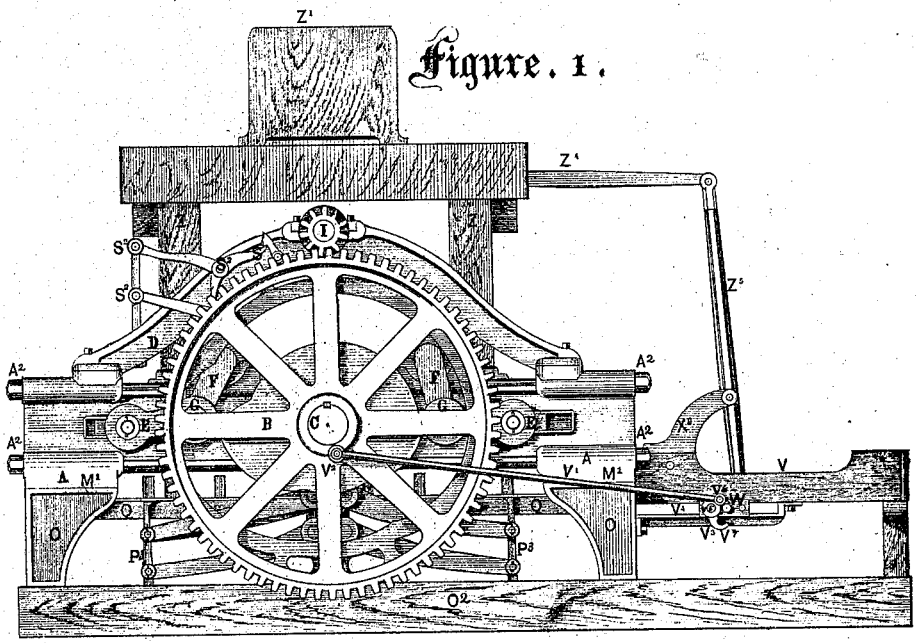
5. Sheets. Sheet 1.

Dobbins & Sangster,

Brick Machine.

NO. 108,012. Patented Oct. 4. 1870.

Figure. 1.



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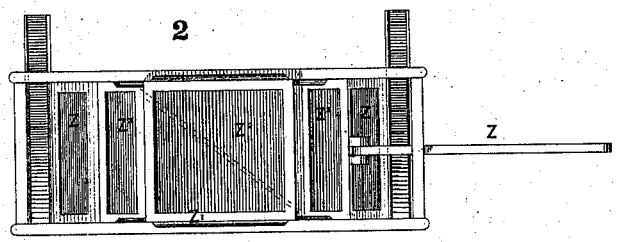

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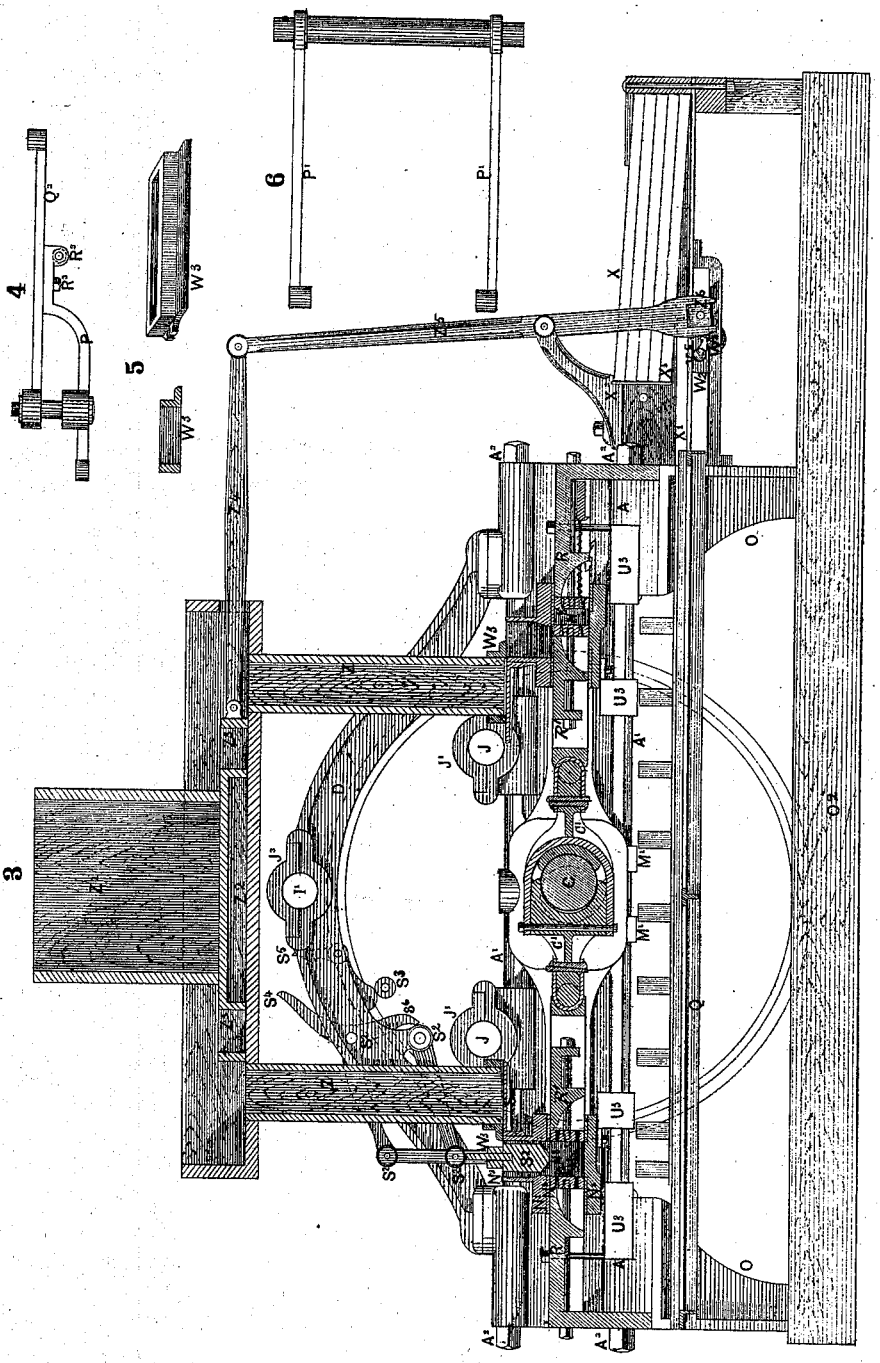
5 Sheets, Sheet 2.

Brick Machine.

No. 108,012. Patented Oct. 4. 1870.



Witnesses

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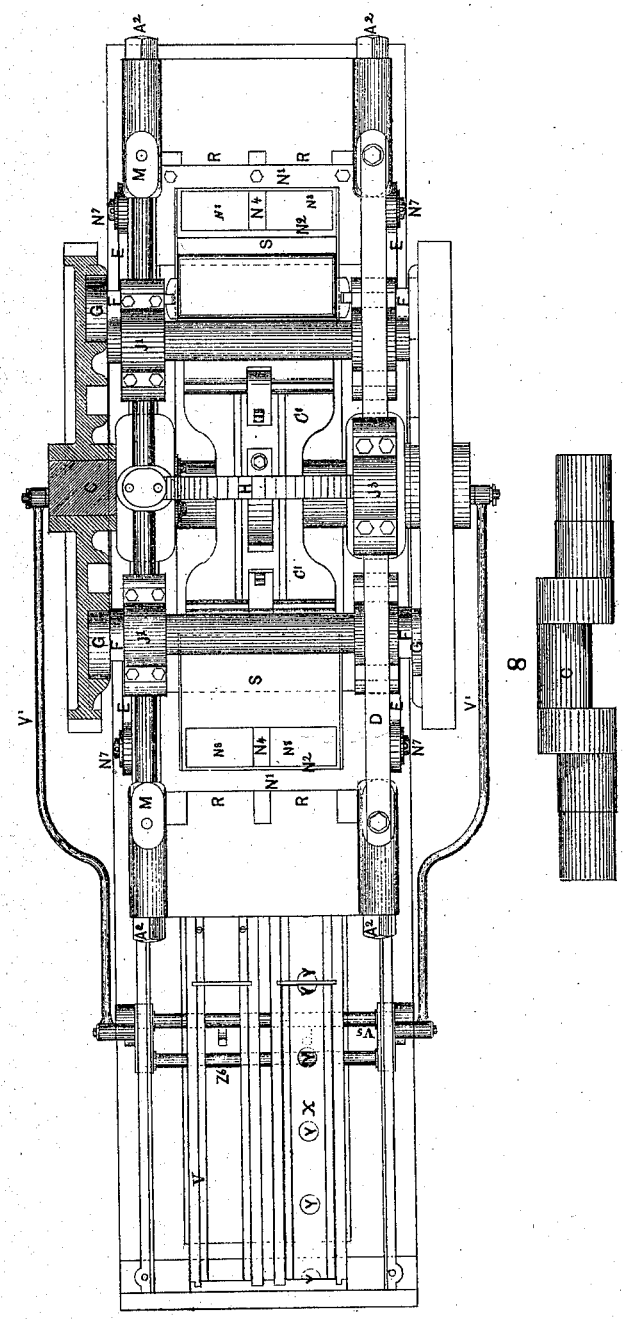
5 Sheets. Sheet 3.

Brick Machine.

No. 108012. Patented Oct. 4. 1870.



Witnesses.

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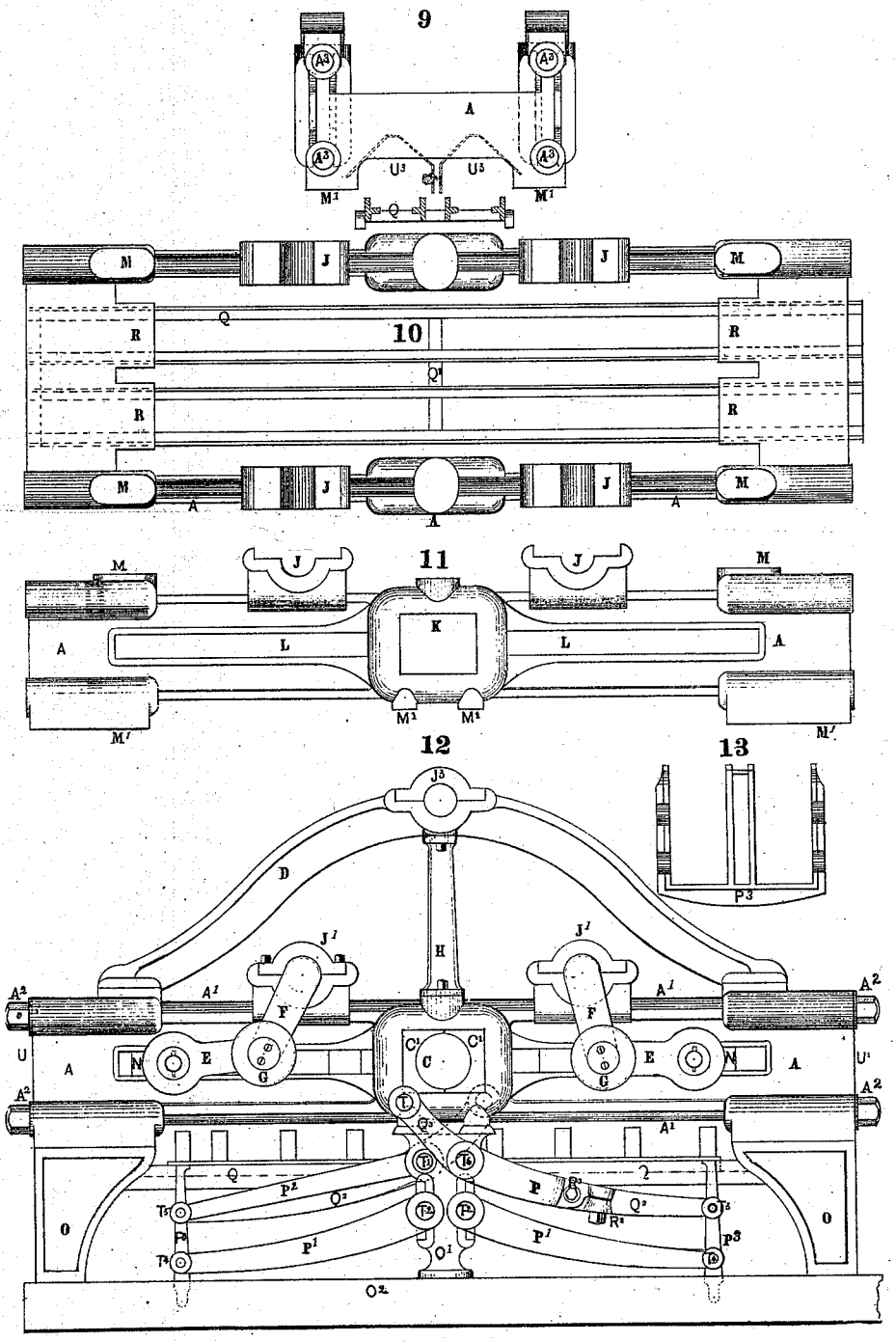
Brick Machine.

No. 108012. Patented Oct. 4. 1870.



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5 Sheets. Sheet. 5.

Dobbins & Sangster.

Brick Machine.

No. 108,012. Patented Oct. 4. 1870

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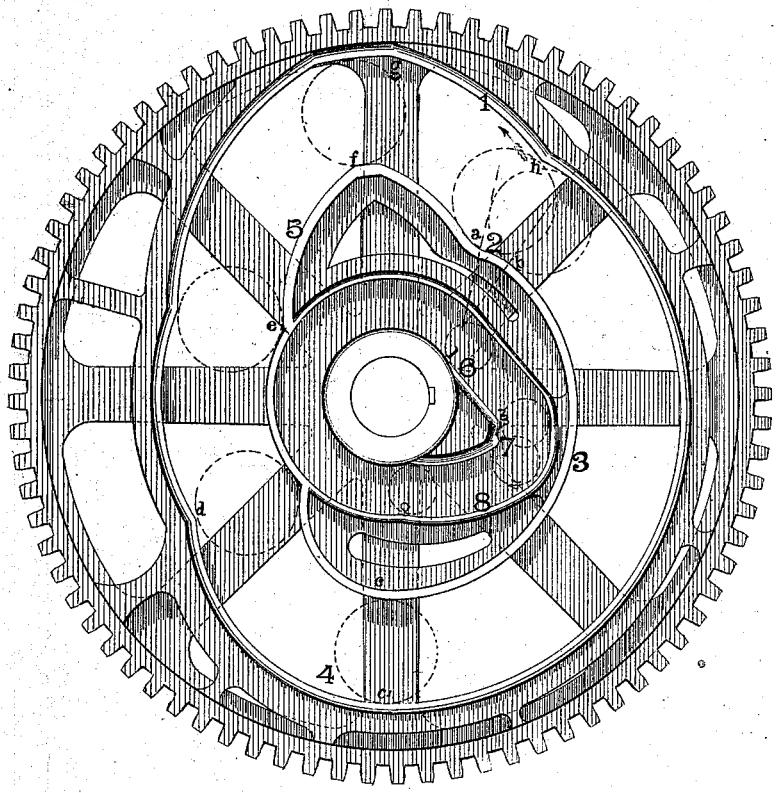

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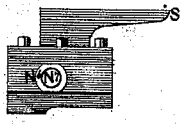

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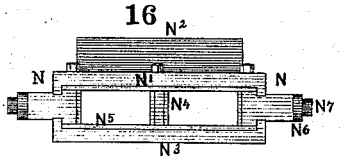

18

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DAVID P. DOBBINS AND JAMES SANGSTER, OF BUFFALO, NEW YORK.

Letters Patent No. 108,012, dated October 4, 1870.

IMPROVEMENT IN BRICK-MACHINES.

The Schedule referred to in these Letters Patent and making part of the same

We, DAVID P. DOBBINS and JAMES SANGSTER, of the city of Buffalo, county of Erie and State of New York, have invented certain new and useful Improvements in Brick-Machines, of which the following is a specification.

Nature and Objects of the Invention.

The first part of our invention relates to mechanism for delivering the brick from a machine having a double set of molds and pistons, operating alternately; and

It consists, in the combination with such a machine, of an intermittently-moving carrier, arranged to move in a line with the molds thereof, each progressive movement of said carrier being made equal to or greater than double the space occupied by the brick when received thereon, so that the brick received from the second mold may be deposited upon the carrier in the spaces between the brick received from the first mold, thereby enabling the one carrier to receive and deliver the brick from both molds.

The second part of our invention relates to a brick-delivering mechanism, consisting of sectional deposit-boards or trays, a track or guide-way for conducting the same past the molds, and a device for giving an intermittent progressive movement to said trays, and this part of our invention consists in the arrangement of said feeding device, beyond the main frame of the machine, and below the track or guide-way, so that the trays may be conveniently presented to its action, and pushed forward, the one by the other, through the machine, without the necessity of coupling or connecting them together.

The third part of our invention relates to a feeding device, such as above mentioned, and consists in the combination of a pawl or dog with a cross-head, having a combined reciprocating and rocking motion, whereby said pawl is made to engage with equidistant holes cut in the trays, and move forward, disengage, and return, thus giving the required intermittent progressive motion thereto, and enabling the trays to be constructed in a cheap and simple manner.

The fourth part of our invention relates to means for compacting the clay in the molds preparatory to pressing; and it consists in arranging a drop-piston or weight, so timed and directed in its movements that it will pass through the charger and act upon the clay, immediately after it has been deposited in the mold, and compact the same, so as to insure an equal density in the brick under the final action of the compressing-pistons.

The fifth part of our invention relates to means for receiving and depositing the brick, and it consists in the combination of a double and single-armed lever, upon the same axis, to actuate the delivery-followers, one arm of said double lever carrying the cam-roller, and the other arm being connected with said single lever by an adjusting-screw or bolt, so that the vertical movement of the delivery-follower may be readily adjusted, and any lost motion, occasioned by the wear of the cam or other parts, taken up, when required.

The sixth part of our invention relates to the movement of the brick-delivery followers, and it consists in so shaping the actuating cam that, when the followers rise to receive the brick, a slight additional movement will be imparted to them, after the mold opens, so that, in case the brick adheres to the end of the piston, it is released, and its descent with the follower insured.

The seventh part of our invention relates to a brick-machine, having a stationary and a movable piston, and a reciprocating mold-box, which latter, during the act of pressing the brick, moves in the same direction, but with only half the velocity of the moving piston, and this part of our invention consists in so shaping the actuating-cam that the movement of said mold-box will be increased in velocity during the first part of the pressing movement, the object being to equalize the density of the clay in the mold.

The eighth part of our invention consists in the combination of radius rods and links, to transmit the motion from the cams to the reciprocating mold-box, said radius arms being hung at right angles to the links, or substantially so, with the cam-rollers attached at or near their points of connection with the links, so that said radius arms will resist the lateral thrust of the cams, and avoid a great part of the friction incident to the use of slides.

The ninth part of our invention consists in the arrangement of deflecting-plates, below the mold-box and pistons, but above the tray guide-way, at such points as to catch and deflect the dust and fine clay which escapes through the perforations of the pistons, and prevent the same from falling upon the finished brick being delivered upon the trays.

General Description.

In the accompanying drawing there are five sheets, containing nineteen figures, all of which are drawn to a scale of one inch to the foot, except figs. 1, 2, and 14, figs. 1 and 2 being drawn to a scale of eleven-sixteenths of an inch to the foot, and fig. 14 to a scale of one and one-half inch to the foot.

Sheet 1, Figure 1, represents a side elevation of the machine complete.

Figure 2, a plan view of the hopper and mechanism for receiving the clay from the elevator and feeding it to the tubes leading to the mold-chargers.

Sheet 2, Figure 3, is a vertical longitudinal section.

Figure 4 is a plan view of the double and single-

armed levers for moving the delivery-followers, and

Figure 5 is a perspective view and a transverse section of the sleeve or frame for connecting the supply-tubes with the mold-chargers.

Figure 6 represents the lower levers for carrying the delivery-followers.

Sheet 3, Figure 7, is a plan of the machinery, below the mechanism for feeding the clay to the molds, and a section through one of the cam-wheels.

Figure 8 is a side view of the main crank-shaft.

Sheet 4, Figure 9, is an end view of the machine, slide-way for the boards or trays, and the device for conducting the dust and clay which falls from the perforations in the pistons away from the brick.

Figure 10 is a plan view of the frame of the machine and slide-way for receiving the trays.

Figure 11 is a side view of the main frame.

Figure 12 is a side elevation, showing the arrangement of the levers for moving the delivery-followers, the slide-way through which the trays for carrying off the brick are moved, and the radius arms, cam-rollers, and links, for moving the sliding mold-boxes.

Figure 13 is a front view of one of the delivery-followers.

Sheet 5, Figure 14, represents one of the cam-wheels for giving the necessary movements to the sliding molds and the delivery-followers.

Figures 15 and 16 are, respectively, a side and front elevation of one of the sliding mold-boxes and charger.

Figure 17 is a front view of one of the perforated pistons.

Figures 18 and 19 are, respectively, a front or end view and a top view of two of the pressing-pistons without the nosing.

Like letters designate like parts in each of the figures.

The Frame.

A represents the main frame. It is cast in one piece, as shown in sheet 4, figs. 9, 10, and 11, with openings lengthwise of the same, shown at A^3, fig. 9, for receiving wrought-iron strengthening-bolts, as shown in fig. 12, marked A^1. They are kept in place by the nuts A^2, thereby greatly increasing the cohesive strength of the machine.

The letters J represent four boxes, for receiving the radius arms.

L represent openings through the sides of the frame, two on each side, for receiving the slides N of the sliding mold, shown in fig. 15.

The letters M show projections from the top, for receiving the feet of the arches.

D, in fig. 12, and M′ are projections from the bottom of the frame for receiving the legs.

K is an opening through the sides, at or near the center, to receive the boxes for the crank-shaft.

O represents the legs for supporting the frame, and

O′ one of the legs for supporting the center of the frame, there being two, one on each side. They also support the arms or levers for operating the delivery-followers.

H is a central brace, for binding together the frame and arches D, to which it is bolted, as shown in fig. 12.

R represent the stationary platens, which are cast in one piece with the main frame.

R′ represent the movable pistons, which are operated by the rotation of the crank-shaft C, through the medium of the connections C^1. They are both connected to the same crank, and therefore operate alternately, and are guided in their movements by the sliding mold-box, through which they pass, and also by boxes sliding in the slots K in the main frame.

The Sliding Mold and its Connections.

In sheet 5, figs. 15 and 16, N^1 represents the top of the mold-box.

N^2, the charger, for receiving the clay from the supply-tubes Z.

It is cast in one piece with the top, for the purpose of securing strength, excepting the bracket S, which is bolted to it. The bracket S forms a bottom for the tube Z when the charger is in its forward position.

N^3 is the bottom plate.

N^4, a center or division plate.

N N represent the parts of the sides of the mold-box, which pass through and slide in the slots or openings in the sides of the frame.

The molds, as a whole, are lettered N^8.

N^6 is a pin for holding the connecting-link, and

N^7, a smaller pin, at the end of the same, for receiving a washer for keeping the said connecting-link in place.

N^5 represent lining plates, with which the four sides of the mold are lined. They are fastened in place by means of countersunk screws, and are arranged so as to be easily taken out when worn, and replaced by new ones or repaired, or so they can be taken out and turned over, so as to use the opposite sides before replacing them by others.

A vertical section is shown through the mold-box, charger N^2, and bracket S, in fig. 3.

E in fig. 12 represents the links connecting with the mold by means of the pins N^6. The opposite ends are connected to the radius arms F by means of a pin. There are four of said links, two on each side of the machine.

G represent the cam-rollers, of which there are two on each side of the machine, arranged so as to turn easily upon a pin on the radius arms, and are kept in place by a washer screwed or otherwise fastened to said pin.

F represent the radius arms, arranged two at each end of the machine, opposite each other, upon a shaft which is supported in the boxes J, as shown in fig. 12.

The object of the radius arms and connections is to take the lateral thrust of the cams, thereby relieving the sliding molds of a great part of the friction incident to the motion of the slides N in the openings L.

The cams for actuating the sliding molds are cast in one piece with the large driving-wheels, but may be cast separate and bolted on, so as to be moved or taken off, or so as to be adjusted as the parts wear away; but we prefer making them in one piece with the wheel, and large enough to allow for wear.

In sheet 5, fig. 14 represents one of the large cam-wheels and cams, for transmitting the necessary movements to the sliding molds. It is a grooved or inside cam, large enough for the friction-roller G to move easily within it. During the revolution of the wheel it imparts five movements to the mold-boxes. The first movement is produced by the angular movement of the cam from *e* to *f*, and carries the mold-boxes forward a distance of eight inches, thus opening the mold to receive the clay from the charger. The box then remains stationary from *f* to *g*. The second movement is produced by the movement of the cam from *g* to *h*, and moves the mold back toward the center of the machine five inches and five-eighths, thereby inclosing or covering the clay, and at the same time compressing it against the movable pistons, and partially carrying it away from the stationary pistons, thereby leaving a vacant space between the said pistons and the clay, which necessitates a further movement, to equalize it within the mold, before the action for condensing it equally on both sides commences. This we accomplish by the third movement of the cam, from *a* to *b*, bringing the mold forward toward the end of the machine one-half of an inch, or nearly so, with a velocity greater than one-half of the velocity of the moving piston. The fourth movement is produced by the movement of the cam from

b to *e*, carrying the mold still forward one and one-half inch, or nearly so, moving at one-half of the velocity of the moving or pressing piston, and in the same direction. The fifth movement is produced by the motion of the cam from *c* to *d*, and carries the mold backward five and three-eighths inches, thereby uncovering the brick, and leaving it in position for the delivery-followers to receive it. The mold now remains stationary from *d* to *e*.

This completes one revolution of the cam-wheel, and gives the motions to the molds necessary to receive the clay from the charger, cover, and inclose it, aid to condense it into the form of a finished brick, and afford the necessary time for the delivery-followers to receive and deposit it upon the boards or trays.

There being a mold upon each side of the crank-shaft which operates the pressing-pistons, the above-described movements of one set of molds and pistons will succeed alternately those of the other.

The Mechanism for Receiving and Delivering the Bricks.

Q represents the guide-way, in which the trays X are supported and guided in their progressive movement under the molds.

P^3 represent the delivery-followers, which move up to receive the bricks as they are delivered from the mold, and down to deposit the same upon the trays, said followers being forked, as represented in fig. 13, so that they may cross the line of movement of the trays.

In figs. 4, 6, and 12, P^1 represents the lower lever, which, in connection with the levers P P^2 Q^2, operate and retain the parallelism of the delivery-followers P^3. They are arranged upon a shaft, as shown in fig. 6, and are jointed at T^2, on the center leg O', and to the lower part of the followers at T^4.

P is a double-armed lever, arranged to move on an axis at T^6, outside of the center leg, and

Q^2 a single-armed lever, upon the same axis, upon the inside of the center leg. A plan of the said levers combined is shown in sheet 2, fig. 4.

The lever Q^2 is connected to the follower at T^5, and directly opposite is a lighter arm, connected to the other side of the follower at a point opposite T^3, and the arm P is secured to the arm Q^2 by means of the bolts R^2 and R^3, which allow the relative angular position of P and Q^2 to be easily changed, to secure a proper vertical adjustment of the followers as the parts wear by use.

The delivery mechanism is duplicated at both ends of the machine, and each receives its motions by means of the cam-rollers T, on the arms Q^3 of lever P, and the cam on the driving-wheels, marked 6, 7, and 8, the part marked 6 of said cam moving from *l* to *m*, carrying the delivery-followers P^3 up far enough to slightly bear against the brick as soon as the withdrawal of the mold-box partially uncovers the same. It then remains stationary from *m* to 7, until the mold is drawn off so as to fully uncover the brick. The part marked 7 now gives the follower a slight additional movement upward, so as to release the brick from the end of the piston, in case it should adhere thereto. The part marked 8, in its motion from *n* to *o*, insures the descent of the follower, and the delivery of the brick upon the trays below it.

The Mechanism for Moving the Trays.

V (see figs. 1 and 3) represents the box for holding the trays. It is arranged beyond the main frame, as shown.

V^1 represents a connecting-rod, communicating motion from a crank on the driving-wheel at V^2 to a pawl or dog, V^3, arranged to move upon a shaft, V^5, supported in slide-boxes which move within the slotted guides V^4. This pawl receives both a rocking and reciprocating motion, by means of its connection with V^1 at V^6, which is eccentric to V^5. A movement of the connection V^1 forward causes a rocking motion of the dog upward, until the double hook V^7 touches the pin W, when the rocking motion is arrested.

The pawl W^1, on the rock-shaft or cross-head, has now engaged with a hole in the lower board or tray, and a forward motion now commences, carrying forward the tray. A backward movement of the connection V^1 rocks the axis V^5 in the reverse direction, and disengages the pawl from the tray, and then returns said axis and pawl to the position shown in fig. 1, ready to engage with the next hole in the tray, as before.

X (see fig. 3) represent the trays in the box. They are prevented from moving forward by the end X^2, excepting the lower board, a space being left below X^4, so that it may pass under, as shown at X^1. As the lower board passes out, the one above will drop into its place, and be progressed in the same manner.

The arrangement of the holes in the trays is shown in the plan, fig. 7, and marked Y.

The progressive movement of the shaft V^5 and pawl V^3 must be equal to more than twice the thickness of the brick, for reasons before stated.

Machinery for Feeding the Clay.

Z (see sheets 1 and 2) represent the supply-tubes, located above the chargers; and Z^1 the hopper for receiving the clay from the elevator; and Z^2 the double charger, arranged to slide below it, as shown; and Z^3 the charging-chambers in the same. It receives its motion by means of the connection Z^4 and Z^5, which is moved by the shaft Z^6, to which it is attached by means of a sliding box, said shaft being attached to the sliding boxes W^1.

W^3 represents the loose sleeve connecting the supply-tube Z with the charger N^2. The weight of the sleeve keeps it constantly seated upon the charger, thus making a tight connection without undue friction.

In figs. 3 and 9 the letters V^9 represent the shields for protecting the brick, as they pass through and out of the machine, from dust and from the clay which escapes from the perforated pistons.

The device for compacting the clay in the mold, preparatory to pressing, is shown in figs. 1 and 3.

S^1 represents the weight or piston, and S^2 S^4 S^6 represent the levers for lifting, guiding, and dropping the same. The levers are operated by means of the roller S, which is attached to and moves with the driving-wheel. As the said roller moves against the arm S^6 it brings the arm S^4 into the position shown in fig. 1, when it engages with the hook of the weighted hook-pawl S^5, thus suspending the weight until the next revolution of the wheel brings the roller S^3 against the weighted part of the pawl S^5, releasing the weight, and allowing it to drop into the position, as shown in fig. 3.

It is important that a certain quantity of clay of a certain density should be supplied to the molds for the production of each brick. The charger N^2, in connection with the action of the mold-box, secures the proper quantity, but the density is liable to great variation. It is the purpose of the drop-piston to secure this uniformity of density, by subjecting the quantity cut off by the charger, (and which is somewhat more than sufficient to fill the mold,) before the mold is closed, to a given pressure. Provision should be made for extra weights, like scale-weights, so that any desired increase or diminution in the weight of the piston may be readily obtained, to suit clays of different qualities.

What we claim as our invention is—

1. The arrangement, with relation to each other, of

the double set of molds N^3, the intermittently-moving brick-trays X, and guide-way Q, as hereinbefore set forth.

2. The arrangement of the reciprocating rock-shaft V^5 and pawl W^1, or equivalent feeding mechanism, beyond the main frame of the machine, and below the guide-way Q, in the manner set forth, so that the trays may be conveniently presented to its action, and pushed forward, the one by the other, through the machine, without the necessity of coupling them together.

3. The trays X, when provided with the apertures Y, in combination with the pawl W^1, reciprocating and rocking-shaft or cross-head V^5, when said parts are constructed and arranged to operate as and for the purpose hereinbefore described.

4. The combination and arrangement of the drop-piston S^1 with the charger N^2, substantially as hereinbefore set forth.

5. The combination, with the delivery-followers P^3 and levers P^1, of the double lever P and single lever Q^2, and the adjusting-bolts R^2 R^3, as hereinbefore set forth.

6. The part 7 of the cam, for actuating the delivery-followers P^3, whereby a slight additional movement is imparted to said followers, after the mold opens, substantially as hereinbefore set forth.

7. The part *a b* of the cam for actuating the sliding mold-box, whereby the velocity of the mold-box during the first part of the pressing movement is increased, substantially as hereinbefore set forth.

8. The combination, with the reciprocating mold-box, of the links E, radius arms F, and cam-rollers G, arranged and operating substantially as hereinbefore set forth.

9. The deflecting plates U^3, combined and arranged with the brick-carrier, as described.

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