

(No Model.)

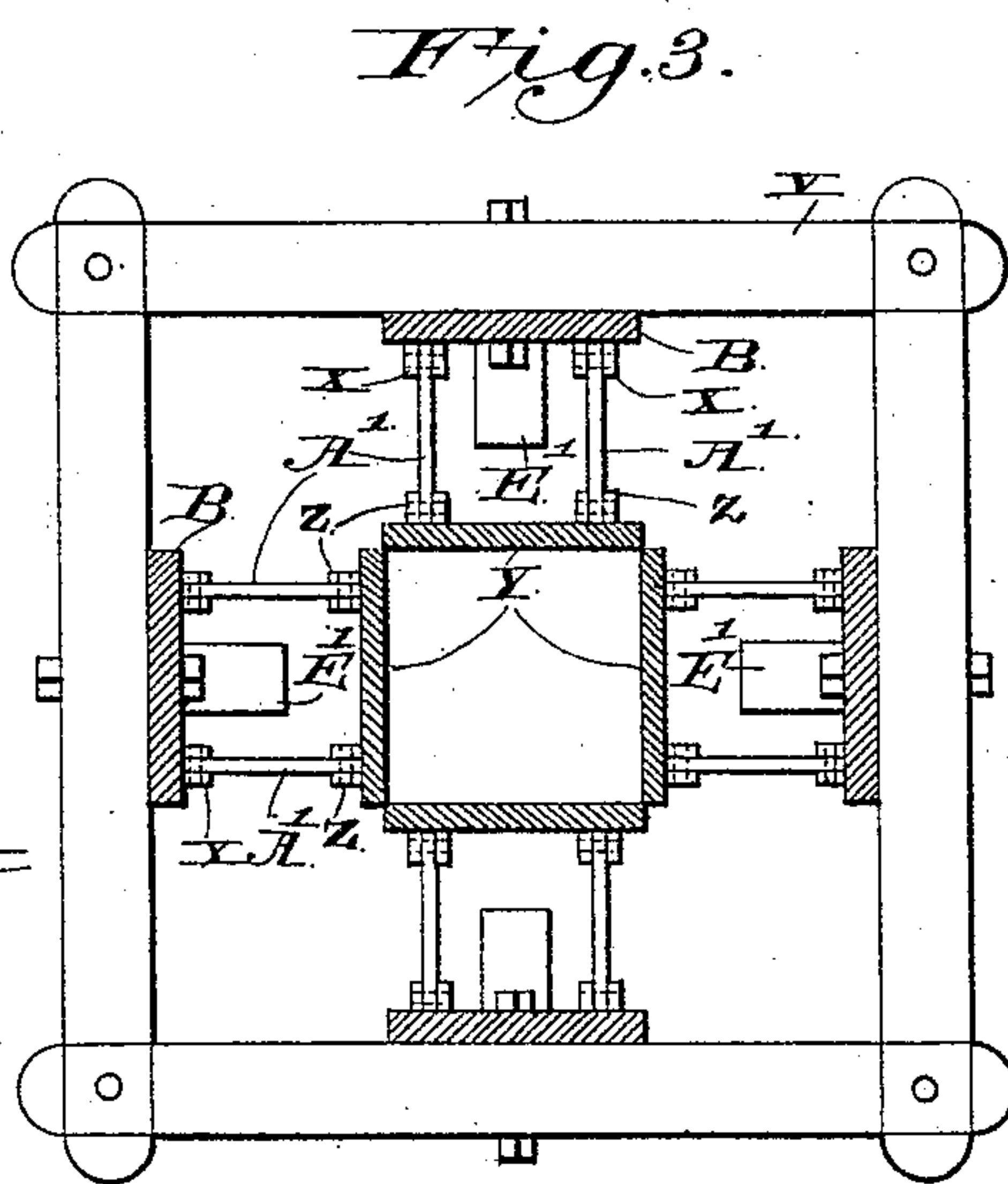
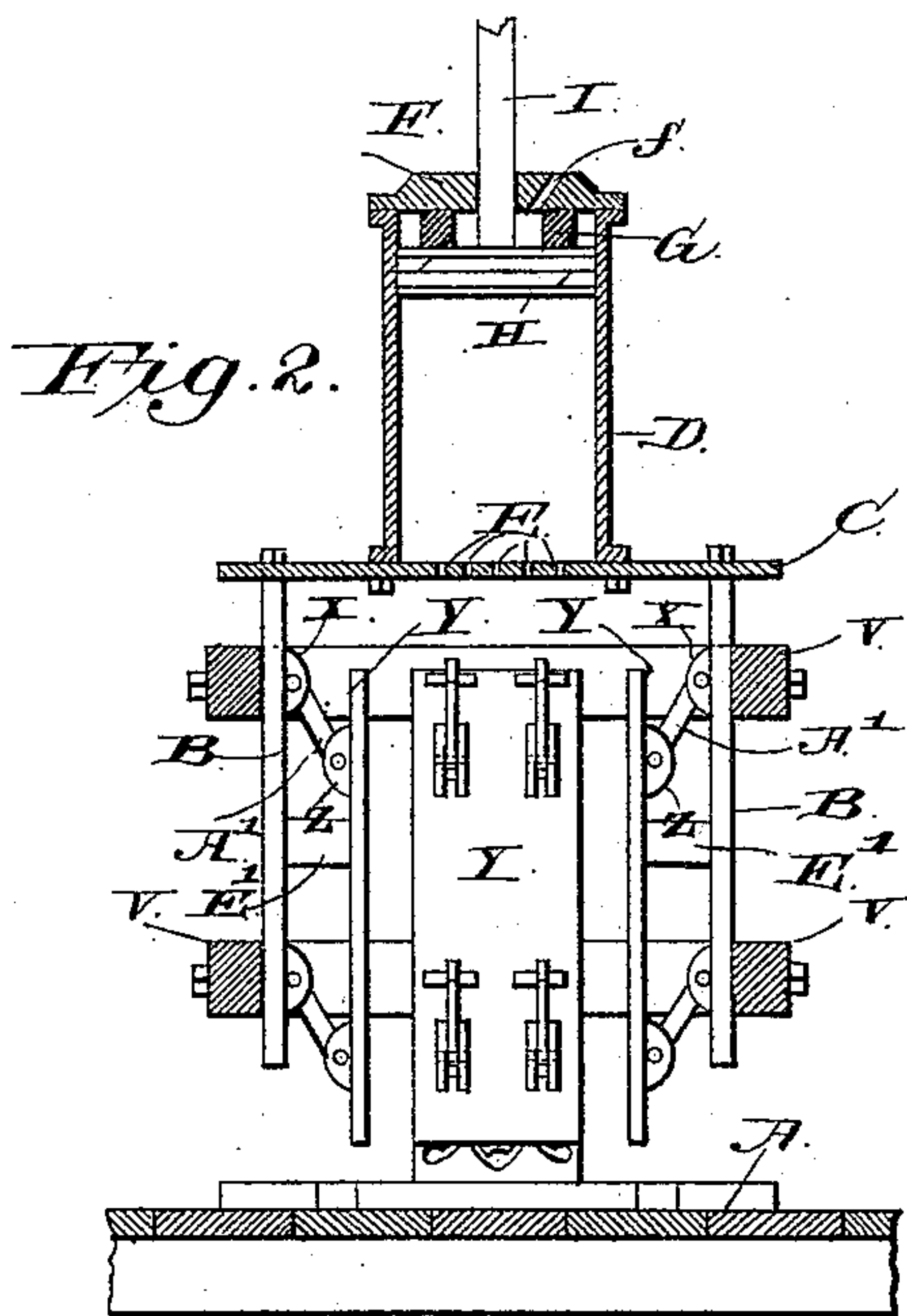
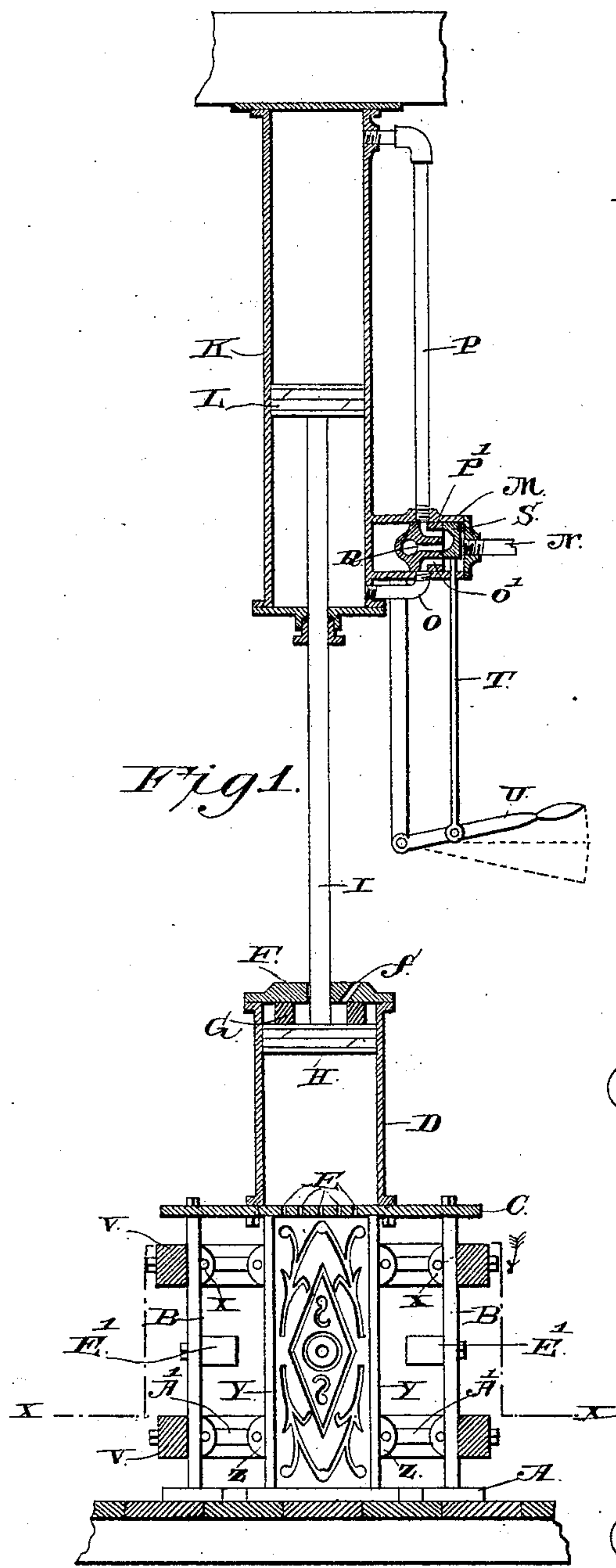
2 Sheets—Sheet 1.

R. M. DOWNIE.

APPARATUS FOR MOLDING PATTERNS ON HOLLOW BRICKS, TILES, &c..

No. 444,628.

Patented Jan. 13, 1891.



Witnesses

M. E. Fowler
J. W. Garner

Inventor

Robert M. Downie

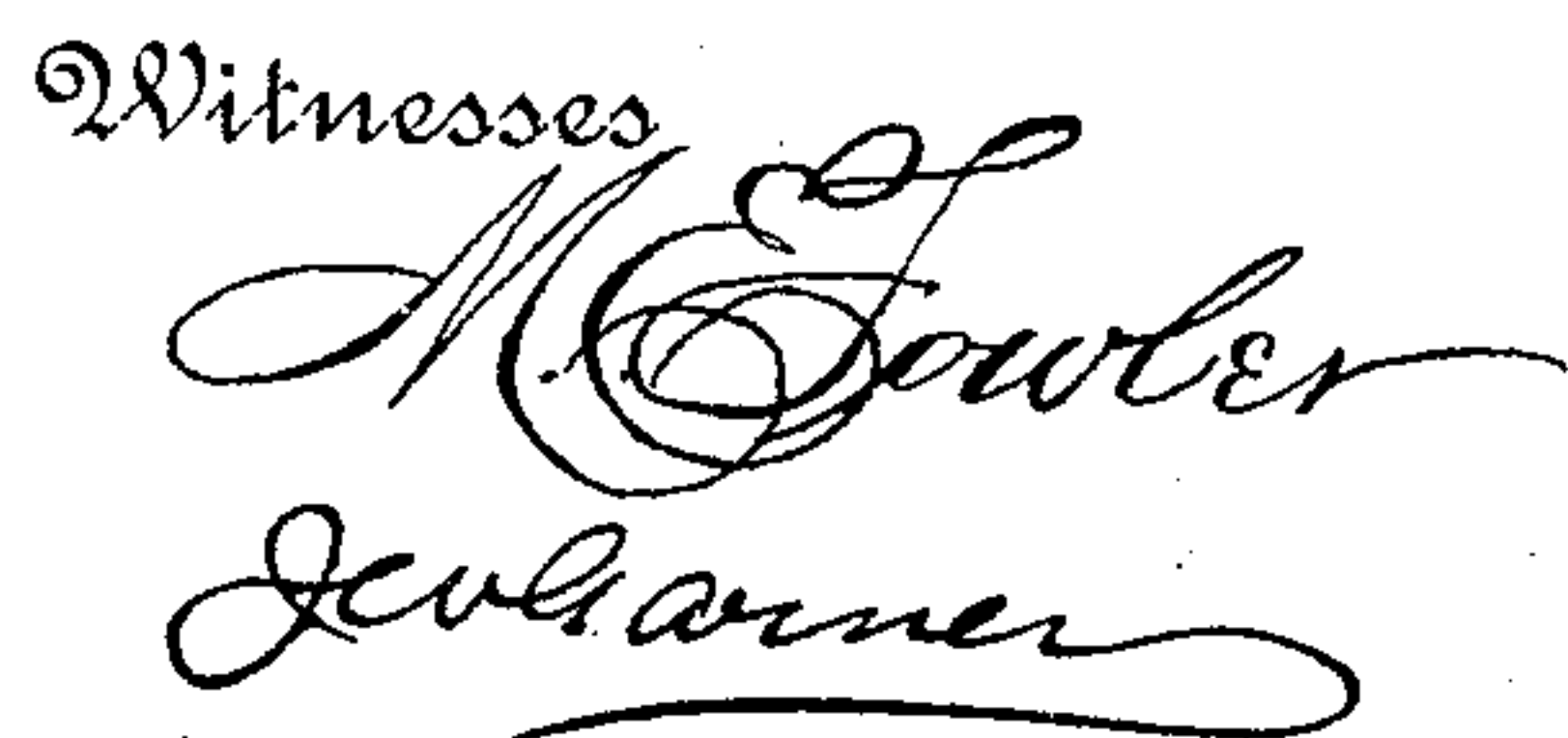
By *his* Attorneys

C. A. Snow & Co.

2 Sheets—Sheet 2.

APPARATUS FOR MOLDING PATTERNS ON HOLLOW BRICKS, TILES, &c.

Patented Jan. 13, 1891.



Inventor
Robert M. Downie

By His Attorneys

Chas Snowdon

UNITED STATES PATENT OFFICE.

ROBERT M. DOWNIE, OF NEW BRIGHTON, PENNSYLVANIA.

APPARATUS FOR MOLDING PATTERNS ON HOLLOW BRICKS, TILES, &c.

SPECIFICATION forming part of Letters Patent No. 444,628, dated January 13, 1891.

Application filed March 8, 1889. Serial No. 302,421. (No model.)

To all whom it may concern:

Be it known that I, ROBERT M. DOWNIE, a citizen of the United States, residing at New Brighton, in the county of Beaver and State of Pennsylvania, have invented new and useful Improvements in Apparatus for Molding Patterns on Bricks or Tiles, of which the following is a specification.

My invention relates to an apparatus for molding ornamental patterns or other configurations on hollow building bricks, tiles, or blocks; and it consists in the peculiar construction and combination of parts that will be more fully set forth hereinafter, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a vertical sectional view of an apparatus embodying my improvements. Fig. 2 is a partial sectional view of the same, showing the presser-plates in a different position. Fig. 3 is a horizontal sectional view taken on the line *x x* of Fig. 1. Fig. 4 is partly a sectional view and partly an elevation of a modified form of the apparatus. Figs. 5 and 6 are perspective views of tiles or blocks while in a plastic condition before and after having been subjected to pressure in my molding apparatus. Figs. 7, 8, and 9 are end views of different forms of tiles or blocks adapted to be molded by my improved apparatus.

Above the four sides of a rectangular base-plate A extend vertical side plates or frames B, on the upper ends of which is bolted the supporting-plate C. An air-cylinder D is arranged on the center of the plate and bolted thereto, and that portion of the plate within the cylinder is provided with apertures E. Under the loosely-fitting head F of the said cylinder is an annular buffer G, which may be made of rubber or any other suitable material, and in the cylinder is a piston or plunger H, from which extends the rod I.

A steam-cylinder K is arranged directly above and in line with the air-cylinder and has a piston L, which is attached to the upper end of the rod I. On one side of the steam-cylinder is arranged a steam-chest M, which communicates with a suitable steam-boiler (not shown) by means of a steam-inlet pipe N, and from opposite sides of the steam-chest extend pipes O P, which communicate with the lower and upper ends of the steam-

cylinder, respectively, their inner ends communicating, respectively, with steam ports O' P'. Between the said ports is arranged an exhaust-port R. A slide-valve S, of suitable construction, is arranged in the steam-chest, and is adapted to throw the steam ports alternately into communication with the steam-inlet pipe and with the exhaust-ports, and thereby steam may be alternately admitted to and exhausted from the ends of the cylinder and the piston caused to play vertically therein, as will be readily understood. A rod T depends from the valve and is attached to a hand-lever U. When the latter is in a horizontal position, the valve S is arranged over both of the inlet-ports, and steam is thereby cut off from both ends of the cylinder. When the valve is raised by means of the lever, steam is admitted to the lower end of the cylinder, and when the valve is lowered by means of the lever, steam is admitted to the upper end of the cylinder.

Bolted to the plates or frames B is a pair of rectangular frames V, which are arranged near the plate C and base A, respectively, and on the inner sides of said frames, at the centers thereof, are bolted the plates B, each of which has two or more pairs of ears X. Presser-plates Y, which have patterns in reverse molded on their inner sides or otherwise formed therein, are provided on their outer sides with pairs of ears Z, and links A' have their ends pivotally bolted between the ears X Z, and thereby serve to connect the presser-plates to the frames.

Inasmuch as the plates B depend from and are attached to the plate C, inasmuch as the latter is attached to the air-cylinder, which is entirely supported by the piston or plunger H, and inasmuch as the presser-plates Y are connected to the frames V by the links, it follows that when the piston L is moved upward in the steam-cylinder the air-cylinder, the plates C, the frames, the presser-plates, and their connections will be raised, as shown in Fig. 2, and the said presser-plates will be swung downward and outward from each other by the links A' in such manner as to leave the base-plate A unobstructed and enable a brick, tile, or building-block of substantial form, while yet plastic, to be placed on end in the center of the base-plate and di-

rectly under the center of the plate C. While the plate C, air-cylinder, and connections are thus elevated the piston L is in the upper end of the steam-cylinder, and when steam is cut off from both ends of the steam-cylinder, in the manner before described, the piston L, by its gravity and the weight of the parts suspended therefrom, will be caused to descend to the position shown in Fig. 1, the said piston being then about midway of the steam-cylinder, the plates C resting on the upper end of the plastic brick, tile, or building-block, and the presser-plates, by contact with the base-plate, being arranged against the sides of the said brick, tile, or building-block. Everything being thus in readiness steam is admitted to the upper end of the steam-cylinder and the steam-piston thereby forced downward, which causes the piston or plunger II to descend in the air-cylinder and force a volume of compressed air through the openings E into the interior of the hollow plastic brick, tile, or building-block, and inasmuch as an exactly equal pressure will be exerted upon every superficial square inch of the interior of the said brick, tile, or building-block, it follows that the latter will be expanded from its interior, and the faces thereof will be compressed against the presser-plates, and consequently the configuration or dies in the latter will become molded on the faces of the plastic brick, tile, or building-block. While the block, brick, or tile is being expanded the presser-plates or molds are held stationary. The air-cylinder and its connections are then raised, as before, the molded brick, tile, or building-block removed from the base-plate A, another is substituted in its stead, and the operation before described is repeated. The form of apparatus illustrated in the drawings is adapted to mold a quadrilateral brick, tile, or block; but it is obvious that by changing the shapes of the presser-plates the machine may be adapted to mold bricks, tiles, or building-blocks of any preferred shape.

In the modified form of my invention shown in Fig. 4 I dispense with the steam-cylinder and its attachment, provide the rod I with a ring or loop at its upper end, to which an elevating-rope operated by suitable means may be attached, and on the said rod I fit a collar B', and I further provide a number of weights C', which are adapted to be placed on the rod, as shown, and may be caused to exert any desired pressure on the plunger H.

Stop-blocks E' are attached to the plate B, as shown in Fig. 1, or to the outer sides of the presser-plate, as shown in Fig. 4, to limit the downward movement of the latter. It will be seen that as the presser-plate descends from the position shown in Fig. 2 to that shown in Fig. 1 they serve to center the block, brick, or tile, and this is an essential feature of the machine. While I have shown and described links as connecting the presser-plates with the vertically-movable frames, I wish it

to be understood that I may employ a cam or other equivalent connection to accomplish the same purpose. It will also be understood that when the plastic block, brick, or tile is within the presser-plates the plastic nature of the article serves to form a hermetically-sealed joint between the meeting edges of the plates, and also between the latter and the plates A and C, and thus prevent the escape of the compressed air, gas, or steam.

The function of the buffer in the upper end of the air-compressing cylinder is to prevent injury to the head or the cylinder or the plunger II when the latter is raised.

I can use either compressed air, gas, or steam as an agent in expanding the tiles or bricks, so as to compress the faces thereof against the presser-plates or molds.

Having thus described my invention, I claim—

1. In a machine for molding patterns on blocks, bricks, tiles, &c., the combination of the compression-cylinder, the vertically-movable frames suspended therefrom, the presser-plates adapted to encompass a hollow block, brick, or tile while the same is plastic, so as to form a hermetically-sealed joint between the several presser-plates, the latter being held stationary while the block or tile is being expanded, the flexible connections between the vertically-movable frames and the presser-plates, the rod having the piston operating in the compression-cylinder, and means, substantially as set forth, for operating the said rod, substantially as described.

2. The combination of the compression-cylinder, the vertically-movable frames suspended therefrom, the presser-plates adapted to encompass a hollow block, brick, or tile while the same is plastic and held stationary while the block, brick, or tile is being expanded, the links connecting the presser-plates to the frames, the rod having the piston operating in the compression-cylinder, and means, substantially as set forth, to operate the said rod, substantially as described.

3. In a machine for molding patterns on blocks, bricks, or tiles, the combination of the compression-cylinder, the plate C, rigidly attached to the base thereof, the vertically-movable frames connected to and suspended from said plate, the presser-plates adapted to encompass a hollow block, brick, or tile while the same is plastic, so as to form a hermetically-sealed joint between the several presser-plates, the latter being held stationary while the block, brick, or tile is being expanded, the pivotal links connecting the presser-plates to the frames, the piston or plunger in the compression-cylinder, and means, substantially as set forth, to operate the same, substantially as described.

4. The combination of the compression-cylinder, the plate C, rigidly attached to the base thereof, the vertically-movable frames connected to and suspended from the said plate, the presser-plates adapted to encompass a

hollow block, brick, or tile while the latter is
plastic, so as to form a hermetically-sealed
joint between the several presser-plates, the
pivotal links connecting the presser-plates to
5 the frames, the base-plate A, the piston or
plunger in the compression-cylinder, the
steam, air, or gas cylinder, the piston therein,
and the rod connecting said piston to the com-
pression-plunger, substantially as described.

In testimony that I claim the foregoing as ¹⁰
my own I have hereto affixed my signature in
presence of two witnesses.

ROBERT M. DOWNIE.

Witnesses:

J. F. MERRIMAN,
W. S. MORRISON.