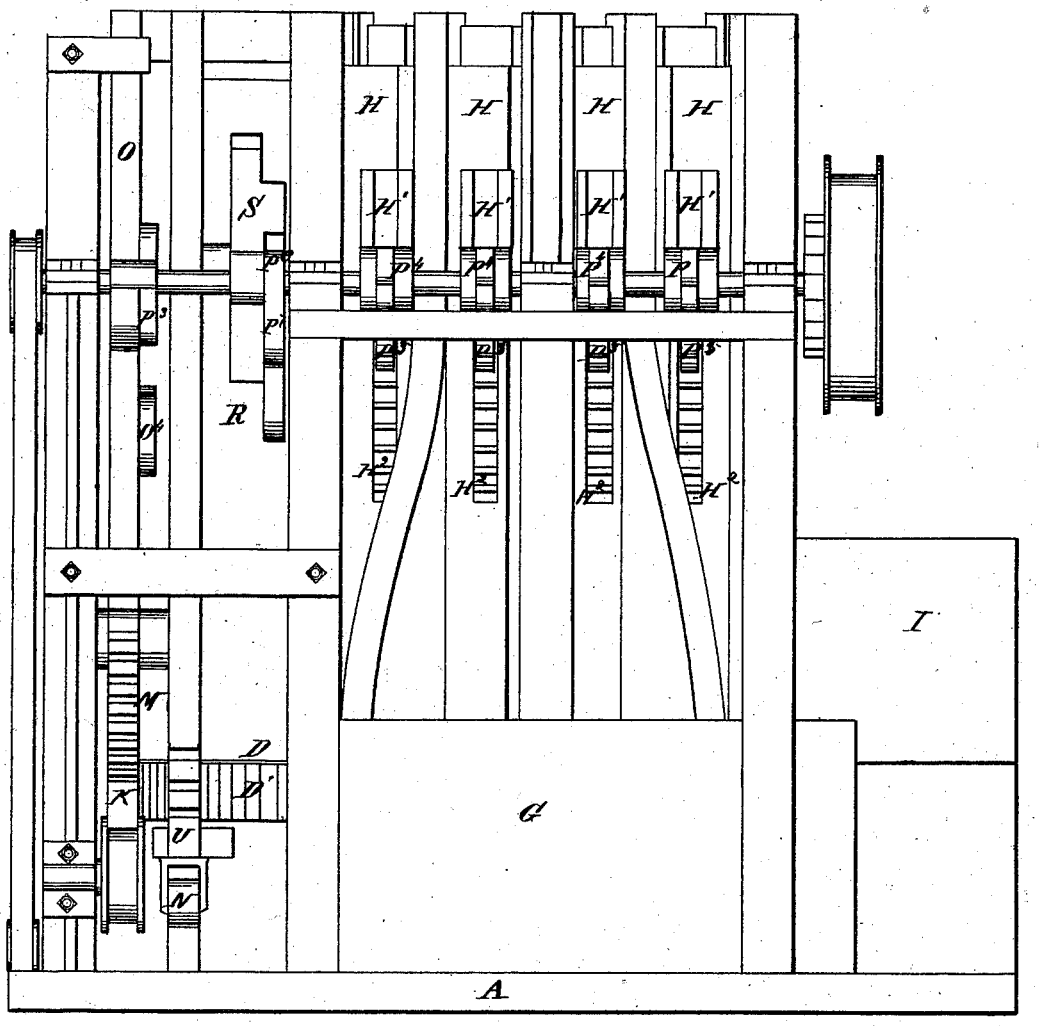
5 Sheets—Sheet 1.

# J. A. GAMEWELL.
## Brick Machine.

No. 201,515. Patented March 19, 1878.

FIG. 1.




ATTEST.

Saml. Knight
Geo. H. Knight

INVENTOR.

John A. Gamewell

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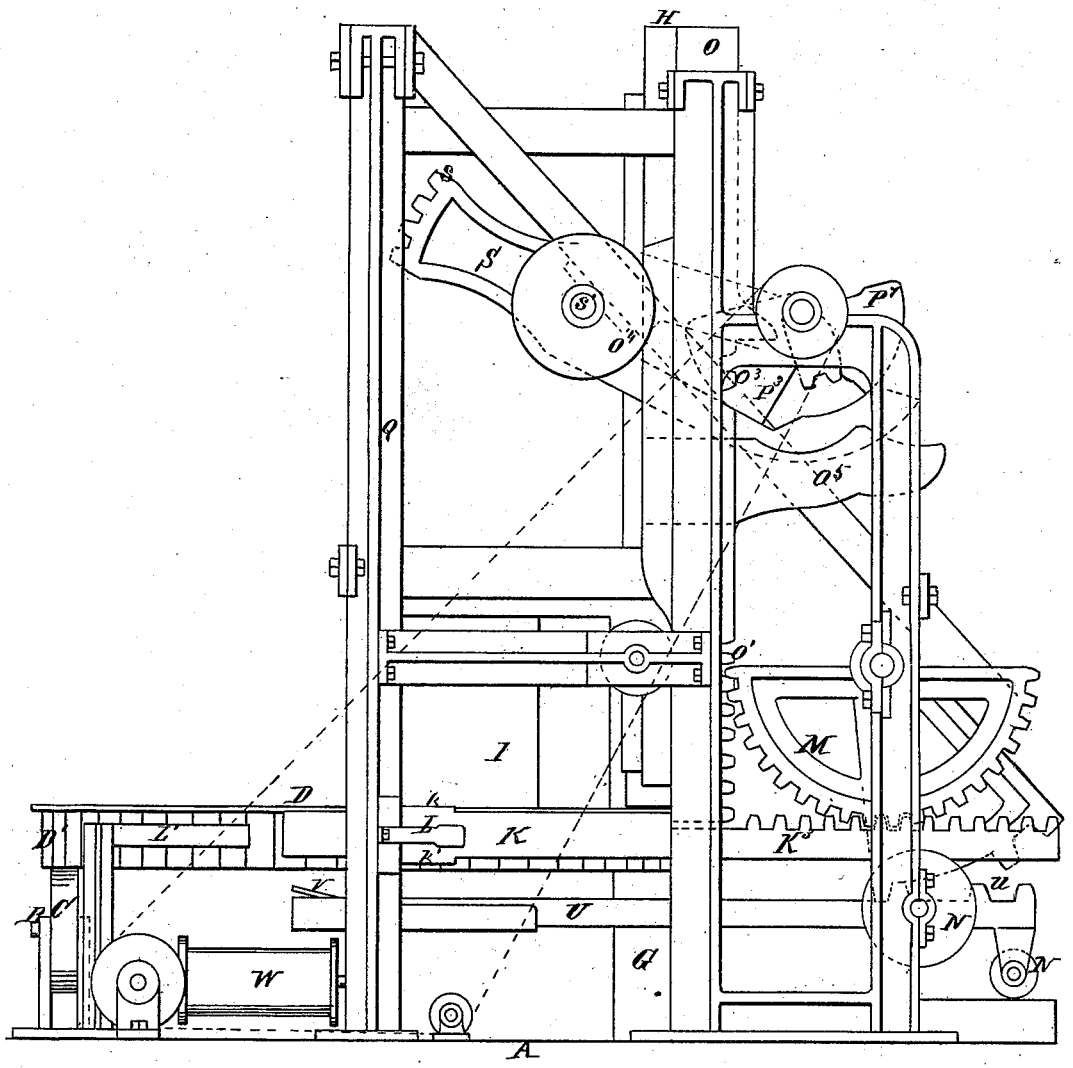
# J. A. GAMEWELL.

## Brick Machine.

No. 201,515. Patented March 19, 1878.

FIG. 2.

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Samel Knight
Geo. H. Knight

INVENTOR.

John A. Gamewell

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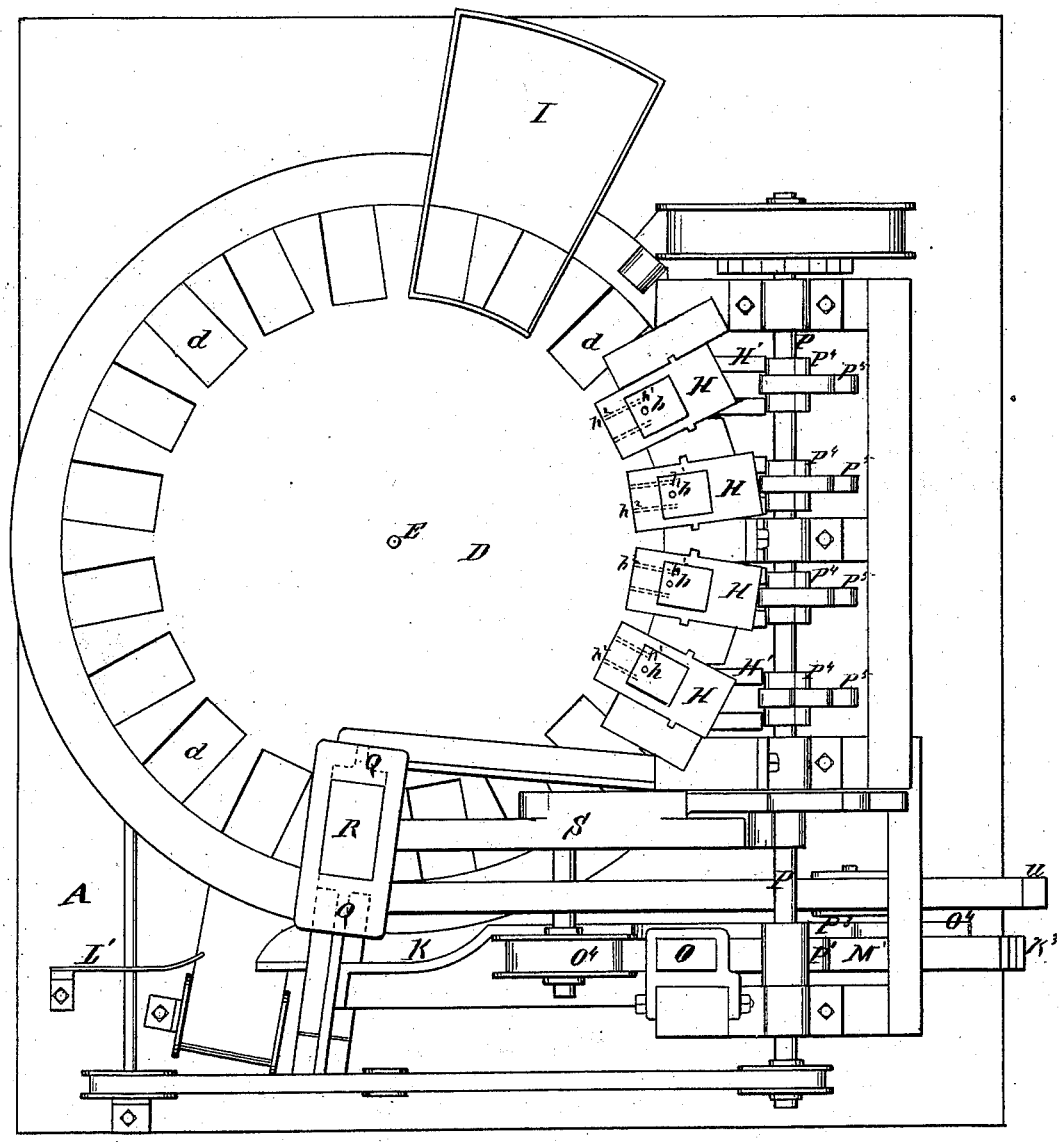
# J. A. GAMEWELL.
## Brick Machine.

**No. 201,515.** **Patented March 19, 1878.**

FIG. 3.

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Saml. Knight
Geo. H. Knight

INVENTOR:

John A. Gamewell

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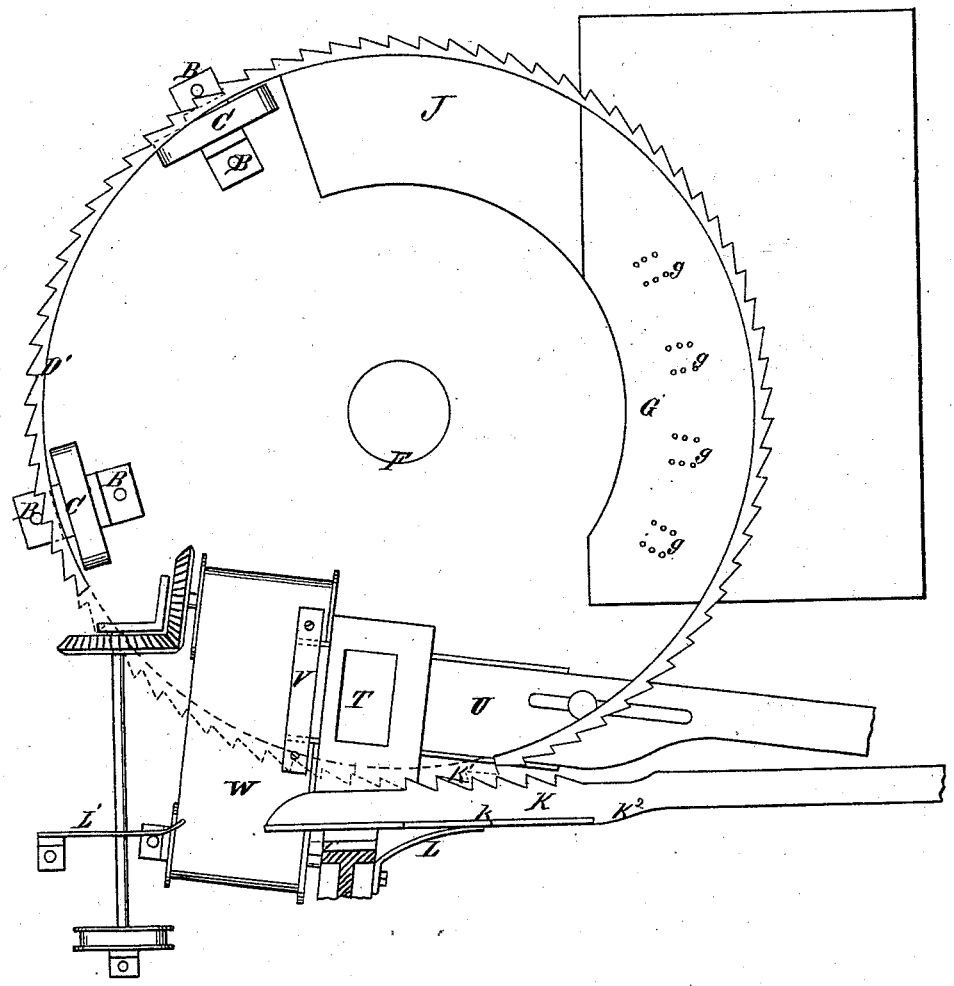
# J. A. GAMEWELL.
## Brick Machine.

**No. 201,515.** **Patented March 19, 1878.**

FIG. 4.




ATTEST.

Samuel Knight.
Geo. H. Knight.

INVENTOR.

John A. Gamewell

# J. A. GAMEWELL.
## Brick Machine.

**No. 201,515.** **Patented March 19, 1878.**

FIG. 5.

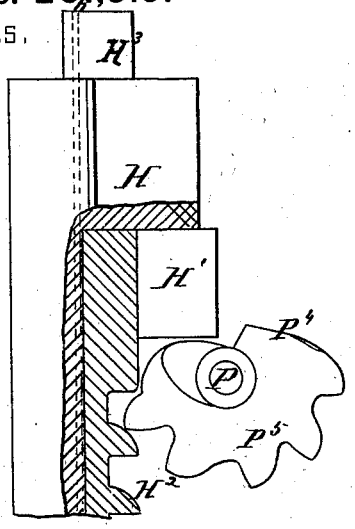



FIG. 6.

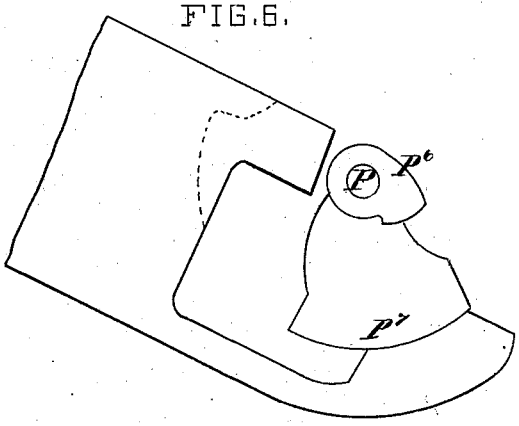



FIG. 7.

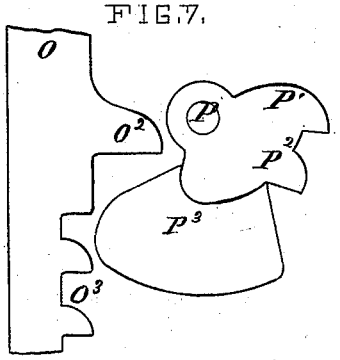



FIG. 8.

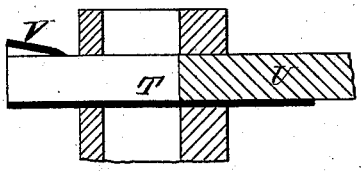



FIG. 9.

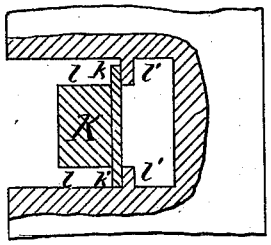



FIG. 10.

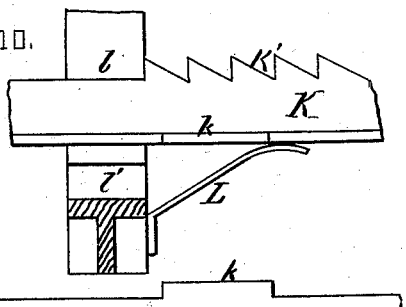
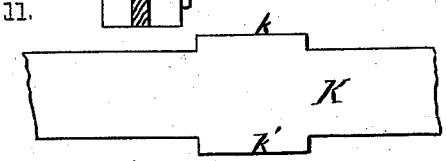



FIG. 11.




ATTEST.

Saml. Knight.
Geo. H. Knight.

INVENTOR:

John A. Gamewell

# UNITED STATES PATENT OFFICE.

JOHN A. GAMEWELL, OF ST. LOUIS, MISSOURI, ASSIGNOR OF ONE-HALF HIS RIGHT TO MARTIN ITTNER, OF SAME PLACE.

## IMPROVEMENT IN BRICK-MACHINES.

Specification forming part of Letters Patent No. **201,515**, dated March 19, 1878; application filed February 12, 1878.

*To all whom it may concern:*

Be it known that I, JOHN A. GAMEWELL, of the city of St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Brick-Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification.

The first part of my improvement consists in forming the anvil and the rams with perforations, to allow the escape of air from the clay in the molds.

The second part of my improvement consists in a ratchet upon a wheel, engaged by a pawl, which is held in engagement with the ratchet in its forward movement by a guide, and is held out of engagement with the ratchet in its backward movement, and reversed in relative position to the ratchet at the end of the strokes, by springs, one of which throws it into engagement with the ratchet, while the other throws it out of engagement with the same.

The third part of my improvement consists in the combination of the rams, arranged in a curved series, to suit the position of the molds in the circular mold-wheel, and operated by cams and cog-racks or sectors on a straight cam-shaft, as hereinafter set forth.

The fourth part of my improvement consists in providing the ram with a tappet and cog-rack, and the cam-shaft with a cam and cog-sector, engaging with the same.

The improvement also consists in the novel combinations of parts, as hereinafter set forth.

Figure 1 is a front elevation. Fig. 2 is a side elevation. Fig. 3 is a top view of the machine. Fig. 4 is a top view of the anvil and driving mechanism of the mold-wheel, off-bearing belt, and the push-bar, by which the brick is shoved upon the off-bearing belt. Fig. 5 is a side view of cam by which the rams are raised. Fig. 6 is a side view of cam for operation of mechanism for discharging the bricks from the molds. Fig. 7 is a side view of cam for operating the arm for moving the mold-wheel. Fig. 8 is a cross-section of delivering-mold, showing shaving-knife, &c. Fig. 9 is a detail cross-section of the ratchet-pawl and guides. Fig. 10 is a top plan of same. Fig. 11 is a side view of the ratchet-pawl and the guides.

A is the bed of the machine, supporting a number of pedestals, B, giving journal-bearing to rollers C, upon which the mold-wheel D rests. These pedestals may be arranged to turn on a pivot, so as to enable the rollers to be made parallel and in line with the direction in which the mold-wheel is moved in putting it into or removing it from the machine. The mold-wheel turns on a removable king-bolt, E, whose lower end enters a standard, F.

G is an anvil, underlying the part of the mold-wheel beneath the rams H, (by which the clay is compacted in the molds *d*,) the anvil forming the bottom of the molds at this place.

The anvil has perforations *g*, to allow the escape of air from the molds when the clay is being compacted therein, and to supply air beneath the bricks, to do away with the suction which checks the rotation of the mold-wheel.

Above the mold-wheel is the hopper I, and as the molds pass beneath it the pulverized earth from the hopper fills the molds. J is a table, which forms the bottom of the molds underneath the hopper, and this table is on a level with the anvil, and forms an extension of it.

The mold-wheel is surrounded by a ratchet, D′, which is engaged by a ratchet-pawl, $K^1$, on the forward movement of the pawl, to turn the wheel around the distance of one mold from another with each forward movement of the pawl.

The head of the pawl has guide-ribs *k k′*, which work in grooves *l l l′ l′*, to hold the pawl in engagement with the ratchet D′ on its forward movement, and out of contact with the ratchet on its backward movement.

The operation of the pawl K is as follows: When it is ready to move forward, it is pressed into engagement with the ratchet D′ by a spring, L, and as it moves forward the ribs *k k′* enter the grooves *l l*, and hold the pawl in engagement with the ratchet. As the pawl

$K^1$ moves forward, its end comes in contact with the spring L′; and as the ribs *k k′* leave the grooves *l l*, the spring L′ throws the pawl $K^1$ out of engagement with the ratchet D′, and holds it in this position until, on its backward movement, the ribs *k k′* enter the grooves *l′ l′;* and as the pawl moves backward, it is out of engagement with the ratchet. Before the pawl reaches its backward position, the incline $K^2$ comes in contact with the spring L; and when the ribs *k k′* escape from the grooves *l′ l′*, the spring L throws the pawl again into engagement with the ratchet D′.

The pawl-bar K has upon its rear end a cog-rack, $K^3$, which is engaged by a cog-sector, M, upon a rock-shaft, M′, to give to the pawl its endwise reciprocation. The rear end of the pawl-bar rests on a roller, N, to ease its movement.

The sector M receives its oscillating movement by a vertically-reciprocating rack-rod, O, said rod having a cog-rack, $O^1$, engaging with the sector M. The rod O has a tappet, $O^2$, and beneath it a short cog-rack, $O^3$, that are engaged, respectively, by a cam, $P^1$, and a cog-sector, $P^2$, on the cam-shaft P, to lift the rod.

The rod has an arm, $O^5$, which is acted on by a cam, $P^3$, and acts in unison with the weight of the rod to cause its descent. The rod O works against an anti-friction roller, $O^4$. The cam-shaft P carries cams $P^4$ and cog-sectors $P^5$, by which the rams H are raised, the said cams acting on tappets $H^1$, and the sectors on cog-racks $H^2$. The cams $P^4$ act to impart to the rams H their upward motion, and to draw their lower ends from the molds *d*, and the sectors act to cause the continued ascent of the rams.

Each ram is placed over one of the molds *d*, so that the rams are arranged in a curved series; and as the cam-shaft is straight, it will be seen that the tappets and cog-racks must be arranged upon the different rams, to conform to the cams and sectors upon the shaft P.

The arms work in vertical guides Q. R is a vertically-moving bar, by which the bricks are discharged from the molds, each mold in turn coming beneath the bar, and as the bar R descends into the mold it forces the brick down upon the table T. The lower end of the bar R is slightly beveled, so that it will enter the mold even if the wheel D is not in exactly the proper position, and the continued downward movement of the bar R forces the wheel to exact position, (if out of position,) and holds it in this position while the rams are descending, and while the pawl $K^1$ is making a retrograde movement.

The bar R is moved upward and downward by a lever, S, whose forked toe *s* engages in the bar. The lever S works on a fulcrum, *s′*. Its rear end is engaged by cams $P^6$ and $P^7$ upon the cam-shaft P, to impart to it its oscillatory movement.

The brick is pushed from the table T by sliding bar U, and passes beneath a knife, V, that reduces all the bricks to a uniform thickness. The bricks pass from the table upon an off-bearing belt, W, driven by cog-wheels and belt, as shown, or by any other suitable means. At the rear end of the bar U is a rack, *u*, which is engaged by a cog-sector on the rock-shaft M′, to give the required motion to the bar U. The rams are made with tubes *h*, extending centrally their whole length, and ending at the lower end in a number of small orifices, $h^1$, through which the air escapes upward from the mold. $h^2$ are side orifices extending from the central bore to the outside of the rams above the molds.

It will be observed that the molds *d* are not provided with followers, (forming the bottom of the molds, as usual,) but that the molds are open at bottom, except when passing over the tables T and J and anvil G, and the bricks are discharged through the bottom of the mold at the proper time by a bar, which also acts as a means of holding the mold-wheel in exact position, (and first placing it in that position, if necessary.)

Extensions of the rams are shown at $H^3$, to receive weights, to adapt them to the different kinds of earth upon which the machine is operating.

The operation is as follows: The hopper is supplied with pulverized clay, which descends into the molds and fills them. The mold-wheel is turned intermittingly the distance from one mold to another, and each mold is in turn carried beneath each of the rams, and thus the contents of each mold receives four blows. As the mold is carried around it reaches the discharging-bar R, and the brick is forced downward out of the mold and upon the table T, from whence it is pushed upon the off-bearing belt.

The mechanical appliances for causing the movement of the parts acting directly upon the bricks have been fully described in the body of the specification.

What I claim herein as new and of my invention is—

1. The drop-rams provided with air-holes *h*, combined with the anvil, provided with air-holes *g*, and the bottomless and topless molds, substantially as set forth.

2. The combination, with a wheel provided with a ratchet, D′, of pawl $K^1$, working in guide-grooves *l l′*, and transferred from groove to groove at the ends of the strokes by springs L L′, substantially as set forth.

3. The combination, with rams H, standing in a curved series and operated by a cam-shaft common to all the rams, of the inclined tappet and racks, made to conform in inclination and position with the cams and sectors on the shaft, substantially as set forth.

4. The combination, with the rams having combined tappet $H^1$ and rack $H^2$, of the cam $P^4$ and cog-sector $P^5$ on shaft P, substantially as and for the purpose set forth.

5. The combination of cam-shaft P, operating the rams, with the cams $P^6$ $P^7$, lever S, bar R, and mold-wheel D, substantially as and for the purpose set forth.

6. The combination of wheel D with the ratchet D′, pawl $K^1$, engaging said ratchet, a cog-sector, M, engaging rack on pawl-bar K, with a rod, O, operated by cams upon the shaft P, which also operates the rams, substantially as set forth.

JOHN A. GAMEWELL.

Witnesses:

SAML. KNIGHT,

GEO. H. KNIGHT.