(No Model.) 2 Sheets—Sheet 1.

O. W. JOHNSON.

RECIPROCATING CUT-OFF MECHANISM FOR BRICK MACHINES.

No. 510,344. Patented Dec. 5, 1893.

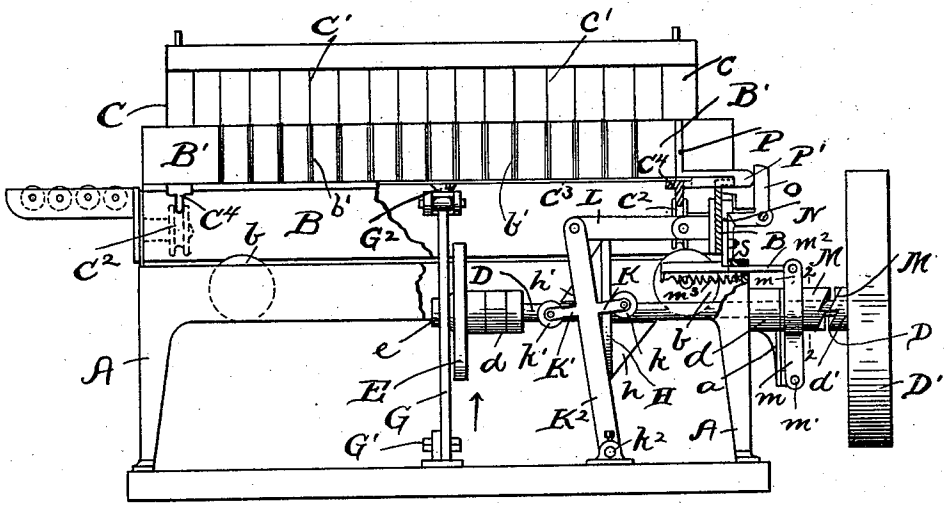


Fig. 1.

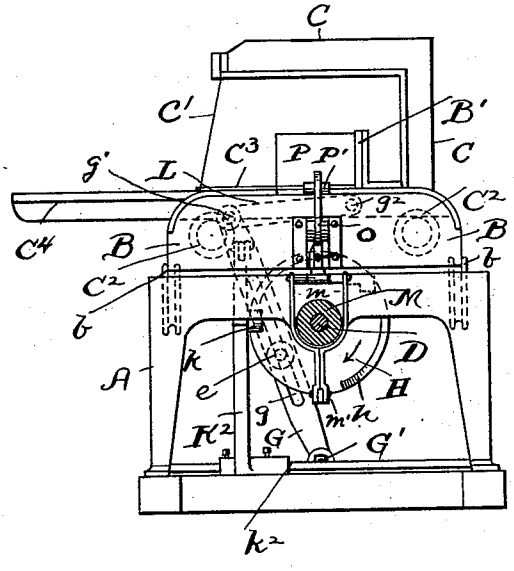


Fig. 2.

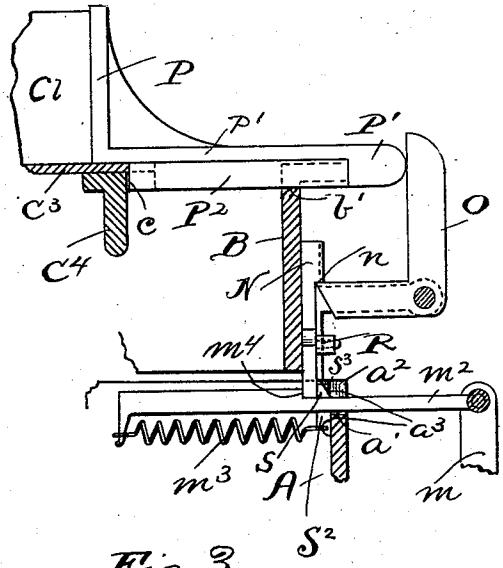


Fig. 3.

Witnesses.
E. B. Gilchrist.
C. F. Wood

Inventor.
Oliver W. Johnson
By Riggs & Riggs
his Attorneys

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

(No Model.) 2 Sheets—Sheet 2.

O. W. JOHNSON.

RECIPROCATING CUT-OFF MECHANISM FOR BRICK MACHINES.

No. 510,344. Patented Dec. 5, 1893.

Fig. 4

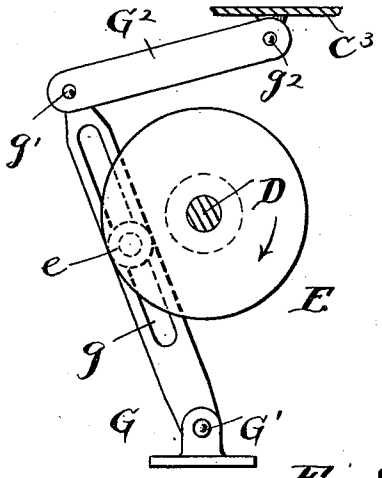


Fig. 7.

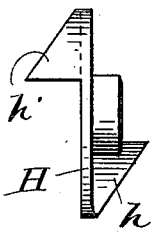


Fig. 6.

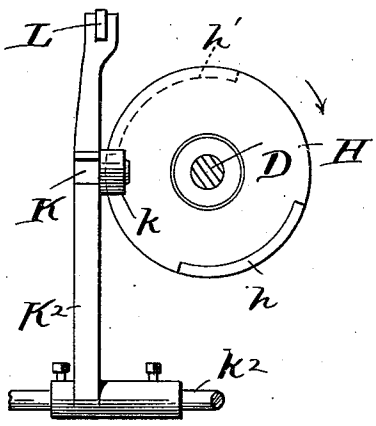
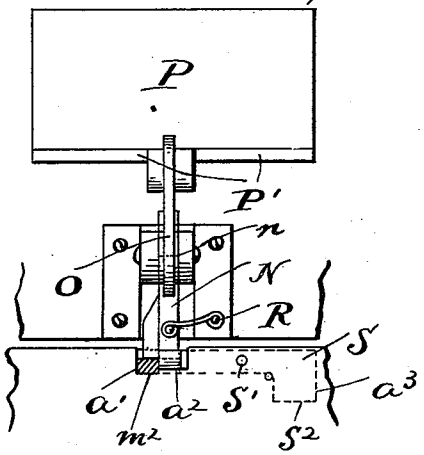


Fig. 8.



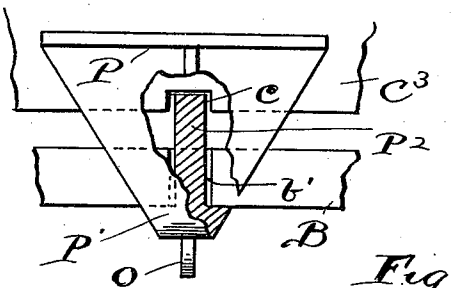


Fig. 9.

Fig. 5.

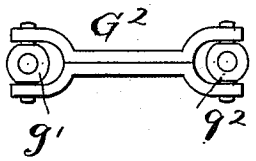


Fig. 10.

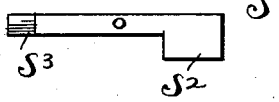
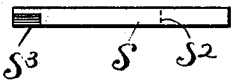


Fig. 11.



Witnesses.
E. B. Gilchrist.
C. Howson

Inventor.
Oliver W. Johnson
By Lyon & Lyon
His Attorneys

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

OLIVER WARREN JOHNSON, OF CLEVELAND, ASSIGNOR TO J. W. PENFIELD & SON, OF WILLOUGHBY, OHIO.

RECIPROCATING CUT-OFF MECHANISM FOR BRICK-MACHINES.

SPECIFICATION forming part of Letters Patent No. 510,344, dated December 5, 1893.

Application filed April 10, 1893. Serial No. 469,735. (No model.)

To all whom it may concern:

Be it known that I, OLIVER WARREN JOHNSON, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Reciprocating Cut-Off Mechanism for Brick-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

My invention relates to an automatic reciprocating cut-off table for brick, tile and other clay product machines, wherein a moving bar or column of clay, as propelled from an auger machine, or any other machine, is adapted to be automatically cut or severed into bricks or pieces, and my invention consists more particularly in a reciprocating cut-off machine that will automatically and perfectly cut a moving bar or column of clay into bricks or pieces and the operating parts whereof are positive in their motion.

My invention consists further in a cut-off machine, the driving-shaft whereof is automatically operated by mechanism actuated by the moving bar or column of clay.

My invention further consists in certain features of construction whereby no loss of power is had and whereby the cutting or severing operation is effected without stopping or bending or buckling the column or bar of clay.

My invention consists moreover in suitable means for positively moving the section of the column or bar of clay severed into pieces away from the main body or column of clay, thereby rendering immaterial the speed at which the main column of clay is traveling.

My invention consists moreover in certain features of construction and combination of parts whereby the severing wires, during the cutting-operation, are moved parallel and at a uniform speed with the section or bar of clay to be cut into pieces and whereby the operating parts after the cutting operation are promptly and positively returned in place and at the proper time for the next succeeding operation.

My invention, furthermore, consists in suitable means for securely locking to the supporting-frame the longitudinally reciprocating-frame that moves the section of clay severed into pieces away from the main column of clay, and for securely locking to said reciprocating frame the clay-receiving table and severing-wire frame, and for retaining said parts locked until the locking means employed has been actuated to unlock the parts, thereby insuring a rigid condition of said moving table and reciprocating severing-wire frame supported thereby until the proper time, and my invention also consists in locking mechanism for the purpose indicated that will automatically perform its function when the parts return to their place of beginning in position for the next succeeding operation.

My invention consists, also, in the details of construction both to most efficiently attain the results already indicated and to attain certain other advantages hereinafter specified.

A preferable construction of machine embodying my invention is illustrated in the accompanying drawings, wherein—

Figure 1 is a front side elevation of a side-delivery cut-off table embodying my invention, portions being broken away and in section to more clearly show the construction. Fig. 2 is a right hand end elevation of the same, partly in section, on line 2—2, Fig. 1, portions being broken away to more clearly show the construction. Fig. 3 is an enlarged front side elevation of a portion of the machine exhibiting more clearly the mechanism for locking the reciprocating table to the supporting-frame and for locking to said reciprocating table the reciprocating severing-wire-frame and clutch-mechanism for operatively connecting the driving-wheel with the driving-shaft, said table, severing-wire-frame, supporting-frame and other parts being shown in section to more clearly show the construction, and the column of clay C′ being shown in position ready to actuate said mechanism to unlock the parts. Fig. 4 shows a right hand side elevation of the mechanism for effecting the reciprocation of the severing-wire-frame, and Fig. 5 is a top plan of the rod or link for operatively connecting the lever-arm of said mechanism with the severing-wire-frame. Fig. 6 is an enlarged right hand side elevation of the mechanism for recipro-

cating the table that receives the bar or column of clay and that supports the severing-wire-frame, and Fig. 7 is a left hand side elevation of the cam-wheel of said mechanism. Fig. 8 is a right hand end elevation of a portion of the machine, exhibiting the locking-mechanism, and the means employed for actuating said mechanism to unlock, and Fig. 9 is a plan view of the same, partly broken away, to show certain features in the construction. Fig. 10 is a right hand side elevation of the latch-locking-lever employed and Fig. 11 is a top plan of the same.

A represents the supporting-frame of the cut-off machine, and B represents the longitudinally-reciprocating frame that is mounted upon wheels or rollers, *b*, supported in any suitable manner by the supporting-frame, the clay being severed or cut upon said table.

C represents the severing-wire-frame, and C′ the severing wires, said frame being adapted to reciprocate transversely of frame B, or rather at right angles to the movement of frame B, frame C being mounted upon wheels or rollers, C^2, in any suitable manner, and being provided with table C^3 upon which the bar or column of clay is cut.

Frame B, at the rear, is provided with a back B′, that is recessed vertically, as at *b*′, for receiving the severing-wires when the latter have severed the bar or section of the bar or column of clay. The severing-wire frame has a forward extension, C^4, for receiving a board or pallet (not shown) flush with the top surface of table C^3 so that when the section of the bar or column is in place on said table and is thereupon severed into pieces by the rearward reciprocation of the severing-wires, back B′ of frame B will force the severed pieces of clay forward off table B onto the board or pallet that is thereupon lifted off and an empty board or pallet put in its place.

By mechanism hereinafter described frames B and C are caused to reciprocate simultaneously, and the severing-wire-frame being carried by or traveling with table C, it follows that the pieces of clay will be cut or severed straight and perfectly.

D represents the driving-shaft that extends lengthwise of and is journaled in suitable boxes *d* rigid with the supporting-frame. Upon the outer or right hand end of said shaft is loosely mounted a driving-pulley or wheel D′, that is adapted to be automatically operatively connected with the driving-shaft as will hereinafter appear. Upon the opposite end of the shaft is operatively mounted a crank-wheel or crank E, the pin *e* whereof engages and is adapted to play within an elongated slot *g* in lever arm, G, that is fulcrumed at its lower end, as at G′, to any suitable support, and at its upper or opposite end is operatively connected by means of a rod or link, G^2, with the severing-wire-frame, the connection between said link or connecting rod, and the lever-arm and severing-wire-frame, being by means of universal joints, *g*′ and g^2, that are not only desirable to attain a nice operation of the parts but are quite requisite to accommodate the movement of the severing-wire-frame with frame B. The position of the parts, in starting the operation, is shown in the drawings, wherein pin *e* of crank-wheel E engages the central portion or approximately the central portion of the slot in the vibrating or oscillating lever-arm G. If now, power were applied to the driving-shaft to cause said crank-wheel to rotate in the direction of the arrow, it follows that pin *e* would move toward the upper end or farther from the fulcrum of lever G and actuate the latter rearward with a slow motion, which motion is desirable, the advantages of transmitting a slow motion to the severing-wires in cutting being well understood. Pin *e* having made a half revolution and the severing operation having been completed, lever G will be actuated forward or in the opposite direction and the pin now descending the slot in said lever, or approaching the fulcrum of the lever, it follows that the movement of said lever is increased as desired.

H represents a cam-wheel operatively mounted on the driving-shaft between crank-wheel E and the adjacent end of the supporting-frame. Wheel H is provided with two laterally-projecting wing-shaped cams, *h h*′, located diametrically opposite and at opposite sides of the wheel, respectively, said cams extending along the circular edge of the wheel and being gradually reduced in size, widthwise, but in opposite directions, respectively, cam *h* decreasing in width in the direction in which it travels and cam *h*′ being reduced in width in the opposite direction. Said cams *h h*′ are adapted to be engaged, respectively, by rollers, *k k*′, secured to the inner side of laterally-extending arms K K′, respectively, of a vibrating or oscillating lever, K^2, that is fulcrumed, at its lower end, as at k^2, to any suitable support and its upper end is operatively connected, by a connecting rod or link, L, with frame B. It is, therefore, quite obvious that the aforesaid cams will oscillate lever K^2 in opposite directions, respectively, and consequently frame B will be reciprocated in the one direction or the other according as the one or the other cam is acting, the arrangement of parts being so timed relative to the operation of the mechanism for actuating the severing-wire frame that the latter and frame B will be reciprocated simultaneously, but of course in directions at right angles to each other as already indicated.

By the construction hereinbefore described, it will be observed that there is no loss of power, no interruption in the operation nor any liability of the clay bending or buckling during the operation.

Proceeding now to describe the means employed for locking the severing-wire-frame to frame B; for locking the latter to the supporting-frame; for locking the movable clutch-mechanism in position out of engage-

ment with the driving-pulley, and the means employed for causing said locking-devices to automatically lock and unlock, and referring first to the clutch-actuating mechanism, M represents an ordinary serrated or toothed clutch-member operatively mounted on the driving-shaft and adapted to be thrown into engagement with its counterpart M′ on the hub d' of the driving-pulley, by means of a lever m, fulcrumed at m' to an arm or bracket a rigid with the supporting-frame, and operatively connected with the clutch in any well known manner, said lever being actuated to establish operative connection between the clutch and driving-pulley by a spring-actuated bar m^2, the supporting-frame being slotted, as at a', Fig. 3, to accommodate the location and operation of said bar, m^3 representing the actuating spring that is secured at one end to the inner end of said bar and at its opposite end, to the supporting-frame. Bar m^2, on its upper side is provided with an outwardly-presenting shoulder, m^4, that is adapted to be engaged by an upright lifting-latch, N. Said latch is adapted to slide on bar m^2 endwise of slot a^2 in the supporting-frame and is provided, near its upper end, with a shoulder n, that is engaged by the one or horizontal arm of a bell-crank, O, the other or upright arm of said bell-crank being adapted to be engaged by the outwardly-projecting horizontal part P′ of a pressure-foot or member, P, the upright part whereof is adapted to be engaged by the bar or column of clay.

Pressure-foot or member P is adapted to move endwise of frame B, the latter being slotted as at b' to receive and form a guide for a tongue P^2 on the under side of the horizontal part of member P, the severing-wire-frame being also slotted, as at c, for receiving the inner end of said tongue, thereby locking said severing-wire frame to frame B until the proper time. Latch N abuts the outer side of frame B, and R represents a spring secured at opposite ends to the latch and frame B, respectively, and acting in the direction to retain the latch in engagement with slot a^2 in the supporting-frame, thereby always maintaining reciprocating-frame B efficiently locked to the supporting-frame as against any tendency to move said reciprocating-frame transversely of the machine.

S represents a locking-lever fulcrumed, as at S′, to the inner side of the supporting-frame, the forward end of said lever being adapted to engage the outer side of the lower end of latch N and lock the latter in position abutting frame B, thereby causing said frame when not in operation, to be rigidly held against moving endwise. Locking-lever S is preferably of the gravity variety, being weighted at its rear end, as at S^2. The supporting-frame of the machine is slotted, as at a^3, for accommodating the location and operation of said locking-lever and the location of said lever is such that its forward end will, in the normal position of the same, engage the upper portion of slot a^2 in the supporting-frame, so that when the latch is lifted by means of bell-crank O the latch is free to ride outward on clutch-actuating-lever operating-bar m^2, and the forward end of said locking-lever is beveled, as at S^3, so that when the latch is returned to its engagement with shoulder m^4 of bar m^2, the latch will automatically tilt said locking-lever by engaging and riding over the beveled end of said lever, whereupon the gravity of the locking-lever will return the same to its normal position, locking the latch in its engagement with shoulder m^4. The operation of the parts will be readily understood. The bar or column of clay passes onto and along the table of the severing-wire-frame until it engages and actuates pressure-foot or member P, causing tongue P^2 of the horizontal part P′ of said pressure-member to disengage recess or slot c in the severing-wire-frame, thereby unlocking the latter from frame B, permitting the reciprocation of frame C. Bell-crank O, by means of the horizontal part P′ of the pressure-foot or member, is thereupon actuated, causing latch N to be lifted out of engagement with shoulder m^4 of the clutch-actuating-lever operating bar, and above locking-lever S, against the action of spring R, causing bar m^2 to actuate the clutch-operating-lever and permitting the reciprocation of frame B, resulting in the operative connection of the driving-wheel or pulley with the driving-shaft and in the actuation of the mechanism for operating the aforesaid reciprocating-frames. The cutting operation having been completed the reciprocating frames will return in position for the next operation, the table of frame C returning under the incoming column of clay; the clutch will be disengaged from the driving-wheel by means of the actuation by latch N, of bar m^2 in the requisite direction against the action of spring m^3; latch N, returning will ride into slot a^2 of the supporting-frame and over the beveled end of locking lever S, depressing said end of the locking-lever in riding over it, whereupon the locking-lever will lock latch N in said slot against shoulder m^4 of bar m^2 and abutting the adjacent end of frame B, thereby relocking reciprocating-frame B to the supporting-frame, and the latch, by means of spring R, will be held in such position until again elevated in the succeeding operation; bell-crank O, by means of shoulder n on said latch, will have been returned to its first position and will in turn have returned pressure-foot or member P into position with the tongue P^2 of the horizontal part of said pressure-member into engagement with slot or recess c in the severing-wire frame, thereby securely locking the latter to frame B and retaining the same thus locked until pressure-foot or member P is again actuated by the incoming bar or column of clay preparatory to the next succeeding cutting operation.

Having thus shown and described a preferable embodiment of my invention, what I

desire to claim and secure by Letters Patent is—

1. In a reciprocating cut-off mechanism, the combination with a reciprocating severing-wire-frame, a vibrating or oscillating lever and a link or connecting rod for operatively connecting the reciprocating frame with said lever, the latter being longitudinally slotted, substantially as indicated, of a rotating shaft, a crank-wheel or crank operatively mounted on said shaft and provided with a pin engaging and adapted to travel endwise of the slot in the aforesaid vibrating or oscillating-lever, substantially as set forth.

2. In a reciprocating cut-off mechanism, the combination with a severing-wire frame, a vibrating or oscillating lever provided with a slot extending lengthwise thereof and a crank or connecting rod operatively connecting the reciprocating-frame with said lever and being connected with said lever and frame by means of universal joints, of a rotating shaft, a crank-wheel or crank operatively mounted on said shaft and provided with a crank-pin engaging and adapted to travel endwise of the slot in the aforesaid oscillating lever, substantially as set forth.

3. In a reciprocating cut-off mechanism, the combination with a reciprocating-frame carrying the table upon which the bar or column of clay to be severed is passed, a vibrating or oscillating-lever and suitable means operatively connecting the reciprocating-frame with said lever, said lever carrying two rollers on opposite sides, respectively, of a rotating-shaft, two cams operatively connected with said shaft and adapted to engage the respective rollers of the lever and actuate the lever in opposite directions, respectively, the arrangement of parts being such that the reciprocating-frame is actuated in the one direction or the other according as the oscillating-lever is actuated by the one or the other of said cams, substantially as set forth.

4. In a reciprocating cut-off mechanism, the combination with a reciprocating-frame carrying the table upon which the bar or column of clay to be severed is passed, a vibrating or oscillating-lever and suitable means for operatively connecting the reciprocating frame with said lever, said lever being provided with two oppositely extending arms provided with rollers, of a rotating-shaft, a cam-wheel operatively mounted on said shaft, said wheel being provided with two cams located diametrically opposite and adapted to engage the respective rollers of the lever arms, the arrangement of parts being such that the reciprocating-frame is actuated in the one direction or the other according as the oscillating-lever is actuated by the one or the other of said cams, substantially as set forth.

5. In a reciprocating cut-off mechanism, the combination with the supporting-frame, a frame adapted to reciprocate longitudinally of the supporting-frame and provided with a back, and a severing-wire-frame supported by and adapted to reciprocate transversely of said longitudinally-reciprocating-frame, said severing-wire-frame being provided with a table for receiving the bar or column of clay to be severed into pieces, and being adapted to receive a board or pallet forward of said table, of suitable means for simultaneously reciprocating said frames, the arrangement of parts being such that during the severing operation the back of the longitudinally-reciprocating-frame will force the severed pieces of clay onto the aforesaid board or pallet, substantially as set forth.

6. In a reciprocating cut-off mechanism, the combination with a supporting-frame, a frame supported by and adapted to reciprocate longitudinally of said supporting-frame, a severing-wire-frame carried by and adapted to reciprocate transversely of said longitudinally-reciprocating frame, said longitudinally-reciprocating frame being provided with an upright back and the severing-wire frame being provided with a table adapted to move in under said back, and adapted to receive the bar or column of clay to be severed into pieces, said back being vertically recessed or slotted for receiving the severing-wires when the latter have performed the severing operation, of a rotating shaft, suitable mechanism for actuating said reciprocating-frames, and suitable means operatively connected with the rotating shaft for actuating said mechanism, substantially as set forth.

7. In a reciprocating cut-off mechanism, the combination with a supporting-frame, a frame supported by and adapted to reciprocate longitudinally of said supporting-frame, a severing-wire-frame carried by and adapted to be reciprocated transversely of said longitudinally-reciprocating frame, the latter being provided with an upright back and the severing-wire-frame being provided with a table adapted to move in under said back, and adapted to receive the bar or column of clay to be severed into pieces, the back being vertically recessed or slotted for receiving the severing-wires when the latter have performed the severing operation, of a rotating shaft, suitable mechanism for actuating said reciprocating frames, and suitable means operatively connected with the rotating shaft for actuating said mechanism, a driving-pulley or wheel loosely mounted on said shaft and suitable means for establishing operative connection between the driving-wheel and driving-shaft, substantially as set forth.

8. In a brick cut-off mechanism, the combination with the supporting-frame, of a movable frame supported by and adapted to reciprocate endwise of the supporting-frame, said reciprocating-frame carrying the table for receiving the bar or column of clay to be severed into pieces, suitable means for locking said reciprocating-frame to the stationary supporting-frame, said locking-means being

adapted to be actuated to unlock by the moving bar or column of clay, substantially as set forth.

9. In a reciprocating cut-off mechanism, the combination with the stationary supporting-frame, a movable frame supported by and adapted to reciprocate on said stationary frame, a lifting-latch and lever for locking the reciprocating-frame to the stationary-frame, said latch being provided with a shoulder, a bell-crank fulcrumed to said reciprocating frame and engaging the shoulder on the latch aforesaid, a reciprocating pressure-foot or member supported by said reciprocating-frame and adapted to actuate the aforesaid bell-crank, said pressure-foot or member being adapted to be actuated by the moving bar or column of clay to operate the bell-crank and thereby actuate the locking-mechanism to unlock the reciprocating-frame from the stationary-supporting-frame, substantially as set forth.

10. In a reciprocating cut-off mechanism, the combination with the stationary supporting-frame, a longitudinally-reciprocating frame supported by said stationary frame, a transversely-reciprocating-frame supported by said longitudinally-reciprocating frame, said transversely-reciprocating frame being provided with severing wires and the table for receiving the bar or column of clay to be severed into pieces, of suitable means for locking said transversely reciprocating-frame to the longitudinally-reciprocating frame, said locking means being adapted to be actuated to unlock by the moving bar or column of clay, substantially as set forth.

11. In a reciprocating cut-off mechanism, the combination with a longitudinally-reciprocating table for receiving and positively carrying the severed section of the bar of clay away from the main column of clay, of a rotating-shaft, driving-pulley or wheel loosely mounted on said shaft, mechanism for reciprocating said table, suitable means operatively connected with the driving-shaft for actuating said mechanism, suitable clutch-mechanism for operatively connecting the driving-wheel with the driving-shaft, suitable means for locking said clutch-mechanism in position operatively disconnecting the driving-wheel and driving-shaft, a pressure-foot or member adapted to be actuated by the moving bar of clay, and suitable means, for unlocking the clutch-mechanism, adapted to be actuated by said pressure-foot or member, a spring for actuating the clutch-mechanism, when unlocked, to establish operative connection between the driving-wheel and driving-shaft, the arrangement of parts being substantially as set forth.

12. In a reciprocating cut-off mechanism, the combination of the supporting-frame, a longitudinally reciprocating-frame supported by said stationary frame and carrying the table for receiving the section of the bar or column of clay to be cut into pieces, a rotating shaft, suitable mechanism for actuating said reciprocating frame, suitable means operatively connected with the rotating-shaft for actuating said mechanism, a driving-pulley or driving-wheel loosely mounted on said shaft and provided with a clutch-member, a reciprocating counterpart or companion of said clutch-member operatively mounted on the driving-shaft and adapted to establish operative connection between the driving-wheel and driving-shaft, a latch for holding said sliding clutch-member out of operative connection with the driving-wheel, suitable means for throwing said sliding clutch-member into operative connection with the driving-wheel suitable means for actuating the aforesaid latch to unlock the sliding clutch member and adapted to be actuated by the moving bar or column of clay, the arrangement of parts being substantially as set forth.

13. In a reciprocating cut-off mechanism, the combination of a stationary supporting-frame, a longitudinally reciprocating frame, B, supported by said stationary frame and provided with a back, B′, a transversely reciprocating-frame, C, supported by said longitudinally-reciprocating-frame, and provided with severing wires, C′, and a table C^3, suitable mechanism for simultaneously-reciprocating said frames, of a rotating-shaft, suitable means mounted on said shaft for actuating the aforesaid reciprocating-frames actuating-mechanism, a driving-pulley or wheel loose upon said shaft and provided with a clutch-member, a reciprocating counterpart or companion of said clutch-member operatively mounted on said shaft and adapted to establish operative connection between the driving-wheel and driving-shaft, a lever for operating said clutch, an operating bar for said lever, a spring for actuating said bar to throw the sliding clutch-member into operative connection with its counterpart or companion, said bar having an outwardly-presenting shoulder, a lifting latch adapted to engage said shoulder, a lever for locking said latch, a spring for holding said latch upon the clutch-lever actuating-bar, the latch having a shoulder near its upper end, a bell-crank engaging said shoulder, a pressure-foot or member for actuating said bell-crank, the aforesaid reciprocating-frames being recessed or slotted, as at c, a^3, the pressure-foot or member having a tongue or key for engaging said slots or recesses, the arrangement of parts being substantially as and for the purpose set forth.

In testimony whereof I sign this specification, in the presence of two witnesses, this 18th day of October, 1892.

OLIVER WARREN JOHNSON.

Witnesses:
C. H. DORER,
WARD HOOVER.