2 Sheets--Sheet 1.

G. W. WEATHERHOGG.

Machines for Dressing Stone.

No. 146,297. Patented Jan. 6, 1874.

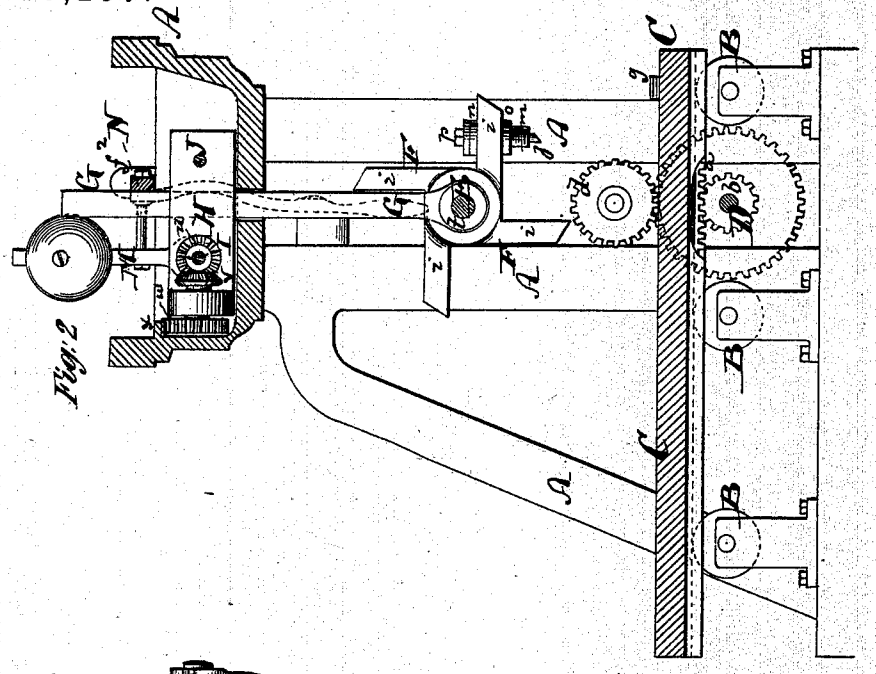

Fig. 2

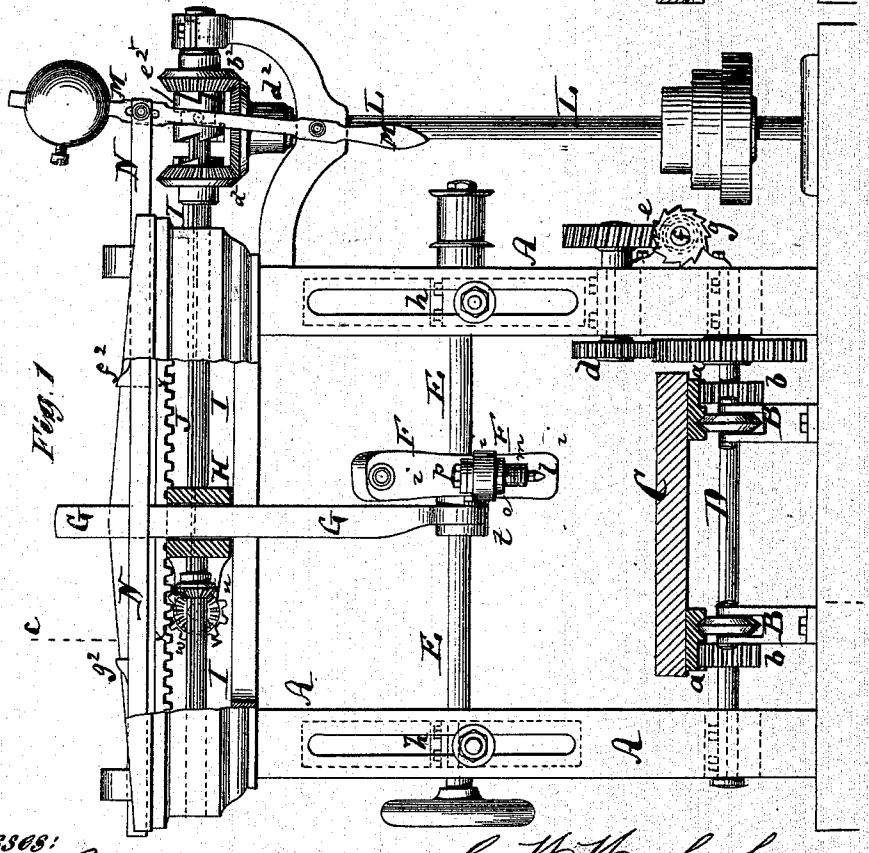

Fig. 1

Witnesses:
Richard Ryan
Fred Haynes

G. W. Weatherhogg
by his Attorneys
Brown & Allen

2 Sheets--Sheet 2.

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Fig: 3

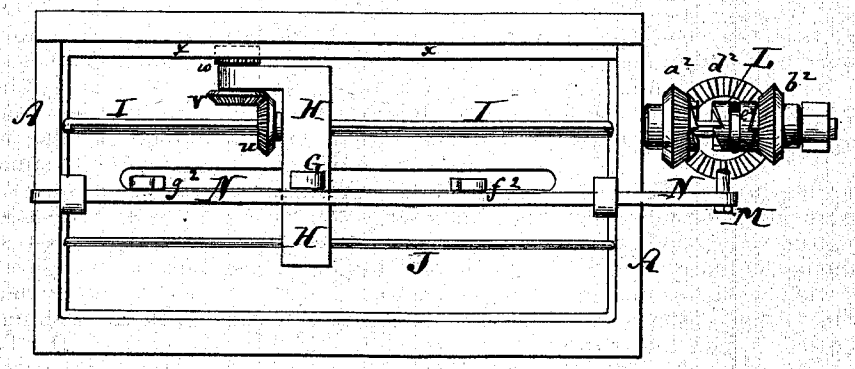
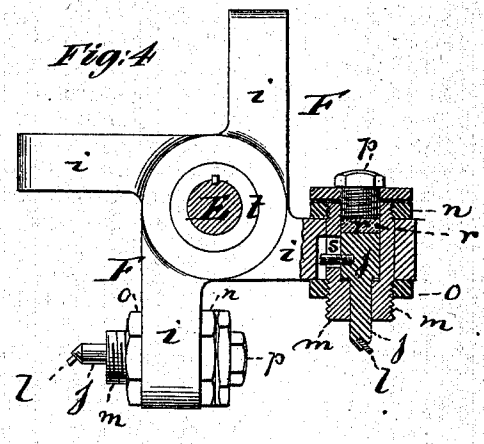


Fig: 4



Witnesses:
Michael Ryan
Fred. Haynes

G. W. Weatherhogg
by his Attorneys
Brown & Allen

UNITED STATES PATENT OFFICE.

GEORGE W. WEATHERHOGG, OF NEW YORK, N. Y.

IMPROVEMENT IN MACHINES FOR DRESSING STONE.

Specification forming part of Letters Patent No. **146,297**, dated January 6, 1874; application filed November 7, 1873.

To all whom it may concern:

Be it known that I, GEORGE W. WEATHERHOGG, of New York, in the county and State of New York, have invented a new and Improved Machine for Facing, Molding, Polishing, and Sawing Stone, and other hard substances, of which the following is a specification:

Figure 1 is a side elevation, partly in section, of my improved stone-dressing machine. Fig. 2 is a vertical longitudinal section of the same taken on the plane of the line *c c*, Fig. 1. Fig. 3 is a plan or top view of the same; Fig. 4, a side view, partly in section, of the cutter-head, showing the manner in which the cutters are applied, this figure being on a scale larger than the others.

Similar letters of reference indicate corresponding parts in all the figures.

This invention relates to that class of stone-dressers which are known as rotary cutters, and in which there are two or more diamond or other cutting points, placed in suitable stocks and adjustable holders and revolved to act upon the surface of the stone. The object of my invention is to so arrange the tool-holders that there will be less liability to fracture the diamonds, and also to render their operation more effective, and thereby to reduce the cost of cutting. This I accomplish chiefly by placing the diamond stocks and holders in such a position that the diamonds receive the shock or blow from the stone during the rotation, and in a line nearly parallel with the holders. In these holders I place spiral springs or rubber cushions, which receive the shock given to the diamonds from the stone, and thereby defend the diamonds from breaking while striking the hard substance, also causing them to cut by friction instead of pressure. In the socket containing the cushion a set screw is applied to bear against such cushion, and thereby give the proper tension to the same. Another feature of my invention consists in imparting to the rotary cutters during operation a transverse reciprocating motion, and in also, at the same time, imparting intermittent longitudinal motion to the stone, so that, for polishing or dressing stones, the cutters will affect the surface of the stone transversely until the whole width has been acted upon, and then the stone is moved lengthwise to bring another section of width beneath the cutters. This is an entirely new motion—the lateral reciprocating motion of the cutters—and enables me to operate the latter very rapidly and obtain a greater proportion of labor by a less amount of tools than could heretofore be done under a similar intermittent motion of the stone.

In the accompanying drawing, the letter A represents the frame of my improved stone cutting and dressing machine. B B are a series of rollers hung transversely at the lower part of the frame for the support of the carriage C, which carries a toothed rack, *a*, meshing into a pinion, *b*, and a transverse shaft, D. To the shaft D is imparted intermittent rotary motion, with suitable speed, by means of gearing *d* and a worm, *e*, from a shaft, *f*, that carries also a ratchet-wheel, *g*, so that, by pawl and lever or other means, intermittent rotary motion may be imparted to the shaft *f*, and thereby also to the shaft D, causing the carriage C to have intermittent rectilinear motion. This mechanism for moving the table C may, of course, be varied, and does not form part of my invention. Above the carriage C is hung, in posts of the frame A, a horizontal transverse shaft, E, upon which a cutter-head, F, having a series of projecting arms, is fitted. The shaft E hangs in bearings *h h*, that are vertically adjustable in the supporting-posts, so that the cutters may be set higher or lower to suit any thickness of stone on the table C. Rotary motion is imparted to the shaft E by suitable means. The cutter-head F, which is more fully represented in Fig. 4, carries in each arm *i* a cylindrical or other shaped tool-holder, *j*, in the end of which the carbon point or diamond *l* is secured. The holder *j*, which is enlarged at its inner end, fits into a tubular screw, *m*, which is fitted through the arm *i* and held in position by two nuts, *n* and *o*, as is clearly shown in Fig. 4. Upon the inner end of the tool-holder *j* is pressed, by means of a set-screw, *p*, a cushion, *r*, of rubber, or an equivalent spring. This cushion may be more or less compressed by the said set-screw, and receives, during the rotation of the cutter-head, the shock that is imparted to the tool-holder by the contact of the diamond with the stone. The blow or shock imparted as the cutter rotates is in a line nearly parallel with the axis

of the holder *j*, and the cushion is, therefore, in position to most effectually counteract such shock, and also to cause the diamond to cut by friction more than by pressure, thus preventing the danger of breaking the diamond and attaining the best possible effect. Through a slot in the side of the tubular screw *m* is fitted, into the holder *j*, a screw or pin, *s*, which prevents the holder *j* from turning in its socket, and also constitutes, if necessary, the limit of motion against the spring *r*. The cutter-head F is mounted upon a sleeve, *t*, which embraces loosely the shaft E, and which is by tongue and feather, or otherwise, so connected with said shaft that it will be rotated by the same, but permitted at the same time to move lengthwise thereon. G is a vertical rod, whose lower end clutches loosely the sleeve *t* of the cutter-head, while its upper part passes through a horizontal slide, H, that is held in the upper part of the frame A. This upper portion of the frame is made in the shape of a box or receptacle, in which the slide H may be moved parallel to the shafts D and E, the slide being for the purpose of receiving its motion, and also, for gaining greater steadiness of motion, caused to embrace and slide on two horizontal rods, I and J. The shaft I is a rotary shaft, for the purpose hereinafter stated, while J is merely a guide-rod. The slide H carries with it a beveled pinion, *u*, which is in gear with another pinion, *v*, whose shaft carries a toothed wheel, *w*, that meshes into a stationary rack, *x*, on the frame. When by gearing a^2 or b^2 the shaft I receives rotary motion from a vertical driving-shaft, L, the pinion *u* will be revolved, because it is in connection with the said shaft by tongue and feather, and while such pinion *u* revolves its connection with the shaft of the pinion *w* will cause the latter to engage in the rack *x*, and by thus turning thereon it causes the slide H, with its appendages, to move lengthwise—that is to say, in a direction parallel with the shafts D, E, and I in the frame A—and to carry with it the rod G and the cutter-head F while the latter is being rotated. The shaft I carries two bevel-wheels, a^2 and b^2, both of which are in gear with a bevel-wheel, d^2, on the shaft L. A clutch, e^2, which may be operated by a hand-lever, M, is fitted to the shaft I, between the two pinions a^2 and b^2, and serves to connect either one or the other with the shaft for operating the latter. With M is also connected a sliding rod, N, that extends over the slide H, and carries two stops, f^2 and g^2. When the upper end of the rod G that extends through the slide H, or any other projection on the slide H, at the end of one transverse motion strikes the stop f^2, it causes thereby the rod N to be moved and the clutch e^2 to be carried against the pinion b^2, while before such motion the clutch was in contact with the bevel-wheel a^2. Thus the motion of the shaft I will be reversed and the slide H moved in the opposite direction, carrying with it the cutter-head F until such slide reaches with its projection the other stop, g^2, and thereby moves the rod N so as to carry the clutch into contact with the wheel a^2, when motion is again reversed. The cutter-head F, while being rotated, receives reciprocating motion on the shaft E, and is caused thereby to cut or affect the stone laterally, the stone being at the same time, by mechanism heretofore described, moved intermittently lengthwise until its entire surface has been dressed or polished in the manner desired. When it is desired to cut or saw the stone the rod G is disconnected from the slide H, and the cutter-head in any suitable way fastened upon the shaft E, so that it will not move laterally thereon, the stone being fed under the rotary cutter-head to be acted upon in the desired manner.

I claim as my invention and desire to secure by Letters Patent—

1. The tool-holder *j*, fitted into the adjustable tubular screw *m*, and combined with the cushion *r* and set-screw *p*, to be operated substantially as herein shown and described.

2. In a stone-dressing machine, the combination of the rotary cutter-head F with the transverse shaft E, whereon it moves laterally, and by which it is rotated, and with the rod G, all arranged to operate substantially as specified.

3. The combination of the rotary cutter-head F with the rod G, slide H, and shaft I, for operation substantially as described.

4. The slide H, provided with the pinion *u*, and combined with the pinion *w*, rack *x*, slide N, and stops f^2 and g^2, substantially as and for the purpose described.

GEORGE W. WEATHERHOGG.

Witnesses:

MICHAEL RYAN,

HENRY T. BROWN.