

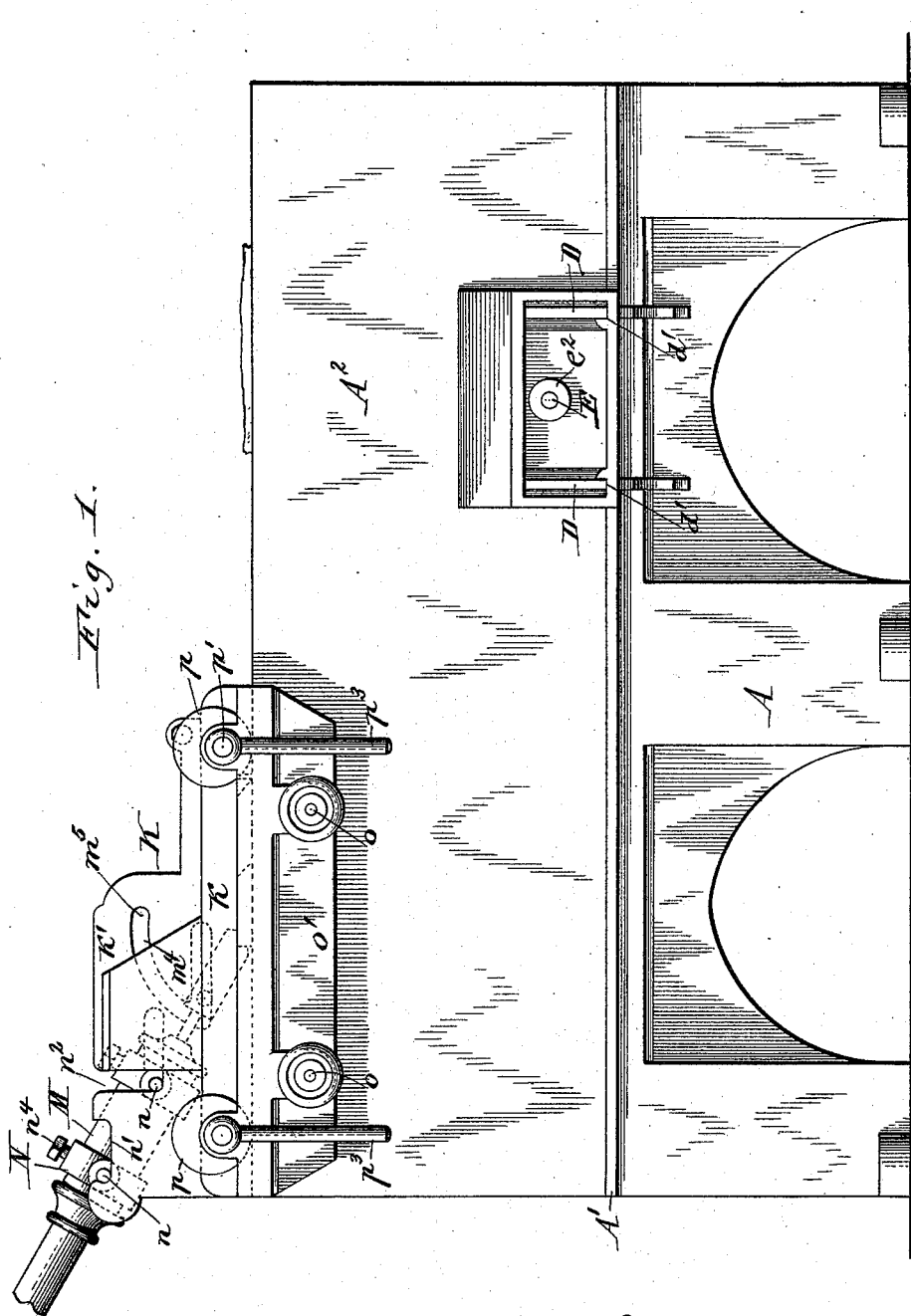
(No Model.)

5 Sheets—Sheet 1.

O. T. DUTRO.
STONE DRESSING MACHINE.

No. 570,466.

Patented Nov. 3, 1896.



Witnesses:

Theo. L. Popp.
Chas. F. Burkhardt.

Oliver T. Britton Inventor.
By Wilhelm Wornat Attorneys.

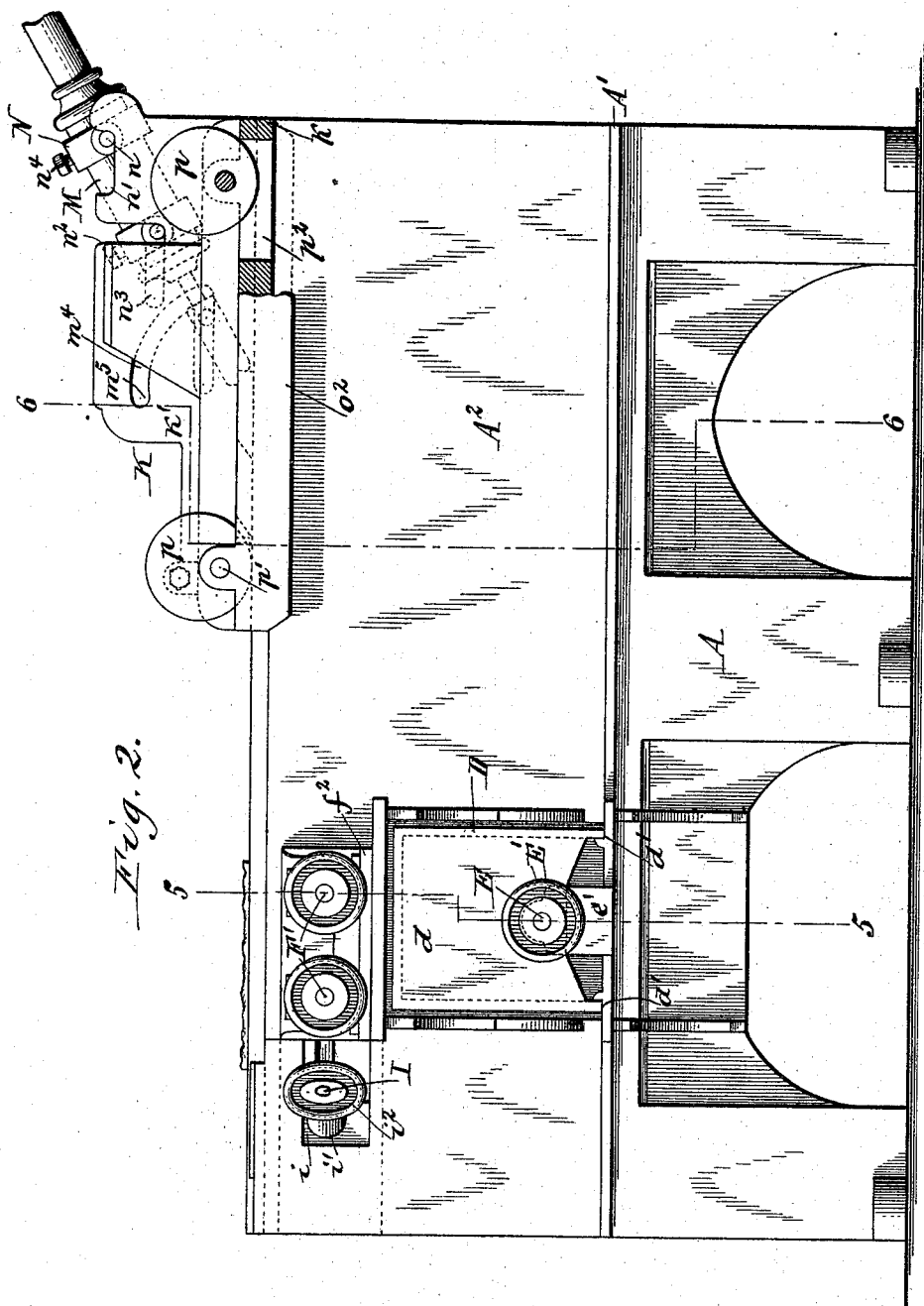
(No Model.)

5 Sheets—Sheet 2.

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Patented Nov. 3, 1896.



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(No Model.)

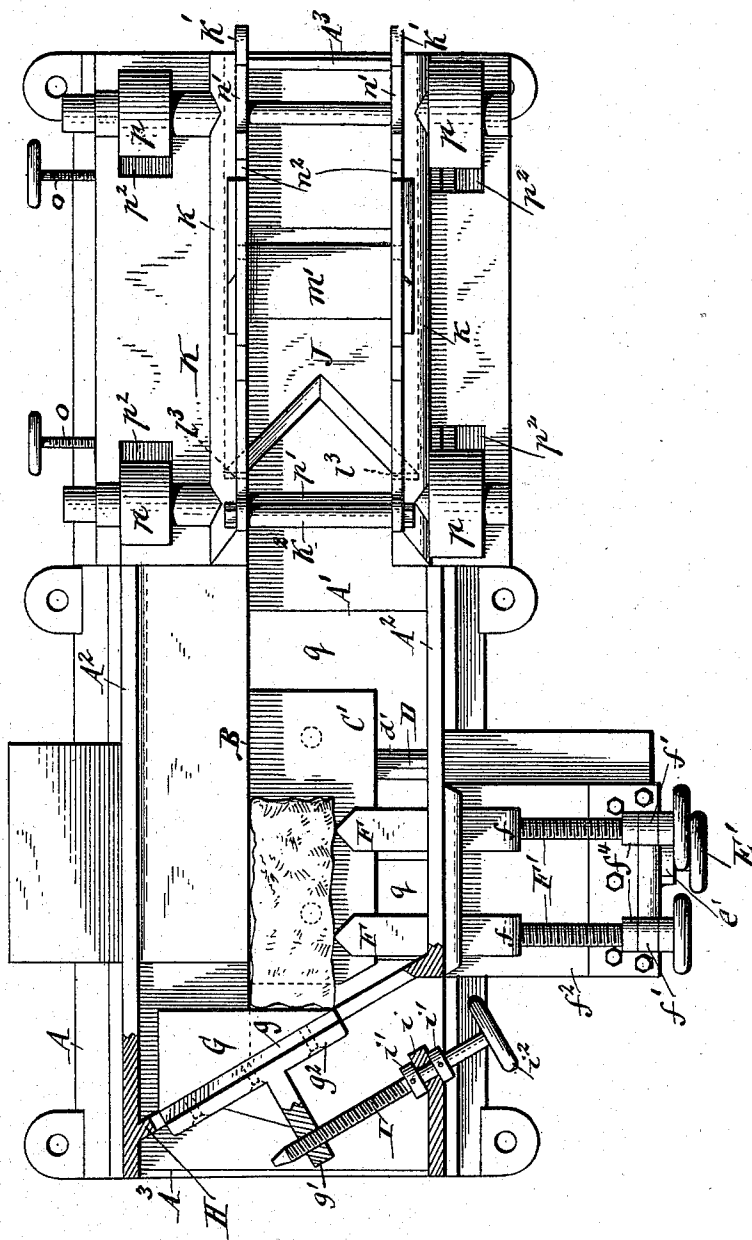
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Fig. 3.



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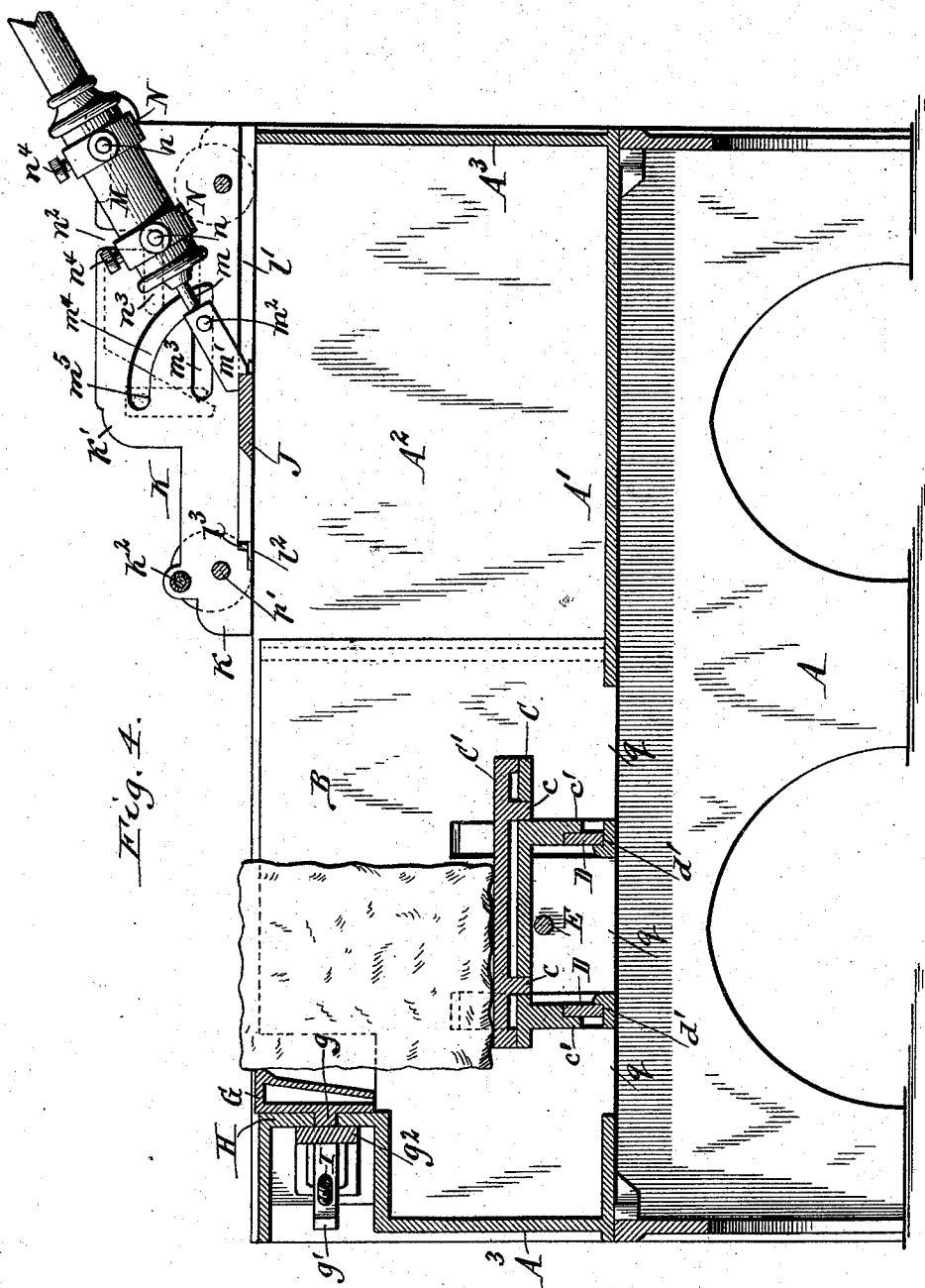
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5 Sheets—Sheet 4.

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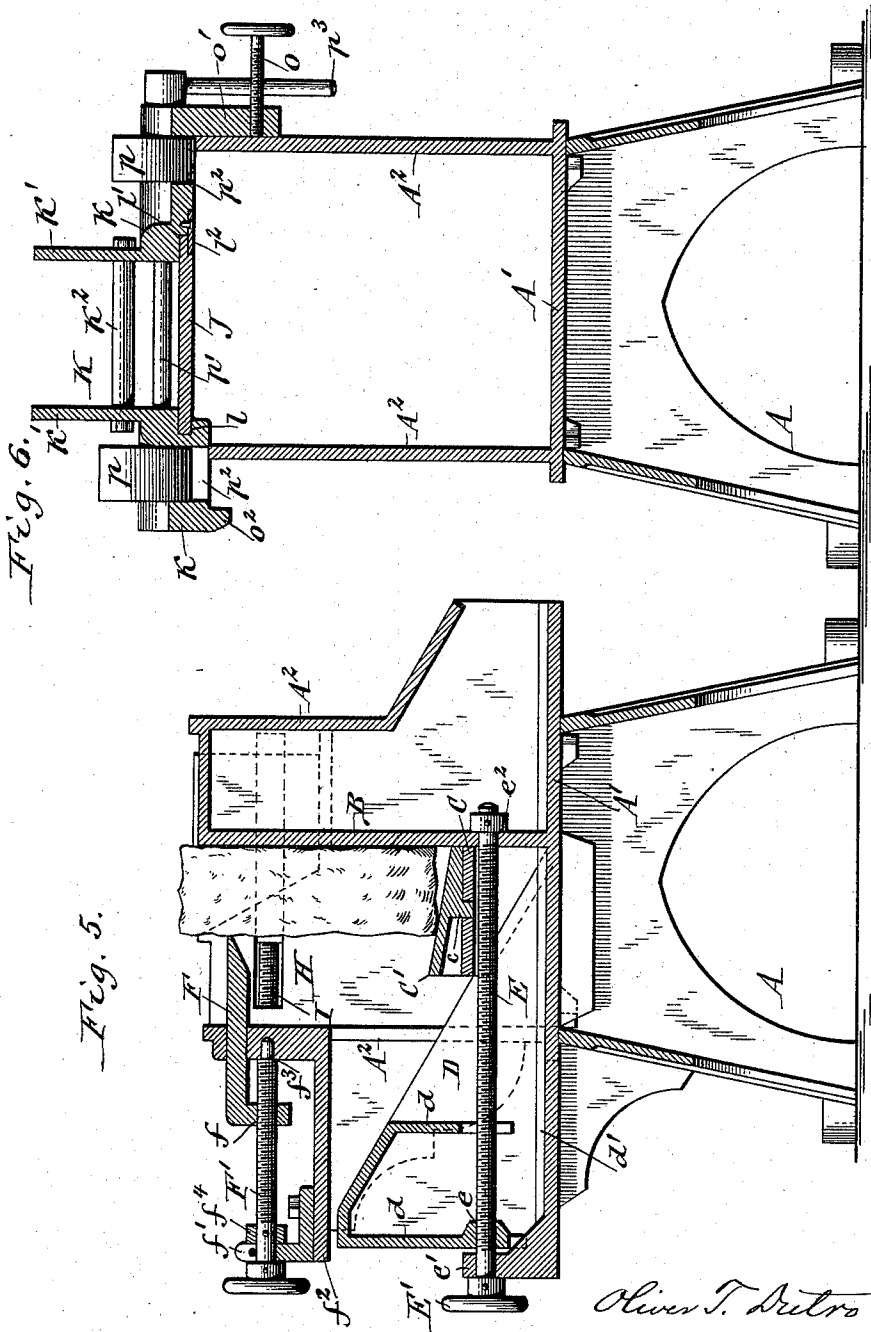
(No Model.)

5 Sheets—Sheet 5.

O. T. DUTRO.
STONE DRESSING MACHINE.

No. 570,466.

Patented Nov. 3, 1896.



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UNITED STATES PATENT OFFICE.

OLIVER T. DUTRO, OF BUFFALO, NEW YORK.

STONE-DRESSING MACHINE.

SPECIFICATION forming part of Letters Patent No. 570,466, dated November 3, 1896.

Application filed December 31, 1894. Serial No. 533,418. (No model.)

To all whom it may concern:

Be it known that I, OLIVER T. DUTRO, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented a new and useful Improvement in Stone-Dressing Machines, of which the following is a specification.

This invention relates to a stone-dressing machine designed more especially for dressing comparatively small blocks, such as paving-stones, although the same is equally useful for dressing larger work, such as building-stones.

My invention has more especial reference to a machine of this class in which the stones are clamped in a fixed holder and in which the cutting-tool is mounted on a carriage which traverses the stone-holder.

One of the objects of my invention is to improve the construction of the stone-holding devices, so as to reliably clamp the stone and facilitate the operation of changing its position for presenting its various sides to the cutting-tool.

The invention has the further objects to improve the construction of the cutting-tool, to render the tool-carriage readily adjustable for centering the tool relatively to the stone, to render the carriage vertically movable by simple means, so that it can be raised on its return stroke, and also to improve the construction of the actuating devices which co-operate with the cutting-tool.

In the accompanying drawings, consisting of five sheets, Figure 1 is a side elevation of that side of the machine on which the operator stands. Fig. 2 is an elevation of the opposite side of the machine. Fig. 3 is a top plan view of the machine, partly in section. Fig. 4 is a longitudinal sectional elevation of the same. Fig. 5 is a transverse section of the machine in line 5 5, Fig. 2. Fig. 6 is a similar section in line 6 6, Fig. 2, with the pneumatic cylinder omitted.

Like letters of reference refer to like parts in the several figures.

The stationary frame of the machine comprises a suitable base A, a bed or horizontal plate A', resting upon the base, upright longitudinal side plates A², extending upward from the bed-plate, and end plates A³, connecting the side plates, the side and end plates

being preferably formed integrally with the bed-plate.

B is an upright abutment or longitudinal wall, which is arranged between the side plates A² near the rear end of the machine and against which the stone to be dressed is clamped.

C is a vertically-adjustable table or platform arranged adjacent to the wall B and forming a bottom rest or support for the stone. This table is preferably provided with an inclined supplemental platform C', which slopes toward the wall B, and thus causes the stone to hug the wall. This supplemental table is removably confined upon the main horizontal table by vertical pins *c*, fitting into openings formed in the main table, as shown in Figs. 4 and 5, so that, if desired, the supplemental table may be removed and the stone supported upon the main table.

D represents a transverse wedge whereby the vertically-movable table is adjusted. This wedge preferably consists of a pair of parallel plates, which are connected by transverse plates or webs *d* and which are guided on transverse rails or ways *d'*, formed on the bed-plate, the latter being extended beyond the sides of the base at this point to afford the necessary range of movement of the wedge, the wall B and the side plates being provided with slots or openings for the passage of the wedge.

The table C is formed with depending flanges *c'*, having inclined lower edges which rest upon the inclined members of the adjusting-wedge, the edges of such flanges being rabbeted, as shown in Fig. 4, to hold the table against lateral displacement on the wedge.

E is a transverse adjusting-screw whereby the wedge is operated. This screw engages with a screw-nut or threaded opening *e*, formed in the end wall of the wedge, and is free to turn in bearings formed in the wall B and an upright lug *e'* of the bed, but is held against lengthwise movement by a collar *e²*, secured to its inner end and bearing against the wall B, and a hand-wheel E', secured to its outer end and bearing with its collar against the lug *e'*. Upon turning the adjusting-screw in one or the other direction by its hand-wheel the wedge is shifted forward or

backward accordingly, thereby raising or lowering the table and the stone and causing the stone to project more or less above the upper edge of the wall B. The table rests loosely upon the wedge and remains in place against the wall B by gravity.

F F represent laterally-movable clamps arranged opposite the wall or abutment B and adapted to impinge against the adjacent side of the stone. In the construction shown in the drawings the clamps are provided with flat-sided or rectangular shanks, which are guided in correspondingly-shaped openings formed in the adjacent side plate A^2 , so as to be held against turning, and each of such shanks is formed at its outer end with a screw-nut f , with which engages a rotary clamping-screw F' . This screw turns in bearings formed in the adjacent side plate and in a lug f' , secured to a bracket f^2 , but is held against longitudinal movement by a shoulder f^3 , formed at its inner portion and bearing against the adjacent side plate, and a collar f^4 , secured to its outer portion and bearing against the lug f' , so that the clamping-jaw is moved toward or from the stone by turning its actuating-screw in the proper direction, each screw being provided with a hand-wheel, as shown, for operating it.

G represents an adjustable rear abutment or clamp which bears against the rear side of the stone and prevents its displacement in that direction. This clamp consists of a block having a receding bearing-face arranged substantially at right angles to the wall B and an oblique rear side which bears against an oblique guide or bar or wall H, arranged in rear of the side clamps and preferably formed integrally with the side plates of the machine. The clamping-block is provided on its rear side with a longitudinal rib g , which is fitted in a corresponding slot formed in the oblique guide-bar, as shown in Fig. 4.

g' is a lug or screw-nut formed on a bar g^2 , which bears against the rear side of the guide-bar and which is secured to the rib of the clamping-block.

I is an oblique rotary clamping-screw which is held against longitudinal movement in its bearing i by collars i' and which engages with the screw-nut g' of the rear clamping-block. Upon turning this oblique screw forward by means of its hand-wheel i^2 the clamping-block is shifted forward on its guide-bar, causing its transverse front face to approach the stone and bear against the rear side thereof, thus effectually resisting displacement of the stone in a rearward direction.

As shown in the drawings, the oblique bar or wall H is arranged at an acute angle to the abutment B, and the end thereof nearest the side clamps is located opposite the rear portion of said abutment. By this arrangement the oblique bar serves to retain the stone in an upright position, preparatory to clamping it, by pushing the same against the oblique

bar, as shown in Fig. 3, the stone being thus prevented from tipping away from the wall B while the operator or his assistant manipulates the several clamping-screws. The oblique arrangement of the clamping-screw of the rear block also brings the hand-wheel of said screw in close proximity to those of the side clamp-screws, enabling the operator or assistant to manipulate the various hand-wheels from a practically single point and facilitating the operations of clamping and releasing the stones.

J is the cutting-tool, and K is the carriage upon which the tool and its actuating devices are mounted and whereby the tool is moved up to and past the clamped stone for dressing it. This carriage moves upon longitudinal ways or tracks formed by the upper edges of the side plates A^2 and consists, essentially, of longitudinal side pieces k , which are formed with upwardly-extending plates k' and a transverse rod k^2 , which connects these plates. The cutting-tool preferably consists of a horizontal steel plate provided in its front edge with an angular or V-shaped notch, the edges of which are sharpened and beveled to form the cutter. The cutting-tool is confined at one of its longitudinal edges in a groove l , formed in the lower inner side of one of the side members of the carriage and at its opposite edge in a groove formed partly by a rabbet l' , arranged in the other side member of the carriage, and partly by a cap-plate l^2 , removably secured to the under side of the last-named carriage member and engaging in a rabbet formed in the adjacent edge of the cutting-tool, as shown in Fig. 6.

l^3 represents cushions, of rawhide, vulcanized fiber, or similar material, which are interposed between the front ends of the tool-grooves and the adjacent portions of the tool and which receive the impact of the latter.

M is the actuating-cylinder of the cutting-tool, which is mounted upon the carriage in rear of the tool. m is the usual reciprocating piston-rod or hammer, and m' an impact-block which is interposed between the front end of said rod and the rear end of the cutting-tool and whereby the blows, which are delivered in rapid succession upon the block, are transmitted to the cutting-tool. This impact-block extends across the entire width of the cutting-tool, by which construction the blow transmitted by the block to the tool is equalized across the width of the latter, thereby avoiding the uneven strain upon the tool and the consequent springing of the same, which would be liable to occur if the comparatively small piston-rod were arranged to strike directly against the rear end of the tool.

The actuating-cylinder may be supplied with compressed air or steam. It is preferably supported in an inclined position by means of bands or rings N, which embrace the cylinder and which are provided on opposite sides with studs or trunnions n . The

studs of the rear supporting-ring rest loosely in elongated notches or recesses n^1 , formed in the upper edge of the side plates of the carriage, while the studs of the front supporting-ring are arranged in vertical notches n^2 , also formed in said side plates in front of the elongated notches, and having forwardly-extending horizontal branches n^3 . This construction permits the actuating-cylinder to be readily put in place on the carriage or removed therefrom, and the elongated rear notches and the horizontal branches of the front notches permit the cylinder to be adjusted forward on the carriage to compensate for the wear of the cutting-tool.

The actuating-cylinder is held from turning in its supporting-rings by set-screws n^4 .

It is well known that the lower side of the bore of a horizontal or reclining actuating-cylinder receives greater wear from the piston than its upper side. By supporting the cylinder in the manner herein shown and described it may be reversed in its supporting-rings from time to time by loosening the set-screws n^4 , so as to equalize the wear.

The intermediate impact-block m^1 is supported at its upper end by studs m^2 , projecting laterally therefrom and seated loosely in horizontal slots m^3 , which are formed in the upright side plates of the carriage and which permit the impact-block to shift forward with the cylinder to compensate for the wear of the cutting-tool. Each of these slots is provided with a curved branch m^4 , which extends upwardly and rearwardly from its rear end and which terminates in a horizontal portion m^5 . In removing the tool from the carriage the studs of the impact-block are passed into the curved branches of the slots m^3 and the block is hung by means of its studs in the horizontal extremity of said slots, as shown by dotted lines in Fig. 4. In this position it is out of the way and permits the cutting-tool to be conveniently withdrawn from its grooves and replaced in the carriage, the block being again returned to its operative position after inserting the tool.

In order to obtain the best results, it is desirable that the apex of the V-shaped cutting-tool should coincide with the center of the stone. The blocks of stone vary in size, and in order to enable the tool to be readily centered the tool-carriage is made laterally adjustable on its guideways. In the construction shown in the drawings this adjustment is effected by a pair of horizontal screws o , which engage in screw-threaded openings formed in a depending flange o^1 , arranged on one of the side pieces of the carriage and which bear at their inner ends against the adjacent side plate of the machine, as shown in Fig. 6. Upon turning these adjusting-screws forwardly by means of their hand-wheels the tool-carriage is drawn toward the side of the machine on which the adjusting-screws are located, the carriage being adjusted in the opposite direction by turning

the screws backwardly and pushing the carriage laterally on its ways.

The lateral movement of the carriage is limited in one direction by the adjusting-screws o and in the other by a flange o^2 , depending from the opposite side piece of the carriage, as shown in Figs. 2 and 6, the depending flanges of the two side pieces being arranged at a sufficient distance apart to afford the necessary lateral adjustment of the carriage.

In the drawings only one stone-clamping device or holder is shown, but in practice a row or series of such holders is preferably employed, a stone being clamped in each holder and the cutting-tool and carriage being moved past the entire series before returning it to its initial position. When the machine is thus organized, the operator, who controls the tool-carriage, stands on that side of the machine on which the adjusting-screws of the carriage are located, and a helper or assistant, who clamps the stones and changes their position in the holders, stands on the opposite side of the machine.

In the operation of the machine the assistant first clamps the stones in the series of holders, this being done by placing each stone upon its table C and adjusting the same to project the stone above the wall to the desired extent, then tightening the side clamps F, and finally tightening the rear block or clamp G against the rear side of the stone. The operator now advances the carriage so as to bring the cutting-tool against the first stone, whereby the projecting portion of the latter is dressed off by the rapid blows delivered against the cutting-tool. After dressing the first stone the operator moves the carriage onward to and past the second stone, and so on throughout the entire series. As soon as a stone has been thus dressed on one side or edge the assistant changes its position, so as to present another edge thereof to the cutting-tool upon the next forward movement of the carriage, thus rendering the work practically continuous.

In order to permit the cutting-tool to clear the projecting portions of the stones which have been thus changed by the assistant, the carriage is made vertically movable, so that it may be raised by the operator on its return movement.

The carriage-lifting mechanism shown in the drawings consists of four rotary cams or eccentrics p , two of which are arranged near the front end of the carriage, on opposite sides thereof, and the other two near the rear end of the same. The front eccentrics are secured to the projecting end portions of a transverse shaft p^1 , journaled in the front portions of the side members of the carriage, and the rear eccentrics are secured to a similar shaft journaled in the rear portions of said members. These eccentrics project through openings p^2 formed in the side members of the carriage, and are adapted to bear against the car-

riage-ways, so that upon turning the shafts in the proper direction to bring the large radius of the eccentrics below the shafts the carriage is lifted from its ways clear of the projecting stones, permitting it to be returned to its initial position without striking the stones.

Each of the eccentric-shafts is provided with a hand-lever p^3 for turning it. In moving the carriage back to the starting-point the operator seizes these hand-levers, the carriage sliding upon its ways by means of the eccentrics. After returning the carriage the hand-levers are turned in the proper direction to allow the carriage to descend to its normal position, and the carriage is again moved successively past the newly-placed stones, these operations being repeated until the stones have been dressed on all sides, when a new lot of stones is placed in the holders.

In my improved machine the movement of the tool-carriage is at all times under the control of the operator, who can thus advance the carriage with greater or less speed and with more or less pressure, as the nature of the stones may require, thereby facilitating the dressing operation and avoiding injury to the cutting-tool.

By employing a cutting-tool of the form shown the converging cutting edges tend to compress the particles of the stone, rendering the same less liable to chip or splinter at the corners.

The rear clamping-block of the stone-holder can be adjusted to extend entirely across the rear end of the stone, and the latter is therefore firmly clamped and protected and prevented from splintering at its rear corners.

The bed-plate is provided around the stone-supporting table C with apertures g , through which the chips drop upon the floor.

I claim as my invention—

1. In a stone-dressing machine, the combination with the stationary frame having guideways, of a stone clamp or holder, a carriage moving on said ways, a cutter or chisel mounted on said carriage and having a V-shaped notch forming converging cutting edges, an actuating-cylinder also mounted on said carriage and a piston arranged in said cylinder and having a rod or hammer arranged to operate against said chisel substantially as set forth.

2. The combination with the stationary frame and the tool-carriage, of an upright wall or abutment against which the stones bear, a wedge movable toward and from said abutment and having its incline trending toward the same, and a vertically-movable table having an inclined under side resting loosely on said wedge and bearing at its front edge against said abutment whereby the table is prevented from moving away from the wedge and compelled to rise when the wedge is advanced, substantially as set forth.

3. The combination with the stationary

frame of the machine and the tool-carriage, of an upright longitudinal wall or abutment for the stones, a stone-clamp arranged opposite said abutment, a transverse supporting-wedge movable toward and from said abutment and having its incline trending toward the same, a vertically-movable table having an inclined under side resting loosely on the wedge and bearing at its front edge against said abutment, whereby the table is prevented from moving away from the wedge and an adjusting-screw engaging with said wedge, substantially as set forth.

4. The combination with the stationary frame of the machine, of a wall or abutment against which the stone to be dressed bears and an oblique bar or wall supported on the frame of the machine and arranged at one end of said abutment and at an acute angle thereto, whereby the stone resting against said abutment is prevented from tipping away therefrom by the oblique bar or wall, substantially as set forth.

5. The combination with the stationary frame of the machine, having an abutment for the stone, of an oblique bar arranged in rear of said abutment, and an adjustable clamping-block having an oblique rear face bearing against said oblique bar and a transverse front face adapted to impinge against the rear side of the stone, substantially as set forth.

6. The combination with the stationary frame of the machine having an abutment for the stone, of an oblique bar arranged in rear of said abutment, an adjustable clamping-block having an oblique rear face bearing against said oblique bar and a transverse front face adapted to impinge against the rear side of the stone, and an oblique adjusting-screw engaging with said clamping-block, substantially as set forth.

7. The combination with the stationary frame and an upright wall or abutment against which the stone is adapted to bear, of a vertically-adjustable table arranged adjacent to said wall and supporting the stone, a clamp arranged opposite said wall and adapted to impinge against the side of the stone, an oblique bar arranged in rear of said wall, and an adjustable clamping-block guided on said oblique bar and adapted to impinge against the rear side of the stone, substantially as set forth.

8. The combination with the stationary frame, the tool-carriage and upright abutment for the stones, of a main supporting-table arranged adjacent to said abutment, and a supplemental table or platform removably arranged on the main table and sloping toward said abutment, whereby the stones are caused to hug the abutment, substantially as set forth.

9. The combination with the stationary frame of the machine having guideways, of a stone clamp or holder, and a tool-carriage

supported on said guideways and having cams or eccentrics for elevating it, substantially as set forth.

10. The combination with the stationary frame of the machine having guideways, of a stone clamp or holder, a tool-carriage supported on said guideways, transverse rotary shafts journaled in the front and rear portions of said carriage, and eccentrics secured to said shafts and adapted to bear against said guideways for elevating the carriage, substantially as set forth.

11. In a stone-dressing machine, the combination with the main frame, a stone-holder and a tool-carriage arranged to traverse the stone-holder, of a supporting-ring mounted on said carriage, an actuating-cylinder reversibly supported in said ring and a clamping device for securing the cylinder in place in said ring, substantially as set forth.

12. The combination with the main frame and the carriage, of a cutter-plate or chisel mounted therein, an actuating-cylinder and piston supported on said carriage, and an im-

25 pact-block interposed between the rear end of the cutter-plate and the rod of said piston and extending across the width of the cutter-plate, whereby the strain upon said plate is equalized, substantially as set forth.

13. The combination with the tool-carriage having slotted side plates, of an actuating-cylinder mounted on the carriage and an impact-block having supporting-studs arranged in the slots of said side plates, substantially as set forth.

14. The combination with the side plates of the tool-carriage having horizontal slots provided with upwardly and rearwardly curved branches, of an actuating-cylinder mounted on said carriage, and an impact-block having supporting-studs arranged in the slots of said side plates, substantially as set forth.

Witness my hand this 26th day of December, 1894.

OLIVER T. DUTRO.

Witnesses:

CARL F. GEYER,
KATHRYN ELMORE.