S. M. CATE & E. JORDAN.

DIE AND STOCK FOR ORNAMENTING METAL TUBES.

No. 12,669. Patented Apr. 10, 1855.

Fig: 1

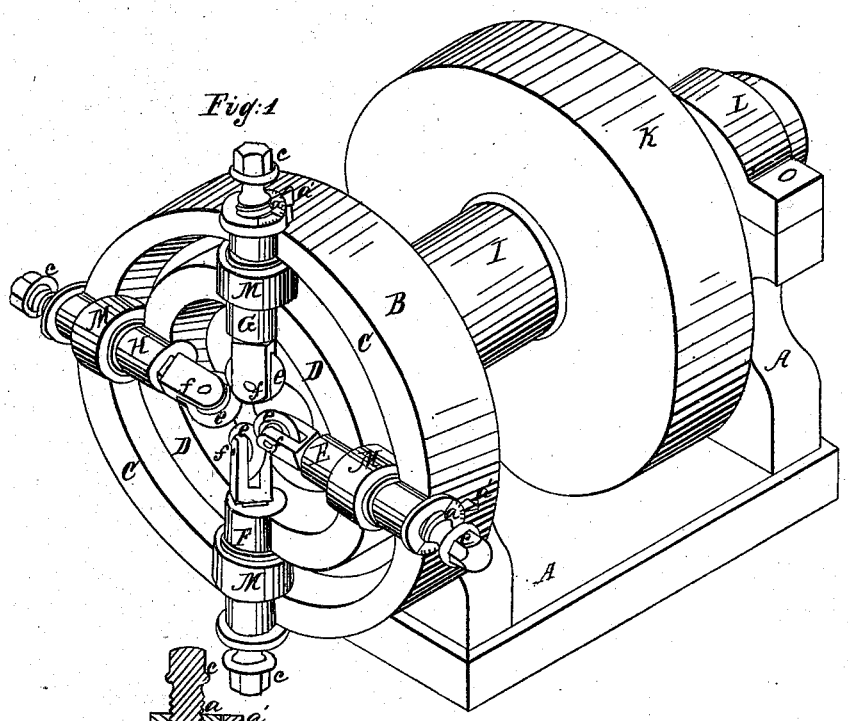
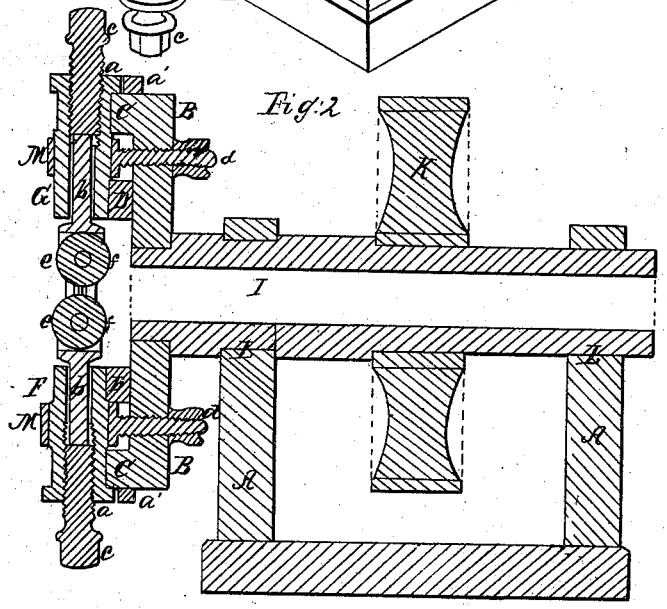



Fig: 2



# UNITED STATES PATENT OFFICE.

S. M. CATE AND E. JORDAN, OF WATERBURY, CONNECTICUT.

## ARRANGEMENT OF DIES AND STOCKS FOR ORNAMENTING METAL TUBES.

Specification of Letters Patent No. 12,669, dated April 10, 1855.

*To all whom it may concern:*

Be it known that we, STEPHEN M. CATE and EDMUND JORDAN, both of the city of Waterbury, in the county of New Haven and State of Connecticut, have invented a new and useful Improvement in Machinery for Ornamenting Metal Tubes, &c.; and we do hereby declare that the following is a full, clear, and exact description of the construction, character, and operation of the same, reference being had to the accompanying drawings, which make a part of this specification, in which—

Figure 1, is a perspective view of the machine, showing one form of dies, for ornamenting by spiral lines, Fig. 2, is a view of a longitudinal section of the same, cut vertically through the center, showing the relative positions of the parts.

Our improvement consists in so constructing, and arranging, the several parts of the machine, as to render it a self feeding machine for impressing spiral ornaments, of any kind whatever, on any, and all, parts of the surfaces of metal tubes; and so that it may be operated by hand, or any other power.

We make the frame, or body, of the machine, A, A, of cast iron, or any other suitable material, substantially, in the form shown in Figs. 1, and 2. We make the front, or working, part of the machine, B, Figs. 1, and 2, of cast iron, or any other suitable material, of a circular disk, with two circular ribs, or projections, C, and D, on its face, to sustain the die stocks, E, F, G, H, as shown in Fig. 1. We attach the front part, B, to the front end of a hollow cylindrical shaft, I, on which shaft we fit a pulley, K. This shaft revolves in bearings, as shown at L, Fig. 1, and at L, and L, Fig. 2. We make the die stock E, F, G, H, of cast iron, or any other suitable material, of a perfect circle in their cross section, and let them into the circular projections, C, and D, about one half of their diameters, so that they may be readily turned to adjust the planes of the rotations of the dies to any desired angle with the hollow shaft, I,—and we graduate the outer ends, as shown at *a*, and *a*, Fig. 1, so that they may each be set at the same angle with perfect accuracy, by the assistance of the guides, or points, *a'*, and *a'*, &c. Or, they may be all set at once by gearing, in any of the well known ways, used for such purposes. We make these die stocks, E, F, G, H, hollow, as indicated in section, in Fig. 2, so that they may receive the square shanks of the die holders, as shown at *b*, and *b*, Fig. 2, and, also, the adjusting screws, *c*, *c*, *c*, *c*, by which we adjust the dies to the size of the tube to be ornamented. We secure these die stocks firmly in their proper position, (when adjusted as above described,) by binding screws on the inner parts of the bands, or sockets, M, M, &c., as shown at *d*, *d*, Fig. 2. We make the dies, *e*, *e*, *e*, *e*, of cast steel, or any other suitable material, of exact circles, with devices on their peripheries in cameo, or, intaglio, (though cameo, is preferred,) of any design which taste, or usefulness, may suggent, all alike, or different designs on each, and use any number of dies, and die stocks, which may be found convenient in any case, (the die stocks always radiating from the center.) We attach the dies to the inner ends of the die holders, *b*, *b*, &c. Figs. 2, and 1, by center pins, or arbors, as shown at *f*, *f*, *f*, *f*, on which the dies revolve to impress the design; thereby essentially avoiding friction in their operation. These pins, or arbors, may be withdrawn, and one, or more, of the dies changed, at pleasure.

To use our machine, for impressing the ornaments on the tube, we set the die stocks so as to bring the planes of rotation of the dies to the desired angle with the hollow shaft, (each die being at exactly the same angle,) and adjust the dies, by the set screws, *c*, *c*, *c*, *c*, to the size of the tube to be ornamented. We then place the tube on a proper mandrel, and insert the end between the dies, and revolve the machine by a band on the pulley, K, (or by any other convenient means,) when the revolving of the part, B, which holds the die stocks, will, by the action of the dies, feed the tube through the hollow shaft, I. And the motion will cause the dies to revolve, on their own axes, and impress their devices on the surface of the tube, as they are feeding it through.

Should it be desired to impress the same, or different, devices, in a spiral opposite to the first, that is, crossing the former, the die stocks have only to be set at the reverse angles, and the tube fed through again, the same as before.

The advantages of our improvement consist in the die stocks being adjustable so as

to bring the planes of rotation of the dies to any desired angle with the hollow shaft, (which controls the direction of the feed.) And in so constructing, and arranging the machine that its revolving motion will feed the tube, after it has been entered, in the exact proportion as it is wanted, as the revolving motion controls the feed by the angle of the dies, so that the tube can never be strained, or forced out of shape, for no force acts upon the tube except the pressure of the dies in the direction of its cross section, so that the tube will come from the machine in the desired shape, with all the ornaments perfectly impressed on its surface, ready for use. And in the simplicity, and small expense, of its construction, and use, as the same parts, (except the dies,) are used, for all kinds of ornaments.

We are aware that a series of stationary dies have been long used to ornament tubes;—and that revolving dies have been used for ornamenting articles while in a lathe; and that revolving dies have also been used where the article has been drawn through by a process like that of wire through a "draw plate," or for welding iron tubes, &c., and that adjustable holders are not new; we, therefore do not claim any of the parts, as such, as our invention, but,

What we claim as our invention, and desire to secure by Letters Patent, is—

The combination of the adjustable die stocks, (E, F, G, H,) with the revolving dies, (*e*, *e*, *e*, *e*,) in a self feeding machine for ornamenting tubes, &c., when the whole is constructed, arranged, combined, and made to operate, substantially, as herein described.

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Witnesses:
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