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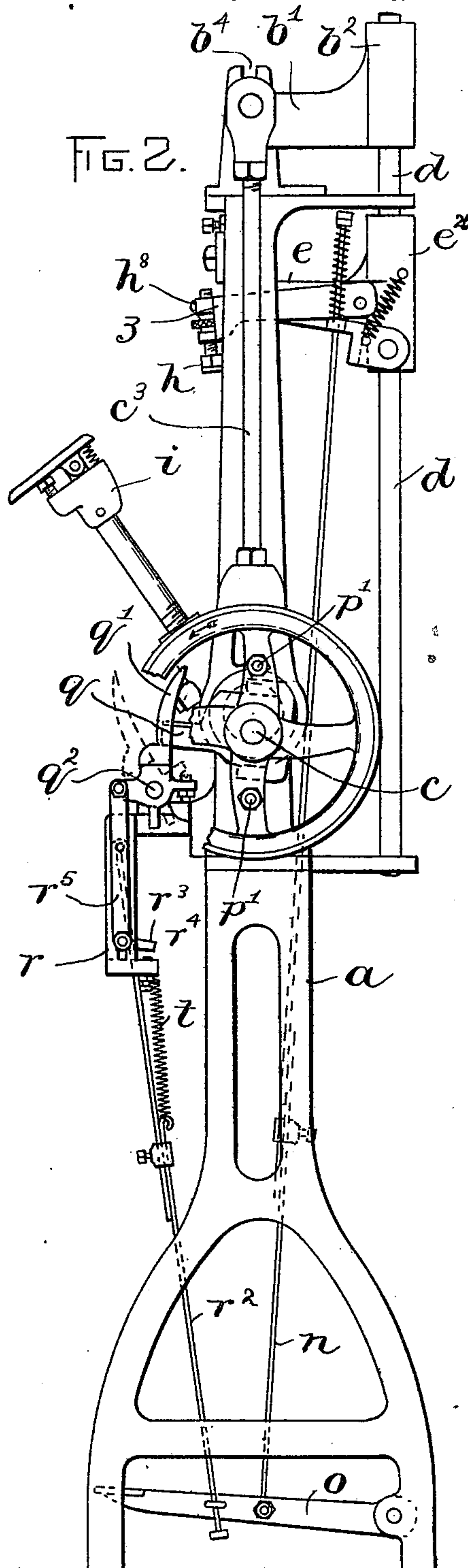
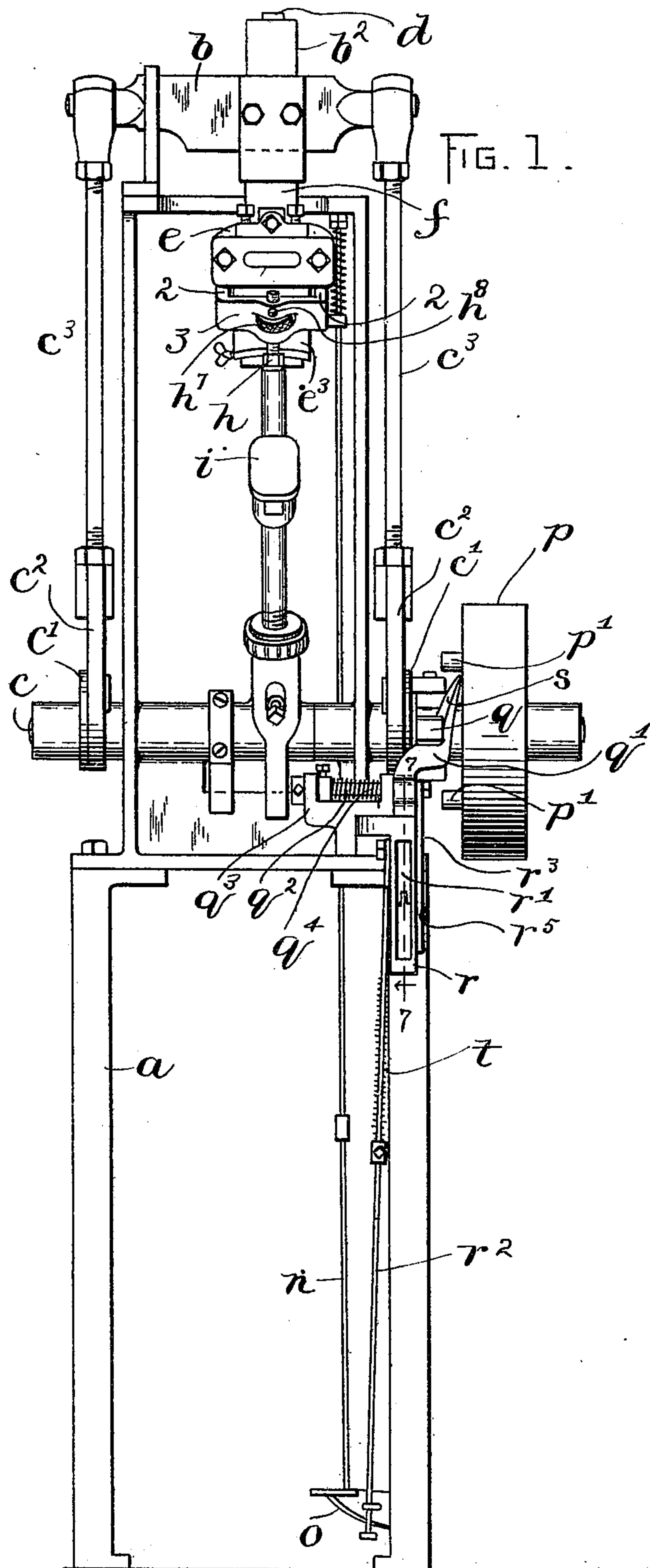
Patented Mar. 27, 1900.

A. G. BREWER.
HEEL BREASTING MACHINE.

(Application filed Apr. 27, 1899.)

(No Model.)

3 Sheets—Sheet 1.



WITNESSES:

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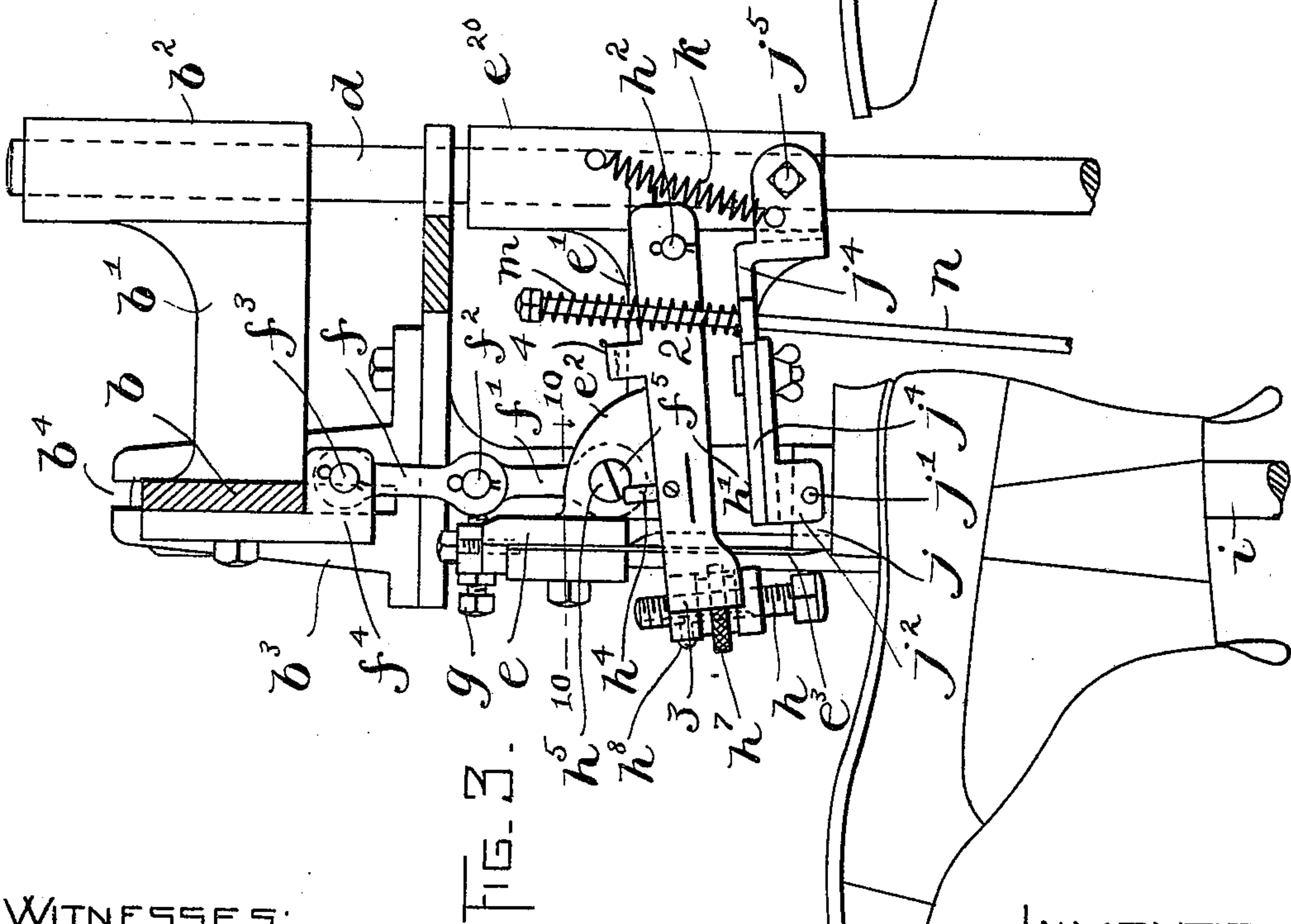
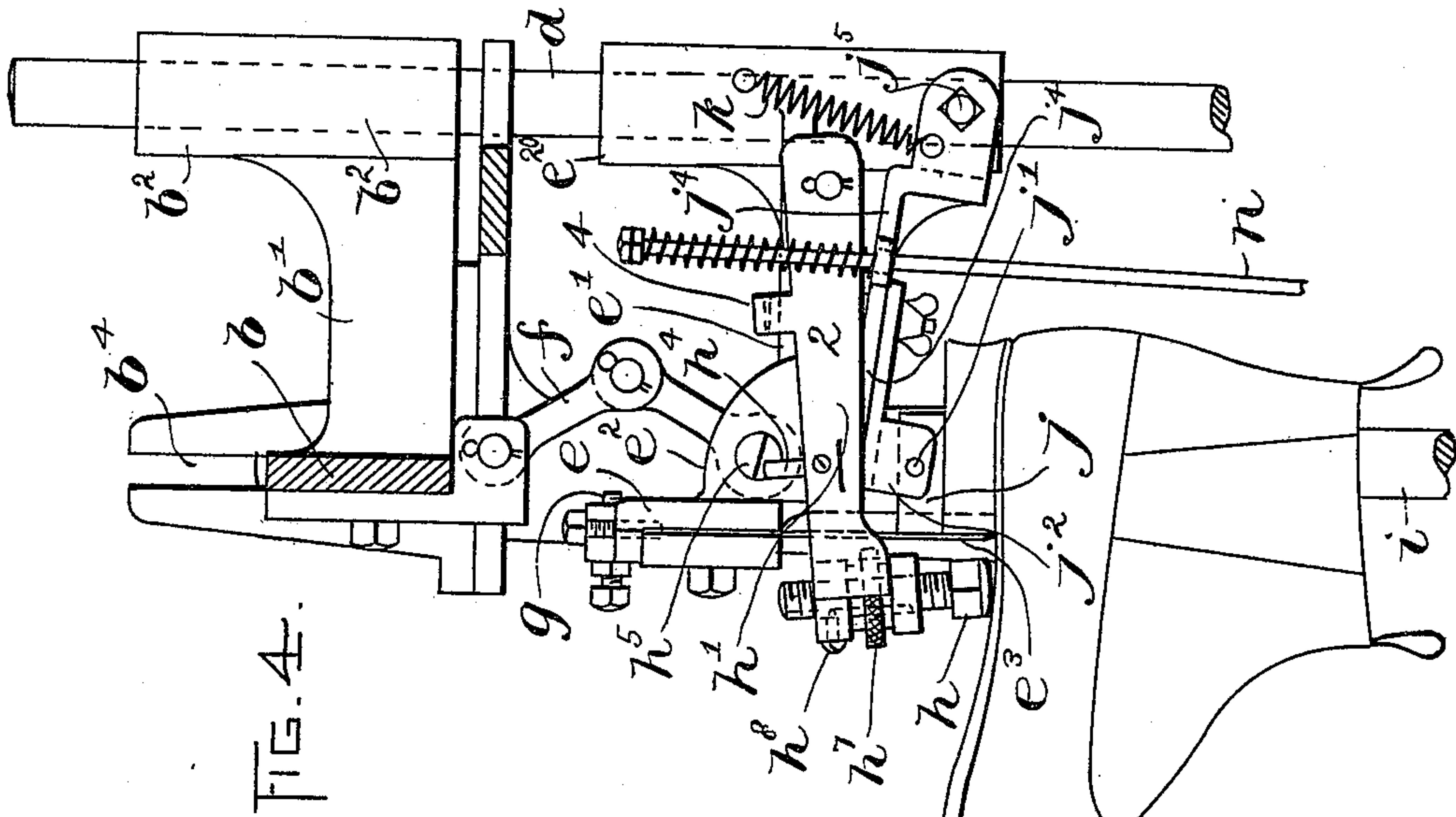
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WITNESSES:
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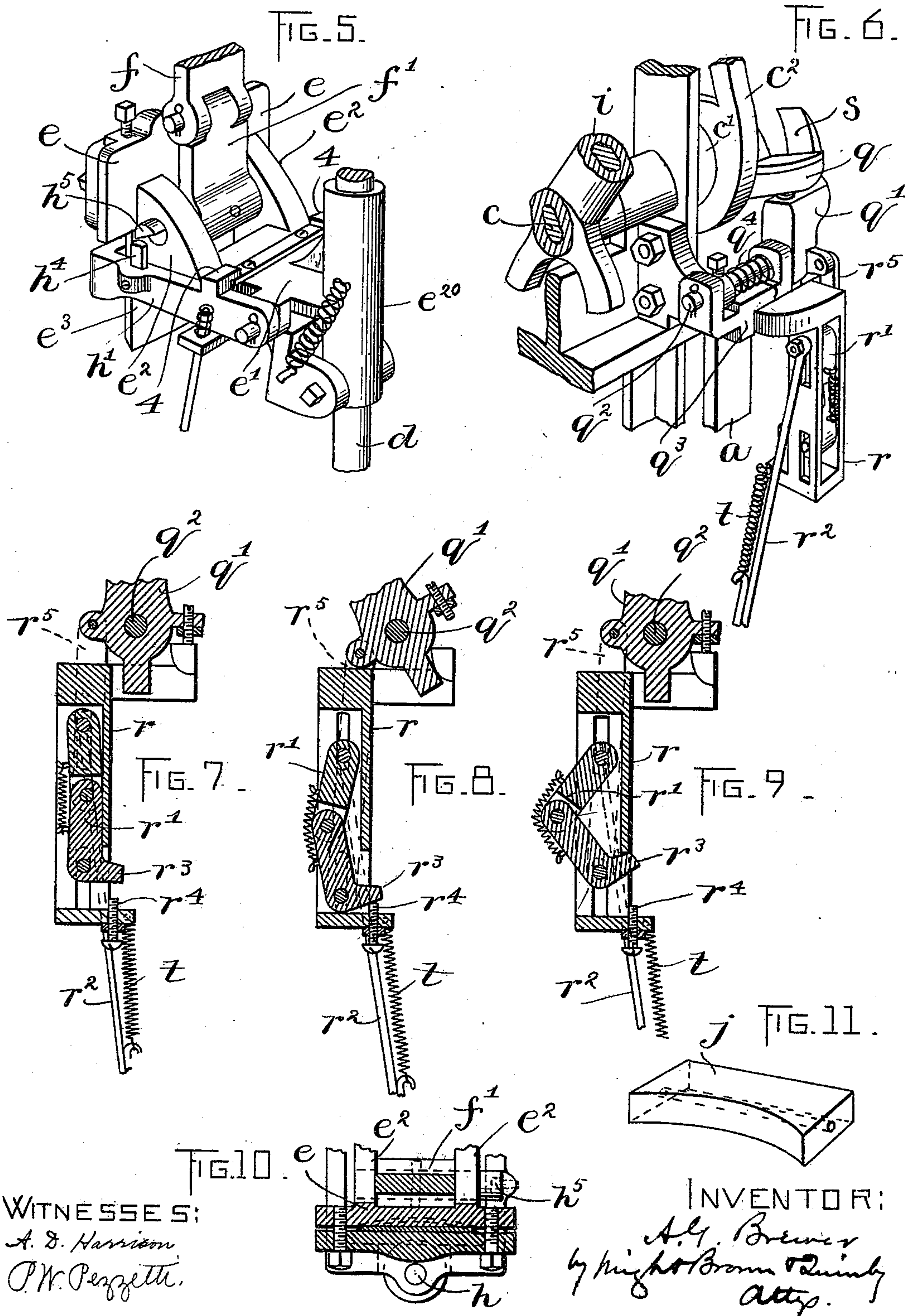
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3 Sheets—Sheet 3.



WITNESSES:
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UNITED STATES PATENT OFFICE.

ALBERT G. BREWER, OF HOPKINTON, MASSACHUSETTS, ASSIGNOR TO THE
UNITED SHOE MACHINERY COMPANY, OF BOSTON, MASSACHUSETTS.

HEEL-BREASTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 645,994, dated March 27, 1900.

Application filed April 27, 1899. Serial No. 714,671. (No model.)

To all whom it may concern:

Be it known that I, ALBERT G. BREWER, of Hopkinton, in the county of Middlesex and State of Massachusetts, have invented certain
5 new and useful Improvements in Heel-Breasting Machines, of which the following is a specification.

This invention relates to power-driven machines for breasting heels; and it has for its
10 chief object to provide automatic means for quickly stopping the action of the breasting-knife when it has cut through the breast of the heel and before it can enter and cut the sole to which the heel is attached.

15 The invention also has for its object to provide simple and convenient means for enabling the operator to accurately locate the heel in proper position relatively to the breasting-knife.

20 The invention consists in the improvements which I will now proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a front elevation of a heel-breasting machine
25 embodying my invention. Fig. 2 represents a side elevation of the same. Fig. 3 represents a side elevation, partly in section, of the upper portion of the machine, showing the connection between the knife-holder and its
30 carrier in operative condition. Fig. 4 represents a view similar to Fig. 3, showing the said connection made inoperative. Fig. 5 represents a perspective view of the knife-holder and certain parts connected therewith.
35 Fig. 6 represents a perspective view, and Figs. 7, 8, 9, and 10 sectional views, of parts of the machine, hereinafter referred to. Fig. 11 represents a perspective view of the block or gage by which the operator adjusts the heel.

40 The same letters and numerals of reference indicate the same parts in all the figures.

In the drawings, *a* represents the supporting-frame of the machine, and *b* represents a carrier which is positively reciprocated on the
45 frame by suitable means, such as a power-driven shaft *c*, eccentrics *c'* *c'* on the shaft, straps *c''* *c''* on said eccentrics, and rods *c'''* *c'''*, connecting the straps *c''* with the ends of the carrier *b*. The carrier is guided in its recip-
50 rocating movement by a fixed vertical guide-rod *d*, engaging a socket *b''*, formed on an arm

b', affixed to the carrier *b*, and a bracket *b'''*, affixed to the frame *a* and having a vertical slot *b''''*, through which the carrier *b* extends.

e represents a knife-holder which is adapt- 55
ed to move with the carrier *b* and is guided by the guide-rod *d*, said knife-holder having an arm *e'*, provided with a socket *e''*, fitted to slide upon said guide-rod. The carrier *b* is connected with the knife-holder *e* by means 60
of a connection having provisions for imparting a positive movement to the knife-holder to cause a positive cutting action of the knife and adapted to be made inoperative to dis- 65
continue the action of the knife, automatic means being provided to make the said con-
nection inoperative when the knife has finished breasting the heel and before it can en-
ter the sole.

In the embodiment of my invention here 70
shown the connection between the carrier and the knife-holder is a toggle composed of the two links or members *f* *f'*, the meeting ends of which are connected at *f''*. The link *f* is connected at *f'''* with an ear or bracket *f''''*, at- 75
tached to the carrier *b*, while the link *f'* is connected by a stud *f''''* with ears *e''* *e'''*, formed on the knife-holder *e*. When the toggle is broken by the deflection of the meeting ends of its members, as shown in Fig. 4, there is 80
no positive connection between the carrier *b* and knife-holder *e*. Means are provided for preventing the breaking movement of the toggle in one direction, said means, as here shown, being a stop-screw *g*, engaged with the 85
knife-holder and arranged to abut against the meeting ends of the toggle links or members *f* *f'* when said meeting ends are slightly at one side of a straight line drawn between the centers of the studs *f'''* and *f''''*. When the 90
toggle is in this position, downward pressure of the carrier *b* will press the meeting ends of the toggle against the stop *g*, and the toggle will therefore constitute a rigid or positive connection between the carrier and the 95
knife-holder.

The means here shown for making the connection inoperative or, in other words, breaking the toggle, as shown in Fig. 4, comprise a gage *h*, movable with the knife-holder and 100
adapted to abut against the shank portion of the sole of a boot or shoe mounted on a jack

or work-support i , hereinafter referred to; an arm h' , pivoted at h^2 to the arm e' of the knife-carrier, the swinging end of said arm having provisions for holding and adjusting the gage h ; projections h^4 on the side portions of said arm, (the arm being practically U-shaped and comprising the two side portions 2 2 and the connecting front portion 3, shown in Fig. 1,) and shoulders or projections h^5 , formed on the stud f^5 , which connects the lower member of the toggle with the knife-holder. The side portions 2 2 of the arm h' are provided with lugs 4 4, Fig. 5, which rest loosely on projections on the arm e' while the gage h is out of contact with the work. When the descent of the carrier and knife-holder brings the gage h into contact with the shank of the boot or shoe, the downward movement of the gage is stopped and the continued downward movement of the knife-holder causes the projections h^4 on the arm h' to coöperate with the projections h^5 on the stud f^5 and gives said stud a partial rotation from the position shown in Fig. 3 to that shown in Fig. 4. The stud f^5 is rigidly affixed to the member f' of the toggle. Consequently the said rotation of the stud swings the toggle members f' and f away from the support g , and thus breaks the toggle, discontinuing the positive connection between the carrier and the knife-holder and the cutting action of the knife. It will be seen, therefore, that by adjusting the gage h so that it will strike the sole of the boot or shoe just before the breasting-knife reaches the sole the action of the knife will be automatically discontinued in time to prevent the entrance of the knife into the sole.

An important feature of my invention is the provision of means for imparting movement from the gage to one end of the toggle, and thus imparting a breaking movement to the toggle, which is much quicker than would be the case if the breaking movement were applied to the joint between the toggle links or members. It will be seen that a slight rotary movement of the stud f^5 , caused by the contact of the arm projection h^4 with the stud projection h^5 , is sufficient to break the toggle, so that the breaking is very quickly accomplished. If, however, the projection h^4 or its equivalent were to act directly on the pin f^2 , connecting the links $f f'$, a much longer movement would be required to break the toggle, and more time would be required for the breaking operation. It is very desirable to stop the cutting action of the knife instantaneously. Hence the importance of the quick breaking of the toggle will be apparent. The jack or work-support i may be of any suitable construction and may be arranged to swing to and from its operative position. The jack is here shown as mounted to oscillate upon the shaft c .

j represents a guide-block which is pivoted at j^1 to ears j^2 , adjustably attached by a screw and thumb nut j^3 to an arm j^4 , which is piv-

oted at j^5 to the sleeve e^2 . The guide j is adapted to bear on the top lift of the heel to be breasted. The arm j^4 , carrying said guide, is yieldingly supported by a spring k and is yieldingly connected by a spring m with a rod n , which is connected with a treadle-lever o at the base of the machine. When said lever is depressed, the spring m , which is interposed between a head or collar on the upper end of the rod n and the arm j^4 , presses the arm j^4 and the guide j yieldingly downward, causing the guide to bear upon the top lift of the heel. The guide enables the operator to properly locate the heel prior to the descent of the breasting-knife. The guide j may be made with one edge straight and the other concave, as shown in Fig. 11, to fit either a straight or a concave heel-breast. The adjustable connection between the guide and the arm j^4 enables the guide to be adjusted toward and from the breast or front end of the heel.

The machine is provided with a suitable clutch, which connects the shaft c with a loose driving-pulley p when the treadle o is fully depressed, this connection being established after the guide j has been brought to bear upon the heel. The loose pulley is automatically disconnected from the clutch and from the shaft when the shaft has made a complete rotation and at the conclusion of the upward movement of the carrier b , so that the carrier and knife will not again descend until the treadle o is again depressed. The means whereby this result is accomplished are shown in Figs. 6, 7, 8, 9, and 10.

It is desirable that the loose pulley p should make but one revolution during the process of breasting the heel, and this is regulated as follows: Pivotaly mounted on one of the eccentrics c' is an arm q , which is normally pressed toward the pulley p by a spring recessed in the said arm and bearing against the eccentric on which it is mounted. The arm q is held out of engagement with the pins p' on the pulley p by a detent q' , which is secured to a rock-shaft q^2 , mounted in a bracket q^3 , and normally moved toward the pulley p by the torsional action of the spring q^4 , one end of which is attached to the rock-shaft by a collar and set-screw and the other end bearing on the bracket q^3 . Extending downwardly from the bracket q^3 is an arm r , which is recessed and forms a guide for a toggle r' , the upper member of which is connected by an adjustable rod r^2 to the treadle o , while the lower member, which is formed with a toe r^3 and arranged to engage an adjustable stop-screw r^4 , is connected by a link r^5 to the detent q' . When the treadle o is depressed by the operator, the detent q' is moved outwardly to the position shown in dotted lines in Fig. 2 and allows the arm q to engage the pins p' on the loose pulley p and move the eccentric around. As the toggle r' in its downward motion reaches the stop-screw r^4 it is tripped and thrown out of line, as shown in Fig. 8,

thus allowing the link r^5 to return the detent q' to its normal position, as shown in Figs. 9 and 2, through the action of the spring q^4 , it then being in the path of the arm q , and as the pulley completes its revolution the said arm q engages the inclined surface s of the detent and is forced toward the eccentric and out of engagement with the pins p' . Referring to Fig. 9, it will be seen that the link and detent are free to return to their normal position while the rod r^2 is still held down by the treadle. When the treadle is released, the spring t returns the rod and toggle to the position shown in Fig. 2, and the machine is so timed that the clutch mechanism is released at the point when the carrier b reaches its highest point.

The gage h is here shown as a screw-threaded rod, the head of which is arranged to strike the shank of the boot or shoe. It is adjusted by means of a nut h^7 , engaged with the screw-thread on the gage, said nut being located between two ears on the arm h' , through which ears the gage is adapted to slide. The gage is prevented from rotating by a key h^8 in one of said ears entering a slot in the threaded portion of the gage. Rotation of the nut h^7 therefore causes endwise movement of the gage.

I do not claim a heel-breasting machine comprising a work-support, a knife-holder movable toward and from said support and having a breasting-knife, a positively-reciprocated carrier for the knife-holder, a connection between the carrier and the knife-holder having provisions for imparting positive movement to the knife-holder and adapted to be made inoperative to discontinue the action of the knife, and automatic means for making said connection inoperative. I furthermore do not claim a heel-breasting machine comprising a work-support, a knife-holder movable toward and from said support and having a breasting-knife, a positively-reciprocated carrier for the knife-holder, a connection between the carrier and knife-holder having provisions for imparting positive movement to the knife-holder and adapted to be made inoperative to discontinue the action of the knife, a yielding gage movable with the knife-holder and arranged to abut against the work, and means intermediate the said gage and connection, whereby contact of the gage with the work is caused to make the connection inoperative.

I claim—

1. In a heel-breasting machine comprising the following instrumentalities, namely, a work-support, a carrier positively reciprocated toward and from the support, a knife-holder located between the carrier and support and having a breasting-knife, a toggle connecting the carrier and knife-holder, means for supporting the toggle against a breaking movement in one direction, whereby the toggle is enabled to impart positive movement to the knife-holder, and a gage mov-

able with the knife-holder; the combination with said instrumentalities, of means for imparting movement from the gage to one end of the toggle and thereby imparting a quick breaking movement to said toggle.

2. In a heel-breasting machine comprising the following instrumentalities, namely, a work-support, a carrier positively reciprocated toward and from the support, a knife-holder located between the carrier and support and having a breasting-knife, a toggle connecting the carrier and knife-holder, means for supporting the toggle against a breaking movement in one direction, a yielding gage movable with the knife-holder and arranged to abut against the work; the combination with said instrumentalities, of means intermediate the gage and one end of the toggle, whereby contact of the gage with the work is caused to impart a quick breaking movement to the toggle.

3. A heel-breasting machine comprising a work-support, a carrier positively reciprocated toward and from the support, a knife-holder located between the carrier and support and having a breasting-knife, a toggle connecting the carrier and knife-holder, means for supporting the toggle against a breaking movement in one direction, an arm pivoted to the knife-holder and provided at its swinging end with a gage, and a stud affixed to one member of the toggle and adapted to be partially rotated to break the toggle by contact with said arm.

4. A heel-breasting machine comprising a work-support, a carrier positively reciprocated toward and from the support, a knife-holder located between the carrier and support and having a breasting-knife, a toggle connecting the carrier and knife-holder, an adjustable stop on the knife-holder adapted to support the toggle against a breaking movement in one direction, and automatic means for imparting a breaking movement in the opposite direction to said toggle.

5. A heel-breasting machine comprising a work-support, a carrier positively reciprocated toward and from the support, a knife-holder located between the carrier and support and having a breasting-knife, a toggle connecting the carrier and knife-holder, means for supporting the toggle against a breaking movement in one direction, an arm pivoted to the knife-holder, a gage adjustably mounted on the swinging end of the arm, means for adjusting the gage relatively to the arm, and a stud affixed to one member of the toggle and adapted to be partially rotated by contact with said arm.

6. A heel-breasting machine comprising a work-support, a knife-holder movable toward and from the support and having a breasting-knife, a guide having a swinging connection with the knife-holder and adapted to bear on the top lift of a heel on the work-support.

7. A heel-breasting machine comprising a work-support, a knife-holder movable toward

and from the support and having a breasting-knife, a guide having a swinging connection with the knife-holder and adapted to bear on the top lift of a heel on the work-support, and
5 means for pressing the guide against the heel.

8. A heel-breasting machine comprising a work-support, a knife-holder movable toward and from the support and having a breasting-knife, a guide composed of a plate or block
10 adapted to bear on the top lift of a heel, an

arm to which said guide is pivoted, said arm being pivoted to the knife-holder, and means for exerting downward pressure on said arm.

In testimony whereof I have affixed my signature in presence of two witnesses.

ALBERT G. BREWER.

Witnesses:

FRED A. WOOD,

WEBSTER W. PAGE.