M. NEWMAN.

Metal Shaping and Dressing Machines.

No. 151,669. Patented June 2, 1874.

fig. 1.

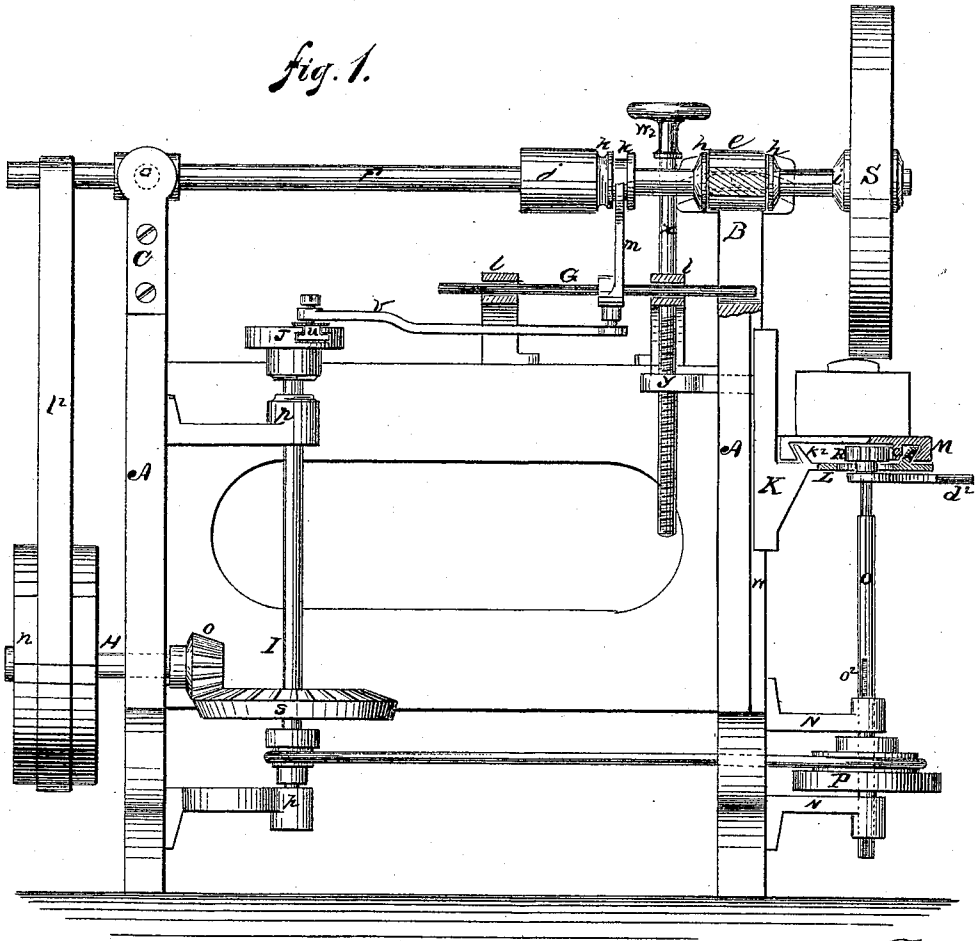


fig. 2.

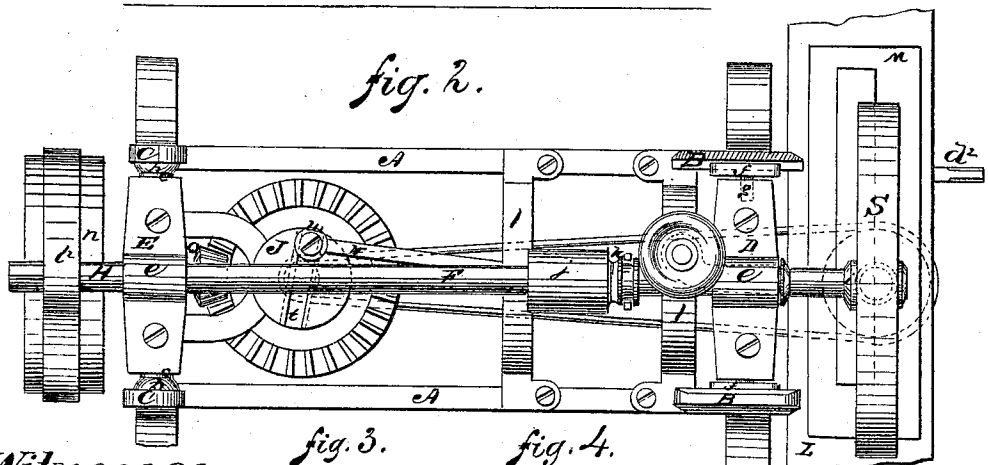


fig. 3.

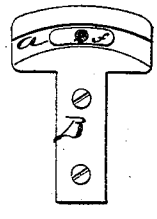
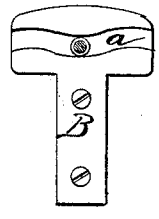


fig. 4.



Witnesses.

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UNITED STATES PATENT OFFICE.

MARTIN NEWMAN, OF UNADILLA, NEW YORK, ASSIGNOR TO HIMSELF AND LORENZO M. NEWMAN, OF SAME PLACE.

IMPROVEMENT IN METAL SHAPING AND DRESSING MACHINES.

Specification forming part of Letters Patent No. **151,669**, dated June 2, 1874; application filed March 31, 1874.

To all whom it may concern:

Be it known that I, MARTIN NEWMAN, of Unadilla, in the county of Onondaga and State of New York, have invented a new and Improved Machine for Shaping and Dressing Metals; and that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

This invention is in the nature of an improvement in a machine for shaping and dressing metals; and the invention consists in a machine for shaping and dressing metals by or with the aid of emery-wheels or other similar cutters, in such manner that plain, curved, or irregular surfaces are shaped and dressed with equal facility, said machine being provided with adjustable guides, whereby the cutter is allowed to adapt itself to the shape or form of the surface to be cut or dressed; also, provided with a horizontal and longitudinal automatic feed and a vertical feed with an adjustable pulley-shaft, the rotary cutter being operated in such manner as to cut from side to side, or across the face of the object to be cut, while the object is fed beneath it horizontally.

By my invention a want long felt by mechanics and manufacturers is supplied—that is to say, objects with curved and irregular surfaces may be shaped and finished with the same facility, and without increase of cost, as are now cut and finished ordinary plain surfaces.

In the accompanying sheet of drawings, Figure 1 is a side elevation of my invention; Fig. 2, a plan or top view of same; Fig. 3, a detail of guide; and Fig. 4, modification of same.

Similar letters of reference indicate like parts in the several figures.

A is the frame-work of my machine. To the upper and front side of the frame A are securely attached two guide-plates, B. These guide-plates are of T shape, and have formed in their inner surfaces curved or other-shaped channels *a*. To the upper and rear ends of the frame A are bolted or otherwise secured two plates, C. These plates have bosses *b* formed on their inner surfaces, within which are secured lugs *c*. Fitting into the channels *a* of the plates B is a cross-head, D. This cross-head is formed of two plates, transversely through the center of which is formed a bearing, *e*, and onto each end of which are secured followers *f*. These followers, entering into the channels *a*, are secured to the ends of the cross-head D by lugs *g*, these lugs entering into corresponding openings or seats formed in the ends of the cross-head, so that the followers may freely turn therein. Extending between the plates C is a cross-head, E. This cross-head is made of two pieces of metal, and with a bearing, *e*, in like manner as is the cross-head D. Into the ends of the cross-head E extend the lugs *c* of the plates C, so that said cross-head may oscillate within the heads of the plates C. Into the bearings *e* of the cross-heads D and E is fitted a shaft, F. This shaft extends from one cross-head to the other, and has suitable collars *h h* formed on it, between which is received the cross-head D; and at or near the front end of the shaft E, which projects beyond the frame A, is formed a collar, *i*, and onto the shaft F is also secured a collar or hub, *j*, with channels or grooves *k k* formed therein. Immediately under the shaft F, and spanning the upper sides of the frame A, are two guide-plates, *l l*, through suitable bearings in which passes a shaft, G. Securely fitted onto the shaft G is a clutch, *m*, the forks of which embrace one of the grooves or channels *k*. Through the lower part of the frame A is fitted, in suitable bearings, a driving-shaft, H, the outer end of which is fitted with a driving-pulley, *n*, and the inner end with a bevel-gear wheel, *o*. Supported by suitable bearings *p* and *r* is a vertical shaft, I. The lower part of this shaft has a bevel-gear wheel, *s*, secured to it, and also channels or grooves for a belt. The upper end of the shaft I has secured to it a disk, J, across the face of which is formed a dovetailed slot, *t*. Fitting into the slot *t* is a stud, *u*, provided with a washer and set-screw. To the stud *u* is secured, by said set-screw, one end of a rod or lever, *v*, the other end of said lever extending and is

secured to the lower part of the clutch *m*. To the front end of the frame A are secured or formed dovetailed guides *w*, into which is fitted a plate, K, in such manner as will enable this plate to slide easily up and down in a vertical direction. On the rear side of the plate K is an arm, *y*, which passes through a slot in the frame A. Into this arm, at its inner end, is fitted a screw-shaft, *x*, which passes upward through one of the guide-plates *l*, terminating in a hand-wheel, w^2. Formed with or secured to the face of the plate K is a bracket or shelf, L, cast onto which are guide-flanges k^2 k^2. Onto the shelf or bracket L is fitted a table, M, having guide-flanges to correspond and fit the guide-flanges of the bracket, and also a rack, *c*. To the lower front end of the frame A is fitted into suitable bracket-bearings N N a vertical shaft, O. This shaft has a groove, o^2, formed on one side, and onto the shaft and between the bracket-bearings N N is placed a cone-pulley, P. The upper end of the shaft O passes through the shelf or bracket L, and has fitted to it a gear-wheel, R, gearing into the rack *c*. This gear-wheel is moved in and out of gear with the rack by the lever d^2. Onto one end of the shaft F is secured a grinding-wheel. This wheel may be of emery or any other suitable substances. And around the outer end of said shaft passes a belt, l^2.

My machine being constructed substantially as above described, it is operated as follows: Motion being communicated to the driving-pulley *n* in any suitable way by means of the bevel-wheels *o s*, the shaft I is caused to revolve, and by means of a belt the shaft F is caused to revolve likewise. As the shaft I revolves, the lever or rod *v*, which is secured in the slot *t* in the disk J by means of the set-screw and stud *u*, as before described, causes the clutch *m* (the clutch being supported and guided by the shaft G) to be drawn and forced alternately backward and forward, carrying with it, by means of the collar or hub *j*, the shaft F, so that this shaft has imparted to it a reciprocating motion, and as it is moved backward and forward the cross-head D is forced back and forth by the collars *h h*, causing the followers *f* to advance and recede within the guides or channels *a* in the plates B. The followers being adjustable on the cross-head, as before described, they are enabled to follow the curved or other shape of said channels or guides, and in consequence thereof the shaft F (being fastened to said cross-head) must likewise follow the motions of the cross-head, and consequently the grinding-wheel on the end of the shaft F receives and follows the same motion, so that when an object is placed on the table M and the edge of the grinding-wheel brought in contact with it, and moving backward and forward, or across the object to be finished, necessarily produces on the surface of the object a shape corresponding to the shape of the guides or channels *a* in the plates B. The throw or lateral movement of the shaft F and grinding-wheel may be regulated by adjusting the stud *u* nearer to or farther from the center of the disk J. As the shaft F and cutter revolve, motion is imparted to the shaft O by an endless belt extending from the shaft I to the cone-pulley P on said shaft, so that the gear-wheel R is caused to revolve, and as it is meshed into the rack *c* in the table M, the table is moved horizontally, feeding any object placed upon it under the grinding-wheel. This feed may be automatic, feeding backward and forward, or it may feed in one direction by power and be thrown back by hand. In order to adjust the table vertically to make its height correspond to the size of the object placed upon it, and so as to bring the surfaces in contact with the cutter, the screw-shaft *x* is turned to the right or left by means of the hand-wheel w^2, and by this means the plate K, with the bracket and table thereon, is moved up and down, the shaft O working through the pulley P. The groove o^2, working with a feather within the pulley, allows the shaft to be adjusted to any height while it is in motion. It is obvious that the motion of the grinding-wheel will be changed to suit any surface it is desired to cut, whether concave, convex, ogee, or otherwise, by simply substituting the plates B, with their channels, for others having the desired guides or channels in them. As the cross-head D follows the direction of the channels or guides, the cross-head E oscillates slightly in the plate C, so that the shaft F may more readily follow the motions of said cross-head.

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

1. In a machine for shaping and polishing metals, the rotary and reciprocating shaft F, carrying the grinding-wheel, and having a vibrating or oscillating motion imparted thereto by means of changeable guides, substantially as and for the purpose described.

2. The combination, with shaft F, operated substantially as described, of a cross-head, D, pivoted followers, and guide-plates, as and for the purpose specified.

3. In a machine for shaping and polishing metals, the vertically-adjustable table, in combination with a sliding shaft, O, as and for the purpose specified.

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Witnesses:
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