

H. & J. L. YOUNG. STONE-CUTTING-MACHINE.

No. 119,910.

Patented Oct. 10, 1871.

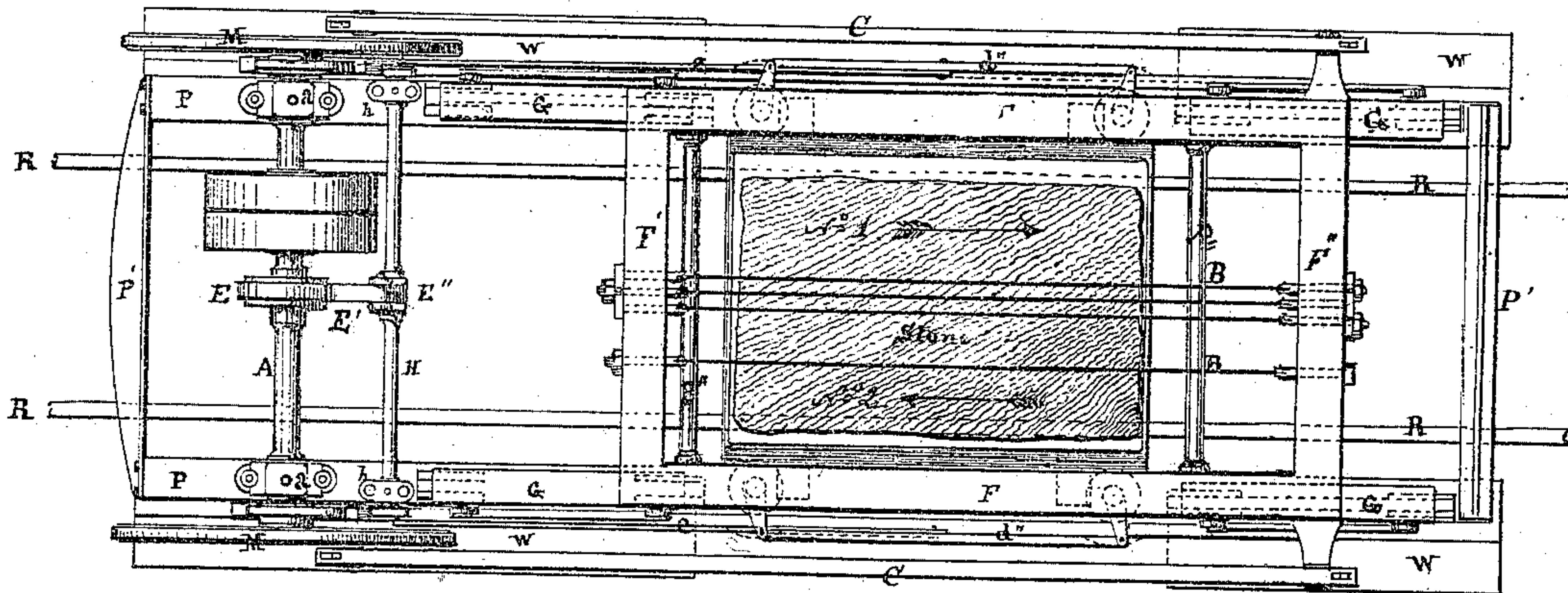
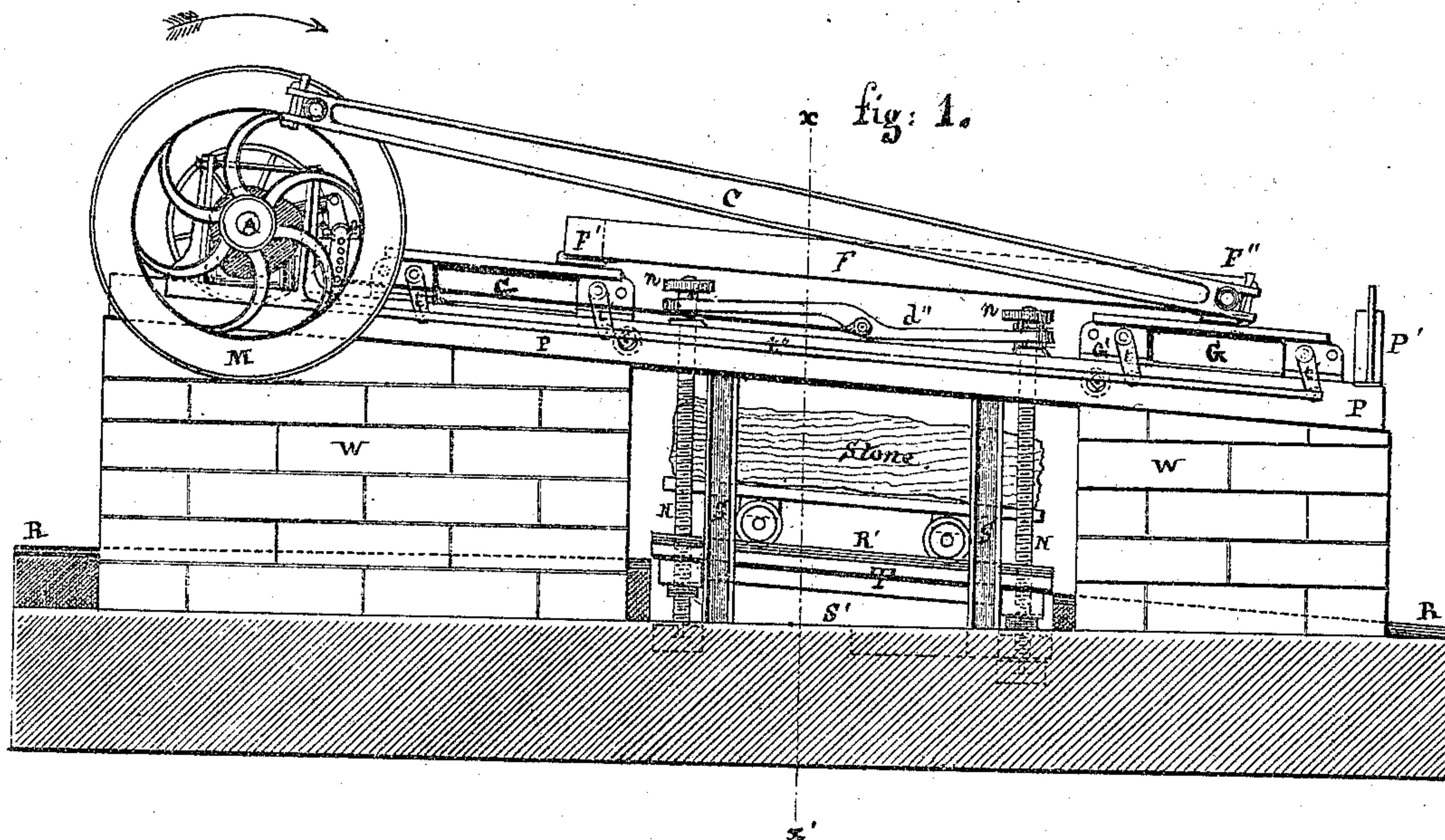


fig. 2.

Witnesses.

H. Gengenbren Hubert
Geo Bell

Inventors.

James L. Young
Hugh Young

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fig: 3.

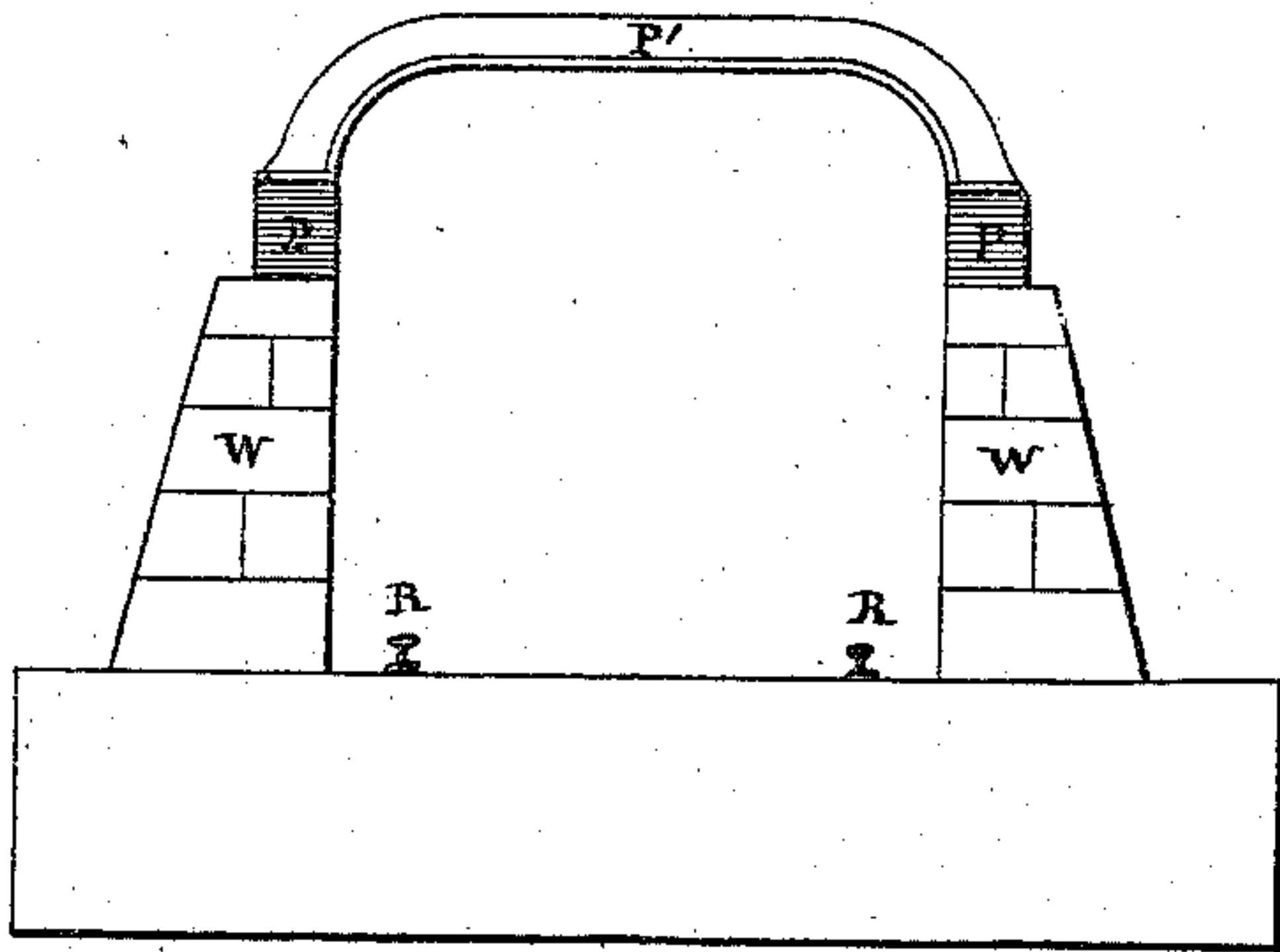
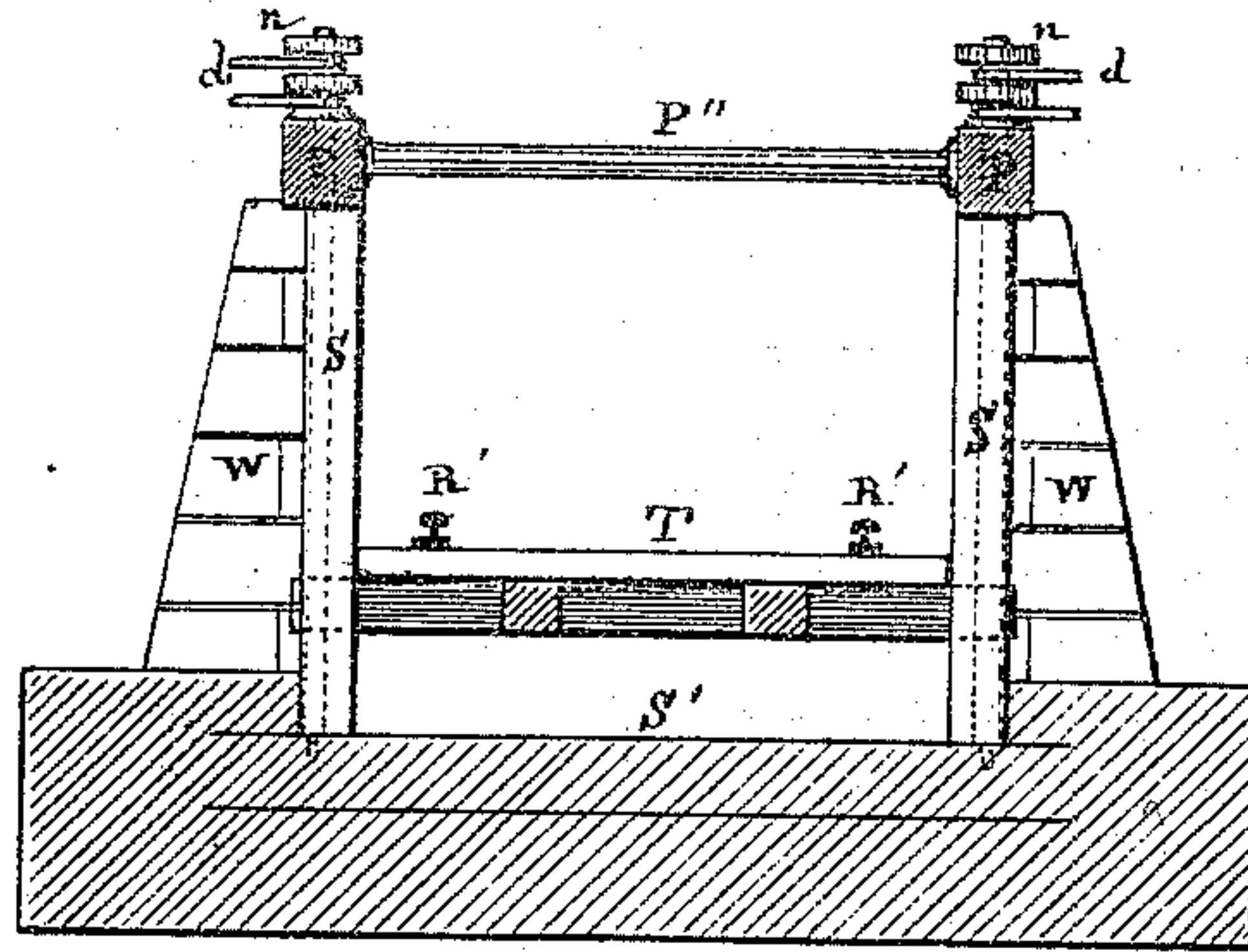


fig: 4.



Section x x'.

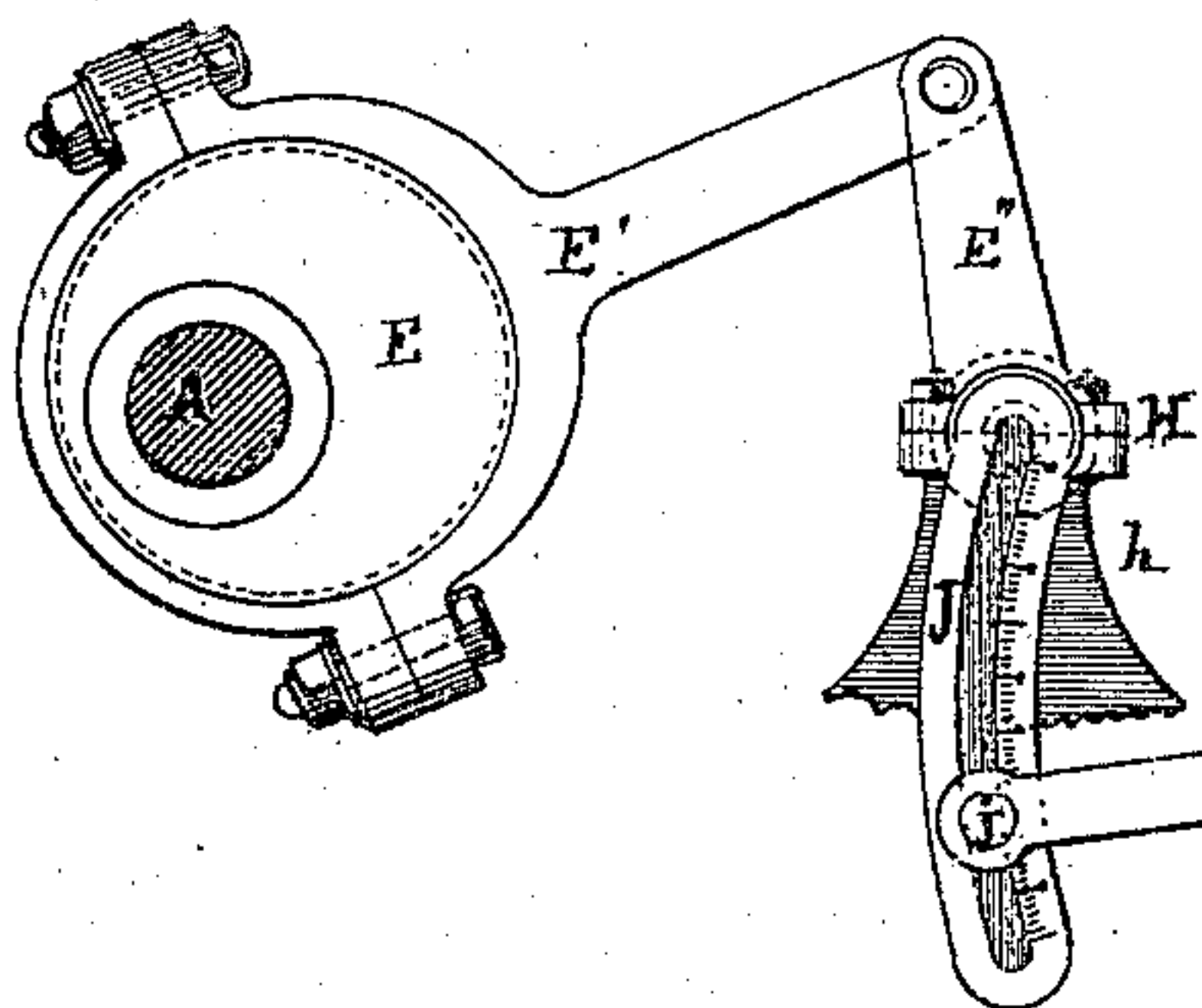


fig: 5.

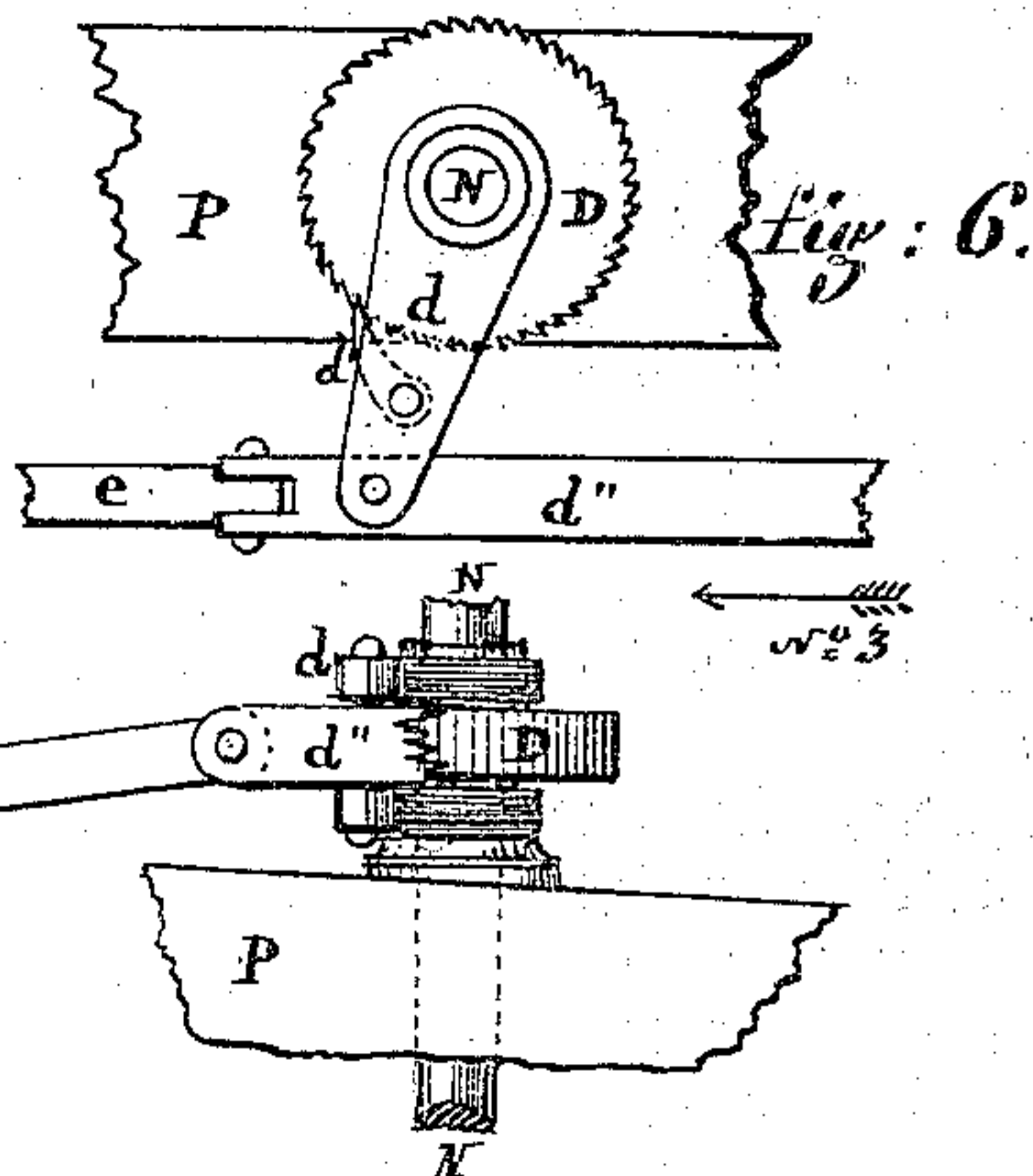


fig: 6.

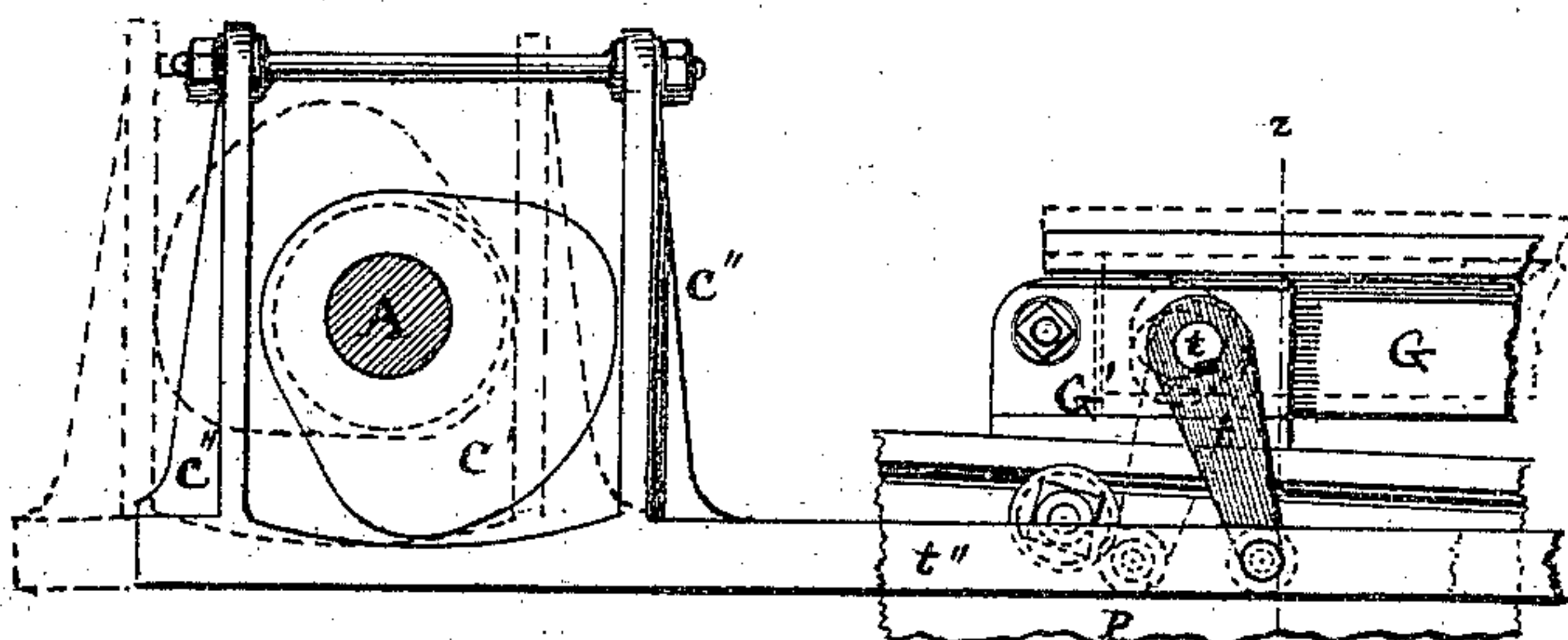


fig: 7.

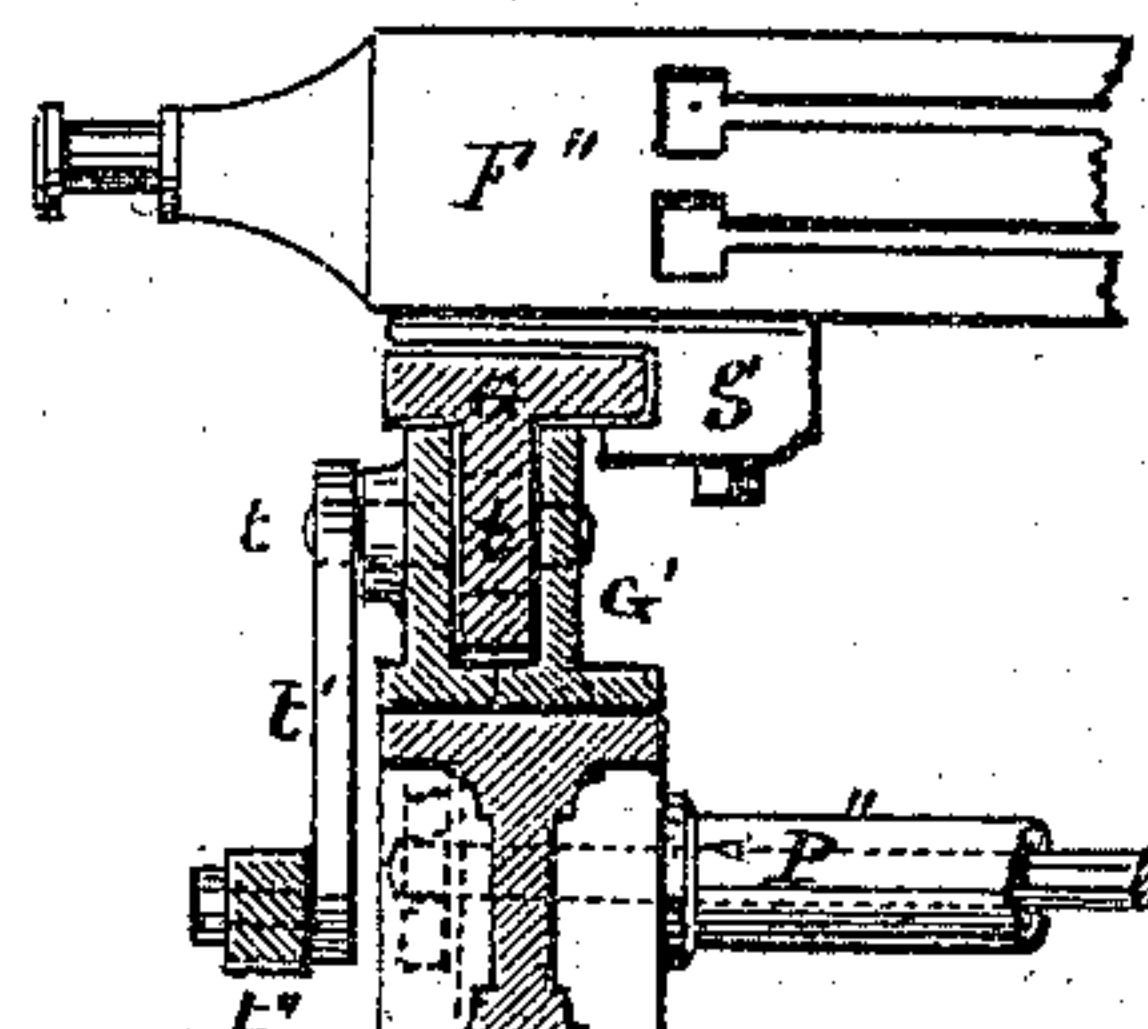


fig: 8.

Section z z'.

Witnesses.

W. Gengembre Hubert
Geo. Bell

Inventors.

James L. Young
Hugh Young

UNITED STATES PATENT OFFICE.

HUGH YOUNG, OF STAMFORD, CONNECTICUT, AND JAMES L. YOUNG, OF NEW YORK, N. Y.

IMPROVEMENT IN MACHINES FOR CUTTING STONE.

Specification forming part of Letters Patent No. 119,910, dated October 10, 1871; antedated September 25, 1871.

To all whom it may concern:

Be it known that we, HUGH YOUNG, of Stamford, in the county of Fairfield and State of Connecticut, and JAMES L. YOUNG, of the city of New York, in the county of New York and State of New York, have invented certain Improvements in Stone-Cutting Machines, of which the following is a specification:

This invention relates to that class of stone-cutting-machines in which a diamond-tool or tools are used for cutting stones; and it consists in the construction of the machine and in the combination of the different parts thereof, one with the other, whereby a more perfect and practical machine is obtained than has been hitherto.

In our several Letters Patent we have described the different modes of using the diamond-tools for cutting stones; in the present application we propose to speak of the construction of a complete and improved stone-cutting machine, such as we now build for applying in practice our said patents.

Figure 1, Sheet I, represents our improved stone-cutting machine in front elevation, and Fig. 2, same sheet, a top view of the same. On this sheet we have represented the general arrangement of all the parts in relation one to the other. Fig. 3, Sheet II, is an end view of the frame of our stone-cutting machine, seen from the lower end of the machine. Fig. 4, same sheet, is a cross-section of the frame of our machine through the line $x x'$ of Fig. 1. Figs. 5 and 6 are details of the feed-motion mechanism, and Figs. 7 and 8 are details of the sash-slides and their elevating and depressing mechanism with part of the saw-sash thereon.

The frame of our machine is composed of two essential parts, viz.: First, the horizontal or inclined top part, composed of the twin pieces P P, united and stayed together by suitable bridges, cross pieces P' P'', &c., and upon which are mounted the main working parts of the machine, including the saw-sash and blades. Second, the vertical part, formed by the four upright pieces S S S S, in which the platform bearing the stone to be cut is to move upward, so as to feed said stone to the saw-blade or blades. The frame pieces P P are made preferably of cast-iron, properly ribbed, and are fastened down upon the foundations W W W W, which may be frames of cast-iron, wall of first-class mason-

ry, or timber; but have to be strongly constructed to insure perfect stability. The pieces P' are properly shaped or arched when required, so as to secure the greatest rigidity of the whole frame, and, at the same time, not to interfere with the free passage of the largest stones under the machine; and when, for the purpose of better bracing the two pieces P P, such pieces as P'' P'' are thought necessary, they are made removable at pleasure, for allowing the passage of such stones as they might interfere with. The pieces S are made of cast-iron, properly ribbed. They are fastened at top to the pieces P P, and at bottom to suitable foundations in the pit S', into which they extend. The sides of the pieces S are planed perfectly true, so as to act as guides for the platform T, which is arranged between said pieces S in such a manner that it will work up and down in a vertical manner. When the platform T is at its lower place it enters the pit S', and the top of the platform is on a level with or corresponds to the railroad R, which is laid between the two walls W, and short rails R' are fastened upon the top of the platform T in such a manner as to complete the railroad R, and allow of trucks being run right through under the machine from end to end thereof. A is the main shaft or arbor of the stone-cutting machine. It is mounted in suitable pillow-blocks $a a$, and receives its rotating motion from any motive power. M M are heavy fly-wheels fastened to each end of the arbor A, to insure regularity of action. $b b$ are wrists or pins fastened to the wheels M, so as to make said wheels act as cranks. F F' F F'' is a strong rectangular saw-frame or sash, composed of the two long pieces, F F, capable of resisting a heavy longitudinal thrust, and of the two end pieces F' and F'', which are made capable of resisting the cross-section strain brought upon them by the stretching of a number of saw-blades, B, which are to be mounted in the said frame or sash.

This saw-sash frame F F' F F'' is, in all respects, similar to the one we have described in the specification of our patent No. 108,228, dated October 11, 1870, and the mode of fastening and stretching the saw-blades therein we contemplate to employ is substantially the same as described in said patent. In this case the piece F'' is made longer than the piece F' and it has at both ends suitable pins or wrists fastened

thereto, upon which are mounted the two pitmen, C C, which, being connected also to the wrists of the fly-wheels M M, will impart to the sash F F' F F'' a go-and-come motion in the direction of the arrows Nos. 1 and 2.

B are the blades, which are to be provided with any ordinary or improved diamond tool or tools, according to the nature of the stone to be cut thereby, or of the kind of cut to be made into the stone. G are slides, upon which the sash F F' F F'' is mounted by means of suitable friction-brasses and retaining-boxes *g*, which will hold down the said sash F F' F F'' upon the slides G. The slides G are not stationary upon the frame pieces P P, but they are mounted in suitable boxes G', which are permanently fastened to the said frame pieces P P, and the slides G are so arranged with regard to the boxes G' that while the said slides G can rise or fall in a perpendicular (or nearly so) manner in the boxes G'. Said boxes may be at any time adjusted so as to prevent any side motion or play of the slides G in the boxes G'. *t* are cam-levers fastened to arbors, which are mounted in the sides of the boxes G' in such a manner that an oscillating motion given to said arbors and cam-levers *t* will cause the slides G to be lifted or depressed, as indicated by the dotted lines in our drawing. *t'* are levers fastened to the arbors *t* to give motion thereto; and *t''* are rods which connect together all the levers *t'* of one side of the machine, to insure a concert of action between said levers *t'* and cause the slides G to rise and fall together and always remain in the same plane one with the others. C' are full cams fastened to the arbor A, which, by acting upon the frames C'', will move the rods *t''* backward and forward and operate upon the slides G, as above stated.

It will be seen that what we obtain is a positive motion up and down, the slides G rising, being held up, falling, and being held down at special periods of the revolution of the arbor A, so as to operate the saw-sash in the best manner to employ such a diamond-protected saw-blade or blades, acting as specified in our patent of October 18, 1870.

N are strong screws passing through holes in the pieces P and suspended thereto by their upper part, which plays in and upon suitable bearings in and on the said pieces P. The screws N pass down through holes in the platform T, and strong nuts fastened under said platform, which in this manner is suspended to the pieces P by the four screws N. The turning of the screws in one or in the other direction will cause the platform T to rise or to fall; and for the quick motion of the said platform, such as is required for adjusting the stone to its proper relation to the saw-blade or blades, we employ any independent motive power applied to the screws N by any suitable arrangement of arbors, gearings, chains, &c., acting upon the wheels *n*, which are fastened to the top of the screws N for that purpose; but for feeding the stone to the cutting-action of the diamond-tool worked in the sash F F' F F'', we deem it essential that

the upward motion of the platform T be not only adjustable as to its exact amount with great accuracy, but also that said feed-motion be controlled by, and only by, the motion of the same arbor which gives motion to the sash F F' F F''.

The following is the mechanism we employ: D are ratchet-wheels, which have fine teeth on their periphery, or compound ratchet-wheels arranged so as to allow of fine action. The ratchet-wheels D are fastened to the top part of the screws N, and *d* are ratchet-levers, provided with suitable dogs *d'* acting upon the ratchet-wheels D. The levers *d* are connected on each side of the machine by the bars *d''*, so that any determined length of motion of the said bars *d''* backward and forward will cause the levers *d* to oscillate of a determined portion of circle, and the dogs *d'* to engage a determined number of teeth on the ratchet-wheels D, thereby causing the screws N to turn a determined portion of a turn, which, according to their pitch, will be a step upward of the platform T of a given desired rise. E is an eccentric mounted on the arbor A; and E' is the eccentric yoke, which is connected to the lever E'', made fast to the arbor H, so that the arbor H will receive an oscillatory motion in the bearings *h h*. At both ends of the arbor H are fastened the sector slide-levers J, in which are mounted the movable wrist-pins *j*, which may be set or fastened at different distances from the point of oscillation of the levers J, and suitable graduations or marks are made, so as to indicate and determine the exact location of the movable wrist-pins *j* upon the levers J, each graduation corresponding to a known amount of feed, which may be determined by experience, to be best suited to any particular work to be done. *e* is a connecting-rod between the wrist *j* and bar *d''*. This arrangement has for its object to obtain, with the regular and limited motion of the eccentric on the arbor A, a variable amount of feed-motion imparted to the platform T; and to be able to graduate said feed-motion with perfect accuracy from nothing upward, by compact scale, to the maximum likely to be required.

I claim—

1. The frame of a diamond-tool stone-cutting machine, consisting of the horizontal or inclined part P P' P P'', upon which is mounted the diamond-tool or tools, and the mechanism imparting motion thereto, of the vertical slide pieces S S S S, between which the platform for receiving the stone to be cut is guided in its perpendicular movement, and of the supports W W W W, between which the stone to be cut may be passed entirely under the machine, substantially in the manner and for the purpose set forth.

2. The combination of the frame P P P' P'', arbor A, pillow-blocks *a a*, wheels M M, and pitmen C C, with the saw-sash frame F F' F F'', and blade or blades B, substantially as and for the purpose specified.

3. The combination of the arbor A, cams C', cam-yoke C'', rods *t''*, levers *t'*, cam-levers *t*, boxes G', and slides G, or substantially the same, with the saw-sash frame F F' F F'', the whole arranged

so as to operate in the manner and for the purpose herein set forth.

4. The variable feed-motion mechanism, consisting of the arrangement of the platform T, screws N, wheels D, levers *d*, dogs *d'*, bars *d''*, and rods *e*, connected to the adjustable wrist *j*, the graduated sector-levers J, arbor H, lever E'', eccentric yoke E', eccentric E, and arbor A, when

used in combination with the frame or sash F F' F F'', and operating substantially as and for the purpose specified.

HUGH YOUNG. [L. S.]
JAMES L. YOUNG. [L. S.]

Witnesses:

R. A. ADAMS,
E. ADAMS.