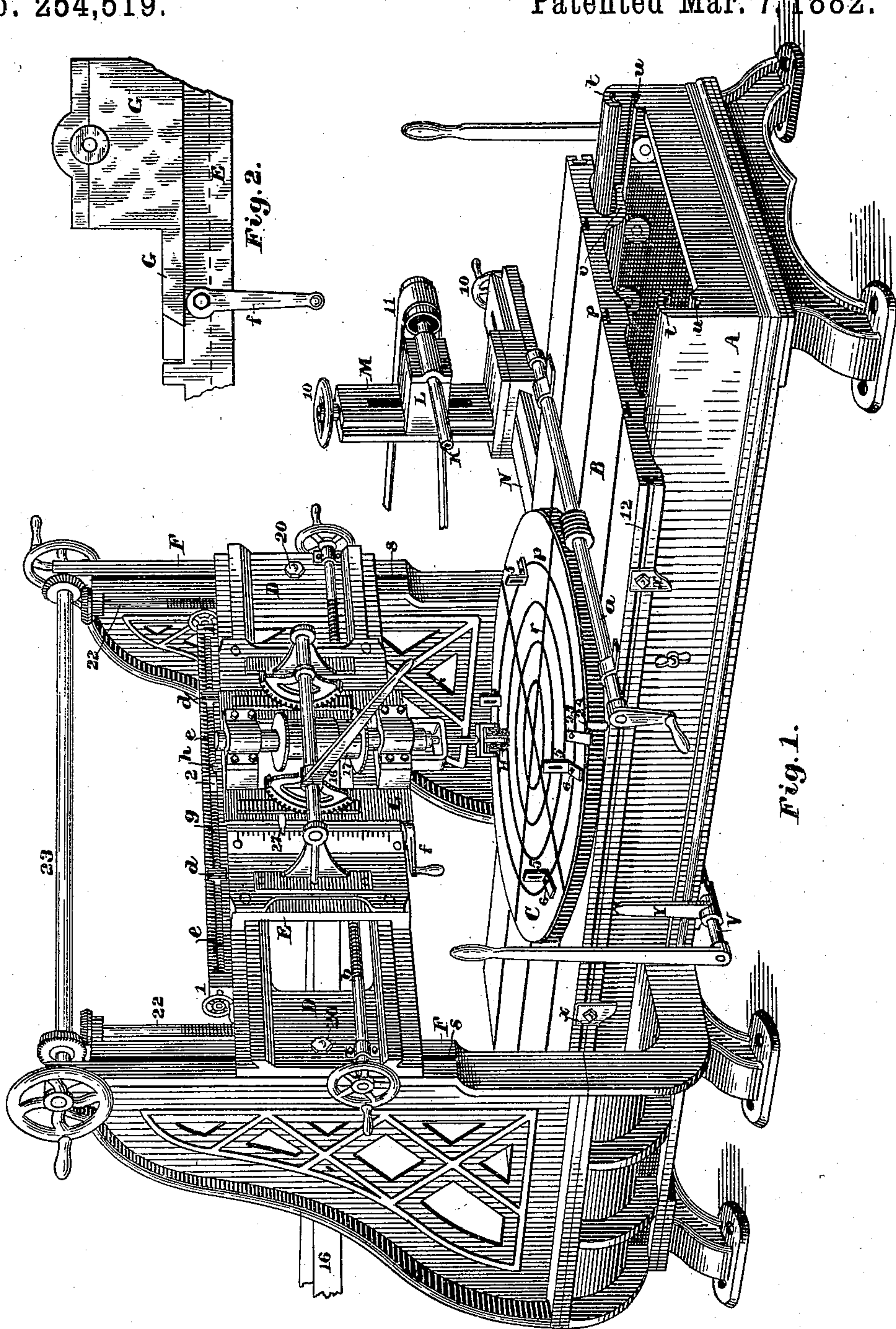


(No Model.)

J. WARREN.
STONE CUTTING MACHINE.

No. 254,519.

Patented Mar. 7, 1882.



Witnesses:
Walter E. Lombard.
H. E. Lombard.

Inventor:
John Warren;
by N. E. Lombard
Attorney.

UNITED STATES PATENT OFFICE.

JOHN WARREN, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO OSCAR L. NOBLE, TRUSTEE, OF SAME PLACE.

STONE-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 254,519, dated March 7, 1882.

Application filed August 29, 1881. (No model.)

To all whom it may concern:

Be it known that I, JOHN WARREN, formerly of Detroit, Michigan, but now of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Stone-Cutting Machines, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to machines for dressing and paneling stone and finishing the edges thereof, and to that class of such machines in which the stone is moved upon a bed or table in various directions to bring every part of the surface to be finished or dressed into contact with the cutting-instruments.

My invention consists in the combination, in a stone-cutting machine, of a longitudinally-movable carriage, an independently-revolving table, a vertically-adjustable cross-slide, a laterally-adjustable slide-rest, and a tool-holder mounted upon said slide-rest and adapted to be vertically adjustable thereon.

It also consists in certain details of construction more or less directly connected with these leading features, all of which details are hereinafter described, and particularly pointed out in the claims.

In the drawings accompanying this specification, Figure 1 represents a perspective view of my improved machine. Fig. 2 is an inverted plan of a portion of the slide-rest and the vertically-adjustable tool-carrying frame with the clamping-cam in position to unlock the tool-frame.

In the drawings, A represents the bed of the machine, on which in suitable ways slides a carriage, B, to which reciprocating motion is imparted in any well-known way. These parts are not essentially different from the ordinary metal-planing machine, except in certain subordinate details, hereinafter described.

On the reciprocating carriage I place a revolving table, C, adapted to sustain the stone to be worked and to be rotated independently of the motion of the carriage. A shaft, *a*, placed across the carriage and supported in bearings thereon, is provided with a worm, which meshes into and acts upon the teeth on

the periphery of the table C to impart rotary motion thereto. I have represented this shaft as provided with a crank for the hand; but in practice it will be provided with a pulley, over which a belt will pass, kept at a proper tension by any suitable means. So, also, the carriage is to be provided with well-known mechanism for imparting reciprocating motion.

It will be apparent that a stone carried upon the table C may, when the carriage is at rest and the table made to rotate, be cut by the tool in circular form, or the table remaining at rest in relation to the carriage, while the latter is moved, the stone may be cut in straight lines, and, further, that any resultant of these movements may be obtained. In addition to these various motions imparted to the stone I use the ordinary transverse movement of the sliding rest E, which carries the tool-holding frame G.

In Fig. 1 the cross-slide is represented at D. It is supported in standards F F, which are bolted to the bed in the ordinary manner. The cross-slide is connected to the standard by means of bolts 20, which pass through slots in the standard and slide therein. The cross-slide is raised and lowered by means of threaded rods 22 22, on the end of which are bevel-gear wheels meshing with like gear-wheels on the shaft 23. By turning this shaft the cross-slide is raised equally at both ends. The slide-rest is represented in Fig. 1 as moving laterally by means of a screw, *b*, provided with a crank at each end, so that the workman may move the cutter from either side; but a pulley may be used instead, and this part of the machine, like the other, may be driven by power. Upon this slide-rest is placed the cutter-frame G, held in vertical slides and adjustable on said rest. The general arrangement of the cutter-frame on the slide-rest is such that it may have independent vertical adjustment on the slide-rest. I also have made some special improvements in connection therewith. The first consists of adjustable stops *d d*, in combination with rods *e e*, cut one with right and the other with left hand threads. The rods are in bearings at the ends and center, (marked 1 1 and 2,) and are provided with cranks or

some equivalent device, so that the rods may be turned. The rods pass through the stops d d , which are threaded like nuts, and as the rods turn in their bearings without longitudinal motion, the stops are carried by the turning of the rods to any required point and there held. The stops slide in slot g in the upper part of the cross-slide D , and are of course independently adjustable to any point within the slot. The bar above the slot is marked with a graduated scale, so that the stop may be adjusted accurately to any distance from the center, and that the motion of the cutter may be thereby accurately determined. A stud, h , on the slide-rest projects into the path of the stops d d , and as the said slide-rest runs to the right or left it comes in contact with one or the other of these stops, and thereby the motion of the slide-rest is arrested and limited. The cutter-frame is adjustable vertically on the slide-rest, and is raised by segmental gears mounted upon a shaft having its bearings upon the slide-rest and operated in connection with racks on the cutter-frame.

The means heretofore provided for holding the cutter-frame in position while the cutter was operating on the stone have not been found satisfactory, and I have provided a simple device which has been found effective. For effective work it has been found absolutely necessary that the frame which carries the cutter should be held perfectly rigid, and it is desirable that it should be adjustable to any point. For this purpose I have provided a simple and effective device which consists of a cam-lever, f , pivoted on the lower end of the slide-rest, behind the cutter-frame, but near the edge thereof, and when unlocked the handle lies behind the frame, as shown in Fig. 2; but when turned so as to bring that part of the cam having the greatest radius against the rear face of the frame, and the lever is in position, as shown in Fig. 1, it binds the frame by pressing it forward against the overlapping flanges of the guides.

As the cam presses against the smooth surface of the frame the locking can be accurately effective at any point. A pointer, 27, is placed on the frame, and, extending over a graduating scale on the slide-rest, indicates to the operator the proper point at which to lock the frame. The circular-revolving table runs on a pivot fixed in the carriage, so as to be removable, and is provided with some special and important details, rendered necessary by its special office and combination. Adjustable clamps are necessary for holding stones of various sizes and shapes. These I have found can be most conveniently adjusted and arranged by means of concentric grooves in the face of the circular table. I have therefore made in the face of said table circular grooves in T shape, like those shown at p in the end of the carriage. Over these grooves I set clamps 5 5, adapted to bear against the edges of the stone when in place on the table. The clamps are provided with T-shaped bolts, the heads of which are

inserted in the grooves and then turned a quarter-circle, and the clamps are held on them by means of nuts 6. Radial grooves r are also made in the face of the table of like shape in cross-section as the circular grooves first described. These serve to hold stones of every possible shape and in any required position. Like grooves are arranged longitudinally in the upper face of the carriage, and the stone may extend from the table to the carriage if its size requires. I contemplate sinking the transverse shaft a , which turns the circular table into the carriage, and having the table flush with the upper surface of the carriage; or I may add a planking of suitable thickness to the surface of the carriage to bring it flush with the table.

In order to provide a suitable stop for the table I have fixed a pin, 24, in the carriage, close to the edge of the table. The upper end of this pin rises above the surface of the table and is threaded. A plain bar, 25, having a hole in one end, is held upon a T-bolt, such as I use for the clamps 5, and is thereby held in any desired position. The bar 25 extends into the path of the pin 24, and thereby the motion of the table is arrested. One of these is placed on each side, and the table may be made to reciprocate back and forth from one stop to another for cutting any part of a circle. One of these bars may be used to hold the table by loosening the nut on the bolt, removing and reversing the bar 25, and slipping it over the pin 24, on which it is clamped to the table by a nut.

The revolving cutter H , which is mounted in the cutter-frame, is carried by the movement of the slide-rest over the surface of the stone, and may work at any point. It is driven by a belt, 16, worked on a pulley, 17, on the cutter-spindle. A second cutter for operating upon the edges of stones may be inserted in the spindle K , having its bearing in the rest L , adjustable vertically on a slotted standard, M , which in turn is also adjustable to or from the carriage on the arm N , firmly secured to and projecting horizontally from the bed A . Both movements are made by means of handles 10 10. The cutter is driven by a belt, 11.

The construction of the ways on which the carriage slides and the guide-rails in connection with them has been improved by me.

Under the flanges t t , which turn from the outer side of the bed with an inward and downward curve, I place the V-grooves u , in which run the guide-rails v of the carriage, extending downward and outward from the lower surface of the carriage, so as to bring the bearings under the overhanging flanges t t . Friction-rollers are placed on the bed for the partial support of the carriage and to facilitate the movement. As the flanges t extend quite over the grooves u , no dust or chips can fall into said grooves and obstruct the movement of the carriage.

Upon the side of the carriage, in proper grooves, I have placed adjustable stops x x to limit the motion of the carriage. They may

be loosened or set by means of a nut on the bolt which fits in the T-groove 12. The stops *x* serve to arrest the carriage when in its motion either of them is brought against a stop-lever, Y, upon the reversing-shaft V.

I contemplate using with this machine the improved cutters described by me in an application now pending before the Patent Office, filed on or about August 17, 1881; but any
10 suitable cutters may be used instead.

All the parts may be driven by power through ordinary intermediate mechanisms.

I am aware that a stone-dressing machine has been patented having a longitudinally-moving table, a rotating stone-carrier, and a vertically-adjustable cross-head carrying a laterally-adjustable block which supports the tool, and I do not claim the construction therein shown.

20 Having thus described my invention, what I claim is—

1. In a stone-dressing machine, the combination of a longitudinally-movable carrier, an independently-revolving table, a vertically-adjustable cross-slide, and a slide-rest laterally adjustable on such cross-slide and carrying an adjustable tool-holder.

2. The combination, with the slide-rest and cross-slide, of the stops *d d* and graduated
30 scale, substantially as described.

3. The combination of the revolving table, mounted on a longitudinally-moving carriage, with shaft K, adapted to carry a side cutter.

4. The combination, with the revolving table and carriage B, of the pin 24 and adjustable bar 25, substantially as described.

5. The combination of the cross-slide and the slide-rest with the adjustable stops *d d* and threaded rods, whereby the stops may be adjusted and held in any position, substantially
40 as described.

6. The combination of the slide-rest, the vertically-adjustable tool-holding frame, and the cam-lever pivoted upon said slide-rest and adapted to impinge upon the back of the tool-holding frame and lock it in position, substantially
45 as described.

7. The bed A, provided with the V-grooves *u u* and the inwardly-curved flanges or lips *t t*, in combination with the carriage B, provided
50 with the downwardly and outwardly projecting guide-rails *v v*, fitted to and adapted to slide in said V-grooves *u u*, substantially as and for the purpose described.

8. In combination with the reciprocating
55 carriage B, the independently-revolving table provided with radial and concentric T-shaped grooves, substantially as and for the purpose described.

9. In a stone cutting or dressing machine, 60 the combination of two sets of tool-operating mechanisms arranged to operate upon different faces of the stone, substantially as described.

Executed at Boston, Massachusetts, this 65 24th day of August, A. D. 1881.

JOHN WARREN.

Witnesses:

N. C. LOMBARD,
WALTER E. LOMBARD.