(No Model.)

5 Sheets—Sheet 1.

F. L. H. SIMS.

BRICK MACHINE.

No. 457,381. Patented Aug. 11, 1891.

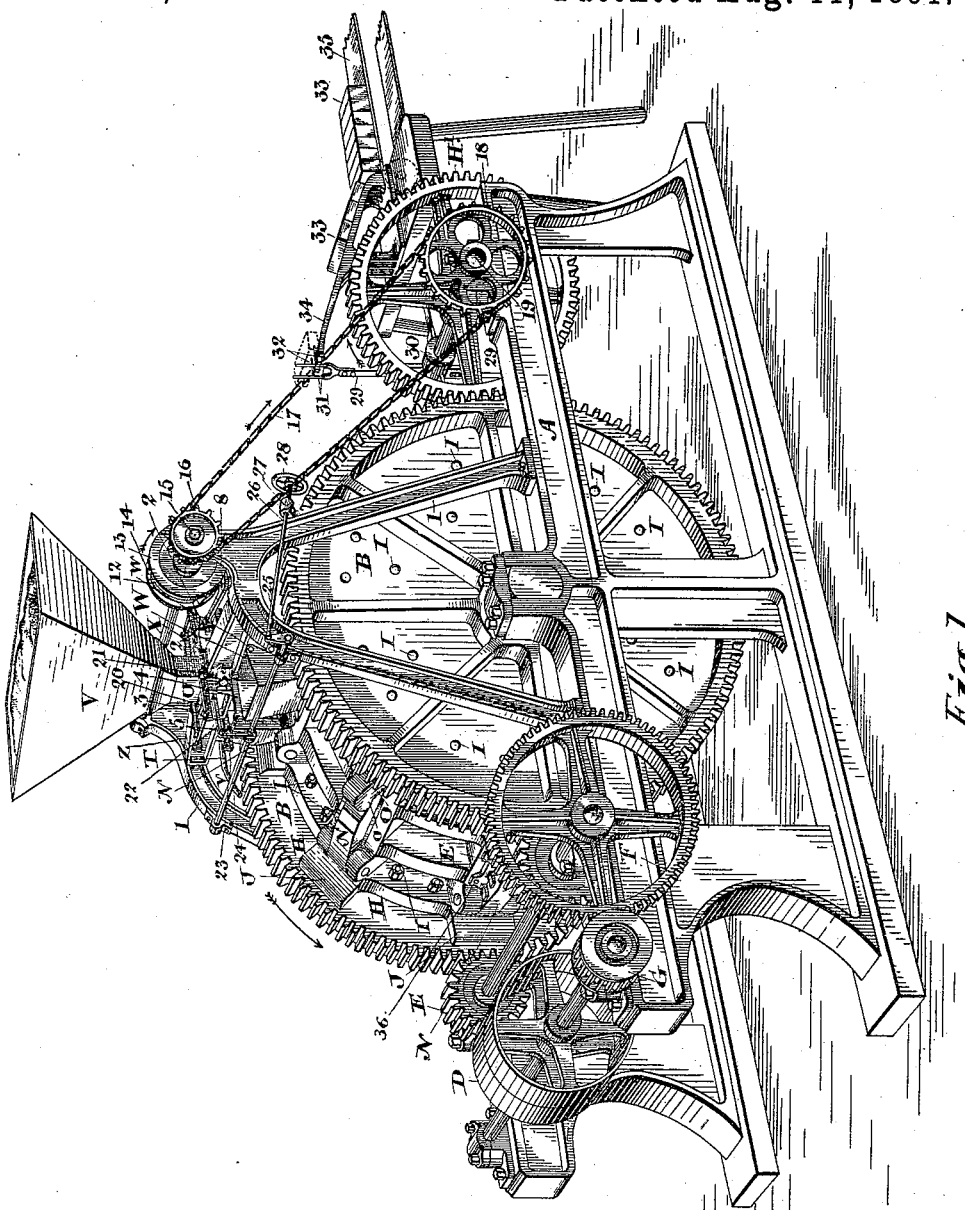

Fig. 1.

Witnesses.
Henry Spratt
John A. Pearson

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by Fetherstonhaugh & Co.
Attys

(No Model.) 5 Sheets—Sheet 2.

F. L. H. SIMS.

BRICK MACHINE.

No. 457,381. Patented Aug. 11, 1891.

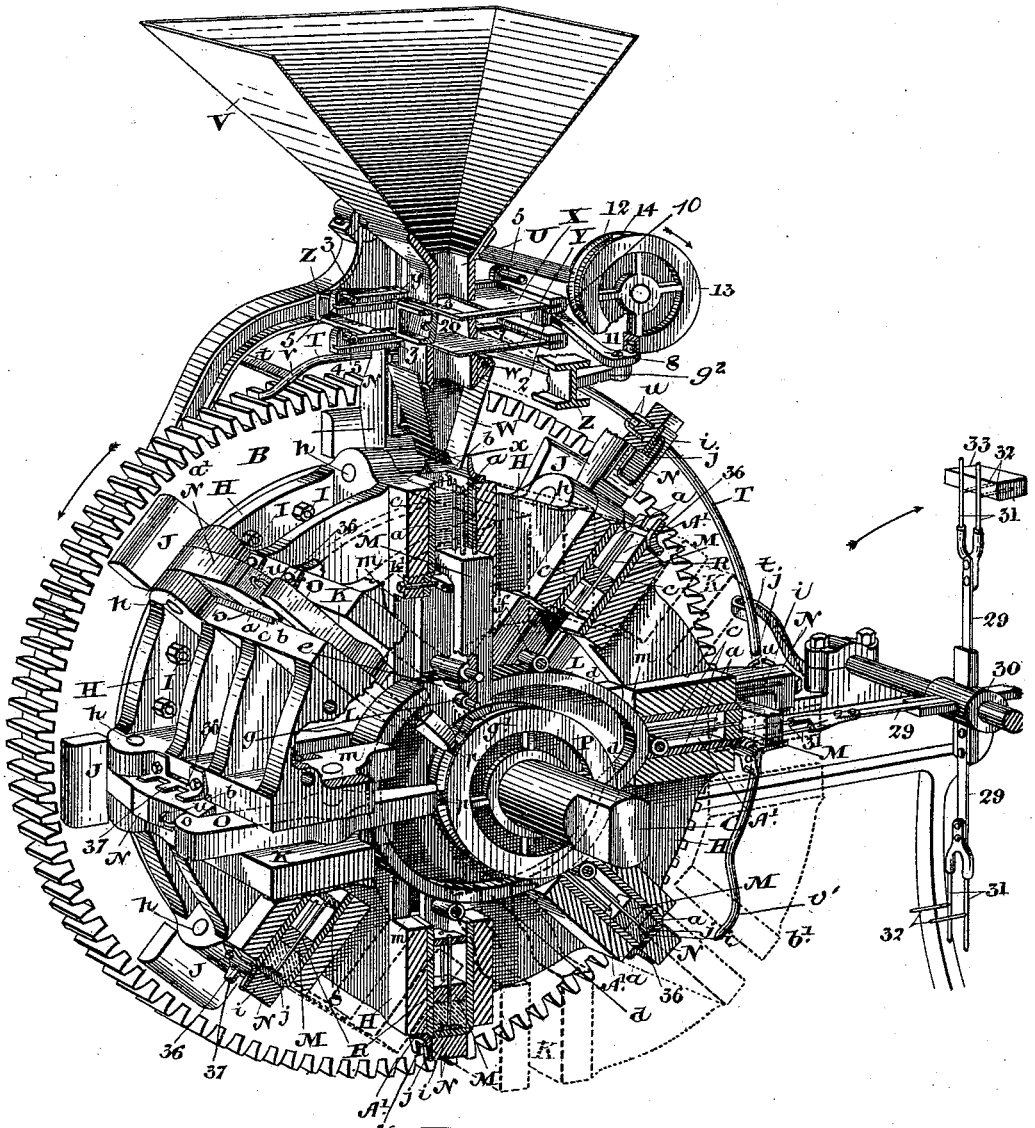

Fig. 2.

Witnesses.
Henry Sproatt.
John A. Pearson.

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Atty.

(No Model.) 5 Sheets—Sheet 3.

F. L. H. SIMS.

BRICK MACHINE.

No. 457,381. Patented Aug. 11, 1891.

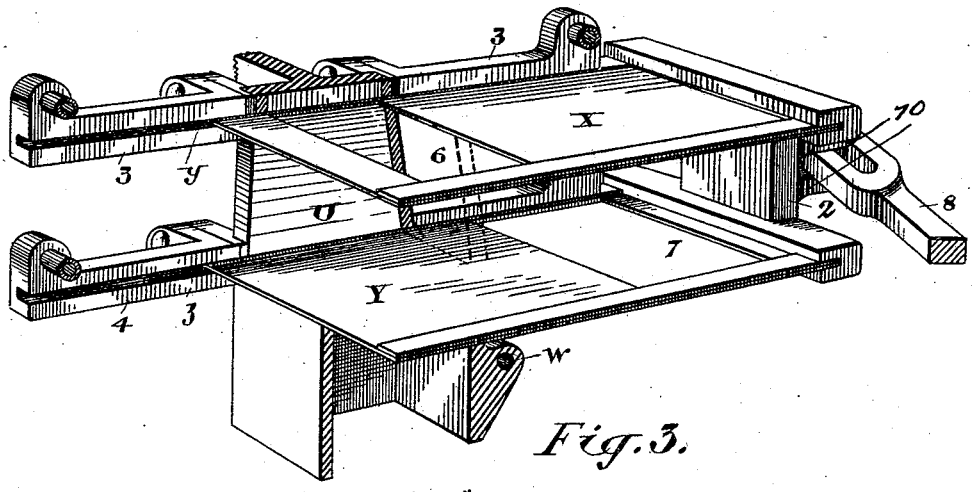

Fig. 3.

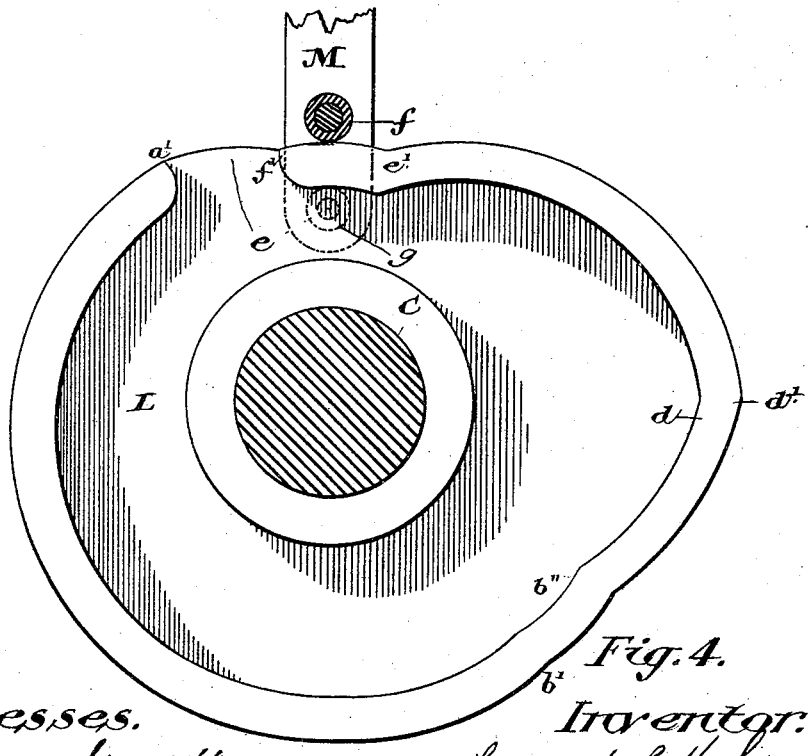

Fig. 4.

Witnesses.
Henry Sproatt
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(No Model.)

5 Sheets—Sheet 4.

F. L. H. SIMS.

BRICK MACHINE.

No. 457,381. Patented Aug. 11, 1891.

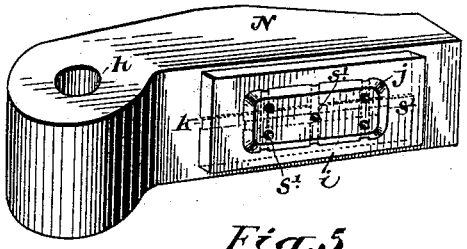

Fig. 5.

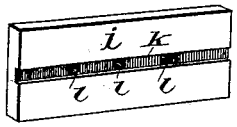

Fig. 5b

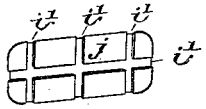

Fig. 5a

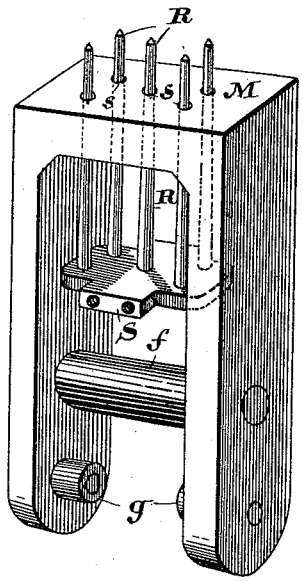

Fig. 6.

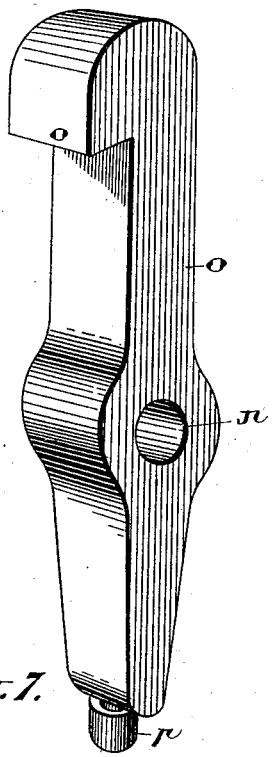

Fig. 7.

Witnesses.
Henry Sproatt
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(No Model.) 5 Sheets—Sheet 5.

F. L. H. SIMS.

BRICK MACHINE.

No. 457,381. Patented Aug. 11, 1891.

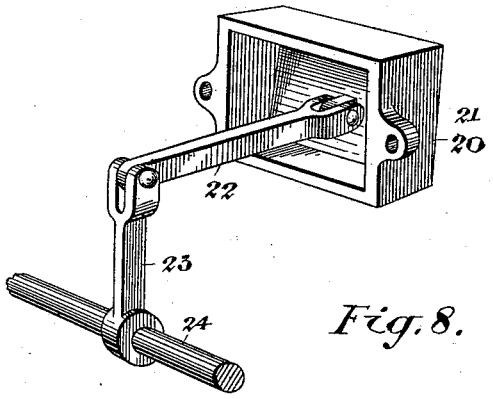


Fig. 8.

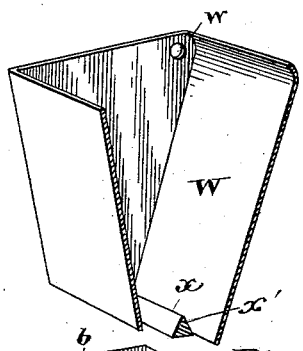


Fig. 11.

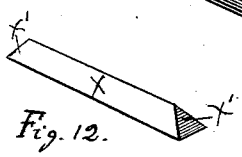
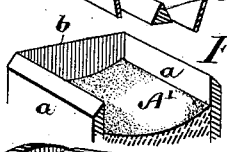


Fig. 12.



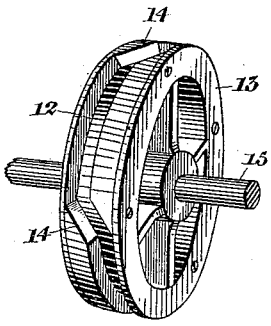


Fig. 9.

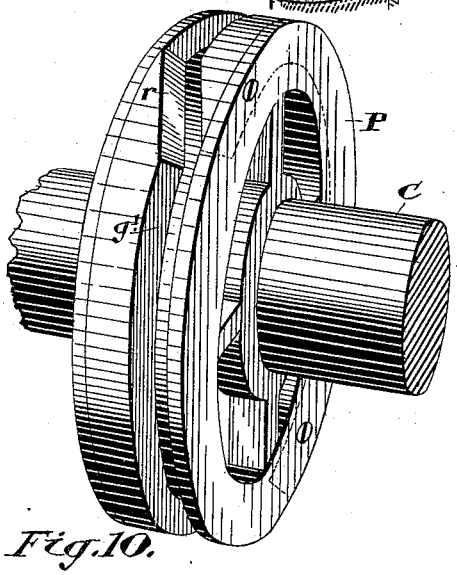


Fig. 10.

Witnesses.
Henry Sproatt
John A. Pearson

Inventor:
Frederick L. H. Sims
by Fetherstonhaugh & Co
Attys

UNITED STATES PATENT OFFICE.

FREDERICK LINDLEY HUNT SIMS, OF TORONTO, CANADA.

BRICK-MACHINE.

SPECIFICATION forming part of Letters Patent No. 457,381, dated August 11, 1891.

Application filed August 6, 1890. Serial No. 361,208. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK LINDLEY HUNT SIMS, manufacturer, of the city of Toronto, in the county of York, in the Province of Ontario, Canada, have invented certain new and useful Improvements in Brick-Machines, of which the following is a specification.

The object of the invention is, first, to design a machine for making dry-pressed bricks in which the bricks are pressed in molds which rotate around a stationary shaft; secondly, to provide suitable mechanism for feeding the clay into the molds in any desired quantity, and, thirdly, in arranging a suitable device for receiving and delivering the bricks, the operation of feeding, pressing, and delivering mechanism being automatic and simultaneous; and it consists, essentially, first, of two large gear-wheels, which revolve on a stationary shaft secured in suitable bearings on the main frame of the machine and are driven from suitable driving-gear, the said gear-wheels having a series of molds located between them, which molds are formed at equal distances apart between the sections of an octagonal or other equal-sided open frame and are provided with lids and plungers, between which the bricks are pressed, each lid being held down during the process of pressing and afterward relieved by a locking-lever operated from a stationary wave-cam on the main shaft and each plunger being operated from a stationary cam keyed to the main shaft, the periphery of the cam being formed of Archimedean spirals and operating so that the direction or resultant of the pressure is practically parallel to the sides of the molds or radius of the circle; secondly, of a spout the upper part of which has secured to it the hopper for receiving the pulverized clay, and the lower part has connected with it a swinging funnel for directing the clay into the molds, while intermediately situated betweeen the top and bottom of the spout are located the gates for measuring and depositing the clay, which gates are connected to and operated from a revolving cam, deriving motion by a suitable arrangement of gearing from the main driving-shaft of the machine, and, third, of the pick-off arms which are fixed to a counter-shaft which derives motion through a suitable system of gearing, the said pick-off arms being designed to receive and deliver each brick upon an inclined table, from which they are automatically transferred onto an endless belt, substantially in the manner hereinafter more particularly explained.

Figure 1 is a general perspective view of my brick-machine. Fig. 2 is a perspective view, partially in section, with one of the large gear-wheels removed to exhibit connection of feeding, pressing, and delivering mechanism. Fig. 3 is a view of the feed-regulating gates, the feed-spout being broken away. Fig. 4 is a side elevation of cam for operating the plunger. Fig. 5 is a detail of the mold-door. Fig. 5^a is a detail showing the plate for forming the depression in the brick reversed to exhibit air-ducts. Fig. 5^b is a reverse view of plate which fits into the mold, showing air-ducts. Fig. 6 exhibits the plunger with core-rods in position. Fig. 7 is a detail of locking-lever. Fig. 8 is a view of the feed-regulating mechanism. Fig. 9 is a detail of wave-cam for operating feed-gates. Fig. 10 is a detail of wave-cam for adjusting the locking-lever. Fig. 11 is a detail showing funnel and mold and the means for directing the clay into the molds. Fig. 12 is a detail of the metal dividing-piece for bottom of the funnel.

In the drawings like letters and figures of reference indicate corresponding parts throughout the several views.

A is the main frame of the machine; B, the large gear-wheels, and C the stationary shaft on which the large gear-wheels B revolve. The shaft C is held in suitable bearings in the frame A, as indicated. The gear-wheels B are driven from the main driving-pulley D by a system of gearing E E, F, and G.

H are open sections of equal size, forming an octagonal frame. Each section H is held to the gear-wheels B by the bolts I, and the whole frame being held between the lugs J, formed on the inner face of the gear-wheels B, the strain is consequently removed from the bolts I.

a are the side plates, and *b* the end plates, of the molds. The end plates *b* extend across the space K between the sections H into the

recesses *c*, cut in the sections H. The side plates *a* fit into the recesses *c*, which are of corresponding depth between the end plates *b*.

L is a cam, the peripheral ring *d* of which is formed on Archimedean spirals of suitable decreasing proportion to operate the plungers M, which press the clay into the molds. The ring *d* extends from both sides of the center web and has an opening *e* at the top, so as to allow of the plungers being inserted in position or removed from the molds. The ring *d* is further constructed as shown in Fig. 4. From *e'* to *f'* the curve follows the circle drawn from the center of the stationary shaft C, in order to allow the plunger to remain stationary in the mold during the time the clay is being deposited. From the point *f'* to the point *a'* the sweep of the cam diverges quickly from the center, so as to throw the plunger rapidly toward the top of the mold, in order to instantaneously eject the air located between the door N and the clay, as herinafter described. From the point *a'* commences the gradual increasing curve of the Archimedean spirals till the point *b'* is reached, where a depression *b''* is made in the cam-ring *d*, so as to allow the door N and the lever O to fly open without any undue strain. From the depression *b''*, at which the brick is formed, the cam-ring *d* extends farther out from the center till the point *d'* is reached, when the cam-ring *d'* returns gradually toward the center till the curve between the points *e'* and *f'* is reached, between which points the plunger remains stationary, as before described.

The sections H have recesses *m* cut in each to allow of their free passage around the cam L.

The plungers M have rollers *f*, which revolve on spindles extending between the legs of the plungers, each roller of which travels around the entire periphery of the cam during the time the mold receives the clay, presses and delivers the brick, and returns to the top of the cam ready to receive the next deposit of clay.

g are friction-rollers situated one on each side of the web of the cam L and held in the ends of the legs of the plungers M. The friction-rollers *g* follow the inner surface of the cam-ring *d*.

N are the doors of the mold, which are hinged at one end at *h* in the spaces K. Each door N has secured to it a plate *i*, on which plate is secured another plate *j*, designed to form the depressions in the brick. In the back of the plate *j* I cut grooves *i'*, which extend from end to end and from side to side, as shown in Fig. 5ª. In the back of the plate *i* I also cut a groove *k*, which communicates with the grooves *i'* by the holes *l* at their points of intersection. The plate *i*, when the door N is brought down, extends into the mold A', and consequently when the clay is being pressed between the plungers M M the air is permitted to escape through the air-ducts formed of the grooves *i'* and *k* and holes *l*.

The door N when closing strikes any suitable receiving-cushion on the section H, by which cushion it is supported a sufficient distance from the top of the mold to allow the edges of the plate *i* to project a little above the top of the mold, so as to allow of the escape of the air through the grooves *i' k*. It will be seen from the situation of the grooves *i'* and *j* and holes *l* that the shape of the bricks will not be affected, and perfect air-ducts are provided to permit the escape of the air, thus relieving the door N and plunger M from all unnecessary strain while the clay is being pressed.

In order to provide an effective means of securing the door N in position during the process of pressing the clay, I provide a locking-lever O, which has a catch *o* formed at one end, which is designed to fit over the outer edge of the door N. The locking-lever O is pivoted at *n* in the space K between the sections H. The other end of the lever O is provided with a friction-roller *p*, which runs in the groove *g'* in the stationary wave-cam P, which is securely keyed to the main shaft C. The groove *g'* has two waves *r* in its circumferential length, one at the upper portion of the cam and one at the lower, the wave at the upper portion being designed to throw out the end of the lever O, in which is placed the friction-roller *p*, so as throw the catch *o* at the opposite end of the lever O over the end of the door N, and thus securely lock the door by keeping the friction-roller *p* in that portion of the groove remote from the main cam L during the process of pressing until the roller *p* reaches the reverse wave *r* at the lower portion of the cam, which wave then throws the friction-roller *p* into the portion of the groove near the main cam L, thus throwing that end of the lever O inwardly and removing the catch *o* from over the end of the door N at the point of rotation of the mold at which the brick is completed. (See Figs. 2 and 10.)

R are core-rods designed to make perforated bricks and tapered, as shown, in order to permit the brick to be easily ejected from the mold. The lower ends of the core-rods R are secured in the plate S, while the upper ends extend through the holes *s*, made in the top of the plunger M. The top of the rods R are cone-shaped and fit into corresponding recesses *s'*, made in the plate *i*. The plate S is secured in a stationary position in the space K between the sections H by the set-screws *k'*, and is of such a size as to permit of the free up-and-down movement of the plunger M, between the legs of which it is situated. (See Figs. 2 and 6.) When the plunger M is forced out into the positions corresponding in both Figs. 2 and 6, the projection of the rods R above the top of the mold corresponds to the depth of the brick.

T is a curved guide-rod supported at *t* on

the frame of the machine and extending partly around the octagonal frame behind the circuit traveled by the back of each door N when thrown open.

u are curved fingers secured to the back of the door and designed to encircle the guide-rod T and hold the door N open and back from the mold from the point from which the brick is completely pressed until it reaches the point where it is required to be shut and locked for the pressure of the next brick. Immediately before the door N opens the curved fingers *u* encircle the bent end *v'*, which extends outwardly and upwardly to the main concentric curve of the rod T, which rod being now encircled by the fingers *u*, the door N assumes a position at right angles to the main shaft and rotates in the direction indicated by the arrow until the curved fingers *u* reach the bent end *v*, which extends outwardly and downwardly to a point in proximity to the mold, and which, as the curved fingers *u* pass over it, throws the door N gradually down, so that when the door N passes the end of the rod it will fall gently on the top of the mold and be then locked in position by the lever O, as before described.

U is the feed-spout, which is oblong in form and has secured to the top of it the hopper V to receive the clay. The feed-spout U forms part of the cross-piece Z, which is supported on the supplemental frame 1. On the bottom of the feed-spout U, I pivot on one side at *w* the swinging funnel W.

x is a triangular prismatic piece of metal with beveled ends *x'* secured lengthwise across the center of the open bottom of the funnel W. The apex of the piece *x* is placed at the top, so as to divide the clay as it falls and throw it into the mold in concaved form, as indicated in Fig. 11, instead of flat, as is usually the case.

X and Y are the upper and lower measuring-gates connected together by the cross-piece 2. The gates X and Y run in grooves *y* and *z*, made in the side walls of the feed-spout U and extending to the outside of the brackets 3 and 4, which are firmly bolted to the cross-piece *z*, and are held apart at their outer ends by the rods 5. The upper gate X has an opening 6 cut in it at its outer end, corresponding to the inner width and length of the spout, so as to allow the clay to drop freely upon the closed portion of the lower gate Y.

7 is an opening cut in the opposite end of the gate Y from that in which the opening 6 is cut in the upper gate X and corresponding to the inner width and length of the spout at this point, which is materially widened and lengthened from the level of the gate X to the level of the gate Y, as indicated in Figs. 2 and 3, so that when the gates are thrown in, so as to allow the sides of the opening 7 to be flush with the sides of the feed-spout U, the clay will drop freely into the funnel W, by which, as before described, it is deposited in the mold.

8 is a crank-lever, which is pivoted on the arm g^2, extending out from the cross-piece Z. The end of the long arm of the lever 8 is connected at the jaws 10 of the cross-piece 2 of the gates. The end of the shorter arm of the lever 8 has a friction-roller 11 pivoted on its end, which friction-roller runs in a groove 12 in the wave-cam 13, which revolves in the direction indicated by arrow. (See Figs. 1 and 2.)

14 are four waves formed in the groove 12, each succeeding wave of which is designed to throw the friction-roller 11 in the opposite direction in the groove to the one preceding it, and consequently as one wave 14 throws the friction-roller 11 out the long arm of the lever 8 is also thrown out and the gates X and Y adjusted so as to receive the clay, and as the next succeeding wave 14 throws in the friction-roller 11 the long arm of the lever 8 is also thrown in and the clay measured and deposited in the mold.

The wave-cam 13 is keyed to the countershaft 15, which is supported in suitable bearings in the supplemental frame 1 and has a sprocket-wheel 16 secured at one end.

17 is a sprocket-chain connecting the sprocket-wheel 16 with the sprocket-wheel 18 on the pick-off shaft 19, on which is secured the gear-wheel H', which meshes with the large gear-wheel B, above described, and from which system of gearing the wave-cam 13 is driven.

The system of gearing above described is so arranged relatively to the large gear-wheel B that the wave-cam 13 is timed to make a semi-revolution during the period the clay is fed into one mold and the next mold is brought beneath the funnel W. The gates X and Y remain stationary a sufficient time to receive the clay, as the friction-roller 11 is then running in the outer straight portion of the groove 12; but when the roller reaches the next wave 14 it is directed into the straight portion of the groove 12, where it remains stationary a sufficient time to measure and deposit the clay requisite for a brick in the mold. During the time the clay is falling down on the lower gate Y, which then extends across the feed-spout U, the next mold is brought around under the funnel W to receive the deposit of clay.

20 is a plate which fits into and forms one side of the feed-spout U. The plate 20 is placed between the gates and slides on suitable supporting-rods 21. The plate 20 is designed to regulate the amount of clay it is desired to press to form a brick.

22 is a rod connected at the inner end to the plate 20 and at the outer end to an arm 23, secured on the spindle 24.

25 is an arm secured on the outer end of the spindle 24 and connected to the screw-spindle 26, which is threaded through a sleeve 27, secured on the supplemental frame 1. The

screw-spindle 26 has a hand-wheel 28 secured on its outer end, as indicated.

It will now be seen that in order to regulate the amount of clay it is desired to have formed into a brick, it is merely necessary to turn the hand-wheel 28 to the right or the left, when the space between the gates X and Y will be increased or decreased at the will of the manufacturer.

29 are spring-arms secured to the hub 30 on the pick-off shaft 19.

31 are two fingers suitably secured on the ends of the spring-arms 29.

32 are supplemental fingers extending from the fingers 31 and at right angles to them. The fingers 31 and 32 are designed to receive and hold the brick 33, and are so timed that as the spring-arms 29 revolve around each set of fingers comes to the horizontal just beneath the level of the mold and receives the brick 33 side upward as it is being forced out of each mold by the plunger M. The fingers 32 at the time the fingers 31 are horizontal form a stop to prevent the brick being forced off. As the arms 29 revolve, they carry with them the brick 33, which gradually shifts its position until the arm 29 reaches the perpendicular, when the brick rests on its top face. As the arm 29 continues to revolve, it passes the curved ends of the inclined plane 34, which is made in three sections, so as to allow the two fingers to pass through the two spaces between the curved ends of the sections and thus leaves the brick upon the inclined table. As each brick is left on the inclined plane 34, it follows that as the curved end is in the path of the fingers each succeeding brick will push each preceding one ahead until the first brick reaches the end of the inclined plane 34, which being rounded off permits the brick to drop down upon the endless traveling belt 35, which conveys it into the kiln. The belt 35 travels just fast enough to permit the bricks to lie at suitable distances apart.

36 is a bracket which is bolted to each section, and is designed to gradually push the swinging funnel W, which normally hangs out of the perpendicular, into the perpendicular, and then out of the perpendicular in the opposite direction as it passes, so as to give the funnel W the longest time possible over the mold, and thus insure the complete delivery of the clay and further help to distribute the clay equally in the mold. The bracket 36 further serves as a rest for the completed brick when it is ejected from the mold. The bracket 36 has three fingers 37, between the two spaces of which the fingers 31 pass and receive the brick as they revolve.

Having now described the principal parts involved in my invention, I shall now briefly describe their operation. The pulverized clay is fed into the hopper V, and from thence passes into the feed-spout U, in which it is measured by the gates X and Y and drops down through the funnel W into the mold. By the time this mold has received its supply of clay the driving-gear has brought the wheel B around in the direction indicated by the arrow till it comes opposite the bent end *v* of the curved guide-rod which supports the door N, at which point the door N of the mold is released and drops down and covers the top of the mold A′. Immediately after the catch *o* of the locking-lever O is brought over the end of the door N by the friction-roller *p*, passing from the wave *r* into the outer part of the groove *g′* in the stationary wave-cam P, and the door is securely locked in position. The plunger M is now forced by the cam in the mold to move outwardly toward the door N, and thus gradually compresses the clay from the point in the circuit marked *a′* to the point marked *b′*, (see Figs. 2 and 4,) where the brick is completely pressed. The door N is then immediately relieved from the catch *o* of the locking-lever O by the friction-roller *p*, passing the wave into the inner portion of the groove in the cam P, and the door N and lever O being relieved from any undue strain by the depression *b″* in the stationary cam P. At this point the brick is completed, and as the plunger M passes this depression in the cam it is still caused to move outwardly by the shape of the cam carrying with it the completed brick till the roller *f* of the plunger reaches the point *d′* in the cam, at which point the outer end of the plunger projects slightly beyond the outer end of the mold to free the brick, and the fingers 37 of the bracket 36 support the brick until it is removed by the fingers 37 as the pick-off arm 29, as before described. From the point *d′* the outer periphery of the cam L approaches toward the center of the shaft C, and the plunger M is drawn back to its normal position by the friction-roller *g* on the mold of the ring *d* from the outer end of the mold until it reaches the point directly above the stationary shaft *c*, at which point the clay is again deposited in the mold and follows the same course of compression as it moves around the shaft, as above described.

As there are shown in the drawings eight molds, and each mold successively and continuously follows the same course in compressing the clay, which it will be seen is in each successive mold in different stages of compression, it will be apparent that a continuous train of bricks is thrown out from the molds onto the pick-off fingers 31 and by them delivered one by one onto the inclined table 34 and finally upon the endless belt 35.

From this description it will be seen that a brick-machine made in the form above described has many advantages over those at present in use. The circular form and rotary motion of the machine, together with the feeding mechanism and delivery device, enables the machine to be continuously pressing and delivering, and consequently the full strength of the driving-power of the machine is exerted all the time, thus economizing both

time and power, while in the machines now in use the feeding, pressing, and delivering mechanism are working at different periods of time, one or both of each of these mechanisms being idle during the period the other or others of them are working. It will also be understood that a rotary motion of the molds around the main cam is such that the direction of the resultant from the different parts of the main Archimedean spirals, which is a decreasing spiral of any suitable decreasing proportion, is practically coincident to the radius of the circle of revolution. Consequently there is no appreciable loss through the polygon of forces, as there would be were the direction of pressure—that is, the molds—fixed and the cam made to revolve.

Another advantage is obtained by placing the piece of metal in the open bottom of the swinging funnel as the clay is falling, as before stated, directed away from the center of the mold, so as to produce a concaved surface concaved in the center and rising to the ends and sides, thus insuring that the "arrises" or edge of the brick shall be strong, well pressed, and firm, instead of uneven and weak.

As the feeding, pressing, and delivering is automatic and practically simultaneous, it will be seen that my machine cannot make more bricks than it can deliver, and consequently the handling of the bricks when they leave the delivery-fingers can be performed with greater facility than in the old form of machines.

With reference to details of construction my machine may be varied in several particulars without altering the principle of my invention. For instance, the molds may be placed lengthwise with the machine instead of crosswise, as shown; also, the molds may be placed in ranks of two or more across each section, and the cam, door, and plungers correspondingly varied to perform their respective functions. The feeding and delivery mechanism may also be varied in form and yet accomplish the result desired.

Although I show core-rods R, it will of course be understood that they may be dispensed with and the brick made without perforations. When, however, I do use them, the importance of them cannot be overestimated in aiding the more equal distribution of the clay in the molds and in facilitating the safe, equable, expeditious, and economic burning of the brick.

Again, although my machine is designed chiefly for making bricks, I wish it to be thoroughly understood that on account of the peculiar principle applied in its construction it may be utilized for compressing or making in molds, which may be of any desired shape, any manufacture or commodity of a plastic, fibrous, or powdered composition.

What I claim as my invention is—

1. In combination, a stationary shaft, the section H, with spaces between forming a series of molds, the covers for said molds, the plungers, and the catches extending through said spaces, and the central cams for operating the plungers and the catches, respectively, substantially as described.

2. In a brick-machine, the molds A′, each mold of which is provided with a hinged door N, which is held rigidly in position by the locking-lever O, provided with the catch *o* and plunger M, having rollers *f*, in combination with the stationary cam L, designed to operate the plunger M, substantially as and for the purpose specified.

3. In combination, the molds having covers with means for automatically holding and releasing them, the plungers operating against the resistance of said covers, and a cam for operating the plungers, having a depression *b″*, acting upon the plungers after the brick is pressed and in unison with the cover-releasing means, substantially as described.

4. In combination, the molds having covers with automatic holding and releasing means therefor, the plungers operating against the resistance of said covers, and a cam for operating the plungers, having a rise to press the bricks, a depression to permit the covers to fly back without undue pressure, and a further rise to discharge the bricks, substantially as described.

5. In a brick-machine, the molds A′, each mold of which is provided with a hinged door N, in combination with the locking-lever O, provided at one end with the catch *o* and at the other with a friction-roller *p*, designed to run in the groove *g′* in the stationary wave-cam P, substantially as and for the purpose specified.

6. In a brick-machine, the locking-lever O, provided at one end with the catch *o* and at the other end with a friction-roller *p*, which is operated by the waves *r* in the groove *g′* of the wave-cam P, substantially as and for the purpose specified.

7. In a brick-machine, a door N, provided with plate *i*, having a groove *i′*, and the plate *j*, having a groove *k* and holes *l*, substantially as and for the purpose specified.

8. In a brick-machine, the molds, the covers N, the plates S, secured within the molds to the side thereof, the core-rods secured to said plates, the plungers M, operating over the core-rods, and the plates *j*, secured to the cover and having recesses *s′*, substantially as described.

9. In a brick-machine, the core-rods R, secured to the plate S, in combination with set-screws designed to hold the plate S rigidly in the space K between the sections H and legs of the plunger M, substantially as and for the purpose specified.

10. In a brick-machine, an octagonal frame formed of the sections H, each of which is bolted at both sides to the large gear-wheels B, in combination with the lugs J on the gear-

wheels B, substantially as and for the purpose specified.

11. In a brick-machine, the molds A′, secured in the space K between the sections H of the octagonal frame and supported on the gear-wheels B, in combination with a suitable system of gearing, substantially as and for the purpose specified.

12. In a brick-machine, the molds A′, rotating around the shaft C, in combination with the feed-spout U, supported on the cross-piece Z, secured on the supplemental frame, substantially as and for the purpose specified.

13. In a brick-machine, the molds A′, rotating around the shaft C, in combination with the feed-spout U, having secured to its top the hopper V and to its bottom the swinging funnel W, substantially as and for the purpose specified.

14. In a brick-machine, the molds A′, rotating around the shaft C, in combination with the feed-spout U, provided with the gates X and Y, having holes 6 and 7 in top and bottom gates, respectively, and operated substantially as and for the purpose specified.

15. In a brick-machine, the feed-spout U, hopper V, and swinging funnel W, in combination with the gates X and Y, having the holes 6 and 7 and connected together by the cross-piece 2, the said gates being operated by the lever 8, the long arm of which is connected to the cross-piece 2, while the short end has a friction-roller 11, secured to it and revolving in a groove in the revolving wave-cam 13, substantially as and for the purpose specified.

16. In a brick-machine, the feed-spout U, provided with the gates X and Y, which run in the grooves 3 and 4, which extend through the feed-spout U to the outer ends of the extension-arms *y* and *z*, substantially as and for the purpose specified.

17. In a brick-machine, the swinging funnel W, provided with a triangular prism-shaped piece *x*, with beveled ends *x′*, extending from the apex of the prism, substantially as and for the purpose specified.

18. In a brick-machine, the feed-spout U, provided with the gates X and Y, in combination with the side plate 20, substantially as and for the purpose specified.

19. In a brick-machine, the feed-spout U provided at one side with the plate 20, in combination with the rod 22, connected at the inner end to the plate 20 and at the outer end to the arm 23, secured on the spindle 24, which has the arm 25 connected to it at its outer end, the said arm 25 being operated by a screw-spindle 26, substantially as and for the purpose specified.

20. In combination, the molds, the covers N, the curved rod T, extending over the molds, and the embracing-fingers *u*, curved to engage the rod, substantially as described.

21. In a brick-machine, the curved rod T, having the top end *v* extending inwardly and downwardly to a point in proximity to the door N and the bottom end *v′* extending upwardly and outwardly from the door N, substantially as and for the purpose specified.

22. In a brick-machine, the swinging funnel W, hinged at *w*, in combination with the bracket 36, secured to each of the sections H and having its inner side flush with the sides of the mold, substantially as and for the purpose specified.

23. In a brick-machine, the bracket 36, having the fingers 37, in combination with the delivery-arms 29, secured to the pick-off shaft 19 and having fingers 31, substantially as and for the purpose specified.

24. In a brick-machine, the mold A′, having a plunger M operated from the cam L, in combination with the delivery-arms 29, secured to the pick-off shaft 19, substantially as and for the purpose specified.

25. In a brick-machine, the mold A′, having a plunger M operated from a cam L, and a bracket 36, provided with the fingers 37, in combination with the delivery-arms 29, having fingers 31 and supplemental fingers 32, substantially as and for the purpose specified.

26. In a brick-machine, the mold A′, having a plunger M operated from the cam L, and a bracket 36, provided with the fingers 37, in combination with the delivery-arms 29, having the fingers 31 and supplemental fingers 32, and the inclined plane 34, made in three sections, as described, and for the purpose specified.

27. In a brick-machine, the mold A′, having a plunger M operated from a cam L, and a bracket 36, provided with fingers 37, in combination with the delivery-arms 29, having the fingers 31 and supplemental fingers 32, the inclined plane 34, and the endless belt 35, substantially as and for the purpose specified.

28. In a brick-machine, the delivery-arms 29, provided with the fingers 31 and supplemental fingers 32, in combination with the inclined plane 34, made in three sections, substantially as and for the purpose specified.

29. In combination, the molds, the carriers for the same, consisting of the gears B B, the delivery-arms 29, the shaft 19, and the operating means consisting of the gear meshing with one of the gears B, substantially as described.

FREDERICK LINDLEY HUNT SIMS.

Witnesses:
HENRY SPROATT,
HARRY DIXON.