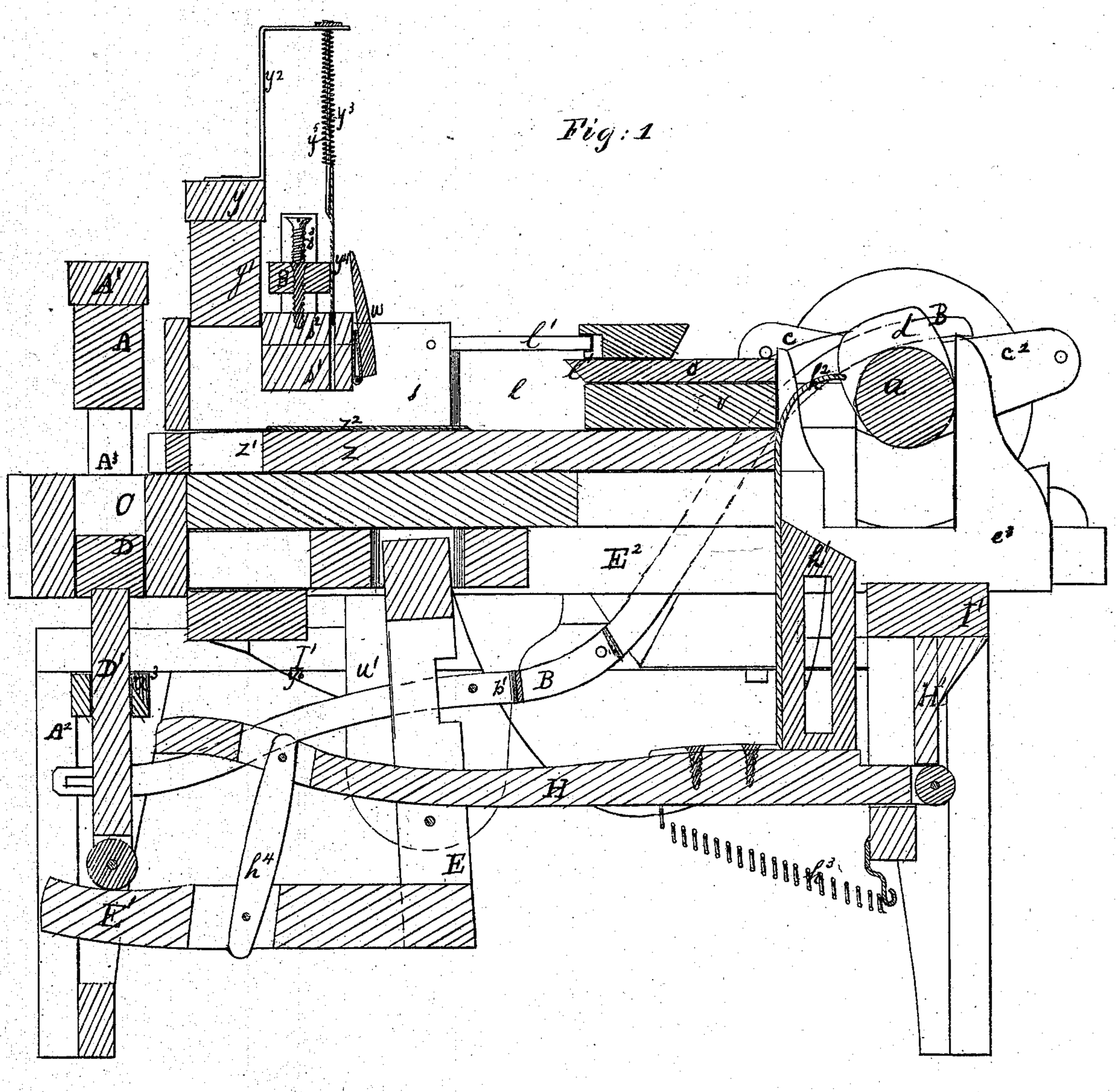
2 Sheets—Sheet 1

S. RIGBY, 3d.

BRICK MACHINE.

No. 104,354. Patented June 14, 1870.

Fig: 1



Witnesses
C. O. Brown
S. M. Spear

Seth Rigby 3rd.
Inventor by
Geo. E. Brown. Atty.

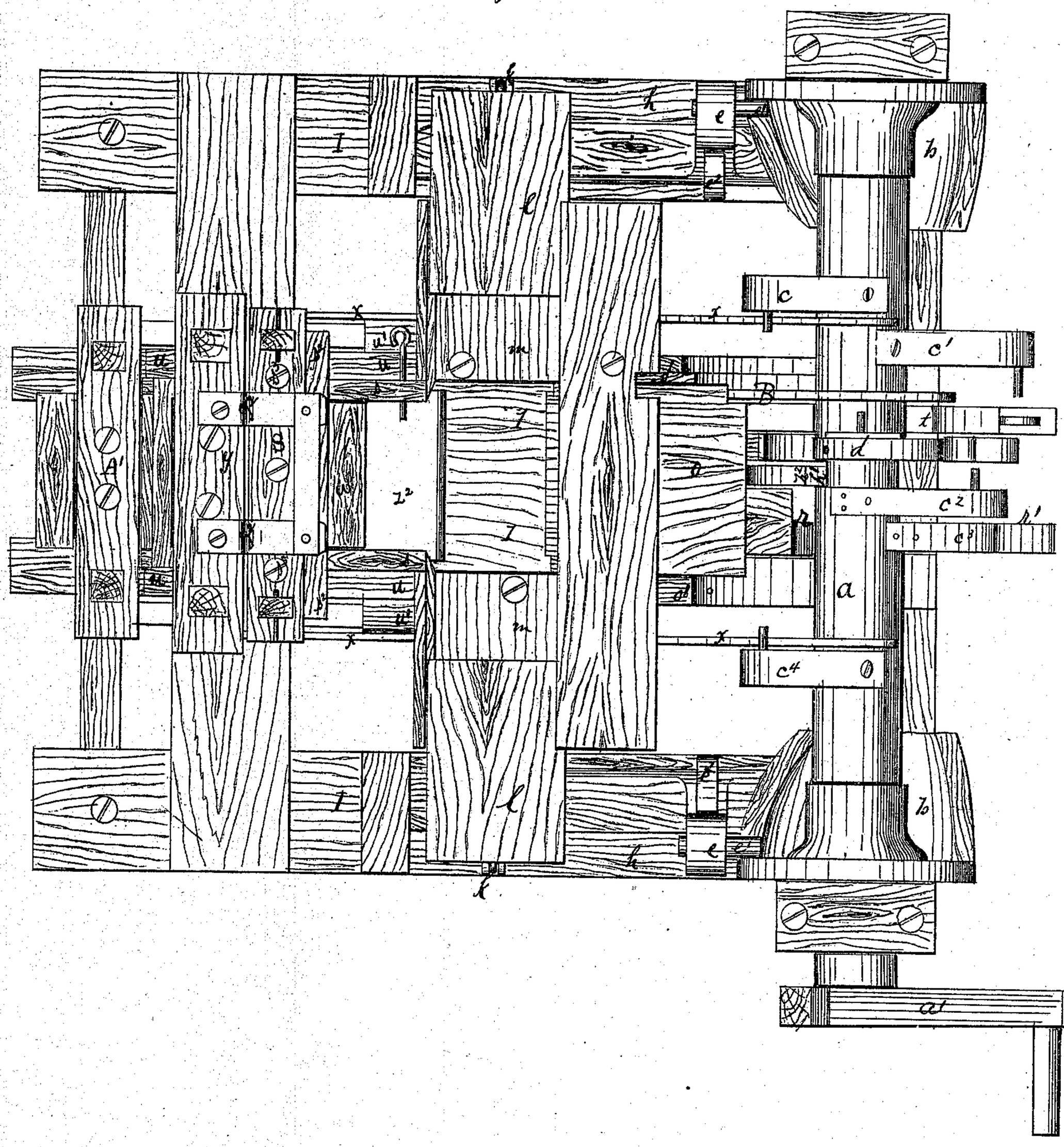
2 Sheets—Sheet 2.

S. RIGBY, 3d.

BRICK MACHINE.

No. 104,354. Patented June 14, 1870.

Fig: 2



United States Patent Office.

SETH RIGBY, 3D, OF NEWCASTLE, PENNSYLVANIA.

Letters Patent No. 104,354, *dated June* 14, 1870.

IMPROVED BRICK-MACHINE.

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, SETH RIGBY, 3d, of Newcastle, in the State of Pennsylvania, have invented a new and useful Improvement in Brick-Machines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing and letters of reference marked thereon making a part of this specifieation, in which—

Figure 1 is a sectional elevation, and

Figure 2 is a plan view.

The principal objection to all brick-machines heretofore gotten up is, that they have no provision for drawing in tempered mud, which on account of its toughness is with difficulty introduced within the mold. Hence, without exception, so far as I know, the material made use of in other brick-machines, is untempered clay, slightly moistened, which easily enters the molds, but makes very poor brick, which readily crumble and break when brought into use.

To enable those skilled in the art to make and use my invention, I now proceed to describe its construction and operation.

Similar letters in the drawing refer to like parts.

My invention has for its object to receive tempered mud and convert the same into brick ready for drying.

This invention consists mainly in plungers, sliding in guideways, and operated by shaft-arms, cams, or the like, in such manner as to collect the mud received between the plungers and force the same forward beneath a regulator to a press-mold; also, in the combination of two pressing dies, one moving downward and the other moving upward, with a mechanism which holds the upper one stationary, and at the same time throws the lower one upward, in order to the final compression of the brick between the two, and in sundry other combinations and arrangements hereinafter fully described.

In the drawing—

I is the frame-work of the machine.

a, a shaft mounted transversely of the frame, furnished at each end with a cam-plate, *b*, and bearing, between the cam-plates, arms $a\ c^1\ c^2\ c^3\ c^4$, and a cam, *d*.

The cam-plates *b*, which are of the same dimensions, and are placed in similar positions relative to the shaft *a*, strike, as the shaft is rotated by any suitable power applied to the crank a^1, pins $e^1\ e^1$ projecting horizontally from arms *e e* extending upward from shafts *h h*, mounted in suitable bearings on the side pieces of the frame I, and at right angles with the shaft *a*.

The effect of the striking of the cam-plates *b* against the pins e^1 is to throw the arms *e* inward, and rotate the shafts *h*.

After the cam-plates have passed, springs $e^2\ e^2$ throw the arms *e* outward, rocking the shaft *h*.

A second arm, *k*, projects upward from each shaft *h*, is jointed at its upper extremity to the outer end of one of the two plungers *l l*, and communicates to its plunger a reciprocating motion.

The plungers *l l* slide in guide-ways *m m* placed transversely of the machine, parallel to the shaft *a*. The guide-ways *m* are in line with, and each of them is partially beneath the box, which receives the tempered mud, and which may be provided with a stirrer to force the mud down into the open space between the plungers *l*. The plungers *l* are arranged to move so far that, when they are at the extremities of their inward throws, the space between them is equal to the lengths of one brick. Hence these plungers shape the ends of the bricks.

The plungers are provided with sharpened horizontal flanges *l'* projecting forward from their upper and inner corners, which cut the mud as the plungers advance toward each other, and have a tendency to keep it down and retain a quantity sufficient to form a brick. One side of the brick is formed at the same time against the end of the plunger *o*, which slides in a guide-way, *o'*, between and at right angles to the plungers *l*, and is operated by the arms c^3 of the shaft *a* coming in contact as the shaft rotates with the bar *r*, which is attached to the under side of the plunger *o*, and passes beneath and extends up in the form of a horn, *r'*, on the opposite side of the shaft *a*. The arm c^3 is so placed on the shaft that it does not strike the bar *r* until the plungers *l l* have compressed the mud to a brick's length. Then the arm c^3 strikes the plate and causes the plunger *o* to move forward, carrying before it the mud collected between said plungers. The plunger *o* has a flange, *l'*, constructed and operating similarly to the flanges of the plungers *l*.

The plunger *o* traverses the open space 1 1, and delivers its quantity of mud to the box *s*, which lies on the opposite side of said space in line with the guide-way *o*. At this point the arm c^3 ceases to exert a pressure on the plate *r*, and the plunger *o* consequently stops. Simultaneously with the stopping of the plunger, a pin of the cam *d* strikes an arm extending upward from the bar *t*, which forms one of the series of parallel bars located beneath the guide-ways *m o'*, and between the two inclosing plates *u u* placed lengthwise of the frame I upon the cross-bars of the same.

The bar *t* is rigidly connected by a vertical standard passing through a longitudinal slot in the bottom of the guide-way *o'*, with a plunger, *v*, inclosed within the plunger *o*, and of a proper width to slide easily in the box *s*. The striking of the cam *d* against the bar *t* causes the plunger *v* to emerge from the plunger *o*, and traverse the box *s*, which is of a width a little greater than that of one brick. The plungers *l* are

drawn backward by the springs e^2 at the same time that the plunger v is moving forward.

At the end of the box s is a horizontal cross-bar, s^1, attached, by standards, to a horizontal beam, s^2, which is connected by screws s^3 s^3 with a girder, S, in such manner that, by means of the screws, the cross-bar s^1 may be raised or lowered. Hence, the said cross-bar forms a regulator with respect to the amount of mud that may be thrust beneath it by the plunger v.

A flap, w, is hinged to the beam s^2, and extends between the sides of the box s, and being formed with an inclined lower side, it readily yields, so as to allow any excess of mud that cannot pass under the regulator s^1 to escape upward and be deposited on the plunger v, whence it is swept off into the open space 1 by the retraction of the plunger v within the plunger o, such retraction being effected the moment the pin of the cam d passes by a spring acting on the bar t. Immediately upon the reception by the plunger o of the plunger v, the former is drawn back to its original position by the arm c^1, striking the horn r'. All three plungers are now in the places where they were at the commencement of the movements just described.

A charge of mud sufficient for the formation of one brick has been thrust under the regulator s^1 by the plunger v. By the continued rotation of the shaft a, pins projecting inward from the arms c c^4 are made to strike the under sides of levers x x pivoted to the outer sides of the inclosing plates u u.

The opposite extremities of the levers x x are jointed to the vertical side pieces of the frame which bears, attached beneath its upper girder y, the molding block y^1, and supported upon the same girder, the vertical standards y^2 y^2, from horizontal arms of which, projecting over the regulator girder S, are suspended two vertical rods y^3 y^3, to the lower ends of which is attached a plate, y^4, whose nether side is sharpened into an edge, and which passes through a slot in the cross-beam s^2 and regulator s^1.

As the arms c c^4 rise in the revolution of the shaft a, they lift the arms of the levers x x, extending above the shaft, and depress the lever arms, which are jointed to the mold-block frame, drawing the latter downward, which movement causes the plate y^4 to descend through the regulator s^1 to the bottom of the box s, cutting straight through the mud therein contained.

Springs y^5 y^5, coiled around the standards y^2, press the cutter downward with force sufficient to carry it through the mud, and yet not so great but that the cutter may yield to a root or stone in the mud, which it cannot sever. Springs y^6, bedded in lugs u', that extend downward from the inclosing plates, and bearing against the lower ends of the side pieces of the mold-block frame, throw the latter, with the cutter y^4, up as soon as the pins of the arms c c^4 clear the levers x

Simultaneously with the descent of the cutter y^4, the plungers l l are thrown once more inward, in the manner before explained. Immediately upon the rise of the cutter the plunger o advances again, pushing before it another charge of mud that is thrust beneath the regulator, in the same manner as the first one, which, by this second charge, is moved forward from beneath the regulator by the width of one brick, which movement leaves it directly beneath the molding die y^1, and resting upon the plate z, which forms the bottom of the box s, and is attached to and slides with the plunger o, the upper surface of the plate z being flush with the bottom of the guide-ways m. A mold-frame, z', is formed transversely in the plate z, near its end.

Immediately after the charge is moved forward beneath the molding die, the plate z is drawn toward the shaft by the retraction of the plunger o. The charge is prevented from moving back with the plate z by the next charge in its rear, which is compressed beneath the regulator s^1, and rests upon a fixed metal plate, z^2, placed beneath the regulator and above the plate z. The charge, therefore, remains stationary until the mold-frame z^1 is drawn under it, when the charge is pressed down into the mold-frame by the descent of the molding die y^1, which movement is effected in the manner before explained.

In the frame z^1, by the operation of the die, the charge is properly molded, and partially compressed. As soon as the die rises out of the mold, the plate z receives motion in the opposite direction from the advance of the plunger o, and the mold-frame with the brick in it, is carried out beneath the pressing-die A.

The pressing-die A is attached beneath the upper girder A^1 of a frame, which slides vertically in guide-ways made in the outer sides of the inclosing plates u u. The same frame is provided, at its lower end, with another girder, A^2, and is operated by a pin of the arm c^1 of the shaft a, striking and lifting the lever B, whose fulcrum is a horizontal rod, b', which passes transversely through the lugs u'.

The lever B is divided into two branches from a point near its fulcrum, and the extremities of the branches are jointed to the lower parts of the side pieces A^3 of the pressing-frame. Spring plates bedded in the lugs u', and bearing against the ends of the side pieces A^3, throw them up as soon as the pin of the arm c' clears the lever B.

The mold-frame plate z slides on horizontal ledges formed on the inner sides of the inclosing plates u. The bottomless press-mold C is constructed between the plates u directly beneath the die A.

When the bottomless mold-frame z', containing a molded brick, has arrived, as above explained, beneath the die A, and directly above the press-mold C, the die A descends and drives the brick down into the press-mold.

A die, D, is stationed within the press-mold, being affixed to the top of a staff, D', which passes through the girder A^2 of the pressing-frame, and whose lower extremity, which is provided with a friction-roller, rests upon an arm, E', that is rigidly attached at one end to the lower part of a standard, E, mounted between the lugs u' on trunnions extending into the same.

A projection from the upper end of the standard enters a slot in the bar E^2, which forms one of the series of parallel bars sliding between the inclosing plate u, and is operated by the cam d, striking the horn e^3 of the bar E^2. As soon as the cam clears said horn, the weight of the arm E^1 and die D draws the bar back again.

As the die A descends into the mold C, pressing the brick downward, the die D retires before it, such retirement being due to the weight of the die, and the sinking of the arm E^1 beneath it, and this movement continues until the horn e^3 of the bar E^2 comes in contact directly with the shaft a, the cam d having passed. The die A moves downward sufficiently after the die D comes to a stand to give the brick a partial compression between the two dies.

During the descent of the pressing-frame, the arm c^2 of the shaft a strikes an arm, h', projecting upward from a lever, H, placed between the lugs u', entering at one end a slot in the block H', which extends downward from the underside of the cross-piece I' of the main frame, passing near its middle through the slot in the standard E, and forked at its other extremity, so as to embrace the staff D'. The arm c^2 imparts to the lever H a slight motion in the direction of the pressing-frame, during which motion the lever enters a notch, a^3, cut in one side of the lower girder A^2 of the pressing die. At the point where the downward motion of the pressing-frame ceases, a pin of the arm c^2 strikes a curved metal horn, h^2, projecting upward from the arm h^1, and thus causes the lever H to travel still further in the notch a^3, which movement stretches

a spring, h^3, that connects a staple in the lever with a pin in the block H′, the tendency of which spring is to draw the lever H downward. A plate, h^4, jointed at both ends connects the lever with the arm E¹. The forked extremity of the lever H having arrived at the end of the notch a^3, the lever is prevented from moving further in this direction, and by the continued pressure of the pin of the arm c^2 upon the horn h^2, the lever is raised, the end in the slot in the block H′ rising therein. The forked extremity of the lever then becomes its fulcrum, resting in the notch a^3.

By means of the connecting-plate h^4, the arm E¹ is drawn upward a little, raising the staff D′ and die D. At the same time the die A is held down by the pressure of the lever H on the girder A^2, and the brick consequently receives another, and a final compression between the upper and lower dies, immediately after which the pin of the arm c^2 clears the lever B and the pressing-frame flies upward, withdrawing the die A entirely from within the press-mold. Then the cam d strikes the horn c^3 of the bar E^2, and causes the latter to move in the direction to throw the arm E¹ upward. The arm E¹ lifts the staff D′ and the lower die D until the upper surface of the die is flush with the guide-way, in which the mold-frame plate z slides. The return of the mold-frame bearing a fresh brick to be pressed, sweeps the finished brick off the surface of the die D upon the table or band placed at the end of the machine, whence the brick is removed to be dried.

From the foregoing description, it will be understood that, in this machine, the mud is subjected to separate and successive compressions in the open space between the plungers in the box s, beneath the regulator in the mold-frame, and in the pressing-frame; also, that, as long as the regulator remains unchanged, the same quantity of mud goes into the composition of each brick.

I claim as my invention—

1. The regulator s^1, in combination with the plunger v, box s, and die y^1, said parts being constructed and arranged to operate as described.

2. The plungers l, sliding in guide-ways m, in combination with the plunger o sliding in the guide-way o', and with the plunger v sliding in and out of the plunger o, substantially in the manner and for the purpose specified.

3. The combination of the dies A D, standard E, provided with the arm E¹ and the lever H, when the latter is operated by a cam, d, in such manner as to hold the die A down and throw the die D up, substantially as explained.

4. The hinged plate w, in combination with knife y^4, regulator s^1, plunger v, box s, and die y^1, said parts being constructed and arranged to operate as described.

SETH RIGBY, 3D.

Witnesses:

JAS. D. BRYSON,

SAMUEL VANTTERN.