

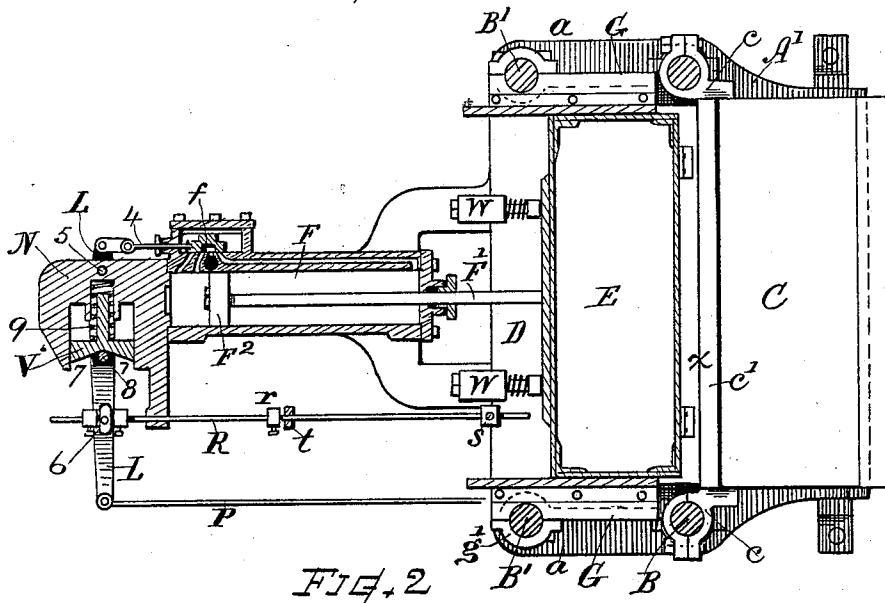
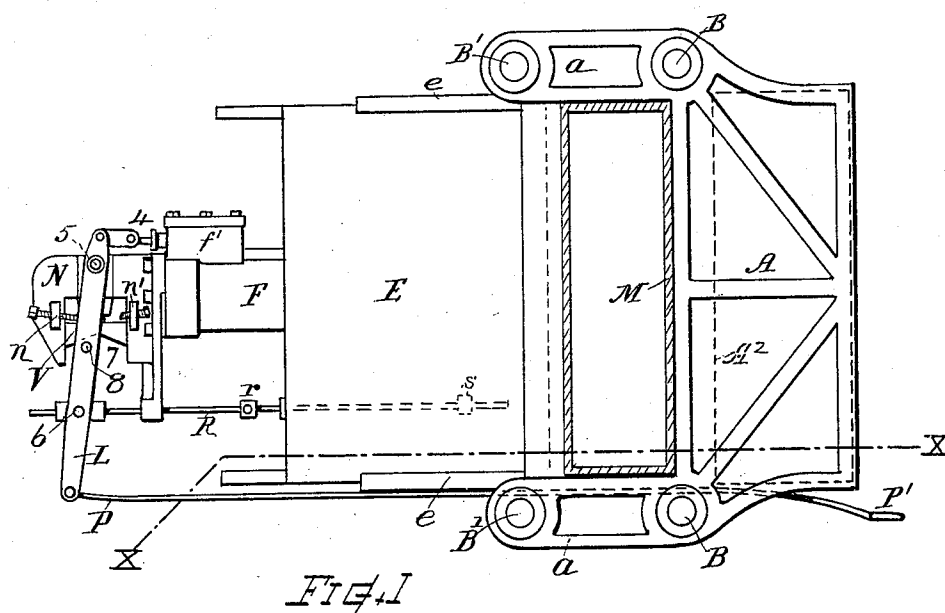
(No Model.)

3 Sheets—Sheet 1.

G. H. BUSHNELL.
STEAM CAKE FORMER FOR OIL MILLS.

No. 583,732.

Patented June 1, 1897.



Witnesses.
Charles A. Bacon
Simon E. Kna

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George H. Bushnell
By Chas. H. Dunleigh
Attorney

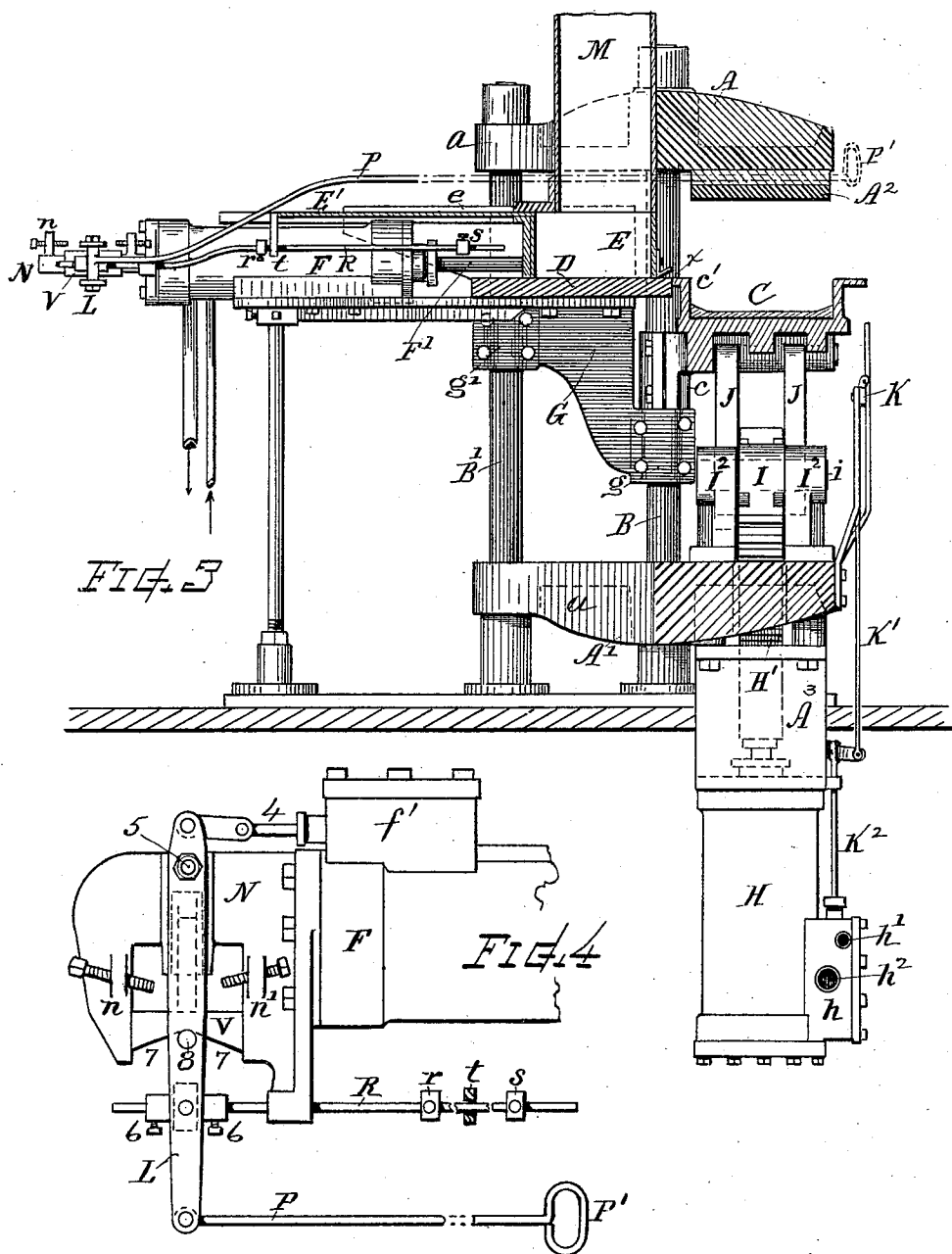
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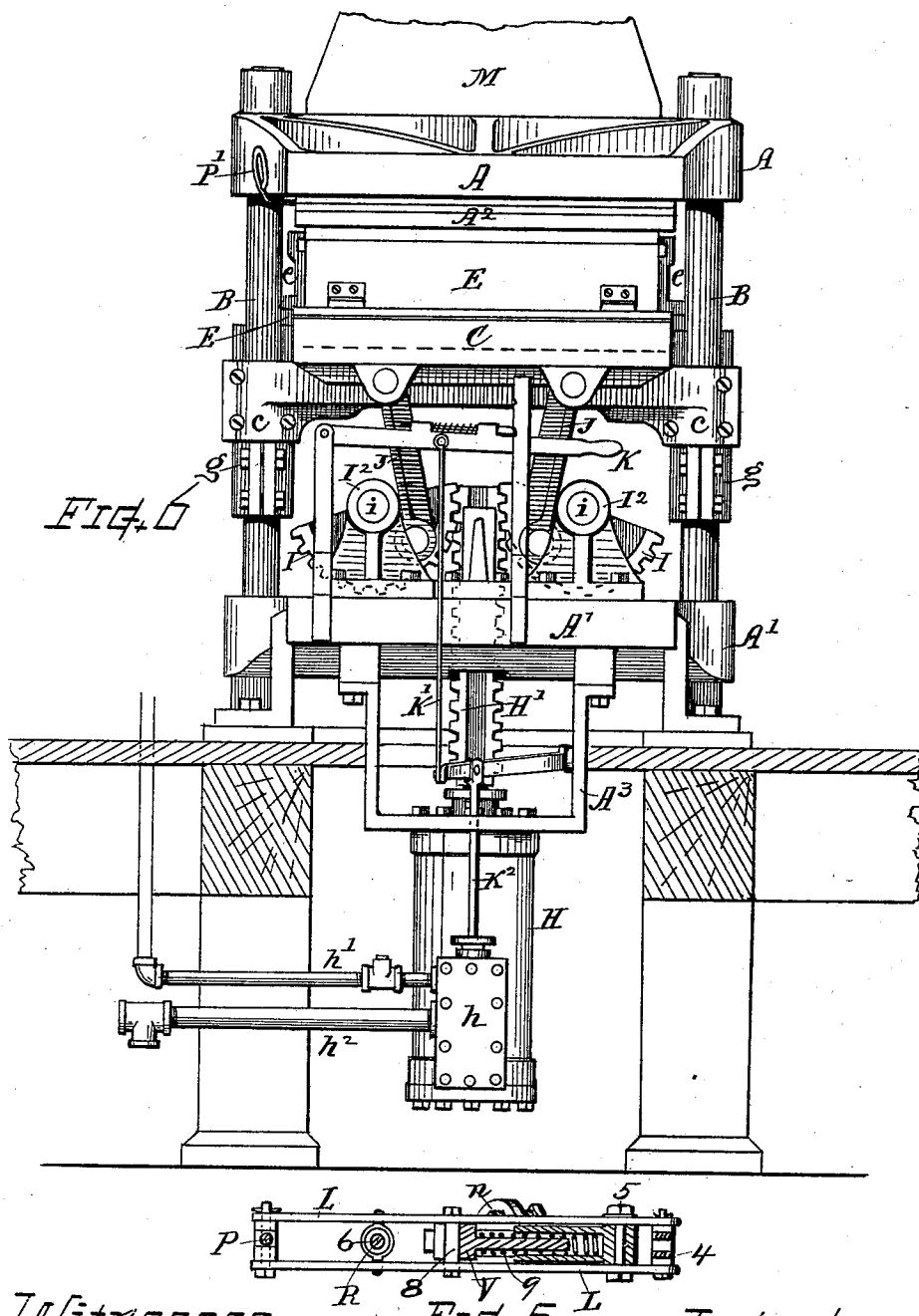
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FIG. 5
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UNITED STATES PATENT OFFICE.

GEORGE H. BUSHNELL, OF THOMPSONVILLE, CONNECTICUT.

STEAM CAKE-FORMER FOR OIL-MILLS.

SPECIFICATION forming part of Letters Patent No. 583,732, dated June 1, 1897.

Application filed June 17, 1896. Serial No. 595,935. (No model.)

To all whom it may concern:

Be it known that I, GEORGE H. BUSHNELL, a citizen of the United States, residing at Thompsonville, (Enfield,) in the county of Hartford and State of Connecticut, have invented a new and useful Improvement in Steam Cake-Formers for Oil-Mills, of which the following, together with the accompanying drawings, is a specification sufficiently full, clear, and exact to enable persons skilled in the art to which this invention appertains to make and use the same.

My present invention relates to the construction and arrangement of the press and cake-forming appliances in mechanism for forming cakes of oil-meal preliminary to the insertion of such material into the oil-presses; also, to the construction and combination therewith of improved mechanism for controlling the action of the pull-cylinder and charging devices, whereby the oil-meal is delivered to the cake-box, the objects being to provide an efficient, serviceable, and rapidly-operating mechanism and a construction that will afford unobstructed access to the cake-box or follower to facilitate folding the cake-cloths by the attendant. These objects I attain by the mechanism illustrated in the drawings and explained in the following description, the particular features of improvement claimed being hereinafter definitely specified.

In the drawings, Figure 1 is a plan view at the top of my improved steam cake-former. Fig. 2 is a horizontal sectional view below the top or head plate, but above the table and cake-box. Fig. 3 is a vertical section at line *x x* on Fig. 1, showing the cake-box or follower at its lowest position with its rear edge in line with the meal feed-table. Fig. 4 is a top view of the charger-controlling mechanism drawn to somewhat larger scale. Fig. 5 is a vertical section of the same, and Fig. 6 is a front view of the complete machine.

In referring to parts, A and A' respectively indicate the upper and lower head-plates of the press-frame, and B B' the upright rods or standards connecting and supporting the same for withstanding the compacting-pressure. The head-plate is constructed and combined with the standards in a manner to forwardly overhang or project at the front

of the standards B, which are disposed therein at positions about midway across the ends of the head, while the standards B' are at positions near the extreme rear part of the head, so that the head presents its plate or working face forward of a plane or line drawn through the vertical axes of the forward standards B. The peculiar form of head is best illustrated in Figs. 1 and 3, the part of the head in rear of the standards B being formed as two integral backwardly-extending end portions *a a*, supported by the standards B' and having an open space between them, extending nearly to the central part of the head or vertical plane of the front standards. Within this open space there is arranged the hopper or chute M, through which the oil-meal is supplied to the machine. Said hopper or chute can be supported upon or attached to the head in any approved manner.

C indicates the pressing-follower or cake-forming box arranged to move up and down to and from the platen A², which latter is attached to the forwardly-overhanging part of the head-plate A. The guiding-bearings *c* are attached to the rear corners of the follower or box C and embrace the rods B in a manner to slide thereon as the follower is raised and lowered by the pressing mechanism. Said cake-forming box and platen extend longitudinally across the front of the machine their entire width, being forward of the axial plane of the front standards B, thus affording when the follower is depressed convenient and unobstructed access to the top of the cake-box along the full extent of its front and ends, so that the cloths for enveloping the oil-meal cake can be laid upon the cake-box and folded over the charge with the greatest facility and despatch and without inconvenience or disadvantageous labor on the part of the attendant.

D indicates the meal feed-table, and E the reciprocating charger or meal-box, resting upon said table and movable between guides *e* from a position beneath the hopper M to a position over the cake-box C, and vice versa, for receiving and charging the oil-meal into said cake-box by means of the piston-rod F¹ and piston F², inclosed in the steam pull-cylinder F, which cylinder is supported upon a suitable bracket or frame at the rear of the

table D. Said piston operates the charger in well-known manner.

E' indicates the usual plate or slide-gate attached to the rear top edge of the charger E for closing the mouth of the hopper or chute M when the charger is moved forward.

The meal feed-table D is supported at its ends by transom-plates G, that are secured to the respective front and rear standards B and B' by clamping joints or hubs *g g'*. Said transom-plates also serve as intermediate tie-braces for the standard, sustaining the same against lateral springing and for holding the parts so as to maintain a close joint at *x* between the front edge of the table D and rear lip *c'* of the cake-forming box when the latter is in position for charging, thereby preventing the meal from entering such joint when the charger is pushed forward. The top of the table and top of the cake-forming box are on the same level when at position ready for receiving the charge. Such position is shown in Figs. 3 and 6. The bearings *c* of the follower that run upon the standards B then rest upon the lower hubs *g* of the transom-plates G, said hubs affording a stop and support for the follower or cake-box when depressed.

The follower or cake-box C is actuated and compression of the cake effected by means of the piston-rod and piston, inclosed in the steam-cylinder H, operating through the medium of the double rack H', the segment-gears I, having their journals *i* mounted in bearings I² on the forwardly-projecting part of the lower press-head, and the knuckle-arms J, the ends of which are respectively pivoted to said gears and to the follower, as shown in Fig. 6. The cylinder H is suspended from the forward part of the lower head-plate A' by a U-shaped hanger A³, the lower end of which forms the cylinder-head, as shown. The steam-supply pipe is indicated at *h'* and the exhaust at *h*². The mechanism is put into and out of action by the shifting of the steam-valve in the chest *h*, controlled by the hand-lever K and connecting-rods K' and K², as will be understood without further description. As a press-actuating mechanism this arrangement of steam-piston, rack, segment-gears, and knuckle-arms is well known and is not in its general detail a feature of my invention.

My improved appliances for controlling the action of the steam pull-cylinder and charger-actuating piston are best shown in Figs. 1, 2, and 4. The cylinder F is provided with a valve-box *f'*, within which the induction and eduction ports are covered by a single slide-valve *f*. The valve-rod 4 is connected to the short arm by a swinging-lever L, fulcrumed at 5 upon a bracket or frame N, supported on the outer head of the cylinder. This lever L is preferably made with upper and lower bars having space between them for the accommodation of the bracket N and coupling-joints, as indicated in Fig. 5. To the long

arm of the lever is joined the handle-rod P, which extends to the front of the machine and has a suitable handle P' thereon within convenient reach of the operator. A second rod R is joined to said lever L by a swivel-eye and collars at 6, which rod extends beneath the gate-plate E' and is provided with adjustably-attached collars or stops *r* and *s*, adapted to be engaged by a tappet *t*, carried by the gate E' or some part that moves with the charger E. A movable block V, having double inclines 7, that engage with a roll or pin 8, carried on the lever L, is supported in a recess or guideway in the bracket N, and a spring 9 is combined therewith for pressing forward said block and causing its inclined surfaces to impinge with suitable force against the roll or pin 8 to normally retain the lever at a central position in relation thereto, thereby holding the lever and valve with the inlet-ports to the cylinder closed. Adjustable stops *n* and *n'* are provided at the opposite sides of the lever for limiting the extent of its movement in either direction.

The pull-cylinder F and its valve-chamber are preferably made with two inlet-ports leading into the rear end and a single port leading to the front end of the cylinder-chamber. In practice the ports and valve are arranged and adjusted to afford a steam-cushion effect at the ends of the piston stroke. The dual rear inlet-ports admit steam to the cushion-space at the first movement of the valve and then admit the steam in greater volume to accelerate the action after the piston and charger have commenced the forward motion.

When desired, spring-buffers W W can be combined with the cylinder-supporting frame or table for arresting the backward momentum of the charger, as in Fig. 2.

In the operation of the controlling appliances the attendant, by the rod P, swings back the lever L, opening the steam-inlet to the rear end of the pull-cylinder and the exhaust from the front end of said cylinder. At the same time the roll 8, running against the incline 7, forces back the block and increases the strain on the spring 9. The steam entering behind the piston then moves the charger E forward over the cake-forming box for delivering its charge of oil-meal into said box in well-known manner. When it reaches its forward position, the tappet *t* strikes the collar S and draws forward the lever L, shifting the valve to a reverse position, admitting steam at the front of the piston and opening the exhaust from the rear, and the piston and charger E are at once moved back to their first position. The tappet *t* striking the collar *r* starts the lever, which, with the valve, is instantly thrown to its central position by the action of the spring-pressed incline-faced block V acting against the roll 8 of the lever, thus bringing the mechanism to its normal position of inaction.

When the charge of oil-meal has been de-

posited in the cake-box C and the charger has returned to its rearward position, the ends of the cake-cloth, which was previously spread across the bottom of the cake-box, can be folded inward over the charge of oil-meal by a quick, simple, and unobstructed movement of the hand from either end of the cake-box, enveloping the mass, which is then caked by pressure of the forming-box upward against the platen A² in usual manner, the pressing action being effected from the steam press-cylinder H and controlled by the lever or handle K, as will be readily understood.

It will be understood that I do not claim, broadly, the combination, with the reciprocating charger in an oil-cake-forming machine, of a steam cylinder and piston for operating the charger and gate.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a cake-forming machine for oil-meal; in combination substantially as hereinbefore described, the upright press-frame standards, the forwardly-overhanging head-plate with the platen thereon, and the pressing-follower consisting of a cake-forming box having guides at its rear corners mounted on the two front standards of the press, the forming-box forwardly projecting therefrom substantially as set forth, with an unobstructed front and end space between said cake-forming box and platen, a meal feed-table, and charging device at the back of said cake-box, and means for applying upward pressure to said cake-forming box, for the purpose stated.

2. In a cake-forming machine for oil-meal, the press-head formed with a forward plate portion, and with backwardly-extended side parts having an opening or space between the same, in combination, with front and rear upright rod-standards respectively arranged through said head, at midway positions, and at its rear parts, the forward plate portion overhanging, as shown, and carrying the pressure-platen beneath said overhanging part, the feed chute or hopper supported within the open space of the head, the meal feed-table carried between said standards, the follower or cake-box mounted with guide-bearings at its rear angles, and projecting forward with unobstructed space beneath the platen, the reciprocating charger and gate, guides there-

for on said table, and means for imparting power and motion to said cake-box and to said charger, substantially as set forth.

3. In a cake-forming press for oil-meal, having the upright press-standards, the head-plate, the meal feed-table and reciprocating charger; and the cake-forming box or follower provided with guide-bearings that slide upon the front standards; the combination with said standards of the transom-plates secured to and forming an intermediate connecting-tie between the front and rear standards; said transom-plates supporting the meal feed-table, and affording a stop and rest for the cake-box or follower when at its depressed position, substantially as set forth.

4. In combination with an oil-cake-forming press having a charger or feed-box actuated by a piston-rod and piston inclosed within a cylinder; a controlling mechanism comprising the shifting lever connected with the valve-rod of the cylinder-valve, the handle or rod for working said lever by hand, a second rod connected with said lever and having stop-collars thereon, a tappet carried by the charger or feed-box gate for engaging said collars, and the yielding presser-block having inclined surfaces that act against a roll or pin in said lever for returning the lever and valve to normal inactive position, substantially as set forth.

5. The combination with a forming-press having a charger or feed-box actuated by a piston worked by steam or fluid pressure within the cylinder; of the controlling-valve, the valve-operating lever pivoted to a bracket at the end of the cylinder, the incline-faced centering device mounted in said bracket and engaging a stud or roll on said lever, the presser-spring therefor, adjustable stops for limiting the swing of said lever, the lever-actuating rods P and R, the stops r and s, and an engaging tappet moving with the charger, substantially as and for the purposes set forth.

Witness my hand this 13th day of June, 1896.

GEORGE H. BUSHNELL.

Witnesses:

JOHN M. MORROW,
WILLIAM J. OBER.