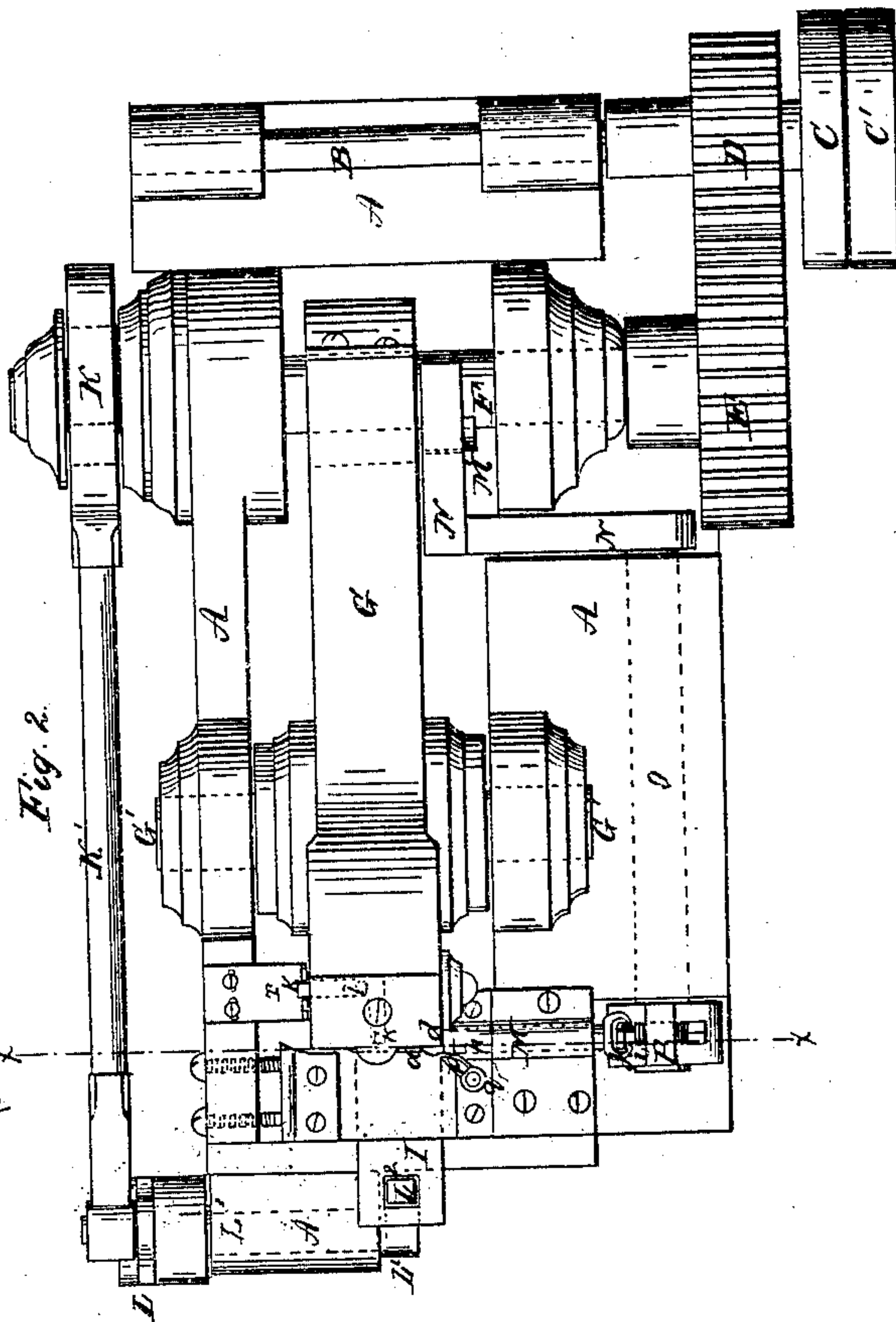
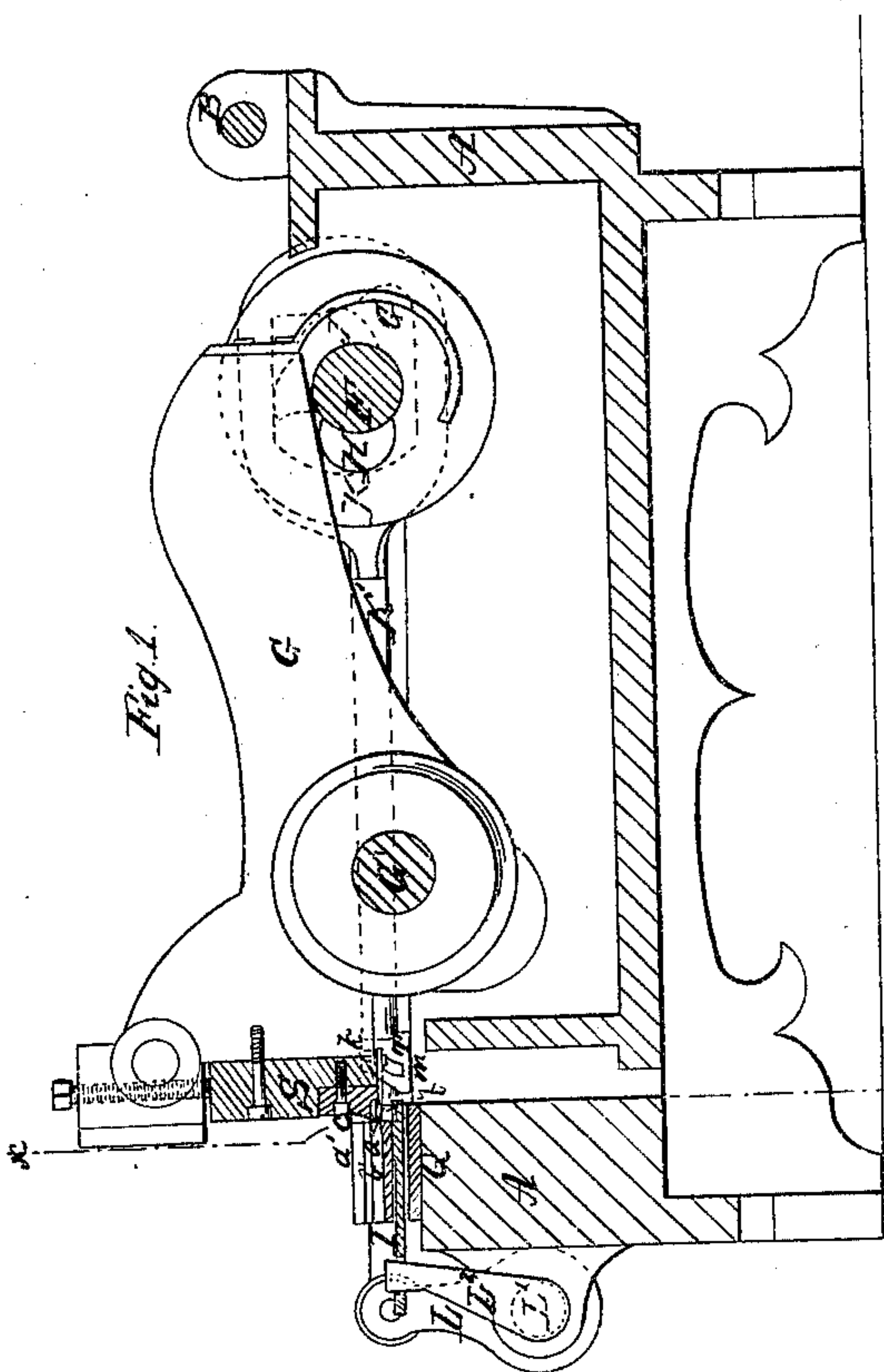
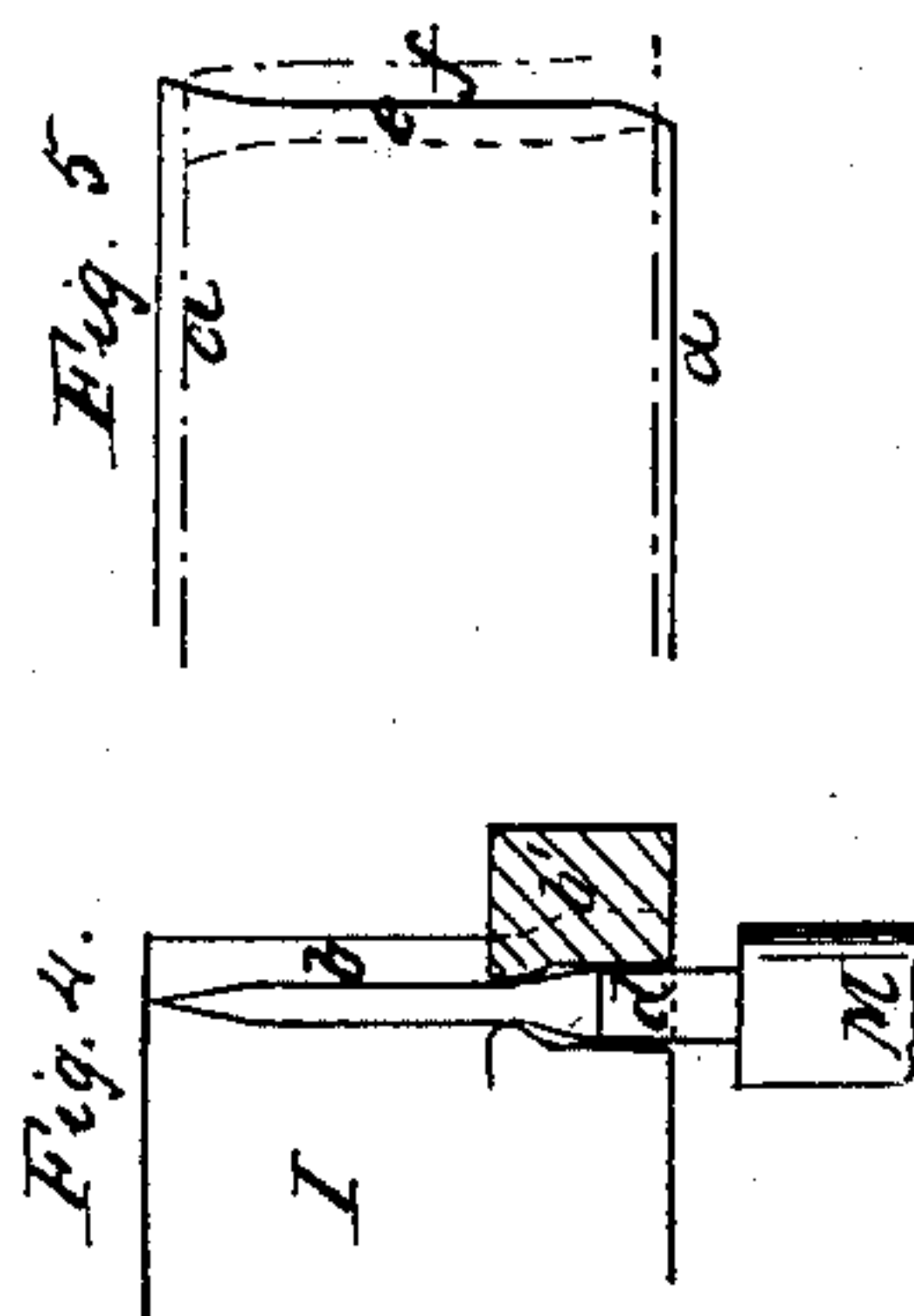
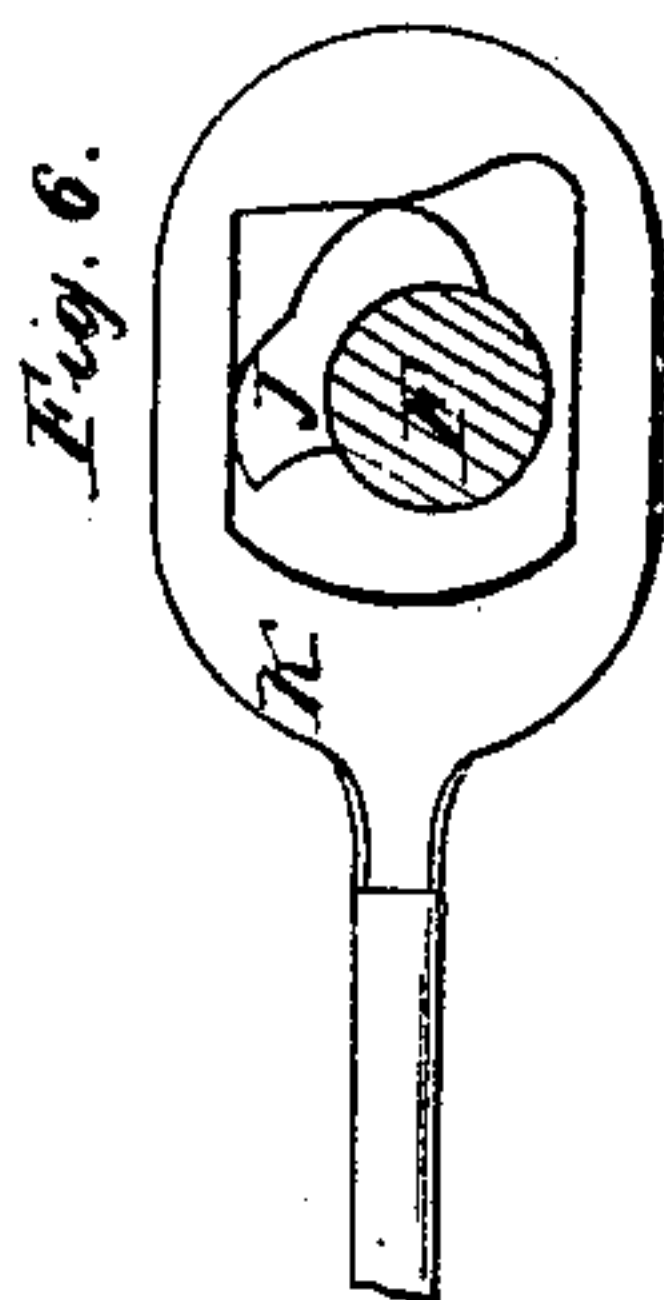
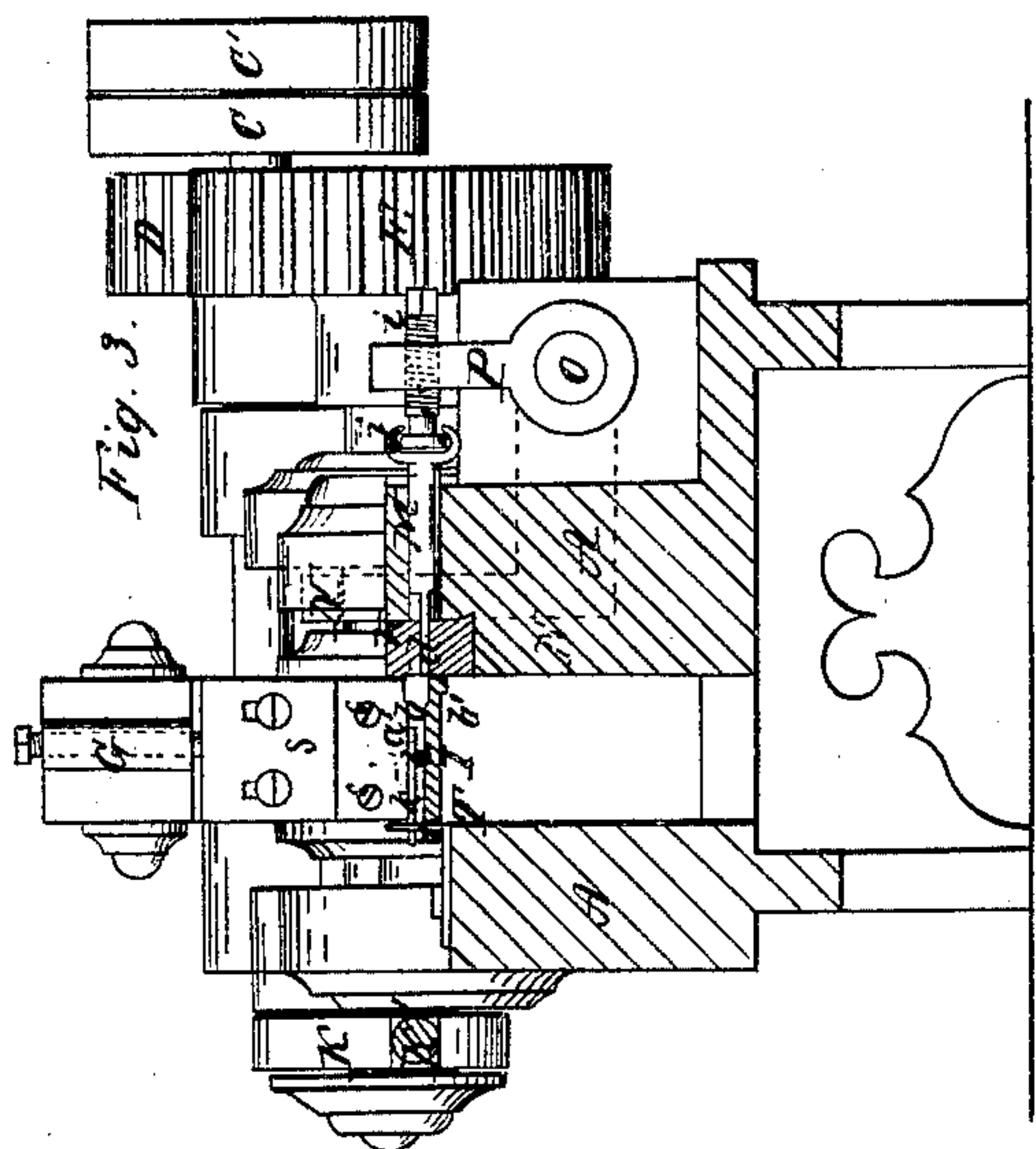


C. Carpenter Jr.,
 Making Horse Shoe Nails &c.,
 No 17, 491,
 Patented June 9, 1857.



UNITED STATES PATENT OFFICE.

CALVIN CARPENTER, JR., OF PROVIDENCE, RHODE ISLAND.

MACHINE FOR MAKING HORSESHOE-NAILS.

Specification of Letters Patent No. 17,491, dated June 9, 1857.

To all whom it may concern:

Be it known that I, CALVIN CARPENTER, Jr., of Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Machinery for Making Horseshoe-Nails or other Headed Nails; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1, is a longitudinal vertical section, taken through the cutters and forming dies, of a machine with my improvements. Fig. 2, is a plan of the same. Fig. 3, is a transverse vertical section of the same, in the line x, x , shown in Figs. 1 and 2. Fig. 4 is a plan of the heading dies. Fig. 5 is a plan view of the lower cutter and the nail plate, showing the form in which the blanks are cut. Fig. 6 is a side view of the cam and yoke for operating the lower die-plate.

Similar letters of reference indicate corresponding parts in the several figures.

The principal object of my invention is to make cut horseshoe nails that shall be equal in character to forged ones. The invention is, however, applicable to the manufacture of other headed cut nails.

It consists in certain improvements in the forming dies.

To enable others to make and use my invention, I will proceed to describe its construction and operation.

A, A, is the framing of the machine.

B is the driving-shaft, carrying fast-and-loose pulleys C, C', to receive a belt from the shaft of a steam-engine or other prime mover from which the machine derives motion, and carrying also a spur gear D, gearing with a larger gear E, on the cam shaft F, of the machine from which the movements are imparted to the several working parts.

a, a' , are the cutters which cut the blanks from a flat plate. The lower cutter, a , is fixed near the front of the machine and the upper one a' , is attached by bolts c, c , to a plate S, that is bolted to the front end of a powerful lever G, that works on a fulcrum or arbor G', and is operated by a cam H, on the rock shaft. These cutters are applied and operated in substantially the same manner, and cut on the same well-known

principle, as the cutters of other cut-nail machines; but such cutters in other machines have straight edges, while these have curved edges of such form as to cut the blanks parallel or nearly so, for the greater portion of their length, but gradually tapering in curved form at the ends; the taper being in opposite directions, at opposite ends; so that by turning the plate over, after every cut, and before another cut takes place, each blank is cut with a point at one end and a swelling at the other end, to form the head of the nail. This is illustrated in Fig. 5, where the outline of the lower cutter is shown in black color and the outline of the end of the nail plate is shown in red color. In this figure, e , represents the edge of the cutter which is of the same form as the edge of the lower cutter. The nail-plate, as represented in this figure, is supposed to have been turned over since the last nail was cut off, and fed forward far enough to cut off another nail; the part f , overhanging the edge e , representing the part that is to be cut off by the next operation of the cutters, to form a nail blank after the part f , is cut off, and the plate is again turned over and fed forward to the cutter, the part adjoining the broad part of the blank f , will be in a position to form the point of the next blank, the line of whose separation from the plate is indicated by a dotted red line; and the part adjoining the narrow or pointed part of the blank f , will be in a position to form the broad part of the next blank. By using a curved cutter of this form, and turning the plate over after every cut, blanks for horseshoe nails, or other nails requiring a head, may be cut without the waste that is consequent upon the cutting them from the plate by a punch without turning the plate over after every cut.

b, b' , are the dies which give the form to two sides of the nail and the whole of the head thereof, and hold it during the heading operation; the upper die b' is made all in one piece with the upper cutter a' , or, more properly speaking, the front edge of this die constitutes the upper cutter. The lower die b , forms part of a plate of metal I, that is fitted to slide back and forth under the lower cutter a , some distance below the cutting edge thereof, deriving the said sliding motion from a cam J, on the shaft

F, acting within a yoke K, on a rod K', that is connected with an arm L, on a rockshaft L', which works in bearings in front of the frame A, and carries another arm L², that works in a slot in the said plate I. The internal sections of these dies, transversely to the nail, are of the form of two rabbets, so that when they come together they form a box to receive and inclose the nail blank; but their section taken longitudinally to the nail is of such form that, by compressing the blank, they give it the required taper form toward the point. The internal form of the dies possesses no novelty. The cam J, which gives the lower die-plate I its sliding motion, is of such form (as shown in Fig. 6, which gives a separate view of the said cam and its yoke) as to give the said plate two movements, back and forth, or, in other words, that it makes a portion of its movement in either direction, then stops, and moves on again, and as to cause the said plate to rest awhile after completing its forward or backward movement. The first part of its backward or inward movement brings it far enough forward, viz., to the position shown in Fig. 1, for the blank to drop into the die, as it falls from the cutters after being cut off, and the rest between the first and second parts of its movement takes place at the time the cut takes place, in order that it may receive the blank in the proper place. After the lower die receives the blank, the second part of the backward or inward movement of its plate I takes place, and brings the blank to a proper position under the interior of the upper die, which stands a short distance behind the edge of the upper cutter; and while this second part of the movement takes place, the lever G, carrying the upper die, continues to descend till just as the movement of the lower die terminates, or immediately after it has terminated, the upper die comes down upon the blank, and by its pressure gives the desired form to the upper and lower sides of the blank, and grasps it tightly, so that it may be submitted to the operation of the "header."

The above described sliding movement of the lower die-plate I, below the lower cutter, also serves to effect the discharge of the finished nails from the machine, after they have been liberated by the rising of the upper die with the ascent of the lever G; for as the said plate I commences to move forward or outward, which it does as the upper die ascends, the nail is pushed off it by coming in contact with the lower cutter, *a*, and caused to fall on the plate Q, in which the plate I slides; and when the plate I returns, it pushes the blank off the plate, Q, and lets it fall on the floor or into a receptacle placed under the machine.

d, is the "header," attached to a piston

M, which slides transversely to the direction of the feed of the nail-plate, being arranged to stand directly opposite to the dies when the latter are closed, and being of a form to fit snugly within that portion of the dies in which the head is to be formed, and consequently corresponding in size and form with the intended size and form of the head of the nail.

h, is a stationary guide, to which the "header" fits. The "header" receives motion at the proper time from a cam M', on the shaft F, acting on the bent arm N, attached to the rear end of a rockshaft O, that is arranged in bearings at right angles to the cam-shaft; the said shaft having, at its front end, an arm P, that is connected with the "header" by a screw, *i*, screwed into the said arm, and a fork, *j*, on the "header"-piston M; the said screw serving to adjust the "header" farther into or out from the dies, according to the length of the nail or thickness of the head. The "header" is attached to its piston M, in such a manner as to be capable of being changed, so that round or square "headers" may be used, to make round or square-headed nails. A change in the form of the "header" will require a corresponding change in the form of the dies.

l, is a gage for regulating the width of the nails, consisting of a very small flat lever, of a thickness equal to that of the nail-plate and of angular form, (shown in Figs. 1, 2, and 3, but best in Fig. 2,) pivoted by a pin *l*, to the bottom of the front end of the lever G, and working horizontally on the said pivot *l*, close under the upper die *b'*. One arm of this lever points toward the cutters, and the other arm stands out sidewise from under the lever G, and is received in a slot *m*, in a small stationary metal stand T, secured to the framing of the machine. The upper part of the slot *m*,—in which the gage stands when the lever G is raised to its highest position and the cutters are open,—is upright; and the stand is so adjusted that, when the said lever is in the above-named position,—at which time the gage is at the same level as the nail-plate entering the machine,—the gage is held by the said slot with its front extremity in a position to arrest the nail-plate, (as it is fed in by the person attending the machine,) with its end so far over the edge of the lower cutter that the nail will be cut to the required width. By moving the stand T, farther forward or backward, the point of the gage is moved farther backward or forward, and hence the nail-plate is allowed to be fed farther or not so far over the edge of the cutter *a*, by which means, the width of the nail is increased or diminished. Lower down than where the gage stands in the slot *m*, at the time the lever G is in its highest position,

the said slot has a sudden curve or inclination, as shown in Fig. 1; and, as the lever G descends to cut off the blank, and bring the die *b'*, into operation, the gage, in passing
 5 down the said curve or inclination, has its front extremity moved back far enough to prevent its interfering with the closing of the dies, as it would do, were it allowed to remain stationary in its operative position.
 10 As the lever G rises again, after the nail is completed, the front extremity or point of the gage is again thrown forward by its other extremity moving up the curve or inclination of the slot, *m*.
 15 *p*, is a gage, for keeping the nail-plate in a proper lateral position, so that the sides of the heads and points cut at one end of the cutters will correspond with the sides cut at the other end; and the nail blanks will
 20 thereby be cut with both sides alike. This gage consists simply of a metal finger, secured to the top of the "header"-guide *h*, or to any convenient stationary part of the machine, by a screw *q*, and adjustable on
 25 the said screw *q*, to move its point toward or from the center of the machine. The nail plate, in being fed into the machine, has one edge held against the point of this gage. By moving the point of the gage toward or
 30 from the center of the machine, the plate will be caused to be thrown more or less toward one or other end of the cutters, as may be necessary. This gage will require to have its position changed, when a wider
 35 or narrower plate is used to make longer or shorter nails.

In this machine, the nails may be made from hot or cold iron.

I do not claim the cutting of the nail-plate in such a manner as to make the heads
 40 and points of the blanks from opposite edges of the plate alternately, by turning over the plate, as that is done in cutting brads and other cut nails, for which purposes straight cutters are used. But
 45

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

1. The attachment of the lower die *b*, to—
 or the construction thereof as a part of—
 a plate I, which has such a sliding move-
 50 ment, horizontally or otherwise, below the lower cutter, at right angles to the movements of the cutters and closing movement of the dies, as is herein described, that the die receives the blank from the cutters while
 55 it is in a stationary condition, and then conveys it under the top die, and, in returning, has the finished nail pushed off it by the lower cutter, substantially as herein specified.
 60

2. The gage *h*, applied to the lever G, or its equivalent, which carries the upper die, and operating as described, in combination with a stationary slotted standard T, by which it is moved out of the way as the dies
 65 close, and which also serves to adjust it to give a greater or less width to the nail blanks.

CALVIN CARPENTER, JR.

Witnesses:

J. F. BUCKLEY,
 L. F. COHEN.