2 Sheets-Sheet 1.

S. Ustick,

Brick Machine.

No. 20,107. Patented Apr 27, 1858.

Fig. 3

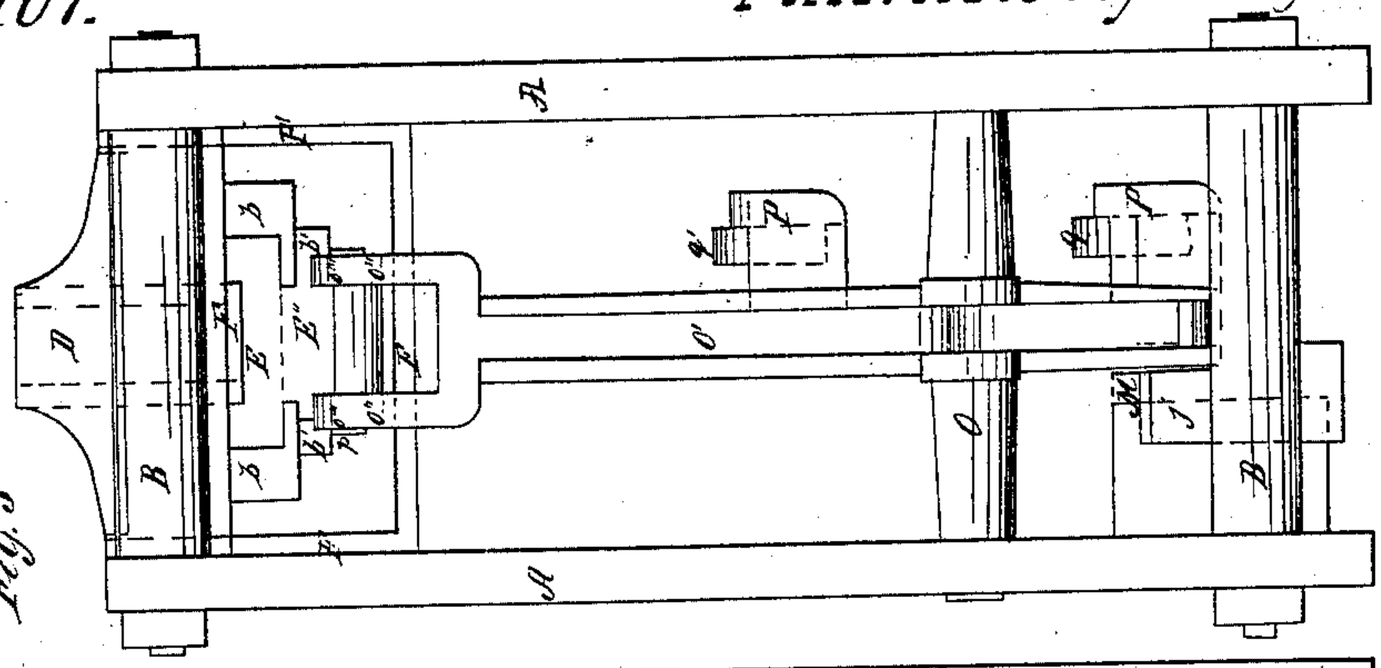


Fig. 2

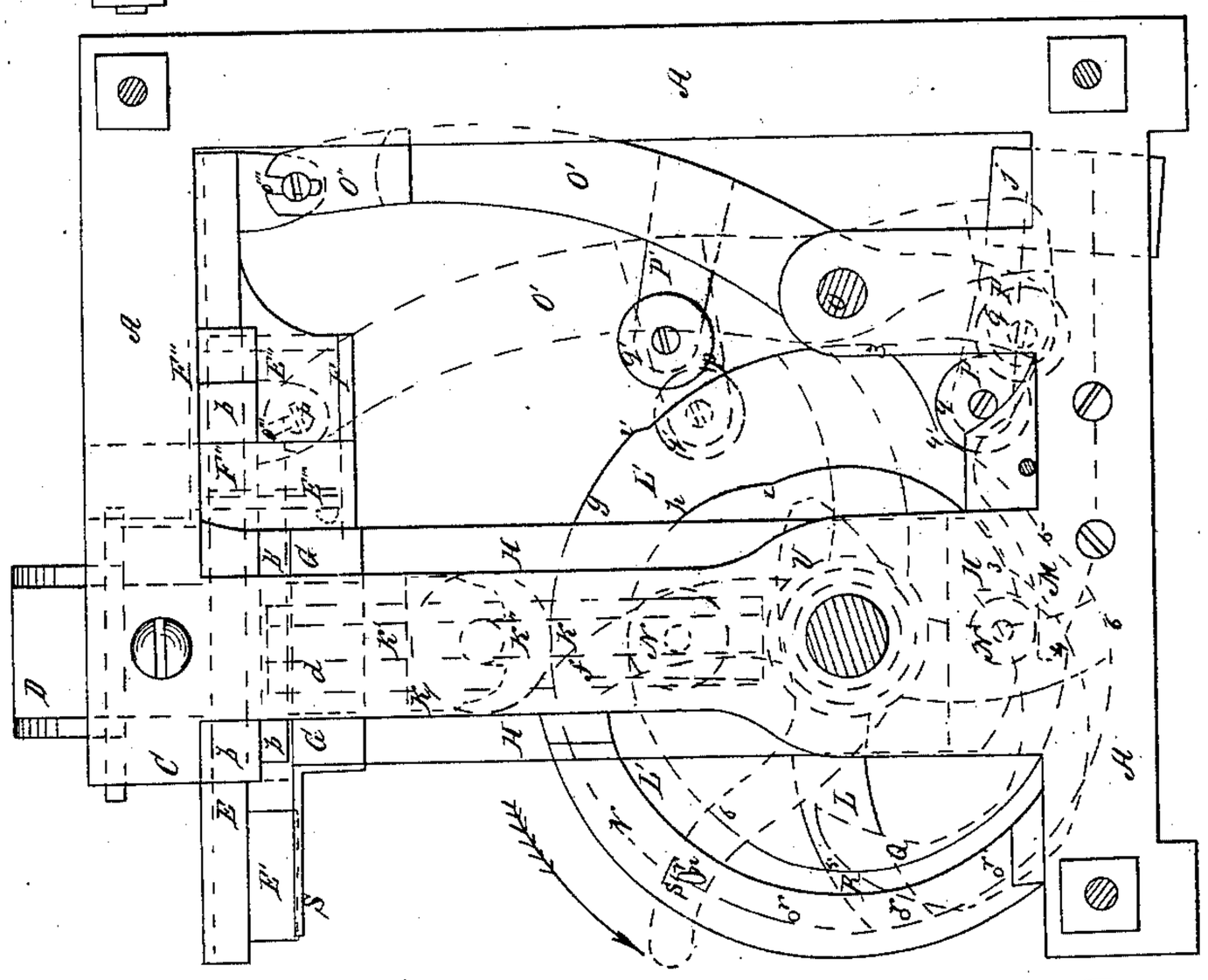
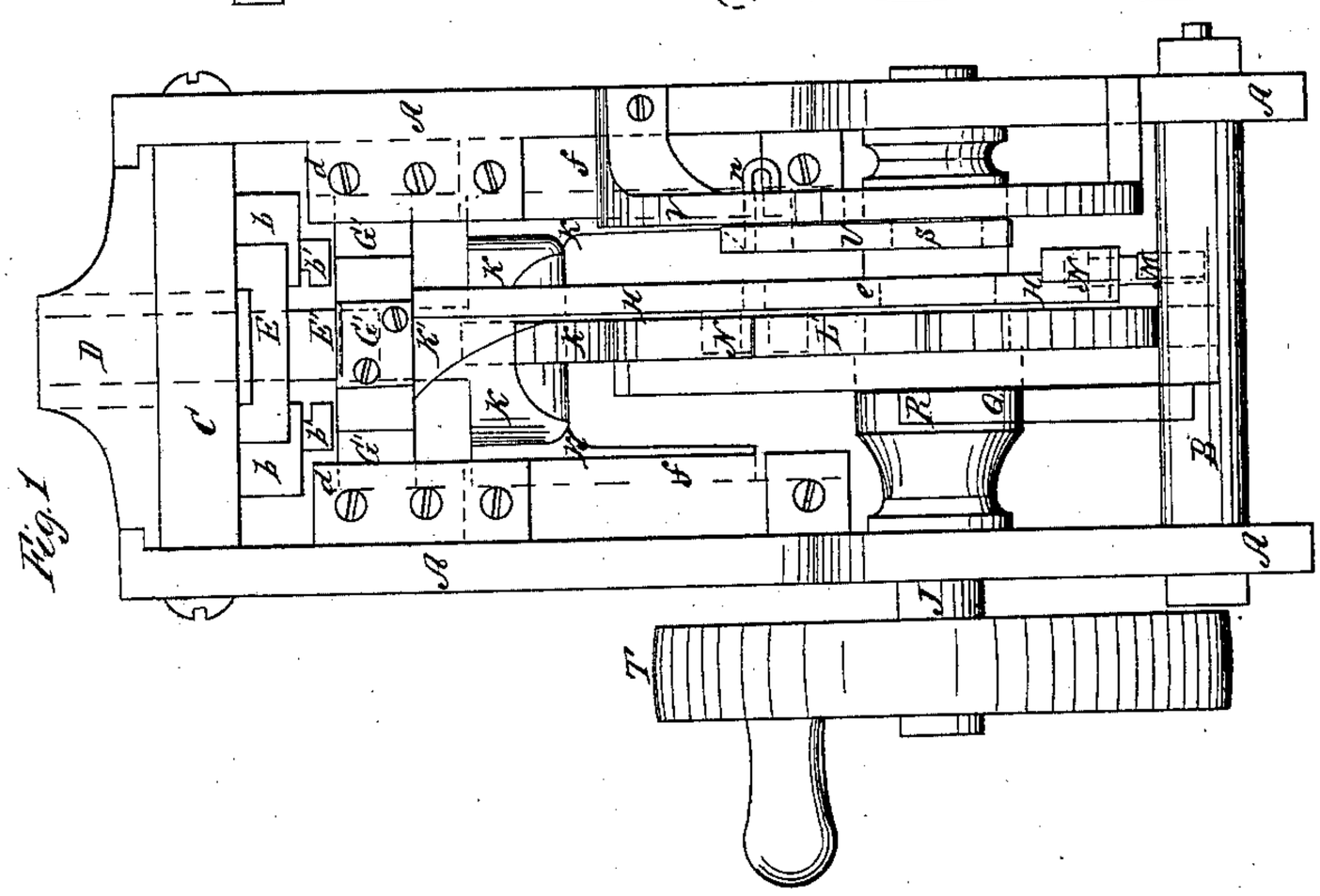


Fig. 1



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2 Sheets. Sheet 2.

S. Ustick,

Brick Machine.

No. 20,107. Patented Apr. 27, 1858.

Fig. 13

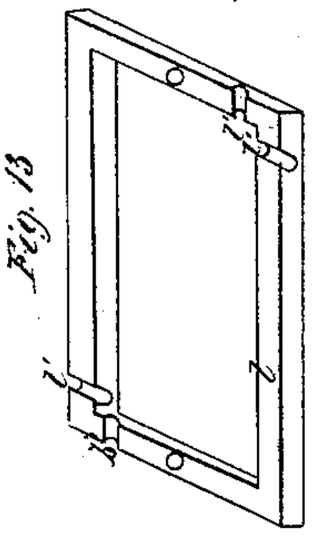


Fig. 14

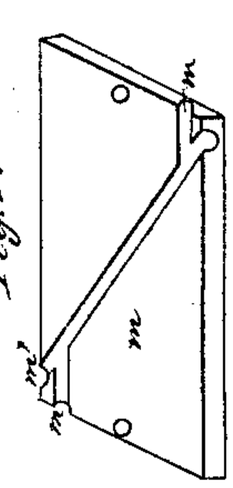


Fig. 4

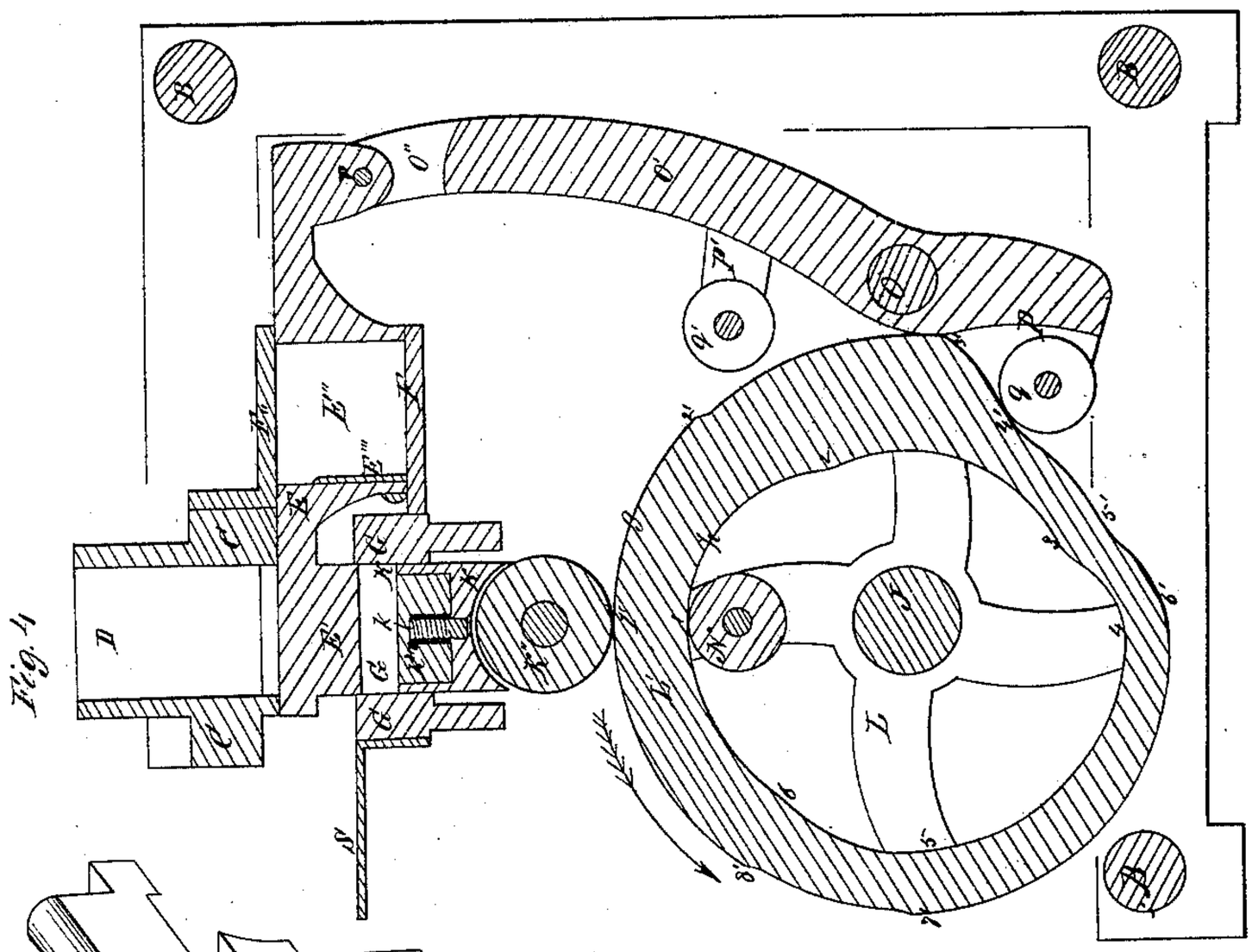


Fig. 5

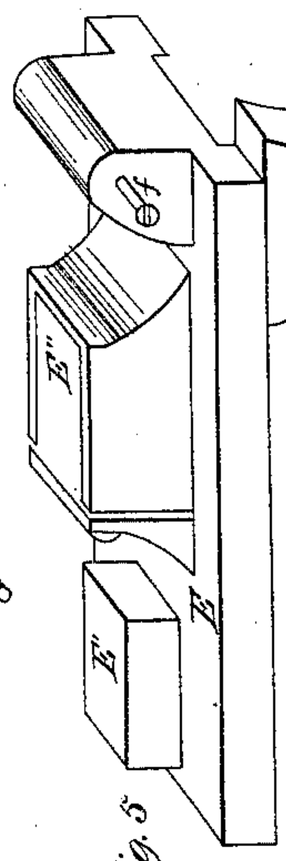


Fig. 6

Fig. 7

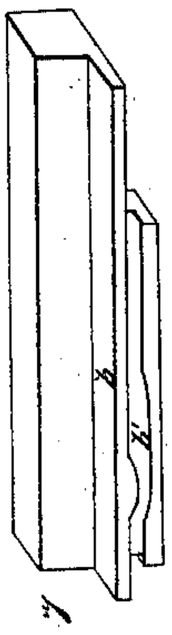


Fig. 11

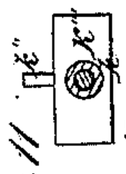


Fig. 10

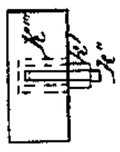


Fig. 9

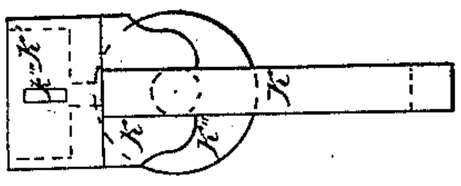
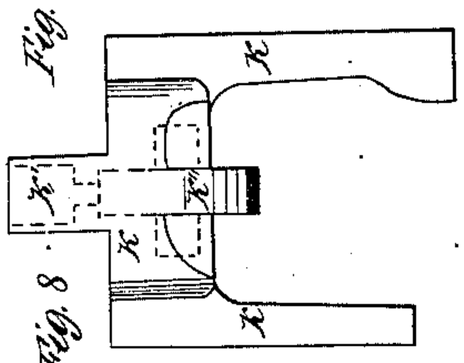


Fig. 12

Fig. 8



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UNITED STATES PATENT OFFICE.

S. USTICK, OF PHILADELPHIA, PENNSYLVANIA.

BRICK-MACHINE.

Specification of Letters Patent No. 20,107, dated April 27, 1858.

To all whom it may concern:

Be it known that I, STEPHEN USTICK, of the city and county of Philadelphia and State of Pennsylvania, have invented new and useful Improvements in Machines for Molding and Pressing Bricks from Untempered Clay, and that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, in which—

Figure 1, is a front elevation of the machine. Fig. 2, is a side elevation of the came. Fig. 3, is a back view of ditto. Fig. 4, is a vertical longitudinal section through the lines *x*, *x* of Figs. 1 and 2. Fig. 5, is an inverted view of the vibrating frame E, with the piston E′, and filling box E″, in connection. Fig. 6, is a view of the scraper E‴, deatched from the filling box E″. Fig. 7, is a view of a guide *b*, of the vibrating frame E, and a guide *b′* of the scraper E‴, combined. Fig. 8, is a front view of the piston frame K, with the piston K′, and friction wheel K″. Fig. 9, is an edge view of the same. Fig. 10, is a side view of the plunger K‴. Fig. 11, is a bottom view of the same. Fig. 12, is an edge view of ditto. Fig. 13, is an enlarged inverted view of the facing *l*, of the piston K′. Fig. 14, is a simi-view of the facing *m*, of the plunger K‴.

Like letters in all the figures indicate the same parts of the machine.

My invention is an improvement on the machines for which Letters Patent were granted to me July 7th, 1857; and September 8th, 1857; and consists in the peculiar construction of the clay charger and parts attached to the same; and of the lower piston and parts connected with it, by which I fill the mold deeper along its sides and ends than in the main area of the same, and thus by getting an additional quantity of clay in the edges of the bricks give great solidity to the corners and edges of the same. Also a peculiar construction of the piston facings, by which I am enabled to expand them readily, to compensate for the wearing of their edges; and a novel device for regulating the depth of clay in the condensing mold, and at pleasure cutting off the communication between it and the hopper, as I will hereafter more fully describe.

To enable others skilled in the arts to make and use my invention I will proceed to describe its construction and operation.

A, A, are side pieces of the standing frame, and B, B, B, and C, cross stretchers of the same.

D, is the hopper.

E, is a vibrating frame, which combines the piston E′, and filling box E″, and *b*, *b*, are guides of said frame.

F, is the bottom, and F″, the cover of the filling box E″, when the latter is in the rear of the mold.

F′, F′, are uprights of the bottom F, and are bolted to the frame sides A, A.

G, is the condensing mold which has slides G′, G′, that move in guides *d*, *d*. The yoke H, is connected at its upper end with the mold G, and is guided at its lower end by the annular groove *e*, in the driving shaft J. The sliding frame K, has on its upper end a piston K′, and in its lower end a friction wheel K″, and is guided by the grooved pieces *f*, *f*.

L, is a cam wheel and L′, the rim of the same; *g* is the outer and *h*, the inner periphery of the rim.

M, is a lever that counteracts the weight of the mold G, and its connections.

N, is a friction wheel on the yoke H, which bears against the periphery *h*, of the cam rim L′.

N′, is a friction wheel in the lower end of the yoke H, against which the front end of the lever M, bears—it being actuated by the weight *j*. O, is a rock shaft and O′ an arm of the same, having cheeks *o″ o″*, connecting with pins *p*, *p*, of the vibrating frame E, by means of the slots O‴, O‴.

P, P′, are arms of the said rock shaft, which have wheels *q*, *q′*, that are alternately acted upon by the cam R, of the piece Q, to produce a reciprocating motion of the piston E′, and filling box E″. The adjustable curved piece U, situated on the driving shaft J, in the annular groove *s*, serves to regulate the depth of the clay charged into the condensing mold G; and also at pleasure to cut off the communication with the hopper D, by its connection with the segmental strip *v*, by means of the pin *n*, and holes *r*, *r*, *r*, and *r′*.

S, is a table in front of the mold G, which receives the bricks when delivered from the latter. T, is a band wheel on the driving shaft J, by means of which power is communicated to the machine.

As the construction and operation of the machine have been fully described in the

Letters Patent which were granted to me July 7th, 1857, I will confine myself to a particular description of my present improvements.

The scraper E‴, in the backward motion of the filling box E″, being actuated by the guides *b′*, *b′*, is made to cut the clay off lower in the middle of the mold nearly from end to end, than at the ends of the same; and the corners of the said scraper being rounded off the clay is left as full along the sides of the mold as at the ends. As the objects attained by this peculiar filling of the mold are fully set forth in the Letters Patent which were granted to me September 8th, 1857, a further explanation I deem unnecessary, except stating that by the use of the movable scraper E‴, instead of making the clay lower in the middle of the mold than toward its ends, as represented in the said Letters Patent, I leave it of uniform depth in the main part of the mold, to make the brick as strong in its middle as in any other part of it. To insure an equal compactness and solidity to the lower part of the edges of the bricks with the upper part of the same I cause the mold to take in a greater depth of clay around the margin of the face of the lower piston than in the middle of the same, as follows. The spiral spring *k*, on the shaft *k′*, of the plunger K‴, forces the face of the latter above the marginal face of the piston K′, when the mold G, is taking in its charge of clay. During the condensation of the clay the spiral spring *k* yields, and the face of the plunger comes even with the marginal face of the piston, the bottom end of the shaft *k′*, resting on the bottom of its socket; and when the mold is drawn off of the brick for the removal of the latter the spring *k* bears against the elbow *k″*, of the plunger shaft *k′*, to keep the face of the plunger even with the face of the piston until the brick is removed from the mold. Besides effecting the peculiar filling of the bottom of the mold by the said construction and arrangement of the piston K′, and plunger K‴, I get rid of the condensed air in the bricks through their lower flat surface, it freely escaping through the joints around the plunger K‴, and thence through the opening *k‴*, in the side of the piston K′.

The cross grooves *l′*, *l′*, *l′*, *l′*, and *m′*, *m′*, *m′*, in the under side of the facings *l*, and *m*, are for the purpose of facilitating the expansion of the said facings, to compensate for the wearing of their edges, which expansion I effect by hammering the bottom of the grooves. I at option construct the facing of the piston E′, like the facing of the plunger K‴, as above described, or otherwise as circumstances may make desirable.

The depth of the clay charged into the condensing mold G, is regulated by altering the position of the curved piece U, on the rear end of which the piston frame K, rests when the piston K′, descends into the mold, by changing the pin *n*, in the holes *r*, *r*, *r*, in the segmental piece V. And when it is desired to cut off the communication between the mold G, and hopper D, the pin *n*, is placed in the hole *r′*, which brings the concentric curve on the rear end of the piece U, directly under the piston frame K, for the latter to rest upon, and thus prevent the piston K′, descending below the top of the mold.

Having thus fully described the construction and operation of the brick machine as invented or improved by me, what I claim therein as new and desire to secure by Letters Patent is—

1. The combination and arrangement of the filling box E″, scraper E‴, and guides *b′*, *b′*, or their equivalent, as an improvement on the filling box E″, in the machine for which Letters Patent were granted to me on September 8th, 1857, when said parts are constructed and arranged to operate substantially as described.

2. The piston K′, and plunger K‴, combined and arranged to operate in the manner and for the purposes set forth, the plunger K‴, being operated by the spring *k*, or its equivalent.

3. The grooves *l′*, in the facing *l*, of the piston K′, and the grooves *m′*, in the facing *m*, of the plunger K‴, constructed substantially as described for the purpose above stated.

4. The curved piece U, in combination with the segmental piece V and pin *n*, arranged as described.

In testimony that the above is my invention I have hereunto affixed my hand and seal this tenth day of April 1858.

STEPHEN USTICK. [L. S.]

Attest:

THOMAS J. BEWLEY,

MO. B. KENNEY.