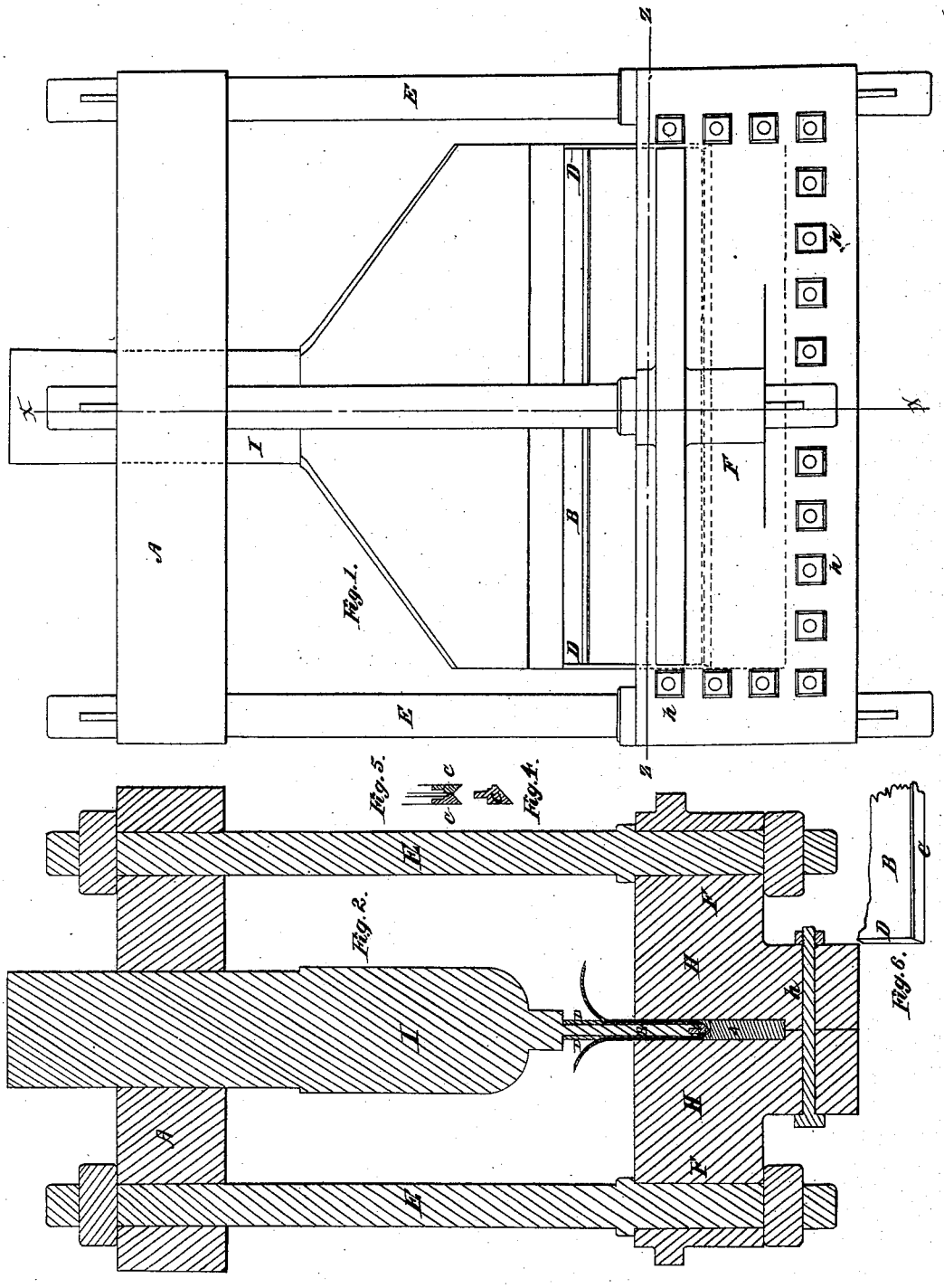
2 Sheets.—Sheet 1.

J. ROBERTSON.

Making Sheet Lead.

No. 5,226.

Patented Aug. 7, 1847.



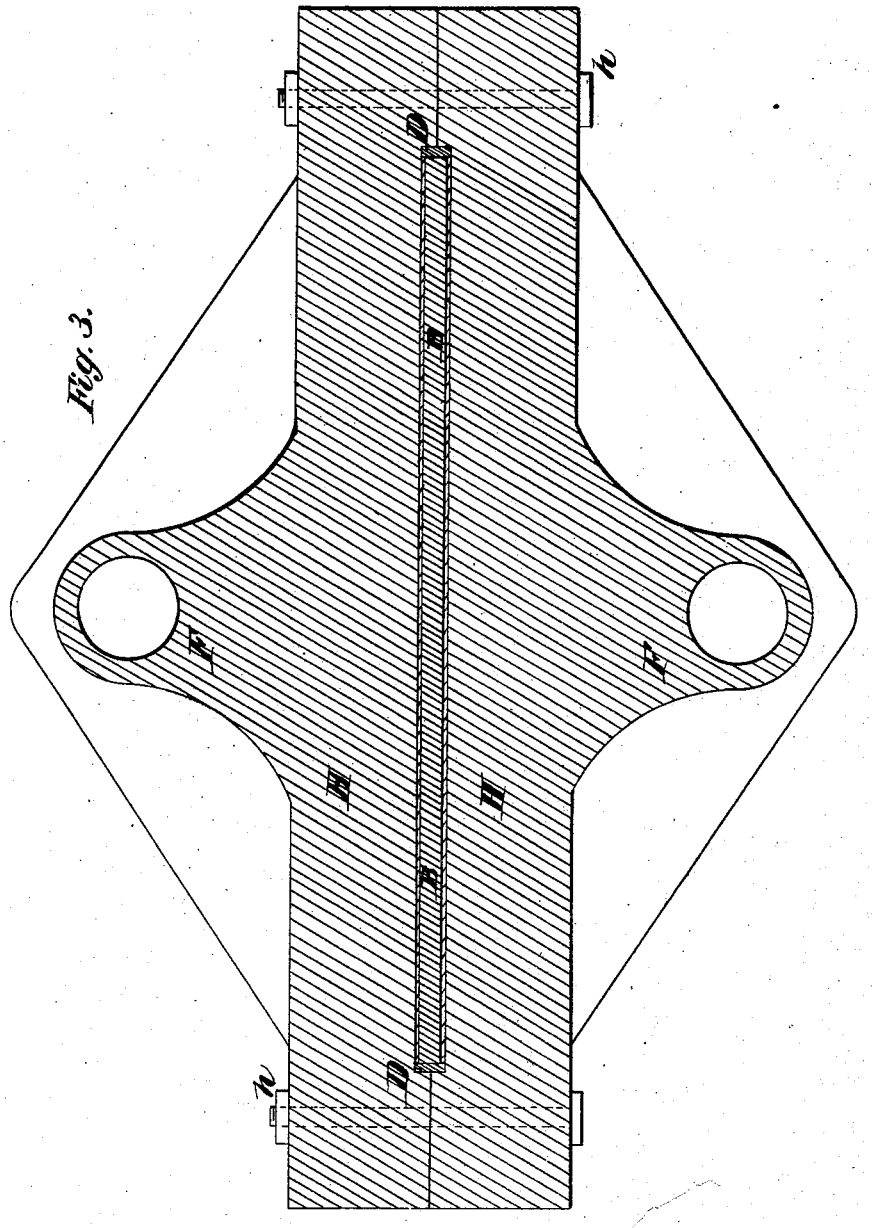
2 Sheets.—Sheet 2.

J. ROBERTSON.

Making Sheet Lead.

No. 5,226. Patented Aug. 7, 1847.

Fig. 3.



UNITED STATES PATENT OFFICE.

JOHN ROBERTSON, OF BROOKLYN, NEW YORK.

MACHINERY FOR MAKING SHEET-LEAD.

Specification of Letters Patent No. 5,226, dated August 7, 1847.

To all whom it may concern:

Be it known that I, JOHN ROBERTSON, of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Machine for Working Lead or other Soft Metal into Sheets, and that the following is a full, clear, and exact description of the principle or character which distinguishes it from all other things before known and of the manner of making, constructing, and using the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a front elevation of the machine; Fig. 2, a cross vertical section taken at the line (X X) of Fig. 1; Fig. 3, a horizontal section taken at the line (Z, Z) of Fig. 1; and Figs. 4 and 5, sectional views of modifications of the ram which acts on the lead in making the sheets.

The same letters indicate like parts in all the figures.

The method universally employed for working lead into sheets is by means of rollers as in the manufacture of sheet iron, but the machinery for this is not only very costly and bulky, but from the width of the sheets very liable to yield under the pressure and thus making the sheets thicker in the middle than at the edges, a defect very injurious to the plumber's operations. It has also been suggested, and tested without economical success, to form the lead into large pipes by the machinery generally employed for that purpose, which pipes were to be cut afterward and opened into sheets; but this process was found to be accompanied by too many serious objections to be practically useful.

The nature of my invention consists in forming lead (or other metal, or compounds of metals having like qualities) into sheets by making pressure on a portion of the surface of a mass of metal in a chamber of the length of the intended width of the sheet or sheets, and thus causing the metal to rise in a thin sheet or sheets between the surfaces of the chamber containing it and the die on the face of the ram by which pressure is made. The ends of the ram or die, thus acting on the surface of the metal to be formed into sheets, being guided at each end in such manner as to insure parallelism of action relatively to the face or faces of the chamber containing the lead or other metal or compounds thereof.

In the accompanying drawings (H, H) represent two plates of metal connected together by screw bolts (*h*) to insure a tight joint where they come together, and where they come together they are cut out to form a chamber with parallel sides, of such length as to determine the width of sheet to be formed, and of such depth, connected with the length and width, as to contain the requisite charge of metal for one operation of the machine. To this chamber is adapted a metal ram (B) the length of which is a little less than the chamber, and its width also less than the chamber, in order that the sheets of lead when forced out may have free passage between its faces and the sides of the chamber, and to afford the means of adapting the same machine to different thicknesses of sheets by simply changing the die (C) which is secured to its lower edge by means of a tongue and groove as is clearly represented in the drawings. The face of this die is beveled so as to form a ridge in the middle of its thickness and running up at an angle of about forty-five degrees either way to direct the metal on each side to the space between the faces of the chamber and the die, which spaces are to be of the thickness of the sheets to be formed, so that by changing the die and putting in others of greater or less width sheets of greater or less thickness can be formed. It has been stated that the length of the ram is a little less than the chamber, this is to admit of attaching to its ends guides (D, D) which accurately fit the sides of the chamber and insure the accurate working of the ram, as this is necessary to good work. The lower ends of these guides extend a little below the ridge of the die and are beveled outward to an edge to separate the lead from the ends of the chamber and prevent it from forcing its way between the guides and the ends of the chamber and thus choking and clogging the operation of the machine; this is represented in a separate section Fig. 6.

The plates (H, H) form the bottom of or bed of the frame and are connected with the head (A) by means of screw rods (E, E, E, E) which pass through the ends of the plates (H, H) and projections (F, F). The ram (B) is forced down onto the lead

by the ram (I) of a hydraulic press which passes through an aperture in the head (A) of the frame which may at the same time answer as the head of the hydraulic engine. As the ram (B) is forced down onto the lead, the inclined surfaces of the die direct it toward the open spaces between the die and the chamber, and the pressure on the other portions of the surface cause it to rise in two sheets (one on each side) that curl over as represented in the drawing.

The machine may be modified so as to make but one sheet by making the die as represented at Fig. 4 with only one inclined face, so that the flat face (*g*) shall run against one side of the chamber, the space for forming the sheet being left between the die and the other side of the chamber. Or the die can be formed as represented in Fig. 5, with the lower surface like an inverted (Λ) to direct the metal to a groove in the middle through which the lead is forced to form the sheet, the die for this purpose being made in two parts and properly secured together. These modifications are however considered inferior to the first described.

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

1. The method of making sheets of lead, or other soft metals, or compounds thereof having like or similar qualities, by making pressure on a portion of the surface and causing it to rise in the form of a sheet or sheets, in a space or spaces left between a long chamber containing the metal and the die, or through a space in the die, the said die being equal in length to the width of the intended sheet or sheets, and having its ends guided by and working in a corresponding chamber containing the metal to be formed into sheets, substantially as described.

2. I also claim in combination with the ram die and chamber the end guides that guide the ram in its movements and separate the lead from the ends of the chamber and prevent it from being forced in between the ram and chamber to choke the machine, substantially as described.

JOHN ROBERTSON.

Witnesses:
PETER MILNER,
THOS. RINNER, Jr.