

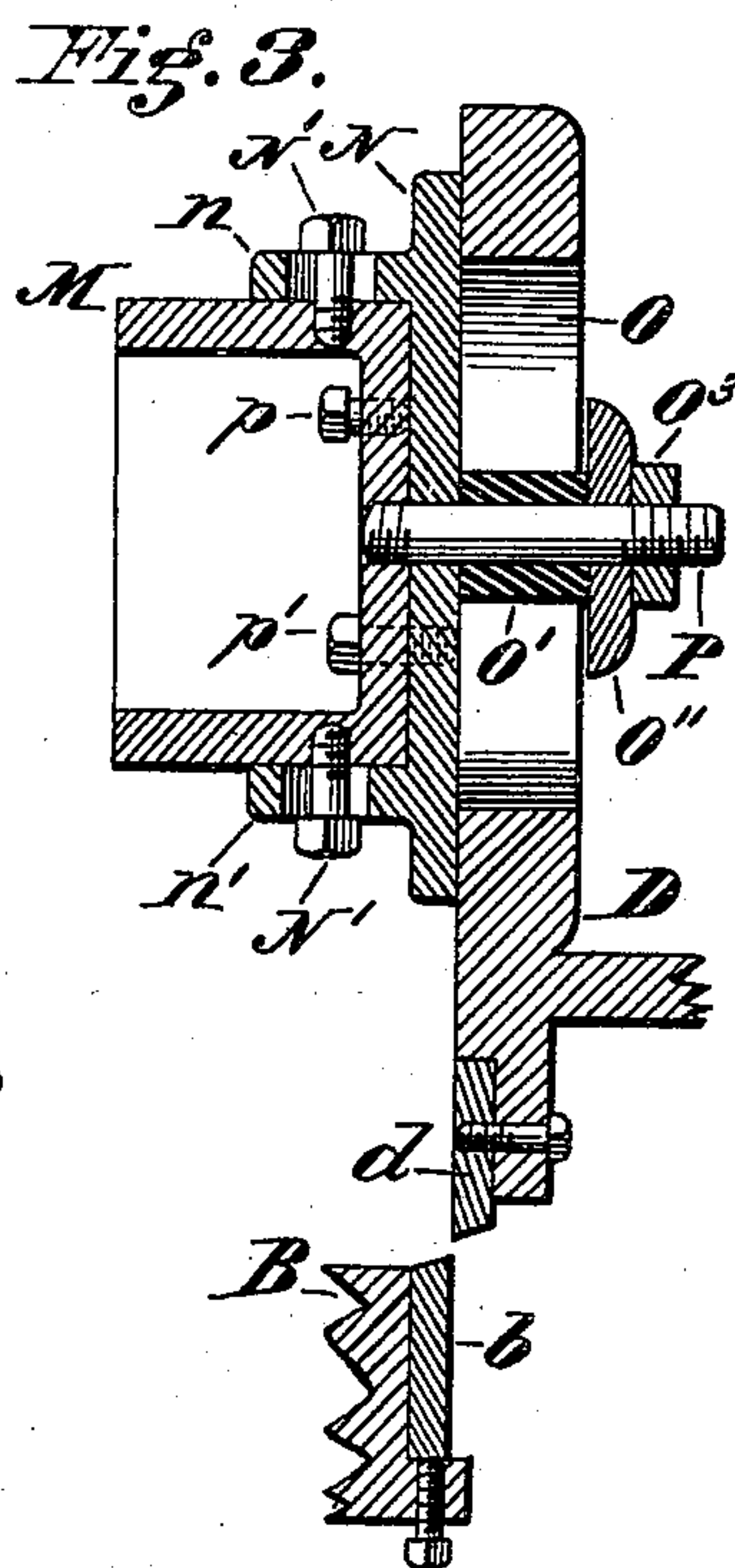
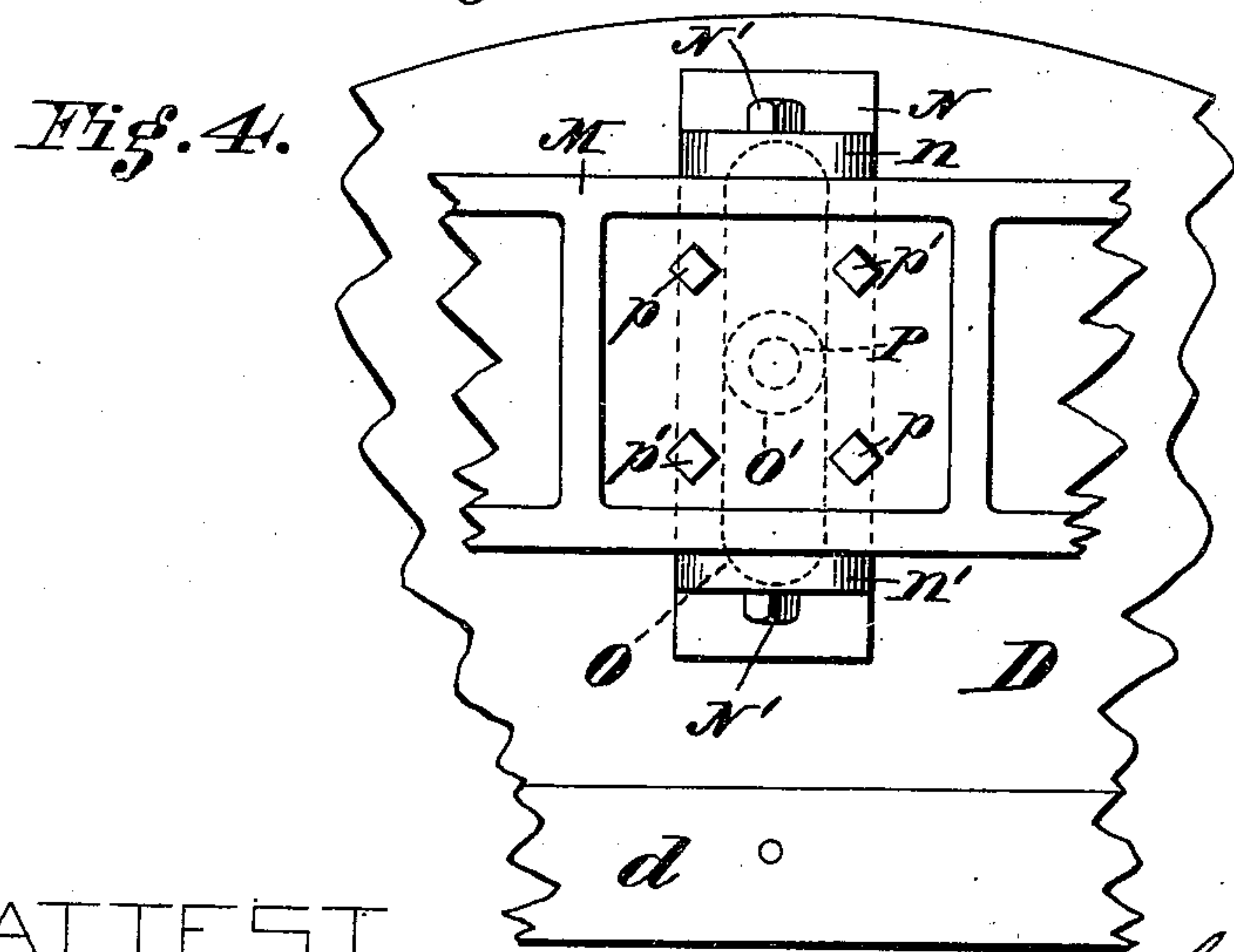
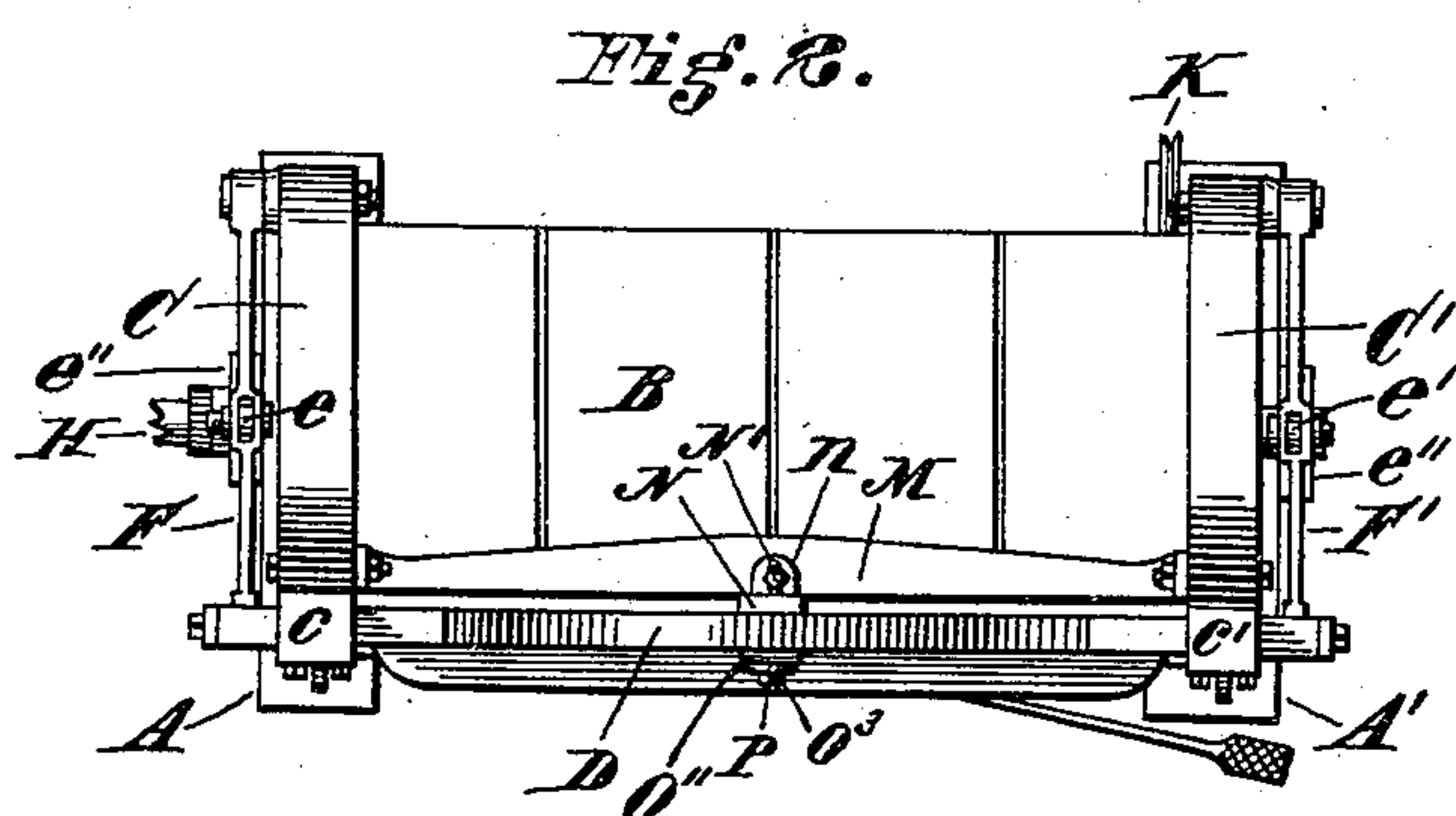
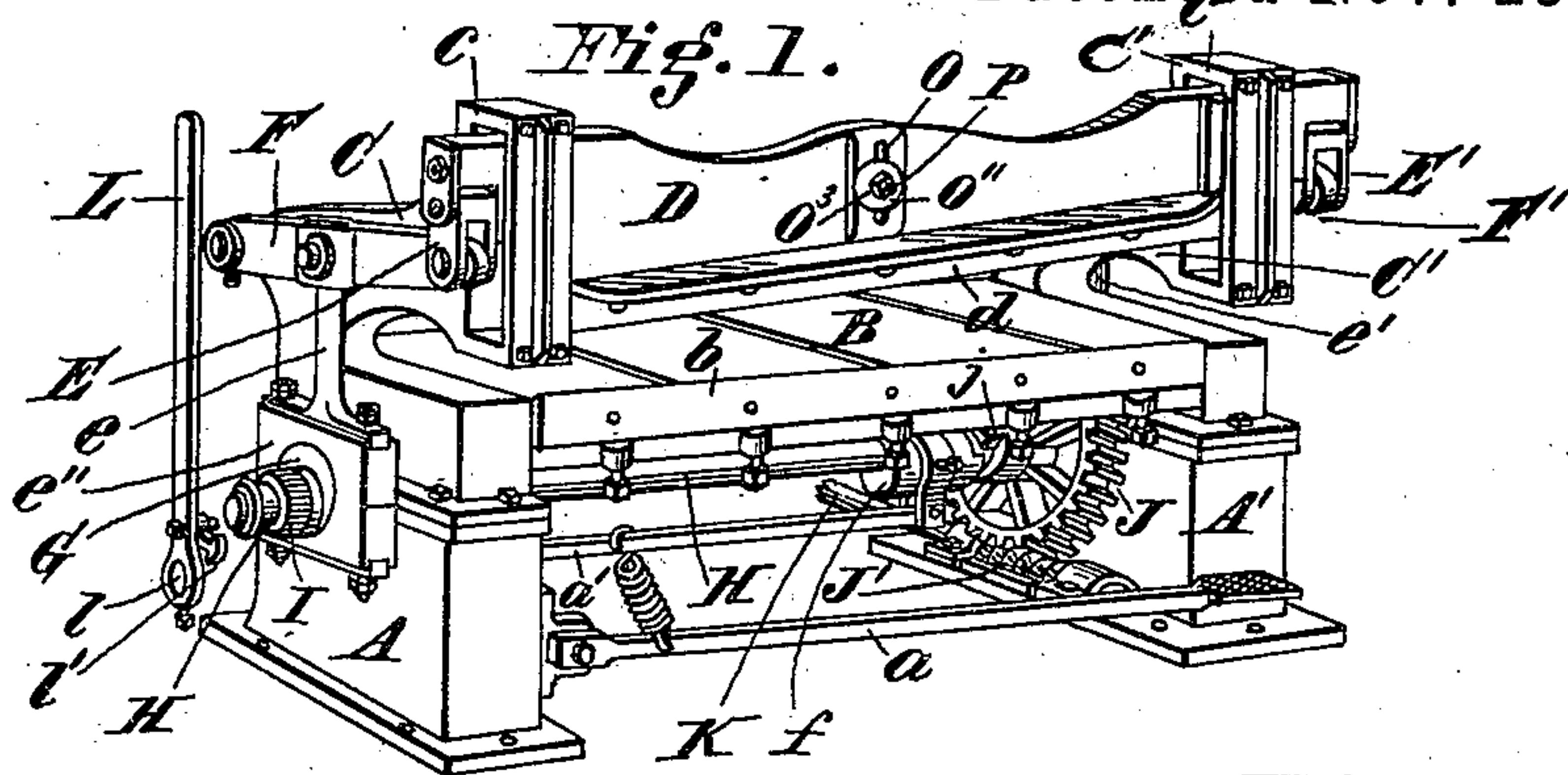
(No Model.)

C. WAIS.

METAL SHEARING MACHINE.

No. 353,041.

Patented Nov. 23, 1886.



ATTEST:

Edw. J. Dempsey.
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INVENTOR

Christian Wais,
by John E. Jones,
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UNITED STATES PATENT OFFICE.

CHRISTIAN WAIS, OF CAMBRIDGE CITY, IND., ASSIGNOR TO CHARLES A. BERTSCH AND JOHN J. BERTSCH, BOTH OF WAYNE COUNTY, IND.

METAL-SHEARING MACHINE.

SPECIFICATION forming part of Letters Patent No. 353,041, dated November 23, 1886.

Application filed April 19, 1886. Serial No. 199,300. (No model.)

To all whom it may concern:

Be it known that I, CHRISTIAN WAIS, a citizen of the United States, residing at Cambridge City, in the county of Wayne and State of Indiana, have invented certain new and useful Improvements in Machinery for Shearing Sheet Metals, of which the following is a specification.

My invention relates to improvements in machines for shearing iron, steel, and other materials in sheet form; and the objects of my improvements are, first, to provide, in connection with the shear-blade-supporting gate or beam, which is suitably mounted in guides on the main frame of the machine, so as to reciprocate vertically therein, two horizontal arms or levers pivoted at their rear ends upon said main frame, and pivotally connected at their fore ends with the opposite outer ends of said shear-gate, and vertical rods or links connecting said horizontal arms or levers intermediate their ends with a pair of eccentrics on a driving-shaft, whereby said shearing-gate is operated by a downward pull of said vertical rods, and both light and heavy work performed with equal facility; second, to provide, in connection with the movable shearing gate or beam and its said operating levers and rods, a driving-shaft having a pair of eccentrics keyed thereto for engagement with said rods, and a clutch and worm-gear driving mechanism, whereby the machine may be readily connected with any motive power for heavy work; third, to provide, in connection with said shearing-gate and its driving mechanism, composed of the horizontal arms, vertical rods, and the driving-shaft provided with eccentrics, as aforesaid, a ratchet-wheel mounted upon either or both the outer ends of said shaft, and a hand-lever having a dog engaging said ratchet-wheel, whereby the machine may be operated by hand-power for light work; and, fourth, to provide, in connection with said movable shear gate or beam, a rigid stationary tie-beam or bridge-tree, the said shear-gate being loosely connected with said tie-beam by means of an embracing shoe or plate attached to the tie-beam about mid-length, a center bolt projecting from the tie-beam through a vertical slot in said shear-beam, and set-screws for properly adjusting said shear-beam to or from the

tie-beam, whereby that part of the upper shear-blade intermediate its ends is prevented from springing laterally or outwardly from the lower shear-blade in its operation of cutting the metal.

In the accompanying drawings, Figure 1 is a perspective view of a shearing-machine embodying my invention, showing the lever for operating the shear by hand detached. Fig. 2 is a plan view of the same, with the driving-shafts shown broken off and the hand-lever omitted. Fig. 3 is a central vertical section of the movable shear gate or beam and the stationary tie-beam, showing the embracing-shoe joint and adjustments, and also a broken-off portion of the shearing-table and lower shear-blade; and Fig. 4 is a broken rear elevation of the parts shown in Fig. 3, with the lower shear-blade and table omitted.

A A' represent the vertical side legs or frame proper of the machine, supporting between them the table B, upon which the sheet metal is placed for cutting.

b represents the stationary or lower shear-blade secured to the front edge of table B.

C C' represent overhanging arms, forming a part of the frame-legs A A', and having guide-boxes c c' at their outer ends, for receiving the opposite ends of the reciprocating shear-gate D, which carries upon its lower edge the upper shear-blade, d, as shown and described in my former Letters Patent of the United States, numbered 271,956, granted February 6, 1883, and 312,236, granted February 10, 1885.

E E' are pendent links pivotally connected with the outwardly-projecting ends of the shear-beam D.

F F' are horizontal arms or levers pivoted at their rear ends to the side frames, A A', and pivotally connected at their fore ends with the shear-beam D by means of the said links E E'.

e e' are vertical rods or pitmen pivotally connected at their upper ends with the levers F F', about midway their lengths, and provided with boxes e'' at their lower ends, for receiving the eccentrics G, keyed to a through-shaft, H. The shaft H is a horizontal driving one, mounted in the side legs, A A', with its ends projecting outwardly a short distance to receive said eccentrics, and also a rigid toothed collar or ratchet-wheel, I, at either or both said ends.

J represents a gear-wheel mounted loosely upon shaft H, and forming, with the endless screw J' on the counter-shaft K, a worm-gear-driving mechanism for operating the shear-gate D, by steam or other motive power, for heavy work. Suitable clutch devices, such as are shown in Fig. 1, and composed of a foot-lever, *a*, at the front of the machine, and connecting by means of a rod, *a'*, with a sliding clutch-collar, *f*, feathered to shaft H, which collar engages a clutch-hub, *j*, on the gear-wheel J, may be used for readily throwing into and out of gear the driving mechanism.

L represents a lever having an opening, *l*, and a pivoted dog, *l'*, at its lower end, and adapted to be loosely mounted upon the outer end of shaft H, when it is desired to operate the machine by hand-power for light work, said dog engaging the teeth of the ratchet-wheel I on said shaft.

M represents a horizontal ribbed tie-beam or bridge-tree rigidly secured at its ends to the overhanging arms C C', immediately in rear of the reciprocating shear-gate D.

N is a vertical shoe or plate having slotted horizontal arms or lugs *n n'* at its top and bottom, for embracing the central front face of the tie-beam M, and N' are screws or taps whose shanks pass through the slots in said arms *n n'* into the said tie-beam for securing the embracing-shoe N in place.

O is a vertical slot cut in shear-beam D, midway its length, and adapted to receive a center bolt, P, which is tapped at one end into the tie-beam M, and projects therefrom through the embracing-shoe N and the said shear-beam.

O' is a thimble or collar fitting upon the bolt P, within slot O, and adapted to serve as a roller or trundle to overcome any undue friction of the bolt and the inner walls of the slot in the vertical movements of the shear-beam.

O'' is a washer, and O³ a nut on bolt P, the washer abutting the outer rim of thimble O' and the nut abutting said washer, to suitably secure the parts in place and at the same time permit the shear-beam to rise and fall freely in its operation of shearing. The said center bolt and its adjuncts, as above described, effectually prevent the central portion of the shear-beam springing outwardly or away from a direct vertical line at the time the shear-blade, which it carries, comes in contact with and passes through the sheet to be cut.

To set the shear-beam properly in relation with the tie-beam, and make due allowance for any wear on the inner faces of the shear-beam and the embracing-shoe N where they come in contact with one another, I provide set screws or taps *p* and *p'*. There are two sets of these set-screws *p* and *p'*, and both sets pass through the tie-beam M, on either side the center bolt, P, the inner ends of screws *p* merely abutting the embracing-shoe N, and the ends of screws *p'* passing into the said embracing-shoe, as shown in Fig. 3. Screws *p*, when

turned inwardly, move the shear-beam outwardly, or away from the tie-beam M, and screws *p'* draw said shear-beam inwardly toward said tie-beam. Before either of the last-preceding operations can be performed the fastening-screws N' must be released or loosened, as is obvious, and before the screws *p* can be operated properly screws *p'* must be likewise loosened, and vice versa.

I claim—

1. In a shearing-machine, the combination, with the shear-blade-supporting gate or beam D, mounted in guides *c c'* on the main frame for its vertical movement, of two horizontal arms or levers, F F', pivoted at their rear ends upon said main frame, and pivotally connected at their fore ends with the opposite outer ends of said shear-gate, and vertical rods or links *e e'*, connecting said horizontal arms or levers with a pair of eccentrics, G, on a through driving-shaft, H, whereby said shear-gate is operated by a downward pull of said vertical rods, substantially as and for the purpose specified.

2. In a shearing-machine, the combination, with the shear-gate D and its reciprocating arms and rods, of a driving-shaft, H, provided with eccentrics G, for engagement with said rods, and a clutch and worm-gear driving mechanism composed of the gear-wheel J, endless screw J', counter-shaft K, foot-lever *a*, connecting-rod *a'*, sliding clutch-collar *f*, and clutch-hub *j*, the parts being connected and adapted to operate substantially in the manner and for the purpose described.

3. In a shearing-machine, the combination, with the shear-gate D and its driving mechanism composed of the horizontal arms, vertical rods, and the driving-shaft provided with eccentrics, as in the immediately-preceding claim, of a ratchet wheel or wheels, I, mounted upon either or both ends of said shaft, and a hand-lever, L, having a pivoted dog, *l'*, at its lower end engaging said ratchet-wheel, whereby the machine may be operated by hand-power for light work, substantially as herein set forth.

4. In a shearing-machine, the combination, with the movable shear-gate D, of a stationary tie-beam, M, said shear-gate being loosely connected with said tie-beam by means of an embracing shoe or plate, N *n n'*, attached to the tie-beam about mid-length, a center bolt, P, projecting from the tie-beam through a vertical slot, O, in the shear-gate, to receive a washer, O'', and nut O³ on its outer end, and set-screws *p* and *p'*, for adjusting the shear-gate to or from the tie-beam, substantially as and for the purpose specified.

In testimony of which invention I have hereunto set my hand.

CHRISTIAN WAIS.

Witnesses:

JOHN E. JONES,
L. M. WELLS.