

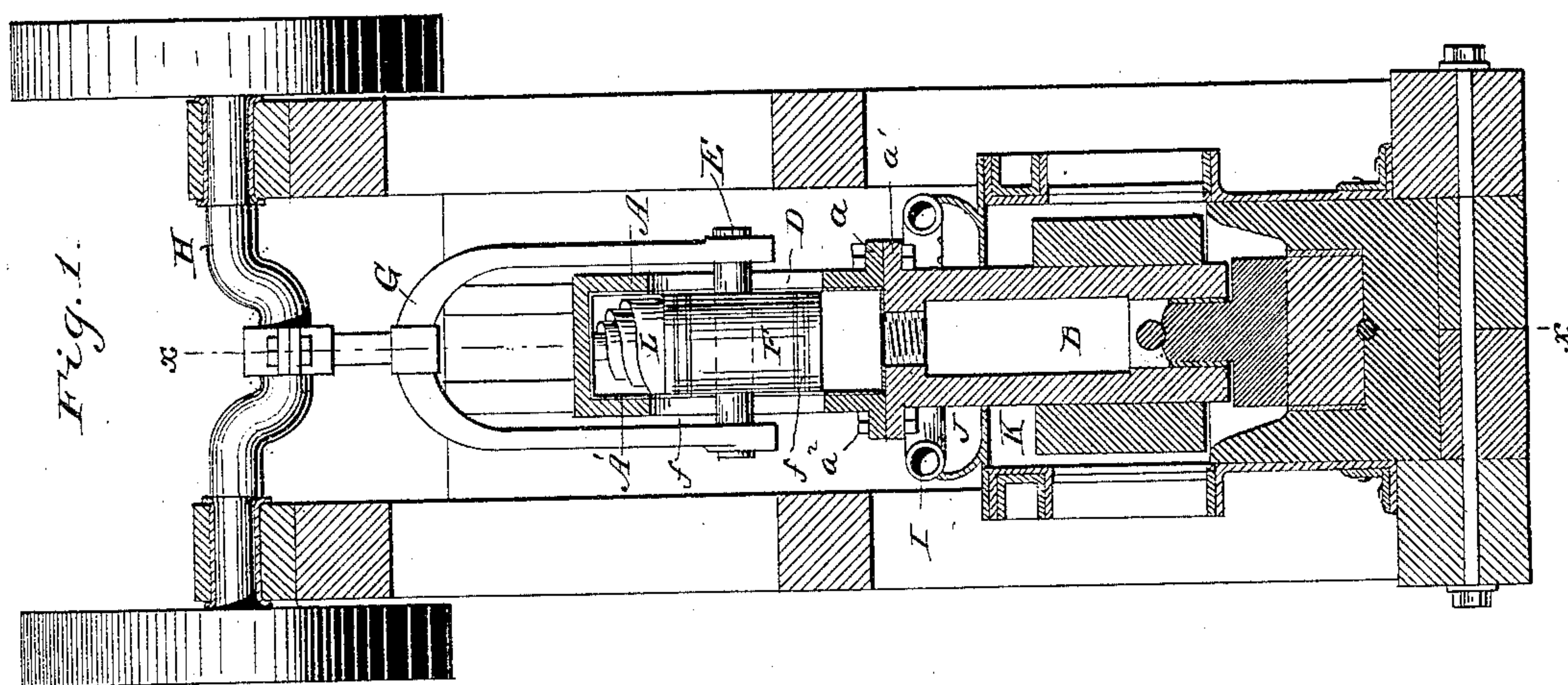
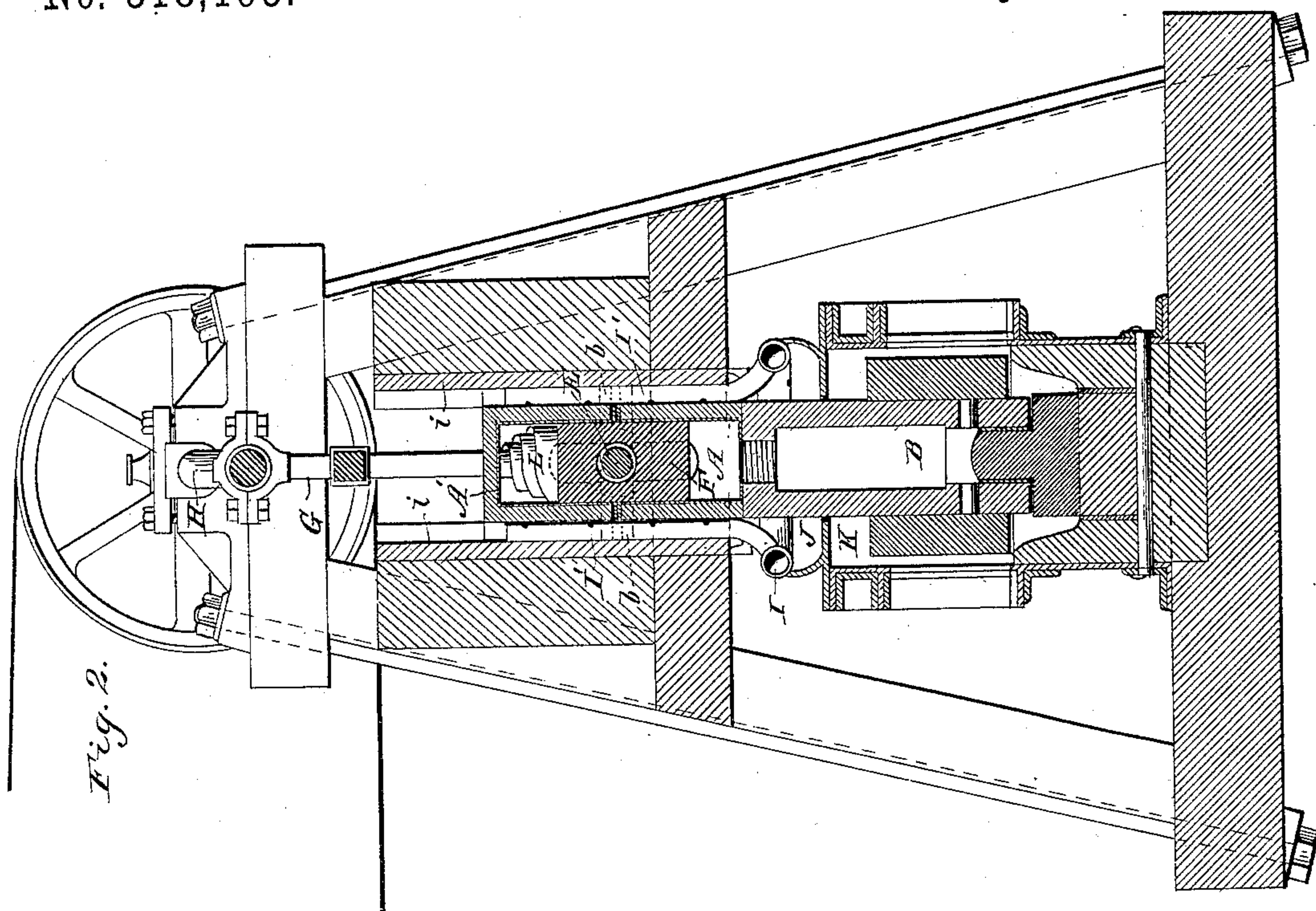
(No Model.)

2 Sheets—Sheet 1.

C. SHOLL, Dec'd.,
J. W. MARSHALL, Administrator.
ORE STAMP.

No. 318,193.

Patented May 19, 1885.



Witnesses:
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 E. Smith

Inventor:
Charles Skoll, de'd.
John W. Marshall, adm^r
by H. N. Low _{attorney.}

(No Model.)

2 Sheets—Sheet 2.

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Fig. 3.

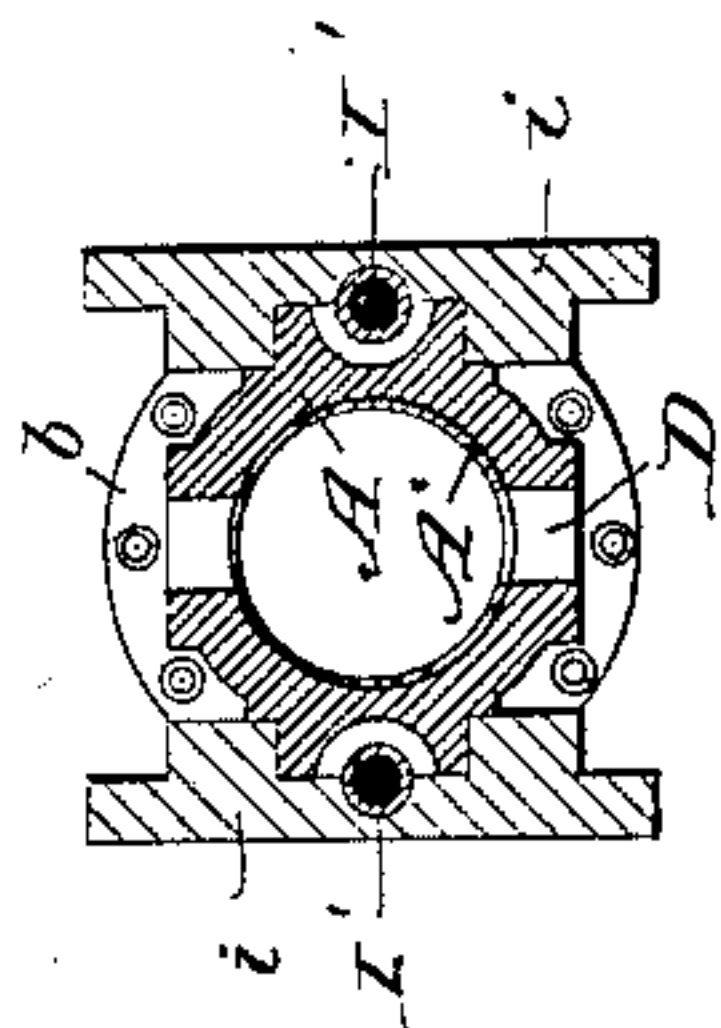


Fig. 5.

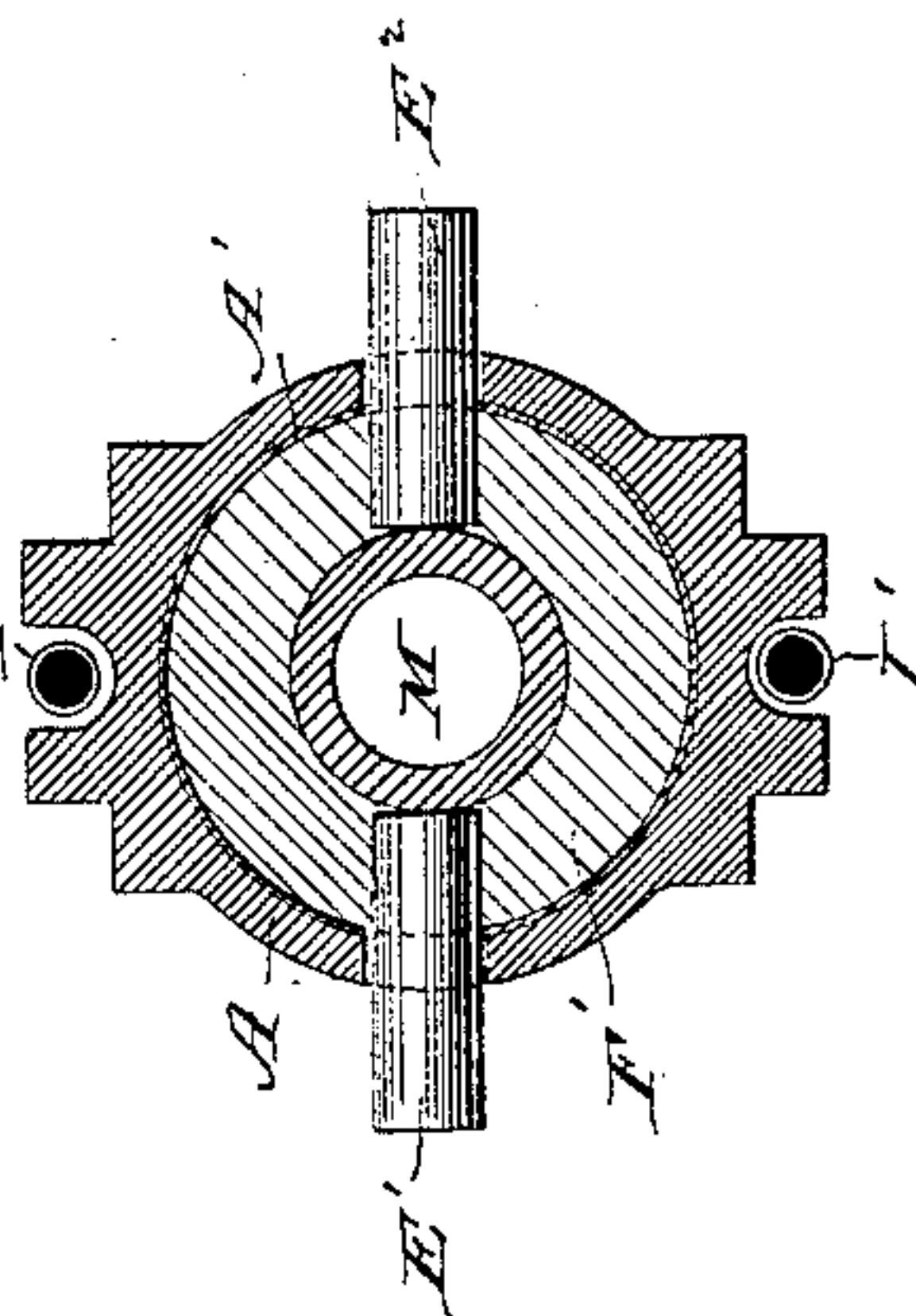
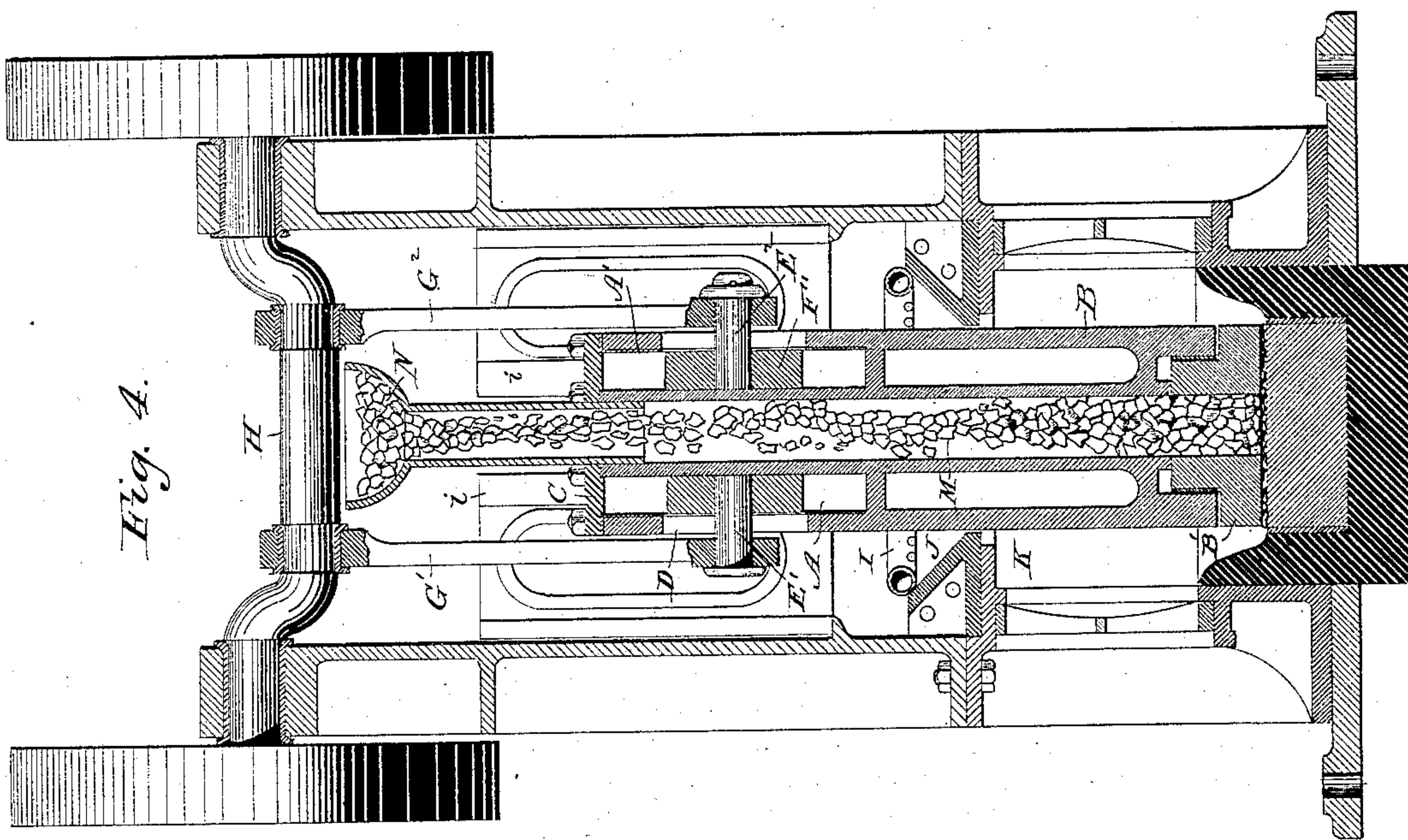


Fig. 4.



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UNITED STATES PATENT OFFICE.

JOHN W. MARSHALL, OF STAMFORD, CONNECTICUT, ADMINISTRATOR OF
CHARLES SHOLL, DECEASED.

ORE-STAMP.

SPECIFICATION forming part of Letters Patent No. 318,193, dated May 19, 1885.

Application filed March 17, 1885. (No model.) Patented in England July 13, 1875, No. 2,524, and September 7, 1883, No. 4,303.

To all whom it may concern:

Be it known that CHARLES SHOLL, deceased, late a subject of the Queen of England, and residing at Islington, in said country, did in his life-time invent certain new and useful Improvements in Ore-Stamps; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The invention relates to that class of stamps or hammers in which there is interposed between the hammer or stamp and the power mechanism an air-chamber and a piston fitting therein. The piston and chamber are connected the one with the stamp and the other with the power mechanism, so that the stamp is operated by the latter through the medium of the air in the chamber. The parts may be so arranged as to form two elastic air-cushions—one for the upward and one for the downward motion of the stamp. It is also preferred to form the pneumatic chamber, which may be most conveniently made cylindrical, with openings through which the air, or a portion of it, may gradually escape as the piston moves toward one end or the other of the chamber. A spring may also be combined with the chamber and piston to maintain the latter normally at about the middle of the chamber. Water-distributing devices may also be used to keep the pneumatic chamber from becoming too highly heated, and, in the case of stamps, to wash the crushed ore. In the case of stamps it is preferred to use a construction whereby the ore may be fed centrally through the pneumatic chamber and stamp to the parts by which it is crushed.

The invention can best be understood by reference to the accompanying drawings, in which I have shown a means for carrying it into effect.

In said drawings, Figure 1 is a vertical central section of a stamp-mill embodying the invention. Fig. 2 is a section on line *xx*, Fig. 1. Fig. 3 is a horizontal section of the pneumatic cylinder and its guides. Fig. 4 is a vertical

central section of another form of the improved stamp-mill, with some of the parts shown in elevation; and Fig. 5 is a horizontal section of the pneumatic cylinder shown in Fig. 4.

Like letters indicate corresponding parts throughout the drawings.

A indicates the pneumatic cylinder, and B the stamp or hammer. These parts are preferably made separately for convenience in transportation and in supplying duplicates of these parts of the apparatus; and the said parts are rigidly united by means of the flanges *a a'* and bolts *a'*, as shown in Fig. 1, or otherwise. The cylinder A is, for the same purpose, made in two parts, which are equal or nearly equal in length, and are rigidly connected by means of the flanges *b* and suitable bolts, and the top or end of the cylinder is cast in one piece with the body thereof. The said cylinder is also provided with a lining, *A'*, composed of a metallic alloy, which will counteract the effect of the heat evolved by the constant compression of air in the cylinder by the reciprocating action of the piston. This lining *A'* is sometimes made in two pieces, each provided with a flange, and the said flanges are held between the flanges *b b* of the top and bottom portions of the cylinder, as shown in Fig. 2. In other cases the said lining is made in one piece, which is provided with a flange and is held in place by a cover, C, bolted to the cylinder A, as shown in Fig. 4. For this lining is used any metallic alloy which is durable and which will diminish the friction between the cylinder and piston, and which is a bad conductor of heat.

The cylinder and piston may be combined with each other and connected with the power devices and stamp in a variety of different ways. In the construction shown I make the cylinder with two longitudinal slots, D, through which passes a transverse pin, E. Upon this pin is pivoted what is termed a "plug" pneumatic piston, F, furnished with rings *f*, of a metallic alloy. This piston may be driven direct from a steam-cylinder or from a crank-

shaft, H, by a bifurcated connecting-rod, G, as shown in Figs. 1 and 2, or by two connecting-rods, G' G², as shown in Fig. 4, the said rod or rods being coupled at one end to the said pin E or to the pins E' E², Fig. 4, and at the other end to the crank of the main driving-shaft H. The slots D are made of such length that they will admit air between the piston and either end of the cylinder; but in the upstroke of the piston the upper ends of said slots will be closed thereby, and in the downstroke of the piston the lower ends of said slots will be closed thereby, so that the air admitted above or below the piston will be compressed and act as a cushion.

The body of the cylinder A may be made in one piece, with a covering-plate at one end, as shown in Fig. 4, or the upper end may be made solid, with the sides adjoining said end, and the body of the chamber may be divided transversely through the slots, as shown in Figs. 1, 2, and 3. The latter construction possesses some advantages. In such case the two parts of the cylinder may be made of similar shape from one pattern, the slots may be more easily cast, leakage of air at the upper end between the plate shown in Fig. 4 and the body of the cylinder obviated, and the piston and pins E may be cast in one piece, thus saving multiplicity of parts and fittings.

In addition to the lining A', there is provided the following means for keeping the cylinder A cool and for supplying water to moisten the ore or other material to be crushed—that is to say, a circular perforated pipe, I, is placed above the cup J at the upper end of the coffer K. This pipe is connected with a suitable water-supply. Two perforated branch pipes, I', extend from the pipe I, and are arranged between recesses or grooves in the guides i and corresponding recesses or grooves in the exterior of the cylinder, as shown in Figs. 2 and 3. By these means a constant stream of cold water can be made to flow over the outer surface of the pneumatic cylinder, and eventually escape into the coffer K, where the ore or other material is crushed.

In Fig. 4 I have shown a form of the invention wherein the cylinder A and stamp B are made with a central tube, M, through which the ore can be fed from a hopper, N, in such a manner that it falls through the center of an annular shoe, B', on the hammer or stamp B into the coffer K. When the apparatus is thus constructed, the shoe B' will wear more evenly or uniformly than those ordinarily employed, and the crushed ore or other material will be equally distributed to the screens or grates.

In the apparatus shown in Fig. 4 the cylinder and stamp are made in one piece, and an annular piston, F', must be employed, instead of a piston of the ordinary type. A spring or springs, L, acting between the piston and one or both ends of the cylinder, serve to keep the piston normally in the middle of the cylinder,

and also supplement the action of the air-cushion.

Instead of the crank H, a steam-cylinder of any desirable description may be used, the piston of which is connected in any suitable manner to the piston F. The piston is thus enabled to be reciprocated by direct action, and belts and a separate motor are dispensed with.

For the purpose of stamping-mills, however, the use of the crank-shaft H is attended with the advantage that a number of stamps or battery may be driven from a single shaft and motor, the shaft being provided with a corresponding number of cranks.

Having thus fully described the said invention and the manner of performing the same, I wish it understood that although I have above referred particularly to a stamp-mill for crushing ore, the said invention can be applied to hammers or stamp-mills for other purposes, and what is claimed is—

1. The combination, with a stamp-head, a power mechanism, and a pneumatic chamber and piston connecting the same, of a water-supplying apparatus for cooling the chamber, consisting of a series of pipes arranged in proximity to the chamber and having jet or spray orifices on their inner faces, substantially as and for the purposes set forth.

2. The combination, with a stamp-head and a power mechanism, of a pneumatic chamber having longitudinal slots through the sides and between the ends thereof, a piston, and a rod attached to said piston through the slots, the chamber and rod being connected with said head and power mechanism, substantially as and for the purposes set forth.

3. The combination, with a stamp-head and a power mechanism, of a pneumatic chamber having longitudinal slots through the sides and between the ends thereof, a piston, and a rod attached to said piston through the slots, the chamber and rod being connected with said head and power mechanism, and the chamber being constructed in two parts, the dividing plane of which passes through the slots, whereby the construction and assembling of the parts are facilitated, substantially as set forth.

4. The combination of a stamp-head, a power mechanism, a pneumatic chamber and piston connected the one with said head and the other positively with the power mechanism to be reciprocated thereby, and a spring acting between the piston and chamber to return said parts to a position which will enable a pneumatic cushion to be formed on either side of the piston, substantially as and for the purposes described.

5. The combination of a stamping-head and an opposing block, a power mechanism, a pneumatic chamber and piston between said mechanism and head for reciprocating the latter, and a hopper or conduit, said chamber and head being formed with a central feed-

aperture communicating with the conduit, substantially as and for the purposes described.

5 6. The combination, with a stamp-head and a power mechanism, of a pneumatic chamber and piston connected with said head and power mechanism, the chamber being provided with the alloy lining A', having lateral flanges clamped between the parts of said chamber, substantially as and for the purposes described.

In testimony whereof I affix my signature in the presence of two witnesses.

JOHN W. MARSHALL,
Administrator of the Estate of Charles Sholl, deceased.

Witnesses:

ABRAM MARSHALL,
W. C. STROBRIDGE, Jr.