(No Model.)

3 Sheets—Sheet 1.

W. H. STEWART.

BRICK MACHINE.

No. 306,660. Patented Oct. 14, 1884.

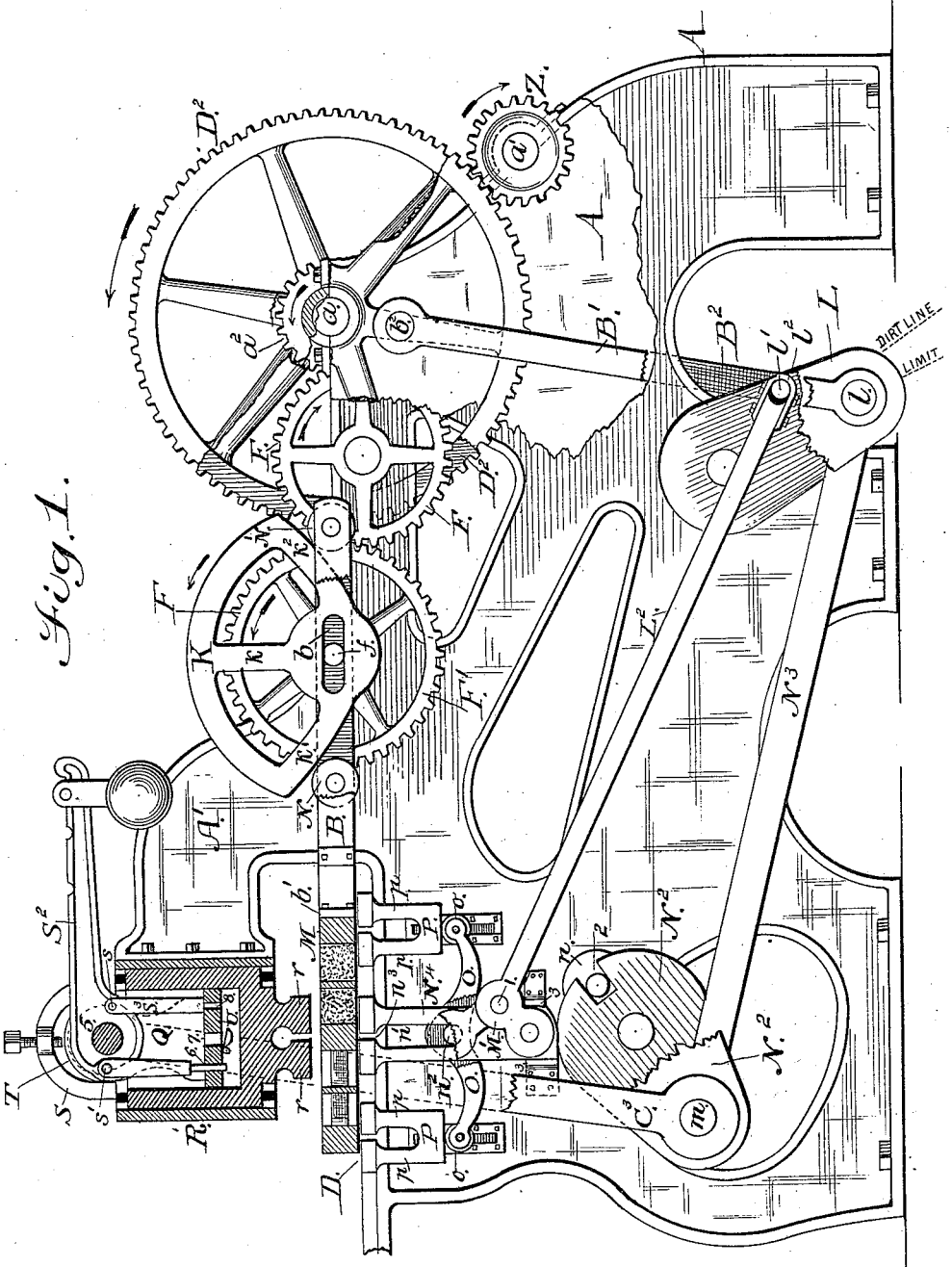

Fig. 1.

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by his attorneys

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Fig. 2.

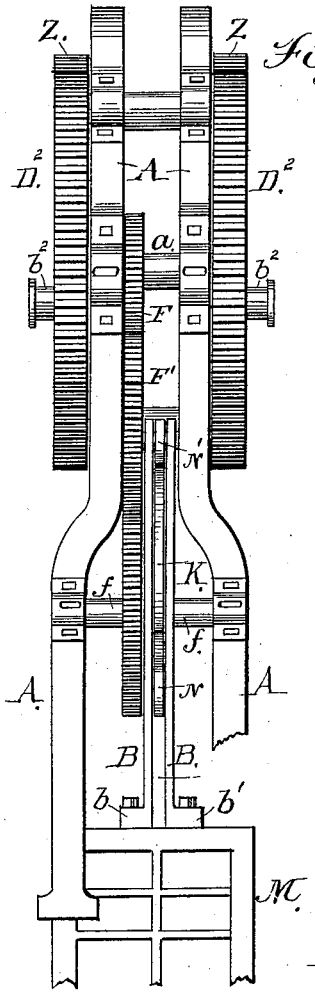

Fig. 3.

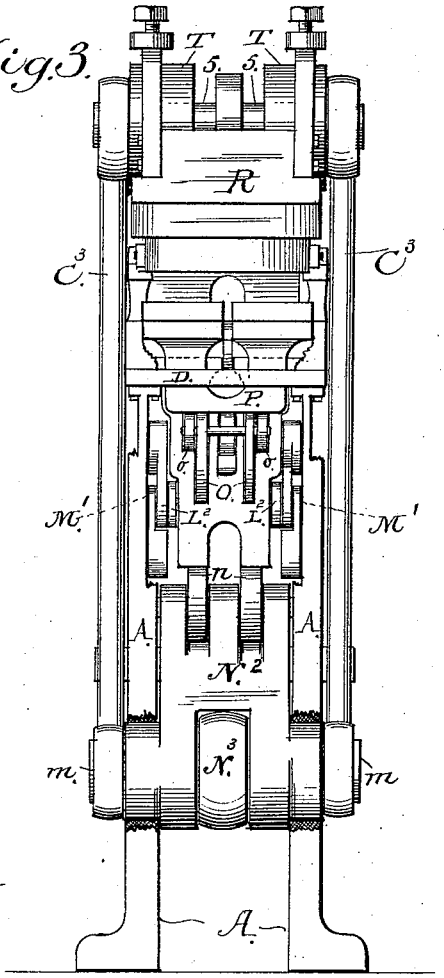

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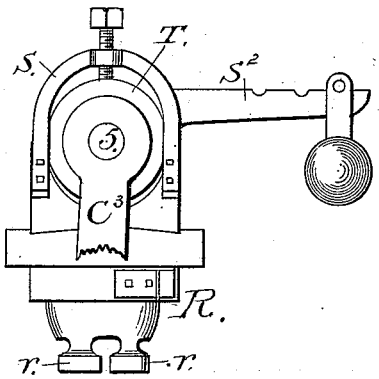
Fig. 4.



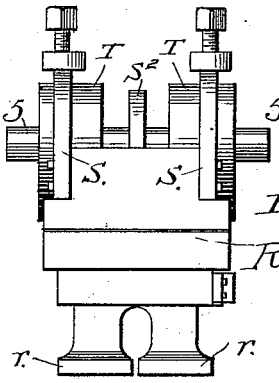


Fig. 5.

Fig. 6.

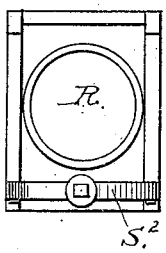


Fig. 7.

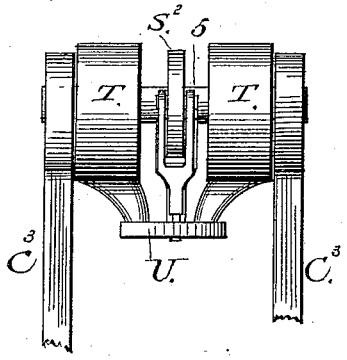
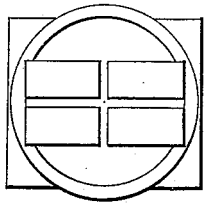


Fig. 8.



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UNITED STATES PATENT OFFICE.

WILLIAM H. STEWART, OF BOONEVILLE, MISSOURI, ASSIGNOR OF ONE-HALF TO JAMES WILCOXSON, OF SAME PLACE.

BRICK-MACHINE.

SPECIFICATION forming part of Letters Patent No. 306,660, dated October 14, 1884.

Application filed March 15, 1884. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. STEWART, a citizen of the United States, residing at Booneville, in the county of Cooper and State of Missouri, have invented certain new and useful Improvements in Brick-Machines; and I do hereby declare the following to be a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side view of my improved machine with a portion of the frame broken away. Fig. 2 is a top plan view. Fig. 3 is a front view. Figs. 4 to 8, inclusive, are details of construction.

My invention consists in the novel arrangement and combination of devices, as will be hereinafter more fully set forth and claimed, and is an improvement on my application No. 112,289, allowed January 8, 1884.

To enable others skilled in the art to make and use my invention, I will proceed to describe the exact manner in which I have carried it out.

In the said drawings, A represents a frame constructed of any suitable material and shape, but preferably in the form shown in the drawings. Journaled in the sides of the frame by any suitable means is a shaft, *a*, upon which are mounted the toothed drive-wheels D^2 D^2, located on opposite sides of the frame A.

Z Z represent drive-pinions, which are connected to mechanism by which power is derived to operate the device, and are suitably journaled in the frame, and mounted upon a shaft, *a'*. Thus the pinions Z Z and drive-wheels D^2 D^2 are caused to move simultaneously. Upon the shaft *a* is also mounted a pinion, a^2, adapted to intermesh with a gear-wheel, F, suitably journaled in the frame A, and this gear-wheel F again engages or meshes with another gear-wheel, F', mounted upon a shaft, *f*. By the arrangement of this train of gearing motion is imparted to a segment or cam-wheel, K, also secured on the shaft *f*. The periphery of the hub of the segment is also connected to the outer curved portion of the cam by spokes *k k' k²*, as many of which may be employed as found desirable. The spokes *k' k²* are formed with cam-shaped surfaces, and are constructed in an inclined position in relation to the center of the shaft, and may be slanted to any number of degrees—*i. e.*, so that when the segment or cam K is revolved in the direction of the arrow, and the spoke *k'* forced against and at an inclination upon the roller N, it will force the said roller forward, and also the sliding bars B, to which and between which the rollers are securely pivoted, and as the segment continues to revolve it will bring the cam-faced spoke *k'* against the roller N', and thus force this roller and the sliding bar back into their normal position. The sliding bar B is formed with a slot, *b*, through which pass the ends of the shaft *f*. This slot, in conjunction with the segment K and the rollers N N', permits of a free-and-easy longitudinal sliding movement of the bars B. The bars B have flanges *b'*, by which they are bolted or otherwise firmly secured to the mold-frame M, made preferably in the form shown, and provided with any desirable number of compartments, preferably rectangular in shape, so as to correspond with the form of bricks now generally in use. The mold-frame, being securely attached to the sliding bars, is also moved backward and forward on a bed, D, by the means just referred to.

Upon one of a series of spokes constituting a part of the wheel D^2 D^2 are formed projecting pins b^2 b^2, and to each of these pins are pivotally secured the upper ends of the connecting-rods B' B^2, while the lower ends of these rods are connected by means of the projecting pins *l l* to the free end of a cam or eccentric, L L, which is pivotally secured between the sides of the frames, as shown in Fig. 1. The cam L has also pins *l' l'* formed on it, and to these pins are connected by a strap, l^2, the connecting-arms L^2 L^2, which extend at an inclination toward the front of the machine, and are connected at a point, 1, to the arms which constitute the toggle-joint M', for a purpose to be hereinafter more fully set forth.

It will be noticed that the openings formed by the straps l^2 and the end of the connecting-arms L^2 L^2 are slightly larger than the diame-

ter of the pins l' l', and by this construction I am enabled to keep the arms L^2 stationary, while the cam and pin are permitted to move from the line marked "dirt-line" to the limit, and thence back again to the dirt-line.

The object of keeping the arms L^2 L^2 stationary for a short period is for the purpose of permitting the mold-frame to complete its journey. Thus I am enabled to utilize the time that the upper compressor is moving away from the mold-frame as well as when it is returning, which would not be the case if the toggle-joint received its motion directly from the cam N^2, as shown in my former application above referred to.

Within the cam L, and pivotally secured on the shaft l l, is a connecting-arm, N^3, which is also pivotally secured to the free end of the cam N^2 by means of a shaft, m, which passes through the cam and through an opening formed in the frame, and extends beyond the surface of the frame, so as to form bearings for the forward end of the rod N^3, as shown in Fig. 3. The upper surface of the cam N^2 is slotted longitudinally at 2 to receive the small rollers n n, while the said cam is also slotted transversely to receive the ends of a shaft upon which rollers n n are mounted. The lower compressor, N^4, is adapted to slide in guides formed by the plate 3, and its lower face is cam-shaped to engage the rollers n n when it is desired to compress the dirt in the mold. The lower compressor, N^4, has a vertical slot, n', through which is passed and in which plays the shaft n^2, while the upper portion of this slot is contracted to form a narrow slot, n^3, which is intended to admit the partitions formed in the mold when the lower compressor is forced upward. Horizontal curved levers O O, mounted upon the shaft n^2, have small rollers o o suitably journaled upon their outer ends, and on these rollers rest the vertically-moving pushers P P, provided with upwardly-extending arms p p, four of which are mounted upon each pusher in substantially the same manner and for the same purpose as those shown in my former application, as is also the case with the bed of my present machine, although, if preferred, I can increase or diminish the number of openings formed in the bed for the reception of the upper arms of the pushers, &c.

To an upwardly-extending portion, A′, of the frame is suitably secured the upper compressor, R, which is constructed substantially as shown, and has a solid head having formers r, similar in form and construction to those on the lower compressor. The upper compressor, R, is formed with a chamber, Q, in which are placed suitable liquids, for a purpose hereinafter set forth.

To the compressor R are suitably secured, by bolts or otherwise, segments or arches S S, which extend over or encircle the heads T T, formed on a shaft, 5. The ends of said shaft extend beyond the side of the compressor, and to this shaft are pivotally connected the plunger-rods C^3 C^3, which are in turn connected to the shaft m, attached to the cam N^2. The heads T T have contracted and slightly curved extensions, which project into the chamber Q of the compressor R, and to the lower ends of these extensions is secured a plunger, U, which is adapted to closely fit the inner sides of the said chamber. In the plunger U are formed openings 6 7 8, for a purpose hereinafter explained.

Mounted upon the shaft 5, and between the heads T, is an outwardly-extending arm, S^2, which is adapted to receive a weight by which the movement of the said arm and its connections is controlled, and on this arm are also formed pins s s', arranged equidistant from the center of the shaft 5. To the pin s is secured, by a strap or otherwise, a downwardly-projecting arm, S^3, the lower end of which rests upon the plunger U and closes the openings 8, formed therein, while from the pin s' projects an arm which has its lower end of smaller diameter than the arm itself, and adapted to be passed through the opening 6. Thus it will be seen that the upward movement of the cam N^2 will cause the plunger-rods to raise the heads T slightly, the distance being determined by means of set-screws secured to the compressor R, as shown in Figs. 1, 4, and 5.

The operation of my present invention is substantially the same as in my former application, except the movements of the upper compressor, R, which I will now describe. The required amount of water (or, if desired, I can use compressed air or gas) having been placed in the chamber Q, and the plunger placed in the said chamber, it is evident that the drop-valve would close by the upward action of the water, and the plunger could not descend in relation to its position in the chamber Q; but it could descend in relation to its downward movement if the extending arms of the compressor R sink deeper into the mold-frame, and by this means effectually compressing the dirt; but if the compressor in descending meets with an incompressible substance which is foreign to dirt or clay, or, in other words, a substance that has a greater resisting power than the strength of the press is able to overcome, then it is that the valve S registers the amount of pressure that is required to make the brick, and also registers the amount of labor that the movements and strength of the press are able to overcome by raising the rod attached to the weighted arm and permitting the water to flow into the chamber above the plunger-head and allowing the plunger to descend, thereby permitting the press to make its complete movement without compelling the compressor R to overcome a resistance that is greater than the strength of the press. Now, if the downward movement of the plunger-rods be reversed, thereby lifting the shaft 5 and heads T T, then the rod at-

tached to the weighted arm will close the opening formed in the plunger-head, and the valve will open and permit the water that has escaped into the chamber above the plunger to flow back, and the compressor R would remain in the mold if I did not provide means for raising it; but, as shown in the drawings, the plunger-rods are permitted to raise the heads and shaft 5 until the said heads come in contact with the set-screws attached to the segments or arches secured to the compressor-frame. This movement will raise the compressor from the mold. Again, we will suppose that the shaft 5 and its connections ascend, say, one-fourth of an inch before lifting the compressor R out of the mold by the means referred to in the preceding paragraph. Then the compressor will be one-fourth of an inch too low, when by its own weight it is permitted to descend by the downward movement of the shaft 5 and heads, as before stated, and at this time, instead of the compressor meeting too much resistance, it finds the mold not quite full, and when it comes in contact with the dirt the drop-valve will again close, because of the natural tendency of the water to escape from between the compressor and the downward movement of the plunger. Thus the compressor is drawn into the mold with as much force as if the water were a solid substance, until the continued movement of the plunger-rods has, through the agency of the water, driven the compressor into the mold until the solidity of the clay resists the pressure that makes a brick, when the valve again opens, but this time a little later than before, as regards the movement of the press, because there is not quite enough dirt in the mold to make a brick of standard thickness; and as a brick that is a little thin is better than one that is worthless, then it is that the benefits of my construction are apparent, because, if the compressor were limited to a certain travel, then when the compressor entered an overcharged mold the whole movement of the press would become strained or broken; or, if it entered a mold not quite full, the clay would not by its own resisting power receive enough pressure from the limited movement of the compressor to make a brick.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a press for the manufacture of bricks, the herein-described means for overcoming the strain upon the press, which consists, essentially, of a compressor having a chamber for the reception of liquids or gases, in combination with a shaft, 5, heads T T, a weighted arm having depending rods, a plunger having openings, segments or arches secured to the frame of the compressor, and the means for raising and lowering the shaft 5 and its connections, substantially as and for the purpose set forth.

2. In a brick-machine, the toothed drive-wheels D^2 D^2, mounted upon a shaft, *a*, in combination with pinion a^2, gears F F', located between the sides of a frame, and the means for giving a reciprocating motion to a mold-frame, substantially as and for the purpose set forth.

3. In a brick-machine, the combination of the drive-wheels D^2, provided with pins b^2 b^2, the connecting-rods B' B^2, the cam provided with pins *l l*, the arm N^3, and the means for raising the lower compressor, substantially as and for the purpose set forth.

4. In a brick-machine, the drive-wheel D^2, connecting-rods B' B^2, cam L, provided with pins *l' l'*, and the herein-described means for keeping the rods L^2 L^2 stationary for a short period, for the purpose of allowing the mold-frame to complete its travel, substantially as and for the purpose set forth.

5. In a brick-machine, the cam N^2, slotted longitudinally and transversely for the reception of the rollers *n n*, in combination with the lower compressor, N^4, and the means for moving said cam, substantially as and for the purpose set forth.

6. In a brick-machine, the connecting-rods L^2 L^2 and the means for keeping the said rods stationary for a specified period, in combination with the toggle-joint M' and the herein-described means for raising the pushers P P, substantially as and for the purpose set forth.

7. In a brick-machine, the upper compressor, R, provided with a chamber for the reception of liquids, in combination with a plunger attached to heads secured on a shaft, 5, a weighted arm provided with depending rods, and the means for raising and lowering the said plunger and its connection, substantially as and for the purpose specified.

WILLIAM H. STEWART.

Witnesses:
RICHARD HADELICH,
WM. ROCKWELL.