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B. ARDREY.

Machines for Cutting Moldings on Marble, &c.

No. 147,032. Patented Feb. 3, 1874.

Fig 1

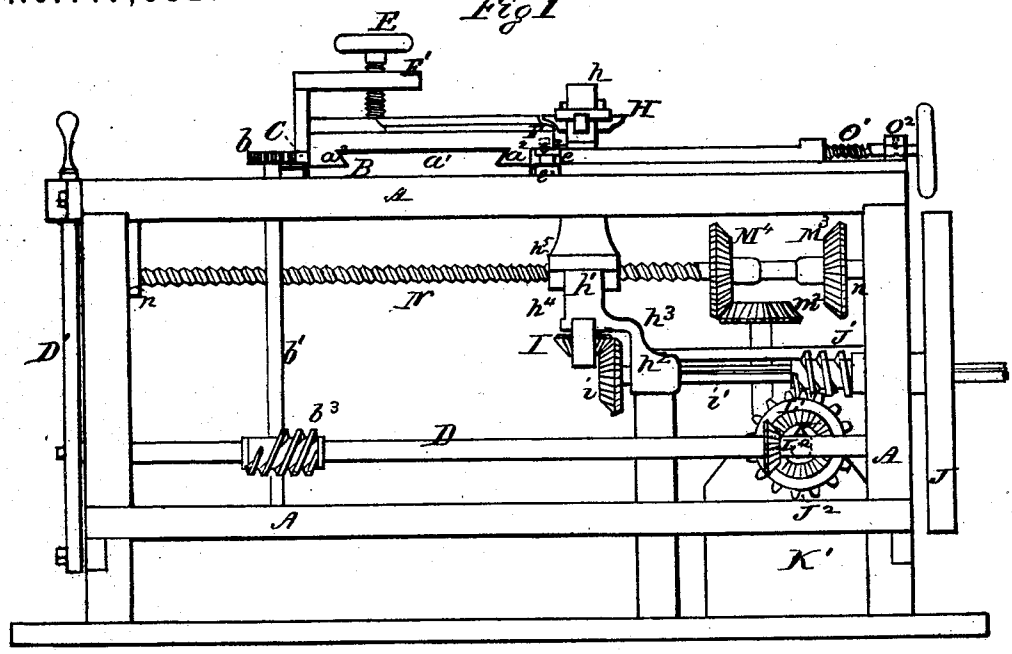
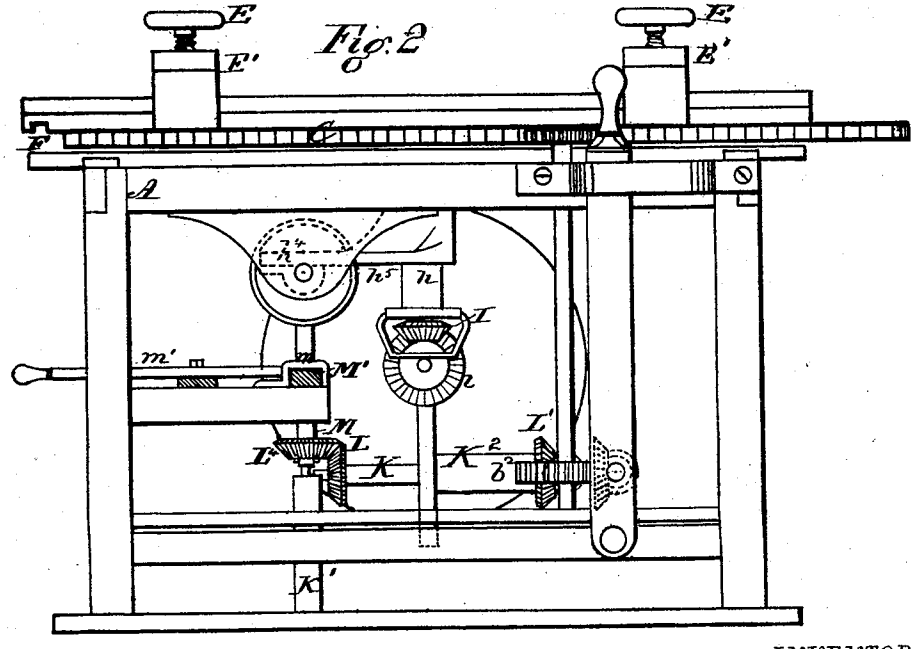


Fig 2



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3 Sheets--Sheet 2.

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Machines for Cutting Moldings on Marble, &c.

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Fig. 3

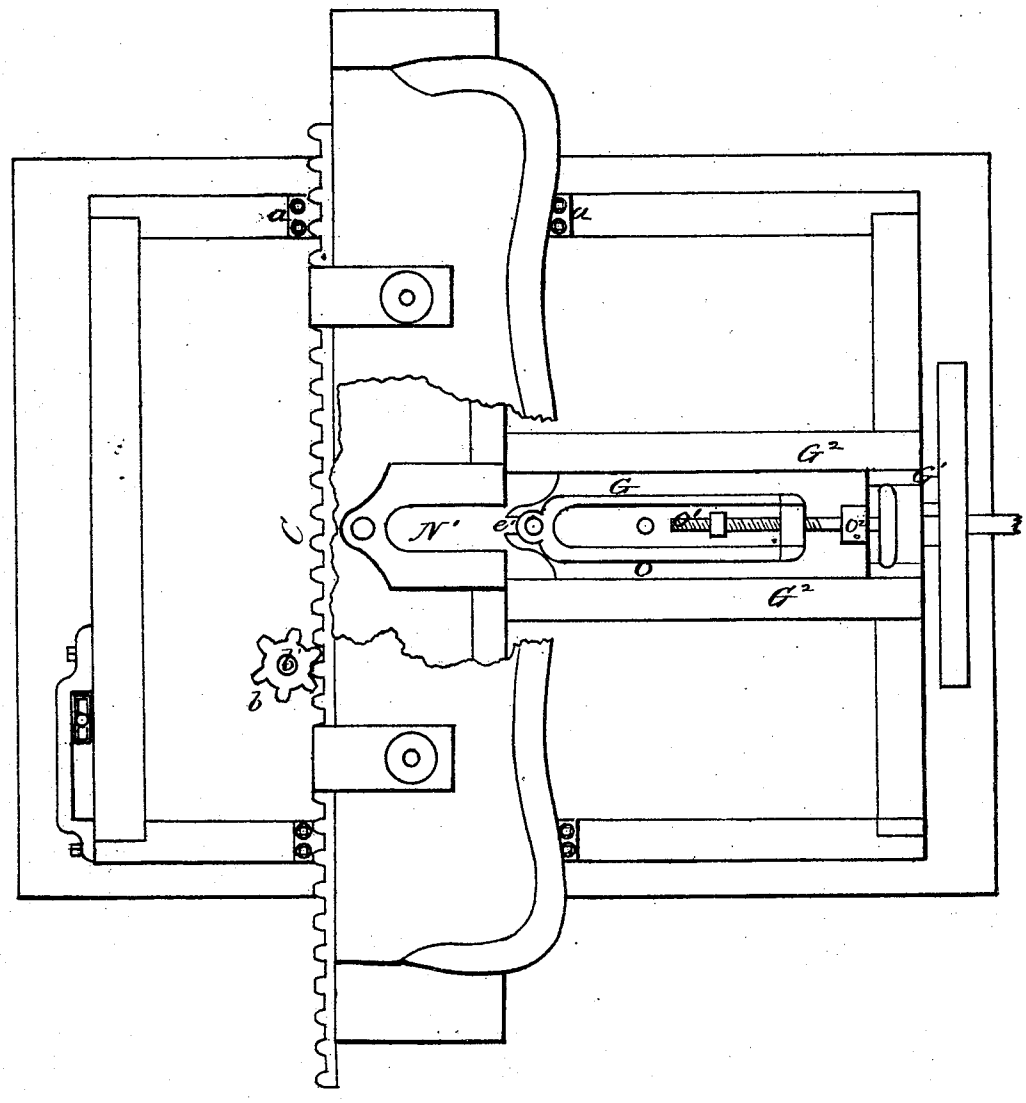

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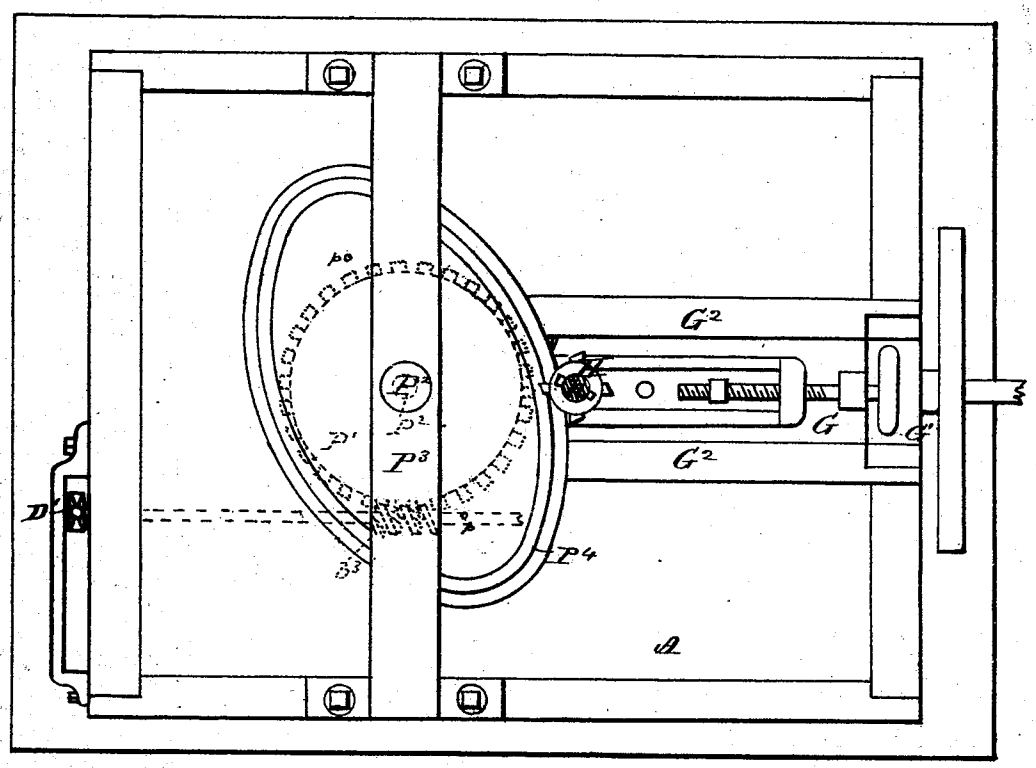
Fig 4



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UNITED STATES PATENT OFFICE.

ROBERT ARDREY, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN MACHINES FOR CUTTING MOLDINGS ON MARBLE, &c.

Specification forming part of Letters Patent No. **147,032**, dated February 3, 1874; application filed September 22, 1873.

To all whom it may concern:

Be it known that I, ROBERT ARDREY, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Machines for Cutting Moldings on Marble and Stone; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification, in which—

Figure 1 is a side elevation of my invention. Fig. 2 is an end view. Fig. 3 is a plan view. Fig. 4 is a plan view, showing modification.

This invention has relation to machines for cutting moldings on marble and stone; and it consists in the construction and novel arrangement of the carriage which holds the plate of marble or stone; the devices whereby said carriage is caused to move forward and backward in front of the cutter; and the mechanism whereby the cutter is caused to move to and fro in conformity with the outline of the plate or stone, and otherwise rendered adjustable. This invention comprises also the peculiar mechanism whereby, when the end or side edge of the plate or stone is reached during the operation of the machine, the cutter may be made to travel along said end or side edge, to form thereon the required continuation of the molding. Said invention likewise, and finally, consists in the provision made in the construction of the machine for carriages of different forms, adapted to the various outlines and sizes of the plates of marble and stone, all as hereinafter more fully specified.

Referring to the accompanying drawings, which illustrate my invention, A designates the main frame or table, upon which all the working parts of the machine are supported. B designates a guide for the movable carriage, which supports and carries the plate of marble or stone. This guide is arranged upon the surface of the frame or table A transversely, and is secured thereto by means of the lugs *a*. A dovetailed ridge, a^1, is formed on the upper side of the guide in the direction of its length, and is embraced by the beveled cleats a^2 on the under side of the carriage. The ridge and cleats retain the carriage in its proper relation to the cutter while said carriage is traveling. C designates a toothed rack, attached to the rear edge of the carriage, and engaging with a pinion, *b*, through the medium of which motion is given to the carriage, causing it to travel to and fro in front of the cutter. This pinion is on the upper end of a vertical shaft, b^1, journaled in the frame A, and holding, near its lower end, a pinion, b^2, which engages with a worm, b^3, on a horizontal shaft, D. The shaft D is laterally adjustable, so that the worm and worm-wheel may be connected and disconnected at will. One end of said shaft is loosely journaled to the main frame A, while the other end is journaled to a lever, D^1, which is pivoted to said frame, and which is employed in controlling the engagement of said worm and worm-wheel. The plate upon which the molding is to be cut is secured rigidly to the carriage by means of the screws E, having their bearings in brackets E′, secured to the rear part of the carriage, and projecting, as shown, over the surface of said plate. The front and side or end edges of the carriage are curved, as shown, or otherwise to conform to the curvature of the plate, which, when placed thereon, is flush, or nearly so, with said carriage. A groove, F, is formed in the under side of the carriage, which groove coincides with the outline of the front and side edges of the carriage, close to which the groove is located. The object of this groove is to receive a traveler, *e*, located at the end of the cutter-carrier, and to cause the cutter to move to and fro as the carriage travels, and thus adapt itself to the peculiarities of outline of the plate of marble or stone. The cutter-carrier consists in part of a horizontal bed-plate, G, having beveled edges, and arranged to move longitudinally through a dovetailed groove, G^1, or channel formed between the horizontal and parallel guides G^2, running lengthwise of, and secured to, the top of the main frame A. The cutter, indicated by the letter H, is secured to the upper end of a vertical shaft, *h*, which has its bearings in a bracket, h^1, which bracket carries the horizontal shaft-bearing h^2, formed at the lower end of a curved arm, h^3, and the screw-box h^4, which is hinged to the arm h^5, projecting lat-

erally from said bracket, as shown. Upon the lower end of the cutter-shaft h is fixed the beveled pinion I, which engages with a beveled spur-wheel, i, on the end of a horizontal shaft, i', which is journaled to the bearing h^2 at its inner end. The shaft i' is the main shaft of the machine, and from it rotary motion is given to the cutter through the medium of the beveled wheels I i. This shaft is so arranged that it may move lengthwise through its outer bearing in the frame A, in order to allow the cutter to adjust itself to the curvatures of the plate. A crank or balance wheel, J, and a worm, J^1, are fitted to said main shaft, which is grooved lengthwise, and said worm and wheel keyed thereto in such a manner that they and the shaft will turn together, while at the same time the shaft may be moved lengthwise without disturbing their arrangement. The worm J^1 engages with a toothed wheel, J^1, attached to a horizontal transverse shaft, K, which has its bearings in the standard K^1 and bracket K^2, and which carries on its ends respectively, the beveled pinion L, and beveled spur-wheel L^1. The wheel L^1 engages with a pinion, L^2, on the shaft D, and thereby communicates motion to said shaft. The pinion L engages with one, L^4, on the lower end of the vibrating shaft M, which has its bearings, respectively, in the top of the standard K^1, and the horizontal bar M^1, said bar being arranged to slide in the direction of its length through the boxes or guides m, secured to the beams of the main frame. This bar is moved by means of a suitable lever, m^1, having one end attached thereto, and being fulcrumed to the main frame, as shown. The object in having the shaft M, as described, is to enable the pinion m^2 on its upper end to be thrown alternately in and out of gear with the beveled wheels M^3 M^4, or in and out of gear with either. The wheels M^3 M^4 are secured to a screw-shaft, N, running lengthwise of the frame A and having its journal-bearings in boxes n n. The threaded portion of said screw-shaft passes through the screw-box h^4, which may be swung down on its hinges and displaced from the screw-shaft, but which is brought and held in connection with said shaft when it is desired to cause the cutters to travel along the side edges of the plate or slab, in which event it is obvious that the rotation of the shaft or screw will cause said box to move in the direction of its length, the course of said box depending on whichever of the wheels M^3 M^4 the pinion m^2 is thrown in gear with. Thus, when said pinion actuates the wheel M^3 the box, and through the medium thereof the cutter, travels toward the rear edge of the plate, or vice versa when the pinion rotates the wheel M^4. N′ designates a slot in the top of the frame A, through which passes the upper part of the bracket h^1, holding the cutter-shaft, said slot being formed to allow the cutter to move to and fro, for the purpose hereinbefore described. The traveler e is a vertical pin or spindle provided with an anti-friction roller, which enters the groove in the under side of the carriage. The shank or body of said traveler has its middle portion fitted into a slot, e^1, in the end of the bed-plate G, where its vertical movement is prevented by the collars e^2. The slot e^1 is designed to allow the traveler to be accurately adjusted to the groove in the under side of the carriage, which adjustment is accomplished by means of the sliding frame o, through the forward end of which the upper part of the traveler-shank passes, and an adjusting-screw, o^1, which has its thread-bearing in the rear end of the frame O and its fixed bearing in the box o^2 attached to the plate G, a pin being inserted in said box and entering a groove in the shank of the screw, to prevent longitudinal movement of said screw. It is obvious that when the screw is turned the frame O, and with it the traveler, may be adjusted according to requirements. The frame O is slotted or made open, so as to include the upper part of the bracket h^1.

The foregoing description has reference to a machine of which the carriage and the devices for giving the latter motion, as well as certain mechanism for controlling the movement of the cutter, pertain to the work of cutting moldings on plates of irregular outline, such, for instance, as shown in Fig. 3 of the accompanying drawings. To adapt the machine, however, to the work of cutting moldings on more regular forms, such as ovals and the like, the moldings on which are continuous, a table, P^4, corresponding to the outline of the slot, is substituted for the carriage already described. This table, as shown in Fig. 4, is supported upon the upper end of a vertical shaft, having its bearings in the frame A. Rotary motion is given to the table through the medium of a toothed wheel, P^1, on the shaft P, with which engages the worm b^3. The plate to be cut is secured to the table by means of the screw P^2 having its bearing in the frame P^3 substituted for the brackets E^1, and by the dowel-pins p p projecting upward from the table and entering suitable openings therein. The frame P^3 is secured to the frame A, as shown. The under surface of the table is grooved to receive the traveler e.

The operation of forming the molding on a stone of oval or other equivalent unbroken outline is continuous, the screw-box h^4 and devices pertaining to the movement of the same not being required for such operation.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The bracket h^1, carrying the rotary cutter H and screw-box h^4, in combination with the screw-shaft N, said screw-shaft and the cutter-shaft being arranged at right angles to each other, substantially as and for the purpose specified.

2. The combination of the horizontal screw-shaft N, vertical cutter-shaft h, screw-box h^4, bracket h^1, right and left gearing M^3 M^4, and laterally-adjustable pinion m^2, substantially as shown and described.

3. The sliding bar M^1 and lever m^1, in combination with the vibrating or adjustable shaft

M, pinion m^2 L^1, and gear-wheels M^3 M^4, said pinions and gear-wheels being arranged as mediums for conveying motion to the tool-carrier, substantially as described.

4. The horizontally-adjustable traveler *e*, in combination with the horizontally-adjustable plate G and adjusting-screw O′, said parts being adjustable independently of the cutter, substantially as shown and described.

5. The combination of the laterally-adjustable shaft D, main shaft *i*′, intermediate connections J^1 J^2 K L^2, lever D^1, vertical shaft b^1, and adjustable worm b^3 with a marble-molding machine, substantially as specified.

In testimony that I claim the foregoing I have hereunto set my hand this 5th day of September, 1873.

ROBERT ARDREY.

Witnesses:
T. A. CONNOLLY,
EUGENE P. EADSON.