

(No Model.)

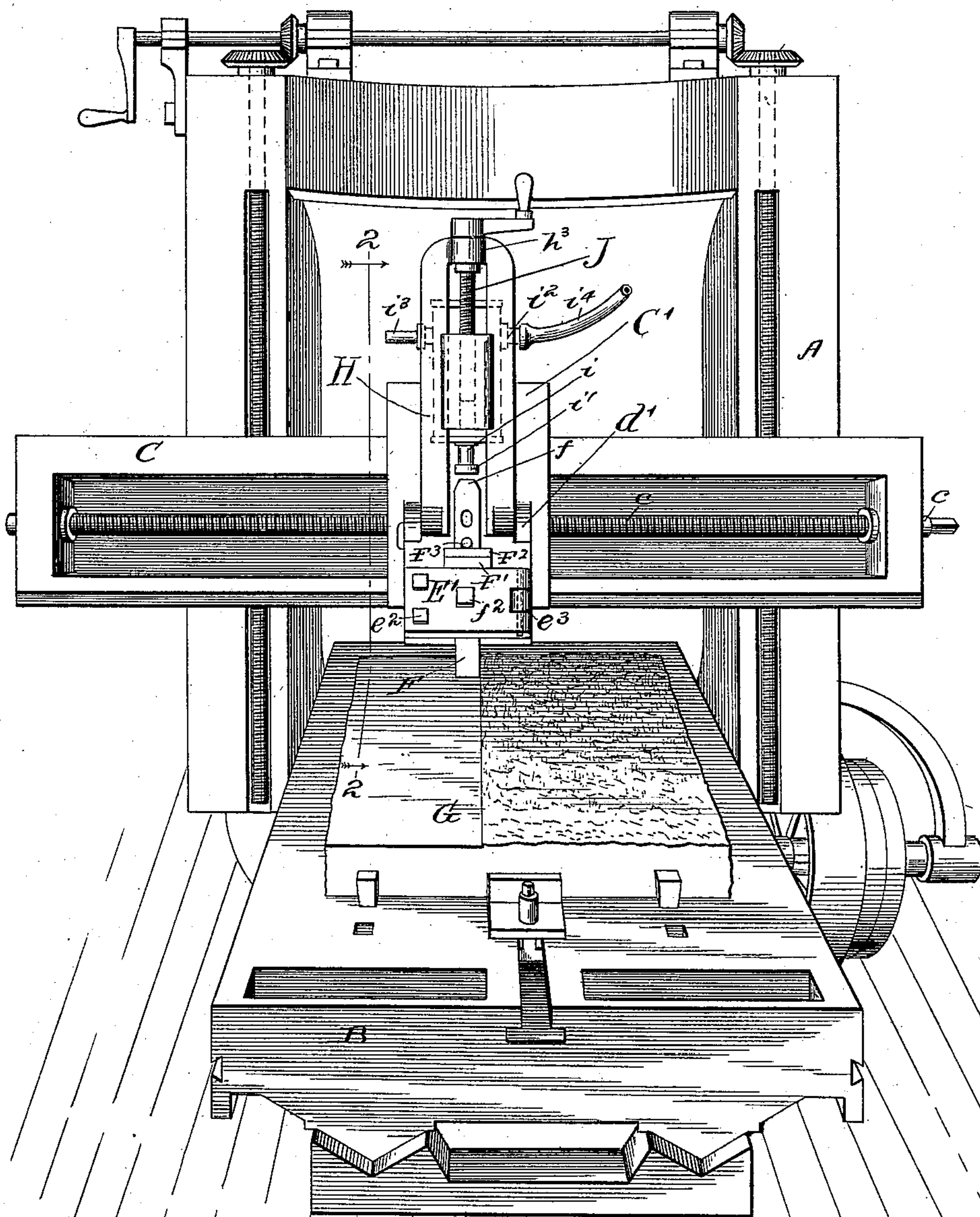
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W. R. HINSDALE.  
STONE DRESSING MACHINE.

No. 600,989.

Patented Mar. 22, 1898.

*Fig. 1.*



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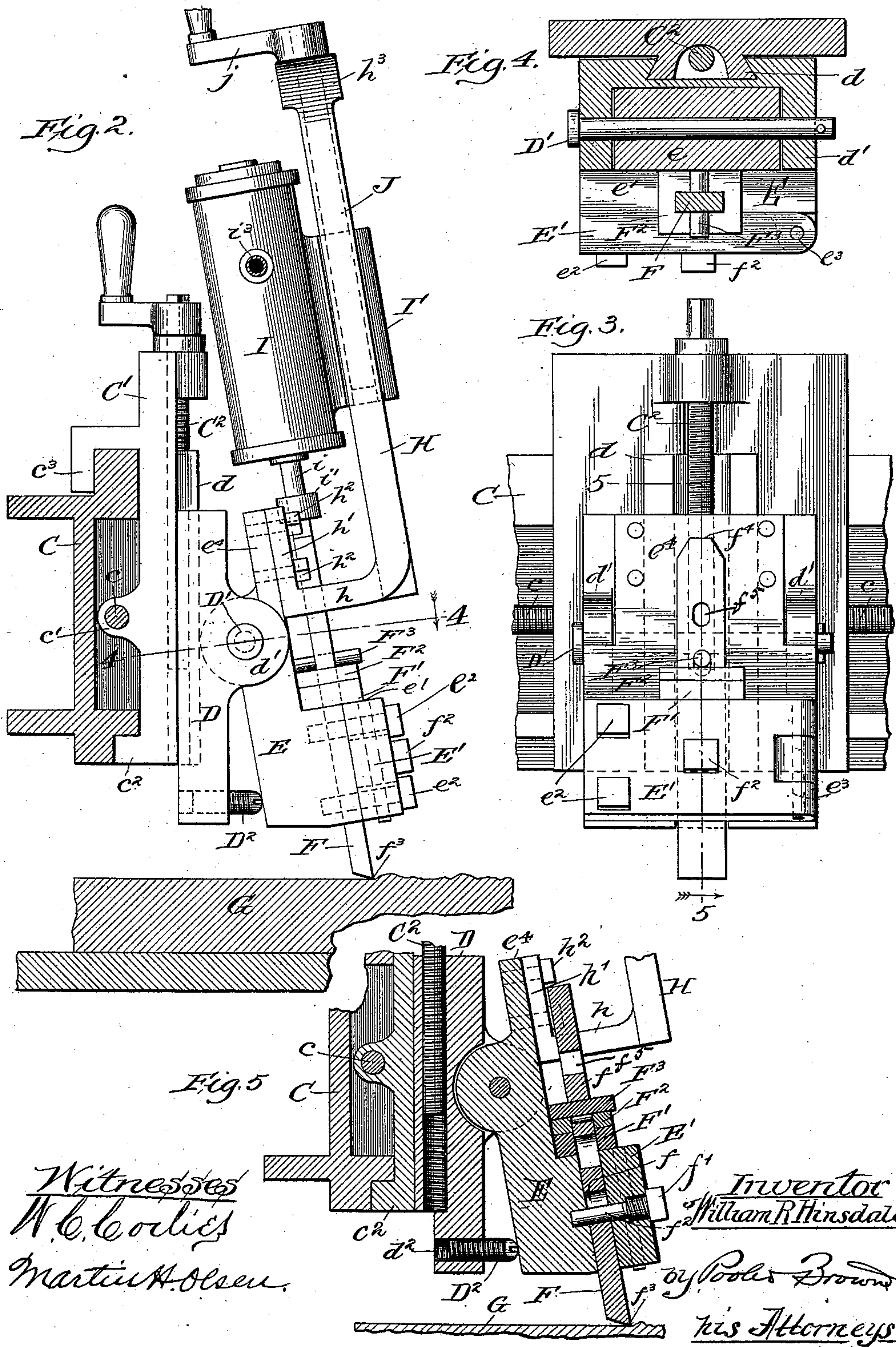
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# UNITED STATES PATENT OFFICE.

WILLIAM R. HINSDALE, OF EVANSTON, ILLINOIS.

## STONE-DRESSING MACHINE.

SPECIFICATION forming part of Letters Patent No. 600,989, dated March 22, 1898.

Application filed March 5, 1897. Serial No. 626,129. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM R. HINSDALE, of Evanston, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Stone-Dressing Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in stone-dressing machines, but is peculiarly adapted for the cutting or dressing of granite or other exceedingly hard stone, and will therefore be illustrated and described in connection with a machine built for dressing granite.

Efforts have been made heretofore to dress the surface of granite blocks by the ordinary planer; but the difficulty with this plan has not been in the machine, but in the cutting-tool, it being quite impossible in practice to make a cutting-tool that will stand the work. If the tool is too hard, it is easily broken; if too soft, it is found that the friction induced by the act of planing heats the tool and draws its temper.

This invention relates more particularly to an improved tool-holder adapted to be attached to a planer which is provided with a suitable motor thereon for imparting a succession of blows to the tool, said tool-holder being so constructed as to hold the tool in such manner that the effect of the blows upon said tool will be in all respects like that imparted by a hand instrument.

The invention consists in the matters hereinafter set forth, and more particularly pointed out in the appended claims.

Figure 1 of the drawings illustrates in a front elevation, partially in perspective, a planer embodying my invention with a block of granite or other stone secured upon the bed-plate or table of the machine. Fig. 2 is an enlarged sectional view of the cross-head of the planer, taken upon the line 2 2 of Fig. 1, and thus showing the tool-holder and tool-hammer apparatus in side elevation. Fig. 3 is a front view similar to that of Fig. 1, but enlarged, showing more clearly the tool-holder head, the tool-hammering apparatus being removed. Fig. 4 is a transverse sectional view taken

upon the line 4 4 of Fig. 2 and looking downward in the direction indicated by the arrow, showing a movable connection of the tool-  
holding head. Fig. 5 is a vertical sectional view through the cross-head and tool-holding head, taken upon the line 5 5 of Fig. 3 and looking in the direction indicated by the arrow.

A represents the usual vertical frame of a planer of ordinary type, provided with a suitable reciprocating bed-plate or table B, a cross-head C, and having also mounted in said cross-head a feed-screw *c*. The construction and operation of such a planer is considered so obvious and well known to the trade that further detailed description of its construction or operation will be omitted. Mounted upon said cross-head C is a frame C', provided with a suitable lug or screw engaging device *c'* and with guide-flanges *c*<sup>2</sup> *c*<sup>3</sup>, whereby upon the rotation of the feed-screw *c* the frame C' will be moved lengthwise of the cross-head C and transversely across the bed-plate B in the desired direction and the desired distance. Upon its front face is secured a vertical movable plate D, to which the tool-holder E is pivotally secured. The plate D is mounted upon the frame C' by a familiar dovetail tongue-and-groove connection *d d*, Fig. 4.

A vertical feed-screw C<sup>2</sup>, secured in the upper end of the frame C', engages the plate D and serves as a means for regulating the vertical adjustment of the plate D and the devices carried thereon. A pair of lugs *d'* extend to the front at each margin of the plate D and are provided with lateral openings through which a bolt D' passes for the purpose of pivotally securing the tool-holder E to the plate D between said flanges *d'*, there being of course a similar aperture through the lug *e* of the tool-holder E, registering with the apparatus in the lugs *d'*. In the lower end of the plate D is a screw-threaded aperture *d*<sup>2</sup>, in which an adjusting screw or bolt D<sup>2</sup> is secured, the head of said bolt projecting beyond the front surface of the plate D a desired distance. In order to adjust the angle of the tool F, the rear face of the tool-holder E rests against said adjusting-bolt D<sup>2</sup>, as clearly shown in Figs. 2 and 5. When, therefore, it is desired to change the angle of the tool F, the bolt D<sup>2</sup> is turned in the de-



sired direction to the right or left. When it is desired to adjust the height of the tool-holder E, the adjusting-screw C<sup>2</sup> is turned to the right or left in the desired direction, and when it is desired to move the tool laterally of the bed-plate the adjusting-screw c is turned in the desired direction.

The lower end of the tool-holder is relatively thicker than its upper portion, thus forming a shoulder on the line indicated at e'. In the thickened portion of said tool-holder E and extending longitudinally there-through is a tool-holding space shown in all the figures of the drawings as being occupied by the tool F, said space or recess being of such depth as to accommodate the tool to be used, which latter does not extend above, but is flush with the outer surface of the tool-holder E. A confining-cap E' serves to hold the tool in position. This cap E' may be secured to the tool-holder E at one end by an ordinary hinged connection, as indicated at e<sup>3</sup>, and at the other end by the bolts e<sup>2</sup> or otherwise.

The cutting-tool F is provided in its end adjacent to its cutting edge with one or more apertures or slots f therethrough.

f' is a screw-bolt secured in a suitable aperture in the cap-plate E' and provided on its inner end with a reduced unthreaded portion f<sup>2</sup>, constituting a bolt proper. This pin or bolt portion f<sup>2</sup> passes through one of the slots f of the tool F, and its inner end rests in a suitable aperture in the face of the thickened portion of the tool-holder E, as more clearly shown in Fig. 5. Surrounding the tool and resting upon the shoulder e of the tool-holder E is a buffer F', which may be of rubber or other suitable resilient material, and immediately above and resting upon said buffer F' is a steel plate or cap F<sup>2</sup>. Said tool is provided adjacent to the end thereof opposite its cutting edge with one or more apertures f<sup>5</sup>, and a pin F<sup>3</sup> rests in one of said apertures and extends beyond the tool on both sides thereof. Said pin forms in effect a stop or shoulder on said tool, between which and a shoulder on the tool-holder rests said buffer F' and the plate F<sup>2</sup>. Said pin F<sup>3</sup> rests in contact with the upper surface of the plate F<sup>2</sup>, so that the buffer F' acts to hold the tool with which the pin is engaged normally in its uppermost position, or in that position in which the guide-pin f' engages the outer or lower end of the slot f in the outer end of the tool.

It will be manifest from an examination of the drawings, together with the above description, that the construction described is one wherein a reciprocating motion may be given to the tool F. The outward or cutting motion of said tool is limited by whatever compression there may be in the buffer F, the actual movement being in fact very slight, while the inward or retracting movement of the tool is limited by the pin f', engaging the outer or lower end of one of the slots f at the

outer end of the tool. In Fig. 5 of the drawings the tool is shown in its retracted position, with its point f<sup>3</sup> engaging the surface of a granite block. The apertures f<sup>5</sup>, engaged by the pin F<sup>3</sup>, are shown as slotted or of oblong form; but it will be understood that this form of aperture is not essential to the operation of the tool. As before stated, said pin forms a stop or shoulder on the tool by which the movement of the tool is controlled by the buffer, and the pin will in practice be of such size as to entirely fill the aperture in which it is mounted. Said tool will be provided with a plurality of apertures f<sup>5</sup> in order to provide for adjusting the tool in the holder when the cutting edge thereof has become worn, so that it will not reach the surface of the granite block. When this occurs, the pin F<sup>3</sup> will be changed to the next adjacent aperture f<sup>5</sup> toward the rear or inner end of the tool, the guide-apertures f being also shifted downwardly, so that the guide-pin f' will engage the next adjacent guide-slot.

In the accompanying drawings I have illustrated a steam-engine cylinder so connected. In said drawings, II is a frame provided at its lower end with a pair of laterally-extending arms h, from the end of each of which projects upwardly a flange h', by which latter the frame is secured to an extension e<sup>4</sup> of the tool-holder E by bolts h<sup>2</sup> or other suitable means. The upper end h<sup>3</sup> of the frame II is integral with the two main or vertical portions; but this is not strictly necessary.

Upon the frame II is secured a steam-cylinder generally provided interiorly with the usual piston-rod i and hammer-head i', the latter being in such position that when extended it will strike the upper end or head f<sup>4</sup> of the cutting-tool F. The usual inlet and exhaust ports i<sup>2</sup> i<sup>3</sup> are provided, and the inlet-port is connected with a suitable source of steam-supply by means of a flexible conduit i<sup>4</sup> or in any other suitable manner. Preferably the cylinder I is adjustably mounted on the frame II, and this is accomplished by means of an integral cross-head or enlarged lug I', slidably fitted between the proximate edges of the two vertical or main members of the frame II, and which guide-lug or cross-head I' engages an adjusting-screw J, which is passed through a suitable aperture in the enlarged upper portion h<sup>3</sup> of the frame and is operated in a familiar manner by a crank j or otherwise.

It will be apparent that upon operating the steam-hammer i the latter will deliver a series of successive strokes or blows upon the upper end f<sup>4</sup> of the cutting-tool F, the hammering blow on the tool driving it down upon the granite surface in precisely the same manner as the blow is delivered by the hand of the workman, the blow being cushioned by the buffer F', and it will also be apparent that the stroke being uniform repeated blows will have the result of giving a finished surface to the



granite or other hard stone being operated upon, the tool being operated by the feed-screw *c* to a new position after each alternate stroke or otherwise, as desired, and thus ultimately covering the entire surface of the stone.

I have found in practice that a machine constructed in accordance with the foregoing description produces work of a superior quality, and that the cutting-tool, instead of taking off the roughened portions of the granite by a rubbing or planing action, now removes them by precisely the same hammering action obtained in handwork; that the work is more uniform and at the same time more rapidly performed. The tool does not get out of order and holds its temper longer than the tools heretofore used in machines where the dressing of granite or other hard stones has been attempted.

What I claim is—

1. In a stone-dressing machine, the combination with a movable tool-holder, and a feed mechanism therefor, of a cutting-tool mounted to move longitudinally in said holder, a stop or shoulder on said tool, a buffer between said stop or shoulder and a shoulder on the holder, a guide-slot in said tool adjacent to its cutting edge, a guide-pin in said holder engaging said slot, means for shifting said stop or shoulder toward the rear end of the tool as the cutting edge of the tool is worn away, and a motor for delivering a succession of blows to the tool.

2. In combination with the frame of a stone-dressing machine a traveling tool-holder, and a motor mounted on said tool-holder for delivering a succession of blows to the cutting-tool, of a cutting-tool movably secured in said tool-holder and provided near its upper end with a series of apertures, a pin or bolt passing through one of said apertures and extending on either side of the tool, and a buffer or other cushioning device located beneath said pin and resting upon a suitable shoulder on the tool-holder.

3. In a stone-dressing machine, the combination with a movable tool-holder and a feed mechanism therefor, of a cutting-tool mounted to move longitudinally in said tool-holder, a loose plate thereon, a buffer between said plate and a shoulder on the holder, a slot in said tool, a guide-pin in said holder engaging said slot, and a motor for delivering a succession of blows to the tool.

4. In a stone-dressing machine, the combination of a frame, a traveling tool-holder thereon, a cutting-tool movably mounted in said tool-holder and provided in its upper end with one or more apertures, a pin or bolt passing through one of said apertures and extending on either side of the tool, a buffer located between said pin and a shoulder on the tool-carrier which is located between the

pin and the outer end of the tool, a guide-pin passing through the lower end of the holder and engaging a guide-aperture in the tool, and a motor for imparting a succession of blows to said tool.

5. In a stone-cutting machine, the traveling tool-holder comprising an adjustable frame portion, and a tool-holder pivotally and adjustably secured to said frame, said tool-holder being relatively thick at its lower portion and provided with a recess in its face equal in depth to the thickness of the tool, and a cap or plate removably secured to the face of said lower thickened portion of the tool-holder, a tool positioned in said recess and provided with an elongated slotted opening therethrough, and a pin passing through a suitable aperture in said cap-plate and said opening in the tool and secured at its inner end in a suitable recess in the face of the tool-holder by means of a screw-threaded connection at the outer end of said pin with a registering recess in the cap-plate.

6. In a stone-dressing machine, the combination with the main frame and a cross-head mounted thereon, of a tool-holder on said cross-head comprising an elongated plate provided in its lower portion with a tool-holding recess, a longitudinally-movable cutting-tool mounted in said recess, a hinged cap adapted to close said recess, a bolt in said cap adapted to engage a guide-slot in said tool, a shoulder on said tool near the upper end thereof, a buffer between said shoulder and the adjacent lower end of the tool-holder and means for imparting a succession of blows to said tool.

7. In a stone-cutting machine, the traveling tool-holder comprising an adjustable frame portion, and a tool-holder pivotally and adjustably secured to said frame, said tool-holder being relatively thick at its lower portion and provided with a recess in its face equal in depth to the thickness of the tool, and a cap or plate removably secured to the face of said lower thickened portion of the tool-holder, a tool positioned in said recess and provided with an elongated slotted opening therethrough, and a pin passing through a suitable aperture in said cap-plate and said opening in the tool and secured at its inner end in a suitable recess in the face of the tool-holder by means of a screw-threaded connection at the outer end of said pin with a registering recess in the cap-plate.

In testimony that I claim the foregoing as my invention I affix my signature, in presence of two witnesses, this 2d day of March, A. D. 1897.

WILLIAM R. HINSDALE.

Witnesses:

TAYLOR E. BROWN,  
CHARLES G. MASON.