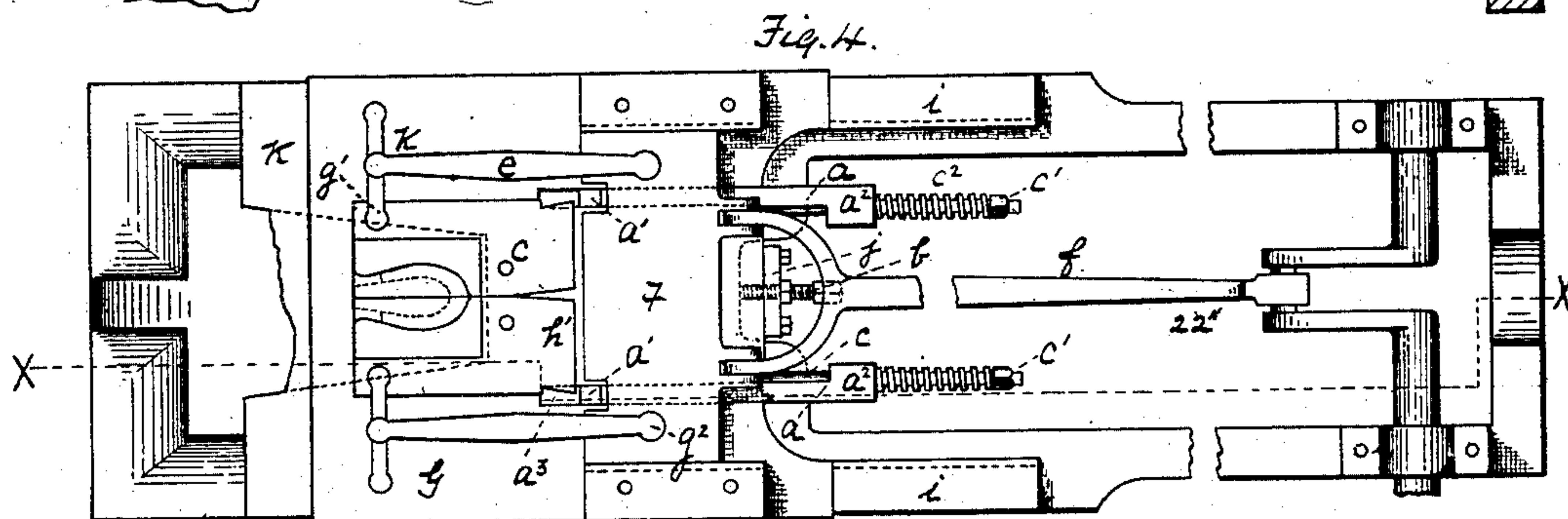
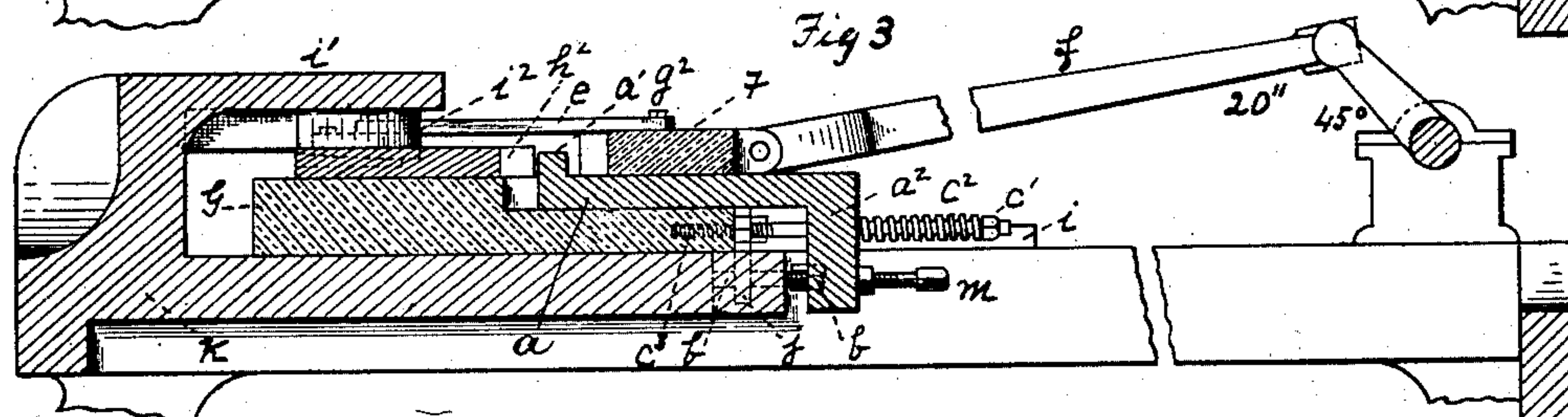
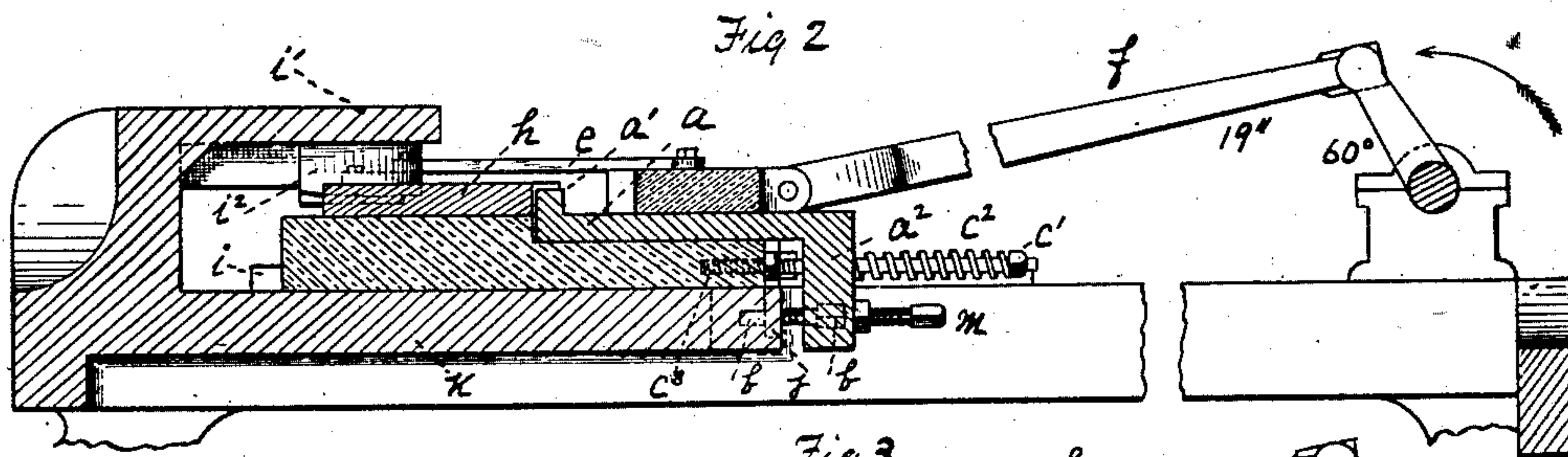
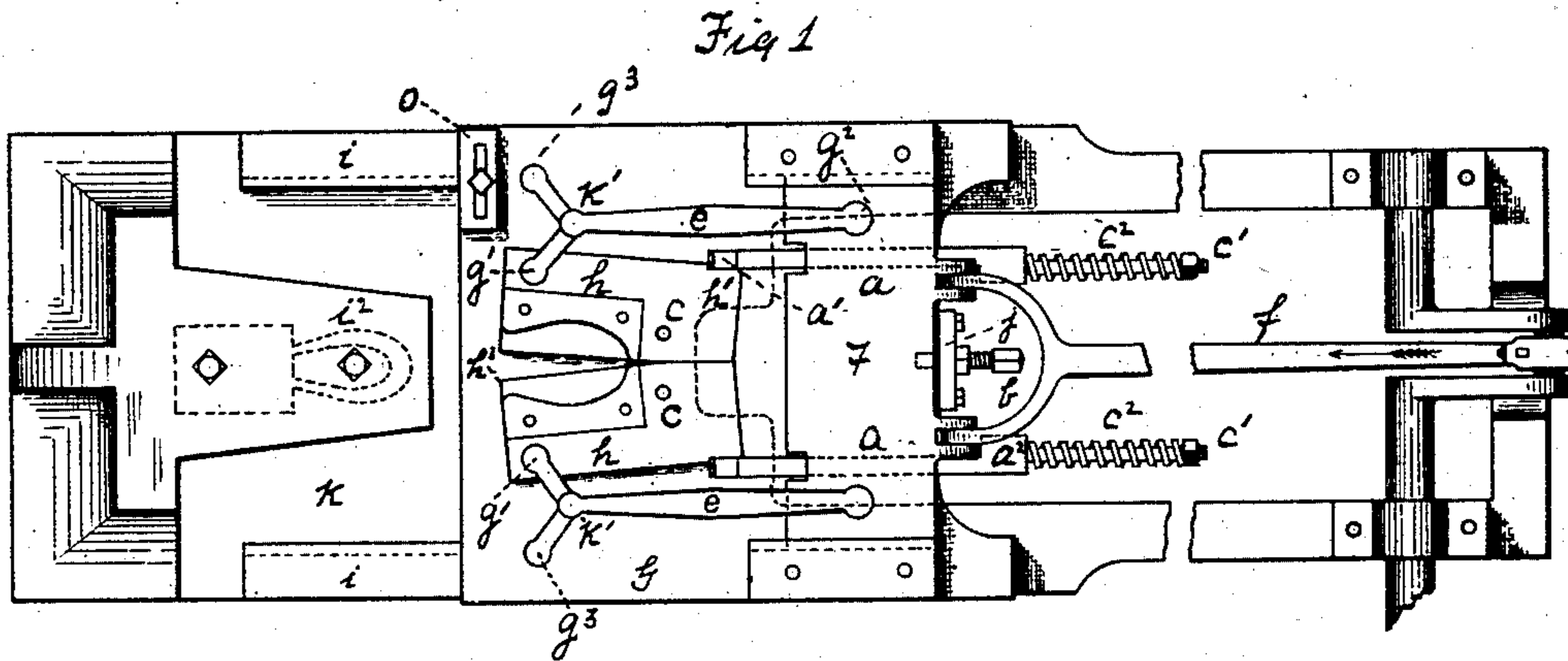


(No Model.)

W. D. YOUNG.
HORSESHOE MACHINE.

No. 315,206.

Patented Apr. 7, 1885.



Witnesses.

J. A. Burns.

W. B. Corwin

Inventor.

William D. Young

By Baker & Kern

his Attorneys

UNITED STATES PATENT OFFICE.

WILLIAM D. YOUNG, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO
SHOENBERGER & CO., OF SAME PLACE.

HORSESHOE-MACHINE.

SPECIFICATION forming part of Letters Patent No. 315,206, dated April 7, 1885.

Application filed August 9, 1884. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM D. YOUNG, of
Pittsburg, in the county of Allegheny and
State of Pennsylvania, have invented a new
and useful Improvement in Horseshoe-Ma-
chines; and I do hereby declare the following
to be a full, clear, and exact description there-
of, reference being had to the accompanying
drawings, in which—

10 Figure 1 is a plan view of my improved ma-
chine, the parts being in the position occupied
when the blanks are fed thereto. Fig. 4 is a
similar view of the same when the parts are
in position at the end of the bending stroke.
15 Figs. 2 and 3 are vertical longitudinal sections
on the line $x x$ of Fig. 4, showing the parts of
the machine in intermediate positions between
those shown in Figs. 1 and 4.

Like letters of reference indicate like parts
20 wherever they occur.

Upon suitable bed-plate, k , provided with
ways or grooves $i i$, is a traveling carrier, G ,
which is adapted to slide backward and for-
ward upon said ways or grooves.

25 Pivoted on the carrier g is a pair of bend-
ing-jaws, h , each of which has an arm or lever,
 h' , extending backward toward the rear part
of the carrier; and situate back of the carrier
 G upon the bed-plate k is a sliding cross-head,
30 F , which moves in suitable guides, and is con-
nected with a crank, f , which actuates it and
gives it a reciprocating motion. The jaws h
are connected separately with the cross-head
 F by arms or rods e , pivoted to the jaws at
35 points g' outside of the pivotal points c of the
jaws, and pivoted to the cross-head at points
 g^2 . The carrier G is slotted longitudinally, as
at a^3 , and projecting upward therethrough to
the sides of the arms h' of the jaws h are guide-
40 pins a' , which are preferably of a peculiar con-
struction, which I will now describe. Guide
rods or bars $a a$ are movably mounted within
the slots or grooves a^3 in the carrier G , length-
wise of the machine, and back of the carrier
45 each bar has an angular downwardly-project-
ing-arm, a^2 , and at its front end is provided
with an upwardly-projecting arm, which I
have already denominated the pin a' . The
bars $a a$ are connected with the carrier G by
50 means of parallel rods $c^3 c^3$, which pass loosely
through holes in the arms a^2 , and are screwed

into the body of the carrier G . (See Fig. 2.)
Suitable springs, c^2 , adjusted on each of the
rods $c^3 c^3$, between the arms a^2 and nuts c' ,
placed on the ends of the rods c^3 , tend by their 55
pressure to force the bars a toward the carrier
 G , and the pins a' against the ends of notches
 h^2 , made at the outer ends of the arms h' . The
arms a^2 extend below the level of the carrier
 G to points opposite the bed-plate k , and each 60
arm is provided with an adjustable stop-bar,
 m , which, as the bar a is carried forward by
the carrier G , will strike against the bed-plate
somewhat before the crank-arm f has com-
pleted its forward stroke. When this happens, 65
the forward motion of the bars a is checked,
and the carrier G moves onward without them
until the crank-arm f begins its backward
stroke, when the springs c^2 , which have in the
meantime become compressed, hold the bars 70
 a stationary until the pins a' engage the ends
of the notches h^2 , and the bars begin to move
back with the carrier.

Mounted on the under side of an overhang-
ing support, i' , in front of the carrier G , is a 75
mandrel, i^2 , of the shape of the inside of the
shoe. It is in the same horizontal plane with
the bending-jaws, and its lower side is slightly
higher than the upper face of the carrier G ,
so that the latter may be able to pass under 80
it without binding. Directly below the man-
drel a hole is made the bed-plate, through
which the bent blanks are discharged after the
carrier has been withdrawn.

Ahead of the jaws h on the carrier G , but 85
to one side of the same, is a laterally-adjusta-
ble stop o , so situate that a straight horseshoe-
blank may be placed on the carrier with one
end against the stop and the middle part di-
rectly opposite the mandrel i^2 . The stop o 90
should be made adjustable, so as to adapt the
machine to use in bending blanks of any de-
sired length.

I have already described the arms e as being
continuous and pivoted to the cross-head F 95
and to the jaws h . This mode of arrangement
is operative and useful; but I prefer to use the
modification which I have illustrated in the
drawings. The arms e are there represented
as being fastened to toggles k' , one arm of each 100
toggle being pivoted to one of the jaws h and
the other arm to the sliding head G at g^3 .

The movement of the parts just described is as follows: Starting with the position shown in Fig. 1, the cross-head F advances and pushes the carrier G forward by means of the arms *e*. During the movement the jaws *h* are held open by the guide-pins *a'*, which abut against the sides of the jaws in the notches *h*² until the movement of the carrier G causes the inner corners, *h*³, of the bending-jaws to encounter the shoe-blank which has been adjusted opposite the mandrel, and forces the ends of the blank inward and around the surface of the mandrel. As this is being done the stop *m* encounters the end of the bed-plate *k*, (see Fig. 2,) and the advance of the pins *a'* stops, while the jaws and carrier continue to move until the jaws are released from the pins, and the blank being now pressed tightly against the mandrel, and into the inner face of the gripping-jaws *h*, the advance of the carrier G will have been completely checked, (see Fig. 3,) and any further forward motion of the cross-head F will act through the toggle-joints *k'* upon the jaws *h*, causing the toggle-joints to straighten and to turn the jaws upon their pivots so that they may close around the mandrel and upon the blank. The crank *f* will then be at the end of its stroke, and the parts will then be in the relative positions shown in Fig. 4. The power of the crank *f* increases toward the end of its stroke, and this power is communicated through the cross-head F, arms *e*, and jaws *h* to the blank, thus wrapping it strongly around the mandrel and thickening up its ends in an effective and desirable manner. As soon as the sliding head F begins to be retracted with the reverse movement of the crank *f*, it acts upon the toggles *k*, opens the jaws *h*, and pulls them back from the mandrel with the carrier G. During the interval between the striking of the stops *m* against the bed-plate and the end of the advance of the carrier G the springs *c*² have been compressed, and as the carrier moves backward these springs hold the guide-bars *a* stationary until their ends *a'* engage with the outer sides of the arms *h'* of the gripping-jaws. The bars *a* then begin to partake of the motion of the carrier G, as before described.

I have said that the forward motion of the carrier G is checked by the jaws coming into contact with the horseshoe-blank, and forcing it against the mandrel *i*. This is the simplest method of stopping the carrier and of causing the lateral squeezing of the jaws; but for certainty and accuracy of action I prefer to use a device which is shown in the several figures of the drawings. A vertical plate or rod, *j*, is secured to the outer end of the carrier G and projects downward therefrom. The object of this plate is to hold a stop-bar, *b*, which extends inward from the plate and at right angles therefrom toward the end of the bed-plate *k*, or toward the end of a slot made therein. The stop-bar *b* preferably passes through the plate *j*, and is secured thereto by a screw-thread, so that its inner extremity may be

adjustable toward or away from the end of the bed-plate. It can thus be set in such manner as to strike the bed-plate at the desired time, and thereby suddenly stop the motion of the carrier G, to which it is attached. (See Fig. 3.) Thus suppose the stroke of the crank-arm *f* and cross-head F to be twenty-two inches, the stops *m* should be so adjusted that they will engage the bed-plate *k* when the sliding head has traveled about nineteen inches, and the stops *b* are preferably arranged so that they may strike the bed-plate very soon afterward, say, at twenty inches of the stroke. The carrier G then stops, and the remaining two inches of advance of the cross-head F is taken up with the lateral gripping action of the jaws upon the shoe-blank and the thickening up of the ends of the same.

When the above proportion of size of the parts is employed, I prefer to make the notches *h*³ a little less than an inch in length, so as to release the jaws *h* just before the stoppage of the carrier G. On the back-stroke of the cross-head F, during the first two inches thereof, the carrier G remains stationary, and the movement of the cross-head merely operates on the toggles to open the jaws *h*. It then acts on the carrier and retracts it, until, at the end of the next inch, the arms *h'*, which have been closed by the opening of the jaws *h*, have been locked within the pins *a'*, and the bars *a* begin to move back with the carrier, as above described. The shape of the mandrel *i*² prevents the horseshoe-blank from being drawn back with the retraction of the gripping-jaws *h*; but as soon as the jaws and the carrier G have been moved away from the mandrel the blank may be stripped therefrom through a hole in the bed-plate, or in any other desirable manner.

It is obvious that by means of the adjustable stops *m* and *j* and the nuts *e'* at the end of the spring *e*², the different parts of my apparatus may be adjusted to any size of horseshoe and to operate at any desired intervals of time.

The advantages of the machine herein described are its simplicity of construction, its effective operation, and the fact that it thickens the heels of the shoe at the same operation and by the same means used for bending the blanks. It thereby effects a considerable saving of time and labor.

I do not desire to limit myself to any particular device for imparting a reciprocating motion to the sliding head F, nor to any particular form for the various parts of the machine; but

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a machine for bending horseshoe-blanks, the combination of a sliding carrier, a mandrel, bending-jaws pivoted to the carrier, a reciprocating head for actuating the carrier, and connecting mechanism for imparting a lateral movement to the jaws from the reciprocating movement of the head, substantially as and for the purposes specified.

2. In a machine for bending horseshoe-blanks, the combination of a pair of pivoted bending-dies traveling first in right lines and then having a lateral motion, so as to bend the blank and thicken up the heel of the same, a mandrel, and mechanism, substantially as described, for imparting the double movement to the jaws, substantially as and for the purposes specified.

3. In a machine for bending horseshoe-blanks, the combination of the pivoted bending-jaws, devices for imparting a reciprocating movement thereto, guides for causing the jaws to move in a right line, and devices for imparting a lateral movement to the jaws after they have passed the guides, substantially as and for the purposes specified.

4. The combination, in a machine for bending horseshoe-blanks, of reciprocating bending-jaws having first a motion in right lines to bend the blank into U form against the mandrel, and then a lateral motion to thicken up the heels of the blank and compress them about the mandrel, with locking-bars *a*, which

hold the jaws open during the rectilinear motion thereof and advance therewith, said locking-bars having suitable stops, which check their motion and release the gripping-jaws at a determined period of their motion, substantially as and for the purposes described.

5. The combination of the bending-jaws *h*, which are pivoted upon a reciprocating carrier, with the locking-bars *a*, and spring *c*², adapted to press said bars toward said carrier, substantially as and for the purposes described.

6. The combination, with the bending-jaws *h h*, of the reciprocating carrier *G*, a suitable stop for checking the advance of said carrier, and devices, substantially as specified, for imparting a lateral movement to the jaws when the carrier comes in contact with the stop, substantially as and for the purposes described.

In testimony whereof I have hereunto set my hand this 7th day of August, A. D. 1884.

WILLIAM D. YOUNG.

Witnesses:

W. B. CORWIN,

W. BAKEWELL.