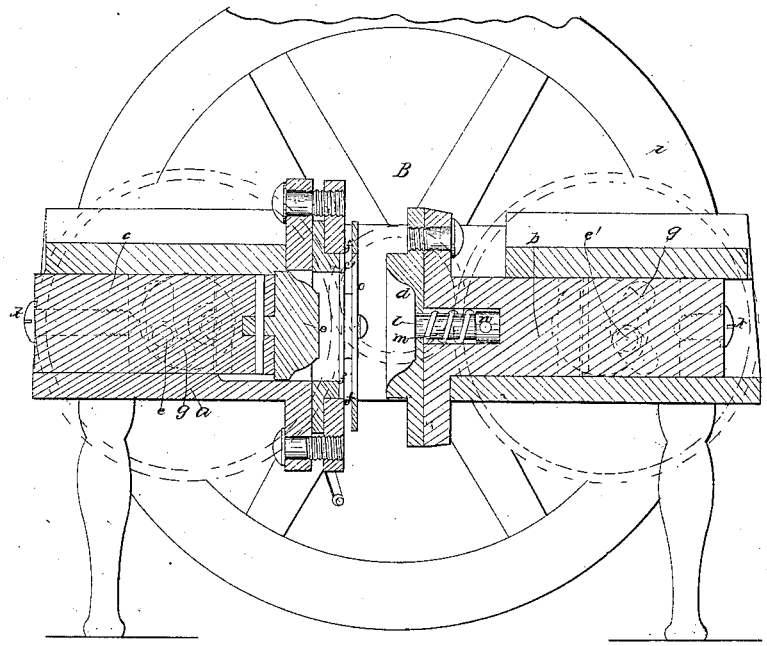
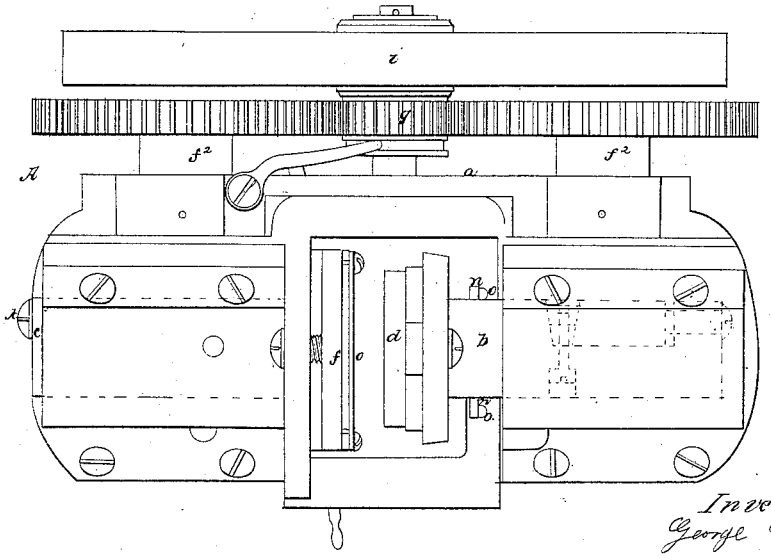
G. Murray,

Sheet-Metal Die.

No. 51,342. Patented Dec. 5, 1865.





Witnesses:
P. B. Cushman
H. Gould

Inventor:
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UNITED STATES PATENT OFFICE.

GEORGE MURRAY, OF CAMBRIDGE, MASSACHUSETTS.

IMPROVED PRESS FOR FORMING METAL BASINS.

Specification forming part of Letters Patent No. **51,342**, dated December 5, 1865.

To all whom it may concern:

Be it known that I, GEORGE MURRAY, a native of the British Provinces, residing in the city of Cambridge, county of Middlesex, and State of Massachusetts, have invented a Machine for Cutting Out and Forming Metal Hollow Ware; and I do hereby declare that the following, taken in connection with the drawing which accompanies and forms a part of this specification is a description of my invention sufficient to enable those skilled in the art to practice it.

This improvement relates to the construction of machines for cutting out and forming basins or other similar hollow ware from sheets of metal; and the invention consists in the arrangement and method of operation of the cutting-off and shaping dies and griping mechanism and a piston for discharging the work.

The drawing represents a machine embodying my invention, a plan of the same being shown at A, and a longitudinal, central, and vertical section at B.

a denotes the table or stand having ways or bearings which support horizontal slide-pieces *b c*, upon the adjacent ends of which are secured in line the shaping-matrix *d* and die *e*, as seen at B.

A stationary bed-die, *f*, is fixed to the table *a*, this die being in the form of an annulus, the inner edge of which is of the diameter of the circular plate which forms the basin. The outer edge of the matrix *d* fits into this bed-die, so that by the movement of the matrix against a sheet of metal placed in front of the bed-die or between said die and a ring, *o*, the circular plate to form the basin is cut from the sheet of metal, as will be readily understood. Just back of this bed-die is a clamping surface or plate, *f'*, against which the metal is clamped by the face of the matrix *d* (near its outer edge) during the coaction of the matrix and die upon the plate previously cut out from the sheet of metal.

The die and matrix are thrown forward by the action of crank-pins *e'*, extending from shafts f^2 upon cams *g*, cut in one side of each slide *b c*.

Motion is communicated to gears upon the two shafts f^2 by a gear, *g'*, on the main shaft, which gear may be thrown into and out of connection with the driving-wheel *i* by a suitable clutch mechanism.

The extent of movement of the die *e* and matrix *d* may be regulated by adjusting-screws *k*, which act upon movable plates set into and forming part of one face of each slide *b c*, the cams being formed in these plates.

A stop-pin (not shown) is so placed that the sheet from which the basin-blank is to be cut rests upon the pin until the forward movement of the matrix clamps it against the bed-die *f*, and the stop-pin is to be so applied that it slides back, after the action of the dies, to allow the chips and the basin when formed to drop from the machine. When a circular plate is previously cut to the requisite form a series of pins may be used to center the blank with reference to the matrix and die.

In the operation of the machine the normal position of the die and matrix leaves a space or throat between them, into which the sheet is dropped, it being held between the rings *c* and bed-die *f* and resting upon the stop-pin. The matrix *d* then moves up and its outer face strikes the sheet, carrying it against the bed-die *f* and cutting from it, by the action of the outer edge of the matrix and the adjacent edge of the bed-die, the circular blank from which the basin is formed. The continued forward movement of the matrix carries the circular blank against the surface *f'*, where it is clamped by the outer face of the matrix *d*. The die then moves forward toward the blank and forces the central portion thereof up into the matrix, such portion receiving the form due to the convexity upon the die and the concavity in the matrix, the blank being, during the shaping operation, held between the two clamping-surfaces to form the flange or outer edge, the matrix drawing back, however, if necessary, to such extent as to allow the perimeter of the blank to contract slightly during the shaping-operation while preserving the outer edge or flange in the plane at right angels, or nearly so, to the axis of the matrix and die. This contraction thickens up the edge or flange of the basin and imparts a rigidity to it beyond what it would have if its diameter were kept the same as the normal diameter of the blank. When the basin is formed it is left in the matrix to discharge it, from which a piston, *l*, is placed in the slide *b*, just behind the matrix. This piston is held in positon by a spring, *m*, and it has pins *n* extending laterally from it, through slots made through the slide. As the

matrix is moved back these pins *n* strike upon pins *o*, extending up from the table *a*, holding the piston stationary during the continued retrograde movement of the matrix, causing the piston to project beyond the rear face, then to force the basin from the matrix, from which it falls to the floor. Instead of the piston a stream or jet of water or steam under pressure may be forced in behind the basin to displace it from the matrix.

By the organization of the machine, as described, with a matrix and die working horizontally hollow metal can be formed with great facility, cheapness, and expedition, it being only necessary to feed in sheets of metal, from which basins are automatically produced and removed from the machine.

The matrix, cutting-off die, and shaping-die are all made removable, so that by substitution of others basins of various sizes and shapes may be formed, as may be desirable.

I claim—

The combination of the reciprocating dies *d* and *e*, piston *m*, and clamp *f'*, all constructed and arranged substantially as described.

In witness whereof I have hereunto set my hand this 26th day of July, A. D. 1865.

GEORGE MURRAY.

Witnesses:

J. B. CROSBY,

F. GOULD.