

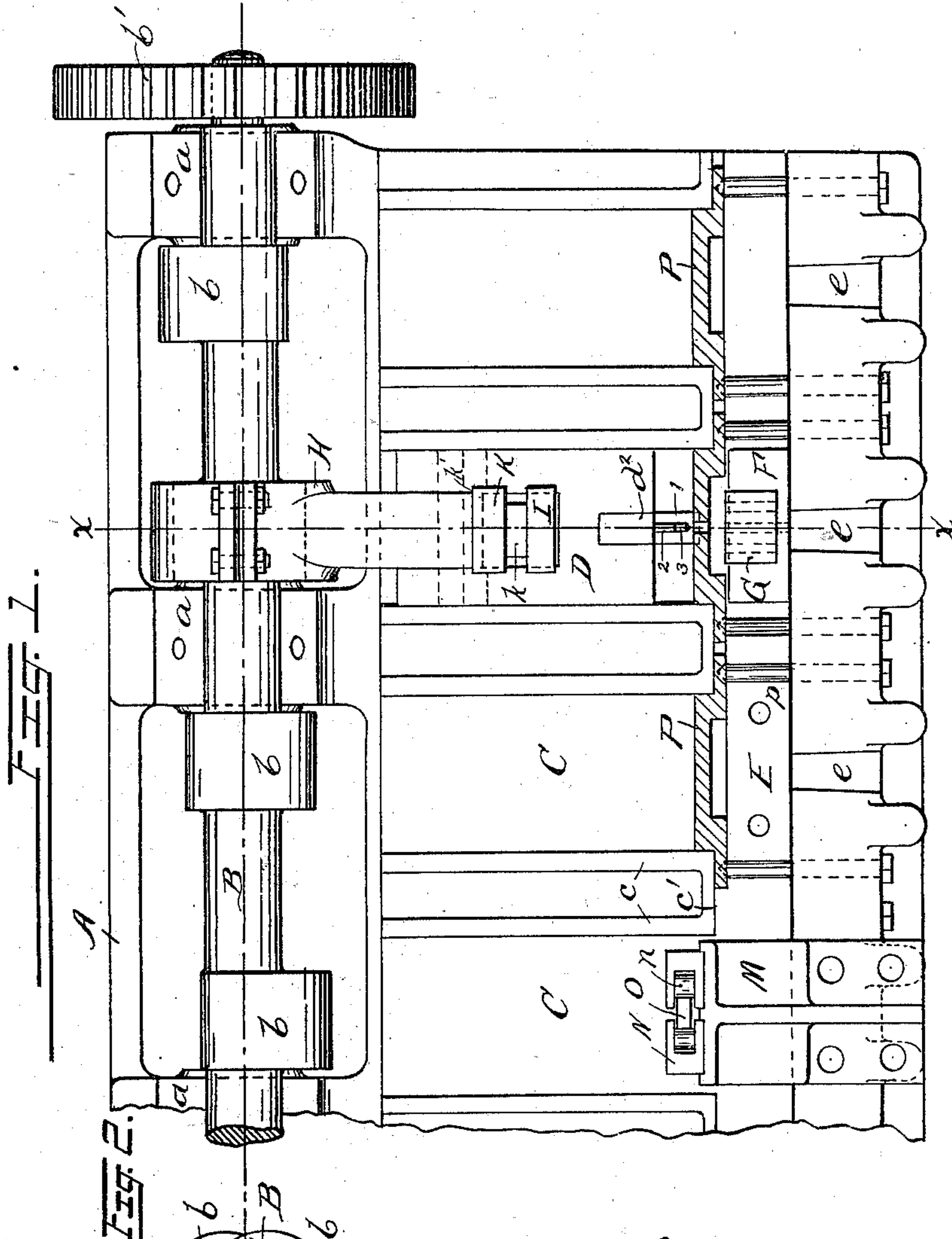
(No Model.)

3 Sheets—Sheet 1.

J. H. STERNBERGH.
MACHINE FOR MANUFACTURING NUTS.

No. 559,500.

Patented May 5, 1896.



Witnesses

E. M. Kelly
David Levan

J. A. Linnhoff

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By *me* Attorney

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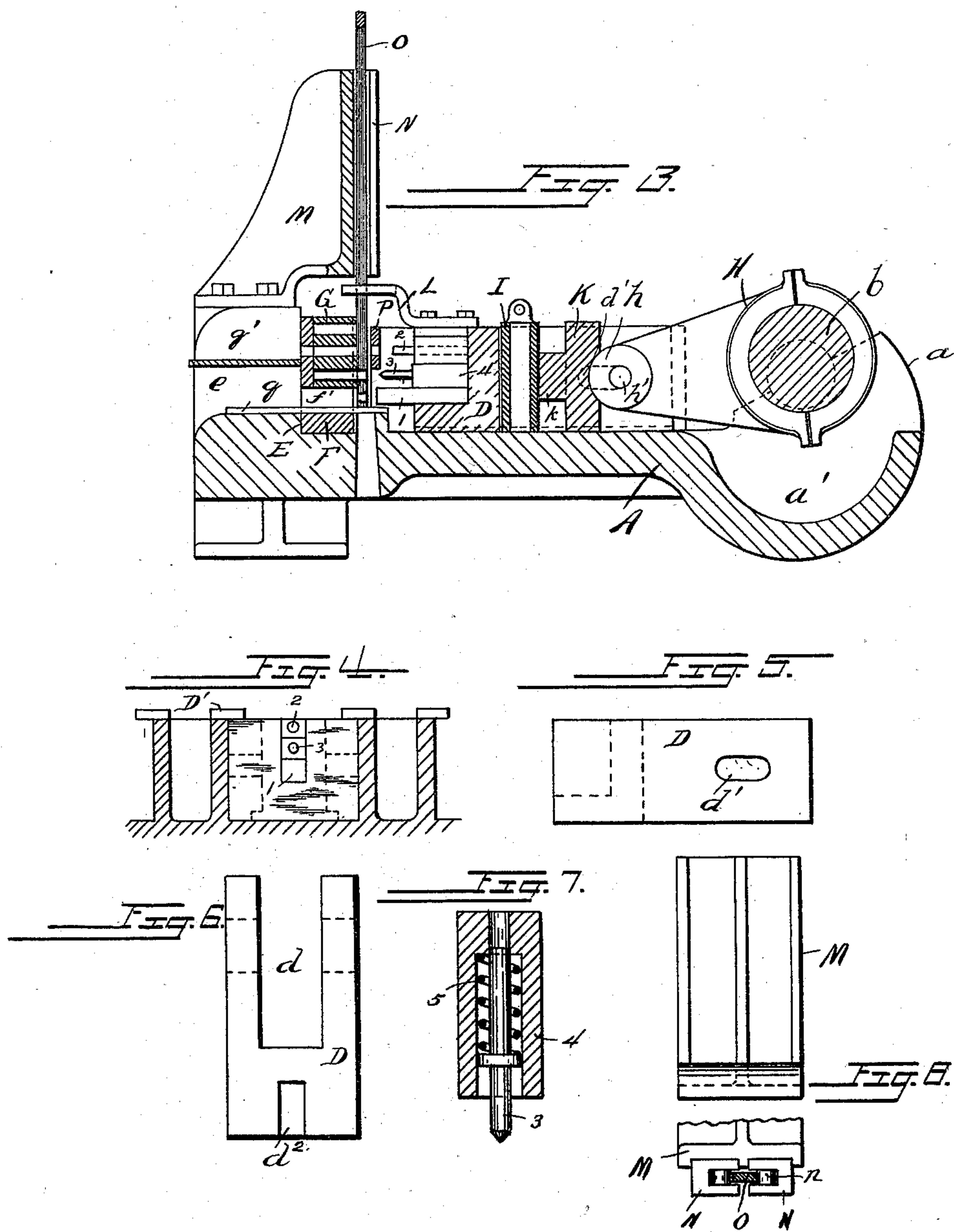
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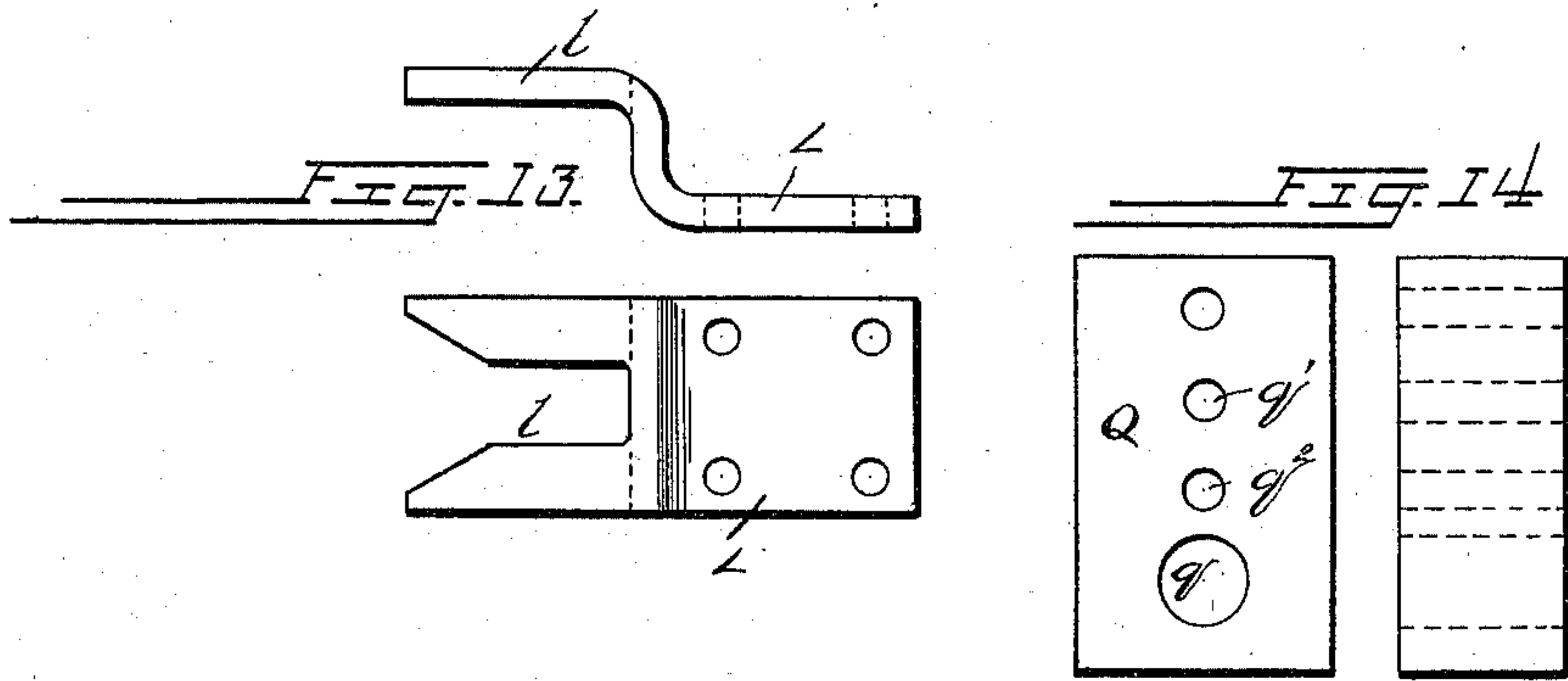
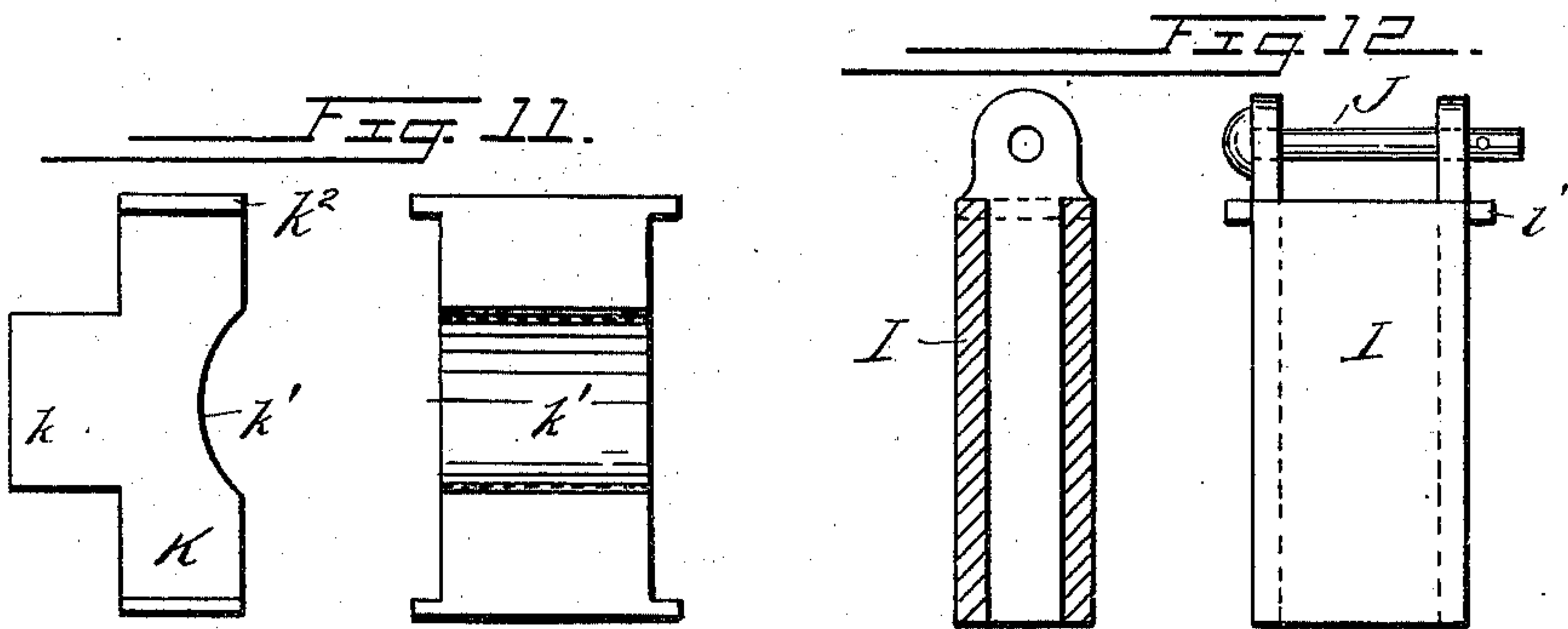
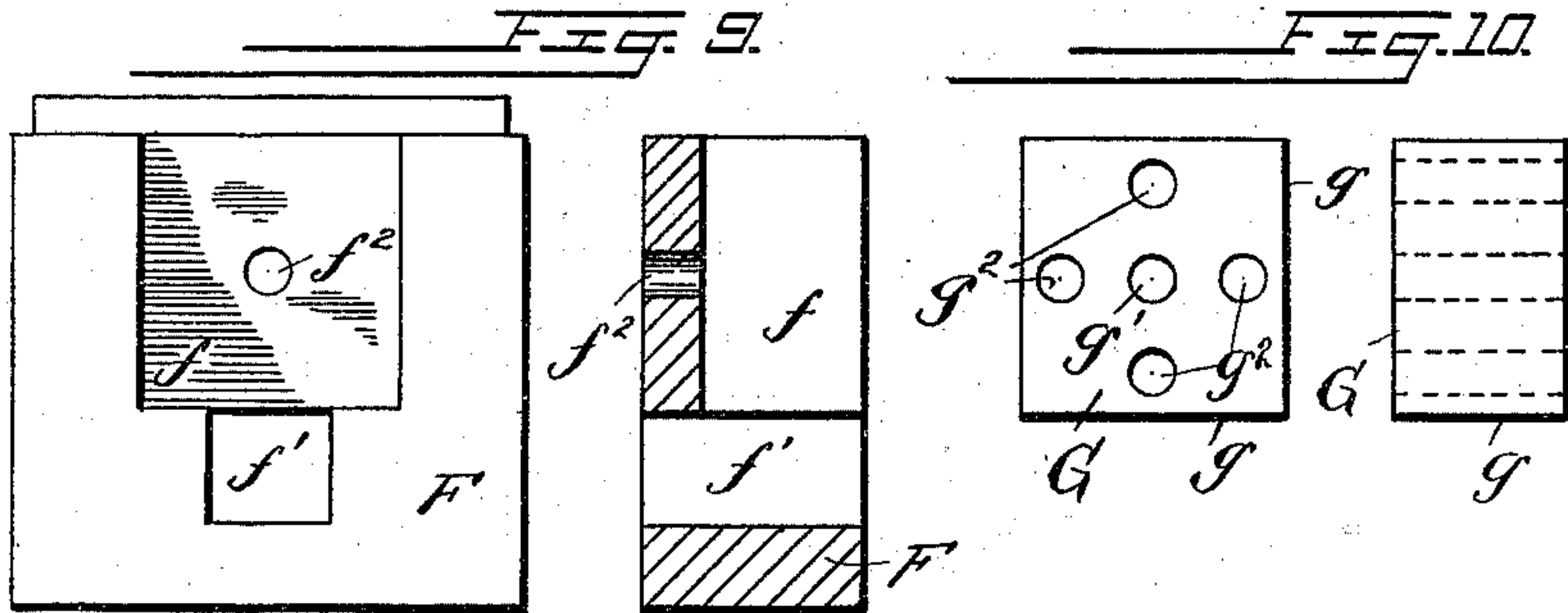
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Edw. Kelly.
David Leman

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By his Attorney J. H. Sternbergh

UNITED STATES PATENT OFFICE.

JAMES HERVEY STERNBERGH, OF READING, PENNSYLVANIA.

MACHINE FOR MANUFACTURING NUTS.

SPECIFICATION forming part of Letters Patent No. 559,500, dated May 5, 1896.

Application filed July 20, 1892. Serial No. 440,580. (No model.)

To all whom it may concern:

Be it known that I, JAMES HERVEY STERNBERGH, a citizen of the United States, residing at Reading, in the county of Berks, State of Pennsylvania, have invented certain Improvements in Machines for Manufacturing Nuts, of which the following is a specification.

My invention relates to an improved form of machine adapted particularly for the manufacture of nuts, and belonging to that class of multiple-punching machines in which are employed a series of plungers or slides operated from a single shaft and set consecutively in advance of each other, so that they will be operated in succession by each rotation of the shaft. The plungers are arranged to move horizontally in parallel lines and are so connected to the shaft as to permit any desired number to be readily operated independently of the others. The bars of metal from which the nuts are formed are supported vertically in suitable guides and fed onward automatically by gravity.

The invention is fully described in connection with the accompanying drawings, and the novel features are specifically pointed out in the claims.

Figure 1 is a plan view of a portion of the machine, four plungers or slideways being shown, in one of which a plunger with punches and fixed dies is indicated in position. Fig. 2 is a cross-section of the operating-shaft, indicating the arrangement of the eccentrics. Fig. 3 is a cross-section through X X of Fig. 1, showing the relative location of the main parts. Fig. 4 is a partial longitudinal section showing an end view of one of the plungers in its slideway; and Figs. 5 and 6 show side and plan views, respectively, of the plunger. Fig. 7 shows in detail the arrangement of the guide-pin located between the shearing and hole-forming punches. Fig. 8 shows the bar-guide bracket, which is fixed to the frame. Fig. 9 illustrates the die-block, and Fig. 10 the reversible die. Fig. 11 shows in detail the plunger-block upon which the eccentric-rod directly operates, and Fig. 12 the removable distance-piece through which movement is transmitted to the plunger. Fig. 13 shows separately the bar-guide which is carried by the plunger. Fig. 14 shows a die for forming washers.

The horizontal frame or bed-plate A is supported upon suitable legs. (Not shown.) Mounted in bearings *a*, formed at intervals in this bed-plate, is the operating-shaft B, extending lengthwise, to which rotary power is conveyed through the gear-wheel *b'*. This shaft is formed with any convenient number of eccentrics *b b*, the centers of which are arranged consecutively in advance of each other, as indicated in Fig. 2. Eccentric-rods H are strapped upon these eccentrics in any ordinary manner and are connected to slides or plungers D, which carry the punches, &c. These plungers are guided in parallel slideways C C, formed in the bed-plate, and are held therein by cap-plates D', bolted to the top of the side walls *c* of the slideways.

The free end *h* of each eccentric-rod enters the jaw-shaped end of the plunger and is connected therewith by means of a pin which fills the hole *h'* in the rod and the projecting ends of which engage oblong holes *d'* in the plunger. The curved outer surface of the rod end *h* bears against the concave surface *k'* of the block K, which is capable of sliding longitudinally in the plunger, and the front *k* of this block presses upon a distance-piece I, interposed between the block and the main portion of the plunger, through which distance-piece the operating power from the shaft B is thus transmitted to the plunger. The thickness of this distance-piece is made about equal to the full throw of the eccentric, and it is so formed as to be conveniently removed from its position during the return stroke of the plunger, thus permitting any one of the latter to be readily thrown out of operation without affecting the others. Furthermore this distance-piece is arranged to serve as a safety breaking piece, being made hollow and sufficiently weak to collapse if undue strain is brought upon it from any cause, thus preventing damage to more important parts of the machine.

The slideways C C for the plungers open into a dieway E, extending at right angles to them for the whole length of the machine. Fitted to this way and removably secured therein directly opposite the plungers are die-blocks F of rectangular form. Each of these blocks is provided with a square recess *f* to receive a square die G, the thickness of which

is preferably sufficient to make it project slightly beyond the face of the die-block. This die is provided with a central hole g' and with a series of four holes g^2 equidistant from the central hole and also equidistant from the four shearing edges g of the die. The size of these holes corresponds with those to be punched in the nuts, while the distance between the central hole g' and each of the series g^2 is equal to the measurement over the flat sides of the nuts to be formed, and the distance between the holes g^2 and the shearing edges g is equal to half this measurement. A hole f^2 in the die-block registers with the central hole g' in the die, and a passage-way f' for the sheared-off nuts extends entirely through the block underneath the die and opens, as does also the hole f^2 , into a frame-passage e , through which both nuts and hole-punchings are delivered into suitable receptacles, the partition q' being provided to permit their separate discharge.

The forward portion of the plunger D is formed with a rectangular recess d^2 for the reception of the punching-tools. These include a shearing-tool, (marked 1,) which is set to operate in connection with the shearing edge g of the die G, a guide-pin, (marked 3,) which is preferably constructed as indicated in Fig. 7, where it is shown mounted in the block 4 and backed by a spring 5, which presses the pin outward to its normal position, but permits it to be forced back, and a hole-punch, (marked 2,) all of which are firmly held in place by means of a plate bolted to the top surface of the plunger, which plate is formed to serve as a bar-guide L, being provided with a flaring jaw-shaped portion l , projecting forward of the plunger and adapted to pass over the bar and to bring it to proper position to be operated upon by the punches. The latter are arranged to correspond with the die G, the punch 2 meeting the central hole g' , the pin 3 one of the holes g^2 , and the tool 1 passing below the shearing edge g , as already described.

Stripper-plates P are secured in position between the plungers and the fixed die by means of bolts p . The shearing-tool 1 passes below this; but the punch 2 passes through an opening in it before puncturing the bar O, which is thus positively stripped off of the punch as the latter is withdrawn.

The bars O are merely placed in vertical position by the operator in front of each operating-plunger, being supported in vertical guides N on the face of brackets M, secured to the frame. The bar fits loosely in these guides, which are preferably provided with antifriction-rollers n , and may be further steadied at their upper ends if desired.

Having been placed in position, the bar drops until its lower end is supported upon a plate q of suitable thickness in the passage $f'e$. In starting upon a new bar in which there is no hole the advancing-punch 1 shears off the end of the bar, the pin 3 coming in contact with the solid bar is merely forced back, and

the punch 2 punches a hole in the bar. Upon the withdrawal of the punch the bar drops automatically, and on the return stroke of the plunger the same operation is repeated, except that the pointed pin 3 passes through the previously-punched hole in the bar into the hole g^2 in the die before the punch reaches the bar, thus insuring, in connection with the guide L, the placing of the bar in exactly proper position before the punching of another hole. The sheared-off nuts and punchings are forced out through the frame-passage e , as already described.

The central hole g' of the die, upon which the greatest work is thrown, is preferably bushed, so as to permit its being readily kept in good form without renewing the die, and the latter is then capable of being used an indefinitely long time, each of the four shearing edges g and of the four guide-pin holes g^2 being equally adapted for service.

In punching washers the form of die illustrated in Fig. 14 is used, a punch equal in diameter to the washer being substituted for the shearing-punch 1 and operating in connection with the large hole q of the die Q, while the punch 2 and guide-pin 3 enter the holes q' and q^2 , as before, and the punchings and washers are similarly removed.

By means of my improved construction I am enabled to produce a machine which is capable of performing a great amount of work with great rapidity and exactness, with a minimum amount of attention, and with a very limited expenditure of power at any particular instant of time, which is also readily accessible in all its parts and in which each particular section is made independently operative or inoperative with the greatest ease and advantage.

The form and arrangement of details as I have illustrated and described them are evidently capable of considerable modification without departing from the spirit of my invention, and I do not therefore desire to limit myself to the exact construction herein set forth; but

What I claim is—

1. In a machine for manufacturing nuts the combination with a die G of punches 1 and 2 and intermediate pin 3, substantially as set forth.

2. In a machine for manufacturing nuts the combination with punches 1 and 2 and intermediate pin 3 of the square die G with central hole and circular series of holes equally distant from said central hole, substantially as set forth.

3. In a machine for manufacturing nuts the combination with die G and punches 1 and 2 and pin 3 of the stripper P all arranged and adapted to operate substantially as set forth.

4. In a machine for manufacturing nuts the combination with the plunger D of the eccentric-rod H, having a slotted connection therewith, plunger-block K, and distance-piece I all arranged substantially as set forth.

5. In a machine for manufacturing nuts the combination with the plunger D of the eccentric-rod H having a slotted connection therewith, plunger-block K and hollow distance-piece I adapted to serve as a breaking piece, all arranged substantially as set forth.

6. In a machine for making nuts the combination with the horizontal bed-plate, the fixed die, and the punch-plunger, of the bracket M with vertical guideway for the nut-bar, and the jaw-shaped bar-guide L carried by the plunger, all arranged substantially as set forth.

7. In a machine for making nuts the combination with a fixed die and the punches carried by the plunger, of the guide-pin 3 and bar-guide L also carried by said plunger, said die being provided with a hole to receive the guide-pin and all adapted to operate substantially as set forth.

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

JAMES HERVEY STERNBERGH.

Witnesses:

H. M. M. RICHARDS,
EDWIN L. MOYER.