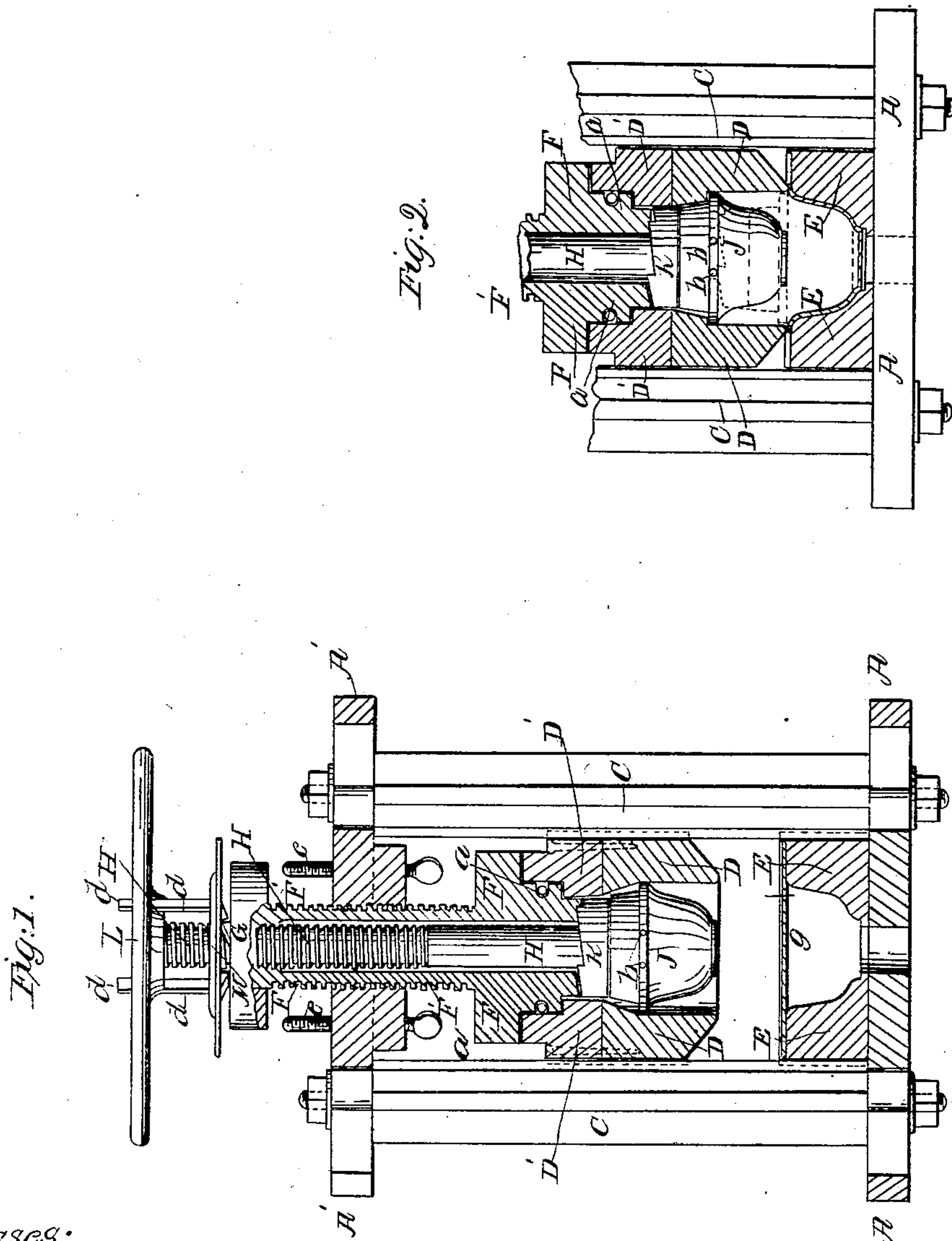


J. B. JONES.
MACHINERY FOR STAMPING VESSELS FROM SHEET METAL.
No. 27,911. Patented Apr. 17, 1860.



Witnesses:
J. M. Thompson.
M. M. Livingston.

Inventor:
J. B. Jones

UNITED STATES PATENT OFFICE

J. B. JONES, OF BROOKLYN, NEW YORK.

IMPROVED MACHINE FOR FORMING VESSELS OF SHEET METAL.

Specification forming part of Letters Patent No. 27,911, dated April 3, 1860.

To all whom it may concern:

Be it known that I, J. B. JONES, of Brooklyn, (E. D.,) in the county of Kings and State of New York, have invented certain new and useful Improvements in Machinery for Forming out Vessels from Sheet-Metal Plates; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 represents a vertical cross-section, taken through my machine, showing the forming-block with the holding-ring in an elevated position, with a metal plate laid over the counter-die box, ready to receive the pressure. Fig. 2 is a sectional elevation of the forming-block with the holding-ring brought down on the counter-die box in a position to commence the operation of forming or stamping. These parts are also represented in this figure, in red lines, in their relative position, when the vessel is completed in the die-box.

Similar letters of reference indicate corresponding parts in both figures.

This invention has for its object the stamping or forming out of a sheet of thin metal—such as tinned sheet-iron, brass, copper, &c.—vessels of any desirable shape, size, or description, so that they will be seamless.

The invention is an improvement on the present process of “drawing down” or stamping vessels, such as oval, round, or square pans, very deep or very shallow, whereby the work can be all done at one and the same operation and with one die acting upon the blank or blanks in a corresponding counter-die. I am thus enabled to accomplish the work with great rapidity and with less liability of injury to the metal than with the present slow method of sinking the metal at many separate operations with different dies.

My invention, to this end, consists, first, in the employment of suitable dies and counter-dies corresponding in shape and size to the kind of work to be performed, and in using with these in a novel manner a device, hereinafter to be described, which is brought down upon the blank so as to hold it with sufficient firmness on the counter-die bed to prevent it from puckering or gathering while the die is brought down and the metal is formed into shape. At the same time this device does not

hold the blank with sufficient rigidity to prevent it from gradually drawing or slipping over the edge or margin of the counter-die as the die descends into the counter-die, or the counter-die descends on the die, which would be the same thing. Still, it is preferable to fix the counterpart or intaglio of the die to the bed or base of the stamping-machine.

It consists, secondly, in arranging a device, which I shall term the “blank-holder,” so as to work in suitably-adjustable guides, and to be acted upon with a reciprocating motion by a suitable screw or other mechanical means in such a manner and in such relation to the die that said blank-holder will be the guide for this die, and conduct the same to the work after the holder has been brought down, and keep it in a firm central position with respect to the counter-die while it completes its operation of sinking or stamping the metal plate, as will be hereinafter described.

It consists, thirdly, in combining the die with the concentric blank-holder, and the two with a suitable mechanical arrangement, whereby the die will be kept completely within the blank-holder until the latter is brought down hard upon the blank plate on the counter-die, combining and arranging therewith adjustable regulating-screws for controlling the movement of this die and blank-holder, as will be hereinafter described and represented.

To enable those skilled in the art to fully understand my invention, I will proceed to describe its construction and operation.

In the drawings, A A represent, respectively, the base and table, which latter is sustained by four strong pillars forming the framework for supporting the several parts of my improved machine.

C C are two perpendicular parallel guides, which are made adjustable to or from each other by suitable set-screws, by which they may be fixed rigidly in their adjusted position, and between these guides is placed a hollow blank-holder, D, which may be circular, oval, or square, or of any desired shape. Directly below this blank-holder D, and resting firmly on the base-plate, is the counter-die bed E, which is held firmly in place between the adjustable guides C C.

On top of the blank-holder D is screwed a cap, D', and on top of this cap is fitted a circular enlargement, F, of the hollow screw.

shaft F', the neck of which enlargement, or that portion fitting into a recess in cap D', has an annular groove cut into it, and by means of pins *a a*, which pass transversely through cap D' and through this slot in the enlargement F, the screw-shaft F' is coupled to the blank-holder and the screw, and the one is allowed to rotate within the other, and by this means the blank-holder may be raised or depressed between its guides C C by turning the screw-shaft F'. Perpendicular V grooves are cut into the surface of the die-holder and cap, opposite each other, into which fit the edges of guides C C, and in this manner the die-holder is prevented from turning with the screw-shaft. The screw-shaft F' passes up through a female screw cut through the center of the top of table A', and carries on its upper end a circular plate, G, having one or more triangular projections on its surface near its circumference, which plate is keyed to and turns with the screw F'. The blank-holder D is hollowed out for receiving a die, J, which die corresponds in shape and is slightly smaller than the cavity represented in the die-bed or counter-die E. The cavity in the blank-holder D is of sufficient size and depth to allow the die to be drawn up within it, so that the bottom of the die will be on a plane with the lower edge of the blank-holder. This die J, which may be of any desirable shape, size, or pattern, is operated by a perpendicular screw-shaft, H, which passes up through the screw-shaft F', to which the die is attached by pins *b b*, passing through it; and through an annular groove cut in the end of its screw-shaft H, in a similar manner to the coupling of the blank-holder with its shaft.

On the top of the die J, and keyed to its shaft, is a circular plate, K, furnished with clutch-teeth on its upper surface, which, at a suitable time in the operation of the machine, will couple the die-shaft with the blank-holder and its shaft, so that the parts will all have a simultaneous movement, either in their approach or receding movement from the counter-die. The screw-shaft H proceeds up through the cap F and screw-shaft F', a female screw being cut into the end of this shaft to receive H, and carries on its upper end, which is some distance above the end of screw F', a large fly-wheel, L, by which the machine is operated, and just under this wheel L is arranged a circular clutch-plate, M, which is hung from wheel L by two rods, *d d*, which pass loosely through this wheel, and couple the two screw-shafts together in their downward movement until the blank-holder is brought down on the blank, when three adjustable gage-pins, *e e*, will disengage this clutch-plate from the shaft F and allow only the shaft H to descend, carrying with it the die J; and when the reverse movement takes place the die-holder will remain stationary until the die is drawn entirely up within it, when the clutch-plate K will engage with the cap F and the die and blank-

holder will ascend together. In this manner the blank-holder is brought down on the face of the counter-die before the die begins to leave the blank-holder, and when the operation of sinking is completed the die will be drawn up within the die-holder before the die-holder commences to leave the counter-die. The adjustable gage-screws *e e e*, which pass up through the table A', can be set so as to disengage or uncouple the two screw-shafts at any desirable moment for regulating the pressure of the blank-holder on the counter-die bed. At the same time they serve to regulate the depth the die is to be driven down into the counter-die, or rather the depth it is desired to form the pans.

The operation of this machine, with its several peculiarities, I will briefly describe, as follows: The counter-die should be firmly held in its proper place, and at the same time capable of being removed from the machine, and another of a different size or pattern introduced in its stead for the various sizes and styles of vessels to be made. It should have a flange projecting up from its outer edge for setting the blanks in their proper place with relation to the descending die. This flange is shown in the drawings. The hole shown through the bottom of the counter die is merely to allow dust, chips, and air to escape therefrom.

The blank represented by *g* in Fig. 1 of the drawings may be of any desirable sheet metal well annealed. These are placed on the counter-die, as shown by Fig. 1, when the several movable parts of the machine are in the position shown in this figure, and the wheel L is turned by any suitable and convenient means, which operation carries down the die J with its eccentric blank-holder D until this blank-holder is firmly seated on the blank *g*, holding it down on the margin of the counter-die, and pressing on it all around equally, but not with force sufficient to injure the metal of the blank. When this takes place, the blank-holder is no longer acted upon by the clutch that brings it down on the face of the counter-die; but the die J commences to descend alone, receiving a direct downward motion from the screw-shaft, but not a rotary motion. Its bottom comes in contact with the blank and the operation of forming the blank into shape commences. The bottom of the die must press upon the blank centrally, so that the metal will be drawn from under the die-holder equally and regularly, and as the die sinks down into the counter-die the blank will be drawn with the die, and the action of the blank-holder upon the blank will be to keep the metal outside of the counter-die flat and prevent it from crimping up or "puckering." The metal of the blank by this means of "carrying it down" is not in the least injured, because the drawing takes place from the center, and the metal is kept down on the margin of the counter-die by a firmly-fixed ring or holder, before described, which constitutes the essential feature of my inven-

tion. When the die is forced entirely down into the counter-die, the movement of the shaft H is reversed and the die recedes from the counter-die until its bottom has cleared the lower edge of the blank-holder; then the clutch K engages with the hollow screw-shaft F', and both are raised together a sufficient height to allow of the removal of the vessel from the counter-die and the introduction of another blank to repeat the operation of forming or stamping pans or other vessels from a single sheet of metal. When the pans have thus been formed, they are removed to another machine for finishing.

For stamping vessels of a different size or shape, the die, counter-die, and blank-holder are to be removed and other suitable ones introduced in their stead. The guides C C are made adjustable for this purpose.

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

1. The employment of a blank-holder, D, or its equivalent arrangement in such a relation to the die and counter-die and operated in conjunction therewith that the blank of which the pan is to be formed will be held down on the counter-die and prevented from crimping while the die is carrying the blank down, essentially in the manner and for the purpose herein set forth.

2. The clutch M, arranged and combined with the die-screw shaft H, in combination with clutch-plate G of shaft F', and gage-screws *c c c*, for the purpose of causing the die and die-holder to descend together until the former comes in contact with the blank on the counter-die, when the die will descend alone the required distance.

J. B. JONES.

Witnesses:

WM. THOMPSON,
M. M. LIVINGSTON.