

No. 623,013.

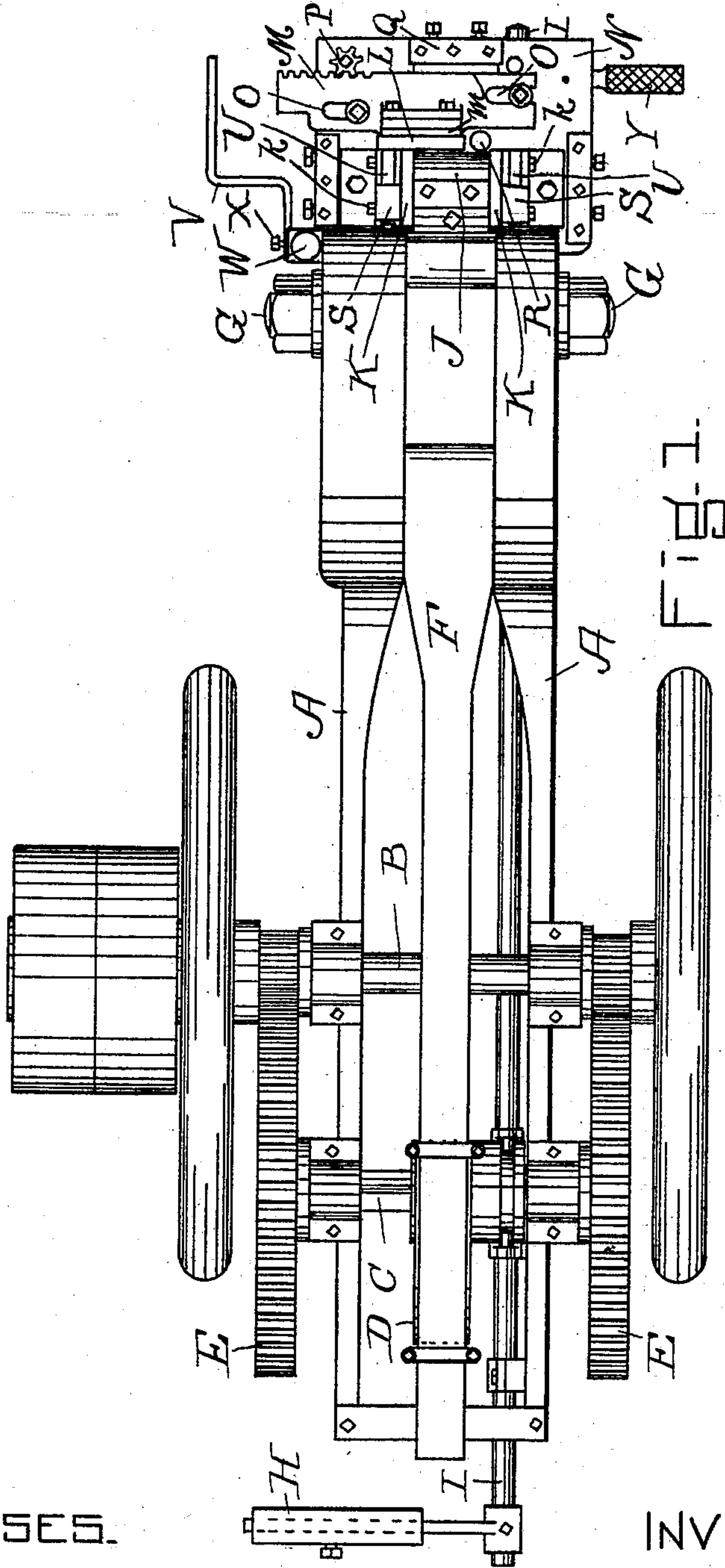
Patented Apr. 11, 1899.

L. M. HAM.
METAL CUTTING MACHINE.

(Application filed Aug. 25, 1898.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES.

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L. M. Ham
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ATT'Y.

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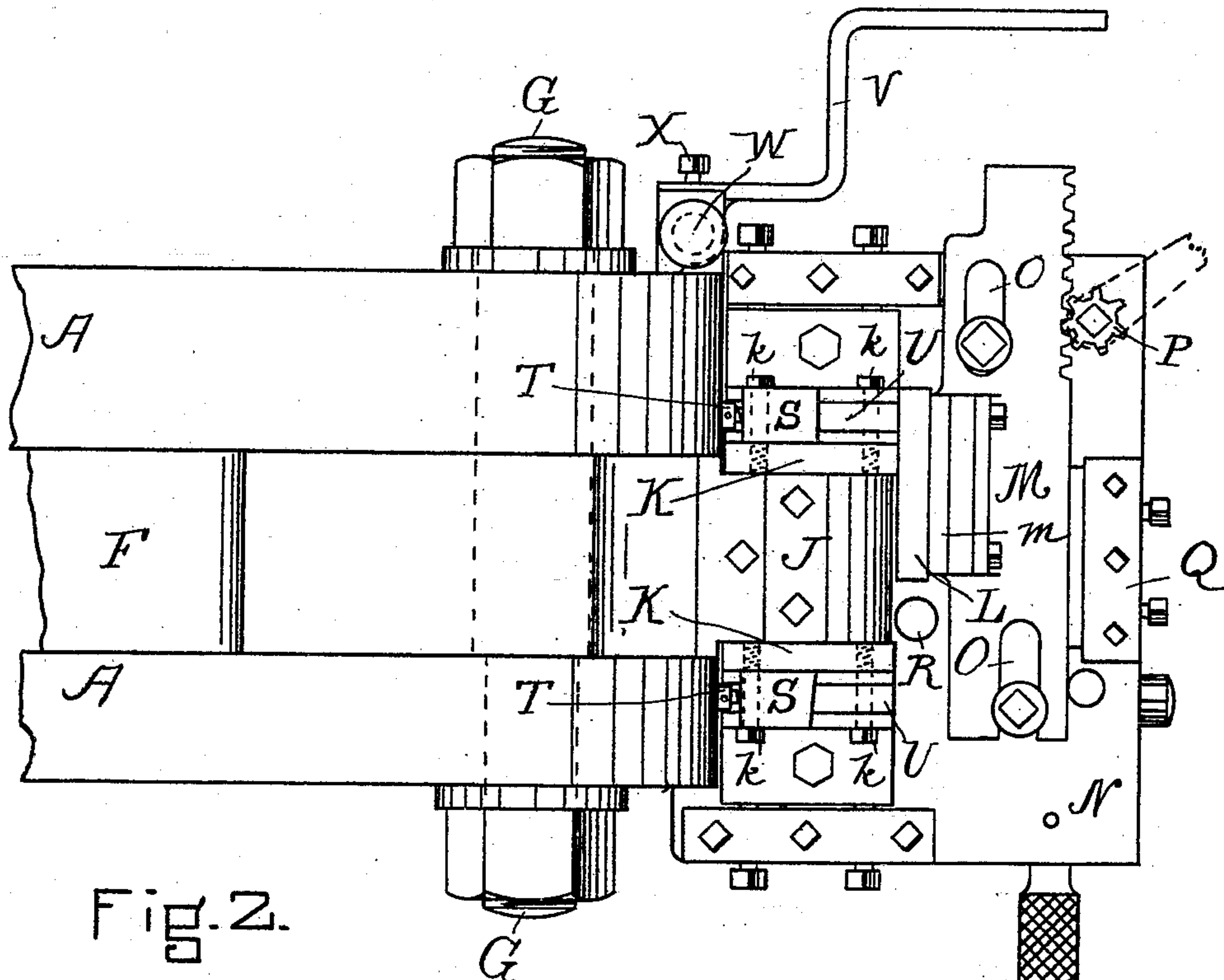


Fig. 2.

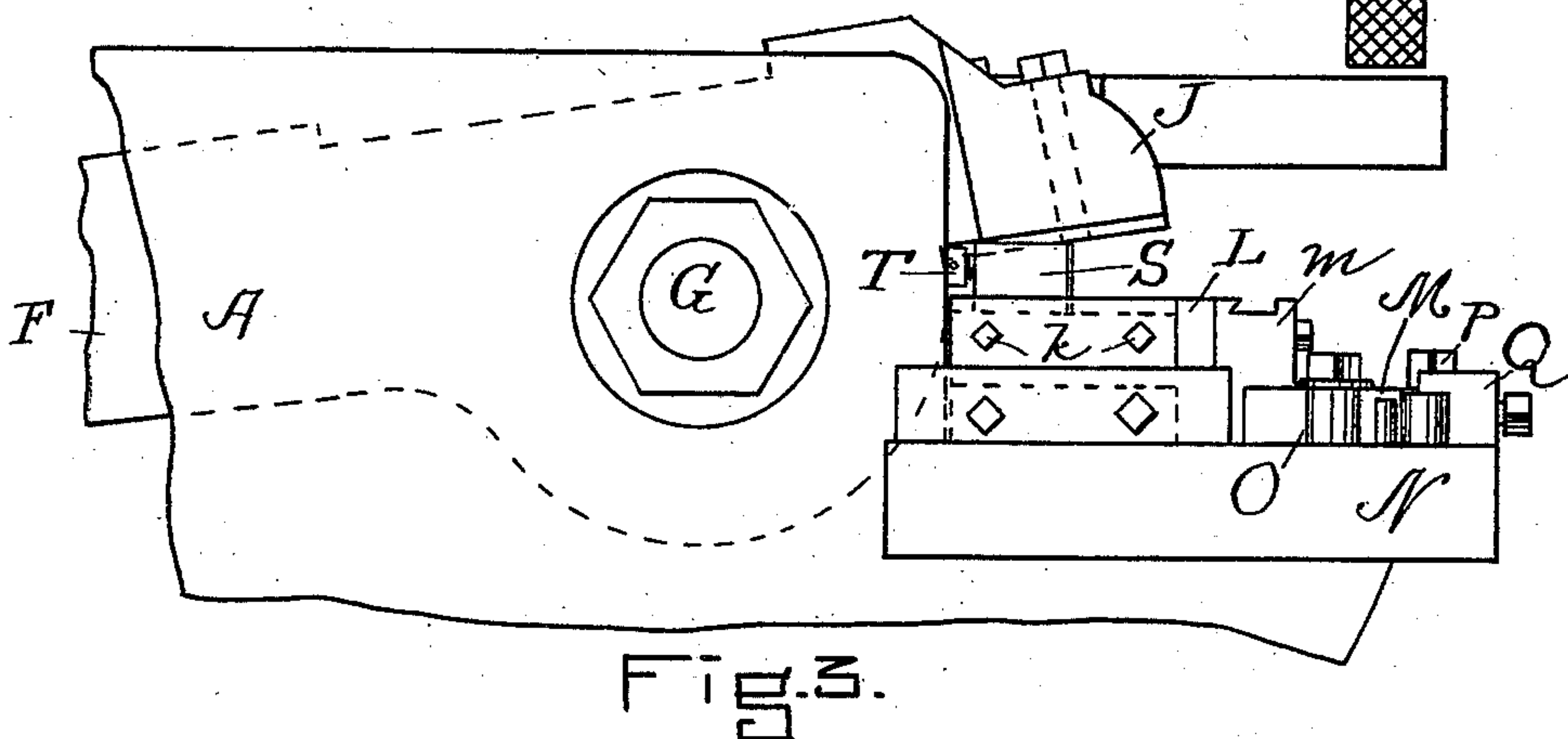


Fig. 3.

WITNESSES.

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INVENTOR.

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UNITED STATES PATENT OFFICE.

LEMUEL M. HAM, OF BOSTON, MASSACHUSETTS.

METAL-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 623,013, dated April 11, 1899.

Application filed August 25, 1898. Serial No. 689,482. (No model.)

To all whom it may concern:

Be it known that I, LEMUEL M. HAM, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Metal-Cutting Machines, of which the following is a specification.

The especial object of my invention is to provide means for quickly cutting off or shaping the ends of structural iron or steel beams, particularly those having double flanges at each edge of a thin central web. In steel-frame structures it is frequently necessary to join these beams together at right angles or otherwise, in which case the end of the web of one beam should protrude between the flanges and against the side of the web of the other one, the two being then joined by bolts through angle-irons and said webs. My improved coping-machine removes these flanges expeditiously and shapes the protruding web to also fit upon the inclined surface of the flanges.

My invention consists in a metal-cutting machine having a vibrating cutting head or jaw and stationary dies cooperating therewith at each side of said head, in combination with a front die made movable in the line of the front of the cutting-head, so as to open a space at the corner, between the front and side dies, to receive the projecting flange of the beam. A rack and pinion, with a lever or other suitable device for moving the front die, are provided, also stout insertible blocks of various heights for the edge of the flange of the various sizes of beams to rest on. In addition to this gages adjustable by a screw and preferably having sliding dovetailed ways are located at the sides of the cutting-head to limit the cutting action to the extent desired. These gages may have beveled front faces corresponding to the inclination of the flange-surface. I also provide a swinging and vertically-adjustable guard-arm which may serve to hold in position short beams or pieces during the cutting operation.

In the drawings, Figure 1 is a plan of a machine embodying my invention. Fig. 2 is a plan, and Fig. 3 a side elevation, of the front end of said machine, showing, on a larger

scale, the parts to which my improvements relate.

Referring first to Fig. 1 as a suitable form of operative mechanism, A represents the body or frame of the machine, B the main shaft, with pulleys, fly-wheels, and geared pinions, and C a square shaft carrying a cam D, rotated by gear-wheels E, meshing with said pinions, said cam working beneath the extremity of the long arm of the vibrating lever F, which has as its fulcrum the transverse shaft G, mounted in the reinforced sides of the frame. The cam has a sidewise movement on its shaft C, so that it may slide into and out of position by pressure on a treadle Y and by the reverse action of a weight H, applied to a longitudinal shaft I. I make no claim of invention to these parts, nor do I limit myself thereto, as my improvements may be combined with any equivalent mechanism.

The cutting-head J is the enlarged end or short arm of the lever F. (See Figs. 2 and 3.) It is faced with steel and works in a vertical plane between the side dies K K and the front die L, so as to have a powerful cutting action upon the interposed metal. The side dies are fixed in permanent position by bolts k. The front die L, however, is made movable, being bolted to an abutment m, formed on a sliding block M, which rests on the flat bed N at the front of the machine. Slots O in said block and stout pins located therein form guides for the movement of the block, which is actuated by a pinion P, engaging the teeth of a rack formed in the edge of the block, such pinion having a suitable handle. An adjustable front stay Q supports said block in its operative position.

In Fig. 2 the front die L and its carrying block M are seen retracted, so that a space is opened between said die and one of the side dies K. In that space a rest R is shown, such rest being a cylindrical pin of proper height having a reduced lower end inserted in a hole in the flat bed N. It serves as a support for the edge of the flange of the beam to rest upon during some of the cutting operations when the die L is moved for its insertion. For various widths of flange similar variations in length of the rest-pin R will be made.

S is an adjustable gage at each side of the cutting-head and adjacent to the side dies. These gages regulate the extent to which the beam-flange can enter beneath the raised cutter-head. Their location is adjusted by screws T, the heads of which abut against the vertical front wall of the frame. The gages are held in place adjustably by a dovetailed engagement with grooved ways U, in which they may slide. The front face of one of these gages is shown in Fig. 2 to be oblique. In use if the square end of the web of the beam is parallel to this front face the edge of the web will be trimmed by the side dies on an equally oblique line.

V represents a guard-arm mounted on a vertical shaft W at the side of the frame adjustable up and down by set-screws X and adapted to swing around in front of the cutting-head, so as to hold down any small or short piece of metal being operated on, so that it shall not tip up and slip between the head and the dies. Long beams are sufficiently heavy to render this device unnecessary. They will usually be handled by balancing them on a low-wheeled truck or by suspending them by chains and wheels from an overhead track.

I am aware of the Hammond patent, No. 516,736, for "shape-metal-cutting machine," in which is set forth apparatus for cutting off flanged beams by first punching a slot through the web of the beam and then inserting a thinner cutting-blade into said slot and severing the flanges of the beam in the plane of the slot by downward and upward movement of said blade. I disclaim such apparatus and mode of operation, my machine serving to cut away the flange on either or both sides of the end of the beam by means of the broad vibrating-head J and its dies, leaving the end of the web protruding, if desired.

I claim as my invention—

1. In a metal-cutting machine, the vibrating cutter and its side dies, in combination

with a front die and means for moving it across the end of said cutter and holding it in its adjusted position, substantially as set forth.

2. In a metal-cutting machine, the combination of the cutting-head and its side dies fixed in position, with the movable front die and means for moving it longitudinally so as to open a space when desired between the front and one of the side dies and to close the same, substantially as set forth.

3. In a metal-cutting machine, the cutter-head with suitable actuating means and the side dies cooperating therewith, in combination with the front die and means for moving it away from a side die, and with an insertible rest adapted to be introduced into the space between said dies, substantially as set forth.

4. In a metal-cutting machine, the combination with the vibrating cutter-head and its fixed dies, of a front die and means for moving it transversely to the fixed dies, and with adjustable gages adjacent to the fixed dies, substantially as set forth.

5. In a metal-cutting machine, a vibrating cutter-head and dies cooperating therewith at its sides and front, in combination with gages movable in dovetail ways at the sides of said head and provided with adjusting-screws abutting against the frame, substantially as set forth.

6. In a metal-cutting machine, a vibrating cutter-head and dies cooperating therewith at its sides and front, in combination with a swinging and vertically-adjustable guard-arm adapted to be moved into position in front of said head and withdrawn therefrom, substantially as set forth.

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

LEMUEL M. HAM.

Witnesses:

A. H. SPENCER,
FRED P. HAM.