2 Sheets--Sheet 1.

J. K. CALDWELL.

Brick-Machine.

No. 163,299. Patented May 18, 1875.

Fig 1.

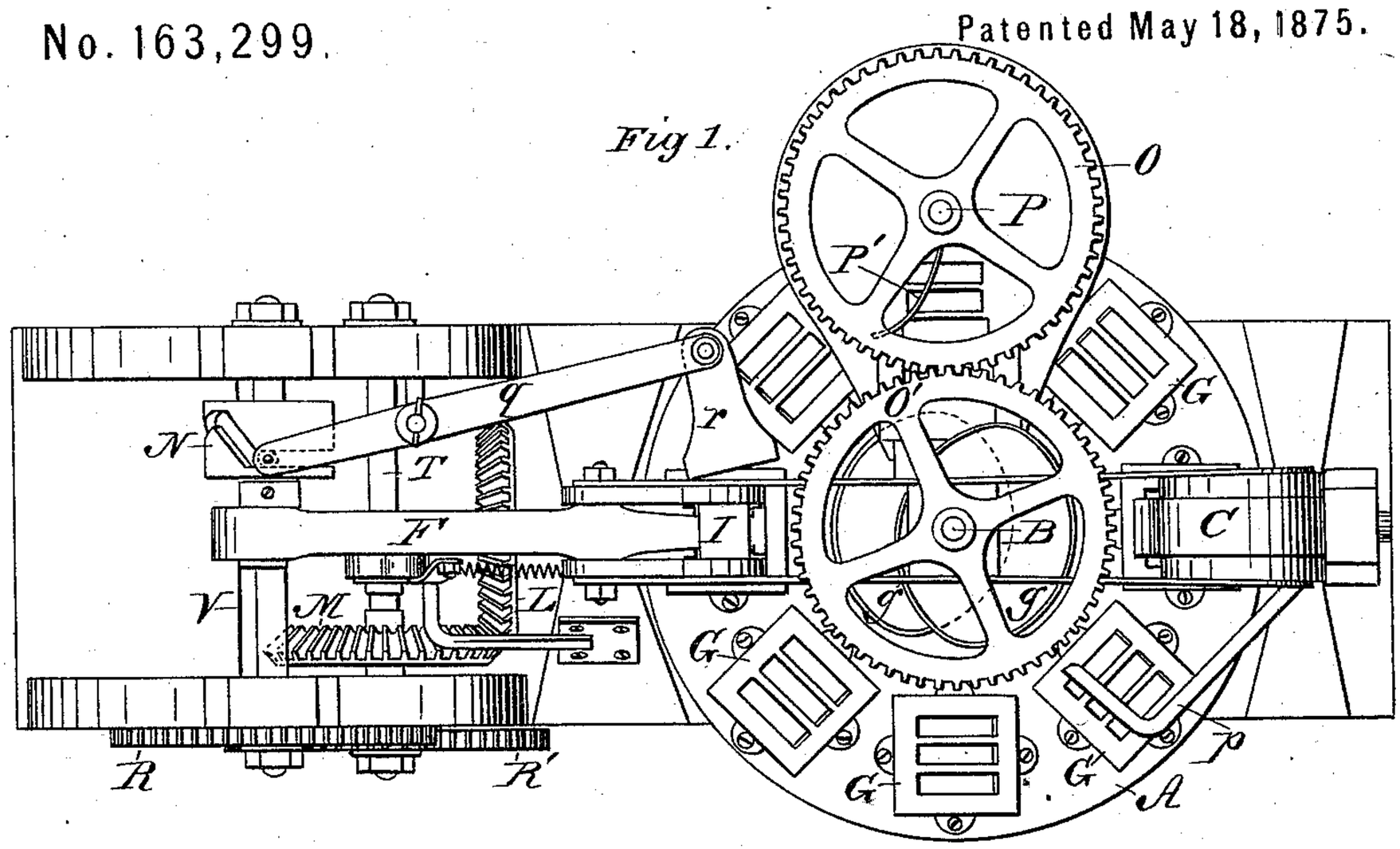
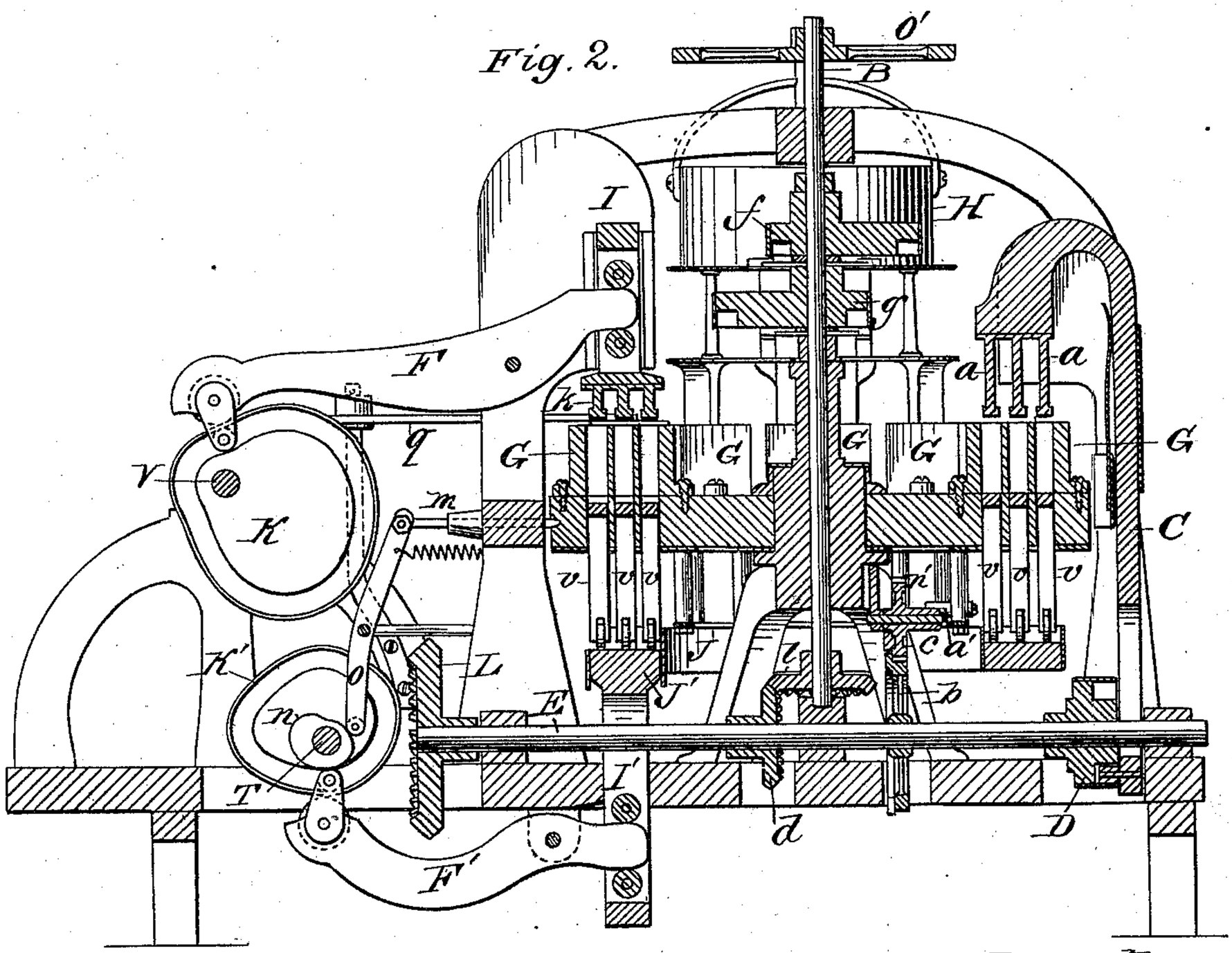


Fig. 2.



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2 Sheets--Sheet 2.

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Fig. 3.

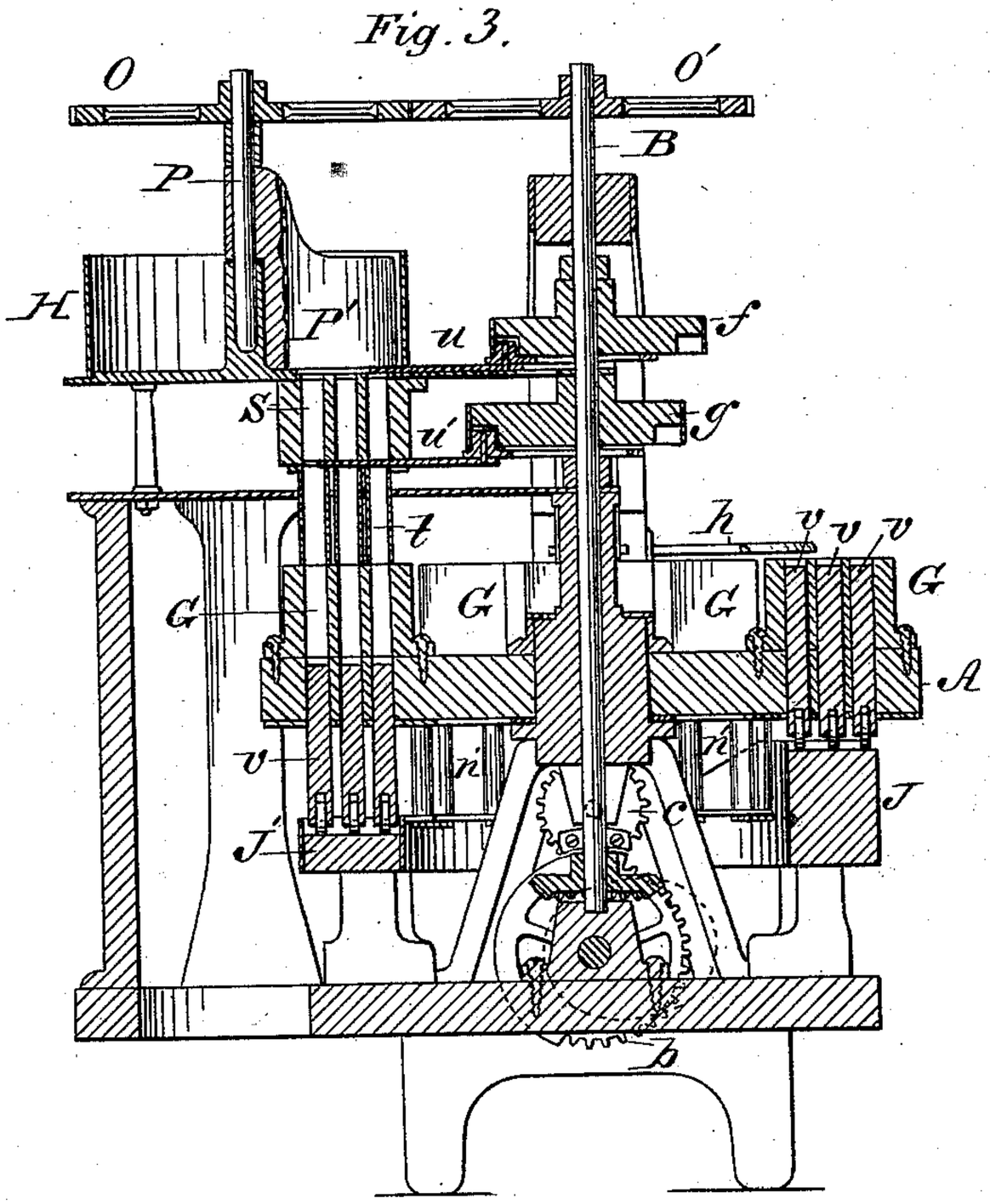


Fig. 5.

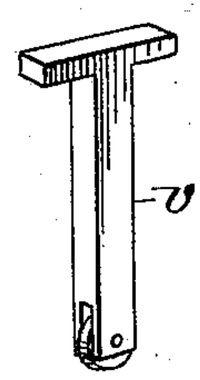


Fig. 4.

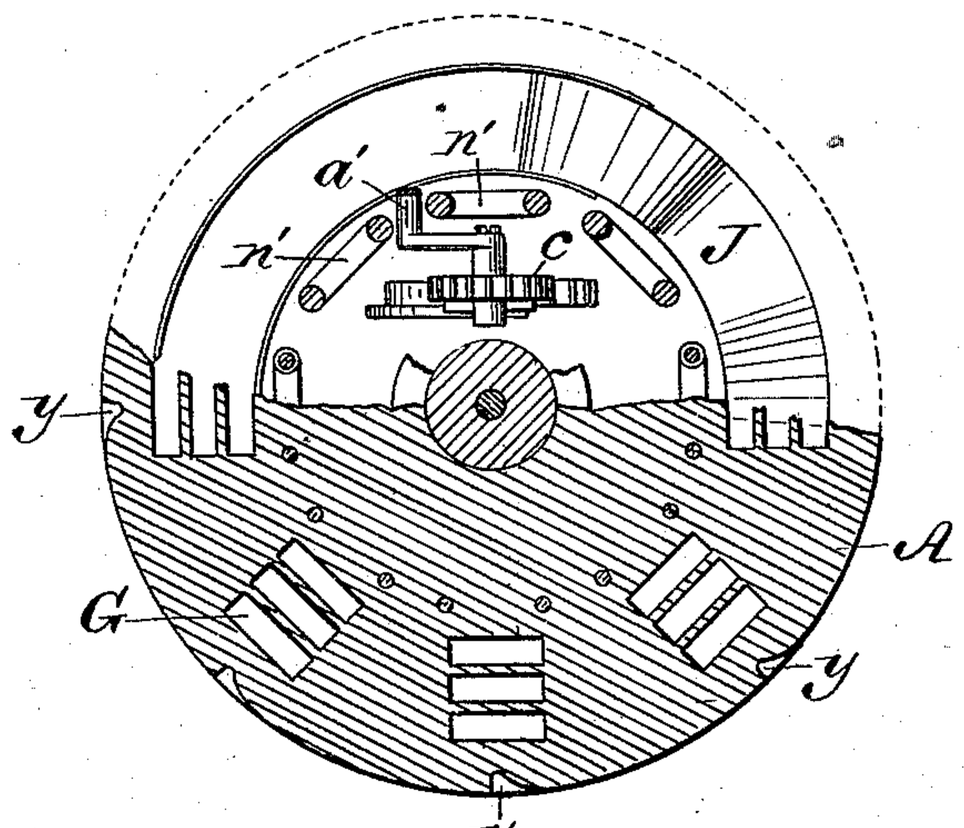
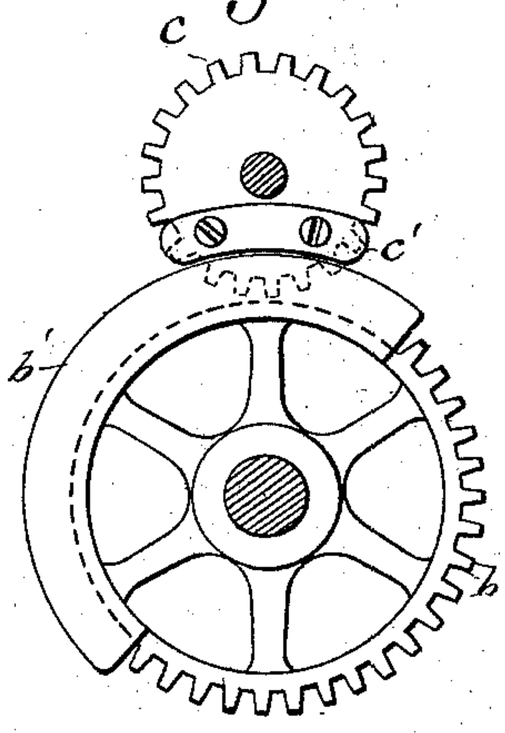


Fig. 6.



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UNITED STATES PATENT OFFICE.

JOHN K. CALDWELL, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN BRICK-MACHINES.

Specification forming part of Letters Patent No. **163,299**, dated May 18, 1875; application filed April 17, 1875.

To all whom it may concern:

Be it known that I, JOHN K. CALDWELL, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain Improvements in Brick-Machines, of which the following is a specification:

My invention relates to brick-machines; and the invention consists of certain devices and combinations of mechanism, whereby the clay is fed from the hopper to the molds through measuring-tubes, and then pressed from above and below, then removed from the molds, and the latter wiped automatically, all as hereinafter more fully described.

Figure 1 is a top plan view; Fig. 2, a vertical section; Fig. 3, a vertical section at right angles to Fig. 2. Fig. 4 is a transverse section looking from below upward; and Figs. 5 and 6 are views of portions shown detached.

Upon a central shaft, B, is mounted a rotating wheel, A, having a series of molds, G, arranged thereon, said wheel being operated intermittently by means of a wheel, *b*, on the main shaft E, this wheel *b* engaging during half its revolution with a pinion, *c*, which has a crank, *a'*, that engages with pendants *n'* projecting from the under side of the wheel A, as shown in Figs. 2 and 4. As shown in Fig. 6, the wheel *b* is provided with teeth on half its circumference only, its other half having a radially-projecting flange, *b'*, arranged to project alongside of the pinion *c*, the latter having a segment or curved projection, *c'*, on its side, arranged to fit over the edge of the flange *b'*, as represented in Fig. 6.

It will thus be seen that as soon as the teeth on wheel *b* have ceased to engage with those of pinion *c*, the flange *b'* being under the stop *c'* the pinion *c* is prevented from turning, and is held stationary until the flange has passed from under the stop, at which time the teeth again engage, and the pinion is caused to make one revolution, when it is again stopped and held as before. The crank *a'* of pinion *c* is so arranged that when it stops it lies in horizontal plane, its end resting between two of the pendants *n'*, as a consequence of which it starts and stops the wheel with a graduated motion, the maximum of motion being when the crank stands vertical, or at the time the molds are midway of their movement. By this means the sudden strain, jar, and concussion usually incident to the movements of the mold-wheel are avoided.

To assist in stopping the wheel, and locking it accurately in the desired position, a bolt, *m*, Fig. 2, is pivoted to a lever, *o*, which is operated by a cam, *n*, and made to slide at the proper instant through a post and engage in a notch, *y*, Fig. 4, in the periphery of the mold-wheel A, the movement of the parts being timed to stop the wheel when the molds G are exactly opposite the pressing-plungers *k*. Across the frame at one side are arranged two shafts, V and T, geared together by wheels R and R', as shown in Fig. 1, and, as shown in Fig. 2, each of these shafts carries a cam-wheel, K and K', which in turn operate two levers, F and F', to the inner ends of which are connected slides I and I', one above and the other below, the mold-wheel. To the upper slide I is secured a series of plungers, *k*, which enter the molds G from above. To the upper end of the lower slide I' is secured a section, J', of the inclined circular track J, which is arranged under the mold-wheel in the usual position. In the wheel, in openings below the molds G, is placed a series of plungers, *v*, having friction-rollers in their lower ends, as shown in Figs. 2 and 3, the parts being so arranged that when the wheel stops these lower plungers *v* will rest on the movable section J' of the track. The result of this arrangement is that as the cams K and K' revolve and operate the levers F and F', the plungers *k* enter the molds from above, while the plungers *v* are pressed up from below, thus applying pressure from both sides at once, and compacting the clay equally from each edge, which is found to produce much better effects than when the pressure is from one side only.

If preferred, the plungers may be arranged to operate alternately or in succession, instead of simultaneously, it only being necessary to modify the cams to do this.

I have shown the molds arranged to press the bricks edgewise, but it is obvious that they may be arranged to press them sidewise instead, if preferred.

Instead of having the molds arranged lengthwise on the wheel, they may be arranged radially if desired, the operation being the same.

As shown in Figs. 1 and 2, the main shaft E is driven by a bevel-gear, L, which engages with a bevel, M, on the lower cross-shaft T.

For the purpose of wiping the tops of the lower plungers *v*, I arrange a rigid rod or arm, *p*, Fig. 1, just above the top of the molds, and, as shown in Fig. 3, these plungers are raised by an elevation on the track J, so as to cause them to protrude slightly above the molds, as they pass under this arm *p*, which, being provided with cloth or other soft material, wipes the tops of the lower plungers clean. A short distance further on, I arrange a vertical slide, C, as shown in Fig. 2, which is raised and lowered at proper intervals by a cam-wheel, D, on the main shaft E. At its upper end, this slide is curved inward, so as to bring it directly over the molds G, and is provided with a series of plungers, *a*, which enter the molds, and wipe them out, cloth or other material being attached to these plungers for that purpose. On the opposite side, just in front of the pressing-lever F, as shown in Fig. 1, I pivot a lever, *q*, having a plate, *r*, secured horizontally to its inner end, its outer end having a stud engaging in a groove in a cam-wheel, N, by which it is made to move horizontally at proper intervals, whereby the plate *r* is made to pass between the plungers *k* and the tops of the molds G, thus wiping the face of the plungers and the molds both at one operation, it being drawn back out of the way before the plungers begin their downward movement. By these several operations, both sets of plungers and the molds are thoroughly cleaned each time they are used. In order to feed the clay to the molds in proper and uniform quantities, I arrange a hopper, H, at one side some distance above the molds, as shown in Figs. 2 and 3. Within this hopper is a rotating shaft, P, carrying a gear-wheel, O, engaging with a similar wheel, O′, on the vertical central shaft B. To the shaft P is secured a curved plate, P′, which, as the shaft rotates, is caused to move around within the hopper, thus feeding the clay, through openings in the bottom thereof, into tubes S, and from thence, through tubes *t*, into the molds G below, as shown in Fig. 3. A cut-off slide or plate, *u*, is arranged between the hopper bottom and the top of tubes S, and another slide, *u′*, is arranged between the tubes S and *t*, these slides being operated by cams *f* and *g* on the central shaft B, as shown in Fig. 3, they being so arranged as to open and close alternately. The tubes S are each of the proper size to contain the required quantity of clay for a brick, and thus the quantity of clay is measured with uniformity. By these means each brick will contain the same quantity of clay, and will be compacted with the same degree or amount of pressure, thus producing brick of a uniformity not otherwise attainable.

The machine is well adapted to be used for re-pressing brick also, it being only necessary to remove the hopper and feeding apparatus. If desired, the upper plungers may be removed, and a platen used instead to cover the top of the molds, and hold the brick in while being re-pressed, the pressure in that case being applied from below only. One great advantage of these deep molds for re-pressing brick is that the pressure may be applied to the bricks while in the lower part of the molds, and then, by shoving the bricks up through the molds, the bricks will be thereby smoothed. The same effect is also produced more or less on the bricks first pressed in the molds.

Having thus described my invention, what I claim is—

1. The combination of the stop-wheels *b c*, the latter provided with a crank, with the rotating mold-wheel A, having pendants *n′* attached, substantially as described.

2. In combination with the rotating mold-wheel A, the spring stop-bolt *m*, lever *o*, and cam *n*, all constructed and arranged to operate substantially as described.

3. The combination, in a brick-machine, of a rotating mold-wheel, one or more plungers, *k*, arranged to enter the molds from above, and the movable section J′ of the track, with one or more followers, *v*, with the mechanism for operating said plungers and followers, whereby pressure is applied to the bricks in the mold both from above and below, substantially as set forth.

4. In combination with the rotating mold-wheel, the stationary wiper *r*, the followers *v*, and the track J, having an elevation of sufficient height to raise the face of the followers above the top of the molds, whereby they are cleaned as they pass under the wiper, substantially as described.

5. The feeding apparatus, consisting of the tubes S and *t*, with the slides *u* and *u′*, and the cams *f* and *g*, all constructed and arranged to operate substantially as described, whereby the clay is fed to the molds in uniform quantities, as set forth.

6. The slide C, provided with plungers or swabs *a*, arranged to automatically enter and withdraw from the molds, substantially as described.

7. In combination with a rotating mold-wheel, carrying a series of followers, *v*, a circular track, J, having a section thereof movable vertically with the lever F′ and the cam K′, all arranged to operate substantially as and for the purpose set forth.

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