

(No Model.)

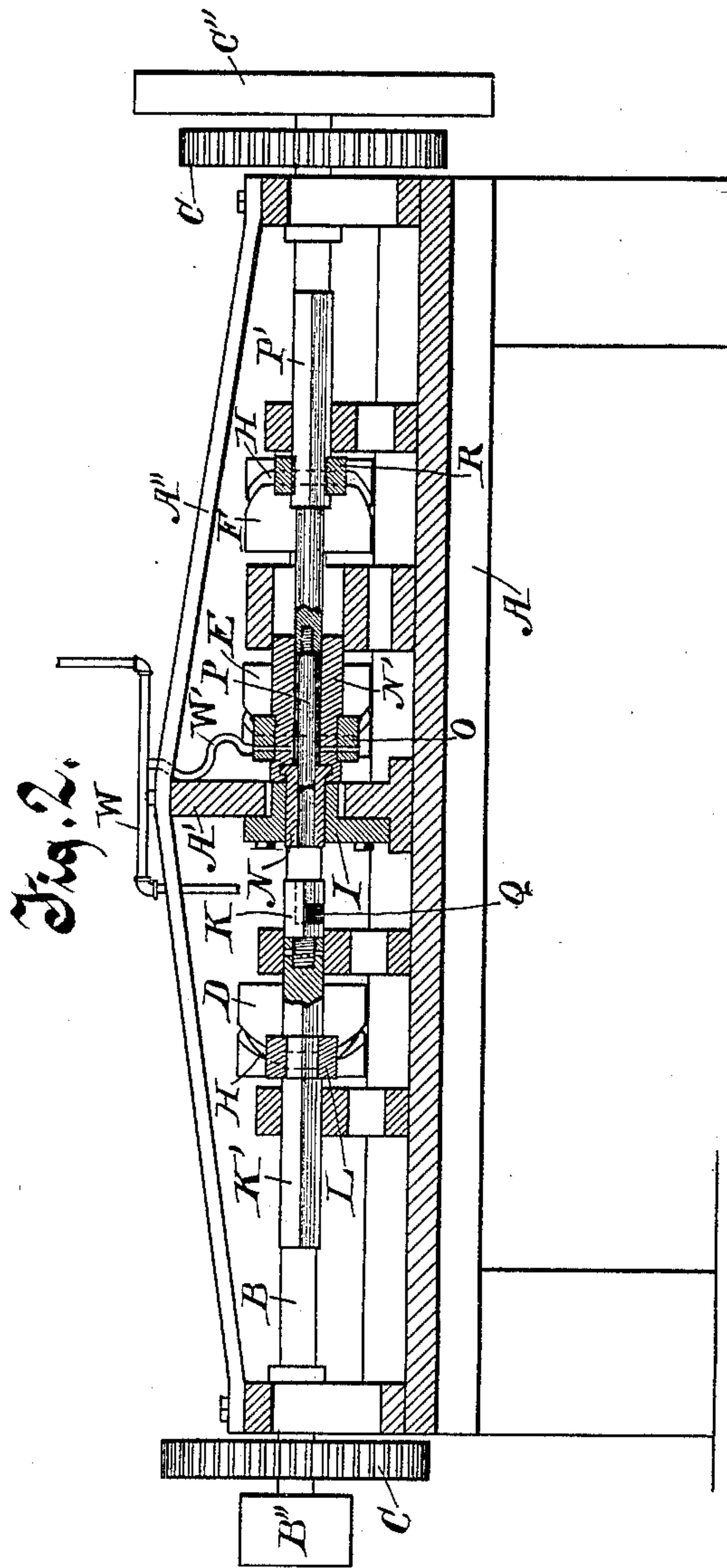
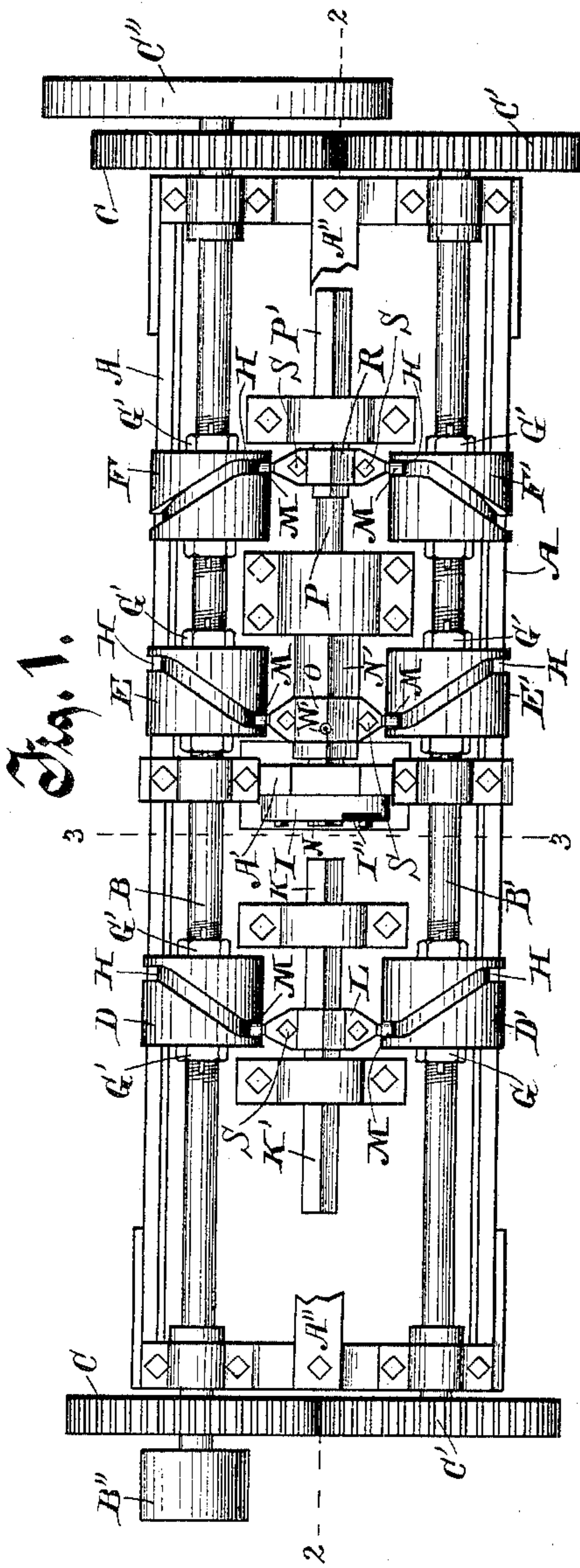
2 Sheets—Sheet 1.

J. ALTMANN.

NUT SHEARING AND PUNCHING MACHINE.

No. 467,908.

Patented Feb. 2, 1892.



Witnesses.

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Anna C. Faust,

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(No Model.)

2 Sheets—Sheet 2.

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Fig. 3.

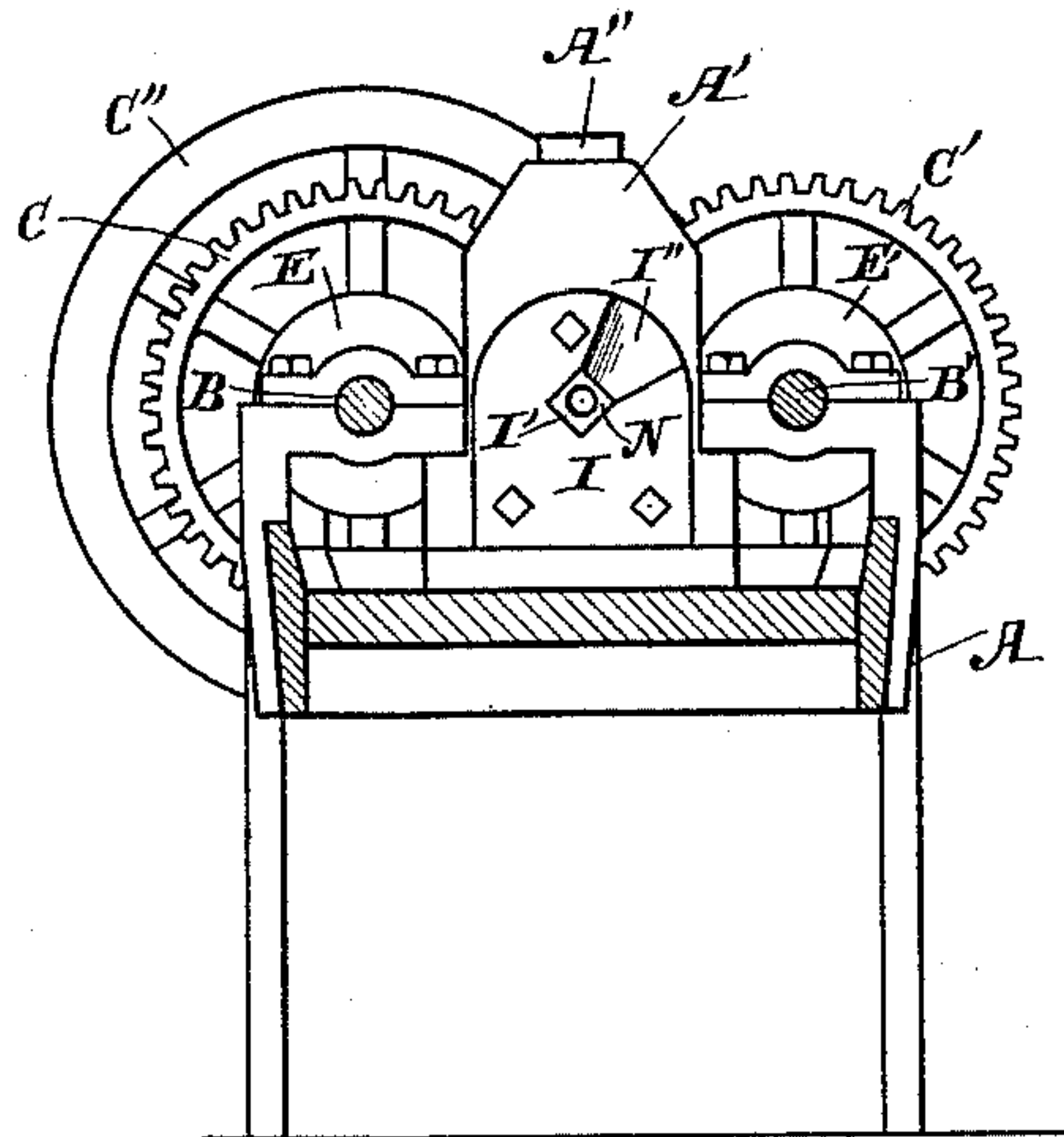


Fig. 4.

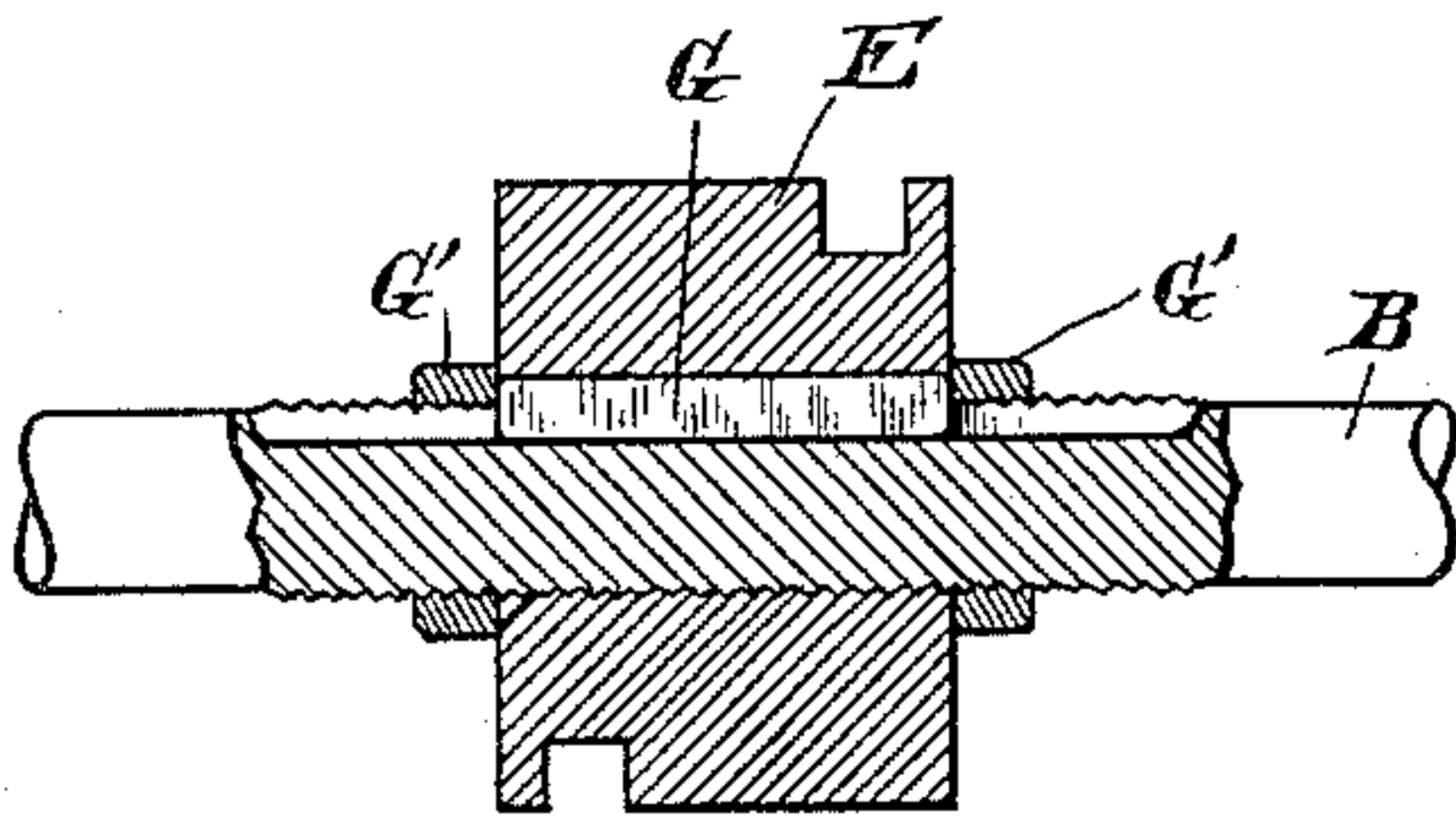
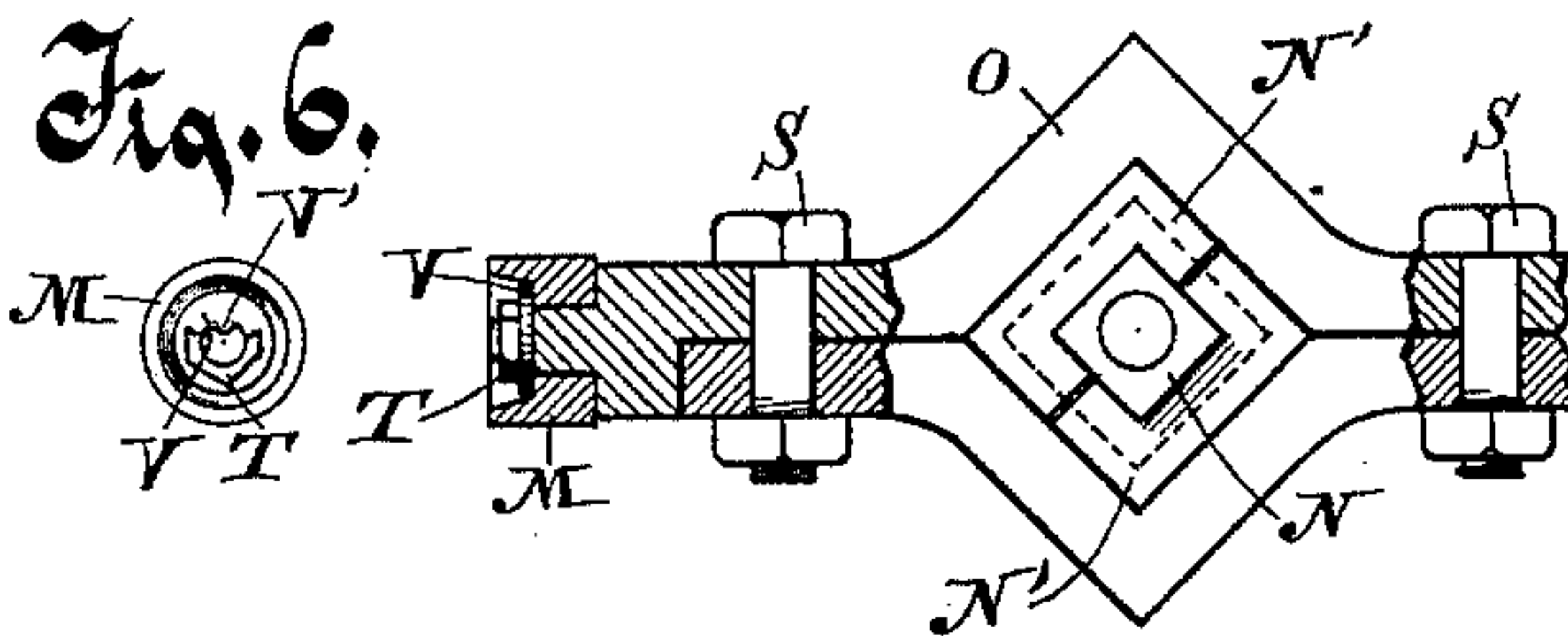


Fig. 5.

Fig. 6.



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UNITED STATES PATENT OFFICE.

JULIUS ALTMANN, OF MILWAUKEE, WISCONSIN, ASSIGNOR OF TWO-THIRDS
TO WM. B. NEEVES AND GEORGE A. NEEVES, OF SAME PLACE.

NUT SHEARING AND PUNCHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 467,908, dated February 2, 1892.

Application filed March 27, 1891. Serial No. 386,631. (No model.)

To all whom it may concern:

Be it known that I, JULIUS ALTMANN, of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented a new and useful Improvement in Nut Shearing and Punching Machines, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

My invention relates to a machine adapted to shear and punch nut-blanks from a bar of metal; and the invention consists in the novel mechanism hereinafter to be claimed for cutting or shearing the nut-blank from a bar of metal and punching the bolt-aperture therefrom and forcing the blank out of the machine.

In the drawings, Figure 1 is a top plan view of the complete machine, a part of the frame only being broken away to exhibit the operative mechanism. Fig. 2 is a longitudinal vertical section of the machine on line 2 2 of Fig. 1. Fig. 3 is a transverse vertical section of the machine on line 3 3 of Fig. 1, looking toward the right. Fig. 4 is a longitudinal central section of one of the cams or eccentrics on a fragment of a shaft. Fig. 5 is a front end view of the clearing-punch and of a portion of the transverse arms secured thereto, which ride in the cams, one arm being shown to its extremity and partly in central section to show interior construction. Fig. 6 is an end view of the arm shown in Fig. 5, parts being broken away for better illustration.

The frame A is of suitable form and strength to support the operative mechanism. As a part of the frame there is included the central fixed post A' and the longitudinal brace or stay rod A''. Two shafts B B' parallel to each other have their journal-bearings in the frame and are geared to each other by cog-wheels C C', giving them concurrent revolvable motion, the shafts being driven by a belt from the power-supply running on the fixed pulley B''. A fly-wheel C'' is also fixed on the shaft B to steady and equalize the motion of the mechanism. The shaft B carries thereon the cams D, E, and F, and the shaft B' carries corresponding cams D', E', and F'.

These cams are each secured to the shaft adjustably by means of a key G and nuts or collars G', turning on the shaft against their respective ends. These cams are arranged opposite each other in pairs on the two shafts B and B', and the cams are each formed in and by a reversely-directed oblique or screw-directed channel in the periphery of a wheel on the shaft. Portions of each of the channels are straight or circumferential at right angles to the shaft, as shown at H.

The post A' is located about centrally of the frame and a shearing-plate I is bolted thereto, which shearing-plate has a transverse aperture I' of the size and form in which the nut-blank is to be cut. A recess or channel I'' is also advisably formed in the face of the plate I from the aperture I' outwardly, which recess preferably widens somewhat toward the outer edge of the plate. This recess is adapted to receive the bar of metal from which the nut-blank is to be cut, and the walls of the recess are shouldered to assist in holding the bar in position for the action of the shearing-punch thereon. In front of the shearing-plate a shearing-punch K is fixed removably in a punch-stock K', which punch-stock is supported reciprocally endwise in bearings therefor in the frame. A cross-head or transverse arms L are secured rigidly but adjustably and removably to the punch-stock K', which arms at their respective outer ends ride in the cams D and D' and are actuated thereby. Anti-friction wheels M are axled on the extremities of the arms L and on the extremities of similar arms on other punches and furnish the bearing-surface of the several arms on the several cams. The cams D and D' are arranged to act concurrently and harmoniously on the arms L, forcing the punch K forwardly against the material from which the blank is to be cut, placed in front of and against the shearing-plate I, and to cut the blank therefrom by forcing so much of the material into the shearing-plate, thereby separating it from the bar of metal. The punch is then carried rearwardly by the further action of the cams until it reaches its limit of travel. This punch and the other punches hereinafter to be described remain

stationary at the extremes of their travel, while the ends of their arms travel in the circumferentially straight parts H of the several cams.

5 At the rear of the shearing-plate a clearing-punch N of the same size and form in transverse section as the punch K is fixed removably in the punch-stock N', which punch-stock is reciprocal in the frame and is provided with transverse arms O, secured removably thereto. The extremities of the punch-arms O are provided with anti-friction wheels M, which bear on the cams E and E', respectively, and are actuated thereby. These cams and this punch N are so arranged that the punch moves forward toward the shearing-plate as the punch K moves away from it and forces the nut-blank out of the shearing-plate, and is moved rearwardly before the punch K advances again.

At the rear of the punch-stock N' a punch-stock P' is reciprocal endwise in bearings therefor in the frame. The punch-stock P' carries a round punch P, which punch P and a portion of the stock P' passes longitudinally in an aperture therefor through the stock N' and the punch N. The punch-stock P' is provided with transverse arms R, fixed thereon adjustably and removably, which arms are provided with anti-friction wheels M, riding on the cams F and F', by which the punch is actuated. The cams F and F', the arms R, and the punch P are arranged to move forwardly just after the punch K moves toward the shearing-plate and the punch P enters the nut-blank while it is at rest in the shearing-plate and forces a core therefrom, forming the bolt-aperture, which core is pushed into the hollow end of the punch K and falls therefrom through the side aperture Q. The punch P moves rearwardly and is withdrawn from the nut-blank at the same time that the punch K moves away from the shearing-plate, and the nut-blank is then forced out of the shearing-plate by the forward movement of the clearing-punch N.

The punch-stock N' is preferably made in two parts longitudinally, which parts are clamped together by the two parts of the arms O, which are secured together by bolts S. The wheels M are axled on the projecting end of one part of the arm O, and are secured revolvably thereon by nuts T, turning on the end of the axle against a washer V, preferably provided with a tongue entering a groove V' therefor in the axle. The wheels, preferably, project over the washer and nut. The arms L and R are constructed substantially like the arms O, as just described. A pipe W supplies water, which is discharged on the punch K' to keep it cool, and a branch flexible pipe W', leading from the pipe W to a duct therefor in the stock N', discharges water on the punch P for cooling it.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with a frame and a shearing-plate thereon, of a shearing-punch reciprocal endwise in the frame and cams on revolving shafts, which cams actuate the shearing-punch, substantially as described.

2. The combination, with a frame and a shearing-plate fixed thereon, of a reciprocal shearing-punch, a reciprocal core-punch, and cams on revolving shafts actuating the shearing and core punches, substantially as described.

3. The combination, with a frame and a shearing-plate fixed thereon, of a reciprocating shearing-punch, a reciprocating core-punch, a reciprocating clearing-punch, and cams on revolving shafts actuating the several punches, substantially as described.

4. In a shearing and punching machine, a shearing-plate fixed on the frame, which shearing-plate has an aperture of the form and size of the nut-blank to be produced, and a recess or channel radiating therefrom in the face of the plate for receiving the metal bar of material therein, substantially as described.

5. In a shearing and punching machine, the combination, with a frame and revolving shafts fixed therein, of wheels secured in pairs opposite each other on the shafts, which wheels are provided with corresponding cam-grooves in their peripheries, a punch-stock reciprocal endwise in the frame between the cam-wheels, and arms fixed on the punch-stock and riding in the cam-grooves in the wheels, substantially as described.

6. In a shearing and punching machine, a reciprocating punch-stock, arms secured thereto, anti-friction wheels axled thereon and rotating at right angles to the axis of the arms, and wheels on revolving shafts having cam-grooves in their peripheries, in which the friction-wheels on the arms travel, all combined substantially as described.

7. In a shearing and punching machine, a fixed shearing-plate, a reciprocal clearing-punch arranged to enter the shearing-plate from the rear, and a core-punch reciprocal on the frame and through the clearing-punch in an aperture therefor, combined substantially as described.

8. In a shearing and punching machine, a punch, a stock therefor formed in two parts longitudinally, and transverse arms formed in two parts bolted together about the punch-stock and clamping the parts of the punch-stock to each other, substantially as described.

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

JULIUS ALTMANN.

Witnesses:

C. T. BENEDICT,
ANNA V. FAUST.