Sheet 1-2 Sheets.

E. Rogers.

Hydraulic Brick Press,

No. 15,778. Patented Sept. 23, 1856.

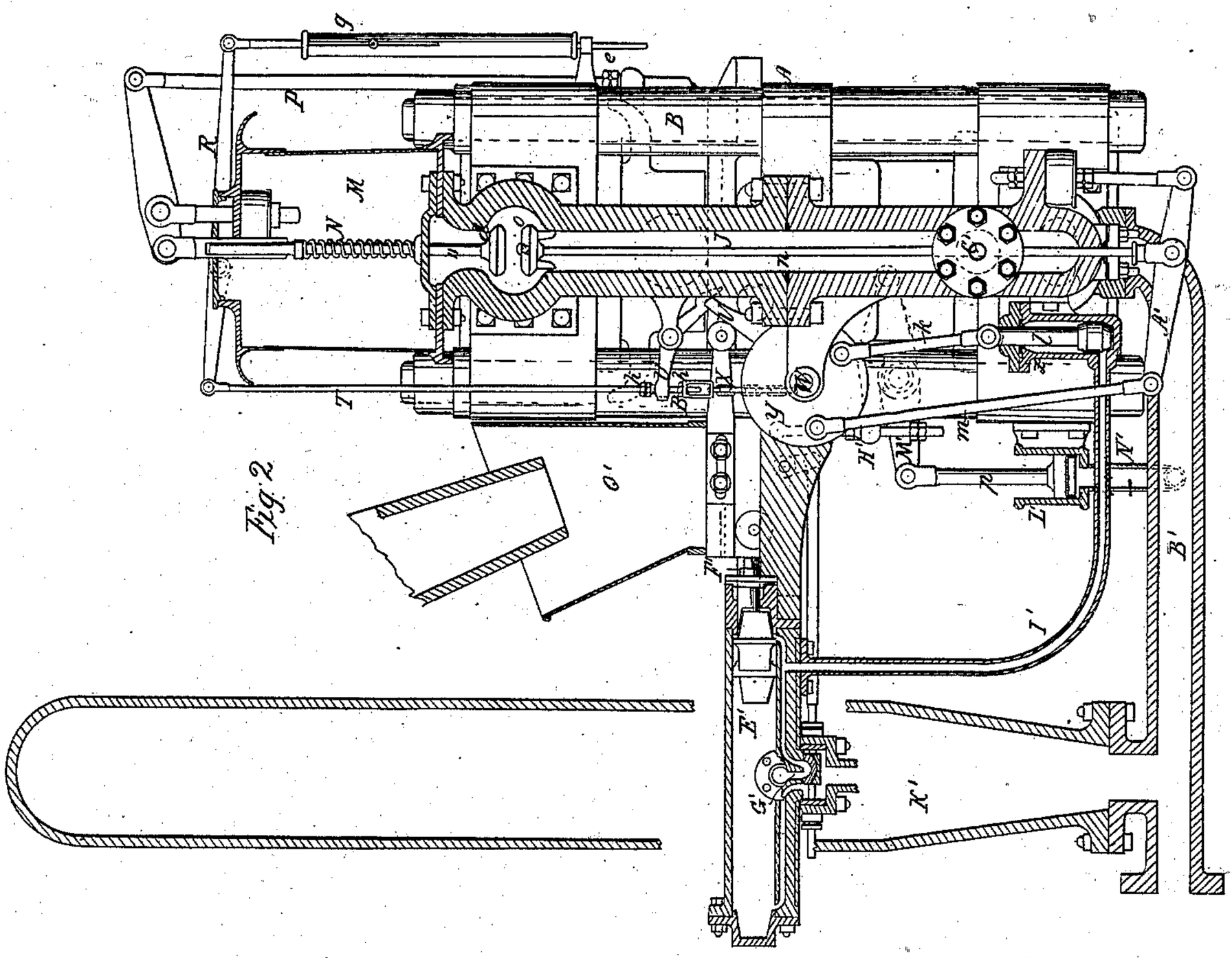

Fig. 2

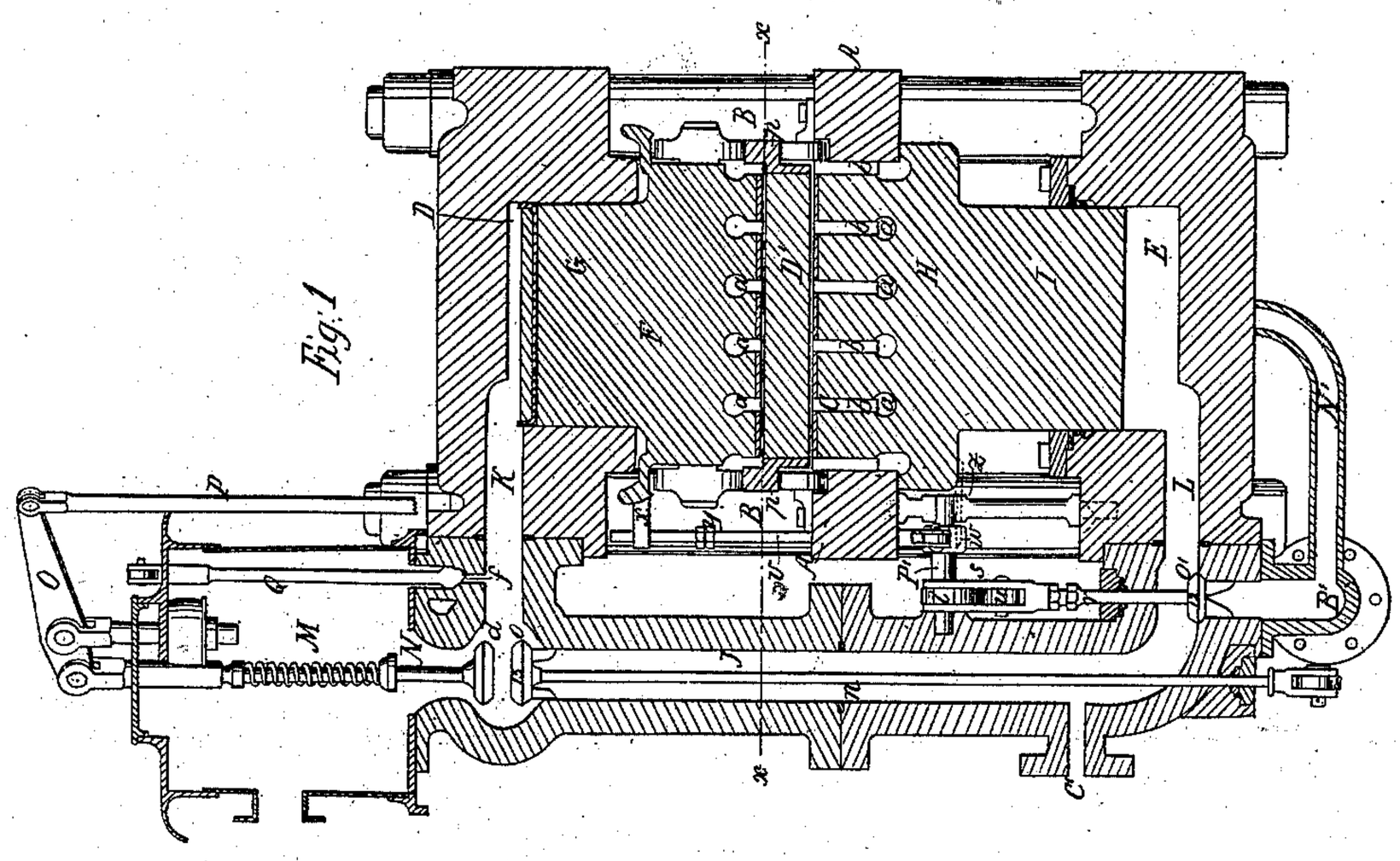

Fig. 1

Sheet 2 2 Sheets.

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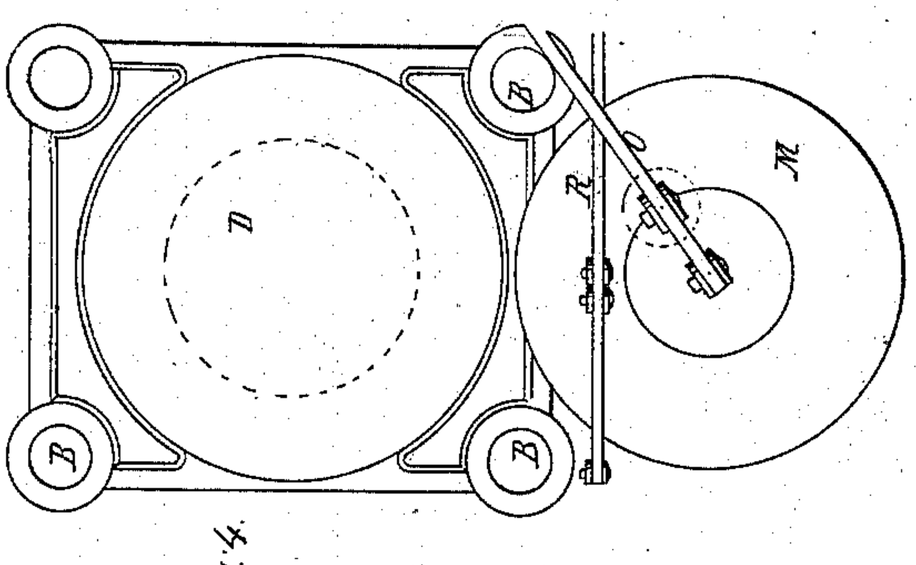

Fig. 4.

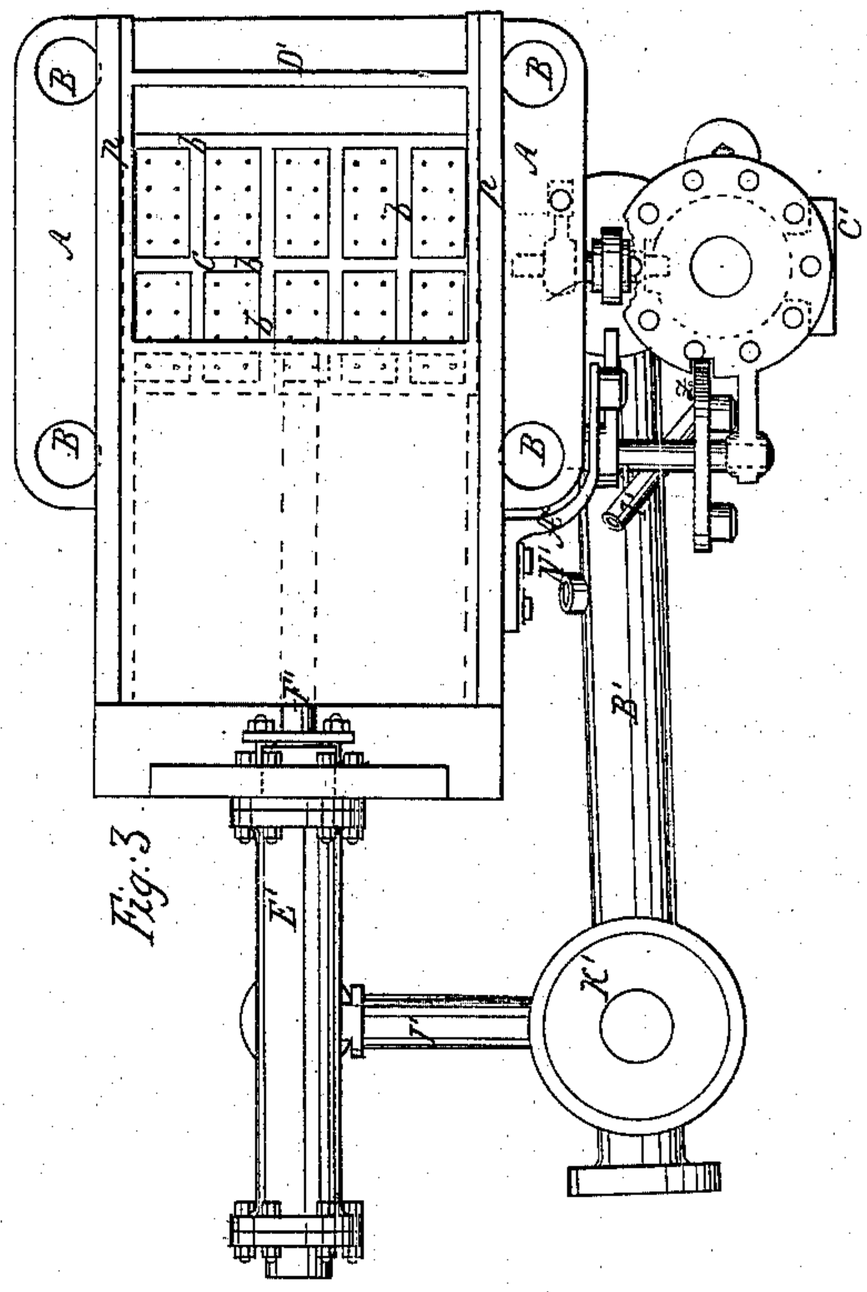

Fig. 3

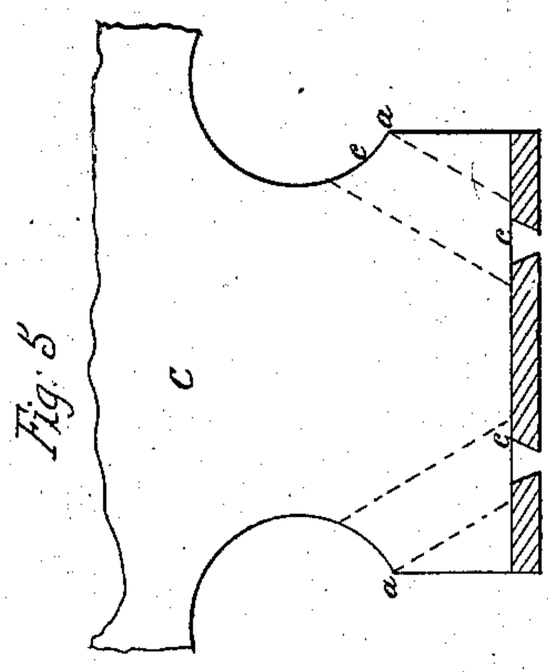

Fig. 5

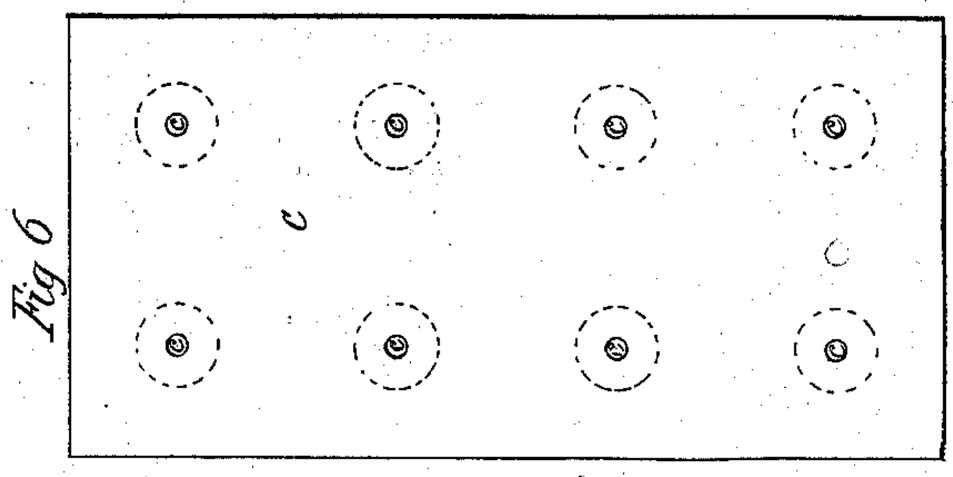

Fig 6

UNITED STATES PATENT OFFICE.

ETHAN ROGERS, OF CLEVELAND, OHIO.

HYDRAULIC BRICK-PRESS.

Specification of Letters Patent No. 15,778, dated September 23, 1856.

To all whom it may concern:

Be it known that I, ETHAN ROGERS, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented a new and Improved Machine for Molding and Pressing Brick by Hydraulic Pressure; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figures 1 and 2, are vertical sections of my improvement, the planes of sections being through the center and crossing each other at right angles. Fig. 3, is a horizontal section of ditto, *x*, *x*, Fig. 1, showing the plane of section. Fig. 4, is a plan or top view of a portion of ditto. Fig. 5, is a detached vertical section of one of the plungers, or a portion of ditto, which fits or works in one compartment of the mold. Fig. 6, is a face view of ditto.

Similar letters of reference indicate corresponding parts in the several figures.

My invention consists in the employment or use of two pumps, one pump being considerably larger than the other and connected with water passages or tubes provided with valves and used in connection with a reserve chamber and other parts, the whole being arranged and operating as will be hereinafter fully shown and described, whereby the bricks are molded and pressed in an expeditious and perfect manner.

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

A, represents a rectangular cast iron frame which is supported in a horizontal position, by rods or bars B, which pass one through each corner of the frame, the frame forming the center of the press.

C, is the mold which is permanently secured within the frame A. This mold is of the usual form and construction with the exception that it has no bottom.

D, represents a cylinder or water chamber which is placed at the upper part of the rods or bars B, and is supported by them.

E, represents a cylinder or water chamber at the lower part of the rods or bars B, the frame A, being equi-distant between the two cylinders, as shown clearly in Figs. 1 and 2.

F, represents a plunger above the molds, the rod G of which fits and works in the cylinder D, and H, is a plunger below the molds the rod I, of said plunger fitting and working in the cylinder E. Both plungers F, H, have grooves *a*, made in them which grooves cross each other at right angles so that as the plungers approach each other, the partition plates *b*, of the mold may pass into the grooves, and oblique passages *c*, are made through the faces of the molds, said passages communicating with the grooves *a*, see Fig. 5.

J, represents a vertical tube or pipe placed at one side of the machine, the upper part of the tube communicating with the cylinder D, by means of a passage K, and the lower end of the tube, communicating with the lower cylinder E, by means of a passage L. A chamber M, is placed on the upper end of the tube J, said chamber having a valve *d*, at its lower part. This valve is attached to a rod N, which passes up through the chamber M, and is attached to one end of a lever O, the opposite end of which is connected by a rod P, with the upper plunger E, said rod being connected by a jam nut *e*, with the plunger, see Fig. 2. A valve *f*, is also placed in the lower part of the chamber M, said valve being placed at the end of a rod Q, which passes up through the chamber M, and is attached to a lever R; one end of this lever R has a counterpoise S, attached to it, said counterpoise being either a weight or spring capable of being graduated as desired. The opposite end of lever R, has a rod T attached to it, said rod being connected by jam nuts *h*, *h*, with a lever U, one end of which is notched to receive a pawl V, on a shaft W, to which shaft a chain X, on the lower end of rod T, is attached, see Fig. 2. The pawl V, has a spring bearing against it, and the lever U, has also a spring bearing against it.

The shaft W, has a circular disk or pulley Y, upon it, to which a rod *k*, is attached, said rod being connected with a plunger *l*, in a small cylinder Z, see Fig. 2. A rod *m*, is also attached to said disk or pulley Y, the lower end of said rod being attached to a lever A′, to which a rod *n*, within the tube J, is connected. The upper end of the rod *n*, has a valve *o*, attached to it, said valve being at the upper end of the tube J, see Figs. 1 and 2.

B′, is a tube communicating with the lower end of tube J. The larger pump is

connected with tube B′, and C′, is a tube communicating with tube J, the smaller pump being connected with tube C′.

D′, is what I term a charger. This charger is a plate or bar fitted between two bars *p*, *p*, which slides back and forth over the mold C, on the frame A. A cylinder E′, is placed back or at the outer end of the charger and a piston F′, which is attached to the charger works in the cylinder E′, see Fig. 2. A slide-valve G′, is placed within the cylinder E′, said valve being operated by a tripping device H′, connected with the lower plunger H.

I′, is a tube which communicates with the cylinder E′, and the small cylinder Z, and J′, is a tube which communicates with the cylinder E′, and the tube B′.

K′, is an air vessel attached to tube B′.

L′, is a small cylinder provided with a piston *g*, the upper end of the rod of which is attached to one end of a lever M′, the opposite end of said lever being connected with the lower plunger H. The cylinder L′, is connected with the tube B′, by a tube N′.

O′, is a valve which is fitted in the end of tube B′, at its junction with the lower passage L, and tube J, see Fig. 1. This valve has a rod *r*, attached to it, the upper end of said rod *r*, being connected by a strap *s*, with a shaft P′, which has an eccentric *t*, upon it, said eccentric bearing against a friction roller *u*, at the upper end of the rod *r*. A vertical rod *v*, is connected to the shaft P′, by an arm *w*, said rod passing through an arm *x*, on the upper plunger F, and having a nut *y*, upon it, below said arm.

To the lower plunger H, an arm *z*, is attached, which, as the plunger H, reaches its extreme height strikes against the arm *z*.

Q′, is a hopper placed at one side of the upper cylinder D.

The operation is as follows. The clay is properly ground and tempered and placed within the hopper Q′. Suppose the mold C, to be filled with clay, and the charger D′, to be forced back. The two pumps being put in operation, the water is forced through the tubes B′, C′, into the cylinders D, E, through the passages K, L, the valves O′, *o*, being open and the valves *d*, *f*, being closed. The two plungers F, H, are consequently forced toward each other and the clay in the mold C, will be compressed with a power of course equal to the pressure of the water in the cylinders D, E. Suppose, for instance, that the larger pump works at a pressure of 300 and the smaller at a pressure of 3,000 pounds to the inch, when the pressure in the passages D, E, reaches a point at which the larger pump is weighted, the valve O′, closes by increased pressure produced by the smaller pump, and the pressure increases until the counterpoise S, is overcome and the valve *f*, rises, allowing the water to escape into the chamber M and diminishing the pressure in the cylinders D, E; as the valve *f*, rises the rod T, descends and the lever U, is actuated by the upper nut *h*, the pawl V, liberated and the shaft W, turned by rod *k*, the chain X, wound upon shaft W, and the rod *u*, drawn downward by rod *m*, and the valve *o*, closed. The pressure of the water is now confined to the lower plunger H, and both plungers H, F, rise and the pressed brick are raised to the top of the mold C, the upward motion of the plungers being facilitated by the opening of valve *d*, occasioned by its connection with the upper plunger F, and at the instant the pressure in the side tubes is reduced below the point at which the larger pump is weighted the valve O′, is opened. At the termination of the upward movement of plunger H, the valve O′, is again closed (by its connection with plunger H) and remains closed until forced open by the downward movement of plunger F, the descent of plunger F, closes valve *d*, and opens valve O′, again resuming the pressure in cylinders D, E. Pressure is communicated to cylinder E′ through tube J′, the upward movement of the lower plunger H, near its termination changes slide valve G′, in or on cylinder E′, thereby causing the charger D′, to advance, lifting the upper plunger from the brick and bringing forward clay from the hopper Q, over the mold C, and removing brick from between the plungers; also, by the action of an arm A*, attached to the charger, valve *o*, is opened, permitting plunger H, to drop and the molds to be filled with clay. The dropping of ram H, changes valve G, reverses the movement of charger which recedes and allows the ram F, to drop by its own weight. The passages *c*, in the plungers allow the escape of air from the molds and thereby allow the clay to be pressed compactly within them.

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

The employment or use of two pumps with the mechanism for working the same under different pressures, when arranged to operate in relation to each other, and mold C, for the purpose of pressing and removing the brick in the manner above described.

ETHAN ROGERS.

Witnesses:

GEO. TEIBOUT,

E. T. STERLING.