

(No Model.)

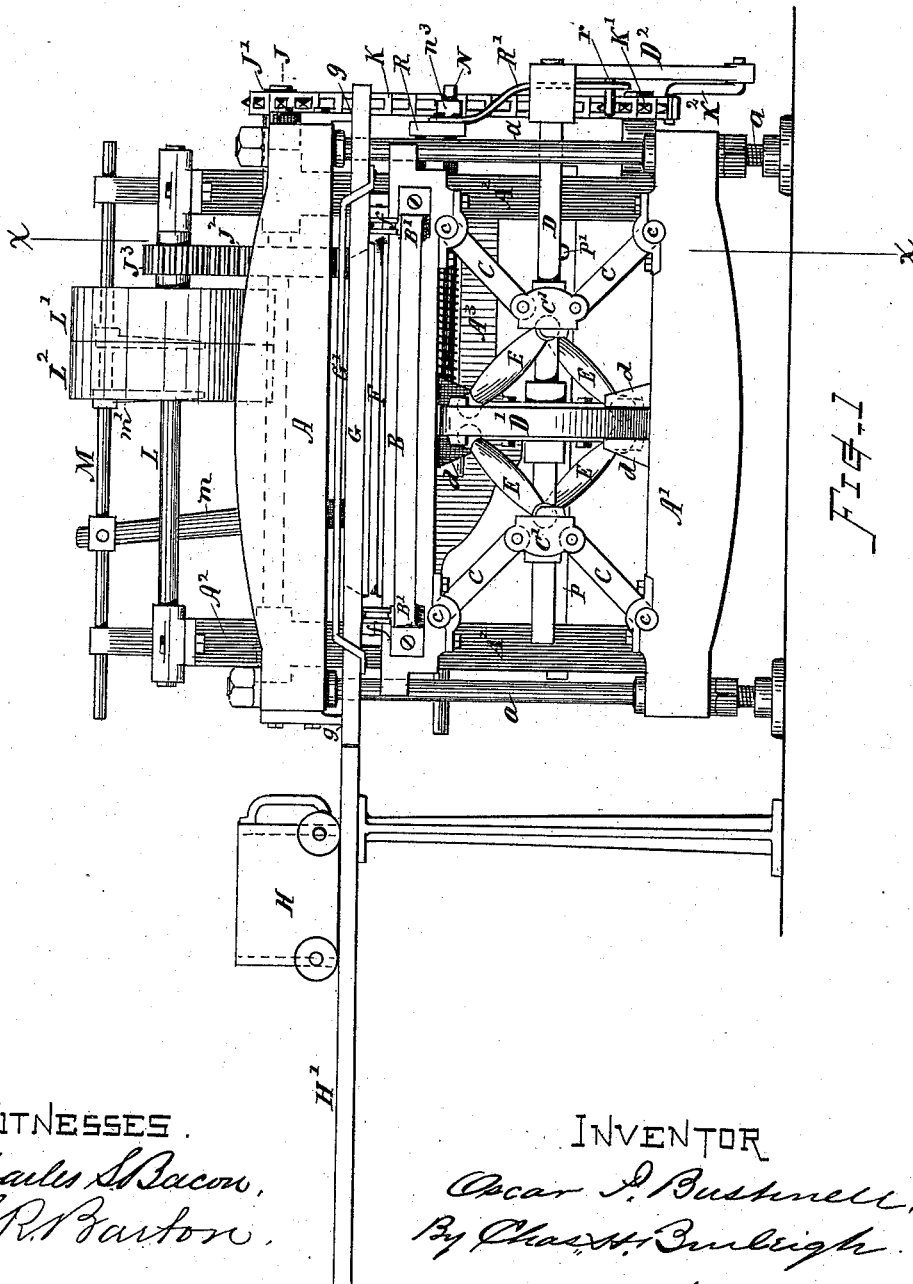
3 Sheets—Sheet 1.

O. P. BUSHNELL.

MOLDING PRESS FOR OIL CAKES.

No. 385,094.

Patented June 26, 1888.



WITNESSES.  
*Charles S. Bacon,*  
*S. R. Barton.*

INVENTOR  
*Oscar A. Bushnell,*  
*By Charles H. Burleigh,*  
*Attorney.*

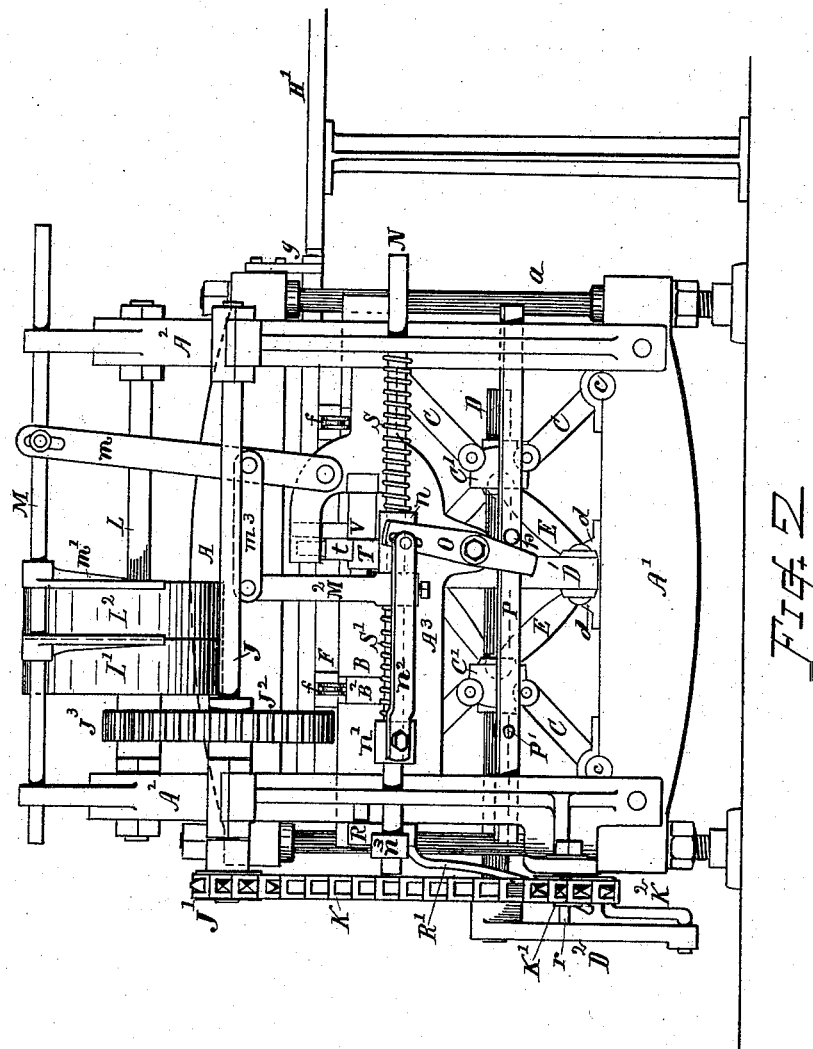
(No Model.)

3 Sheets—Sheet 2.

O. P. BUSHNELL.  
MOLDING PRESS FOR OIL CAKES.

No. 385,094.

Patented June 26, 1888.



WITNESSES.

*Charles H. Bacon.*  
*S. R. Barton*

INVENTOR.

*Oscar P. Bushnell.*  
*By Charles F. Durlough.*  
*Attorney.*

(No Model.)

3 Sheets—Sheet 3.

O. P. BUSHNELL.

MOLDING PRESS FOR OIL CAKES.

No. 385,094.

Patented June 26, 1888.

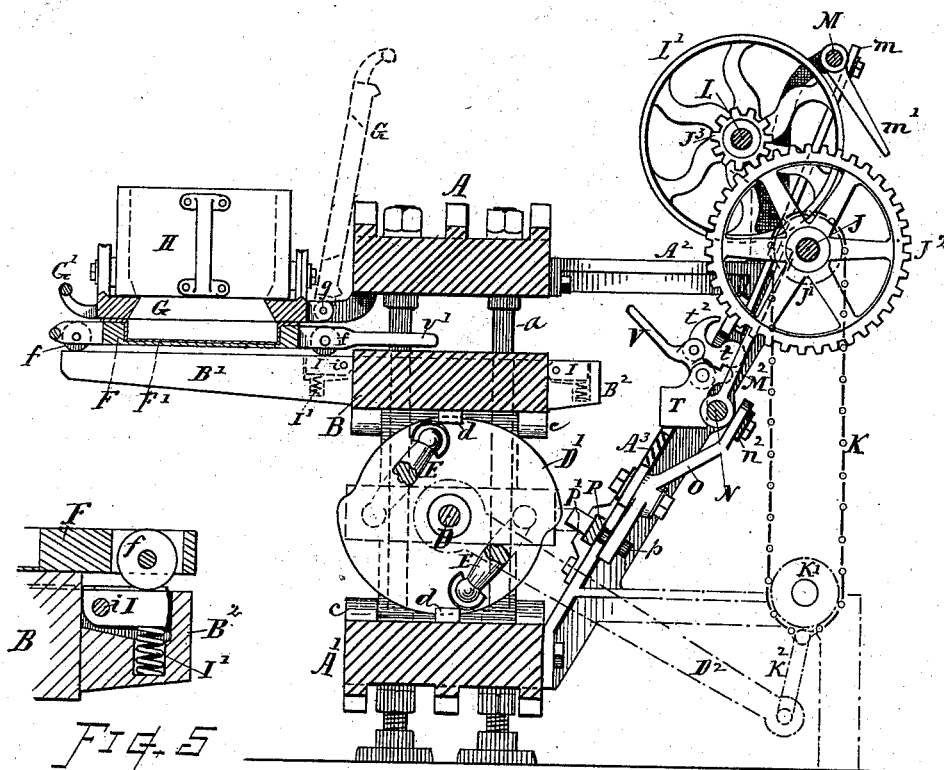
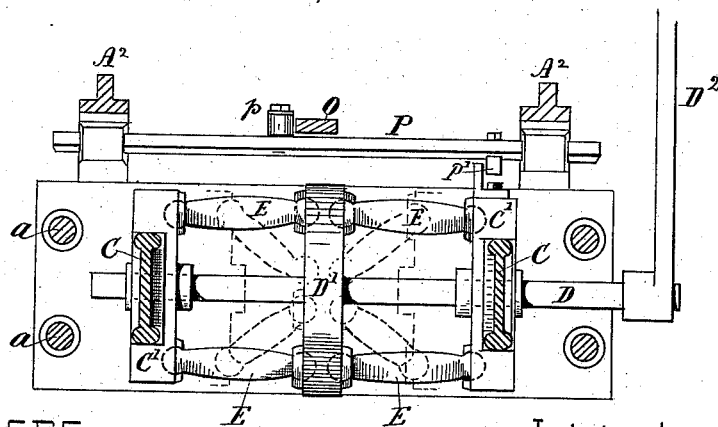


FIG. 3

FIG. 3



WITNESSES

Charles S. Bacon,  
S. R. Barton.

INVENTOR.

FIG. 4

Oscar P. Bushnell,  
By Charles S. Burleigh,  
Attorney.

# UNITED STATES PATENT OFFICE.

OSCAR P. BUSHNELL, OF WORCESTER, MASSACHUSETTS.

## MOLDING-PRESS FOR OIL-CAKES.

SPECIFICATION forming part of Letters Patent No. 385,094, dated June 26, 1888.

Application filed September 26, 1887. Serial No. 250,703. (No model.)

*To all whom it may concern:*

Be it known that I, OSCAR P. BUSHNELL, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Molding-Presses for Making Oil-Cakes, 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.

The object of my present invention is to provide a practical and efficient press or mechanism for forming cakes in the process of extracting cotton-seed oil and for similar purposes, whereby the cakes can be formed in a rapid and convenient manner.

Another object is to afford a simple and efficient mechanism for applying the pressure by means of oppositely directed universally-jointed arms, in combination with an operating-plate which swings or carries the adjacent ends of said arms in a circular arc by oscillation of the actuating-shaft.

Another object is to provide means for operating the pressing mechanism and for throwing the parts out of operation automatically when the forming of the cake within the press has been effected.

Another object is to afford facilities in a cake-forming machine whereby the mechanism for condensing the cake will be automatically put into action by the advance movement of the cake-form or mold-carrier frame when introducing the cake uncondensed into the press.

Another object is to provide yielding devices, arranged as hereinafter described, for supporting the mold-carrier or cake-forming frame to permit the depression of said former by the press without strain on the mechanism.

These objects I attain by mechanism such as herein described, the particular subject-matter claimed being hereinafter definitely specified.

In the drawings, Figure 1 is a front view of my improved cake-forming machine. Fig. 2 is a rear view of the same. Fig. 3 is a vertical section at line *xx*, Fig. 1, with the position of the press-actuating lever and chain indicated by dotted lines. Fig. 4 is a horizontal

sectional view showing the devices for working the knuckle-joints of the press. Fig. 5 is a sectional view showing the detail of the yielding supports for the mold-carrier frame.

My improved cake-forming mechanism comprises, in combination, means for gaging the delivery of the desired quantity of seed-meal and depositing it in the proper shape for producing the cake, a pressing mechanism for condensing the same into a compact mass, and means for actuating and controlling the pressing mechanism, the several devices for performing the various functions and attaining the desired results being constructed, combined, and organized for operation, as more particularly hereinafter explained.

Referring to parts, A and A' denote, respectively, the upper and lower heads of the press connected by standards or bolts *a* in the usual manner. The lower ends of the bolts in the present instance extend below the bottom head and are provided with shoes that serve as feet for the machine to stand upon.

B indicates the pressing-follower, disposed to work upward between the standards *a* and carried by knuckle-joint arms C, the knuckle-joints C' of which slide upon and form journal-bearings for the press-operating shaft D. Said arms are hinged to the follower B and lower head, A', as at *c*, and are preferably disposed in the manner illustrated, so that the knuckle-joints C' approach each other when the press is opened and are forced apart for closing the press.

Centrally upon the shaft D and rigidly fixed thereto I employ a socket plate or wheel, D', having in its opposite sides joint-sockets for supporting the inner ends of a system of oppositely-directed arms or links, E, the outer ends of which are confined in sockets on the respective ends of the knuckle-joint blocks C'. The arms E are preferably made with spherical bearing-heads and the sockets are of corresponding form, thus forming universal joint connections.

The arms E are arranged in pairs and extend diagonally to the right and left in such manner that partial rotation of the wheel D' will cause the arms to act in the manner of knuckle-joint levers for applying the pressure for forcing apart the knuckle-joints C' of the arms C, and thus closing the press. The reverse ac-

tion of said wheel D' and arms E again opens the press. In Fig. 4 I have shown the arms E by full lines in position as extended for applying the pressure, and by dotted lines indicated their position, as when the press is opened. Movement is imparted to the shaft D by means of a lever, D<sup>2</sup>, fixed on one end of said shaft and operated by mechanism which will be hereinafter described.

10 The periphery of the wheel D' is made in cam shape to follow the movement of the follower as the knuckle joint arms C are straightened, and said wheel is confined between pairs of lugs *d d*, rigidly fixed on the lower head, 15 A', and on the follower B, which prevent lateral movement of the plate or wheel D' and shaft D, and thereby maintain uniform action of the opposite pairs of arms, C, so that the follower will stand parallel with the head A. 20 A bracket, B', is attached to the front of the follower, upon which is supported the mold-carrier frame F. Said frame is mounted on guide rolls or trucks *f*, grooved or otherwise, that run on guideways or tracks which extend laterally across the follower and along 25 the top of the bracket B' and on the short bracket B<sup>2</sup> at the back of the follower, so that said mold-carrier frame F can be easily run into and from the press by hand. A suitable handle is provided at the front for conveniently moving the carrier-frame. 30

The fly or gaging table G is hinged to the head of the press, as at *g*, and can be let down upon the top of the forming-frame F, as indicated, or swung up out of the way, as indicated by dotted lines in Fig. 3. The mold-carrier frame F is provided with a central opening to receive the mold or pan F', in which the cake is formed, and the table G is provided with an opening of corresponding shape 40 having inwardly-inclined edges. A handle, G', is provided for conveniently raising and lowering the table.

H indicates the meal-box or hopper for containing and delivering the seed-meal or material of which the cakes are to be formed. Said box is provided with wheels that run on guidetracks along the edges of the table G and upon the extension H', which in practice is beneath 50 the heater, and is supported in stationary position adjacent to the end of the hinged table G, so that the box H can be run across from one to the other. The bottom of the box is open, so that when drawn across the space within the table G the material will drop into the pan F' on the carrier-frame, the movement of the box leaving the surface of the material straight and level with the top of the table G. A suitable handle is provided 60 on the hopper-box to facilitate moving it across the table.

The arrangement of the cake-forming frame, open gaging-table, and movable meal box or hopper, and the method of delivering the meal 65 for a cake are substantially the same as heretofore employed, and I do not therefore make

claim thereto as an essential part of my present invention.

At the back and front of the follower, at positions corresponding to the positions of the trucks or rolls *f* when the form or mold-carrier frame F is in the press, I arrange sections I' of the supporting-tracks, which are depressible or pivoted, as at *i*, and which rest upon springs I'. (See Fig. 5.) The purpose 75 of this device is to afford a yielding action when the press is closed together and pressure is applied for condensing the cake, so that the frame F will come solidly down upon the follower B, the yielding of the springs I' and 80 pivoted sections I permitting the necessary downward movement beneath the wheels *f* without strain. Then when the press is again open to slightly lift the frame and cake from the surface of the press-follower, so that it can 85 be readily withdrawn.

Supported at the back of the machine by a suitable frame, A<sup>2</sup>, and at a sufficiently-elevated position, is a shaft, J, carrying a sprocket-wheel, J', and beneath said sprocket-wheel, at a low position, is supported a second sprocket-wheel, K'. A drive-chain, K, is arranged about these sprocket-wheels, and the end of the lever D<sup>2</sup> is connected to said chain 95 by a suitable link, K<sup>2</sup>, so that as the chain revolves about the sprockets the end of said lever will be raised and depressed, the link K<sup>2</sup> accommodating the variation between the line of movement of the lever-arm and the line of movement of the chain K as the latter revolves 100 about the guiding-sprockets. The shaft J is provided with a gear, J<sup>2</sup>, which meshes with a pinion, J<sup>3</sup>, on the driving-shaft L, which latter shaft is provided with a tight and a loose pulley, L' L<sup>2</sup>, for the driving-belt. A shipper-rod, M, having a suitable fork, *m'*, is provided 105 for carrying the driving-belt from one of the pulleys to the other. Said shipper-rod is connected by a lever, *m*, with actuating mechanism, whereby the belt is automatically shifted 110 and the action of the mechanism controlled as required.

The stopping and starting mechanism for controlling the action of the machine is made as follows: A shaft or bar, N, is arranged across 115 the back of the machine and supported for reciprocative movement in suitable bearings. Fixed thereon is an arm, M<sup>2</sup>, that connects by link *m*<sup>3</sup> or otherwise with the shipper-rod lever *m*. Two coiled springs, S and S', are arranged on the bar N, one of which springs, S, 120 abuts against the frame A<sup>2</sup> and against a movable collar, *n*, while the other spring, S', abuts at one end against the hub of arm M<sup>2</sup>, or an equivalent collar, fixed upon or keyed to the bar N, and its other end against a collar, *n'*, sliding loose on said bar N. This latter collar is connected by a link, *n*<sup>2</sup>, with the first collar, *n*, and also with a setting-lever, O, that is fulcrumed on the cross-bar A<sup>3</sup> of the frame and 125 actuated by a connection from the pressing mechanism or by a stud, *p*, on a slide-rod, P,

adjacent to the arms C, which rod is provided with a second stud, P', that engages with one of the knuckle-joint blocks C', or with a projection fixed thereon, so that when the press is closed as said knuckle-joint block approaches its outward limit of movement it engages and moves the bar P and lever O and effects the compression of the spring S. A collar,  $n^2$ , is fixed on the rod N, and a swinging dog, R, is arranged to drop between said collar and frame for holding the rod against movement when the springs are compressed. Adjacent to the collar  $n$  and pivoted upon the frame is a drop-dog, T, and also a lifting-lever, V, adapted to be engaged by a projection,  $v'$ , attached to and extending backward from the mold-carrier frame. Pivoted upon said lifting-lever V and engaging with the drop dog T is a weighted-latch device,  $t$ , which operates to throw the dog from engagement with the collar  $n$  when the lever V is lifted to a limited degree. Said latch is provided with an arm or an upwardly-extending tail-piece,  $t'$ , that strikes against the frame A<sup>3</sup>, (or some other suitable stop device,) when the lifting-lever is carried beyond the established limit, and effects the throwing off of the latch from the dog, so that the dog can drop down against the bar N in position for again catching the collar. Thus when the cake-former or mold-carrier F is moved into position beneath the press its arm  $v'$ , by engaging the lifting-lever V, throws off the dog T and allows the spring S to move the collar  $n$  and arm M<sup>2</sup> in direction for shifting the belt onto the tight pulley L'; and immediately by the further movement of the lever V and action of the tail  $t'$  effects the raising of the latch  $t$  from the dog T, so that said dog will be free to catch the collar  $n$  whenever the latter is moved to the proper position. The lifting-lever V and dog T are both pivoted to a stationary portion of the frame by the same pin or stud, but to have independent movement, and the latch device is pivoted to suitable ears on the lifting-lever, as illustrated in Fig. 3.

The collar  $n$  is provided with a notch of sufficient width to receive the dog T, while at the same time the end of the collar can rest against the hub of arm M<sup>2</sup> or a fixed collar on the shaft.

The dog R is furnished with an arm, R', that engages with a pin or lug,  $r$ , on the press-actuating arm D<sup>2</sup>.

In place of the sliding bar P, with studs P' for moving lever O, said lever may be connected directly with the knuckle joint by a rod or any suitable link.

The process of forming the cakes is briefly this: The molding-pan F', which is of sheet metal, fits into the carrier-frame F, and upon this pan is laid a cloth of corresponding width and about twice the length, more or less. The seed-meal properly crushed and cooked is deposited upon said cloth as the box or hopper H is moved across the table. When the

box is returned to place, the fly or table G is turned up on its hinges, (see dotted lines in Fig. 3,) and the ends of the cloth are closed over the top of the mass of meal on the molding-pan. The mold-carrier frame F, with its pan and contents, is then run back onto the follower B of the press, so that the upward movement of the follower will compress the cake against the head. When compressed, the mold-carrier is drawn to the front to its usual position. The molding-pan containing the cake and its wrapping-cloth are removed from the carrier and another pan and cloth are placed thereon for receiving the supply of seed-meal for a second cake.

Referring now to the operation of the mechanism when in position, as shown in Fig. 2, the spring S is under strain; then when the mold-carrier is run back and the collar  $n$  is released by the arm  $v'$ , lifting-lever V, and throwing-off dog T, the spring S expands and throws the bar N and arm M<sup>2</sup> forward, carrying the shipper-rod M, which shifts the belt onto the tight pulley L'; also, at the same time carrying forward the spring S', link  $n^2$ , and setting-lever O without changing the strain on said spring S', and moving the bar N, so that the dog R will drop behind the collar  $n^2$  and confine the bar at that position against return action. This puts the press-driving mechanism in operation. The revolution of the drive-chain K on the sprockets J' K' lifts the arm D<sup>2</sup>, carrying the link K<sup>2</sup> over the top of the sprocket J', thus partially rotating shaft D and forcing apart the knuckle-joint arms C by the action of the arm E and wheel D'. As the knuckle-joints C' approach their outward limit of movement, a lug on one of said knuckle-joints strikes the stud P', (see Fig. 4,) and the bar P is moved, carrying the stud  $p$  against the lever O and causing said lever to act for drawing back the collars  $n$  and  $n'$ , compressing the springs S S', the bar M being meanwhile held by the dog R, so that the shipper cannot be moved. The collar  $n$  is moved away from the fixed collar or hub of arm M<sup>2</sup>, thereby allowing the dog T to drop behind said collar  $n$  to prevent the expansion of the spring S. When the press has completed its action and the lever-operating arm D<sup>2</sup> descends, the pin or lug  $r$  on its side engages the arm R' and throws off the dog R from the collar  $n^2$ . This allows spring S' to expand and to force the bar N, with the arm M<sup>2</sup>, the shipper-lever  $m$ , and belt-shipper-fork  $m'$ , over to the opposite direction, so as to carry the belt from the tight pulley L' to the loose pulley L<sup>2</sup>. The mechanism is thus stopped, leaving the parts in position with spring S strained, ready to be again thrown into action, and the press opened or with the follower B depressed. The cake-form or mold-carrier frame can then be readily drawn to the front, and this action, by removing its arm  $v'$  from the lifting-lever V, allows said lever to drop, so that the latch device  $t$ , pivoted thereto, will again fall into position to engage

with the dog T ready to lift said dog when the lever V is again elevated by a subsequent introduction of the mold-carrier and cake material into the press.

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

1. The combination, with the fly-table, the press-head, and follower, the press-operating shafts and gear, driving-pulleys, and automatic shipper for stopping and starting the press, of the mold-carrier having a lug that trips the starting-shipper lock when said mold-carrier is introduced or inserted within the press, whereby the press is put into action automatically by the operation of inserting the mold-carrier

2. The combination of the press-follower provided with projecting brackets at front and rear, the pivoted yielding sections I, and springs I', arranged within said brackets, and the mold-carrier frame having front and rear projections provided with supports or truck-wheels F, that rest upon the yielding sections when said frame is in the press, substantially as and for the purpose set forth.

3. The mechanism for applying pressure, consisting of oppositely-directed arms E, having spherical or universal bearing joints at their ends, the outer ends of which connect with the parts against which pressure is exerted, and their inner ends working in combination with a rotative wheel or operator, whereby said inner ends are caused to move in a circular arc in a plane substantially perpendicular to the direction of the pressure or movement of their outer ends, substantially as set forth.

4. The combination, with the follower B and head A', of the shaft D, carrying the wheel or socket-plate D', the knuckle-joint blocks C', provided with sockets, the arms E, disposed between said wheel and the knuckle-joint blocks, and the arms C between said blocks and the pressing-head and follower, substantially as and for the purpose set forth.

5. The combination, with the pressing-heads and follower, the knuckle-joint C', pressing-arms C, arms E, wheel D', and shaft D, of the fly-table G, the mold-carrier frame F, supporting-tracks f', and means, substantially as described, for operating said shaft.

6. The combination of the knuckle-joint blocks C', arms C C, pressing-follower B, and head A, provided with lugs d, the actuating shaft D, passing through said knuckle-joint blocks, the wheel or socket plate D', fixed on said shaft and having a cam-shaped periphery confined between said lugs, and the arms E,

socketed or universally jointed at their respective ends between the said wheel and said knuckle-joint blocks, substantially as and for the purpose set forth.

7. The combination, with the cake-forming press-head and pressing-follower operated by the knuckle-joint arms and shaft D, of the arm D<sup>2</sup>, chain K, link K<sup>2</sup>, sprocket-wheels K' and J', and operating-shaft J, with driving-gear for imparting motion to said shaft, for the purposes set forth.

8. The combination, with the press-head and pressing-follower, its operating-shaft D and arm D<sup>2</sup>, of the chain K, link K<sup>2</sup>, sprocket-wheels J' and K', shaft J, gears J<sup>2</sup> J<sup>3</sup>, shaft L, pulleys L' L<sup>2</sup>, shipper M m', and spring-levers and trip dogs arranged for automatically operating said shipper, substantially as set forth.

9. In combination with the press-heads, pressing-follower, press-operating knuckle-joint arms, and mold-carrier frame, the bar N, shipper-actuating arm M<sup>2</sup>, springs S S', collars n, n', and n<sup>2</sup>, dogs R and T, setting-lever O, connection P, actuating said setting-lever from the knuckle-joint, the lifting-lever V, tripping-arm v' on said mold-carrier, and latch t, substantially as and for the purposes set forth.

10. The dog R, having an arm, R', in combination with the press-operating arm D<sup>2</sup>, provided with a lug or pin, r, and spring-actuated bar N, having the collar or stop device n<sup>2</sup>, substantially as and for the purpose set forth.

11. The combination of the partially-rotative wheel D' and the knuckle-joint blocks C', each having bearing-sockets thereon, and the arms E, disposed in oppositely-directed pairs, with their respective ends sustained in said bearing-sockets, substantially as and for the purpose set forth.

12. The pressing-follower having depressed grooves or guideways across its upper surface and attached brackets or extensions having upon their tops guideways or tracks disposed in continuation of said grooves, and provided with yielding or depressible sections at front and rear of said follower, in combination with a mold-carrier frame provided with wheels or trucks that run on said guide-tracks and rest upon said yielding sections while the mold-carrier is in position for condensing the cake, substantially as set forth.

Witness my hand this 20th day of September, A. D. 1887.

OSCAR P. BUSHNELL.

Witnesses:

CHAS. H. BURLEIGH,  
ELLA P. BLENUS.