

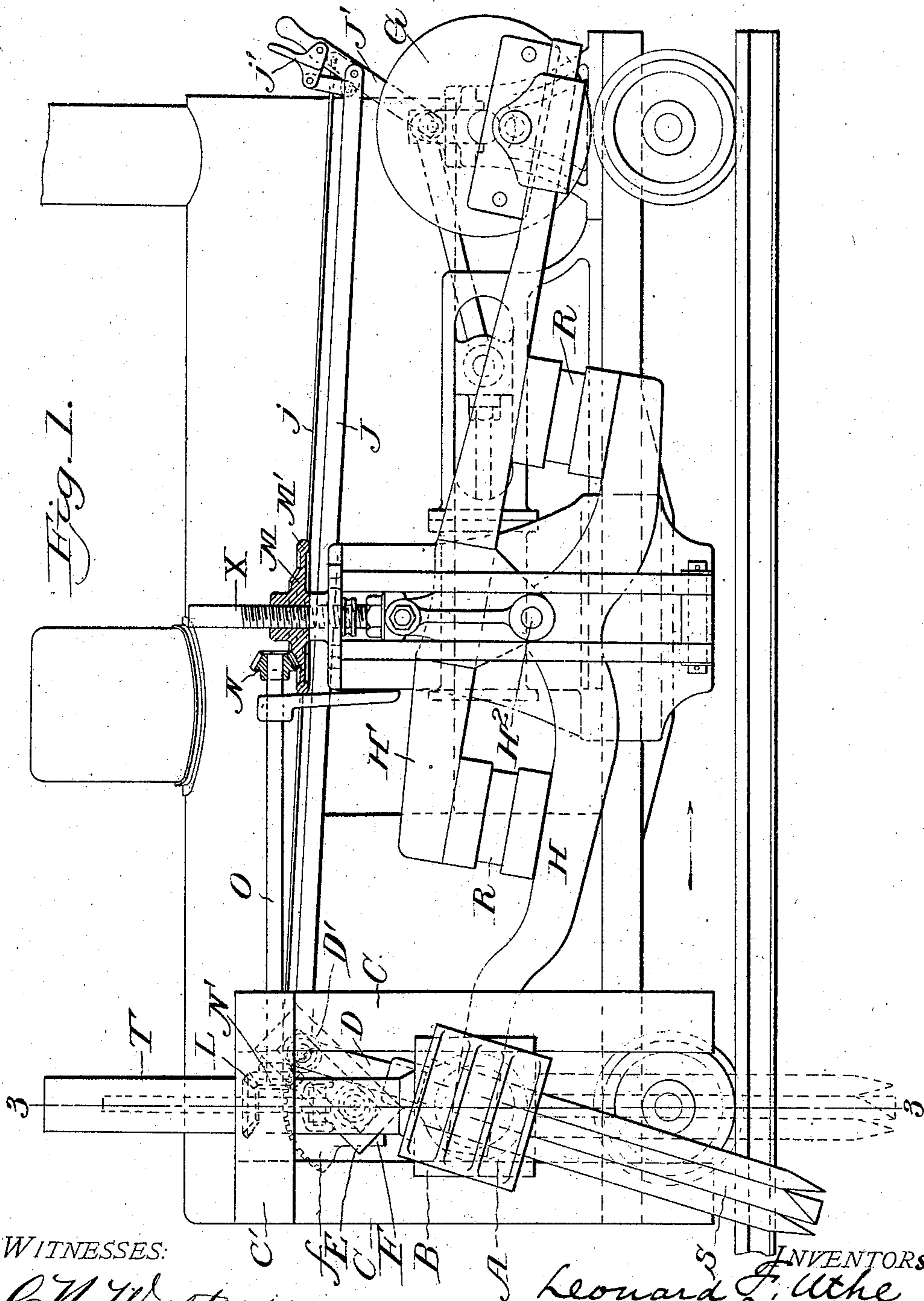
No. 816,050.

PATENTED MAR. 27, 1906.

L. F. & A. J. UTHE.
CHANNELING MACHINE.

APPLICATION FILED MAY 5, 1904.

4 SHEETS—SHEET 1.



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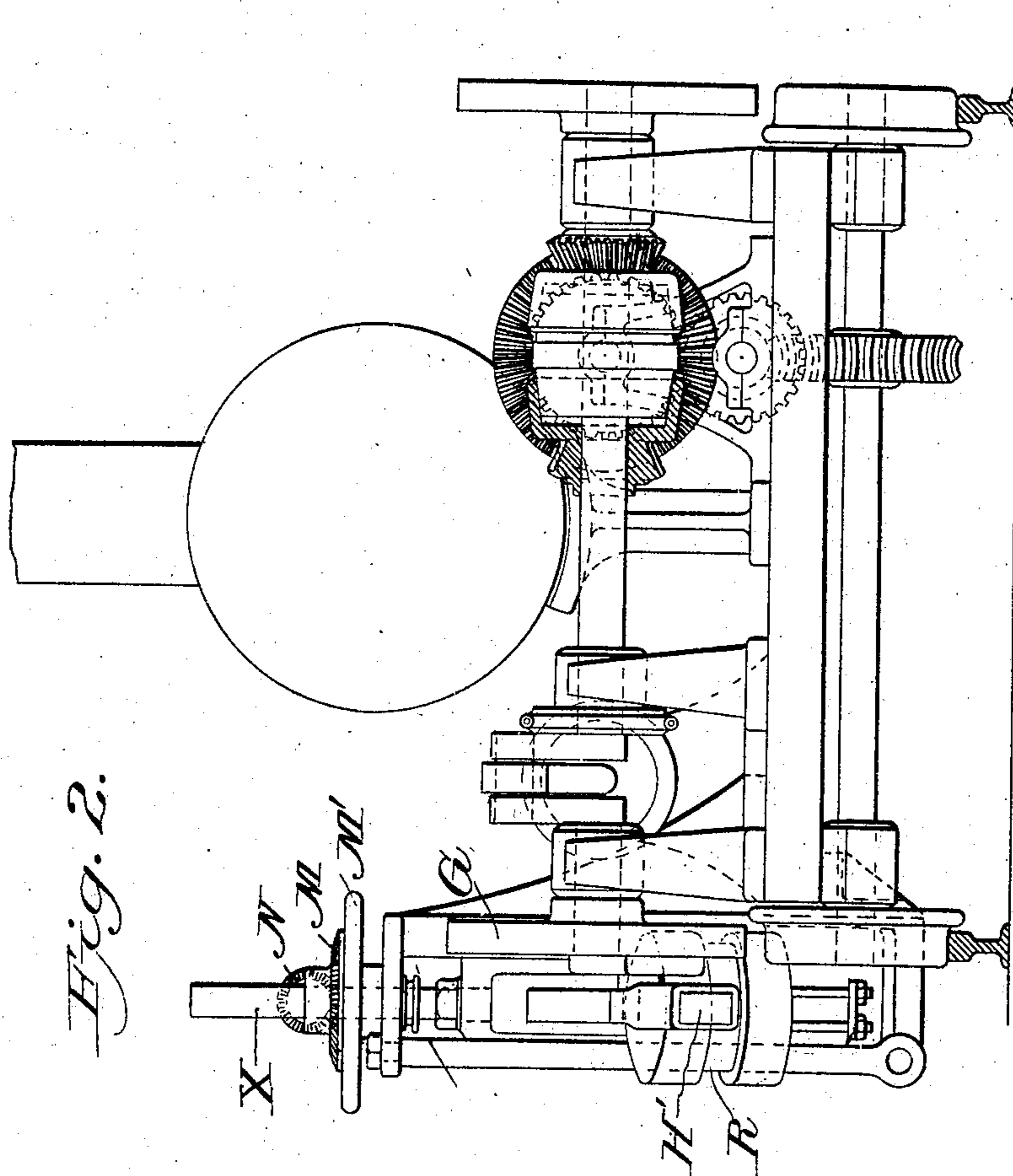


Fig. 2.

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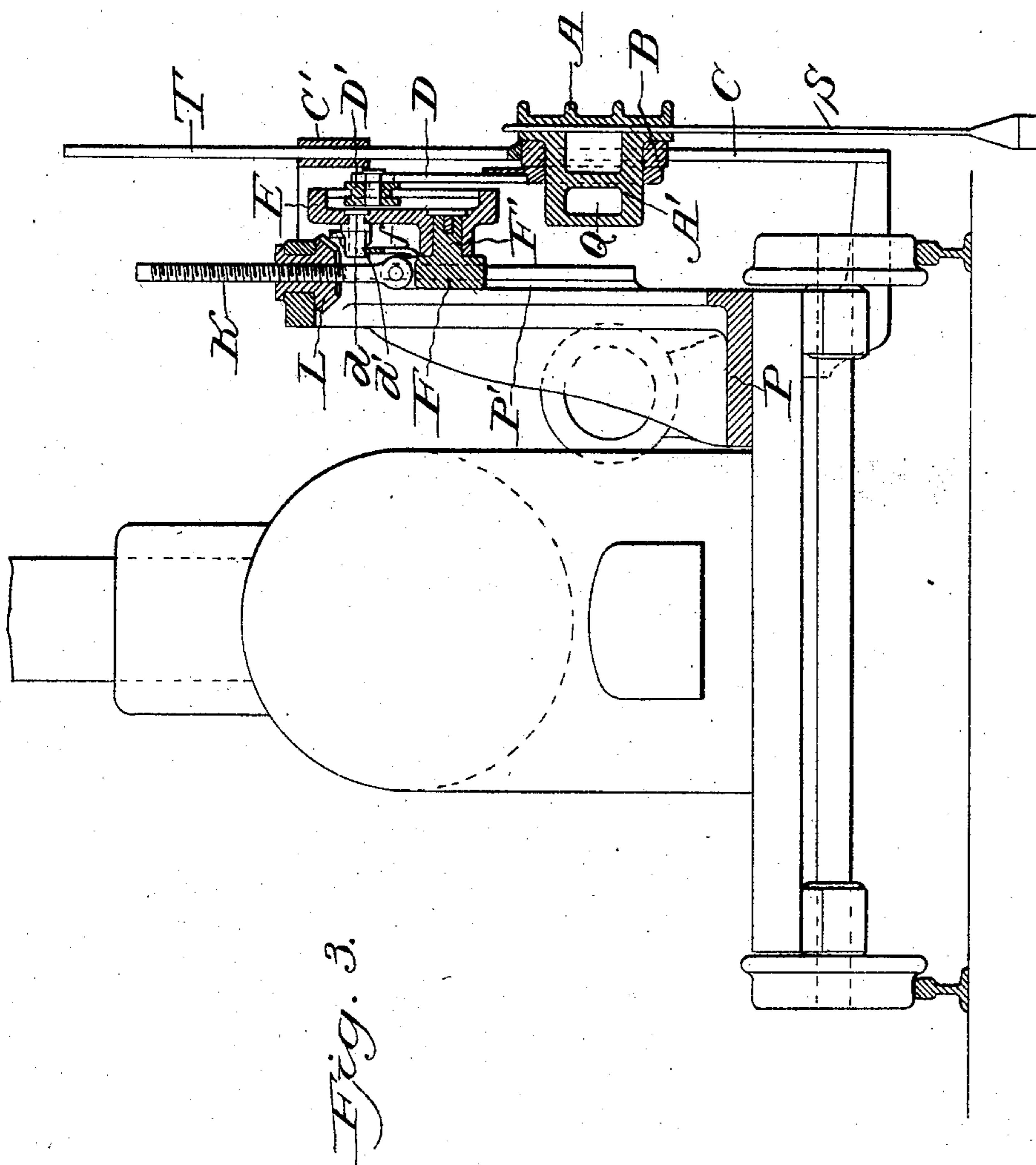


Fig. 3.

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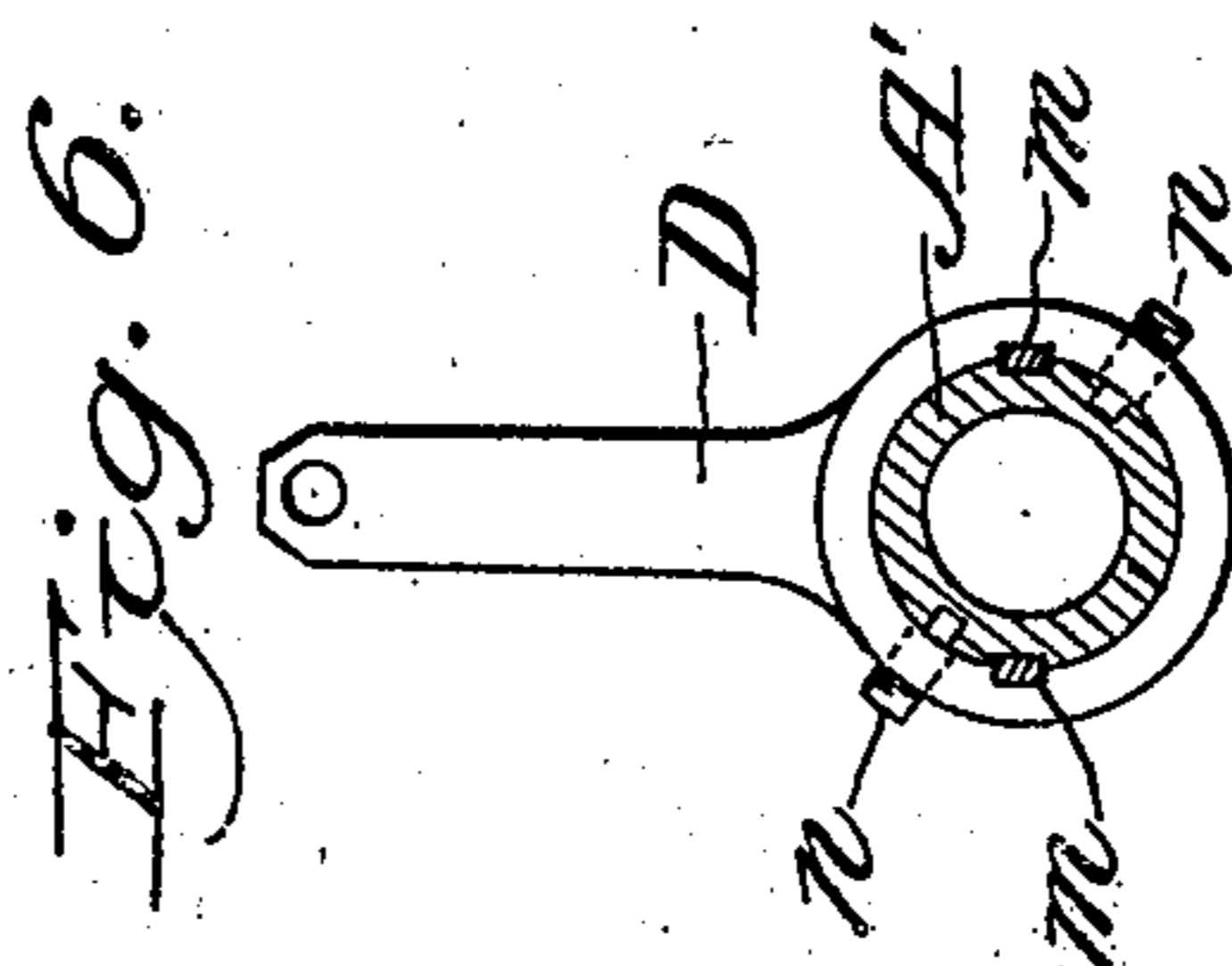
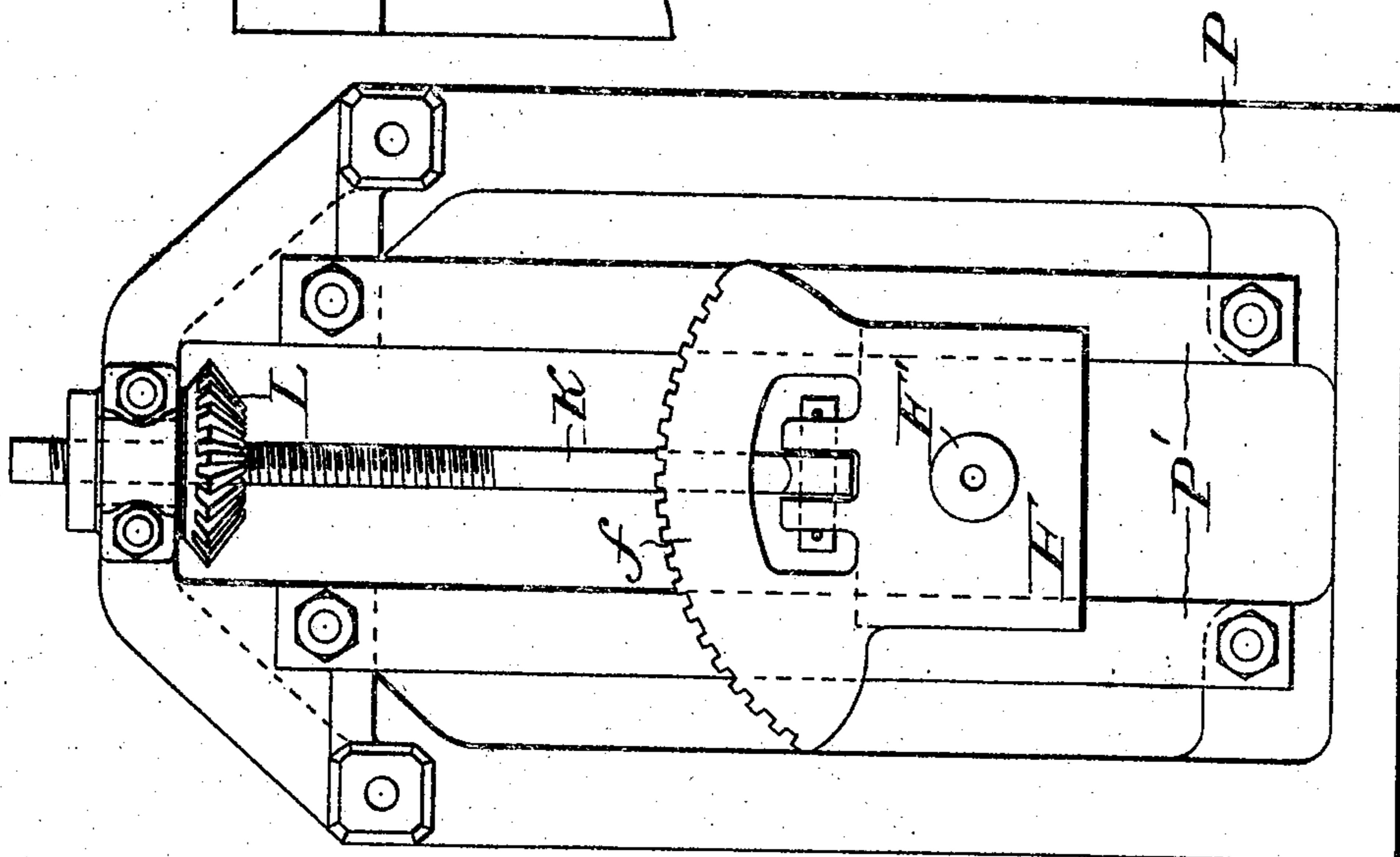
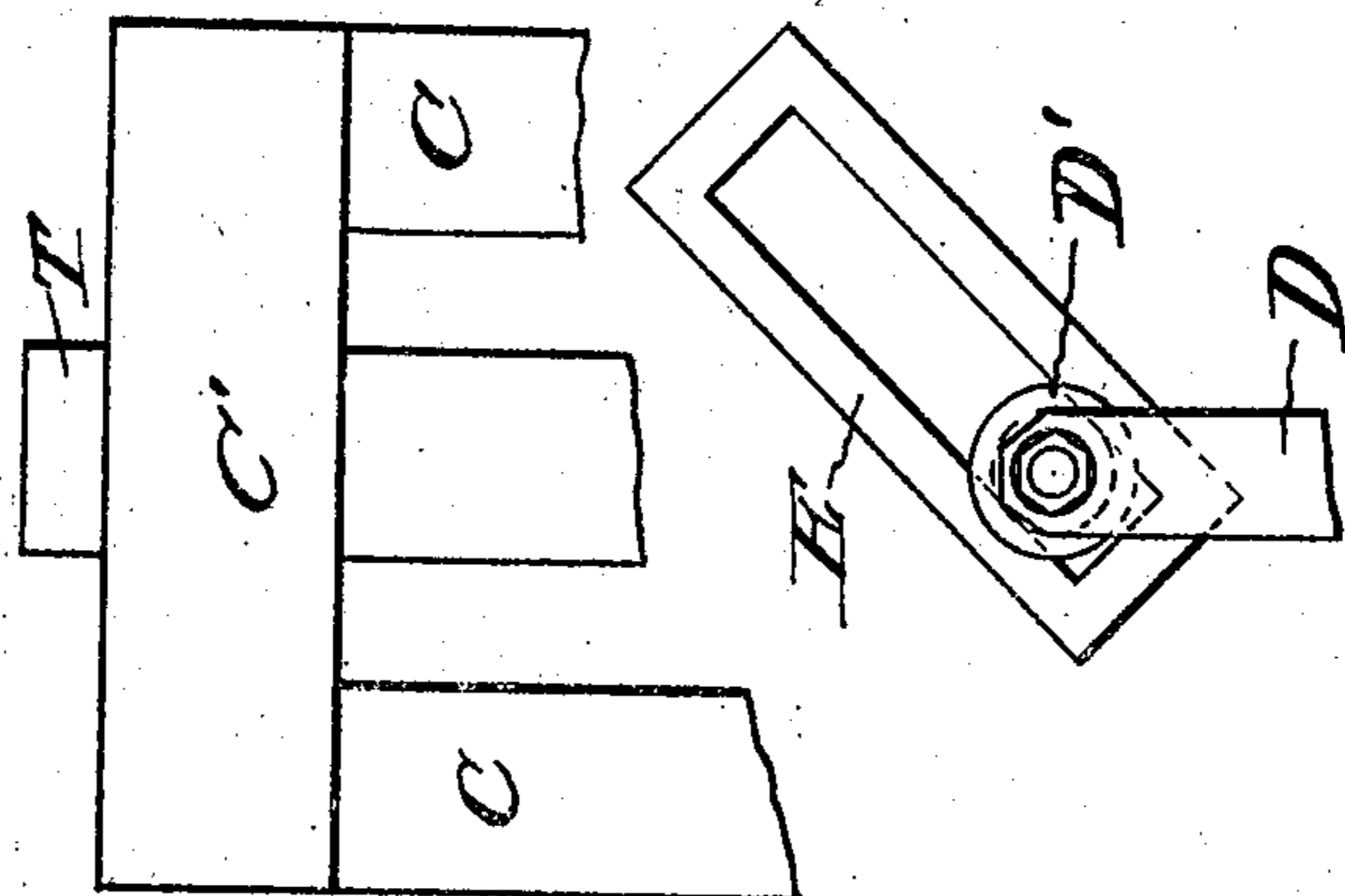
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UNITED STATES PATENT OFFICE.

LEONARD F. UTHE, OF NORTH AMHERST, AND ALBERT J. UTHE, OF
ELYRIA, OHIO.

CHANNELING-MACHINE.

No. 816,050.

Specification of Letters Patent.

Patented March 27, 1906.

Application filed May 5, 1904. Serial No. 206,561.

To all whom it may concern:

Be it known that we, LEONARD F. UTHE, residing at North Amherst, and ALBERT J. UTHE, residing at Elyria, in the county of Lorain, State of Ohio, citizens of the United States, have invented new and useful Improvements in Channeling-Machines, of which the following is a specification.

This invention relates particularly to stone-channeling machines used in stone-quarries to cut a narrow slot or channel of any desired length or depth, usually from fifteen to eighteen feet deep, preparatory to getting out the stone.

The object of the invention is to provide a means for giving oscillating motion to the cutters or drills in addition to the vertical motion imparted by known machines.

The invention further provides a means for varying the extent and direction of the oscillatory motion, and in use on those machines having a variable fulcrum for the rocking lever provides means for raising and lowering the devices whereby the oscillatory motion is produced.

In the accompanying drawings, Figure 1 is a side elevation of the machine. Fig. 2 is an end elevation thereof. Fig. 3 is a cross-section on the line 3 3 of Fig. 1. Fig. 4 is a detail in elevation of the bracket for supporting and guiding the block upon which is mounted the guide which produces the oscillatory motion of the cutters. Fig. 5 is a detail in elevation, showing the swinging block E. Fig. 6 is a detail showing how the arm D is rigidly fastened to the clamp A.

The following description will be confined, except as otherwise appears, to our invention and the parts directly associated therewith, it being assumed that suitable means will be provided for producing the advance movement of the machine along its track after each stroke of the cutters, which action is well known and is produced by appropriate gearing between the main or crank shaft and the wheels on which the machine is supported.

Referring specifically to the drawings, A indicates a clamp which holds the cutters S. This clamp has a rearwardly-extending shank or trunnion A', which extends through and is rotatable in a head or block B, which is slidable between the guides C, supported on the frame of the machine. Projecting upwardly from the block B is what is technic-

ally known as a "back-board," being a bar which slides through a slot or way in the cross-bar C' and assists in guiding the block B, which would otherwise have to be made inconveniently long. The rear end of the shank or trunnion A' behind the block B has a hole Q, which receives the end of the section H of the lever, the other section of which is indicated at H'. The fulcrum of this lever is at H², and rubber buffers R are located between the sections of the lever to cushion the shock. The section H' is connected at its end to the crank-disk G on the main crank-shaft, whereby the vibration is effected and the vertical reciprocation of the block B, clamp A, and cutters S is produced.

D is an arm which is rigidly fastened to and projects upwardly from the clamp A, and it carries at its upper end a grooved roller D'. The arm D is rigidly fastened to the shank or trunnion A' of the clamp A by keys and set-screws (indicated at m and n, respectively, see Fig. 6) and serves the double purpose of oscillating the clamp and preventing it from working forward and out of the slide B.

E indicates a block having guides in which the roller D' travels, and this block is pivotally carried to swing in a vertical plane upon a trunnion F', projecting from a block F, which is slidable vertically in guides P', supported by a bracket P, carried by the frame of the machine. The block E is located behind the guides C and the clamp A and is supported by the block F, which, as said before, is vertically slidable in the guides P'.

The block F is connected to the screw K, which extends thence upwardly through a bevel-gear nut L, carried in a bearing at the top of the bracket P. The gear of this nut is in mesh with a bevel-gear N at the end of the shaft O, the other end of which carries a bevel-gear N, meshing with the gear M on the hand-wheel M'. This hand-wheel is used to raise and lower the fulcrum-block H² of the main lever in the manner disclosed in the Bryant patents above referred to—that is, the hand-wheel carries a nut on a screw X, which is connected to the fulcrum-block, and by turning the hand-wheel the fulcrum-block is raised and lowered in its guides.

As above stated, the guide-block E is capable of being turned upon its trunnion F, and thus swung to either side of the vertical line, the pivot F being in line with the line of the

movement of the block B. J' indicates a lever which is fulcrumed on the frame of the machine in a position conveniently accessible to the operator, and this lever is connected
 5 by rod J to the guide-block E and is used to shift the block angularly as desired. To hold the guide-block E rigidly as shifted during the reciprocation of the parts, the block F has a quadrant f with notches to receive the projecting end of a dog d, which is
 10 pivoted on the bolt d', by which the rod J is connected to the guide E. The dog D is operated by latch-lever j', carried by the main lever J' and connected by link and bell-crank
 15 and rod j to the dog. When the dog is engaged, the parts are held as set, and the disengagement and desired adjustment is effected in an obvious manner.

Referring now to the operation of the machine, it may be premised that the motion of the cutters of such machines as have come to our notice heretofore has been vertical only. Our invention provides means for giving a swing or oscillation to the cutters as they
 25 strike, producing a chipping blow, which is highly advantageous in effecting the cut desired. In order to produce the most effective action, the oscillation is opposed to the direction of the travel of the machine—that is, as
 30 the machine is advancing in the direction shown by the arrow in Fig. 1 when the cutters are raised they occupy the position indicated by dotted lines in said figure, and they strike downwardly and backwardly with a
 35 swinging stroke to the position shown in the full lines. When the machine is traveling in the opposite direction, the opposite action takes place, the effect in either instance being to strike downwardly and backwardly instead of vertically, as heretofore.

The vibration of the lever H' produces vertical movement of block B, clamp A, and the cutters. By means of the lever J the guide E may be set to give any degree or direction of
 45 swing desired. As the clamp A lifts the roller D' on its arm D travels in the guides of the block E and swings the clamp laterally, turning it on its trunnion A', so that the cutters are swung out of the vertical line. When
 50 the clamp and cutters descend, the reverse action takes place by reason of the travel of the roller D' in the guide-block E, and the swinging blow above referred to is delivered.

When the machine reaches the end of the channel, it is desirable that a vertical blow be given. This is effected by swinging the guide-block E until its axis is in line with the axis of reciprocation of the block B, which consequently has no effect on the cutters, but
 60 allows them to reciprocate vertically. When the machine is then reversed and travels back along the channel, the block E is shifted over to the other side, producing an opposite or reverse swing to chip in the opposite direction.

65 When applied to a machine having a ver-

tically-adjustable fulcrum for its main lever, it is essential that the block F and guide E should be raised or lowered accordingly in order to keep the parts in proper relation. This is effected by the gear connection between the hand-wheel M' and the screw K. As the hand-wheel is turned to raise or lower the fulcrum H² the gearing acts to raise or lower the screw K in an obvious manner, and the screws being geared together the block F and guide-block E are raised or lowered to the desired extent. When the invention is used on a machine having a fixed fulcrum, the means to raise and lower the guide-block may be omitted as unnecessary.

It will be understood that at each stroke of the cutters the machine will have advanced along the track a sufficient distance to give a new cut for the cutters or drills, and it will be readily seen that a swinging stroke toward the existing channel or previous cut will have a greatly superior effect in chipping or cutting off the rock.

Various modifications may be made without departing from the scope and idea of our invention, and, as above indicated, it may be applied to various types of machines.

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

1. In a channeling-machine, the combination with guides, and a block reciprocative therein, of cutters carried by and pivotally connected to the block, and means to swing the cutters during the reciprocation of the block.

2. In a channeling-machine, the combination with guides, and a block reciprocative therein, of cutters pivotally connected to the block, and means to swing the cutters to either side of the axis of reciprocation during the strokes thereof.

3. In a channeling-machine, the combination with oscillatory reciprocative clamp having an arm, and cutters held in the clamp, of a guide angularly arranged with respect to the axis of reciprocation, in which guide the arm is slidable to oscillate the clamp.

4. In a channeling-machine, the combination with an oscillatory reciprocative clamp having an arm, and cutters held in the clamp, of a guide adjustable angularly with respect to the axis of reciprocation, in which guide the arm is slidable, during the reciprocation of the clamp, to oscillate the same.

5. In a channeling-machine, the combination with guides, and a block reciprocative therein, of a cutter-clamp pivoted to the block and having a projection, and a guide-block pivoted in line with the axis of reciprocation and capable of being swung at an angle to either side of said axis, the projection having engagement with said guide-block to swing the clamp.

6. In a channeling-machine, the combination with a reciprocative block, a cutter-

clamp pivoted thereto, and a lever connected to the block and clamp to reciprocate the same, of a vertically-movable guide-block disposed angularly with respect to the axis of reciprocation and arranged to engage the clamp and turn the same on its pivot, means to raise or lower the fulcrum of the lever, and connections between said means and the guide-block, constructed to raise or lower the latter accordingly.

7. In a channeling-machine, in combination, a reciprocative and pivoted cutter-clamp, a lever connected thereto and having adjustable fulcrum-piece, a bracket having guides, a block slidable in said guides, and carrying a pivoted guide having connection with the clamp and adjustable angularly with respect to the axis of reciprocation, screws

connected to said piece and block to raise or lower the same, and gearing between the screws to produce similar movement thereof.

8. In a channeling-machine, in combination, vertical guides, a block reciprocative therein, a cutter-clamp having a trunnion extending through the block, an operating-lever the end of which is connected to the trunnion, and means to turn the clamp on the trunnion during the reciprocation thereof.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

LEONARD F. UTHE.

ALBERT J. UTHE.

Witnesses:

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A. BAKER.