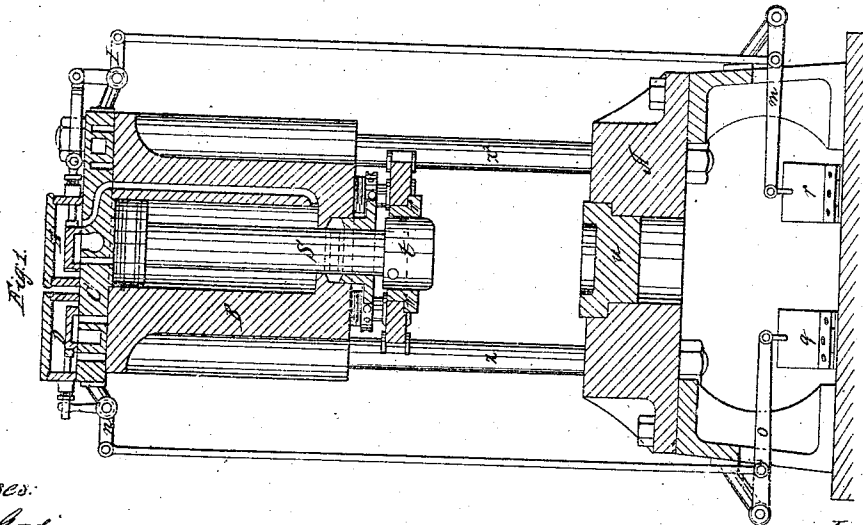
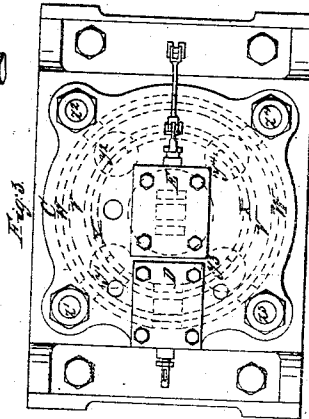
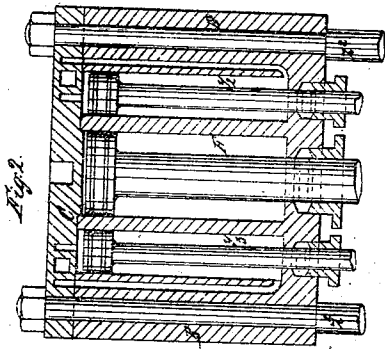
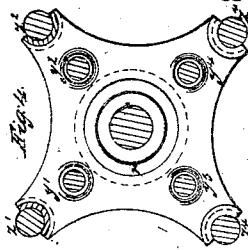


*W. D. Grimshaw,*

*Hydraulic Press,*

*N<sup>o</sup> 84,625.*

*Patented Dec. 1, 1868.*



*Witnesses:*

*W. M. Goring*  
*H. B. Northrup*

*Inventor:*

*W. D. Grimshaw.*

# United States Patent Office.

W. D. GRIMSHAW, OF NEWARK, NEW JERSEY.

Letters Patent No. 84,625, dated December 1, 1868.

## IMPROVEMENT IN STAMPS AND DIES FOR SHEET-METAL.

The Schedule referred to in these Letters Patent and making part of the same,

*To all whom it may concern :*

Be it known that I, W. D. GRIMSHAW, of the city of Newark, in the county of Essex, and State of New Jersey, have invented an Improved Steam, Pneumatic, or Hydraulic Compound Cylinder-Engine Press, for Shaping Forms from Sheet-Metal; and I do hereby declare the following to be a full and exact description of the same, reference being had herein to the drawings accompanying this specification, as part of the same.

The nature of my invention consists in arranging, adapting, and employing several cylinders with pistons to give varied pressures upon the sheet, required for the production of sunken work, smooth and perfect on the sides as on the bottom.

Figure 1, in the drawings, is a front view of the press and its parts;

Figure 2 is a view taken in section at a right angle to the supporting-pillars;

Figure 3, is a parallel plan of the top plate, showing valve-chests, valves, ports, and passages; and

Figure 4 is a slide, attached to the four pistons of four cylinders, said slide being guided in its motion by the four supporting-pillars.

The same letters refer to the same parts in each figure. Upon a suitable foundation a base-block, A, is properly secured.

Four pillars,  $x^1$   $x^2$   $x^3$   $x^4$ , standing up from the base-block, support the casting B, in which are four cylinders,  $y^1$   $y^2$   $y^3$   $y^4$ , equidistant from each other, and in the centre a fifth cylinder, F, of larger diameter than the other four.

On the upper side of the top plate C, there are two receiving-chests, D and E, with valves and ports, the ports in D opening into circular passages in the under side of the plate C, the passage  $x$  communicating with the top of the pistons in the four cylinders, and the passage  $w$  with the under side of the same. The exhaust is through the middle passage  $v$ .

The receiving-chest E has in it valve and ports, as in common steam-engines.

In the centre of the base-block A is a die,  $u$ , of the required form, a suitable follower,  $t$ , being attached to  $s$ , the piston-rod in the centre cylinder.

A disk,  $r$ , is placed in the middle of the slide, ng. 4, having an aperture in its centre, through which the follower  $t$  can freely pass, the disk being a plane surface, perfectly parallel to the face of the die  $u$ .

Two treadles,  $q$  and  $p$ , are connected with the valve-rods by the levers  $o$   $n$  from  $q$ , and  $m$   $l$  from  $p$ .

The flat, thin metal plate to be operated upon is placed upon the face of the die  $u$ . The pressure of the foot of the operator upon the treadle  $q$ , brings down the slide, fig. 4, upon the plate, and holds it so that in being drawn from between the disk and the die, the metal can but be stretched.

By the pressure of the foot upon the treadle  $p$ , the follower  $t$ , on the piston-rod  $s$ , is brought down, carrying the thin metal plate into the die, making the surface of the sides smooth by the strain upon the metal as it comes from the slide and the die. Thus from one operating is produced a deeper dish, in a finished state, than is now produced by repeated blows from a drop in the ordinary way.

This press can be operated either by steam, water, or compressed air. I prefer combined water and air.

### Claims.

What I claim, and desire to secure by Letters Patent, is—

1. The employment of four cylinders,  $y^1$   $y^2$   $y^3$   $y^4$ , combined with the main cylinder F, to equalize the pressure upon the four corners of the guide-plate H, fig. 4, when descending on the four guide-posts  $z^1$   $z^2$   $z^3$   $z^4$ , constructed, adapted, and arranged, substantially as set forth.

2. The top plate C, with circular passages  $x$ ,  $w$ , and  $v$ , in combination with the five cylinders, as specified and shown.

3. The levers  $o$   $m$   $n$   $l$ , and the treadles  $p$  and  $q$ , when combined with the five cylinders for graduating the pressure upon the plate H, fig. 4.

W. D. GRIMSHAW.

Witnesses:

W. M. GOODING,

F. B. NORTHROP.