

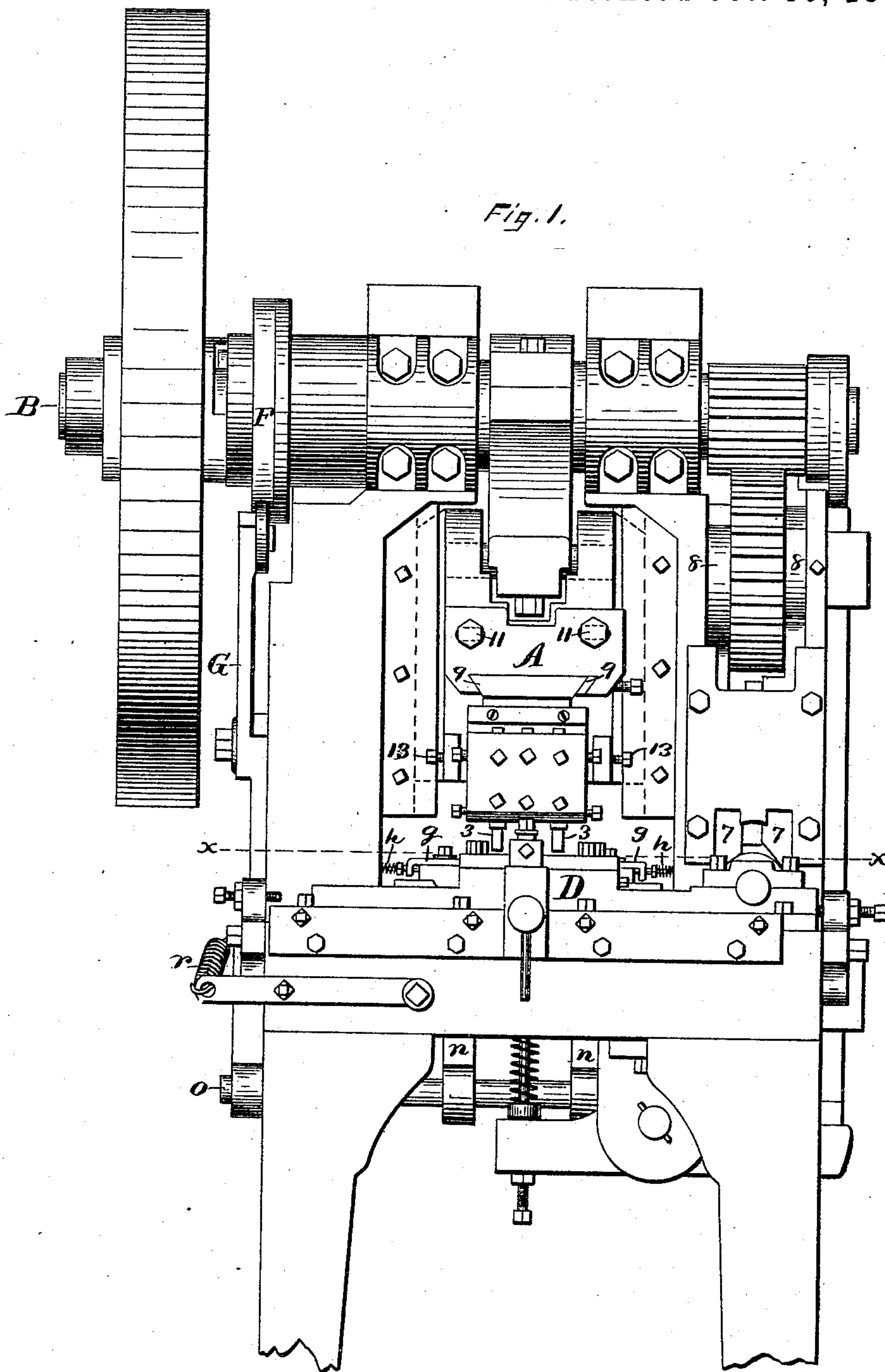
(No Model.)

4 Sheets—Sheet 1.

G. DUNHAM.
NUT MAKING MACHINE.

No. 391,951.

Patented Oct. 30, 1888.



Witnesses.

John Edwards Jr.
J. H. Whiting.

Inventor.

George Dunham,
By James Shepard
Atty.

(No Model.)

4 Sheets—Sheet 2.

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Fig. 2.

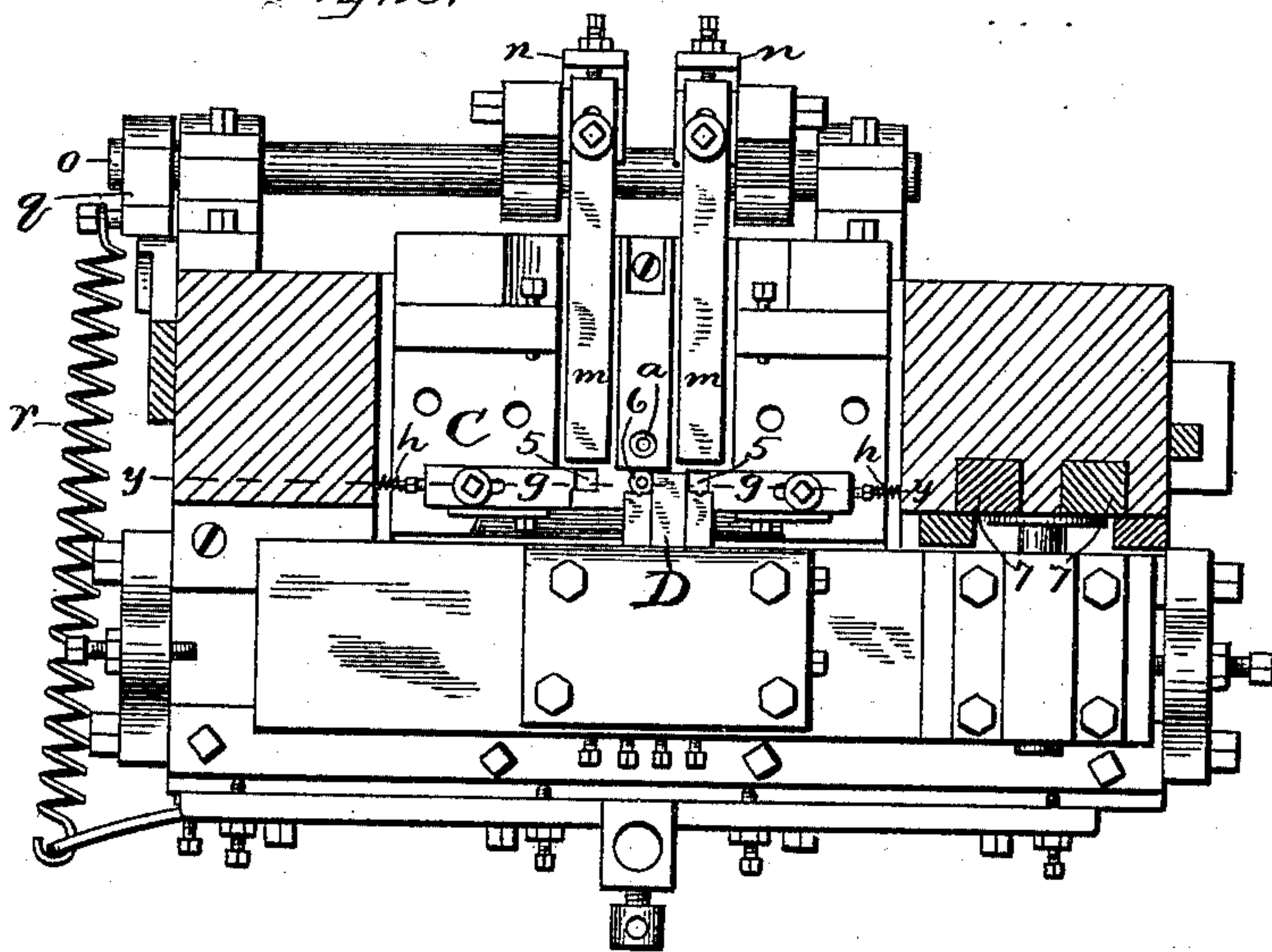
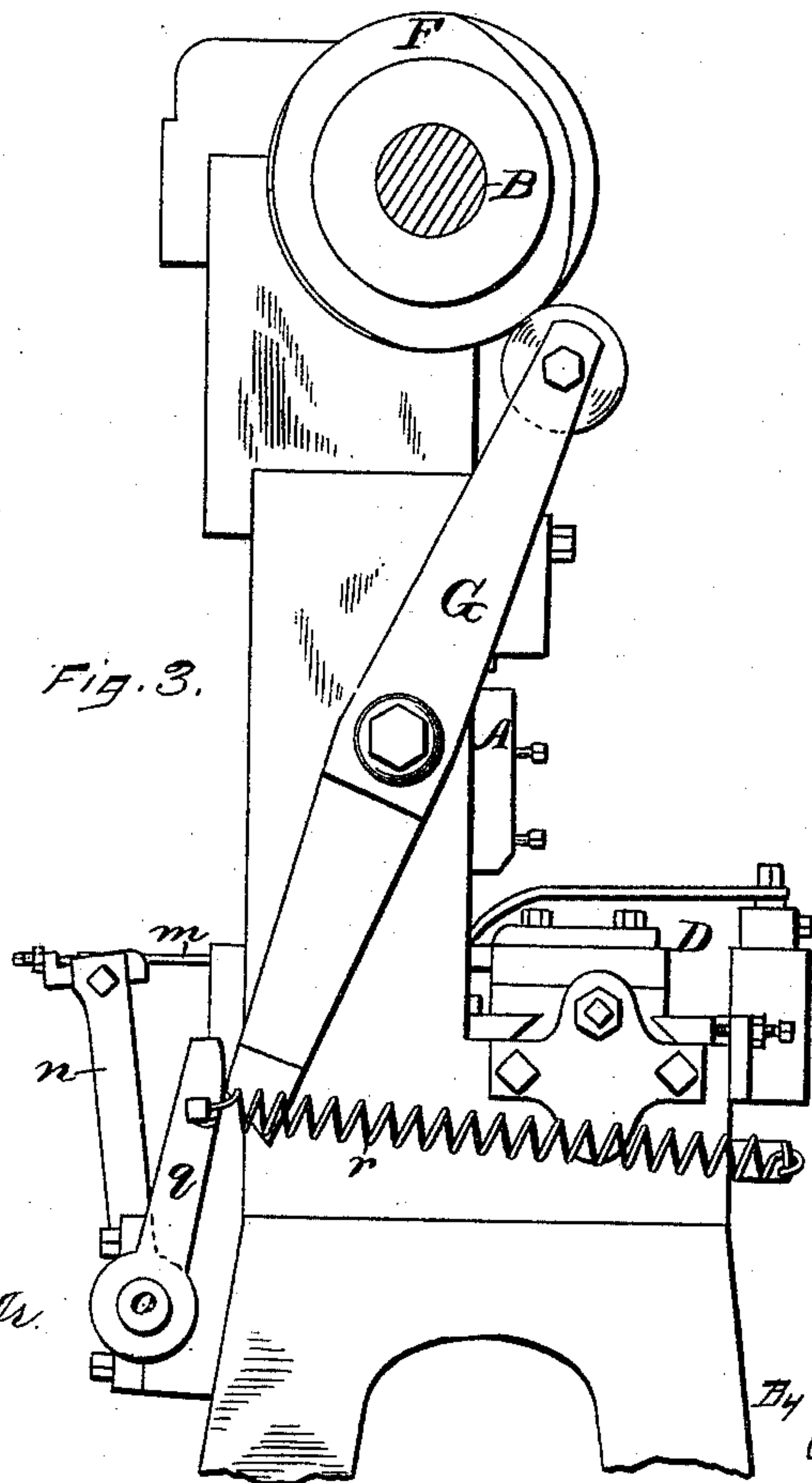


Fig. 3.



WITNESSES.
John Edwards Jr.
M. H. Whiting.

INVENTOR.
George Dunham.
By James Shepard.
Att'y.

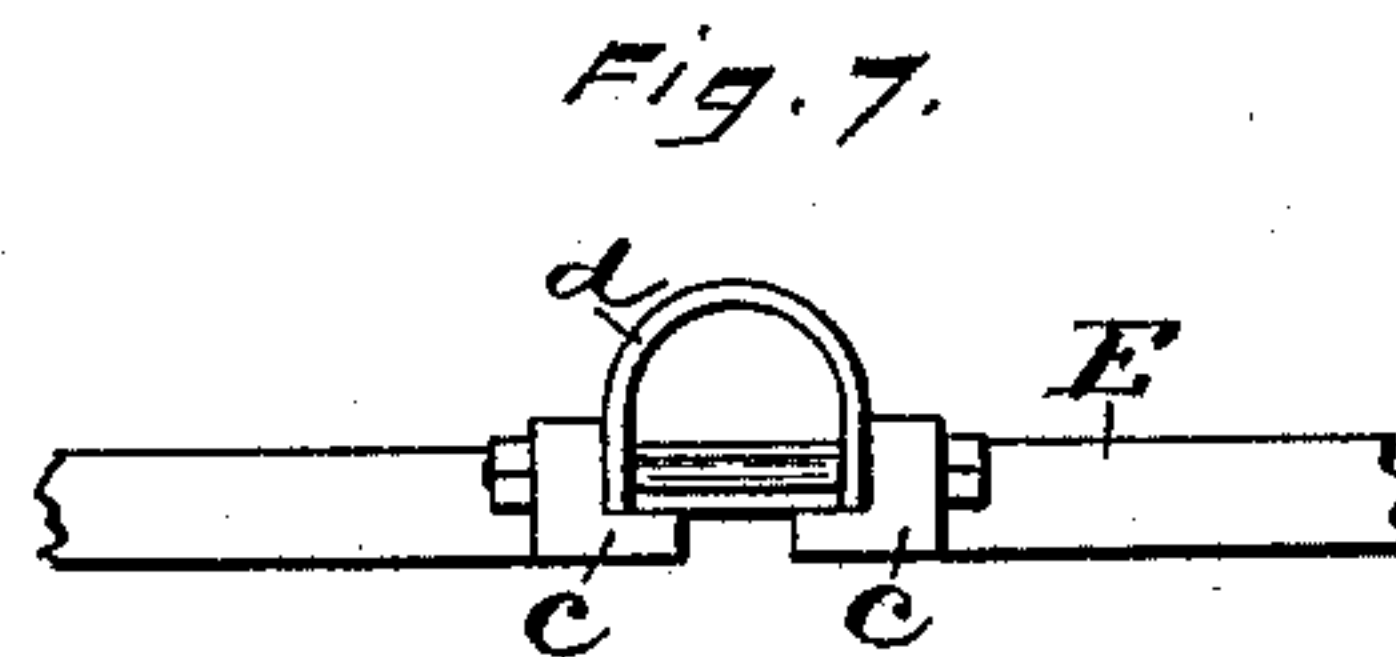
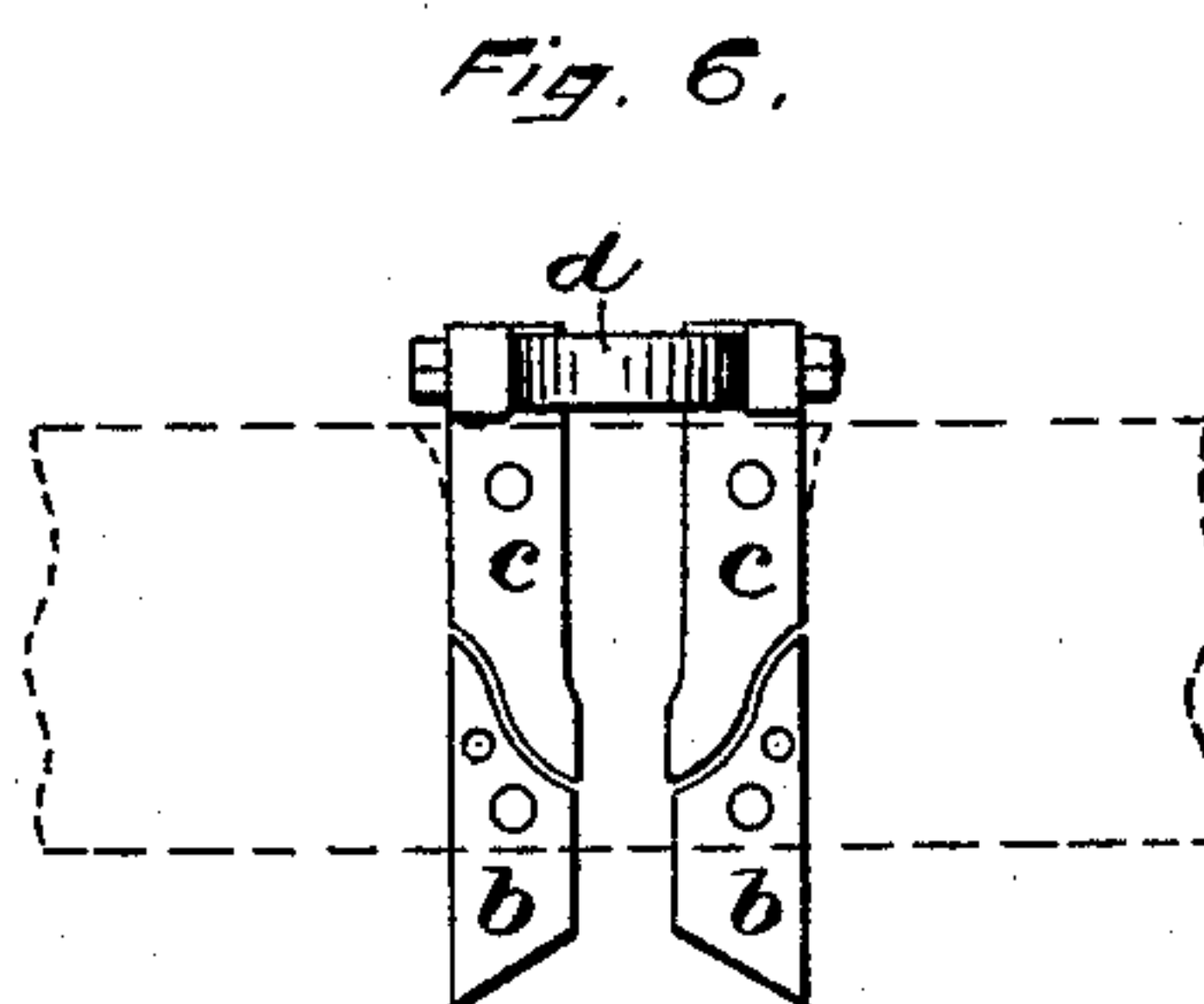
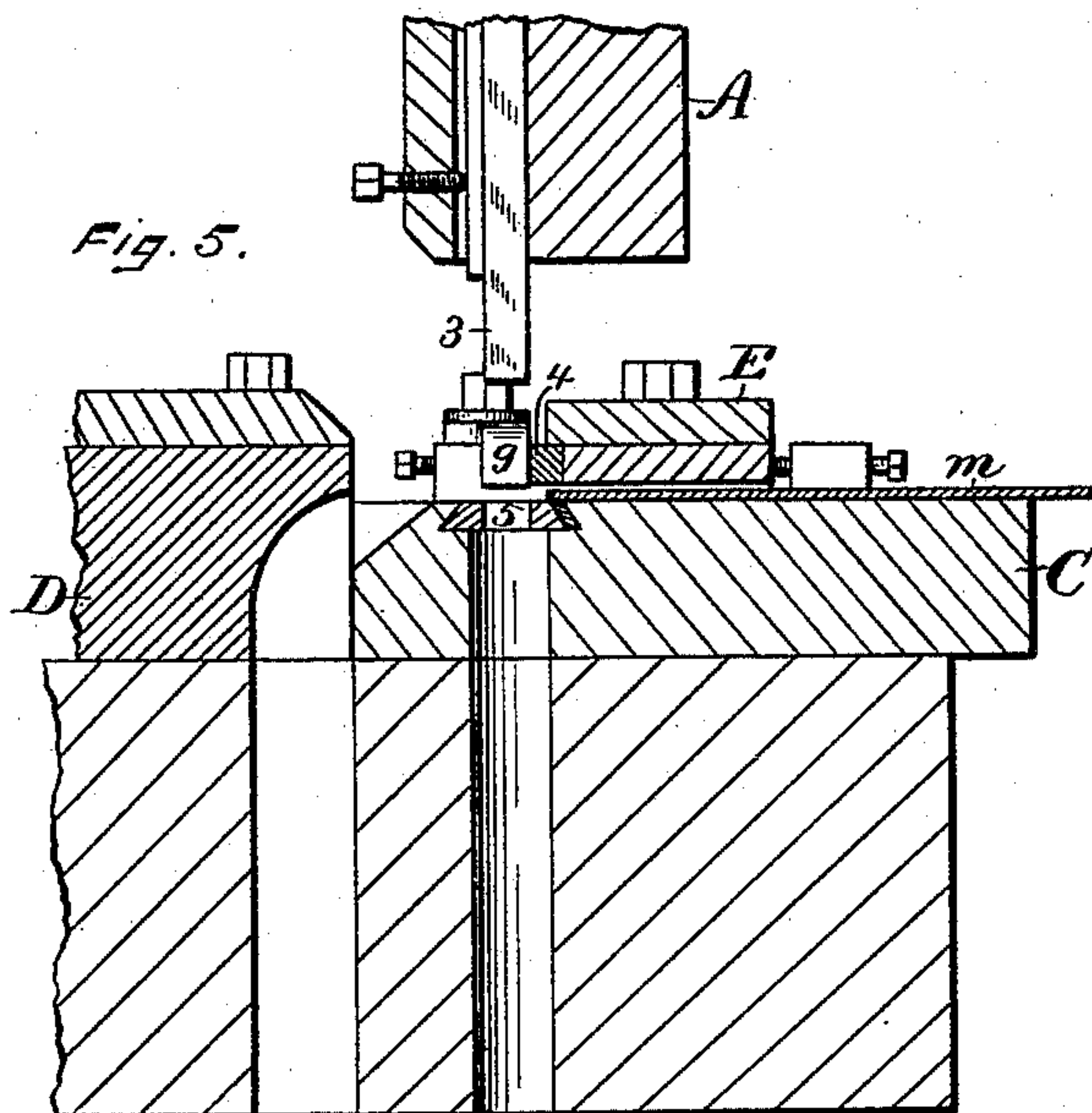
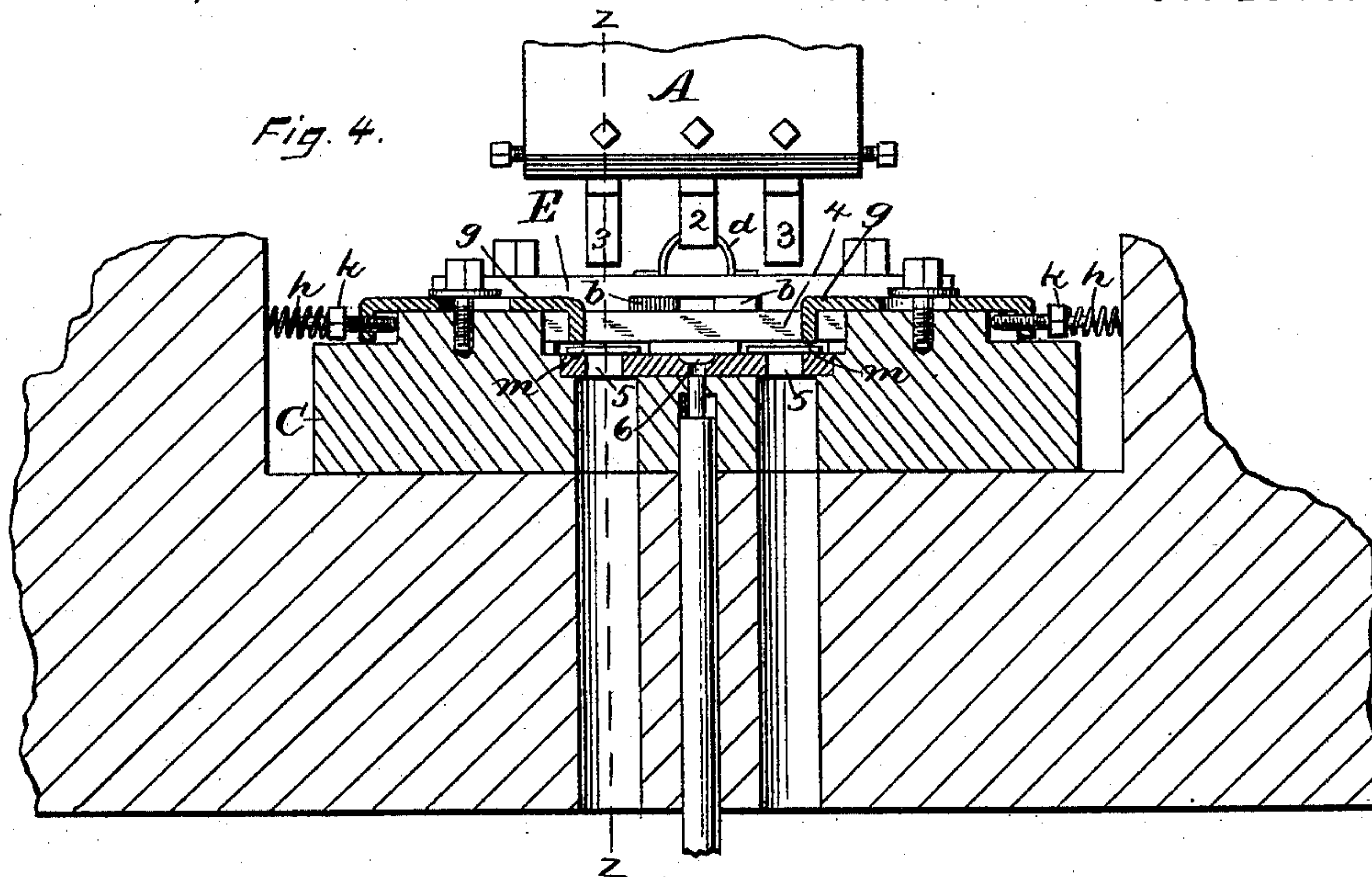
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Fig. 8.

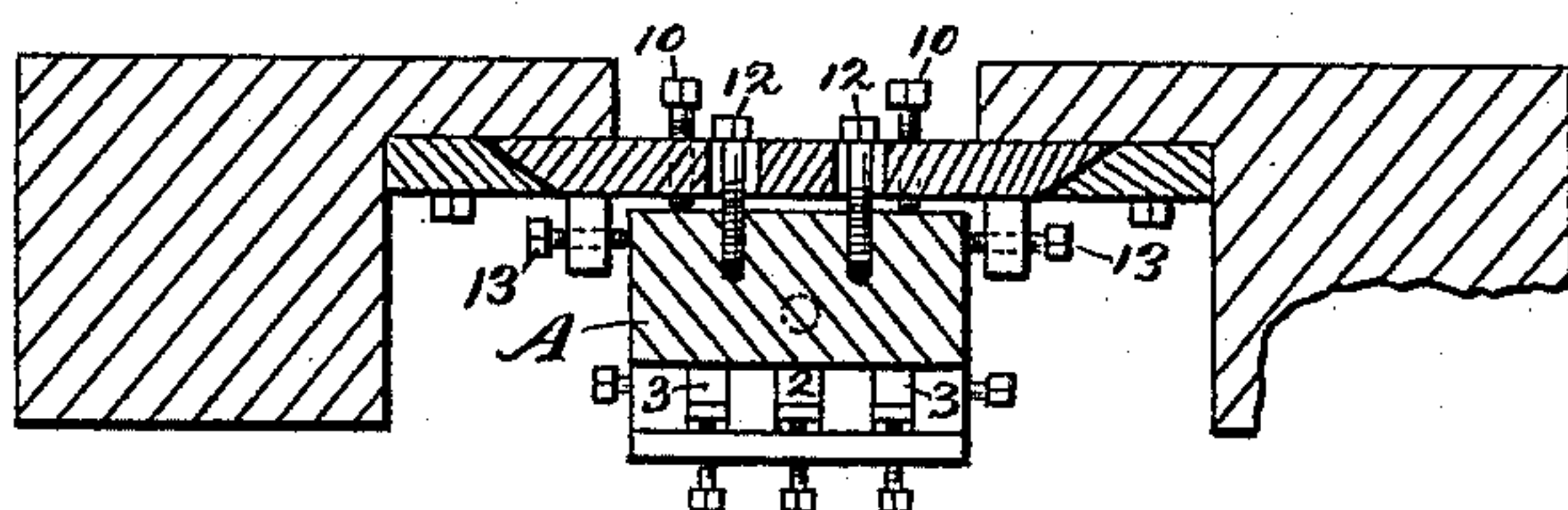


Fig. 9.

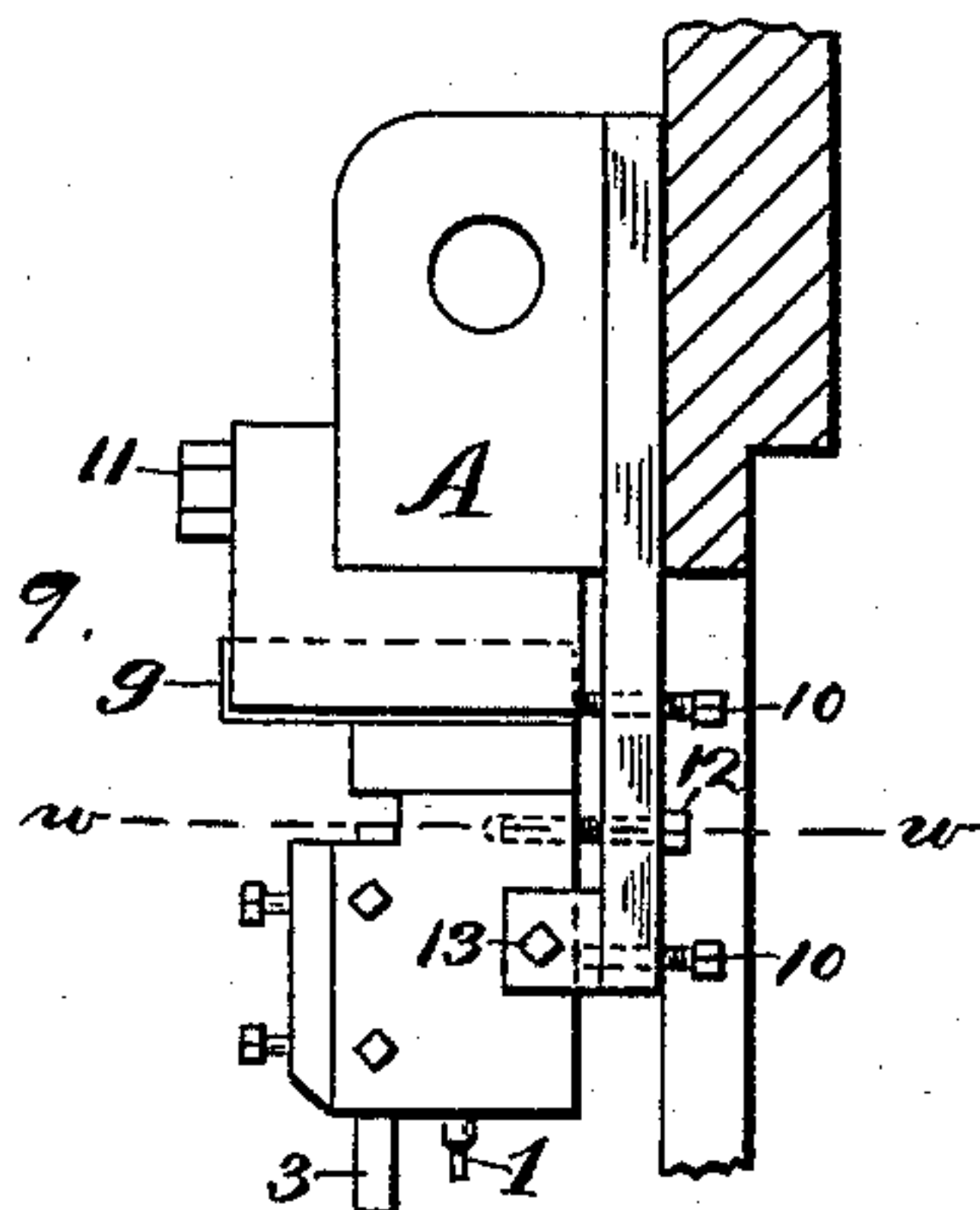
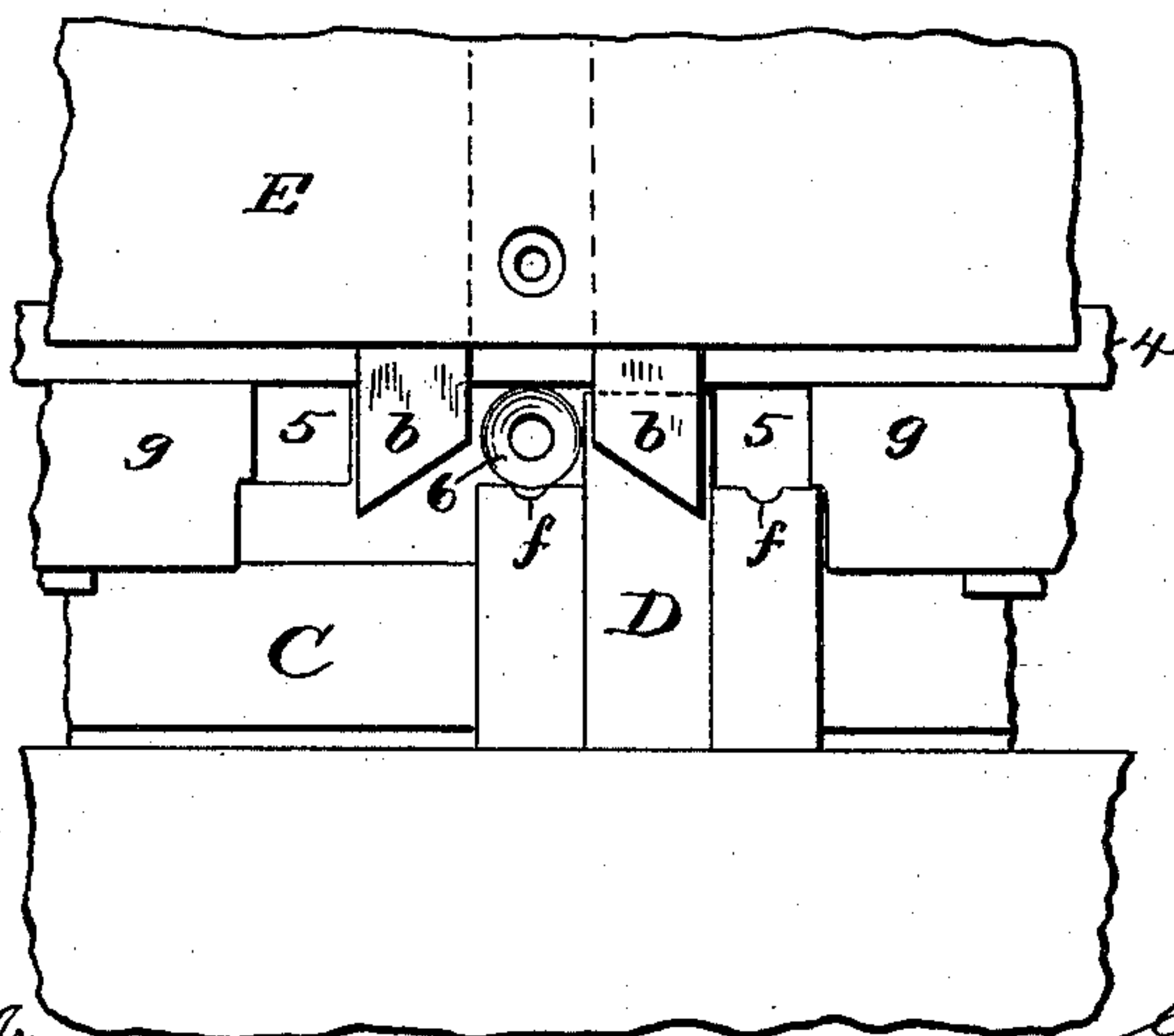


Fig. 10.



Witnesses,

John Edwards Jr.
W. H. Whitney.

Inventor,

George Dunham,
By James Shepard Atty.

UNITED STATES PATENT OFFICE.

GEORGE DUNHAM, OF UNIONVILLE, CONNECTICUT, ASSIGNOR TO GEORGE M. DUNHAM, OF WEST NEWTON, PENNSYLVANIA.

NUT-MAKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 391,951, dated October 30, 1888.

Application filed March 8, 1888. Serial No. 266,540. (No model.)

To all whom it may concern:

Be it known that I, GEORGE DUNHAM, a citizen of the United States, residing at Unionville, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Nut-Machines, of which the following is a specification.

My invention relates to improvements in machines for making nuts, washers, or analogous articles; and the objects of my improvement are to improve the efficiency of the machine, particularly the manner of holding the bar, clearing the scrap from the dies, and holding and gaging the nut-blanks.

In the accompanying drawings, Figure 1 is front elevation of my machine. Fig. 2 is a horizontal section of said machine on line *x x* of Fig. 1, with one holding-cap and other parts removed. Fig. 3 is a side elevation of my machine with the driving-shaft in section. Fig. 4 is an enlarged vertical section of a portion of said machine on line *yy* of Fig. 2. Fig. 5 is a vertical section of a portion of said machine on the line *z z* of Fig. 4. Fig. 6 is a plan view of the devices for holding the bar, the plate or cap to which they are attached being indicated by broken lines. Fig. 7 is a rear elevation of said devices for holding the bar and the plate to which they are attached. Fig. 8 is a horizontal section on line *w w* of Fig. 9 of the slide which carries the punches, together with a portion of the frame. Fig. 9 is a side elevation of said slide with a vertical section of a portion of the frame; and Fig. 10 is a plan view, on a still larger scale, of the several dies and connected parts.

The machine herein illustrated and described is an improved form of the nut-machine shown and described in the application of George M. Dunham, Serial No. 241,156, filed June 13, 1887.

The slide A, bearing a round punch, 1, Fig. 9, a blanking-punch, 2, and two trimming-punches, 3, is reciprocated in suitable ways by a crank or eccentric on the main shaft B, as in ordinary nut-machines. A die-bed, C, contains a stationary shear-blade, 4, Figs. 4, 5, and 10, for acting against one side of the blanking-punch 2, the round die *a*, Fig. 2, for the punch 1, two trimming-dies, 5 5, for the trimming-punches 3 3, and a crowning-die, 6, which acts

in opposition to the blanking-punch 2. Moving transversely over the face of the die-bed is the carrier or transfer D, containing two right-angular notches, the side wall of which, that is parallel to the shear-blade 4, acts in opposition to said blade for severing the blank from the bar under the action of the punch 2. The side walls of the notches, which are at right angles to the blade 4 and which form the middle projection of said carrier D, serve to carry the nut-blank to the right or to the left, to present said blank to the trimming-dies 5 5. This carrier D may be reciprocated by any suitable mechanism; but I prefer to operate it by means of the slides 7 7 and their cams 8 8, as more fully shown and described in my patent of January 24, 1888, No. 376,769, for a mechanical movement. These parts are all substantially as shown and described in the aforesaid application and patent, and therefore I consider it unnecessary to describe them more specifically, excepting as they may be referred to in connection with my improvements.

The lower end of the slide A, I mount in horizontal ways 9 9, Figs. 1 and 9, so as to make the punches move bodily toward and from the front by means of the adjusting-screws 10 10 and 12 12, Figs. 8 and 9. I also attach this lower part of the slide A to the upper part by means of the bolts 11 11, Figs. 1 and 9, which bolts pass through slots, as indicated by the broken lines in Fig. 1. Upon each side of the lower part of the slide are laterally-adjusting screws 13 13, passing through lugs on the main portion of the slide, as shown, whereby I am enabled to adjust the lower end of the slide laterally, when the bolts 11 11 are loosened. Thus it will be seen that I am enabled to adjust all of the punches bodily to and from the front and laterally to either side.

E designates a holding cap or plate or take-off through which the round punch 1 passes, and underneath which is a groove or channel through which the bar is fed for feeding the dies. Projecting from the front edge of this plate there are two wings, *b*, beveled at their front end, and underneath which the cutting portions of the carrier D reciprocate. Back of these wings I arrange a pair of holding-jaws, *c c*, said jaws being pivoted to the plate

E and pressed apart at their rear end by the spring *d*, whereby their front ends are continually pressed against the sides of the bar to hold it firmly as well as to center and guide it.

The round hole for the center of the nut is first pressed, and then as the bar is fed along to a position over the crowning-die 6 a blank is severed therefrom by means of the blanking-punch 2 acting against the blade 4 upon one side and the parallel wall of the notch in the carrier D on the other side, so as to cut a blank from the bar and trim a slight portion from its outer end. That portion of the carrier D which, in connection with the shear-blade 4, acts as a blanking-die, is also further recessed, as at *f*. (Shown most clearly in Fig. 10.) In cutting the blank a small portion of the metal enters the recess *f*, and thereby prevents the blank from jumping laterally away from the central projection on the carrier. Upon the further descent of the blanking-punch the under side of the nut is crowned in the crowning-die 6, and as the blanking-punch retreats the carrier D moves to one side to present the nut-blank to one of the trimming-dies 5. In thus passing to the trimming-die any scrap that may be on the top of the carrier is forced against the beveled end of one of the wings *b*, and by it is pushed toward the front of the machine. When the carrier presents a blank to the trimming-dies 5, said blanks are stopped by the side gages, *g*. These side gages are loosely held in place by screws passing through slots and pressed or held in position by the springs *h*, thereby permitting said side gages to yield and move out of the way in case a nut-blank of an extraordinary width is presented. The inward movement of these side gages is limited and regulated by means of the screw-pin *k*, Fig. 4, the ends of which strike against stop-shoulders on the die-bed C. When the trimming-punch descends to trim the blank and returns, the projection that filled or partially filled the recess *f* is trimmed off as scrap, and the carrier moves back out of the way.

In connection with the trimming-dies 5, I arrange clearers *m*, which pass through slots or ways in the die-bed C to the rear of the machine, where they are connected by a rocking arm, *n*, to the rock-shaft *o*. This rock-shaft is operated to work the clearers by means of cam F acting upon lever G, and which in turn acts upon the arm *q* of the rock-shaft, said arm being pressed in the opposite direction by means of the spring *r*. These clearers are by this mechanism reciprocated over the face of the trimming-dies to remove the scrap immediately after the trimming of each blank.

I have shown two blanking-dies and a carrier which takes a blank in both directions; but my clearers for the trimming-die may, if desired, be used in connection with a single-

acting machine having only one finishing-die. This will require only the omission of the extra pinion for driving the slides 7 7 that reciprocate the carrier and placing the operating-cams for said slides directly upon the main shaft, so that the carrier will then receive one reciprocating movement for every revolution of the shaft B. As illustrated, for a double acting machine there is only one reciprocation of the carrier for every revolution of the shaft B.

While I have shown my improvement as applied to a certain nut-machine, I intend to apply such of my improvements as are adapted therefor to other nut-machines or machines for making washers or other analogous articles.

I claim as my invention—

1. In a nut-machine, the slide A, having its lower end adapted to hold several punches and made separately from the main or upper portion of said slide, and provided with adjusting devices for adjusting the punches bodily to or from the front and rear, and also laterally, substantially as described, and for the purpose specified.

2. In a nut-machine having a groove or way for the rod or bar to pass through, the combination of the jaws *c c*, pivoted to the plate E upon each side of said way, and the spring *d* for pressing said jaws against opposite sides of the bar when passing through said ways, substantially as described, and for the purpose specified.

3. In a nut-machine, the combination of the blanking punch and dies, one member of said dies being formed on the reciprocating carrier, and the stationary wing *b*, beveled at its outer end, substantially as described, whereby the movement of the carrier under said wing frees the dies from scrap, as set forth.

4. In a nut-machine, the combination, with the blanking-punch, of the shear-blade 4, and the reciprocating carrier having an edge parallel to that of said shear-blade and in connection therewith serving as the blanking-die, said parallel edge having also the holding-recess *f*, substantially as described, and for the purpose specified.

5. In a nut-machine, the combination of the blanking punch and die, the trimming die and punch, a carrier for transferring the blank from the blanking to the trimming dies, and the yielding gage *g*, substantially as described, and for the purpose specified.

6. In a machine of the class hereinbefore specified, the combination of the punching-die and punch for the middle hole, the blanking die and punch, a carrier, a trimming die and punch, and a clearer, *m*, for removing the scrap from said trimming-die, substantially as described, and for the purpose specified.

GEORGE DUNHAM.

Witnesses:

GEORGE E. TAFT,
THOMAS G. FLANAGAN.