holder dwells at a desired limit and the plunger continues to the end of its stroke.

3. The combination in a machine for drawing sheet metal of a reciprocating plunger, a rotatable driver therefor, a reciprocating blank-holder adapted to hold the blank during drawing and to release it thereafter, an oscillating driver therefor, arranged substantially at right angles to the driver of the plunger, and a universal connection between the plunger-driver and the blank-holder driver, whereby the blank-holder dwells at a desired limit and the plunger advances to the end of its stroke.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 6th day of December, 1895.

ROBERT J. GOOD.

Witnesses:

BERNARD J. ISECKE,
HENRY V. BROWN.