(No Model.)

J. C. TITUS.

BRICK OR TILE MACHINE.

No. 450,201. Patented Apr. 14, 1891.

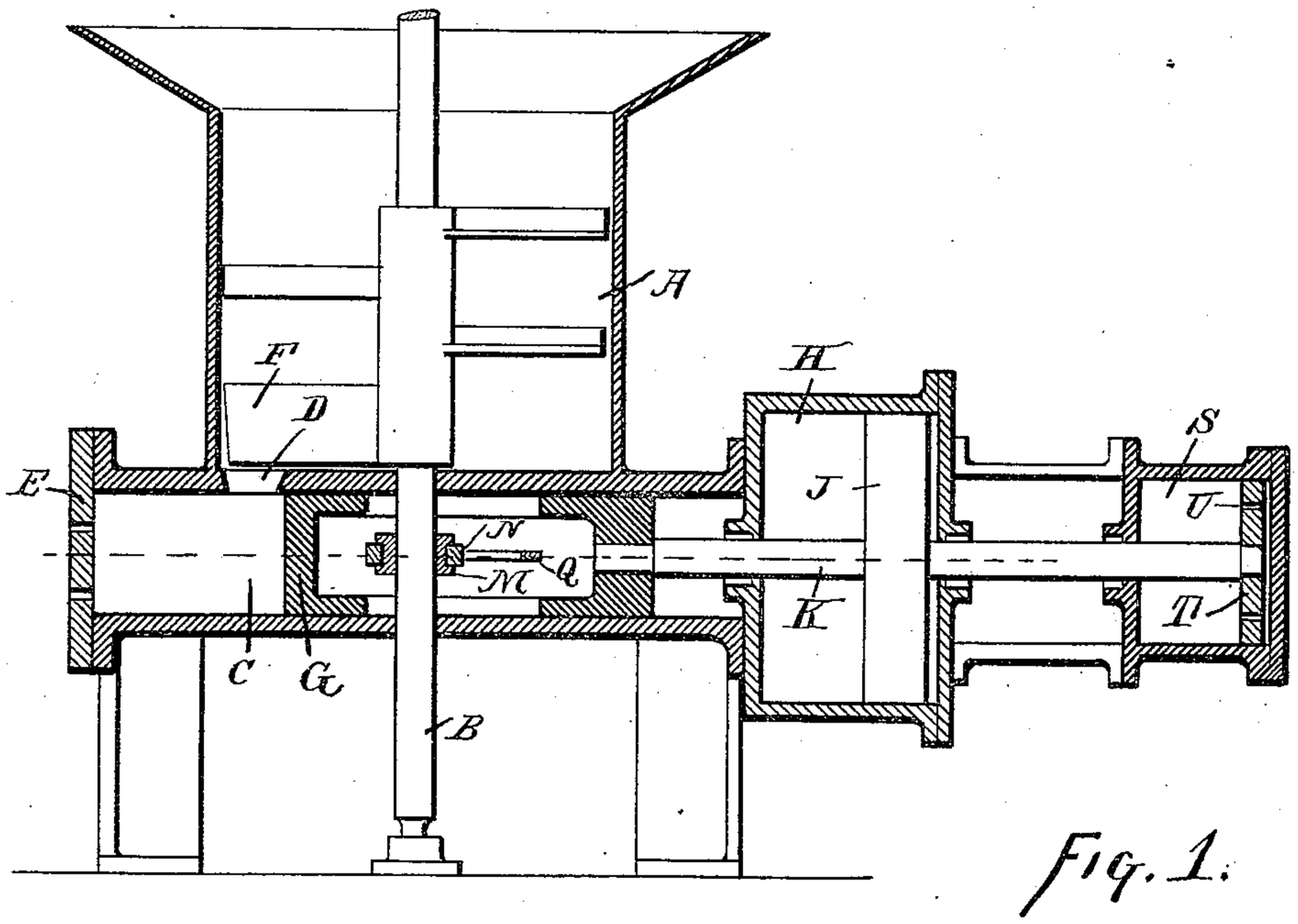

Fig. 1.

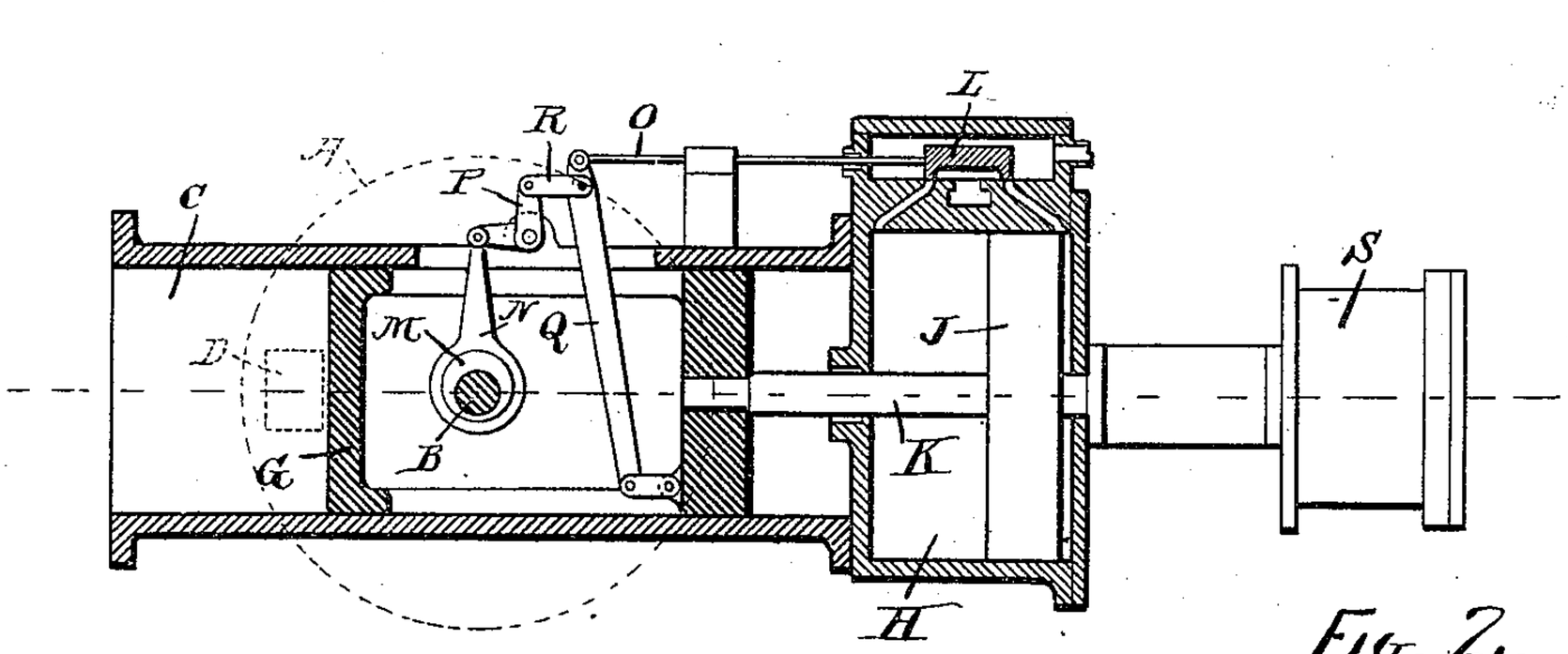

Fig. 2.

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UNITED STATES PATENT OFFICE.

JOHN C. TITUS, OF NEW BREMEN, OHIO, ASSIGNOR OF ONE-HALF TO THE NEW BREMEN MACHINE COMPANY, OF SAME PLACE.

BRICK OR TILE MACHINE.

SPECIFICATION forming part of Letters Patent No. 450,201, dated April 14, 1891.

Application filed February 2, 1891. Serial No. 379,904. (No model.)

To all whom it may concern:

Be it known that I, JOHN C. TITUS, of New Bremen, Auglaize county, Ohio, have invented certain new and useful Improvements in Brick or Tile Machines, of which the following is a specification.

This invention pertains to that class of brick or tile machines in which the clay is forced out of a chamber through a die by the action of a plunger; and the nature of the improvements will be readily understood from the following description, taken in connection with the accompanying drawings, in which—

Figure 1 is a vertical longitudinal section of a machine exemplifying my improvements, and Fig 2 a horizontal section of the same.

In the drawings, A indicates the usual pug-cylinder; B, the pug-shaft provided with the usual wings in the pug-cylinder and adapted to be rotated by any of the usual means; C, the plunger-chamber under the pug-mill and arranged to receive the clay therefrom; D, the opening in the floor of the pug-mill through which the clay goes from the pug-mill to the plunger-chamber; E, the die forming the end wall to the plunger-chamber and through which it is the duty of the plunger to force the clay to form the tile or brick, the intention being to employ any desired or suitable or usual form of die; F, the usual feed-wing on the pug-shaft for urging the clay out of the pug-mill into the plunger-chamber; G, the plunger fitted to reciprocate in the plunger-chamber to and from the die and past the opening D, the exemplification showing this plunger as of skeleton-box form with a pug-shaft passing down through it; H, the pressure-cylinder for steam or water or other pressure-fluid, this cylinder being shown in the exemplification as arranged tandem to the plunger-chamber; J, the piston of the pressure-cylinder; K, the piston-rod connecting the pressure-piston and the plunger; L, the valve of the pressure-cylinder, (shown as an ordinary slide-valve with little or no lap,) the arrangement of pressure-cylinder and valve being the same as in ordinary slide-valve steam-engines employing valves with little or no lap; M, an eccentric driven by the pug-shaft, the exemplification showing the eccentric as being secured directly to the pug-shaft; N, the eccentric-rod; O, the valve-stem; P, a bell-crank lever pivoted to the plunger-chamber and having one of its arms engaged by the eccentric-rod; Q, a lever pivoted at one end to the valve-stem and at the other end to the plunger, so that regardless of other motions this lever may have it will be oscillated as the plunger reciprocates; R, a link connecting the second arm of the bell-crank lever with the lever Q at an intermediate point in its length; S, a dash-pot cylinder shown as arranged tandem to the pressure-cylinder; T, the piston of the dash-pot cylinder, connected with the plunger in the exemplification by means of a continuation of the piston-rod from the pressure-piston to the dash-pot piston, and U small passages through the dash-pot piston placing the two ends of the dash-pot cylinder in communication with each other, these passages merely exemplifying the usual passages leading from one side of the piston to the other, as usual, in such dash-pots, such passages ordinarily finding their equivalent in a dash-pot piston fitted loose enough to permit a certain amount of leakage past it or in an external conduit placing the two ends of the dash-pot cylinder in restricted communication.

Assume the pug-mill to have more or less perfectly charged the plunger-chamber with clay and that the plunger is stationary at the back end of its stroke, as illustrated in Fig. 2. As the pug-shaft rotates, the slide-valve will be pulled to the left and steam will pass behind the pressure-piston. The eccentric being pulled the valve opens through the medium of the lever Q, which found a stationary fulcrum at its point of attachment to the plunger. The plunger pressed by the steam in the pressure-cylinder now moves to the left and shuts off opening D and presses the clay in the plunger-chamber and forces it through the die. The continued rotation of the eccentric will move the valve the other way and the plunger will be retracted. In this way, as thus far described, the plunger will make a complete double stroke at each rotation of the pug-shaft; but it may be safely assumed that both the quantity and quality of the clay in the plunger-chamber is subject to great

variation and that some charges of clay will require greater pressure than others. The provision is such that the pressure upon the clay is regulated entirely by the resistance offered by the clay in the plunger-chamber.

It has been stated that the eccentric, as it leaves the position indicated in Fig. 2, pulls the valve open to the left; but it does not pull it entirely open. As soon as the valve opens any distance whatever, then steam flows behind the piston and the plunger moves to the left. This is the case if the pressure thus flowing to the piston is capable of moving the plunger against the resistance of the clay; but if it is not capable of moving it then the fulcrum of lever Q on the plunger remains a stationary one and the valve continues to open as the eccentric advances, and consequently it may be insured that the valve will continue to open so long as the plunger continues to remain stationary. If the plunger, instead of remaining stationary, advances to the left, the effect is to rock the lever Q on the link R as a fulcrum and to push the valve to the right and close it. The result is that eccentric rotation produces valve-opening and plunger movement produces valve-closure, these two movements modifying each other. Hence if the plunger moves two slowly or not at all, the valve will open wider and the plunger will receive more steam force, while if the plunger moves too fast it will automatically lessen the steam force which acts on it. Therefore the clay in the plunger-chamber will be acted on by a force controlled by its own resistance. If the clay in the plunger-chamber is incapable of yielding to the maximum power of the pressure-cylinder, then of course the plunger will not move through its full stroke, but it will continue to reciprocate through such fraction of the stroke as is possible with the power available. The reasonable presumption is that the resistance offered by the clay to the advance of the plunger will increase as the plunger advances, at least during the early parts of the compressing-stroke; but if a machine should have stood for sometime unused it might be possible for the plunger to become stuck at or near the beginning of one of its strokes. In such case the plunger would by remaining stationary call for more steam, and might eventually secure a full valve-opening. This might break down the abnormal resistance and permit full steam-pressure to act during the completion of the stroke against an ordinary or even extra light resistance before the valve would close. This might cause damage to the machine, and to guard against it I employ the dash-pot cylinder, which is to be filled with liquid, the liquid transferring itself from one end of the dash-pot cylinder to the other as the piston moves, the communication between the two ends of the dash-pot cylinder permitting the transfer to take place at normal piston speed without serious resistance, but the restricted passage producing an extraordinary resistance when the piston seeks to move at extraordinary speed. In the abnormal case just mentioned the extra power of the pressure-cylinder would be checked by the dash-pot and the shooting of the plunger by the sudden breaking down of resistance thus avoided.

I claim as my invention—

1. In a brick or tile machine, the combination, substantially as set forth, with a plunger-chamber, a plunger working therein, a die, and means for supplying the plunger-chamber with clay, of a pressure-cylinder, a piston therein connected with said plunger, a valve for the pressure-cylinder, an eccentric adapted to be continuously rotated, a lever connected with said valve and plunger, and an eccentric-rod connected with said eccentric and lever, whereby the rotation of the eccentric tends to move the valve in one direction and the movement of the plunger tends to move it in a reverse direction.

2. In a brick or tile machine, the combination, substantially as set forth, with a plunger-chamber, a plunger working therein, a die, and means for supplying the chamber with clay, of a pressure-cylinder, a piston therein connected with said plunger, a valve for the cylinder, a part adapted for continuous rotation, and connections between said continuously-rotating part and valve and plunger, whereby the admission of steam to said piston is controlled by the resistance offered by the clay in the plunger-chamber.

3. In a brick or tile machine, the combination, substantially as set forth, with a plunger-chamber, a plunger working therein, a die, and means for supplying said chamber with clay, of a pressure-cylinder, a piston therein connected with said plunger, a valve and valve-operating mechanism, a dash-pot cylinder, and a piston therein connected with said plunger so as to move therewith, said dash-pot cylinder being provided with a restricted passage, placing its two ends in communication with each other.

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Witnesses:
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