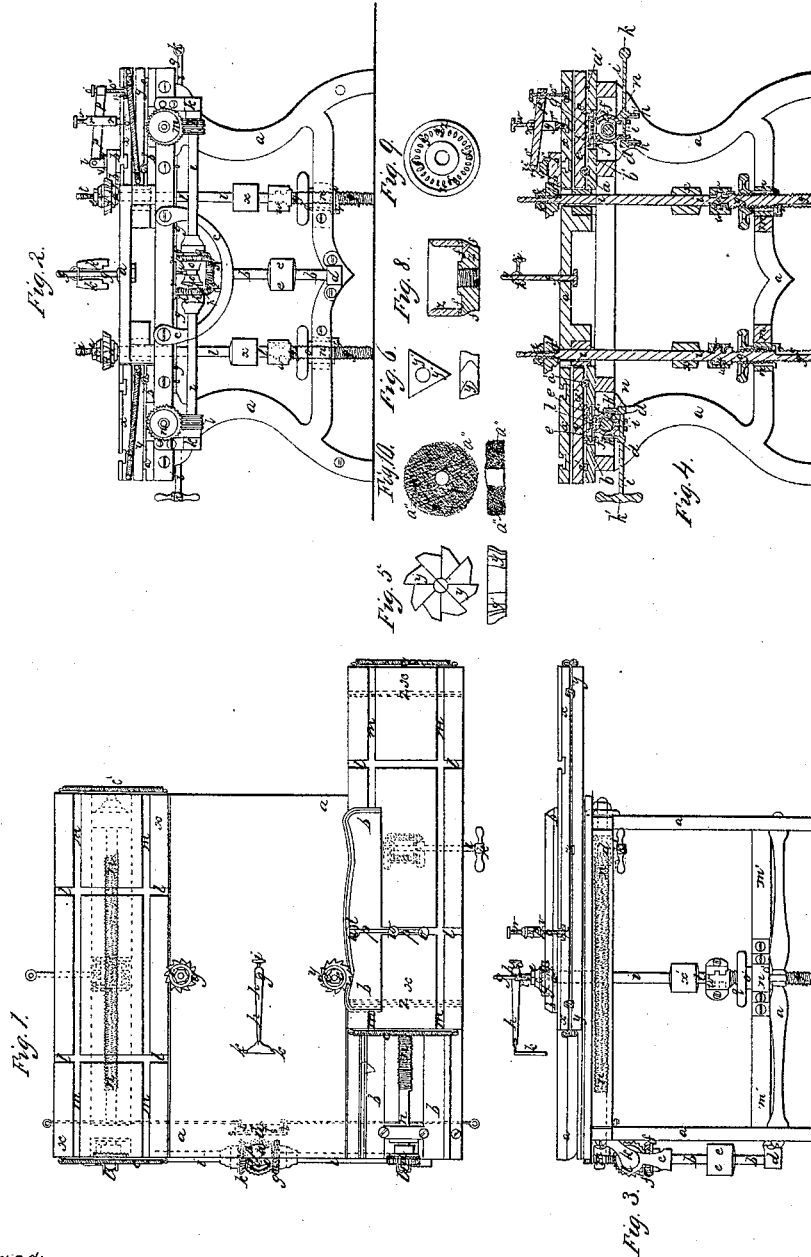


J. W. Maloy.
Dressing Marble.

N^o 53.845.

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Witnesses;

Sam^l. M^r. Barton

Joseph Garrett

Inventor;
James W. Mealey

UNITED STATES PATENT OFFICE.

JAMES W. MALOY, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN MACHINES FOR CUTTING AND FINISHING MARBLE.

Specification forming part of Letters Patent No. 53,845, dated April 10, 1866.

To all whom it may concern:

Be it known that I, JAMES W. MALOY, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Machines for Cutting and Finishing Marble, &c.; and I do hereby declare that the following description, taken in connection with the accompanying plate of drawings, hereinafter referred to, forms a full and exact specification of the same, wherein I have set forth the nature and principles of my said improvements, by which my invention may be distinguished from all others of a similar class, together with such parts as I claim and desire to have secured to me by Letters Patent.

My improvements are represented in the accompanying plate of drawings, of which Figure 1 is a top view, Fig. 2 a side elevation, Fig. 3 a front elevation, and Fig. 4 a central vertical transverse section, of my improved machine. Figs. 5, 6, 8, 9, 10 are detail views of the several implements used on the said machine for cutting, grinding, and polishing the marble, &c.

The present invention has for its objects the cutting and finishing of the edges of slabs of marble and other similar material by machinery in lieu of the mode of hand labor ordinarily heretofore practiced, the results attained being economy in the manufacture and a nearer approach to perfection in the work produced.

The following description, in detail, of the construction and operation of my new machinery for working the edges of marble slabs, &c., will fully explain its essential features.

a a a in the drawings represent the framework of my new machine. *b b* is a vertical shaft supported by and turning in standards *c c* and *d d*. The shaft *b b* is actuated by a belt on the drum *e e*, and has on its upper end a bevel-gear, *f f*, which engages with two other similar gears, *g g* and *h h*, attached to and operating a horizontal shaft, *i i*, which turns in and is supported by standards *k k*. On the ends of the shaft *b b* are formed worms *l l*, which engage with gears *m m*, connected with and operating screw-shafts *n n*, placed at right angles to the shaft *i i*, and which turn in and are supported by bearings formed by the sides of the frame *a a*.

On the shaft *i i*, between the gears *g g* and *h h*, is a clutch, *o o*, having teeth *p p* formed

on its ends. This clutch *o o* is allowed to play laterally either way on the shaft *i i*, so as to engage with or be disengaged from the gears *g g* and *h h*, for the purpose of reversing the motion of the shaft *i i*. The clutch *o o* is operated by means of rods *q q*, attached to a plate, *r r*, formed with slots *s s*, which play back and forth over pivots *t t*. To the bottom of the plate *r r* is attached an arm, *u u*, which connects with a groove, *v*, formed in the center of the clutch *o o*.

x x are traveling tables or platforms so constructed as to travel transversely upon or longitudinally with under tables or platforms *y y* on suitable ways *z z* and *a' a'*, attached, respectively, to the platforms *y y* and frames *b' b'*. The lateral return movement of the upper tables or platforms, *x x*, is induced by spiral springs *c' c'*, attached to both ends of the tables *x x* and *y y*. The upper tables, *x x*, are connected with and held to the lower tables, *y y*, by the guides or ways *z z*, and both are fed along laterally by means of half-screw nuts *d' d'*, engaging with the screw-shafts *n n*. The screw-nuts *d' d'* play on pivots *e' e'*, supported by standards *f' f'*, formed on plates *g' g'*, which are attached to the under sides of the lower tables or platforms, *y y*, and are made to engage with or be disengaged from the screw-shafts *n n* by means of cams *h' h'*, that can be brought to bear against or be loosened from the sides of the screw-nuts *d' d'*. The said cams *h' h'* are connected to rods *i' i'*, which pass through and find a bearing or support in the lower portion of the screw-nuts *d' d'*, and are operated by handles *k' k'*, attached to the opposite ends of the rods *i' i'*. Springs *l' l'* are formed on the pivots *e' e'*, between the upper portions of the screw-nuts *d' d'*, for the purpose of throwing apart the separate sections of the screw-nuts *d' d'* when the cams *h' h'* are loosened therefrom.

Attached to cross-bars *m' m'* are boxes *n' n'*, that form bearings for screw-nuts *o' o'*, which engage with and operate vertical screw-shafts *q' q'* in such a manner as to raise and lower, but not to revolve them, the rotation of the screw-shafts *q' q'* being prevented by dogs *r' r'*, that engage with slots *s' s'*, formed in the circumferences of the shafts *q' q'*. The tops of the screw-shafts *q' q'* form steps or seats upon which rest the bottoms of vertical shafts or spindles *t' t'*, having dogs *u' u'*, which revolve

in and yet are held by slots $v' v'$ in the clamps $w' w'$ on the tops of the screw-shafts $q' q'$. The shafts $t' t'$ are rotated by belts on the drums $x' x'$, and are raised or lowered according as the shafts $q' q'$ are elevated or depressed by the operation of the screw-nuts $o' o'$. These shafts or spindles $t' t'$ extend up through the top of the table $a a$, and screw-threads are cut on their ends to receive and hold either of the implements $y' y'$, $z' z'$, and $a'' a''$, used for preparing and finishing the marble $b'' b''$.

$y' y'$, Figs. 1 and 5, represent the implement used for cutting the marble, &c., of any particular form of molding. The teeth, being made of the desired shape and independently of each other, are held in place upon the shafts $t' t'$ by washers $c'' c''$ and $d'' d''$, placed above and below the cutters $y' y'$ and nuts $e' e'$, which screw down upon the upper washers, $c'' c''$. Cutters $y' y'$, Fig. 6, formed in a single piece and of any desired shape, can also be used.

$z' z'$, Figs. 8 and 9, represent an implement used in sanding and rubbing or grinding the marble, &c., and is screwed on the shaft $t' t'$ and held by a nut and washer.

$a'' a''$, Fig. 10, is a buffer, of felt or other suitable material, made to fit on and revolve with the shafts $t' t'$ for the purpose of polishing and finishing the marble, &c., after being cut and sanded or rubbed by the implements $y' y'$ and $z' z'$.

The device $z' z'$ is made hollow, as shown in Fig. 8, to receive the sand or other material used in rubbing, which is made to pass out through apertures $f'' f''$, &c., formed in its bottom, which extend in an inclined direction through the outer periphery of the lower portion of the tool $z' z'$, which is formed of the required shape of the molding, and made to screw onto the upper portion of the tool $z' z'$.

A pivot, $g' g'$, is attached to the center of the table $a a$, upon which an arm, $h' h'$, is made to turn or be raised or lowered thereon, and is securely held in any desired position by means of a screw, i' , working in the end of the arm $h' h'$. On the other end of the arm $h' h'$, at right angles with the same, are prongs $k' k'$, which fit into the box $z' z'$, for the purpose of preventing the sand, &c., from flying out and to press it through the apertures $f'' f''$, &c.

The tops of the upper platforms, $x x$, are formed with grooves $l' l'$ and $m' m'$ at right angles with each other, in which are held in any desired position or allowed to travel either transversely or longitudinally the bottom plates, $n' n'$, of screws $o' o'$, which work vertically in the ends of lever-arms $p' p'$, the other ends of which pass through slots $q' q'$, formed in standards $r r$, the bottom plates, $s' s'$, of which are also held by or allowed to travel in the grooves $l' l'$ and $m' m'$. The lever-arms $p' p'$ turn upon pivots $t' t'$, passing through their opposite ends and attached to standards $u' u'$, formed on plates $v' v'$, which are pressed upon and securely hold the

marble $b'' b''$ in place by means of the pressure exerted upon the lever-arms $p' p'$ by screws $w' w'$, which work through the tops of the standards $r' r'$, and are brought to bear upon the said lever-arms $p' p'$. The plates $s' s'$ are adjusted to the required thickness of the marble on which they rest by raising or lowering the lever-arms $p' p'$, to which they are attached, by means of the screws $o' o'$, that operate the same.

From the foregoing description, reference being made to the drawings, it will be seen that the marble $b'' b''$ or other material to be operated upon, being placed on the upper table or platform, $x x$, is securely held thereon by the pressure exerted by the screw $w' w'$ upon the lever-arm $p' p'$, the plate $v' v'$ being adjusted to the proper height by means of the screw $o' o'$, working in the opposite end of the lever-arm $p' p'$. The cutter $y' y'$, being fixed on the shaft or spindle $t' t'$, between the washers $c'' c''$ and $d'' d''$, is held thereon by the nut $e' e'$, and is revolved with the shaft $t' t'$ by means of a belt connected with the drum $x' x'$. The shaft $t' t'$ is adjusted to the required thickness of the marble, &c., by means of the screw-shaft $q' q'$, operated by the screw-nut $o' o'$, in such a manner as to raise or lower the said shaft $q' q'$, but not to rotate it, as hereinbefore described. The marble $b'' b''$, or other material employed, is brought to bear with a firm and constant pressure against the cutter $y' y'$ by means of the lateral force exerted by the springs $c' c'$ upon the table or platform $x x$, which travels transversely on the ways $z z$. It is fed along longitudinally, together with the upper and lower tables or platforms $x x$ and $y y$, by the motion imparted to the screw-shaft $n n$ by the power applied to the drum $e e$ of the shaft $i i$, which rotates the gears $f f$, $g g$, and $h h$, and revolves the shaft $i i$, worm $l l$, and gear $m m$, attached to the screw-shaft $n n$.

By disconnecting the clutch $o o$ from one gear, $g g$, and engaging it with the other, $h h$, the motion of the shaft $i i$ is reversed; or by disengaging it from both they may be thrown wholly out of gear.

By unlocking the half screw-nuts $d' d'$, the tables $x x$ and $y y$ are disengaged from the screw-shaft $q' q'$ and are allowed to play freely back and forth on their ways $z z$ and $a' a'$.

The marble $b'' b''$ being cut to the form of the molding desired, the tables $x x$ and $y y$ are disengaged from the screw-shaft $q' q'$ by the means above described, and are pushed back to their original position. The cutter $y' y'$ is then removed from, and the box $z' z'$ is attached to, the shaft $t' t'$ and supplied with sand or other grinding material, and the marble is fed along as before. The box $z' z'$ revolves with the shaft $t' t'$ against the marble, which is brought to bear against it by the lateral pressure exerted upon the tables $x x$ and $y y$, thereby rubbing the sand which passes through the apertures $f'' f''$, &c., upon the slab, and effecting the desired result.

The arms or prongs $k' k'$, formed at right

angles with the arm $h'' h''$, are turned so as to fit over and into the box $z' z'$ in such a manner as to allow a free passage for the sand between them, and at the same time to prevent its being thrown out of the box $z' z'$ as it revolves. After the marble has been sufficiently sanded and rubbed by the process above described, the box $z' z'$ is removed and replaced by the polisher or buffer $a'' a''$, which is revolved against the marble as it is fed along, the operation being performed in a manner precisely similar to that already described for the cutting and rubbing of the marble.

It will be obvious that by making the teeth of the cutter $y' y'$ separate, so as to be easily inserted between the washers $c'' c''$ and $d'' d''$ on the shaft $t' t'$, any one can be readily taken out for sharpening or repairing or for inserting a new one without displacing the remainder.

It is evident that the apparatus can be made with any desired number of spindles, carriages, &c., although but two sets have been hereinabove described. Moreover, while one or more slabs are being cut others can at the same time be rubbed or polished.

Having thus described my improvements, I shall state my claims as follows:

What I claim as my invention, and desire to have secured to me by Letters Patent, is—

1. The combination of a revolving tool or tools with a feeding table or platform susceptible of two motions, one tangential to the circle described by the said revolving tool or tools and the other at right angles to that of the first, as set forth and for the purpose specified.

2. The combination of the two traveling ta-

bles or platforms, operating together as described.

3. So arranging and operating the table or platform that supports the marble or other material to be acted upon as to convey the latter automatically to the revolving tool or tools.

4. The arrangement of the clutch-nut $d' d'$, screw-shaft $q' q'$, revolving shaft $i i$, and vertical shaft $b b$, operating as described, for the purpose of feeding the traveling table along and yet permit its disengagement from the said devices, as specified.

5. The use of the adjustable lever swivel-clamp for holding the material to be acted upon firmly in its place, as described.

6. The use of a revolving, grinding, or rubbing cylinder, so arranged and constructed as to contain the grinding material and deliver it through apertures to the material to be acted upon, as set forth.

7. In combination with the revolving, grinding, or rubbing tool, the pronged lever-arm $h'' h''$, for the purpose specified.

8. The arrangement of devices for feeding the revolving tool or tools up and down, the same consisting of the screw-shaft $q' q'$, screw-nut $o' o'$, and shaft $t' t'$, as described.

9. The arrangement of devices for holding the sectional cutters in their place and so that they can readily be inserted or removed, as specified.

JAMES W. MALOY.

Witnesses:

JOSEPH GAVETT,
SAML. M. BARTON.