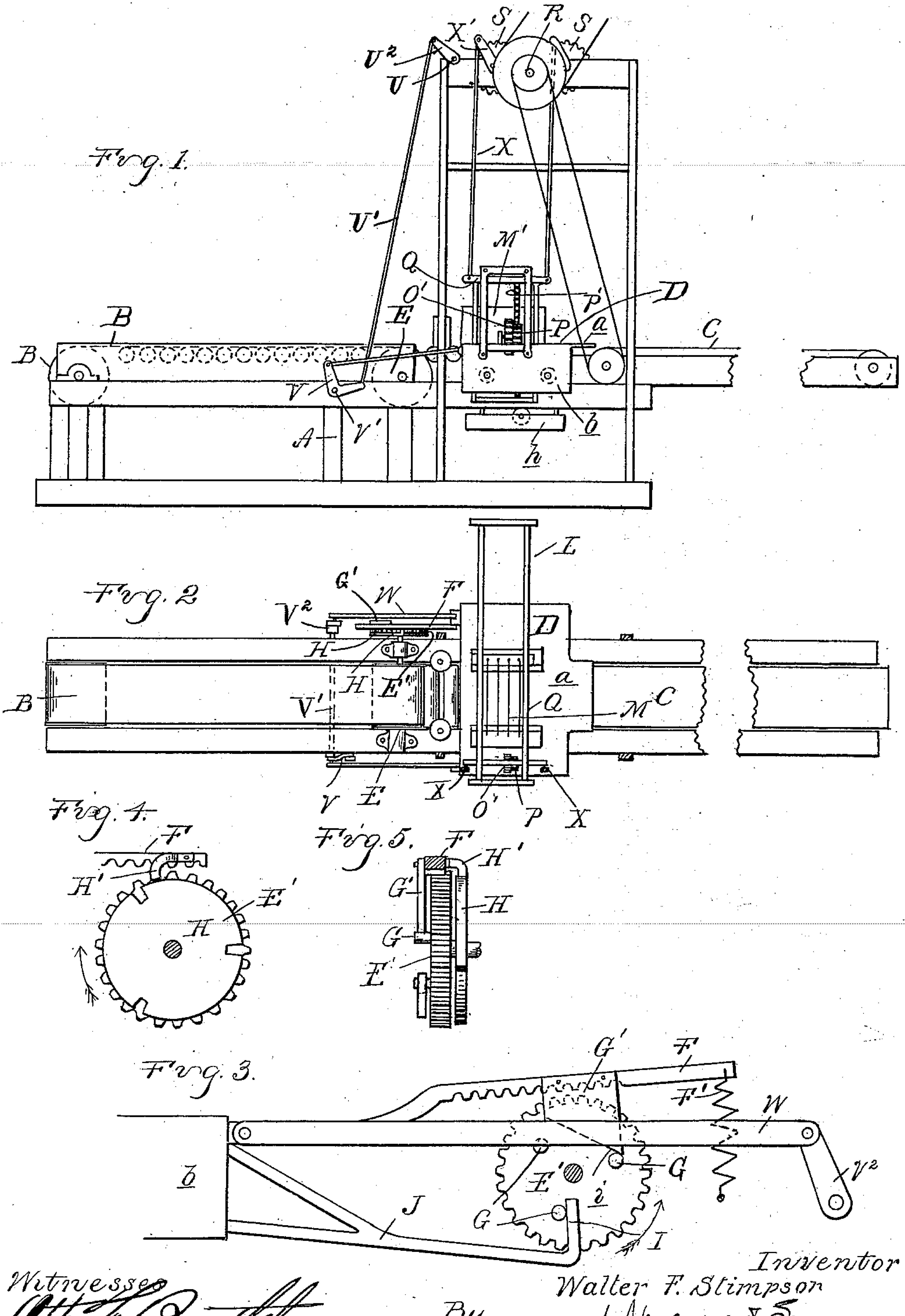
No. 624,399. Patented May 2, 1899.

W. F. STIMPSON.

BRICK MACHINE.

(Application filed July 8, 1897.)

(No Model.) 3 Sheets—Sheet 1.



Witnesses
Otto F. Barthel
Wm. P. Dogherty

Inventor
Walter F. Stimpson
By Thos. S. Sprague & Son
Attys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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(No Model.) 3 Sheets—Sheet 2.

Fig. 6.

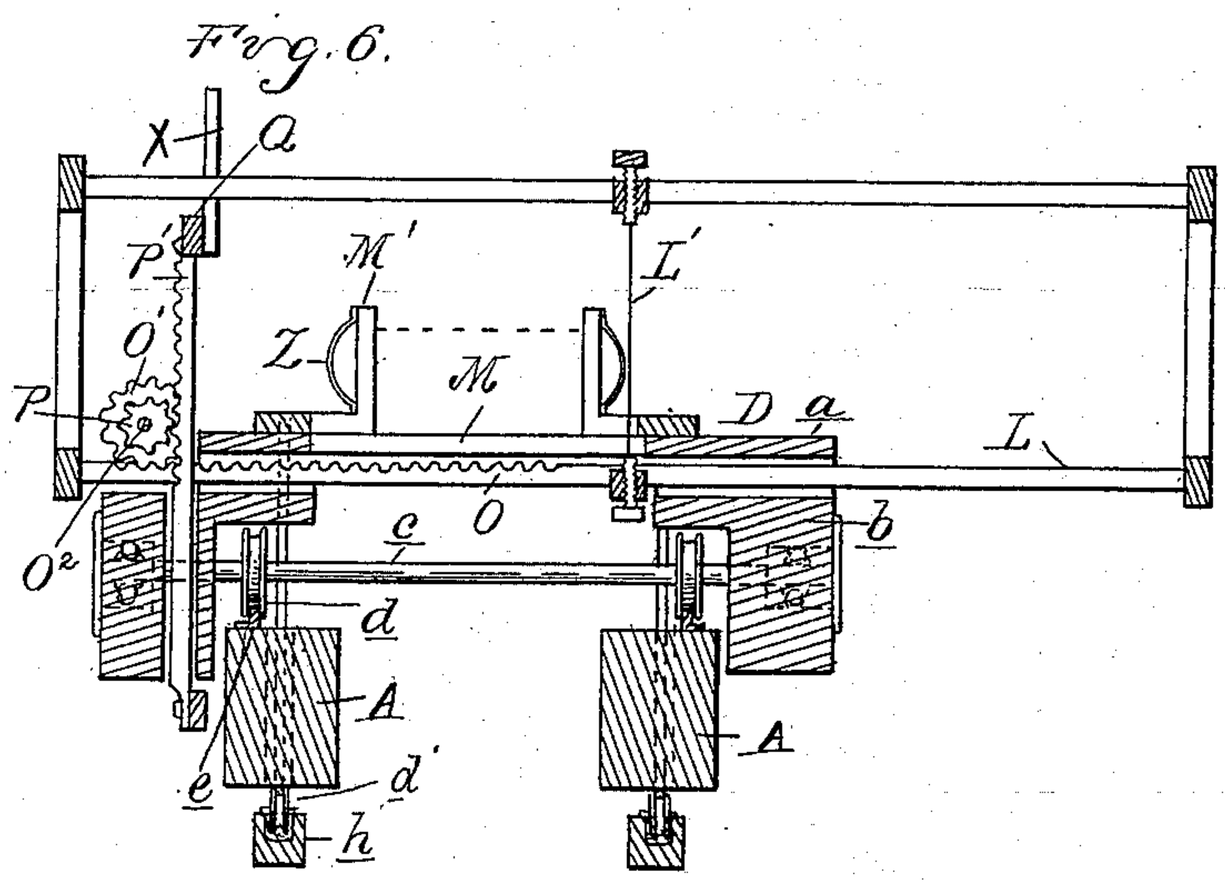


Fig. 7.

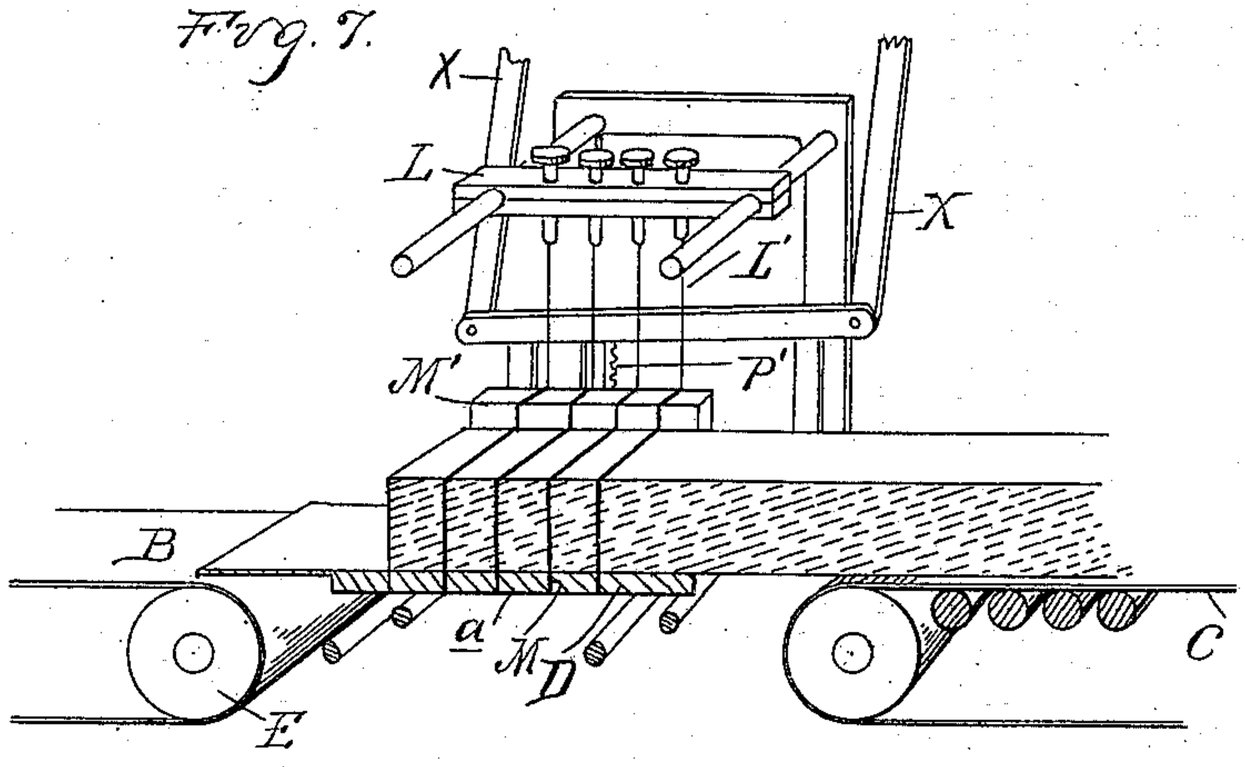
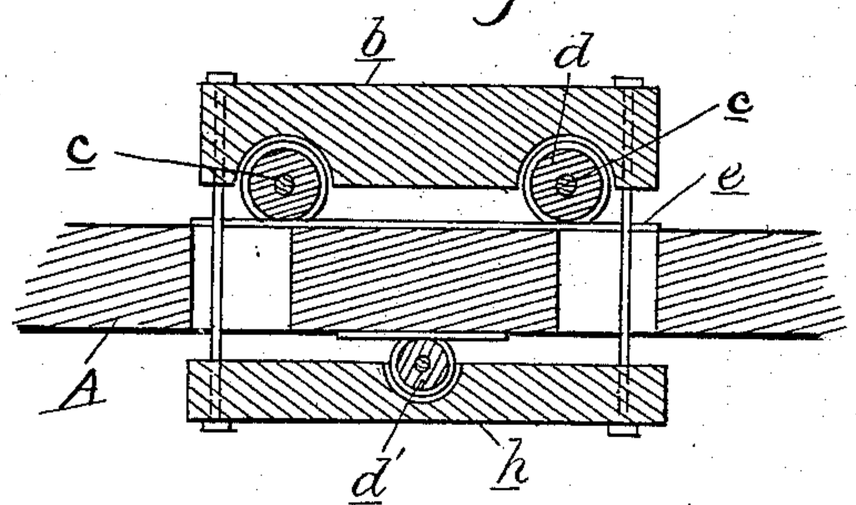


Fig. 8.



Witnesses.
Wm. F. Gardner
W. B. Dougherty

Inventor
Walter F. Stimpson
By Thos. G. Sprague & Son
Attys.

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(No Model.) 3 Sheets—Sheet 3.

Fig. 9.

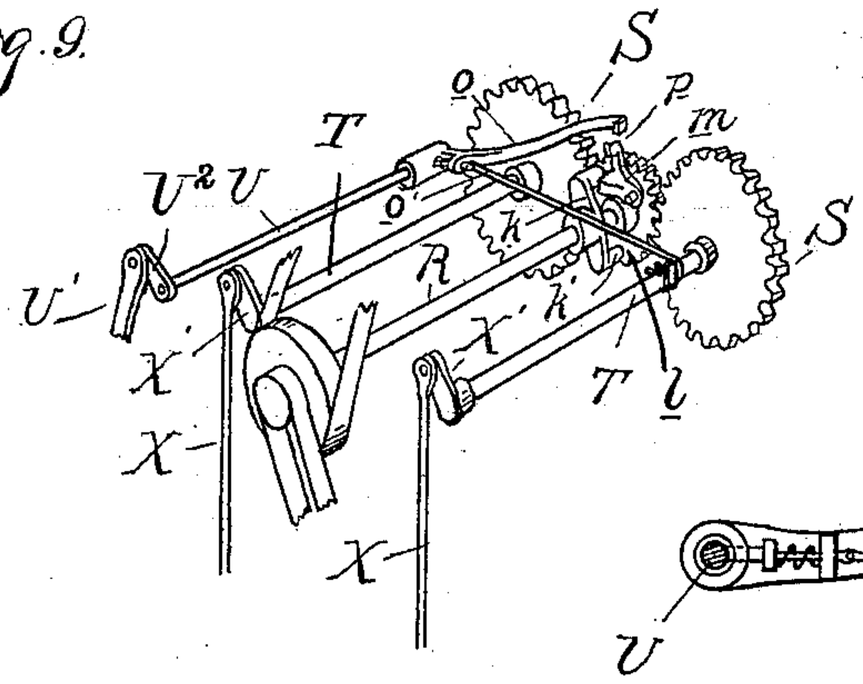


Fig. 10.

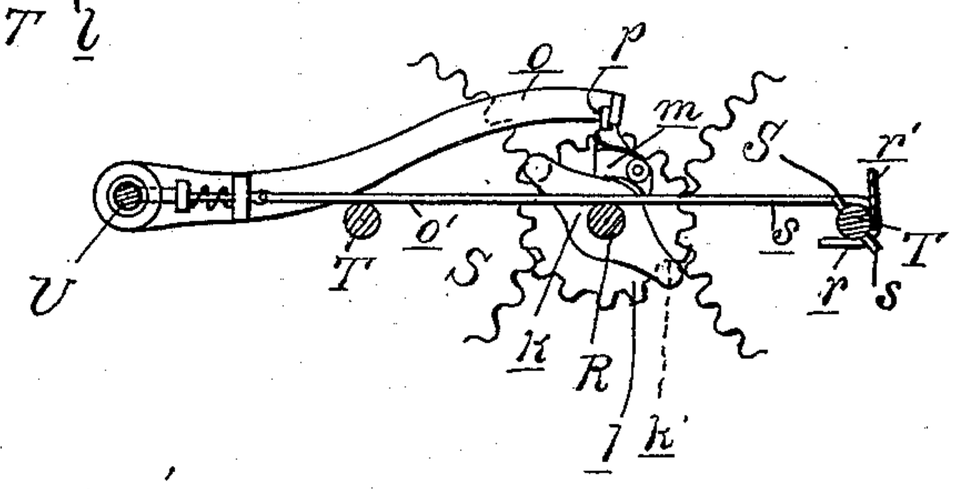


Fig. 11.

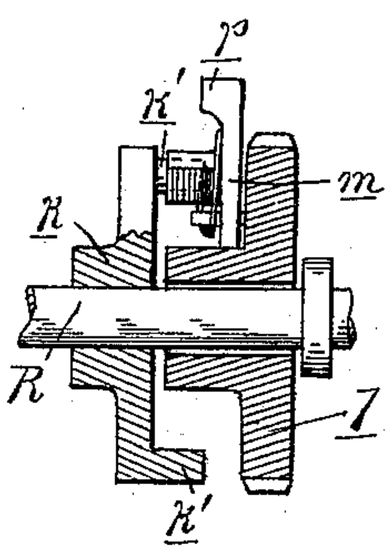


Fig. 12.

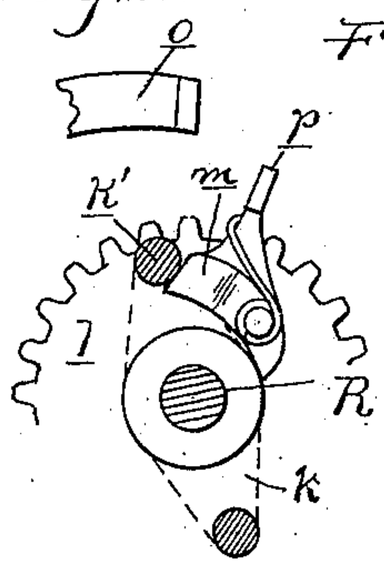


Fig. 13.

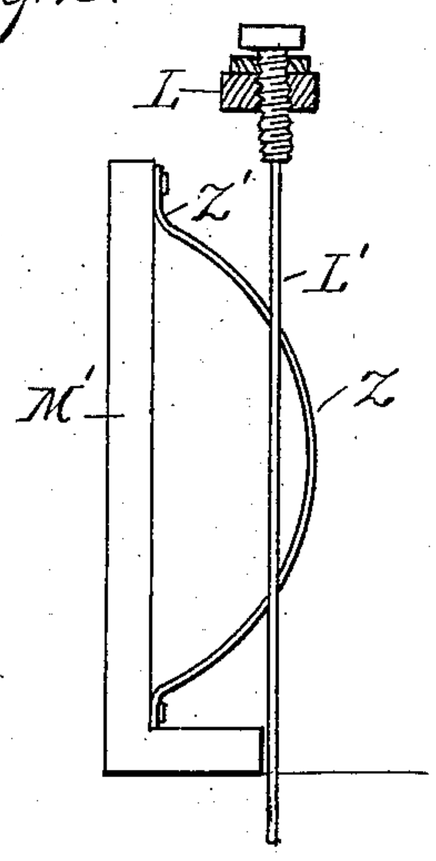


Fig. 14.

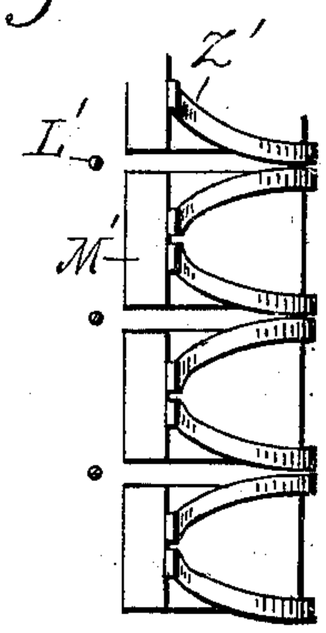
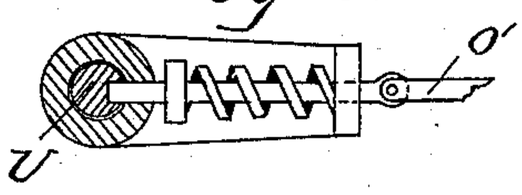


Fig. 15.



Witnesses
W. F. Stimpson
M. A. Dougherty

Inventor
Walter F. Stimpson
By Thos. G. Sprague & Son
Attys.

UNITED STATES PATENT OFFICE.

WALTER F. STIMPSON, OF MILAN, MICHIGAN, ASSIGNOR TO H. BREWER & CO., OF TECUMSEH, MICHIGAN.

BRICK-MACHINE.

SPECIFICATION forming part of Letters Patent No. 624,399, dated May 2, 1899.

Application filed July 8, 1897. Serial No. 643,813. (No model.)

To all whom it may concern:

Be it known that I, WALTER F. STIMPSON, a citizen of the United States, residing at Milan, in the State of Michigan, have invented certain new and useful Improvements in Brick-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention consists in the construction of a cut-off mechanism for brick, tile, or other machines used in the manufacture of clay products, &c.

The invention particularly consists in the construction of the actuating mechanism for the longitudinally-reciprocating table across which the column of clay is fed, and, further, in the construction of that table and its support, and, further, in the construction of the cut-off and its actuating devices, and in the construction, arrangement, and combination of the various parts, all as hereinafter more fully described, and specifically pointed out in the claims.

In the drawings, Figure 1 is a side elevation of my improved machine. Fig. 2 is a top plan view thereof with the cut-off-actuating mechanism removed. Fig. 3 is a side elevation of the actuating devices for the reciprocating tables. Figs. 4 and 5 are elevations illustrating the last-mentioned parts. Fig. 6 is a vertical transverse section through the frame of the machine, beside the actuating devices for the cut-off. Fig. 7 is a sectional perspective illustrating the operation of the cut-off. Fig. 8 is a longitudinal section illustrating the antifriction separating devices for the reciprocating carriage. Figs. 9, 10, 11, and 12 are detail views illustrating the devices for the cut-off carriage. Fig. 13 is an end elevation of the wire-cleaning device, and Fig. 14 is a top plan view. Fig. 15 is a detail view of the spring-latch o', engaging the shaft u.

A is the frame of the machine, which supports the working parts.

B is an endless belt upon which the column of clay is fed, and which belt is moved with and by the clay. Centrally of the machine is a cut-off, and beyond the cut-off is a second belt C, which removes the cut bricks. These belts and the frame may be of any desired construction.

My invention relates solely to the construction of the cut-off mechanism.

The cut-off mechanism is as follows: D is a table between the two belts. This comprises the top a and the frame b. The table is mounted upon rollers, balls, or other antifriction-bearings. I have shown the axles c mounted in ball-bearings and having wheels or rollers d running on tracks e on the frame. The frame b also has a bearing to hold it against upward thrust—such, for instance, as the beams or members h below the frame A—and having rollers, such as d', contacting with rails or bearings on the under face of the frame.

While I have shown an ordinary wheeled carriage, it is evident that any other form of antifriction device may be used to support the table and reduce the friction which the moving clay has to overcome in actuating it. So far as one particular of my invention is concerned I deem it essential that the table shall be supported in bearings which shall resist both up and down movement for reasons which will hereinafter more plainly appear.

The clay reciprocates the table forward and backward by the following mechanism: The belt B passes at one end around the roller or drum E. Upon the end of the shaft of this drum is a gear-wheel E'. Connected to the carriage is a rack-bar F, which is adapted to mesh with the gear-wheel E' and to be disengaged therefrom by turning on the hinge or pivot by which it is connected with the carriage or table. The spring F' acts to hold the rack-bar in engagement with the gear-wheel. G are pins on the gear-wheel E', which are adapted to strike the inclined face i on the under face of the block or flange G' on the rack-bar when the carriage has been moved far enough in one direction, lifting the rack-bar out of engagement with the gear-wheel. After thus lifting it out it is held out of engagement the necessary length of time between the forward reciprocations by any suitable mechanism—such, for instance, as the notched disk H, beside the gear-wheel E', and a finger H', bearing thereon, which is se-

cured to the rack-bar and will ride over the plain face of this disk between the notches, thus holding the rack-bar out of engagement until another notch is reached in the revolution of the disk, at which time, the pin having passed out from beneath the inclined face *i*, the rack-bar is free to drop into engagement with the gear-wheel, being positively moved and held therein by the spring F′. By this construction the table is reciprocated forward at intervals at exactly the same speed as the movement of the clay, the parts being so proportioned as to produce this result: The table is returned by the engagement of the pins G with a finger I on the arm J, which is connected to the table, the parts being so combined that a pin G will strike this arm at the proper moment and will continue in engagement therewith, drawing the table backward until the pin runs off the end of the arm in its upward movement. With this exceedingly simple mechanism I am enabled to get the differential movement required in the forward and backward reciprocations of the table and to get an absolutely positive length of movement for the table both ways, the reciprocations being effected entirely by the force and movement of the clay.

It is customary in machines of this kind to carry on the reciprocating table a transversely-reciprocating cut-off, and such cut-offs are usually driven from a motor or power supported on the frame of the machine or adjacent thereto to pull or push the cut-off sidewise, thereby imparting to the supporting-rollers of the table a considerable side friction, which must be overcome by the power of the clay in its movement. This friction is objectionable, because it sometimes causes the column of clay to slip or to buckle or bend. I have overcome these objections by applying the power for propelling the cut-off in the direction of the load—that is, down upon the wheels which carry the reciprocating table, or upward, in case it is desired. As will readily be understood, this prevents any side motion or thrust on the supporting-rollers of the table, and thereby greatly reduces the friction which the clay has to overcome in its forward motion.

The cut-off comprises the frame L, moving in suitable transverse guides in the table and carrying, as is shown, the desired number of wires L′ or other cutting devices for severing the column of clay, the table being provided with slits M, in which these wires run. At each side of the table suitable abutments M′ are provided, between which the column of clay passes to resist the side motion in the act of cutting. This frame L has a horizontal rack-bar O, with which a gear-wheel O′ on the shaft O^2 engages. On this same shaft is a pinion P, with which the rack-bar P′ on the frame Q engages. This frame moves in suitable guides in the reciprocating table, and as this rack-bar P′ moves up or down it actuates, through the pinion P, gear-wheel O′, and rack-bar O, the cut-off, which transversely moves the wires through the column of clay. In its downward movement the load on the supporting-rollers *d* is simply increased. In the upward movement the rollers *d′* sustain the load or thrust, and in this upward movement the actual work of the clay to move the table is lessened. The frame Q is intermittently operated through the mechanism shown in Figs. 1, 9, and 10 and is controlled by the movement of the clay. This mechanism is of the following construction: R is a driven shaft turned from any suitable source of power, which carries at one end the head *k*, which has on it the pins or lugs *k′*. Loose on this shaft is the pinion *l*, which meshes upon opposite sides with the gear-wheels S, which are secured to the ends of the shafts T, as plainly shown in Fig. 9. On this pinion *l* is a spring-actuated dog *m*, which is so located as to be normally inside the path of movement of the pins or lugs *k′*—that is, the pins or lugs will pass over it without touching. It is held in this position by means of a lever or arm *o*, secured to the rock-shaft U by means of a flexible or jointed spring-latch *o′*. The arm or lever *o* has a lug or finger engaging with a lug or finger *p* on the dog *m*. When these parts are thus engaged, they are in the position shown in Fig. 10. The disengagement of these parts is controlled by the movement of the clay through the following connecting devices: The shaft U is provided with a crank-arm U^2, which is connected by a connecting-rod U′ with the bell-crank lever V on the shaft V′, mounted on the frame of the machine, as shown in Figs. 1 and 2. This shaft, at the other end, has a rock-arm V^2, which is connected by the pitman or connecting-rod W with the reciprocating table, as plainly shown in Fig. 2. When the shaft U is rocked and lifts the arm *o* out of engagement with the finger *p* of the dog *m*, its spring will immediately throw out that dog into the path of the pin *k′* and cause the gear-wheel *l* to turn, thereby turning the gear-wheels S, and through the shafts T the cranks X′ on those shafts and connecting-rods X will move the frame Q and its rack-bar, operating the cut-off in one direction. As soon as the shafts T begin to rotate the arm *o* is disengaged from its shaft and drops in such position that upon the completion of the rotation of the wheel *l* it will catch the dog and release it from engagement from the shaft. This is accomplished by having the spring-latch *o′* provided with a hooked end *r*, engaging over one of the shafts T, which hooked portion acts as a guide for the spring-latch. The spring-latch is also provided with a shoulder or plate *r′*, which is adapted to be struck by pins *s* or cams on the shaft T, moving the latch lengthwise against the tension of its spring and releasing the arm from connection with the rock-shaft, so that it will drop in the manner and for the purpose just described. From this description it will be seen that the movement of the clay or the

reciprocating table controls absolutely the movement of the cut-off.

It will be understood without further description that the next operation of the gear-wheels S will be to move the rack-bar P′ in the opposite direction and effect the cutting by the cut-off in its return movement.

It will be observed that the power applied for operating the cut-off is applied up or down (in this case both up and down) upon the reciprocating table, which carries the actuating devices for the cut-off. By this means all side friction on the supporting devices of the reciprocating table is obviated and the power required of the clay to operate the table is greatly lessened.

The mechanism carried by the table for operating the cut-off is also very light and simple.

It is desirable to clean the wires after each operation. This I accomplish, preferably, by the mechanism shown in Figs. 13 and 14. To the side plates or side abutments M′, between which the column of clay is guided, I secure the bowed scrapers Z, preferably of spring metal. These scrapers have the outwardly-extending ends Z′, so as to make an enlarging opening, into which the wires may be guided, as plainly shown in Fig. 13. These bow-shaped scraper-bars are desirable, because they scrape the wires off gradually and thoroughly clean them.

I do not deem it necessary to describe the operation of the machine as a whole, for the reason that I have described the operation of each part of the mechanism in connection with the description of its construction.

It will be seen that the reciprocating table moves forward by power applied from the periphery of the wheel E, thus causing the table to move forward at the same speed as the clay, and that the power (from the moving clay) for returning the table is applied to the periphery of the wheel; but the connection to the table is from the pins G, nearer the center of the wheel E′, thus giving a multiplying-lever for returning the table. The result of this is twofold. It returns the table under the moving clay at a less speed than is required in its forward movement, and it reduces the power required from the moving clay to move the table against the clay movement, both factors greatly decreasing the tendency of the clay to upset in the return of the table.

The operation of the machine as a whole is as follows: The clay is fed onto the belt B from a clay-mill, causing that belt and its supporting-rollers to move at the same speed as the clay. The clay passes over the table D, and after the bricks are cut they are delivered upon the discharge-belt C. The table D, being in its initial position and a sufficient quantity of clay being upon the machine, the table moves forward with the clay because of the engagement of the rack F with the gear-wheel E′. As the table moves forward it rocks the bell-crank lever V, which through the connections described connects the power-driven shaft R with the shafts T, which actuate the vertical rack-bar P′, which movement through the gearing described causes the cut-off frame to move laterally through the clay and cut off the bricks and then to be automatically disconnected from the power-shaft. When the table is moved forward the desired distance, one of the pins G on the wheel *e′* will engage the flange G′ on the rack-bar F and lift that rack-bar out of engagement with the gear-wheel, as shown in Fig. 3. Another of the pins G will engage the finger I on the arm J and draw the table back, this backward movement being at a slower speed than the forward movement because of the location of the pin G some distance in from the periphery of the wheel, while the forward actuation of the table is produced by engagement of the rack-bar with the periphery of the wheel. At the proper time the rack-bar will again drop into engagement with the gear-wheel and another operation will take place.

What I claim as my invention is—

1. In a brick-machine, a cutting device comprising a longitudinally-reciprocating carriage, means for actuating the carriage by the clay, a horizontal transversely-moving cut-off on the carriage, and an actuating device therefor applied in the line of the load on the carriage, whereby side thrust or side friction is obviated.

2. In a brick-machine, a cutting device comprising a longitudinally-reciprocating carriage, of a horizontal transversely-moving cut-off thereon, an actuating mechanism on the carriage for the cut-off and a motor or power device outside the carriage for imparting motion to said actuating mechanism, said power being applied up or down substantially in the line of the load on the support for the carriage whereby there is no side thrust thereon in moving the cut-off.

3. In a brick-machine, a cutting device comprising a longitudinally-reciprocating carriage, a transversely-moving cut-off thereon, a rack-bar on the cut-off, an actuating-pinion on the carriage engaging the rack, and a vertically-moving rack-bar, and connecting devices for actuating said pinion.

4. In a brick-machine, a cutting device comprising a longitudinally-reciprocating table, driven by the moving slab of clay and supported to resist up-and-down motion while moving, a transversely-moving cut-off and a vertically-moving actuating device therefor adapted to actuate the cut-off in both its up and down movements.

5. In a brick-machine, the combination with a longitudinally-reciprocating table, actuated by the moving clay, of a transversely-moving cut-off on the table, a gear and pinion supported on the table, a rack on the cut-off with which the gear engages, a vertically-moving rack on the table engaging the pinion,

and an intermittently-actuating device for the vertical rack, controlled by the movement of the clay.

6. In a brick-machine, the combination with a longitudinally-reciprocating table, actuated by the moving clay, of a transversely-moving cut-off on the table, a shaft on the table having a gear and pinion, a frame, guided in the table, the vertical rack, meshing with said pinion P, and a link or pitman connection for intermittently driving the vertical rack, controlled by the moving clay.

7. In a brick-machine, the actuating device for the cut-off, comprising shafts T, cranks on said shafts, pitmen connected to the cranks and to the cut-off, gears S on said shafts, a driven shaft, a gear-wheel loose on the driven shaft, and meshing with the gears S, pins or lugs K′ on said shaft, a dog on the gear-wheel adapted to be normally out of contact with said pins, means controlled by the column of clay for throwing the dog into contact with said pins, and devices on the operating devices for disengaging the dog.

8. In a brick-machine, the actuating device for the cut-off comprising the clutch mechanism, the rock-shaft U having its movement controlled by the movement of the clay, the spring-latch *o′*, the arm *o*, connected to the shaft U by means of that latch and devices on the operated mechanism for actuating the latch as soon as the arm *o* has released the dog.

9. In a brick-machine the actuating device for the cut-off comprising the clutch mechanism, the rock-shaft U, the arm *o* the spring-latch *o′* connecting the arm *o* to the shaft U, the hooked end *r*, on the latch *o′* and the lug or plate *r′* on said hooked end *r*, the shaft T, and the cams or pins *s* adapted to strike the lug *r′* as and for the purpose described.

10. In a brick-machine, the combination of the reciprocating table, of the gear-wheel E′ driven by the column of clay, the rack F, the cam G′ connecting the rack-bar F with the gear-wheel E′ intermittently, said rack-bar being connected to the table, pins G on the gear-wheel E′ the hook I and the lever J carrying the hook.

11. In a brick-machine, the combination with the reciprocating table, of devices for reciprocating the table operated by the movement of the clay and consisting of the gear-wheel E′, a rack-bar adapted to be intermittently connected with the gear thereon to move the table forward, an arm extending from the table and a pin G on the gear-wheel E′ adapted to be coupled intermittently therewith said pins being at an inner point on the wheel, whereby such connections move the table back at a slower speed than it is moved forward.

12. In a brick-machine, the combination with the reciprocating table, of mechanism for reciprocating it by the motion of the clay, consisting of the gear-wheel E′, the rack-bar F connected to the reciprocating table, means for intermittently connecting the rack-bar with the gear on the wheel, the arm J having the finger I, pins G adapted to engage the finger I and the plate or cam on the rack-bar adapted to be struck by the pins to intermittently disengage the rack-bar from the gear-wheel.

13. In a brick-machine, the combination with the reciprocating table, of the actuating devices therefor, operated by the movement of the column of clay, said devices comprising the gear-wheel E, the rack-bar F, the plate G′ on said rack-bar and the inclined face *i* on said plate, the pins G on the gear-wheel adapted to strike said inclined face, the finger H′ and the notched disk H beside the gear-wheel E′, these parts coöperating to feed the table forward, substantially as described.

14. In a brick-machine, the combination with a movable cut-off comprising a series of wires or knives, of the slitted table through which they move, the slitted standards or guides on the table beside the path of the brick, and bowed scrapers into which the wire moves for the purpose described.

15. In a brick-machine, scrapers for the wires, comprising bowed scrapers secured beside or to the slitted standards or guides and having the outward-extending end portions Z for the purpose described.

16. In a brick-machine, the combination with the reciprocating cut-off, having a wire or wires for severing the clay, of curved scrapers arranged on either side of each wire for the purpose described.

17. In a clay cut-off, a reciprocating table, means for moving the table forward at the speed of the clay, and for moving it back at a less speed, by the movement of the clay, and means for cutting off the clay.

18. In a clay cut-off, a reciprocating table, devices for moving it forward at the same speed as the clay, means for gearing back the power-applying device for the table in its return movement, such devices being actuated by the column of clay and means for cutting off the clay.

19. In a clay cut-off, a reciprocating table, a wheel, from a part of which the table is moved forward actuated by the clay, means for disconnecting the driving device at the end of the forward travel of the table, and means for connecting the table to the wheel at a point nearer its center than the forward driving-point, to return the table.

In testimony whereof I affix my signature in presence of two witnesses.

WALTER F. STIMPSON.

Witnesses:
M. B. O'DOGHERTY,
OTTO F. BARTHEL.