2 Sheets—Sheet 1.

P. N. Wolliston,

Brick Machine.

No. 55,400. Patented June 5, 1866.

Fig. 1.

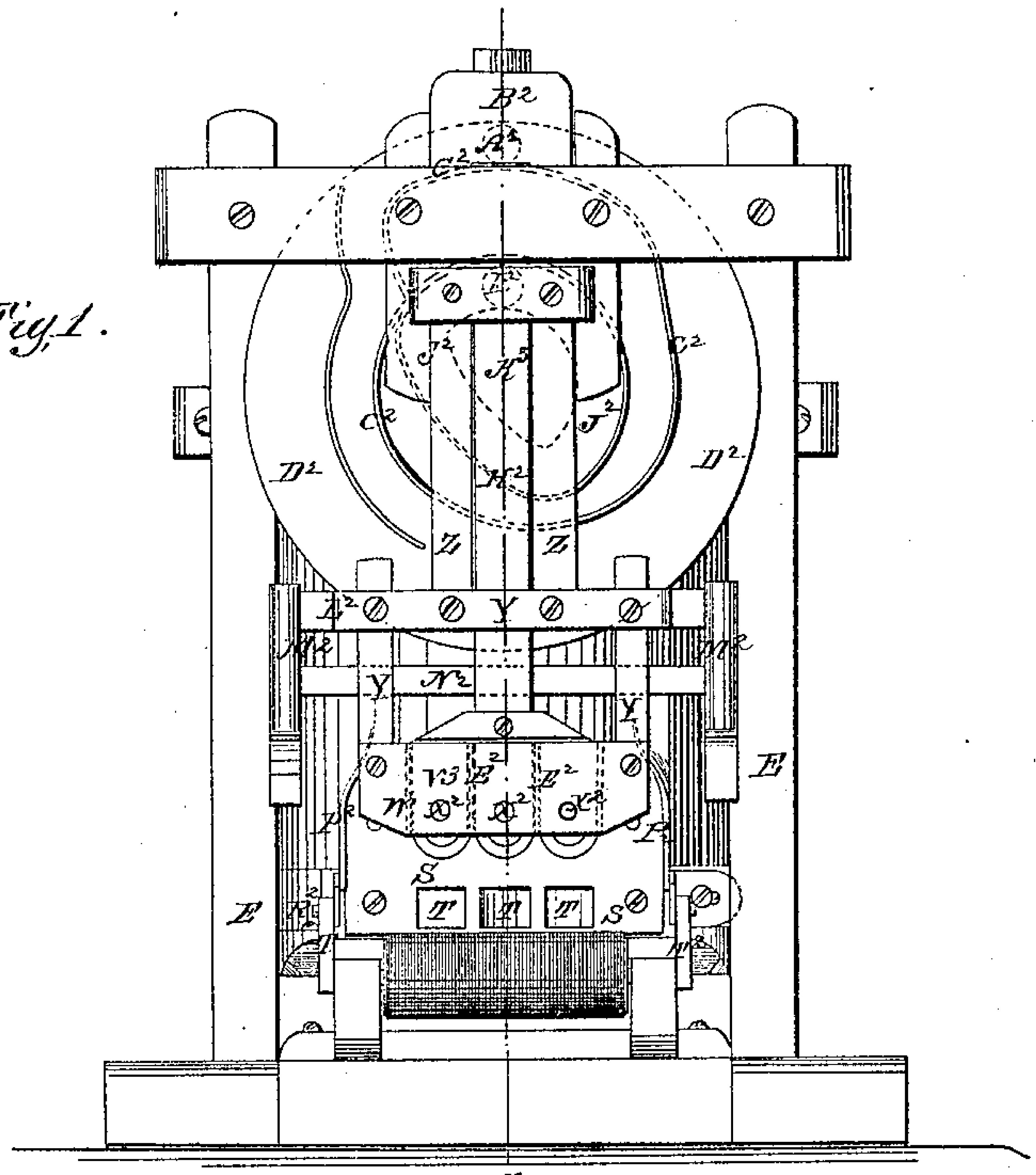
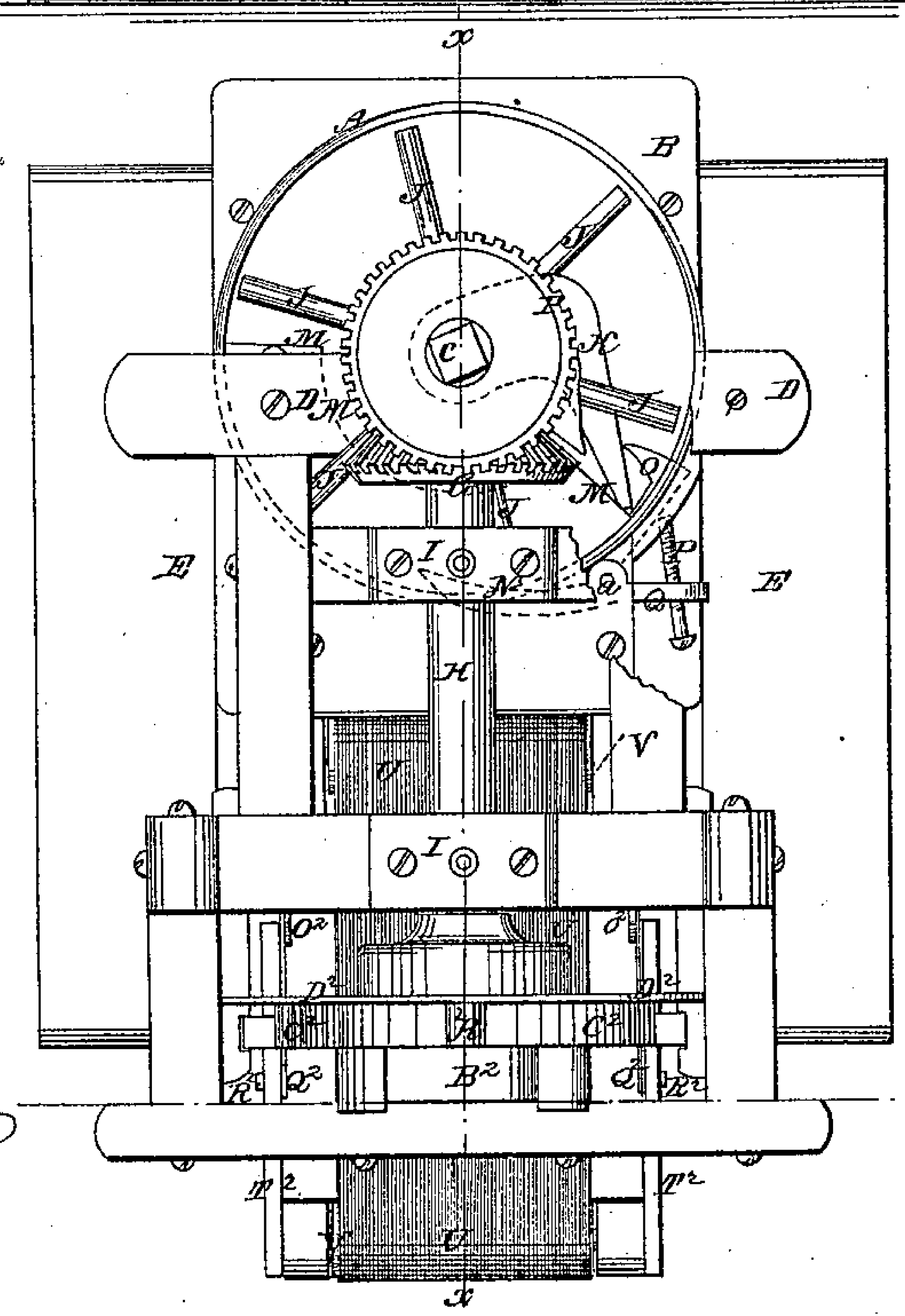


Fig. 2.



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AM. PHOTO-LITHO. CO. N.Y. (OSBORNE'S PROCESS)

2 Sheets—Sheet 2.

P. N. Molliston,

Brick Machine.

No. 55,400. Patented June 5, 1866.

Fig. 3.

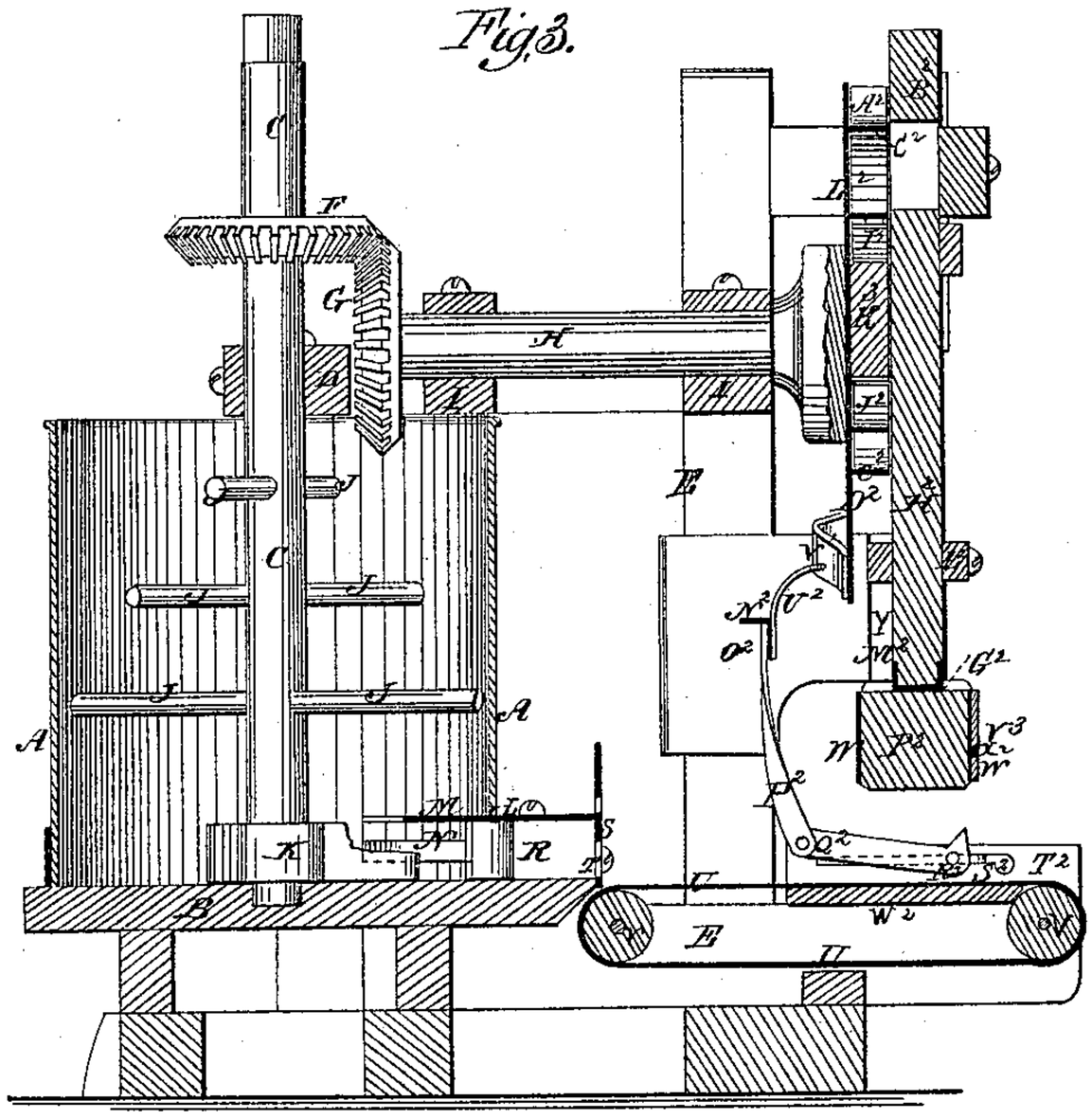


Fig. 5.

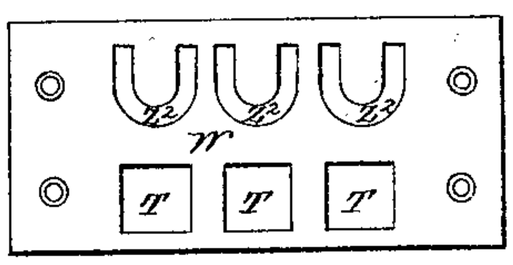
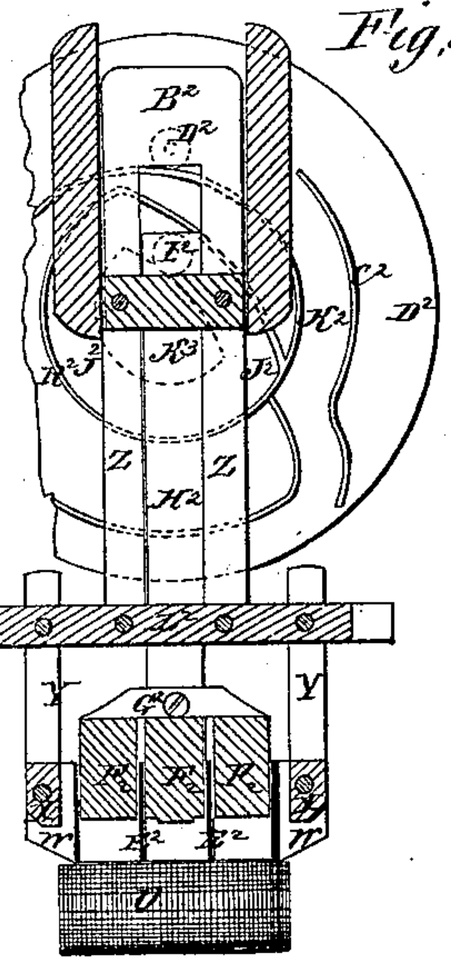


Fig. 4.



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UNITED STATES PATENT OFFICE.

PHILIP N. WOLISTON, OF SPRINGFIELD, OHIO.

IMPROVED BRICK-MACHINE.

Specification forming part of Letters Patent No. **55,400**, dated June 5, 1866.

To all whom it may concern:

Be it known that I, PHILIP N. WOLISTON, of Springfield, in the county of Clarke and State of Ohio, have invented new and useful Improvements in Machines for Making Bricks, Tiles, &c.; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

The present invention relates to a machine to be used for the manufacture of bricks and tiles more especially; and it consists, first, in a novel construction and arrangement of the kneader or mixer within the mud or clay box of the machine for forcing the mud or clay from the box through the die-plate, the arrangement of these parts being such as to enable the quantity of clay delivered from the clay-box to be regulated at pleasure; second, in a peculiar construction and arrangement of the molds for the bricks or tiles, to be hereinafter particularly described; and also in a novel arrangement of parts for removing the bricks or tile formed in the molds from the same.

In accompanying plates of drawings my improvements in machines for making bricks, tiles, &c., are illustrated, Figure 1, Plate 1, being an elevation of the front end of the machine; Fig. 2, Plate 1, a plan or top view of the same; Fig. 3, Plate 2, a central vertical longitudinal section taken in the plane of the line *x x*, Fig. 2, Plate 1; Fig. 4, Plate 2, a transverse vertical section taken in the plane of the line *y y*, Fig. 2, Plate 1; Fig. 5, Plate 2, a detail view, to be hereinafter referred to.

Similar letters of reference indicate like parts.

A in the drawings represents an upright vessel secured at its lower end on the bed-piece B of the frame-work of the machine; C, a vertical shaft turning at its lower end in the center of the bed-piece B, and extending up through the vessel A in bearings of the cross-bar D of the frame-work E, with a bevel-gear wheel, F, fixed to its upper end, interlocking with a similar bevel-gear wheel, G, upon one end of a horizontal shaft, H, extending in the direction of the length of the machine, turning in bearings of cross-bars I I of the frame-work. The vertical shaft C has a series of horizontal radial arms, J, attached to it at suitable points of its length within the vessel A, which arms, as their common shaft is revolved in any suitable manner, operate against the mud or clay placed in the said vessel, thoroughly kneading and mixing it, from which it is forced out by the scraper or arm K, secured to the lower end of the shaft C and bearing upon the surface of the bed-piece B through the opening L, made in the lower end of the vessel A and upon one of its sides, this scraper-arm K moving under the horizontal shelf M of the vessel A and acting in conjunction with the scraper-arm N, extending across, or nearly so, the said opening L, turning upon a fulcrum-pin, *a*, of the bed-piece B, as will be explained. The scraper N, as the shaft-scraper K passes by it, scrapes the surface of the same, at the same time gradually closing or swinging across the opening L of the vessel, so as to allow the shaft-scraper to pass by it, when, by the action of the shaft-scraper K against the arm O, hung to the fulcrum of the scraper N and projecting inside the vessel A, the said arm O is thrown back against the set-screw P of the arm Q of the scraper N, swinging the scraper N upon its fulcrum again into position within the vessel A, to act upon the shaft-scraper K as it again comes around to the same by the continued revolution of the shaft.

By means of the arrangement of the scraper N with the arm Q and set-screw P in reference to the swing or movement of the shaft-scraper K, the quantity of mud or clay passed through the opening L of the vessel A can be regulated at pleasure by simply adjusting the set-screw P according thereto, as is obvious without further explanation.

In front of the opening L of the vessel A a chamber, R, is made, forming a continuation of the same, the outer end of which is closed by a plate, S, having a series of similar square-shaped openings, T T, with their lower edges in the same line with each other. U U, a horizontal endless belt or apron moving over and around rollers V, one at each end, turning in suitable bearings of the frame-work E, the upper surface of this endless apron being just below the lower edges of the plate-openings T. Across this belt it is intended to lay a series of boards, upon which the clay, as it is forced out of the vessel by the action of the scrapers, as above explained, is delivered through the plate-openings T in continuous strips of corresponding size and shape thereto, each of these boards, with the strips of clay upon them,

being carried forward to the action of the molds V^3 and removed therefrom after the clay has been acted upon by them by means of an arrangement of devices to be presently explained.

The molds V^3 are constructed and operated as follows: The molds V^3 consist of parallel side pieces, W W, secured together at each end by cross-bars X of an upright frame, Y, that, by parallel uprights Z, having a roller, A^2, secured in the cross-piece B^2 of their upper ends, is hung on the raised cam-shaped flange or lip C^2 upon the front side of the disk D^2, secured to the horizontal shaft H, hereinbefore referred to, this flange C^2 being made of such a shape as to raise and lower the said frame Y from and to the endless apron U as the said disk D^2 revolves. The space between the two cross-bars X of the side pieces, W, is divided into a series of equal spaces or parts by means of cross-plates E^2, the size of which spaces corresponds to the size of the bricks which are to be formed in the machine, it being intended that the lower edges of the division and other plates constituting the same shall be made sufficiently sharp that as the frame is brought down by the action of the cam-disk D^2 they will readily cut or penetrate the strips of clay upon the endless apron U. Through each of the spaces of the frame formed by the side pieces, W, and cross-bars X and division-plates E^2 plays a follower, F^2, all secured to a common cross-head, G^2, on the lower end of a vertical shaft or bar, H^2, playing in and between the uprights Z of the frame Y, to the upper end of which shaft H^2 a roller, I^2, is hung, that moves in the cam-shaped groove J^2, formed by the raised flange C^2, center cam, K^3, and the inner flange, K^2, of the disk D^2, the shape of which groove or channel is to be such as to raise and lower the said followers from and to the endless apron.

The frame Y, by its cross-bar L^2, moves in guideways or grooves M^2 of the frame-work E.

The shape of the cam-flanges of the disk D^2 is to be such as to impart an upward and downward movement, as before explained, to both the molds and the followers arranged to move in the same, but in such a manner that the molds shall be first brought down upon the strips of clay on the endless apron, cutting the same into cakes or blocks corresponding thereto, when, the followers then being brought down upon the clay in such molds, it is caused to be firmly and compactly pressed into shape, after which both the molds and followers are raised, leaving the clay thus molded upon the endless apron with the board between the two, which board, by the action of the devices to be now explained, is carried along upon the endless apron, (at the same time drawing the boards forward next in position to it upon the same for the molds to act upon the clay,) discharging the molded bricks from the machine.

To feed the molded bricks from the machine the arrangement of devices below described is provided.

N^2 is a horizontal rock-shaft extending transversely across the machine, turning in bearings of the uprights O^2, which shaft is provided with vertical arms P^2, pivoted at their lower ends to one end of arms Q^2, playing by a stud or pin, R^2, of their other or opposite ends in grooves or slots S^2 of the side pieces, T^2, of the bed-piece, parallel with the edges of the endless apron and extending in the same direction therewith. To the rock-shaft N^2, and at the center point of its length, a bent upright curved arm, U^2, is secured, with which, as the disk D^2 revolves, and upon each revolution of the same, a lug, V^2, upon the back side thereof comes in contact in such a manner as to swing the rock-shaft N^2 in the proper direction to move the arms Q^2 forward in their slots or guide, carrying the board having the molded bricks along with them, and at the same time bringing the next board of the endless apron under the molds in proper postion for being acted upon by them, this feeding movement of the clay-boards taking place when the molds are at the highest point of elevation, and is fully accomplished before the molds descend. To form a hard surface for the molds to act against when brought down upon the endless apron a board or other bed-piece, W^2, is placed under the apron at such point of its length as plainly shown in Fig. 3 of the drawings. In the front side of the several molds an aperture, X^2, is formed, the object of which is to allow the surplus clay or mud in the several sections of the molds to escape from them when the followers act upon it, as is obvious without further explanation.

Although I have herein explained the clay or mud as being delivered from the kneading or mixing vessel through one opening, it is obvious that by duplicating or triplicating or still further increasing the number of scraping devices it can be delivered through a corresponding number of openings, in connection with each of which, of course, an endless traveling apron, molds, &c., would be employed, arranged, and operating as hereinbefore explained, and therefore I do not intend to limit myself to one delivering arrangement for the clay from the kneading-vessel.

When tiles are to be formed the plate W, through which the clay is forced from the kneading-vessel, is changed, and a plate having apertures corresponding to the shape which the tiles are to have used in place thereof, a series of openings, Z^2 Z^2, being shown in the upper portion of the plate for the forming of horseshoe tiles such as are used for drainage-pipes.

What I claim as new, and desire to secure by Letters Patent, is—

1. The mixer or kneader shaft C, having a scraper, K, at its lower end, in combination with the scraper N, when arranged together and so as to operate substantially in the manner described, for the purpose specified.

2. So arranging the scraper N that its movement can be adjusted at pleasure, substantially as and for the purpose described.

3. The arrangement of the molds V^3 in combination with the followers or plungers F^2, when so operated as to move up and down, substantially in the manner described, for the purpose specified.

4. Forming apertures in the molds, as and for the purpose specified.

5. The rock-shaft N^2, connected with the sliding arm Q^2, in combination with the lug V^2, or its equivalent, upon the rotating disk D^2, when arranged together and with the endless traveling apron U, so as to operate substantially in the manner and for the purpose described.

6. The disk D^2, having cam-shaped flanges, in combination with the molds V^3 and followers F^2, connected with the said flanges, and all arranged together so as to raise and lower the said molds and followers, substantially as and for the purpose specified.

7. Forcing the clay from the kneading-mill through openings corresponding in shape to that which it is desired to impart thereto, according as bricks, tiles, &c., are to be made from it, substantially as described, the clay as it is forced through said openings passing to the molds to be operated upon by them, for the purpose specified.

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