

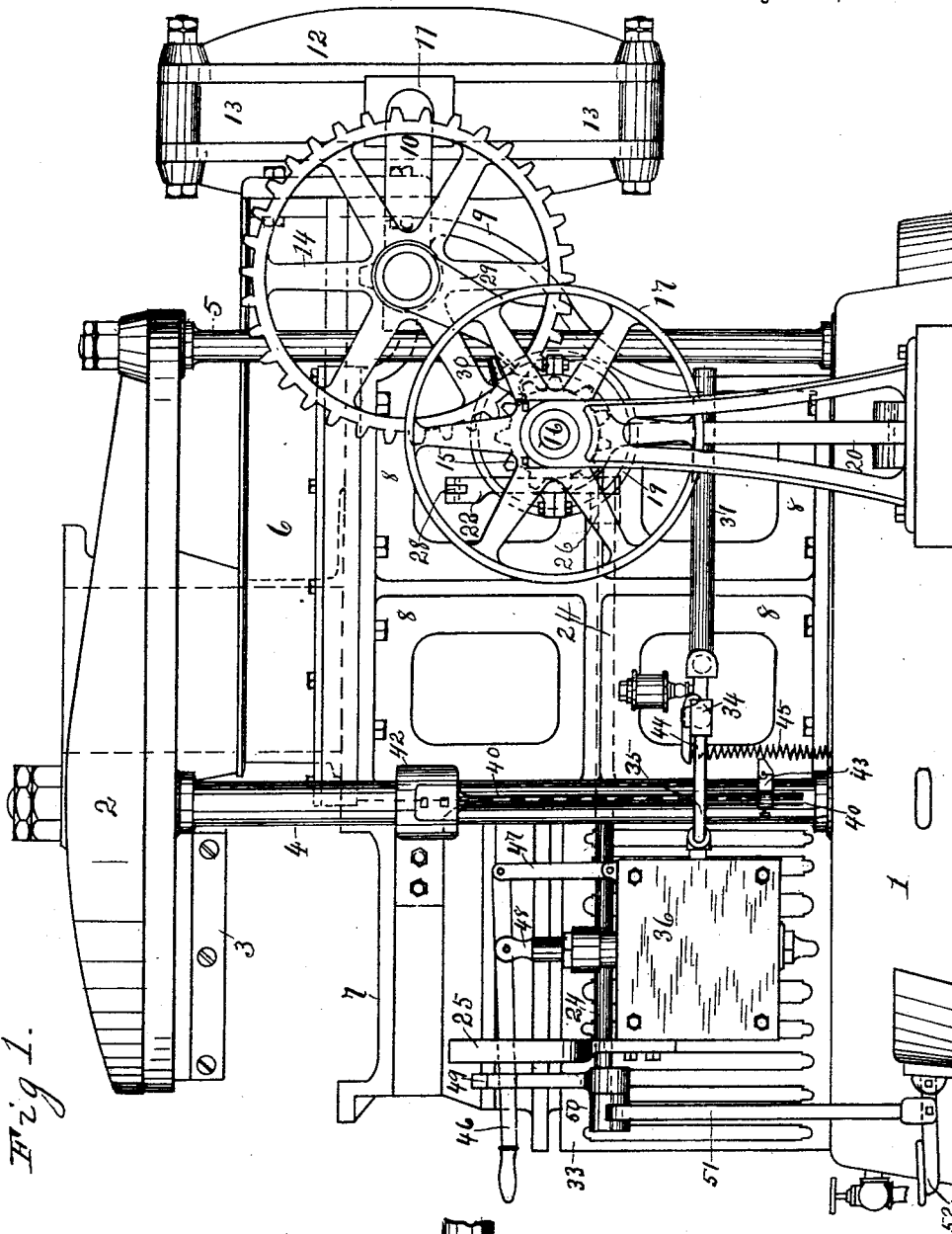
(No Model.)

3 Sheets—Sheet 1.

T. DE ARMON.
OIL CAKE FORMER.

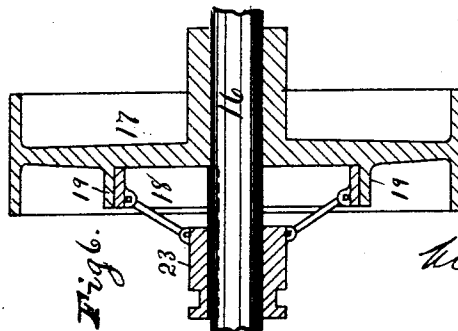
No. 586,353.

Patented July 13, 1897.



WITNESSES:

L. L. Allen.
Wm. P. Whitney



Thos De Armon

INVENTOR:

By R. J. McCarty
ATTORNEY:

(No Model.)

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Fig 2.

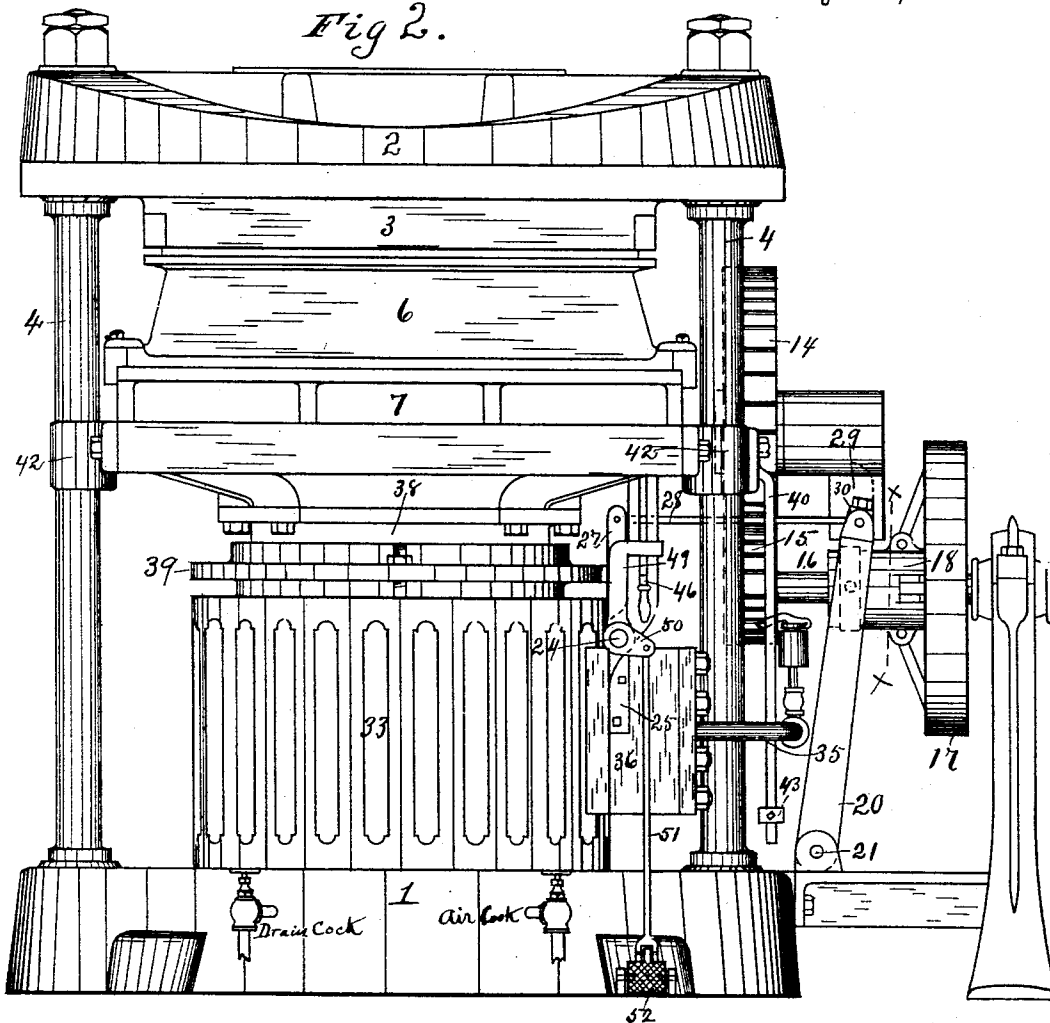
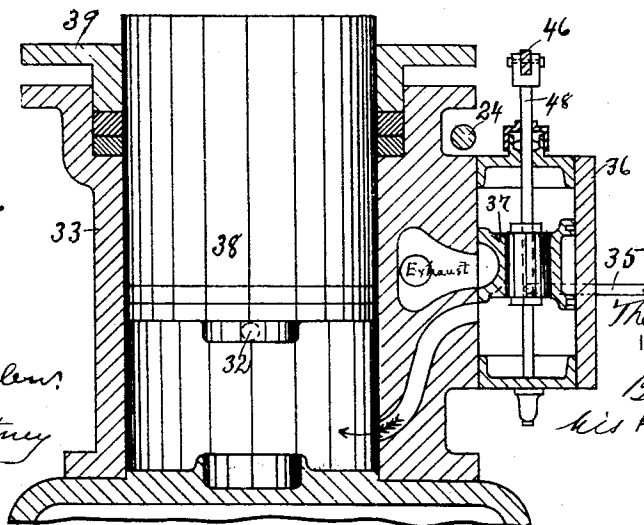


Fig 4.



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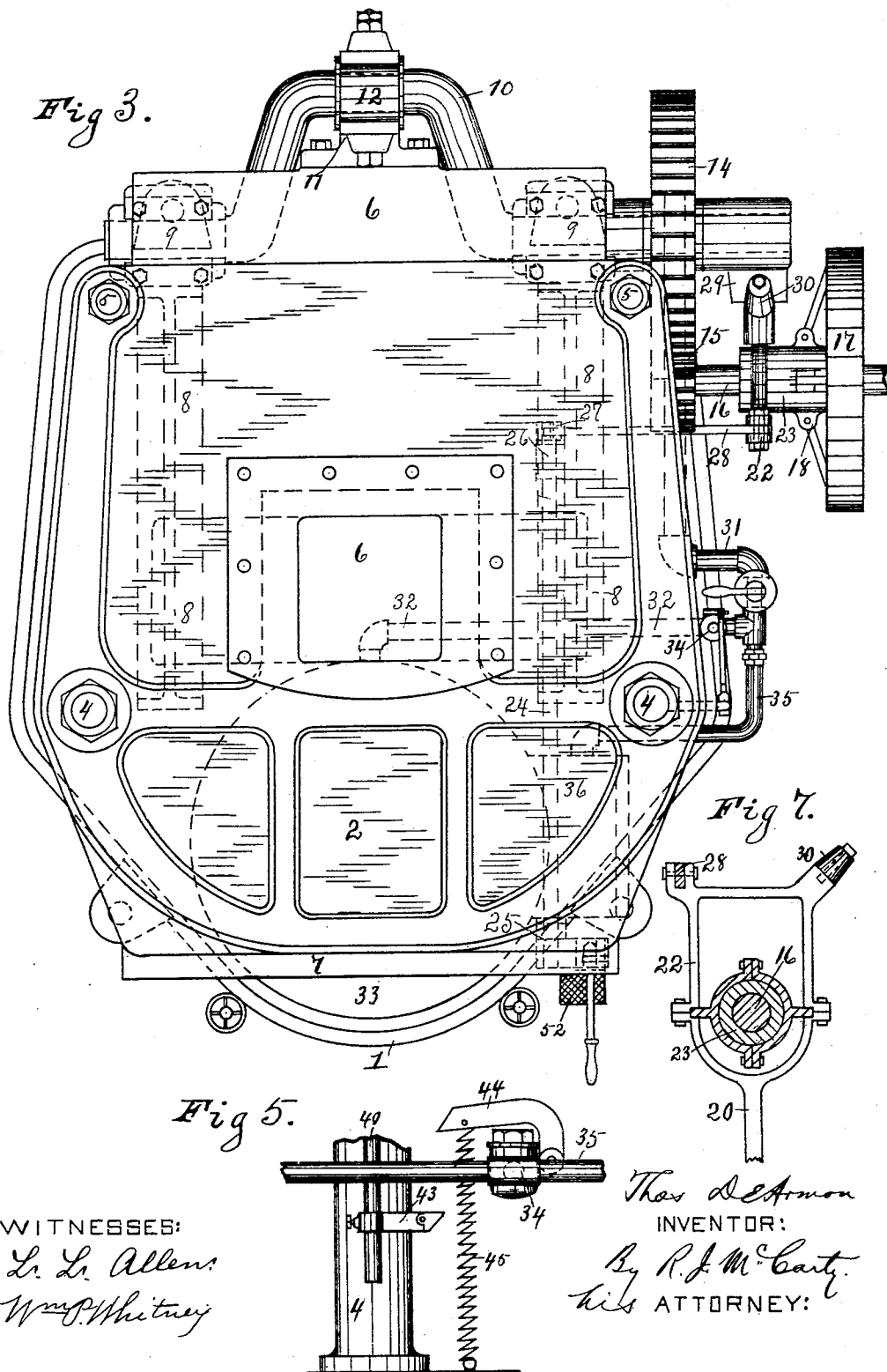
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3 Sheets—Sheet 3.

T. DE ARMON.
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UNITED STATES PATENT OFFICE.

THOMAS DE ARMON, OF DAYTON, OHIO.

OIL-CAKE FORMER.

SPECIFICATION forming part of Letters Patent No. 586,353, dated July 13, 1897.

Application filed April 3, 1897. Serial No. 630,511. (No model.)

To all whom it may concern:

Be it known that I, THOMAS DE ARMON, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Oil-Cake Formers; and I do 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 appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in machines for forming oil-cake.

The object of the invention is to provide a machine of this character with a greatly-increased capacity over those heretofore in use. This capacity is obtained by greatly reducing the number of operations necessary in the formation of the cake.

To this end the invention pertains to mechanism for actuating a reciprocating meal-delivery box or carrier and to the means for controlling the movement of said carrier, to mechanism for actuating the former-plate, and to means for controlling the movement of said former-plate, as will hereinafter more fully appear from the following specification, taken in connection with the accompanying drawings, upon which similar reference-characters indicate corresponding parts.

Figure 1 is an elevation of the side of the machine upon which the actuating mechanism is located. Fig. 2 is a front elevation. Fig. 3 is a top plan view. Fig. 4 is an enlarged vertical sectional view of the steam cylinder and valve. Fig. 5 is an enlarged side elevation of a supplemental steam-valve. Fig. 6 is an enlarged sectional view through the friction clutch and pulley. Fig. 7 is an enlarged sectional view on the line *xx*, Fig. 3.

1 designates the base of the machine; 2, the head-block, having the upper or stationary former-plate 3.

4 and 5 designate, respectively, front and rear upright columns which support the head-block and upper former-plate. The former of these columns are called upon to stand the tensile and the latter the compression

strength due to the operation of the machine in forming the cake.

6 is a horizontally-reciprocating carrier in which the meal from which the cake is formed is carried forward and delivered into the vertically-movable former-plate 7. The said carrier is mounted to slide upon supports or guides 8 8, that rise vertically from the base of the machine and form the sides thereof. These supporting parts also have rearwardly-projecting portions that form bearings 9 9 for the journals of a crank-shaft 10, through the movement of which the reciprocating carrier 6 is actuated. The said carrier is connected with the crank-shaft by a wrist-box 11, in which the crank is journaled and which is guided in its movements by being confined in a slotted piece or yoke 12. The slot 13 in said yoke extends throughout the length thereof, and the wrist-box 11 travels from the center to each end of said slot during each revolution of the crank.

The driving mechanism for the crank-shaft consists of a spur-gear 14, keyed thereto, and a spur-pinion 15, keyed to a driving-shaft 16, upon which a driving-pulley 17 runs loose, and is thrown in gear with said shaft through a friction-clutch 18, which may be moved in and out of engagement with a flange 19 on the inner side of the pulley. This movement is imparted to the clutch by moving a shifting lever 20, which has its fulcrum at 21 and has on its upper end a yoke 22, that incloses the sleeve 23 of said clutch. The movement of the shifting lever 20 necessary to engage the clutch with the driving-pulley 17 is obtained through a rock-shaft 24, mounted along the side of the machine in bearings 25 and 26. 27 is a rigid arm projecting from the inner end of said rock-shaft and with which and the yoke 22 a connecting-rod 28 is flexibly connected.

I have described now the mechanism through which the drive-pulley may be geared to the main driving-shaft 16 to drive the crank-shaft. The means for effecting a disengagement of said clutch devices, in order that the reciprocating carrier 6 may remain idle while the cake-forming mechanism is in operation, consists of a wiper or cam 29, having a fixed connection on the crank-shaft and which upon

each revolution of said crank-shaft is brought in contact with an antifriction-roller 30 on one corner of the shifting yoke 22. (See Fig. 7.) This contact moves the clutch inwardly.

31 designates a main steam-inlet pipe supplying pipe 32, which enters the rear of a cylinder 33 and is controlled by a gate-valve 34. This main inlet-pipe 31 also supplies a pipe 35, that opens into a valve-chest 36 and supplies the cylinder 33 through a slide-valve 37 with the initial pressure to raise the steam-piston 38, the movement of which actuates the reciprocating carrier or cake-former 7.

40 designates a rod depending from one of the guide-pieces 42, surrounding the columns 44 and guiding the movements of the former-plate 7. On the lower end of said rod 40 there is attached a trip-piece 43, the engaging end of which trips the arm 44 of the gate-valve 34 upon the upward movement of the former-plate 7 to admit steam to the cylinder through pipe 32. The initial pressure admitted below the piston through valve 37 is only sufficient to cause a gradual elevation of the cake-former 7 to a point at which the compression or formation of the cake takes place. At this point the additional pressure necessary for compression is admitted through the supplemental valve. This arrangement of the valves and their time movements avoid any unnecessary admission of steam to the cylinder.

39 designates packing-glands.

The valve 34 is normally held closed by a helical spring 45. In passing the arm 44 upon the downward movement the end of the trip-piece 43 yields.

46 is a hand-lever having a fulcrum on a post 47, rising from the valve-chest 36. The stem 48 of the slide-valve 37 is connected to this lever, the movement of which controls said valve, as shown in Fig. 4.

It is essential that the machine be permitted to perform its two separate functions—to wit, that of delivering the oil-meal to the cake-former and, subsequently, that of compressing said meal into cake—without the possibility of one operation being at any time premature or out of time. This certainty of operation is accomplished by means of a locking device to secure the lever 46 against an upward movement to admit steam into the cylinder through the valve 37 during the movement of the carrier 6. This locking device consists of two arms 49 and 50, rigidly connected to the rock-shaft 24 at right angles to each other and forming, as it were, a bell-crank lever. The former of these arms—to wit, 49—has its upper end terminated at a right angle and is movable in and out of a position above and across the lever 46.

51 is a connecting-rod between the arm 50 and a foot-treadle 52.

The rock-shaft 24 is moved to throw the clutch 18 in gear with the driving-pulley by pressing on said foot-treadle. The same movement brings the arm 49 to a position

across the upper side of the lever 46, and the latter cannot be moved upward to open the valve 37.

As supplementary to the above description the operation of the machine is described as follows: As it appears in Fig. 1 the machine is in a position to begin an operation. The box or reciprocating carrier 6 is charged with a load of meal and is ready to be sent forward. Foot-pressure may now be applied to the treadle 52 to rock the shaft 24. This throws the clutch 18 in gear with the driving-pulley, and motion is thereby imparted to the crank-shaft 10 to advance the carrier 6 and return it to the rearward position. When this operation is completed, the cam 29 throws the clutch out of gear, and thereby stops the crank. This movement rocks the shaft 24 to its former position, which brings the arm 49 away from a position above the lever 46, and the latter may then be raised by the hand to open the valve 37 to admit the initial steam-pressure below the piston 38 to raise it, and therewith the former-plate 7 with its load. The continued movement of said piston and plate causes the trip 43 to open the gate-valve 34 to admit additional pressure to the cylinder through the auxiliary pipe 32. When the pressure has moved the former-plate sufficiently to complete the formation of the cake, the lever 46 is lowered to its former position, and the steam is permitted to exhaust from the cylinder. The cake is then removed from the former-plate 7 in the usual manner.

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

1. In a machine for forming oil-cake, the combination with a reciprocating carrier, and a crank-shaft to which said carrier is connected, of a former-plate upon which the carrier delivers the meal to be formed into cake, a valve through which the initial pressure is admitted to said former-plate, a manually-operated lever controlling the movement of said valve, a rock-shaft, and means thereon for locking said lever against any movement to open said valve until after the said reciprocating carrier has completed its movement, substantially as described.

2. In a machine for forming oil-cake, the combination with a reciprocating carrier, a crank-shaft to which said carrier is connected, of a clutch controlling the connection of said crank-shaft with the driving-shaft; a parallel rock-shaft adapted to actuate the clutch to engage the driving-shaft and the primary driving-pulley, and a cam carried on the crank-shaft adapted to disengage said clutch and driving-pulley, whereby intermittent movement may be imparted to the reciprocating carrier and means for forming oil-cake during the cessations in the movements of said carrier, substantially as described.

3. In a machine for forming oil-cake, the combination with a reciprocating carrier, and a crank-shaft to which said carrier is con-

needed; of a former-plate to receive meal from said carrier and form it into cake; a piston upon which said former-plate is mounted; a slide-valve controlling the inlet of steam to cause an initial movement of said piston; an auxiliary gate-valve controlling a subsequent inlet of steam to said piston; and a rod rigidly carried on said former-plate to actuate said auxiliary gate-valve when said former-plate has been moved by the initial movement of the piston, substantially as described.

4. In a machine for forming oil-cake; a reciprocating carrier, and a crank-shaft to which said carrier is attached, in combination with a vertically-movable former-plate; a piston upon which said former-plate is mounted; a slide-valve controlling the inlet of steam to cause an initial movement of said piston; an auxiliary valve through which a subsequent inlet of steam is admitted to the piston, after it receives its initial movement; and a rod depending from said former-plate, having a tappet adapted to trip said auxiliary valve, as said former-plate moves upward, substantially as described.

5. In a machine for forming oil-cake, the combination with a horizontally-reciprocating carrier or delivery-box, and a crank-shaft to which said carrier is connected; of a vertically-reciprocating cake-former; a piston upon which said cake-former is mounted; a valve through which steam-pressure is admitted to cause an initial movement of the piston; an auxiliary or supplemental valve controlling a secondary admission of pressure to said piston after it has reached a certain point in its upper travel; clutch mechanism interposed between the crank-shaft, and the primary driving-shaft; a horizontal rock-shaft connected with said clutch mechanism; and means on said rock-shaft for locking the valve through which the initial steam is introduced

to the piston, in a closed position, simultaneously with the movement that engages the clutch, substantially as described.

6. In a machine for forming oil-cake, the combination with a horizontally-reciprocating carrier adapted to carry oil-meal to the front of the machine; a vertically-reciprocating cake-former adapted to receive said meal and to form it into cake; and mechanisms controlling the transmission of movement to said carrier, and cake-former; of a horizontal rock-shaft a movement of which in one direction enables the transmission of motion to said carrier, and locks the mechanism through which motion is transmitted to the cake-former, and a movement of which in an opposite direction prevents the transmission of motion to said horizontally-reciprocating carrier, and enables a transmission of motion to the vertically-reciprocating cake-former, substantially as described.

7. In a machine for forming oil-cake, the combination with a steam-cylinder, and a piston; of a cake-former mounted on said piston; a valve controlling an initial inlet of steam to move said piston and former to a point where a compression of the cake begins; a supplemental valve controlling the admission of steam to said cylinder to supply pressure required for said compression; a hand-lever to operate the valve through which the initial pressure is admitted; and trip mechanism carried on the cake-former for automatically operating the supplemental valve as said cake-former is moving upwardly, substantially as described.

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

THOMAS DE ARMON.

Witnesses:

W. B. NEVIN,
R. J. MCCARTY.