

C. M. FIELD.

DIAMOND CUTTING MACHINE.

No. 175,815.

Patented April 4, 1876.

Fig. 1.

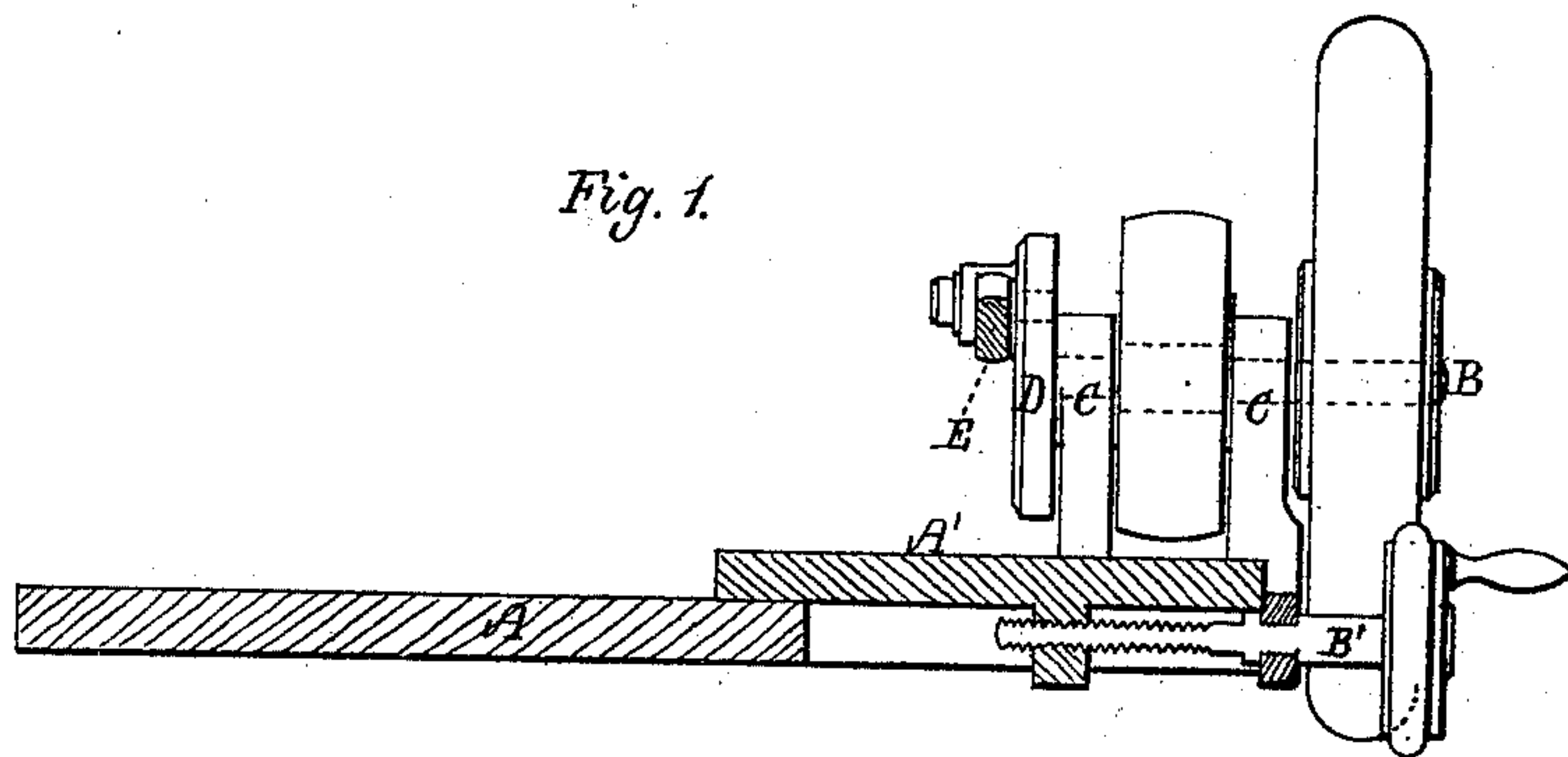


Fig. 2.

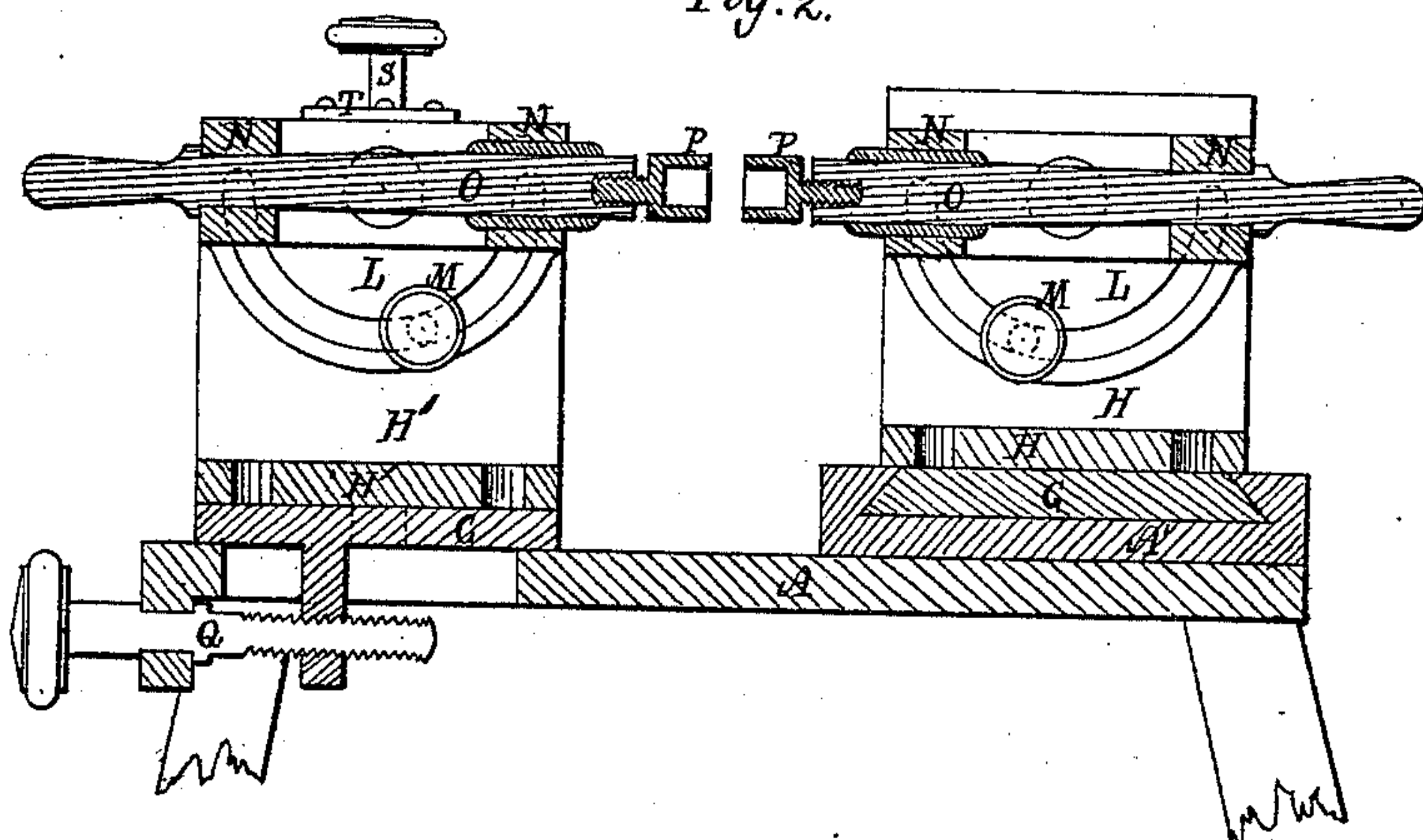
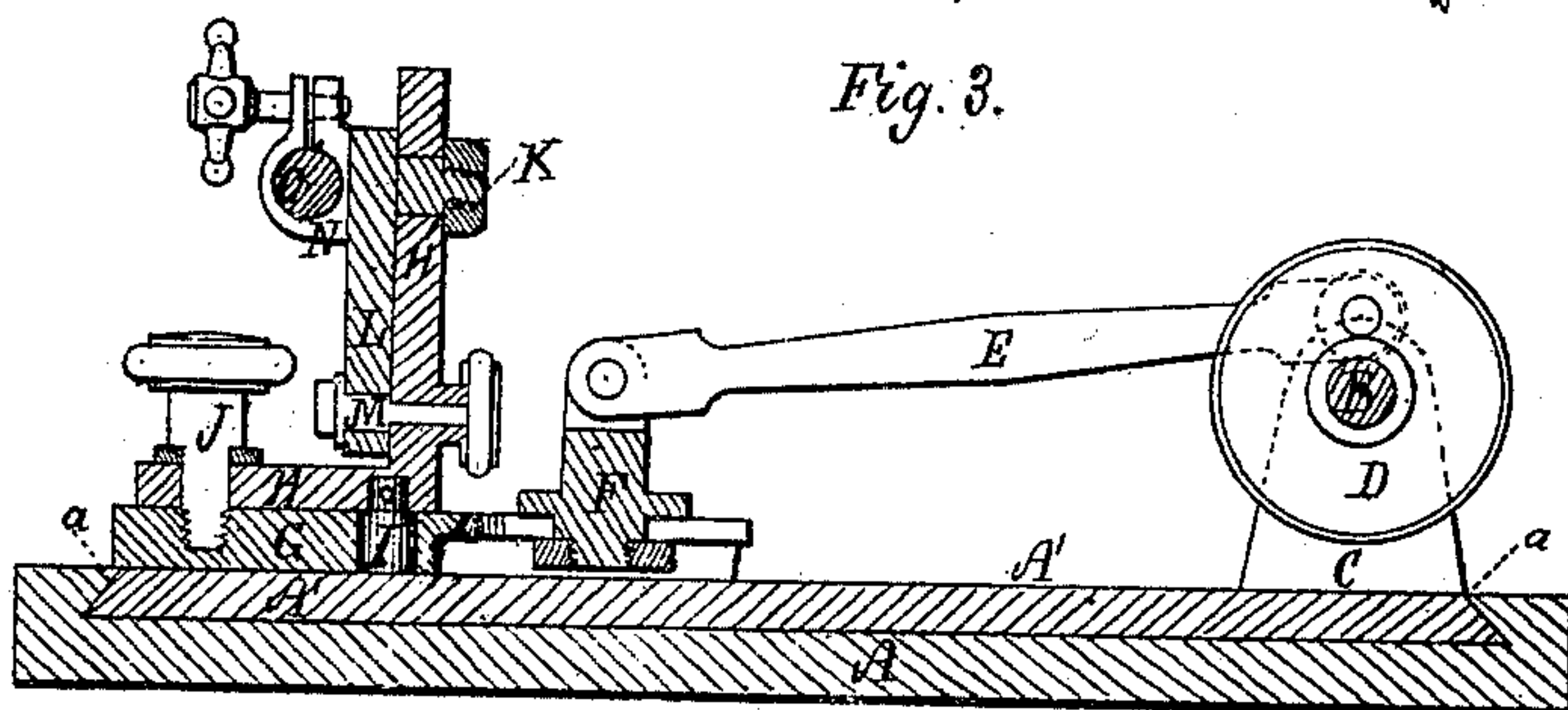


Fig. 3.



Witnesses.
W. C. Fay
H. Boardman

C. M. Field,
Att'y.

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Fig. 4.

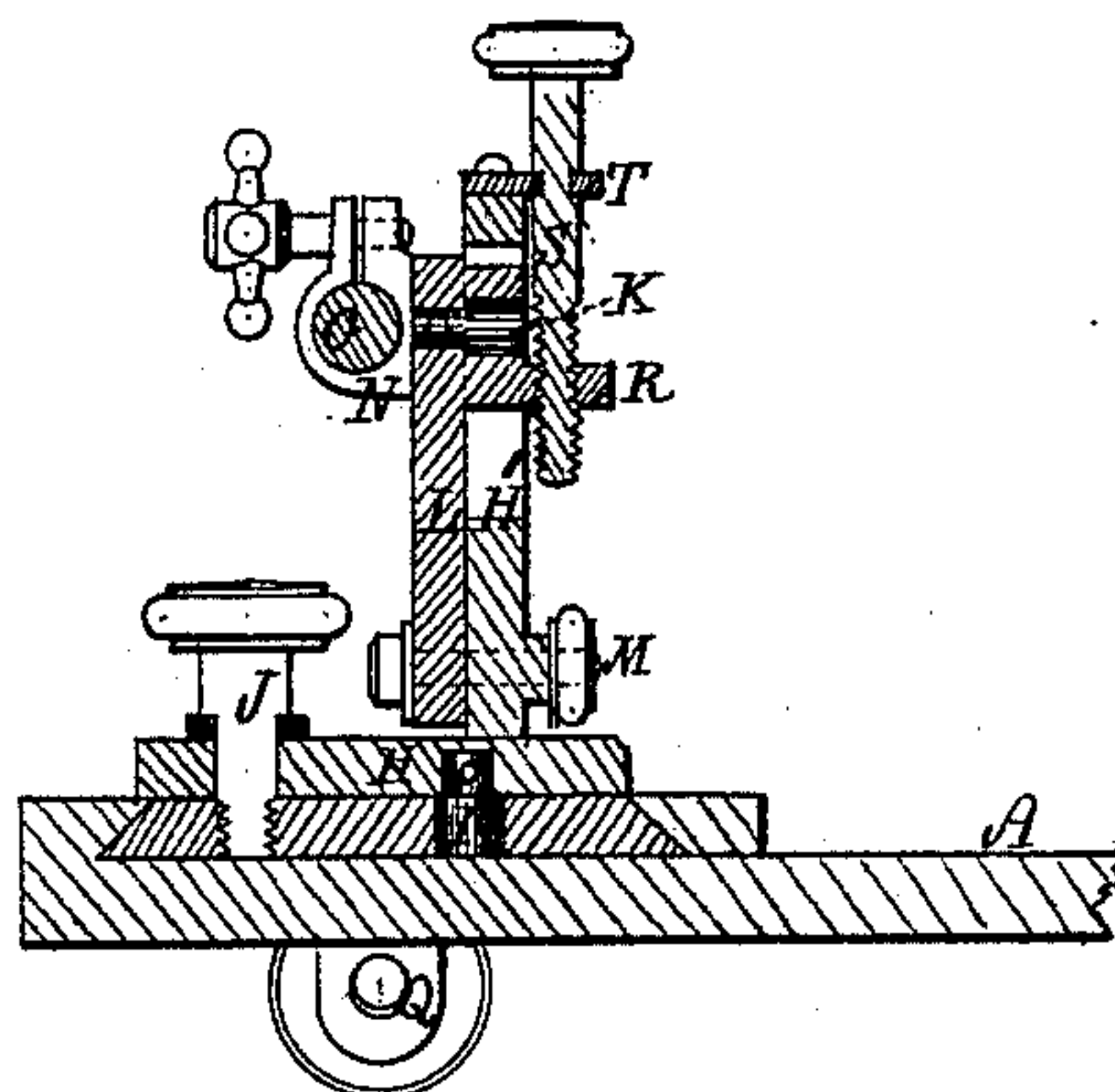
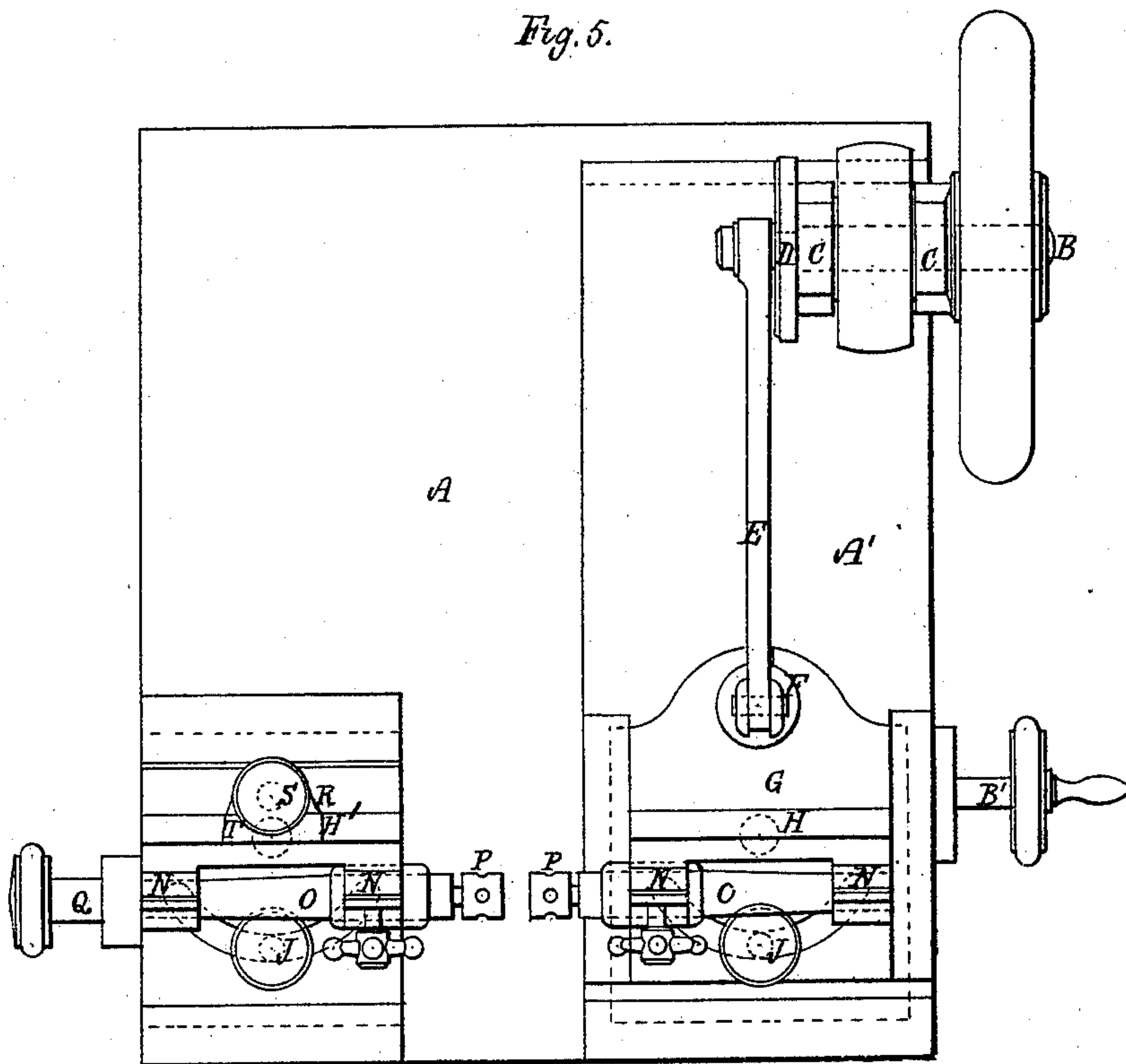


Fig. 5.



Witnesses.
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UNITED STATES PATENT OFFICE.

CHARLES M. FIELD, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN DIAMOND-CUTTING MACHINES.

Specification forming part of Letters Patent No. **175,815**, dated April 4, 1876; application filed July 24, 1873.

To all whom it may concern :

Be it known that I, CHARLES M. FIELD, of Boston, Suffolk county, Massachusetts, have invented certain Improvements in Machinery for Cutting Diamonds or other Gems, of which the following is a specification :

Heretofore the reducing or cutting of diamonds has been effected by hand-labor to a great extent, if not entirely, and the purpose of this machine is to perform this labor more perfectly and at much less expense than has been before accomplished.

These improvements consists of a primary bed-plate or base, deposited upon a flat tablet, and susceptible of bodily adjustment in suitable guides, (making part of such tablet,) and to and fro of such tablet, with respect to a tail stock or carriage for holding the stone to be cut, and which is located at the opposite side of the tablet, the said main bed-plate being fed backward and forward by a screw or other suitable means, and bearing at its front end an adjustable tool carrier or stock, which carries the stone cutting or reducing tool, the stock being driven backward and forward upon the main bed by a pitman connected to a crank which makes part of a horizontal shaft, revolving in bearings erected upon the rear end of said main bed, the pitman being attached to the tool-carrier in an adjustable manner, in order that the carriage may be bodily shifted with respect to the tool-holder, so as to bring it in working position opposite the various faces to be cut on the gem.

The drawings accompanying this specification represent, in Figure 1, a vertical section of my machine, taken through the main bed or base plate and its adjusting-screw. Fig. 2 is a vertical section through the said main bed or base plate and the tool-holder or carrier, to be explained. Fig. 3 is a vertical section of the tool holder or carrier. Fig. 4 is a section of the stone-holding carriage, and Fig. 5 is a plan of this machine.

In the above-named drawings, A represents a flat rectangular table or tablet, supported upon suitable standards or legs, whereby it is maintained in a horizontal position.

A' represents a flat rectangular oblong plate, which I term the "main" or "working" bed-plate, this plate being placed upon the top of

the tablet A, and extending preferably from front to rear thereof, and also capable of sliding movements in the direction of its shortest plane upon the tablet, it being guided in its working path thereupon by suitable guides or ways, *a a*, and provided with a feed or adjusting screw, B', by which its position upon the tablet may be varied, in order to advance the tool-carrier toward the diamond-holding carriage or arbor, or vice versa.

Upon the inner end of the shaft B I affix a crank or crank-wheel, D, to the wrist of which I pivot the rear end of a pitman, E, the opposite end of such pitman being pivoted to a post, F, erected upon the rear end of a horizontal flat plate, G, disposed upon the top of the bed-plate A', at the right front corner of the latter, and sliding in dovetailed or other guides or ways making part of such plate A', the said post being applied to the plate in an adjustable manner, as represented, in order to vary the line of coincidence of the two arbors of the machine, to be hereinafter described.

This adjustment is effected by confining the post by means of a binding-nut in a longitudinal slot in plate G, as represented in Fig. 3. Normally, the two arbors of the stone-holding device and the tool-carriage would be opposite each other; but by loosening the binding-nut the tool-carriage can be moved along in one direction or the other, as required for the work, and when thus adjusted the binding-nut is tightened, so as to fasten the post F in the part of the slot to which it is brought by this new adjustment.

The revolution of the crank-wheel imparts alternating or reciprocating movements to the plate G upon the main plate A'.

Upon the top of the plate G, and at about its center, I dispose an upright L-shaped plate or standard, H, and I pivot this standard to the plate G by a vertical pivot, I, by which rotary motion of the standard and its arbor or spindle is permitted upon said plate G, the standard being confined to the plate in any desired position or angle by a clamp-screw, J, as shown in Fig. 3 of the drawings.

To the outer or front face of the standard H I pivot, by a horizontal journal, K, a sectoral plate or head, L, said head being susceptible, by means of the pivot, of a swivel-

ing movement in the arc of a circle upon the standard, and of being set in any desired or given position thereupon by a clamp-screw, M. Upon the upper post of the head L I form bearings N N, and within these bearings I mount a horizontal arbor or spindle, O, such spindle being the support of the cutting-tool. This cutting-tool is, in practice, a diamond of inferior grade, and is secured in a collet, P, whose shank enters a socket created in the end of the spindle, the diamond being secured within, or to, the collet by cement or solder, or by any of the methods now employed to hold diamonds in hand-tools.

The "tail-stock" of the machine, or the carriage which supports the gem to be cut, is similar in general construction to the tool-carrier hereinbefore described, except that it has no alternating motion, and is disposed directly upon the tablet A, in lieu of upon the main bed-plate A', and is changed in position upon such tablet, and toward or away from the tool-carrier, by a feed or adjusting screw, Q, arranged as shown in Fig. 5 of the drawings. Another difference also exists in that the tail-stock is susceptible of vertical adjustment by extending its horizontal pivot through a boss or arm, R, extending rearward from the upright or L-shaped standard H', and screwing through this boss a vertical screw, S, the upright part of which is swiveled within a shelf, T, departing from the top of the said standard H'.

In lieu of the feed-screw B', for adjusting the position of the main bed-plate A', a lever, or its equivalent, may be employed, by which the movements of the said bed-plate may be effected in much less time than could be done with a screw.

As the tool borne by its carrier moves in a reciprocating path past a diamond held in or upon the arbor of the tail-stock, it sets upon the diamond with abrasive effect, similar to the same operation by hand-labor, but much

more rapidly, and I am enabled to reduce a diamond or other stone to its finished form with the mathematical exactness and finish always resulting from mechanical means as distinguished from the results of hand-labor.

I obtain by my arrangement of parts great range and freedom of adjustment for the tool-carrier and diamond-holder, which enables me to instantly and easily present the diamond to the tool, or cause the tool to act upon the diamond at any desired angle, which is a matter of great importance in cutting many-faced stones.

The only skilled labor requisite in the operation of this machine is to apply the diamond to be cut to its supporting-arbor, and adjusting its position to the tool. This being done, women or inexperienced persons can tend the machine while it is reducing the face thus determined, as no calculation or judgment is involved.

As one person of experience can apply and adjust the diamonds to a number of machines, and as the cutting of the face is accomplished by the machine in much less time than by hand, it will be seen that a great economy is effected.

I do not here claim the specific instrumentalities which I have shown as one means of carrying my invention into effect, the same being subject-matter of a separate application for Letters Patent in my name.

I claim—

In an organized machine for cutting diamonds or other precious stones, a bed-plate laterally adjustable upon a suitable tablet or support, and bearing a tool-holding carrier or "head-stock," to which alternating motions are imparted, substantially as and for purposes stated.

CHARLES M. FIELD.

Witnesses:

FRANCIS E. FAXON,
W. E. BOARDMAN.