

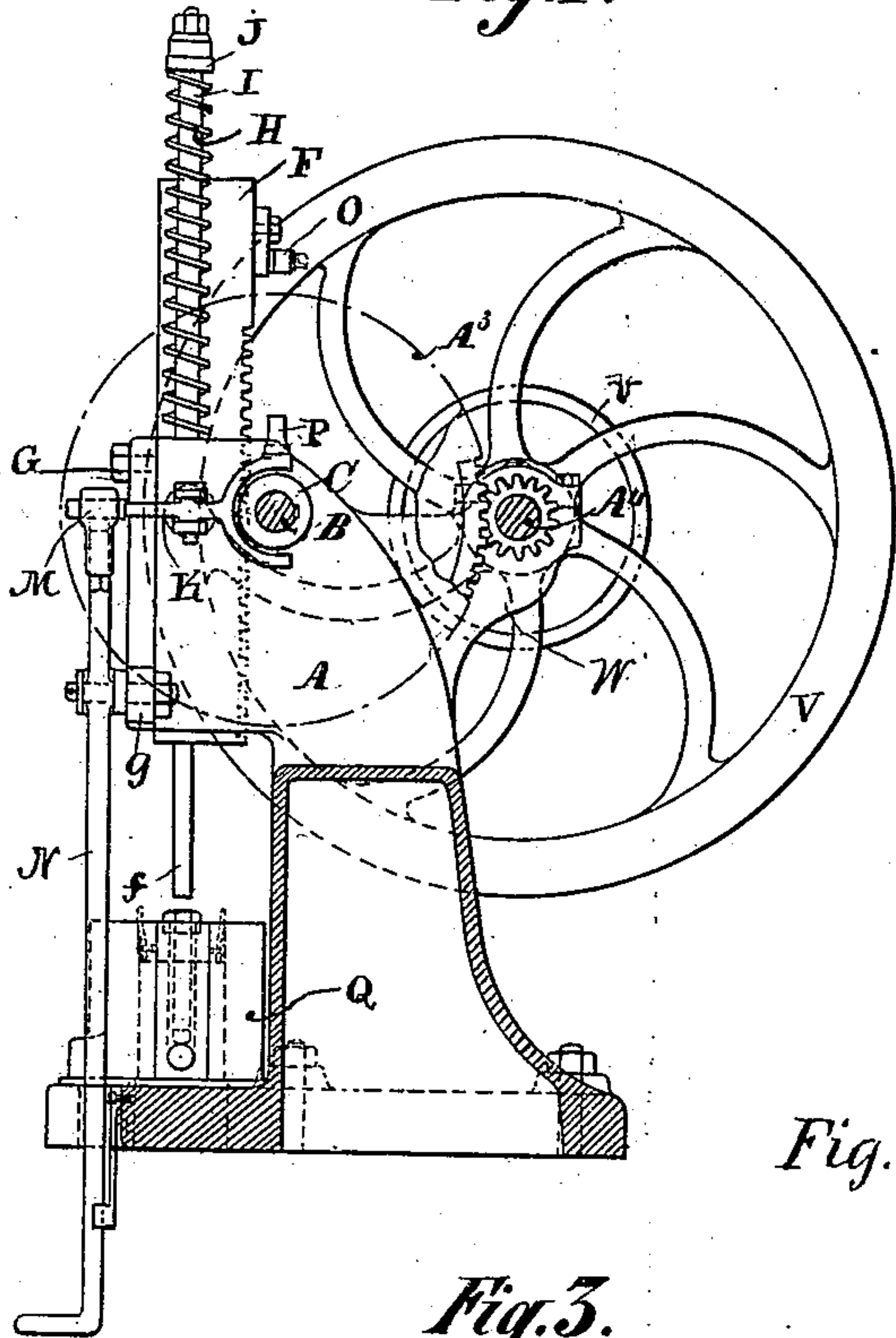
(No Model.)

E. P. BAVILLE.  
PUNCHING MACHINE.

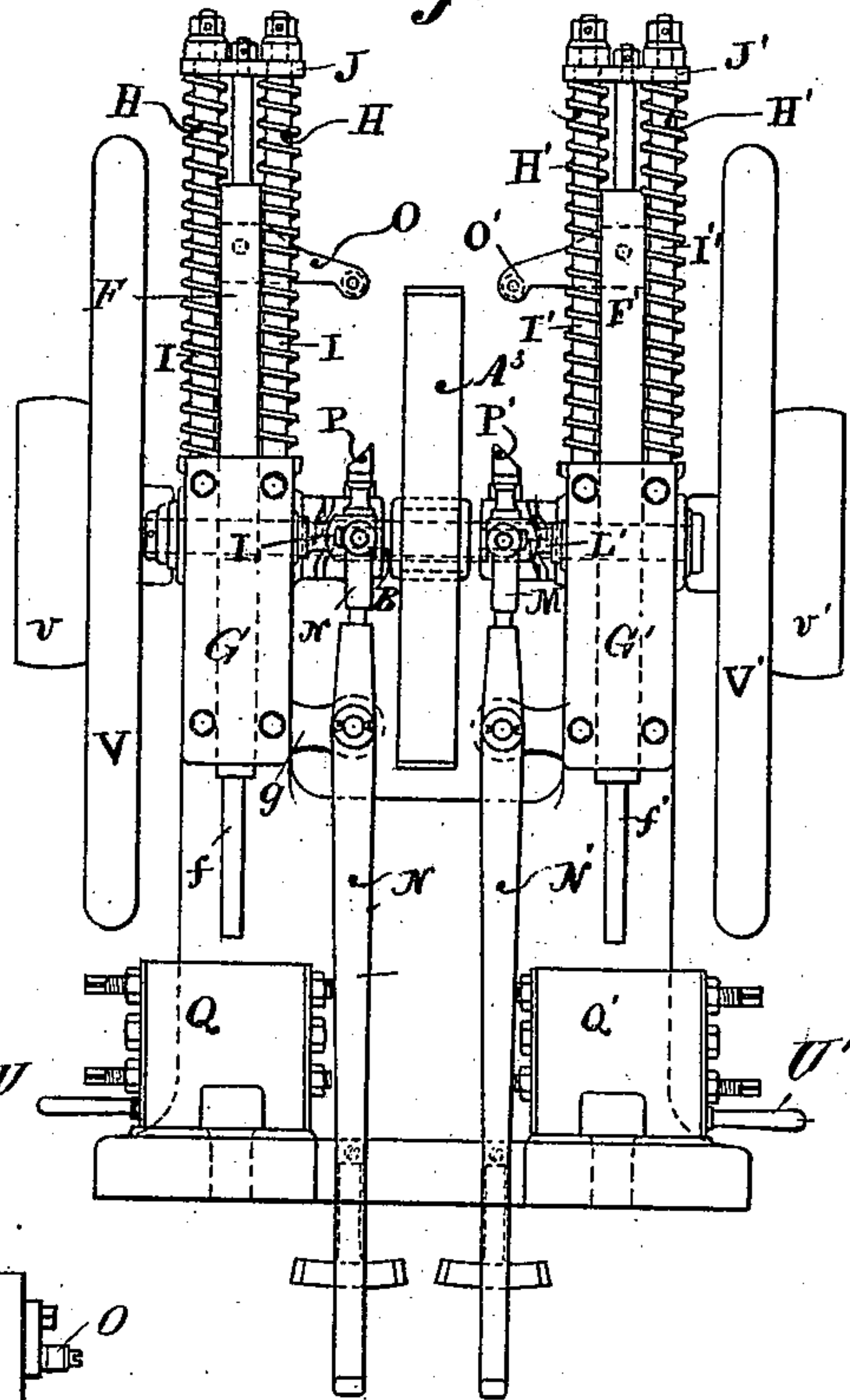
No. 361,570.

Patented Apr. 19, 1887.

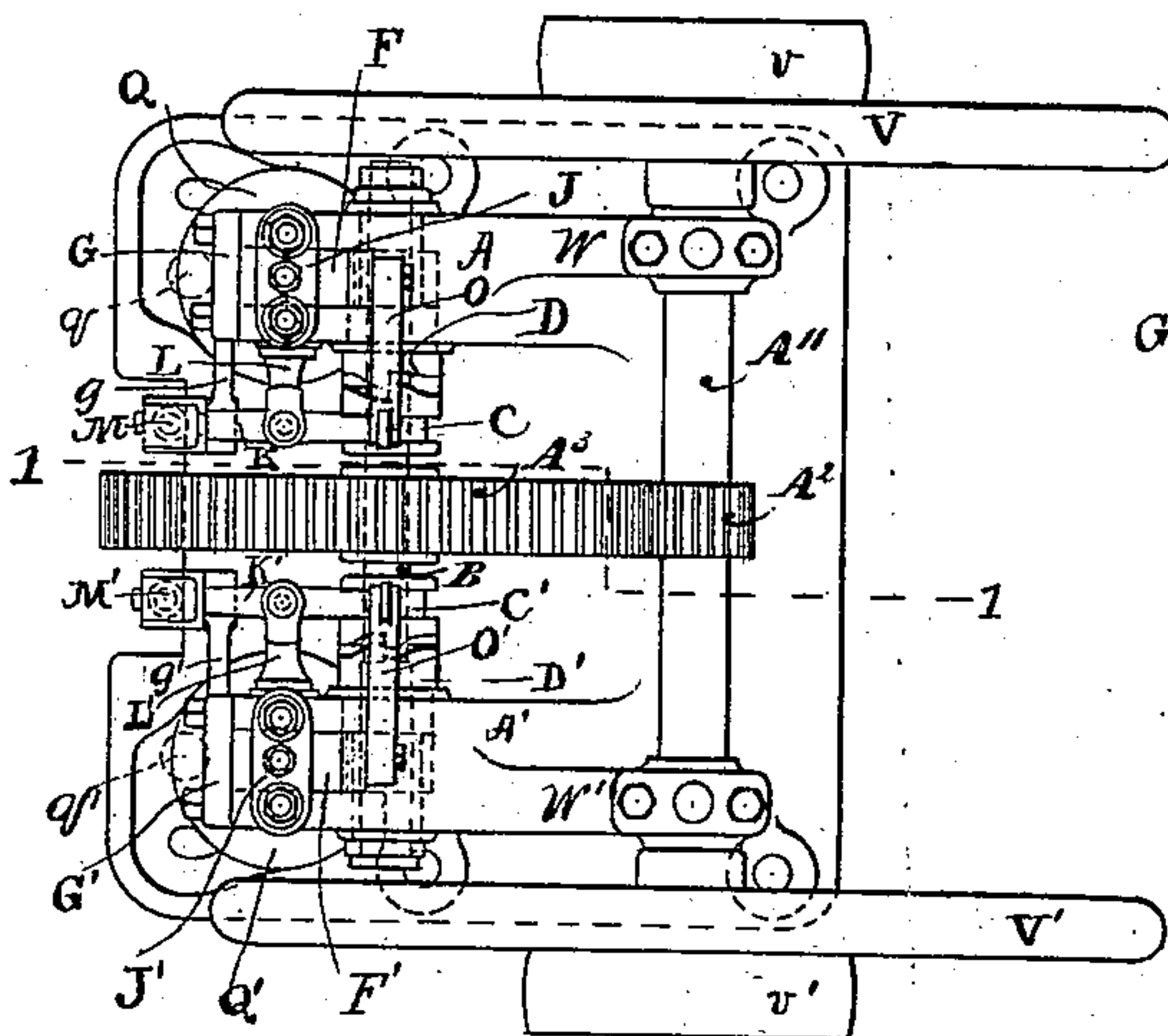
*Fig. 1.*



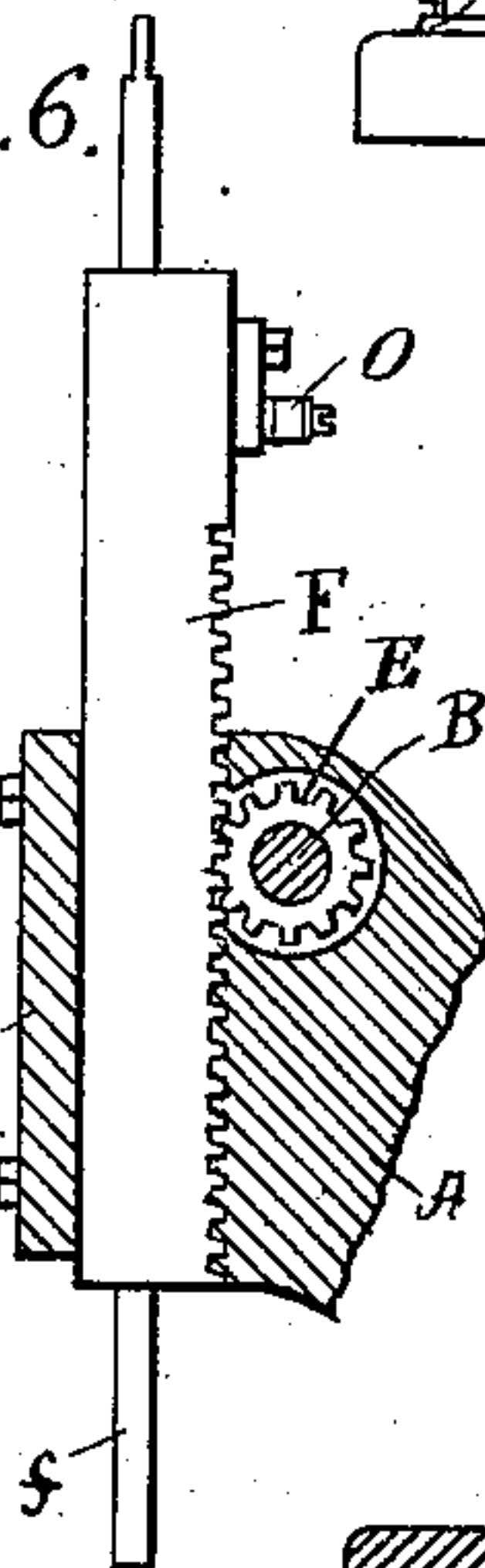
*Fig. 2.*



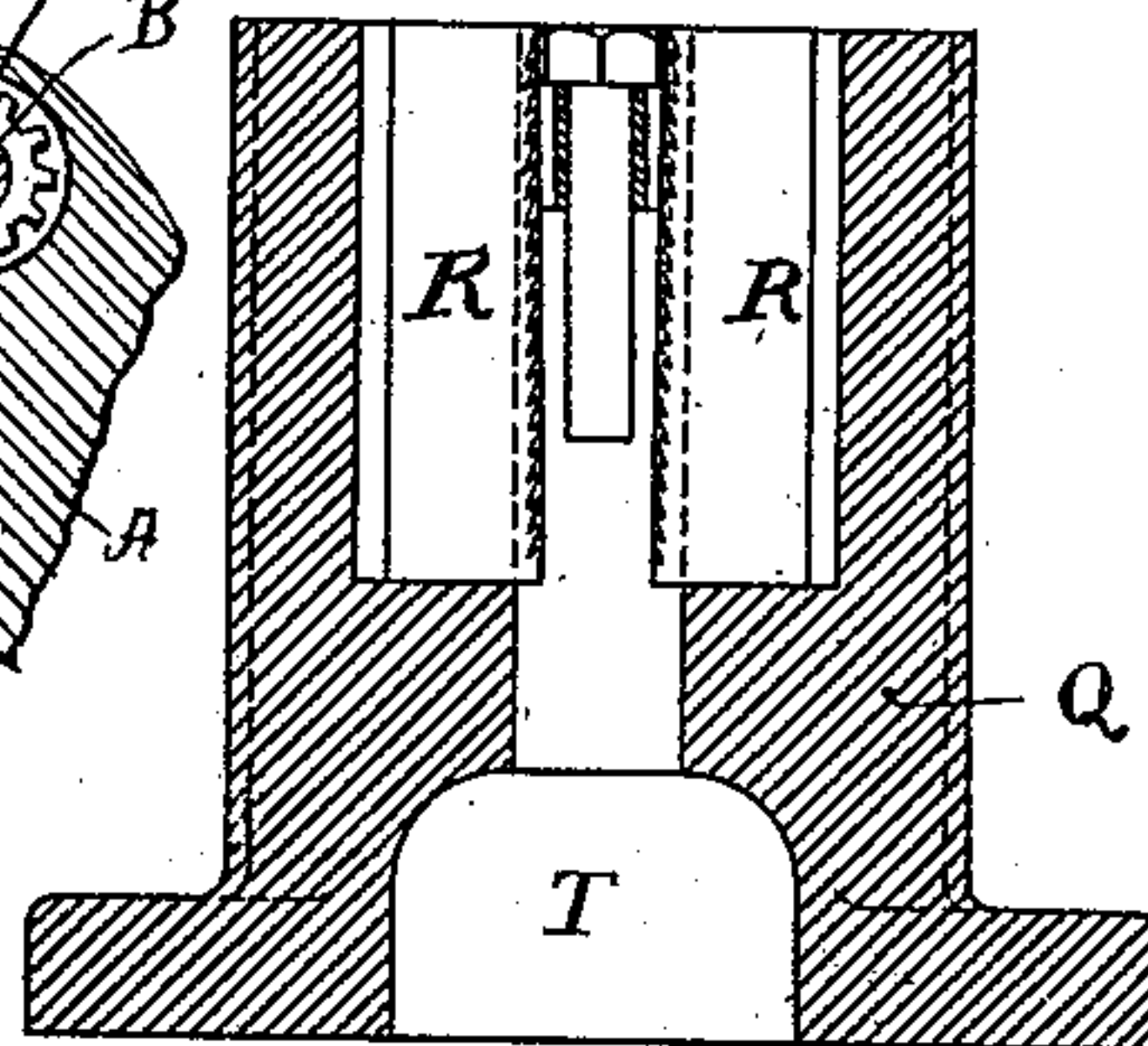
*Fig. 3.*



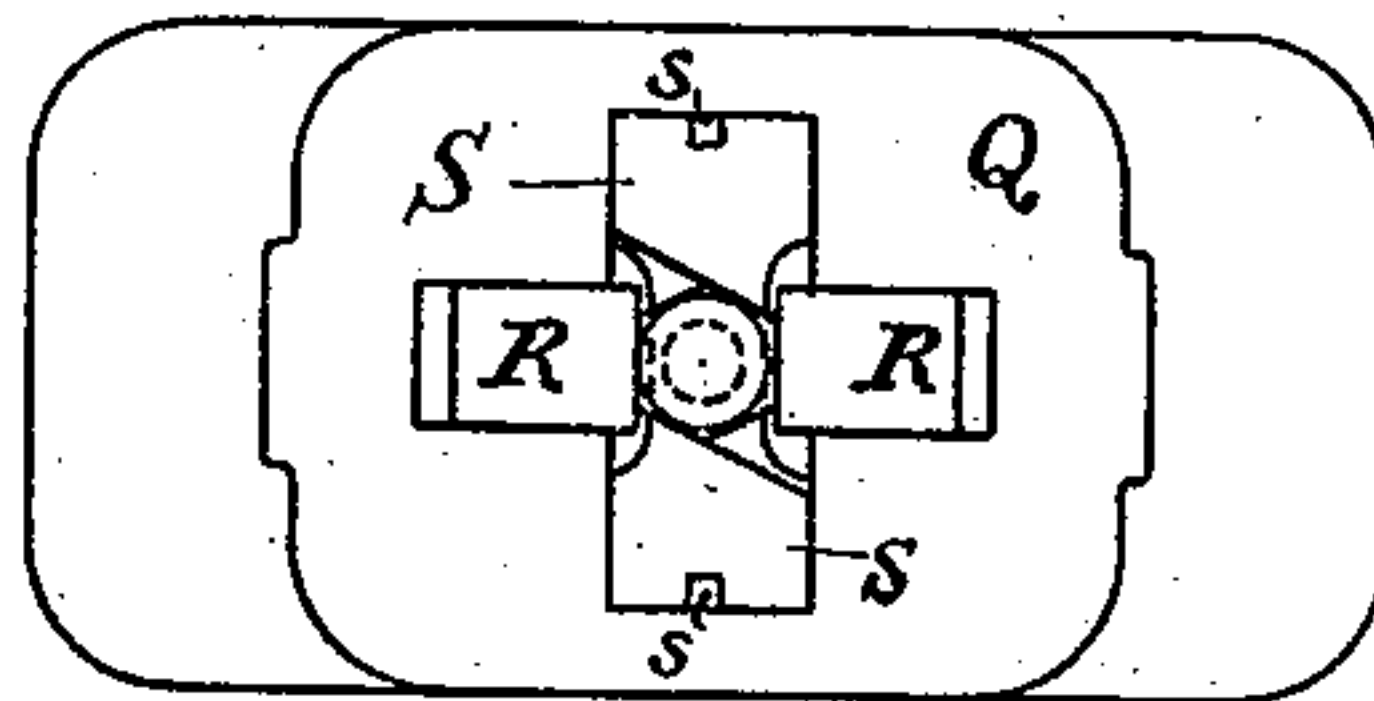
*Fig. 6.*



*Fig. 4.*



*Fig. 5.*



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# UNITED STATES PATENT OFFICE.

EDMOND PIERRE BAVILLE, OF BRUSSELS, BELGIUM, ASSIGNOR TO JULIEN PONTY, OF SAME PLACE, AND HENRY HOWARD, OF COVENTRY, R. I.

## PUNCHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 361,570, dated April 19, 1887.

Application filed October 27, 1886. Serial No. 217,318. (No model.) Patented in Belgium July 26, 1886, No. 73,983.

*To all whom it may concern:*

Be it known that I, EDMOND PIERRE BAVILLE, of Brussels, in the Kingdom of Belgium, have invented certain new and useful  
5 Improvements in Machines for Punching, Shaping, or Cutting Metal, (for which I have obtained a patent in Belgium, No. 73,983, dated July 26, 1886,) of which the following is a specification.

10 The invention consists in certain features of novelty, which are particularly pointed out in the claims, being first fully described with reference to the accompanying drawings, in which—

15 Figure 1 is a vertical section on the line 1 1, Fig. 3. Fig. 2 is a front elevation, and Fig. 3 a plan view, of the complete machine. Fig. 4 is a vertical section, and Fig. 5 a plan view, of the holder for the cutting-tool and the article  
20 being cut. Fig. 6 is a sectional elevation, showing in detail some of the parts hereinafter more particularly referred to.

The frame of the machine consists of an integral casting having a pair of arms or standards, A and A', projecting upward, from the  
25 rear sides of which arms project brackets W and W', respectively, which carry at their extremities journal-boxes, in which is journaled the main driving-shaft A" of the machine.  
30 This shaft is provided at each end with a fly-wheel, V and V', and a belt-pulley, v and v', and at the center with a pinion, A<sup>2</sup>, which meshes with a pinion, A<sup>3</sup>, keyed to the center of a counter-shaft, B, turning in bearings in  
35 the extremities of the arms A A'.

It may here be observed that the machine shown in the drawings is, in its nature, duplex, the parts on opposite sides of the pinion A<sup>3</sup> being absolute duplicates of each other. It will  
40 suffice, therefore, for the purposes of this description, to refer to the parts on one side only, the corresponding parts on the opposite side being designated by the same reference-letters with the addition of the prime mark (').

45 C represents the sliding sleeve of a clutch which is secured to the shaft B, so as to be incapable of rotary but capable of longitudinal movement thereon, by means of a spline and groove, as shown in Fig. 1. The other half of  
50 this clutch consists of a sleeve, D, which has

formed on one end thereof clutch-teeth and on the other end cog-teeth E, which latter occupy a socket formed in the arm A, as shown more clearly in Fig. 6. The teeth of this cog E gear with the teeth formed on one face of a  
55 bar, F, which works within a groove cut in the end of the arm A, being held in place therein and in mesh with the cog E by a plate, G, secured to the end of the arm by screw-bolts. This rack-bar F carries at its lower end the  
60 punch f, and is moved downward by the cog-wheel E whenever the sliding member C of the clutch is brought into engagement with the other member, D, it being again elevated  
by springs H as soon as the two members of  
65 the clutch are disengaged. These springs H surround rods I, projecting upward from the arm A, on opposite sides of the rack-bar F, and bear against the under side of a cross-head, J, which slides on said rods and is con-  
70 nected with the said rack-bar, nuts being placed on the extremities of the rods I to prevent the springs from forcing the cross-head off.

The mechanism for engaging and disengag-  
75 ing the two members of the clutch will now be described.

K represents a short lever, bifurcated at one end and provided with short toes for projecting into the circumferential groove in the  
80 sliding member of the clutch in the usual way, being fulcrumed at an intermediate point to a bracket, L, projecting from the side of the arm A. The other end of this lever is passed loosely through an eye formed through a piece,  
85 M, which latter is provided on its under side with a socket for the reception of the upper extremity of a lever, N, the latter being fulcrumed to a bracket, g, projecting from the  
90 edge of the plate G, and preferably formed integral therewith. The lower end of this lever is crooked, so as to enable the operator to move it to one side with his leg, whereby the  
sliding member C of the clutch is shifted into  
95 engagement with the other member, and the rack-bar F caused to descend. When the rack-bar F has descended as far as it is desired, a tappet or trip, O, projecting from it comes against the inclined face of a lug projecting upward from the bifurcated end of the  
100



lever K, and forces it, and consequently the sliding member C of the clutch, toward the pinion A<sup>3</sup>. This disengages the clutch and permits the springs H to elevate the rack-bar 5 in the manner already described.

So much of the machine as has thus far been described is applicable to all classes of metal-working machines which operate by a reciprocating punch. For dressing the heads of bolts, 10 nuts, and similar purposes I employ a holder constructed as follows:

Q is a heavy metal casting perforated from top to bottom for the passage of the article being operated upon. Extending into the body 15 of this casting and opening into the eye or perforation thereof at opposite points are grooves or recesses within which fit the tools R, which, for the purpose of dressing the opposite sides of nuts and the heads of bolts, consist of rectangular blocks having teeth or serrations formed on their adjacent faces. The 20 grooves in which these tools fit do not extend completely through the casting, but terminate at such a point as to leave offsets or shoulders for supporting the tools against the heavy 25 pressure to which they are necessarily subjected. Extending completely through the casting Q, and at right angles to the grooves just mentioned, are other grooves in which fit rectangular blocks S, whose adjacent faces are 30 held in contact with the sides of the article being operated upon until the punch descends by means of springs or feathers s, fitting in grooves in the backs of said blocks and bearing 35 against the walls of the grooves in which said blocks work. By these blocks the article is held in proper position between the cutters H, said blocks being forced to descend with said bolt under the influence of the punch, all 40 falling together into the enlarged space or cavity T, formed in the under side of the casting Q. By each operation the two opposite sides of the article are dressed, the operation being repeated as often as necessary to produce 45 the desired shape.

In order to facilitate the insertion of bolts with long stems without necessitating the elevation of the punch *f* more than is absolutely 50 necessary to clear the bolt-head when in place, (see Fig. 1,) and thus reduce its extent of movement to a minimum, the casting or holder Q is pivoted, as at *g*, to one side of the vertical line of the punch, so as to enable it to be swung to one side. The bolt may then be inserted 55 and the holder swung back into position for receiving the impact of the punch, a handle, U, being provided for this purpose.

It may be here said that the "rack-bar," so called, constitutes in effect the "plunger" of 60 the machine, and that portions of the invention are applicable to machines having plungers generally, without regard to the particular mechanism by which said plungers are moved.

65 Having thus described my invention, what I claim as new therein, and desire to secure by Letters Patent, is—

1. The combination, with the plunger and a clutch for connecting its operating mechanism with the driving-shaft, of a trip or tappet 70 carried by said plunger and adapted to shift the sliding member of the clutch when the plunger has descended as far as is desired, substantially as set forth.

2. The combination, with a plunger, a revolving shaft, and a clutch for connecting said 75 shaft and plunger, of a trip carried by the plunger for shifting the clutch, and a spring for retracting said plunger, substantially as set forth. 80

3. The combination, with shaft and the two members of a clutch, one of which is provided with cog-teeth, of the rack-bar and a tappet or trip carried by said rack-bar and adapted 85 to shift the clutch, substantially as set forth.

4. The combination of the shaft B, the sliding member C' of the clutch, the lever K for shifting said member, the member D of the clutch, having teeth *d* and cog-teeth E, the bar 90 F, having teeth meshing with the cog-teeth E, and the punch carried by said bar, substantially as set forth.

5. The combination, with the rack-bar F and cog E, gearing therewith, of a rotary shaft and a clutch for connecting said shaft with said 95 cog for turning the latter in one direction, a trip carried by said bar for shifting the clutch, and a spring for moving said bar in the other direction, substantially as set forth.

6. The combination, with the arm A, of the 100 rack-bar F, the cross-head J, to which said bar is connected, the rods I, extending upward from the arm A, the springs H, interposed between the top side of said arm and the under side of the said cross-head, the cog-wheel E, 105 and means for connecting the latter with a moving shaft and disconnecting it, substantially as set forth.

7. The combination, with the shaft and the clutch mounted thereon, of the operating-lever 110 K, having inclined projections P, and the plunger having tappet O, for engaging said inclined projection for shifting the clutch, substantially as set forth.

8. The combination, with the shaft and the 115 clutch mounted thereon, of the lever K, engaging the sliding member of said clutch, and the operating-lever N, having a sliding connection with the lever K, substantially as set forth. 120

9. The combination, with the plunger, of the perforated casting Q and the cutters arranged therein, substantially as set forth.

10. The combination, with the plunger, of the perforated casting Q, the cutters R, and the 125 gripping-blocks S, for holding the article in proper position between the said cutters, substantially as set forth.

In testimony whereof I have hereunto set my hand.

EDMOND PIERRE BAVILLE.

Witnesses:

LÉON DOGQUIER,  
AUG. FOERISSEN.