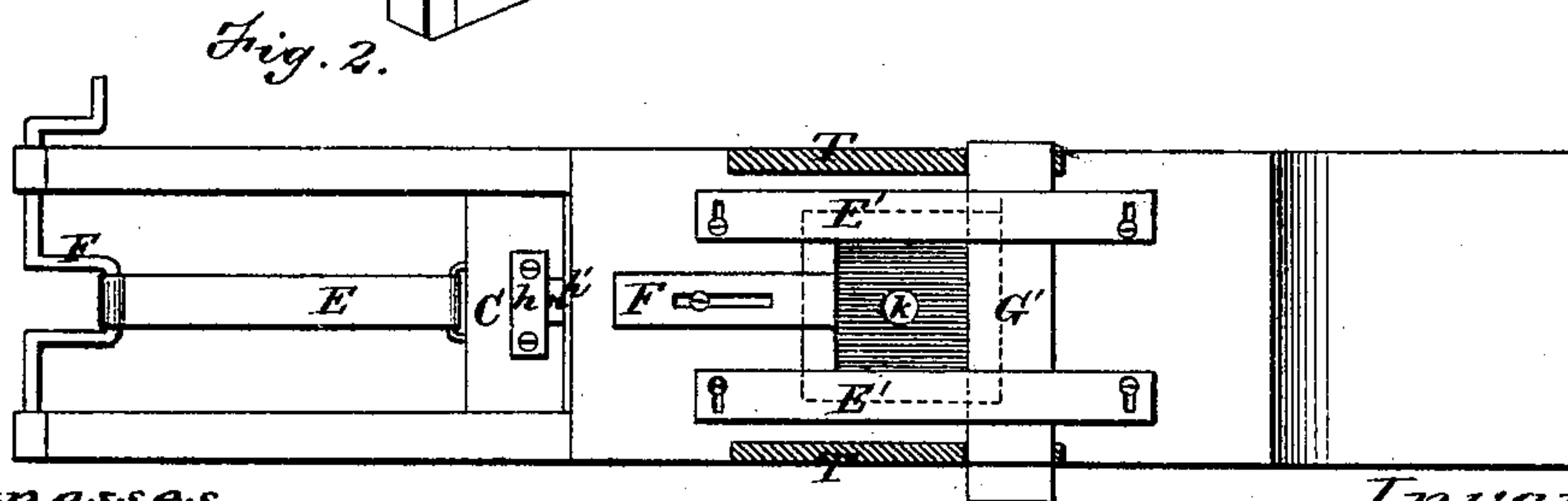
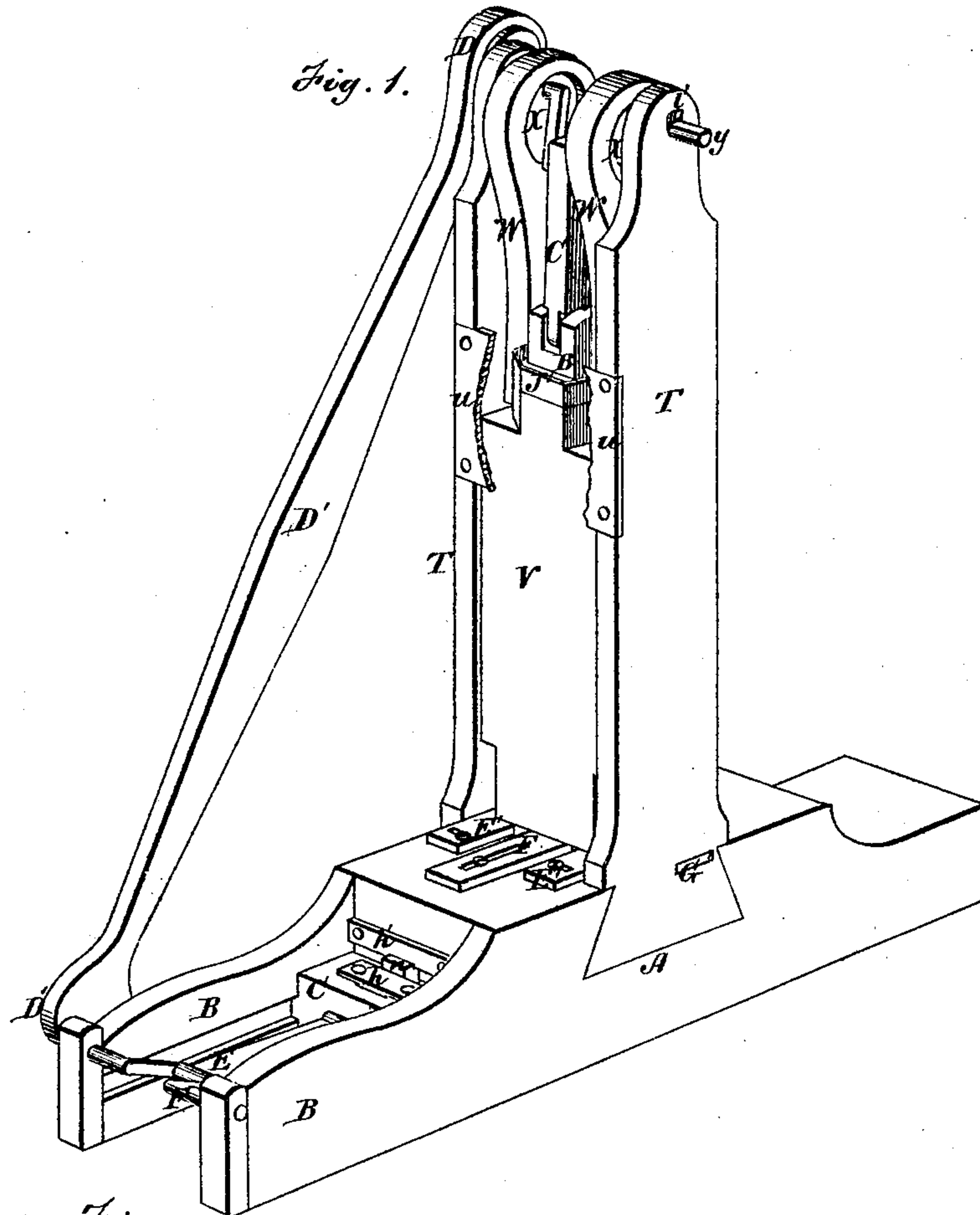


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Improvement in Machines for Making Nuts.

No. 131,105.

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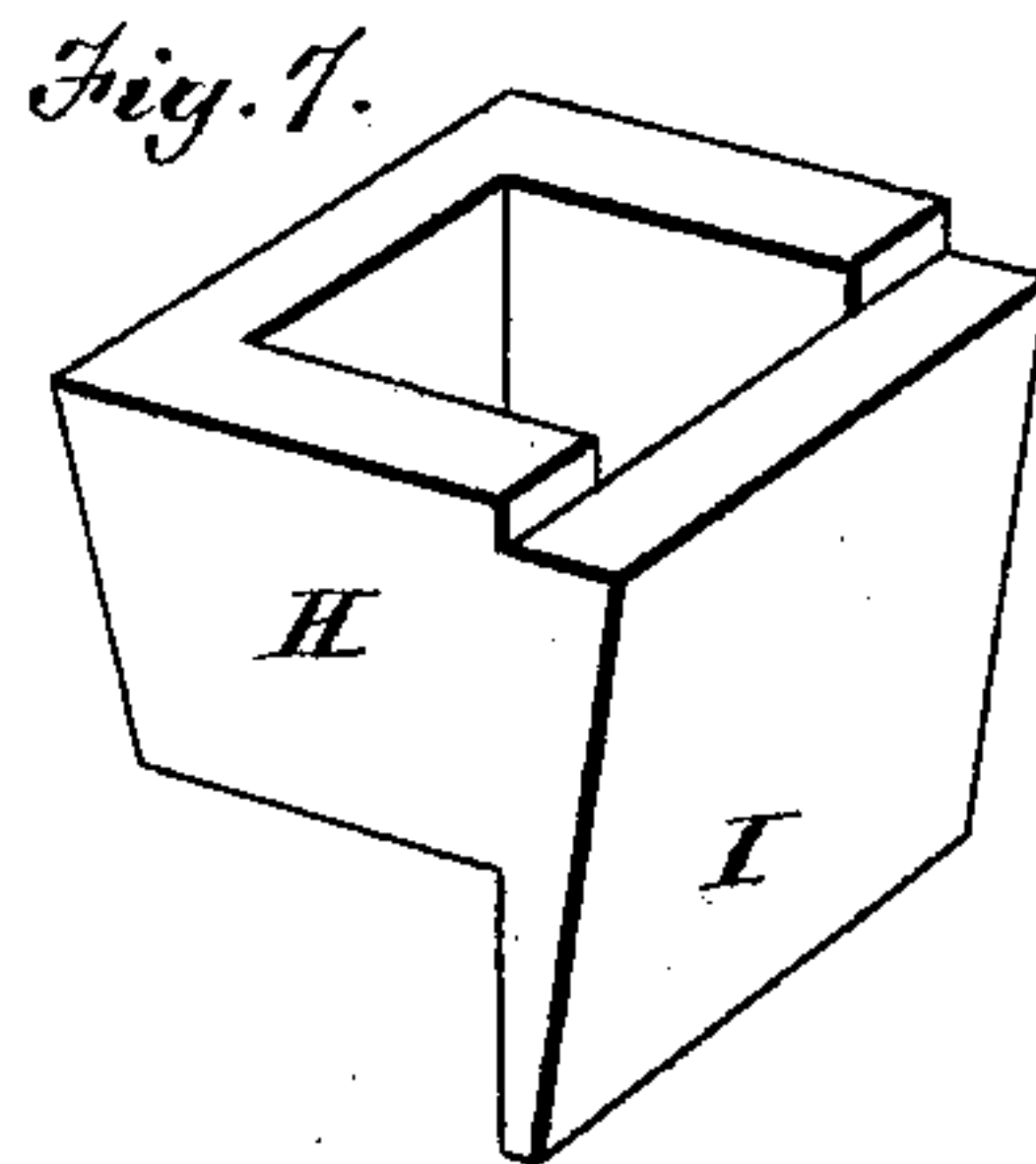
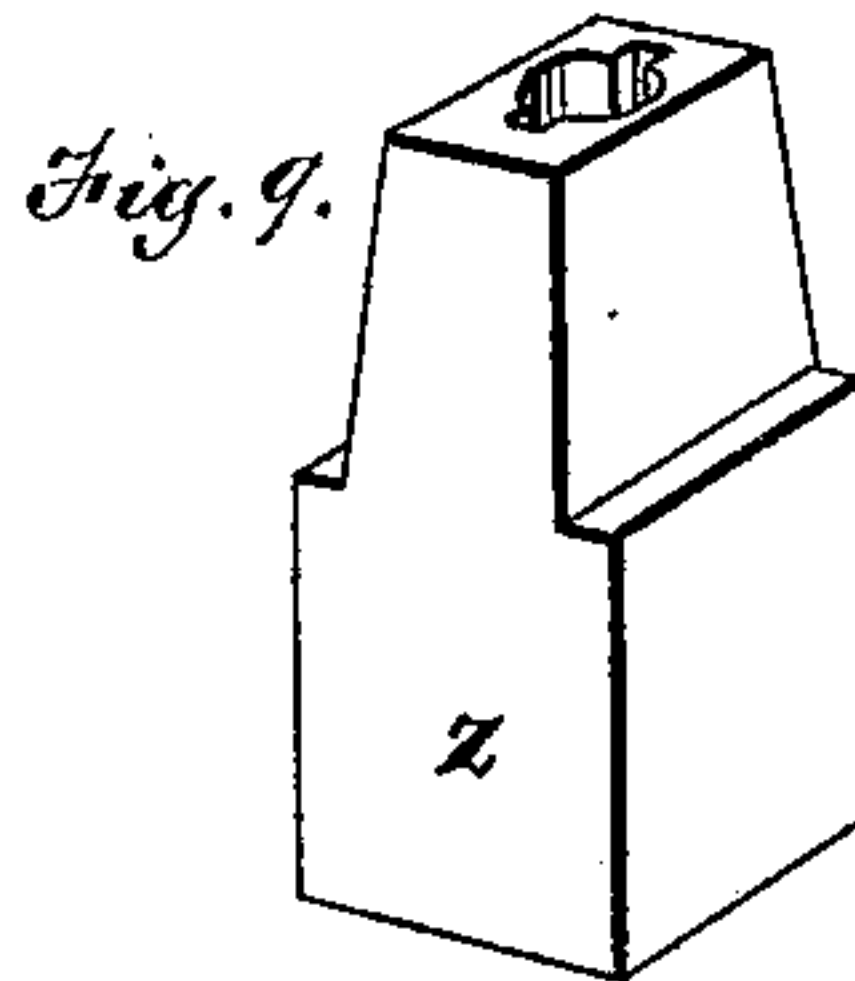
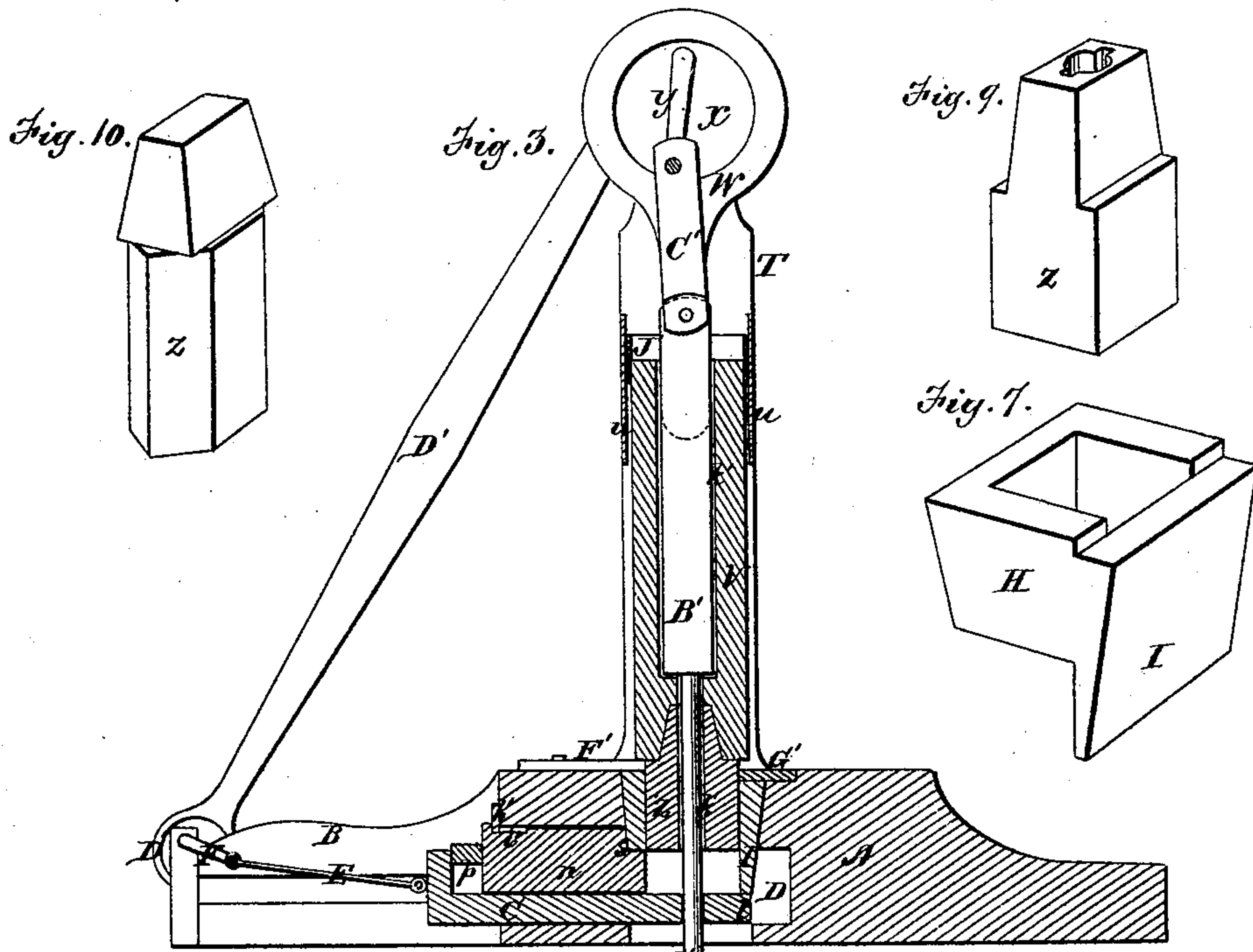


Fig. 8.

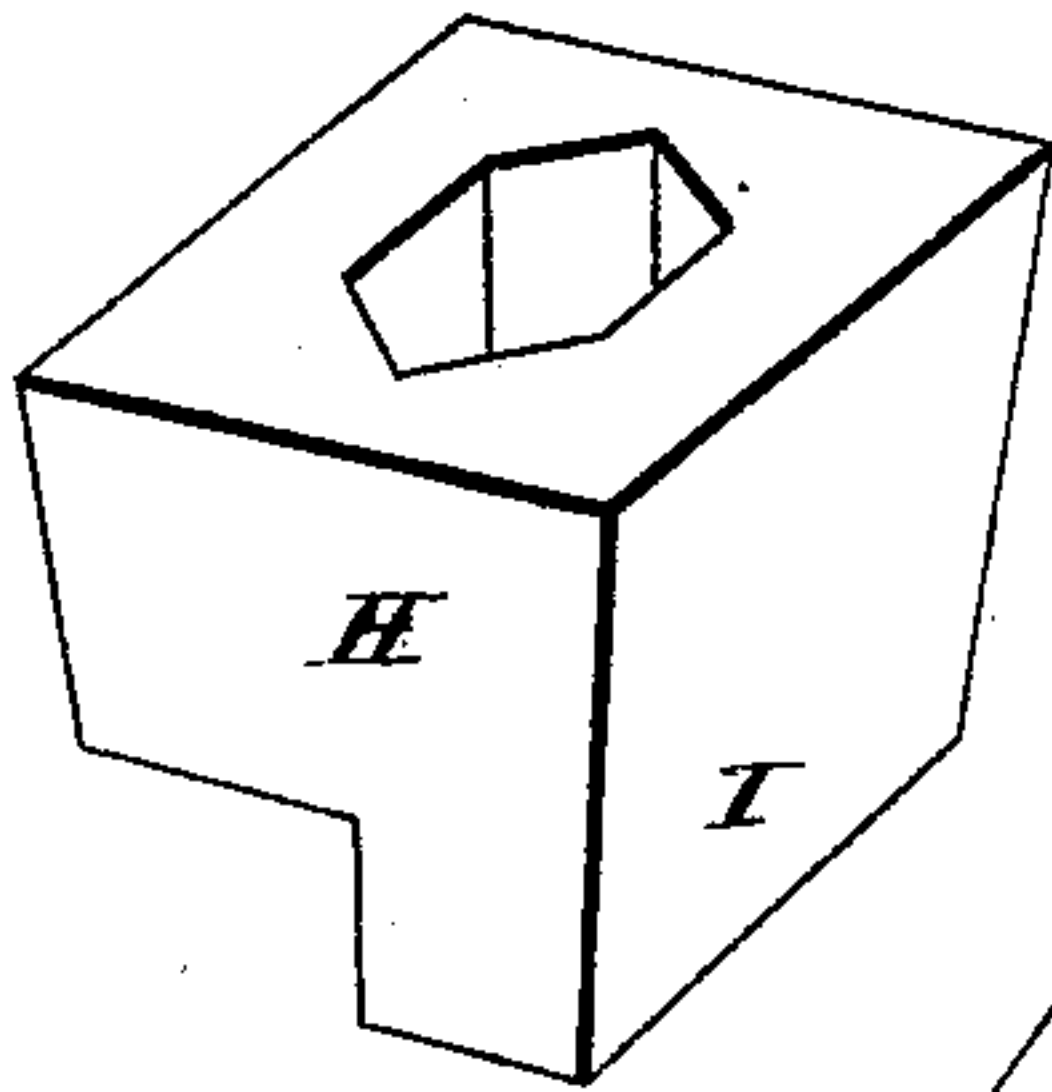


Fig. 4.

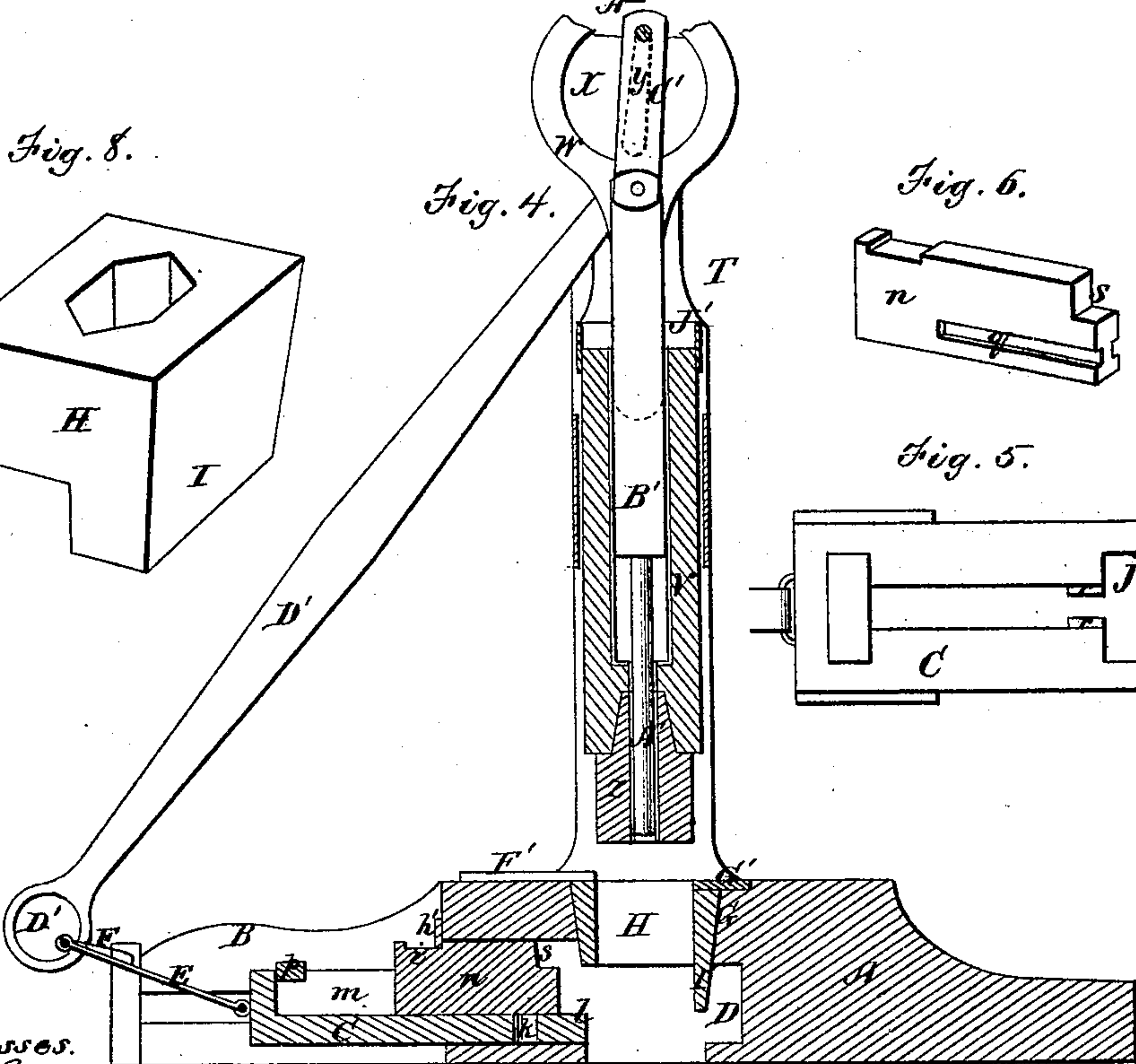


Fig. 6.

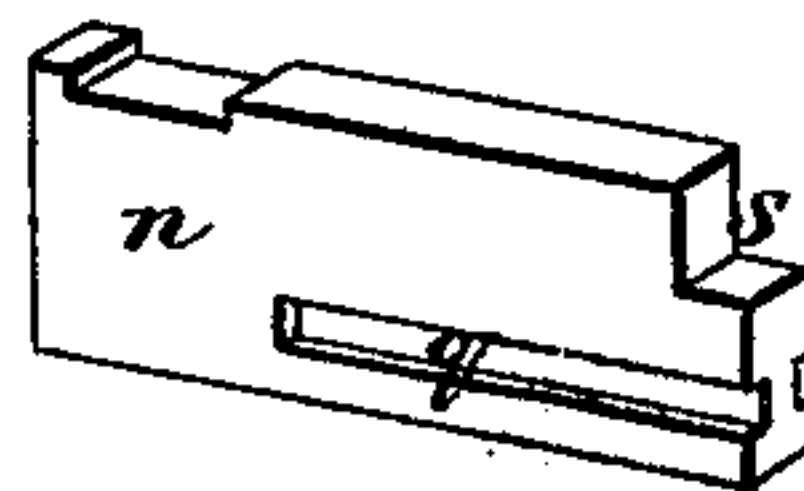
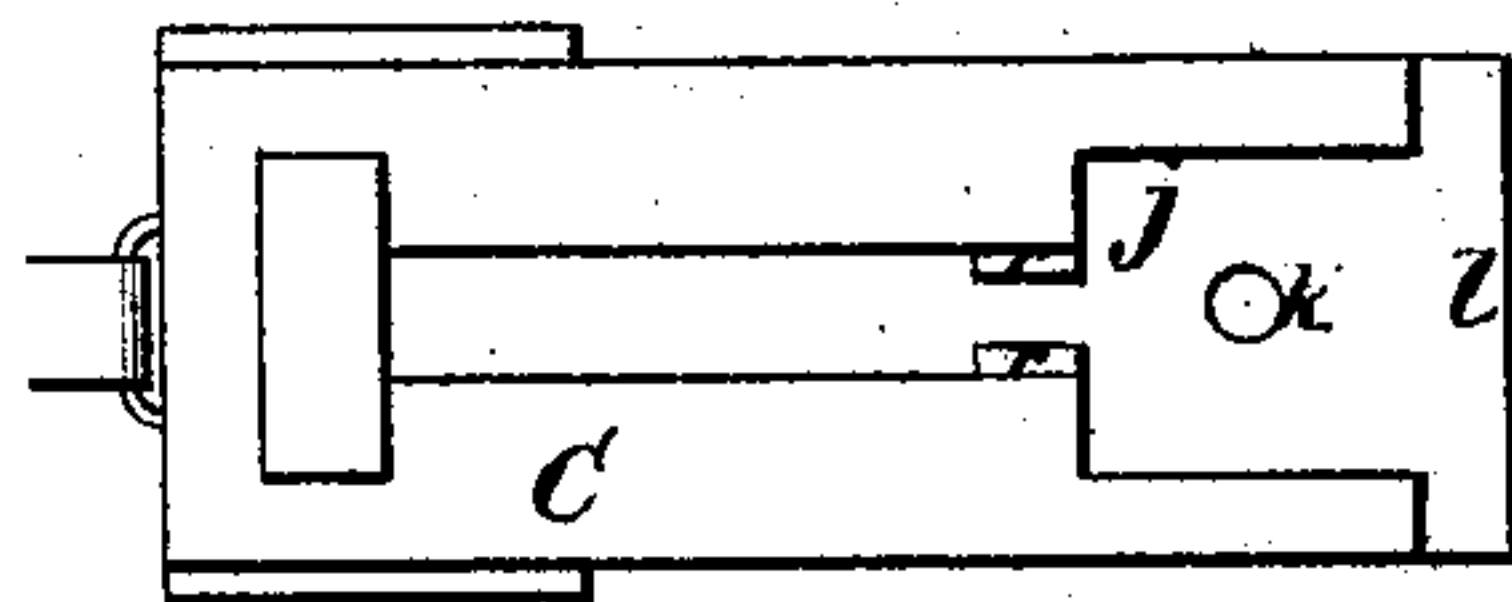


Fig. 5.



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# UNITED STATES PATENT OFFICE.

LOUIS AUGUSTUS LIVINGOOD, OF WOMELSDORF, PENNSYLVANIA.

## IMPROVEMENT IN MACHINES FOR MAKING NUTS.

Specification forming part of Letters Patent No. 131,105, dated September 3, 1872.

*To all whom it may concern:*

Be it known that I, LOUIS A. LIVINGOOD, of the borough of Womelsdorf, in the county of Berks and State of Pennsylvania, have invented a new and Improved Machine for Making Hot-Pressed Wrought-Iron Nuts and Washers; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing forming part of this specification, in which—

Figure 1, Sheet I, is a perspective view of my improved machine. Fig. 2, Sheet I, is a top-plan view with the housings and their attachments removed. Fig. 3, Sheet I, is a central vertical section, showing the parts in position for forming a nut. Fig. 4, Sheet II, is a similar section, showing the parts withdrawn for discharging the nut. Fig. 5, Sheet II, is a plan view of the drawer in which the nuts are formed. Fig. 6, Sheet II, is a perspective view of the slide for dropping the finished nut from the drawer. Figs. 7 and 8, Sheet II, are perspective views of dies for square and hexagonal nuts; and Figs. 9 and 10, Sheet II, are similar views of the punches accompanying such dies.

Similar letters of reference in the accompanying drawing indicate the same parts.

My invention has for its object to provide an improved machine for making hot-pressed wrought-iron nuts and washers; and to this end it consists, first, in the combination of parts by which the nut is cut from the bar, pressed, pierced, and discharged from the machine. It consists, secondly, in the combination of parts to form a matrix or chamber, in which the nut is pressed and pierced, as I will now proceed to describe.

In the accompanying drawing, A is the base of the machine, composed of cast-iron, and provided at one end with two parallel side pieces, B, which are grooved longitudinally in their proximate faces to receive the tongues of a sliding drawer, C. The drawer enters a horizontal passage, D, in the base, and is connected, by a rod, E, to a crank-shaft, F, having its bearings in the ends of the side pieces. G is a vertical opening communicating with the passage D, and adapted to receive the die-box H, beneath which the end of the drawer passes. The lower edges of the die are flush with the

upper side of the passage D on all sides excepting the front, where it extends downward within said passage, as shown at I. The drawer is composed of a rectangular block having its inner end recessed at *j* to correspond in size and form with the inner walls of the die. The bottom of the recess is provided with a central opening, *k*, and projects beyond the recess in the form of a flange or ledge, *l*. When the drawer is moved in, the vertical walls of the recess form a continuation of the die on all sides excepting the front, which is occupied by the die projection I, fitting over the ledge *l* and against the end of the drawer, as shown. By this construction the lower part of the die is movable with respect to the upper portion. *m* is a central longitudinal slot opening into the recess, and adapted to receive a drop-slide, *n*, projecting somewhat above the upper surface of the block so as to enter a groove in the upper side of the passage D in the base of the machine. The drop-slide is somewhat shorter than slot *m*, and is held therein by a block, *p*, placed behind it, so that its inner end shall be flush with the inner wall of the recess *j*. The drop-slide is further constructed with side grooves *q* to receive short tongues *r* at the inner end of the slot *m*, the grooves *q* being of such length that when the drawer is moved back the inner end of the drop-slide shall be in the same vertical line with the end of the ledge *l*. The tongues are nearly equal in length to the thickness of the block *p*, so that when the latter is removed the drop-slide may be drawn back clear of the tongue and lifted from the drawer. S is a notch formed in the inner end of the drop-slide, the base of which is flush with the upper surface of the drawer and equal in length to the thickness of the die-box. When the drawer is moved in, the vertical wall of the notch strikes the die-box and arrests the movement of the drop-slide when its inner end is in line with the inner wall of the die, as shown in Fig. 3. T are uprights or housings connected together by cross-bars U, and secured in any suitable manner to opposite sides of the base A at or near the center. They are preferably fastened by being dovetailed into and bolted to the base. V is a cross-head fitting within vertical grooves in the proximate faces of the housings, and connected, by two parallel eccen-



tric rods, W, to the eccentrics X, which are mounted upon a crank-shaft, Y, having its bearings in the upper ends of the housings. Z is the cut-off punch, of the proper form to fit the die H, mortised into the lower end of the cross-head, and secured in place by lateral screws. A' is the piercer, secured in the lower end of a guide-bar, B', which is fitted loosely within a vertical chamber of the cross-head W, and connected, by a pitman, C', to the crank of the shaft Y. The piercer passes directly through the center of the cut-off punch and is secured in the end of the guide-bar by a mortise and screw. The crank-shafts F and Y are connected to each other by the eccentrics and rod D', which are so arranged that when the machine is in operation the drawer shall be moved into the base just before the cut-off punch and piercer descend, and recede when the latter moves up.

The operation of forming and pressing a nut or washer is as follows, power being applied to the crank-shaft Y in any suitable manner: A bar of wrought-iron, of the proper width and thickness, is heated to whiteness and inserted in the machine, over the die-box and between the adjustable guides E', until its end rests against an adjustable guide, F', when the cut-off punch descends and severs the nut from the bar. The edge of a transverse plate of steel, G', inserted through the housings along the front of the die, constitutes the cutter by which the blank is severed from the bar. Immediately before or during this movement the drawer C is moved in, and the punch, descending, forces the blank into the recess of the drawer, where it is subjected to severe pressure and pierced by the piercer A'. The piercer and punch then recede, and by the same motion the drawer is moved out and the nut allowed to drop through the hole K in the drawer before the drawer moves to drop the nut. When the piercer has cleared the nut, or while it is clearing the same, the drawer is moved back independently of the drop-slide, so that the latter only holds the nut against the projection I of the die-box until the end of the ledge l is in line with the end of the drop-slide. The latter is then moved back by the tongues r coming in contact with the ends of the grooves q to allow the nut to drop through the base of the machine. These various operations are all performed at one revolution of the main crank-shaft, as will be readily understood.

The principal walls of the die are thus removed from the nut simultaneously, leaving it suspended between two points, only one of which is subsequently removed. By this arrangement, therefore, the nut cannot be clamped or bound in the die and interfere with the formation of the second nut, but drops at once and with certainty clear through the base of the machine, when the slide is drawn back.

The backward movement of the drop-slide

is limited, as shown in Fig. 4, by a pivoted stop, h', at the end of the base A, which enters a notch, i, in the top of the slide.

To change the form of the nut the cut-off punch and die-box are removed for the application of others of the desired form, the punch being disconnected by loosening the lateral screw and the die removed by lifting it from the opening G. When the punch is removed the die-block should be changed before the second punch is applied. The piercer may be changed by disconnecting the guide-box B' from the crank-shaft Y and withdrawing it from the cross-head. To remove the drawer the stop h' is swung upward upon its pivot, and the block p removed, so that the drop-slide can be lifted from its place. The drawer may then be pulled out and another of the requisite form inserted in its place, to which the drop-slide is applied as in the first instance, no change in this device being necessary.

When a die-box and cut-off punch of a form other than square or rectangular are employed, as shown in Figs. 8 and 10, the upper edges of such box form the cutters for separating the blank from the bar, and the cutter-plate G' is not required.

J' is a box or reservoir affixed to the top of the cross-head, and supplied with water in any convenient manner, which is permitted to flow down one or more grooves, k', in the cross-head and cut-off punch for the purpose of cooling the piercer and other parts which may be affected by the heat of the metal bars. l' are rubber blocks inserted in the housings immediately over the crank-shaft Y, to allow the parts connected with said shaft to rise or yield slightly for the purpose of preventing breakage when a metal bar of unusual thickness is accidentally introduced into the machine.

Having thus described my invention, what I claim is—

1. In a machine for making hot-pressed wrought-iron nuts and washers, the combination of the cut-off punch, the piercer working through the punch, the removable die-box H, the sliding drawer, and the drop-slide, whereby the nut is cut from the bar, pressed in the die-box, pierced, and discharged from the machine at one operation, substantially as described.

2. The combination of the die-box, the drawer, and the drop-slide to form a chamber within the base of the machine in which the nuts are pressed and pierced, substantially as described, for the purpose specified.

3. I claim the slide n, constructed with the off-sets s and grooves q, jointly with the drawer C, projections r, and stop h', substantially as described, for the purpose specified.

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