# H. Ward,

## Dressing Stone.

No. 3528. Patented Apr. 10, 1844.

Fig: 1.

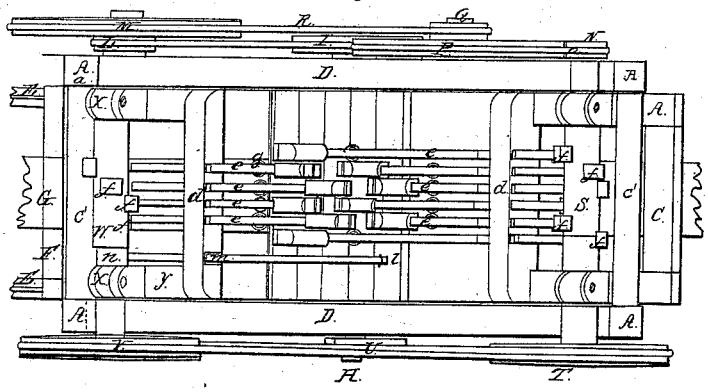


Fig: 3.

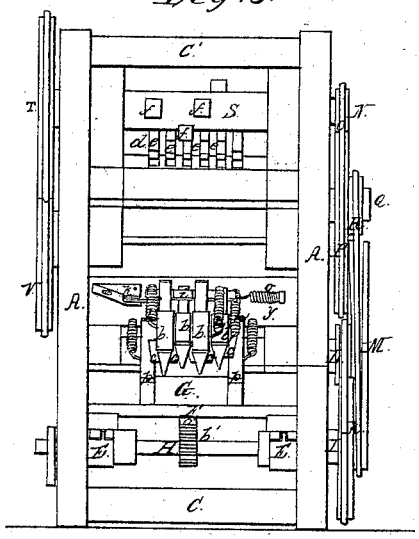
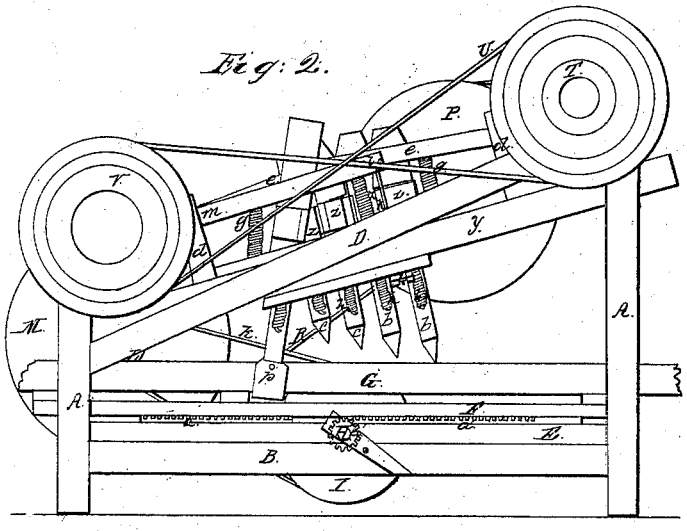


Fig: 2.



# UNITED STATES PATENT OFFICE.

HAMMOND WARD, OF CHARLETON, MASSACHUSETTS.

## MACHINE FOR DRESSING STONE.

Specification of Letters Patent No. 3,528, dated April 10, 1844.

*To all whom it may concern:*

Be it known that I, HAMMOND WARD, of Charleton, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Machinery for Dressing or Picking Stone, and that the following description and accompanying drawings thereof, taken in connection, constitute a full and exact specification of the same.

Figure 1 of the drawings above mentioned represents a top view of my improved stone dressing machine. Fig. 2 is a side elevation of the same and Fig. 3 is an end view thereof.

The operative parts of the mechanism are arranged and supported upon a framework of timber or other suitable material, the same consisting of four posts A, A, A, A (Figs. 1, 2, 3) united together at or near their lower ends by horizontal longitudinal and transverse bars B, C, and at their upper parts by inclined bars D, D, and horizontal and transverse ones C, C, as seen in the drawings.

The posts at one end of the frame, are constructed somewhat longer than those at the opposite end. Long horizontal rails or timbers E, E, are secured to the inner sides of the posts and lower bars D, D, the said rails being parallel to each other and supporting on their upper edges a movable carriage F, upon which the stone G to be dressed is placed and secured in any convenient manner.

The carriage is moved longitudinally by means of a long rack of teeth $a'$ applied to its underside and acting in connection with a cogged pinion $b'$ fixed upon a horizontal transverse shaft H, Fig. 2; the shaft H being turned by a pulley I upon its opposite end around which (pulley) a band K operates, the said band proceeding from a grooved pulley L attached to the side of a larger pulley M. Motion is imparted to the latter pulley by means of a small pulley N fixed on one end of the cam shaft and an endless band O extending therefrom to a larger pulley P having a smaller pulley Q attached to its side from which (smaller pulley) another band R extends to and around the large pulley M.

The cam shaft S is driven or caused to turn around by means of a pulley T on its other end and a crossed band U proceeding therefrom to and about another pulley V situated upon one end of the driving or other cam shaft W, sustained or revolving in bearings formed in the tops of standards or posts X, X, which extend upward from an inclined or movable frame Y. The opposite cam shaft S is similarly sustained on the frame Y. The frame Y is arranged within the upper part of the main framework and is sustained thereon by journals (represented in Fig. 1, by dotted lines, at $a$, $a$,) fixed either at one end or at some other suitable part thereof and so arranged as to permit the other end of the frame Y, or that upon which the cam shaft S is situated to be moved up and down in a vertical direction and confined at any desirable inclination to a horizontal plane.

The shafts, stocks or handles Z, Z, &c., which carry the cutting tools $b$, $b$, &c., $c$, $c$, &c., extend or pass downward through the frame Y and in direction perpendicular or thereabout to the same as seen in the drawings. The frame Y serves also to sustain two "harnesses" $d$, $d$, which extend across it parallel to each other and at the distance apart as seen in Fig. 1, each of the said harnesses constituting the fulcra or bearings of a series of trip hammers $e$, $e$, $e$, &c., which are put in operation or caused to rise by means of cams or wipers $f$, $f$, $f$, &c., extending from the cam shafts before mentioned, and to fall upon the heads of the cutter stocks by springs $g$, $g$, (see Fig. 2) each of which (springs), is attached at one of its ends to one of the hammers and at its other end to the frame Y.

The front or first two rows of cutters $b$, $b$, are for the purpose of picking or removing the rough portions of the stone, and act upon the stone prior to the other cutters whose object is to dress or smooth the surface. The front cutters are formed with pointed or inverted pyramidal ends while the rear cutters $c$, $c$, are wedge or chisel shaped. Each cutter is lifted from the stone, after it has been driven down upon the same by means of a spring $h$ applied to its stock and to the frame Y.

In order that the front cutters may operate upon the stone in such manner as to reduce its surface in the requisite degree for the action of the dressing or finishing cutters, they should have not only a motion up and down but a lateral or transverse movement imparted to them. The peculiar object of this transverse motion is to prevent the

cutters from forming longitudinal and parallel channels or grooves in the stone and to cause each of them to remove the surface thereof in fillets or wide paths which fall into one another. By such a peculiar movement of the front cutters the rough parts of the stone are easily removed and a reduction effected sufficient for the action of the dressing or finishing tools. Such lateral motion of the front cutters, is produced by a transverse sliding bar *i*, (see Fig. 3) which is arranged and supported underneath the frame Y and between the two front ranges of cutter stocks each cutter stock passing through a notch formed in the side of the bar so that whenever the bar is moved to and fro in the direction of its length it carries or moves the cutters with its laterally over the surface of the stone. The machinery which moves the slide bar consists of a cord or chain *k* attached to one end and proceeding therefrom through the frame Y and to the end *l* of a lever *l m*, which end is elevated by means of a cam or eccentric *n*, arranged upon the cam shaft W. The lever *l m* has its fulcrum in the harness frame contiguous to the cam shaft W. When the end *l* of the lever is raised, the slide bar *i* is drawn in one direction and when depressed it is drawn in the opposite direction by the counteraction of a spring O applied to the opposite end of the slide bar and to the frame Y.

In order to form a sharp and even corner upon the edge of the stone I combine with the pickers and dressers one or more blunt tools P whose lower edge is formed at right angles or thereabout to its sides. Such a tool has its stock which is elevated and depressed in a similar manner to those of the pickers and finishers. When it falls upon the surface it cuts or breaks off the edge, for a slight depth, square to the surface so that when the stone is turned over upon the carriage so as to bring its side under the operation of the cutters, they will not injure the edge or corner but leave it sharp and true as desired. Such cutters I find to be a great addition to stone dressing machines, and to obviate the difficulties heretofore experienced in the operation of the cutters upon the corners of the stone.

The shanks or stocks of the cutters should be suitably guided and supported so as to move up and down within the frame Y and be so arranged therein that they can be easily removed or their number increased or diminished at pleasure in order to adapt the mechanism to dress stones of different widths. The harnesses which support the hammers should be so constructed as to render it easy to increase or diminish the number of hammers according as the same may be requisite; all of which will be easily understood by mechanicians and those who use stone dressing machines.

The peculiar object of rendering the frame Y movable as before mentioned and described, is to adjust or vary the inclination of the cutters to the surface of the stone some kinds of stone requiring the cutters to act upon it at a greater inclination than others and as the stone is to be supported upon the moving carriage, by a series of blocks by which it is elevated to the requisite height or may be raised to such height by any other desirable and proper means, it together with the cutter frame Y may be arranged so as to bring the cutters to the proper degree of inclination to the stone.

Having thus explained my improvements I shall claim—

1. The manner by which I am enabled to vary or alter the inclination of the cutting chisels with respect to the plane or face of the stone to be dressed, viz., by sustaining or arranging the stocks or spring holders of the chisels in a movable frame Y which shall turn on centers or bearings disposed at one end thereof or any other suitable part of the machine.

2. Also the combination with the series of cutters for dressing the top surface, of the square or blunt edge cutter or cutters P, P, for the purpose of forming the square corner or edge of stone as hereinbefore set forth.

In testimony that the above is a correct specification I have hereto subscribed my name this thirteenth day of November of the year A. D. 1843.

HAMMOND WARD.

Witnesses:

HENRY CLARKE,

PERMELIA D. CLARKE.