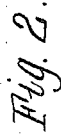
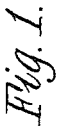


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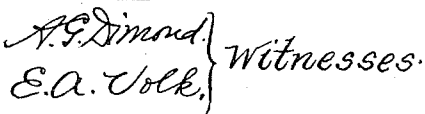
4 SHEETS—SHEET 1.



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4 SHEETS—SHEET 2.



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4 SHEETS—SHEET 3.

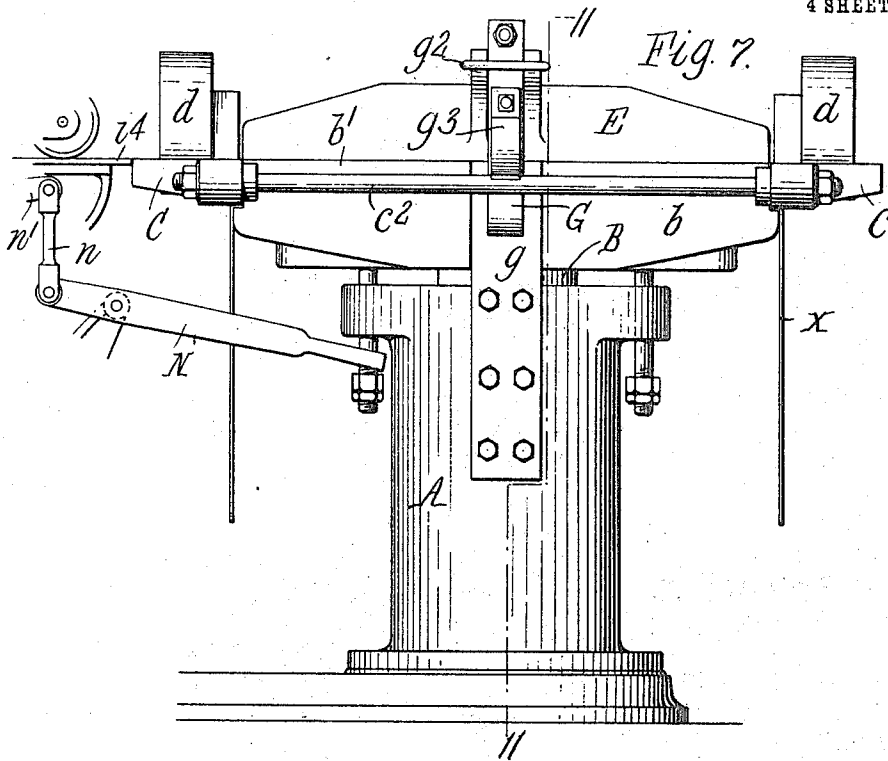


Fig. 8.

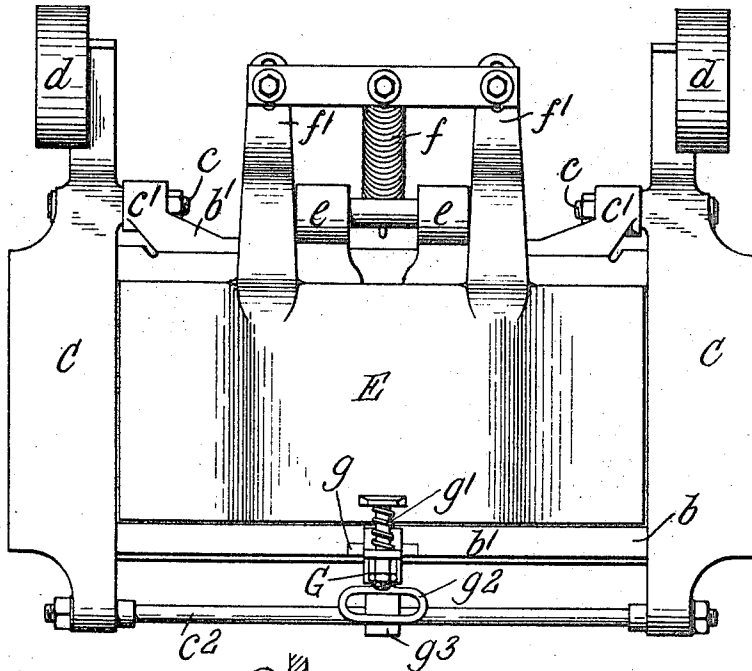
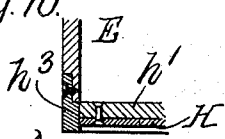


Fig. 10.



A. J. Diamond
E. A. Volk. } Witnesses.

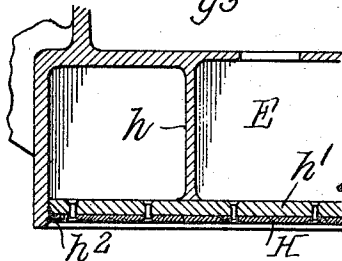


Fig. 9.

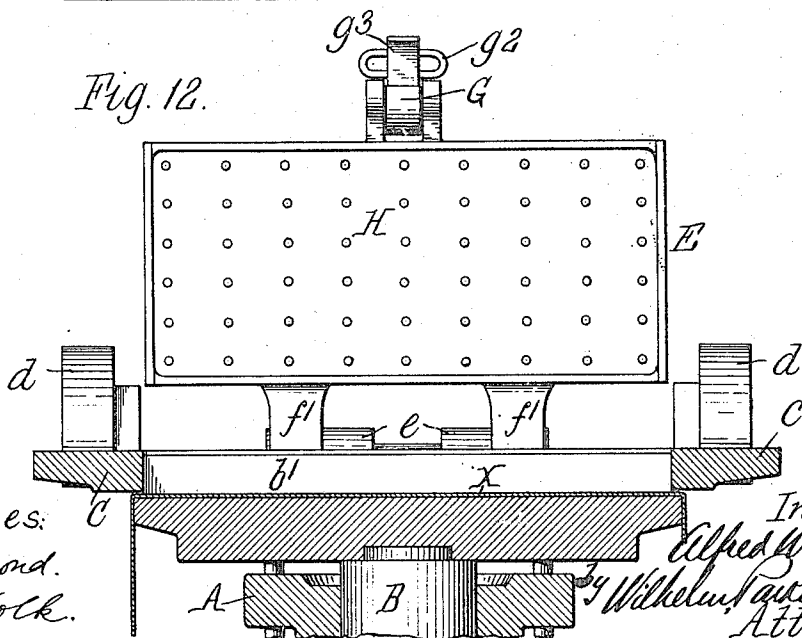
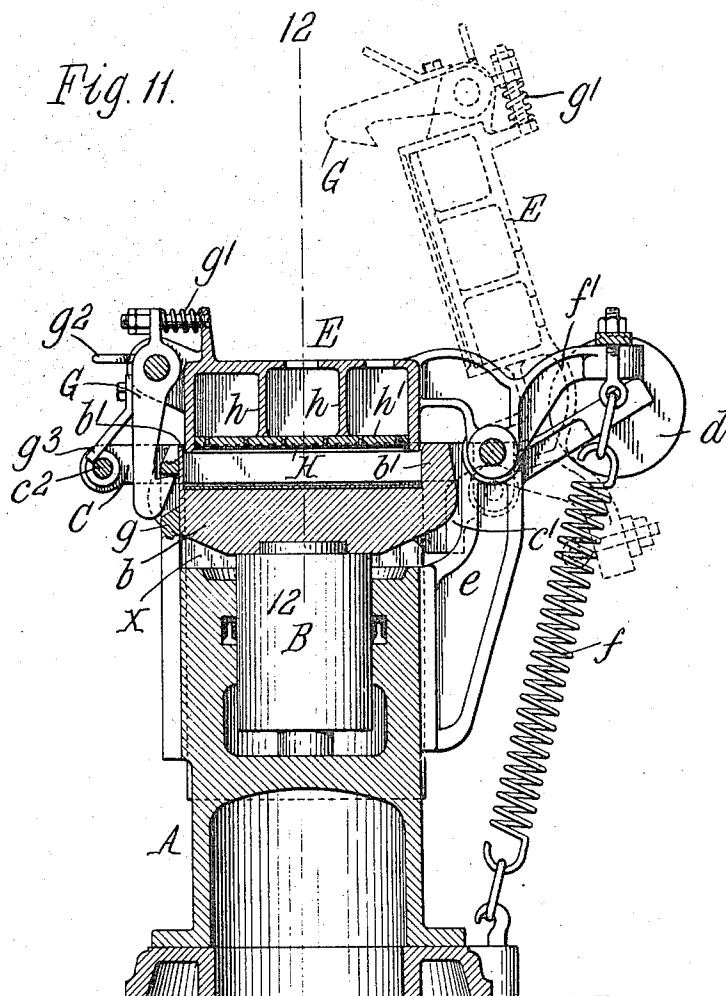
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A. W. FRENCH.
MACHINE FOR FORMING OIL CAKES.
APPLICATION FILED MAY 14, 1908.

1,059,986.

Patented Apr. 29, 1913.

4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

ALFRED W. FRENCH, OF PIQUA, OHIO.

MACHINE FOR FORMING OIL-CAKES.

1,059,986.

Specification of Letters Patent.

Patented Apr. 29, 1913.

Application filed May 14, 1908. Serial No. 432,782.

To all whom it may concern:

Be it known that I, ALFRED W. FRENCH, a citizen of the United States, residing at Piqua, in the county of Miami and State of Ohio, have invented a new and useful Improvement in Machines for Forming Oil-Cakes, of which the following is a specification.

This invention relates to machines for forming oil cakes, and some features of the machine are more particularly applicable to formers used for making cotton seed oil cake.

According to the usual method of manufacturing oil from oil bearing seed, the meal or ground seed is molded into cakes and wrapped in press cloths before being placed in the oil presses. In molding the cakes an open-ended charging box is moved horizontally beneath the discharge-opening of the meal cooker or kettle to receive a charge of meal and is then moved over the cake mold box to fill the same, and returned to receive another charge. The cake is then pressed in the mold box.

Some meal flows under pressure more readily than others and must be confined in press boxes to express the oil therefrom. The cakes of such meal are ordinarily made the same width as the press cloths therefor so that the cloths will not project beyond the side edges of the cakes and prevent the proper placing of the cakes in the press boxes.

One object of this invention is to produce a desirable and efficient machine in which cakes of uniform thickness and density with well formed ends as well as sides can be made rapidly with the minimum exertion, and in which the cakes can be made of the same width as the cloths, and the cloths will be held straight with their edges coincident with the side edges of the cakes; also to provide a desirable hydraulic operating mechanism for the charging box which reciprocates the same with a steady uniform motion and is more economical than the steam-operated mechanisms heretofore used and eliminates the danger incident to the steam formers.

Other objects of the invention are to provide the cake former with a press-head of novel construction which prevents the meal from sticking to the same and breaking away from the cake when the press-head and mold box are separated after pressing the

cake; and also to improve cake-forming machines in the respects hereinafter described and set forth in the claims.

In the accompanying drawings, consisting of four sheets: Figure 1 is a front elevation of a portion of a cake forming machine embodying the invention, showing the operating mechanism for the charge box. Fig. 2 is a rear elevation of the latch device for the operating valve for the charge box. Fig. 3 is a plan view of the portion of the machine shown in Fig. 1. Fig. 4 is a cross sectional elevation thereof, on an enlarged scale, in line 4—4, Fig. 3. Fig. 5 is a broken sectional plan of the operating cylinder and valve for the charge box, showing the valve in position to advance the box. Fig. 6 is a sectional plan of the operating valve for the charge box, showing the normal position thereof. Fig. 7 is a front elevation of the cake-press portion of the machine. Fig. 8 is a plan view thereof. Fig. 9 is a fragmentary transverse section of the press-head. Fig. 10 is a longitudinal section of a portion of one end of the press head. Fig. 11 is a transverse sectional elevation of the cake press in line 11—11, Fig. 7. Fig. 12 is a fragmentary longitudinal sectional elevation thereof, in line 12—12, Fig. 11, showing the press head raised and the press cloth and end bars of the cake mold in place ready to mold a cake.

Like letters of reference refer to like parts in the several figures.

A represents the upright cylinder and B the ram of the cake-forming press. The cylinder may be of any usual or suitable construction. The ram is movable vertically in the cylinder and has an enlarged head or platen *b* on which the oil cakes are molded and pressed and which preferably has raised flanges or marginal portions *b'* along its opposite long sides which form the side walls of the cake mold. There are no flanges on the ends of the platen, and the press cloth is laid thereon between the side flanges with its ends hanging down over the ends of the platen, as shown in Fig. 12, the cloth being held straight and centrally on the platen by the side flanges *b'* thereof.

C represents movable end bars which are adapted to extend horizontally at the ends of the platen over the press cloth and form the end walls of the cake mold, see Fig. 12. These end bars are hinged by bolts *c* to brackets *c'* on the rear side of the ram

platen, or are pivoted in any other suitable way so that they can rise and fall with the platen and can be swung upwardly and rearwardly independently of the platen.

- 5 The end bars are preferably connected at their front ends by a rod c^2 which serves as a handle for raising and lowering them. Weights d are secured to rearwardly projecting arms on the end bars C, or other
- 10 suitable means are provided for counterbalancing the end bars so that less exertion is required to operate them.

- E represents a press head which is hinged to brackets e rising from the rear side of the press cylinder, or is otherwise suitably hinged to swing from a horizontal position over the platen, as shown by full lines in Fig. 11, to the broken line position shown in the same figure. A spring f connecting
- 20 arms f' projecting rearwardly from the press head with the base of the press, or other suitable means, are provided for counterbalancing the weight of the press head. The press head is held rigidly in the horizontal position by a latch G and is of a size
- 25 to enter between the end and side walls of the cake mold to press the cake when the press ram is raised. Any suitable latch can be employed. That shown is pivoted to the
- 30 front side of the press head and has a hooked lower end which is caused to engage in a hole in a keeper g rising from the front side of the press cylinder by a spring g' acting on the upper end of the latch. The
- 35 latch has a handle g^2 for operating it and raising and lowering the press-head, and it also preferably has a finger g^3 , Fig. 11, projecting therefrom over the handle rod c^2 for the end bars C, so that by raising said handle
- 40 rod the latch will be released and the press head together with the ends bars C can be swung upwardly with one motion by simply lifting on the handle rod c^2 .

- When a press head having the usual polished metal lower face is used, the meal often adheres thereto and is broken away from the cake, spoiling the latter, when the platen and press head are separated after pressing the cake. This is especially true
- 50 of cotton seed cake. To prevent this, the bottom of the head is preferably covered with material H, preferably of the sort used for press cloths. The meal will not adhere to this cloth under the pressure used in the
- 55 cake-forming press with sufficient tenacity to be broken away from the cake. The press head, see Fig. 9, conveniently consists of an integral hollow casting having top, side and end walls and vertical ribs h between the
- 60 side walls, and a separate bottom plate h' to which the cloth H is riveted and which is slipped endwise between the side walls of the casting and is held in place against the lower edges of the ribs h by lips h^2 on the
- 65 lower edges of the side walls. The bottom

plate is secured against endwise movement by strips h^3 , Fig. 10, secured to the end walls of the head against the ends of the plate. This construction of the cake molding press or mechanism is desirable and coöperates

70 to be described, in the rapid and easy production of the cakes, but the cake press could be of other construction in so far as the other parts of the machine are concerned.

- 75 I, Figs. 1 and 3, represents the horizontally reciprocating charge box which receives the meal from the kettle and discharges it in the cake mold. The charge box is open at top and bottom and normally stands beneath the discharge opening of the kettle i , as shown in Fig. 1, and has the usual horizontal apron or plate i' extending rearwardly from the top of the box to close the kettle discharge opening when
- 80 the box is moved forwardly to fill the cake mold. The apron i' slides and is guided in horizontal ways i^2 supported by a suitable frame i^3 and serves to properly guide the charge box in its movements. The charge
- 85 box shown has wheels which roll on a table or top i^4 of the frame i^3 and on the front and rear flanges of the press platen, which are opposite thereto in the same horizontal plane, to support the box. The charge box
- 90 could be constructed, supported and guided in any other suitable manner.

- The hydraulic operating mechanism for the charge box is preferably constructed as follows: K represents a horizontal cylinder which is suitably supported in rear of the charge box on the frame i^3 , and k a piston which works in said cylinder and has a piston rod k' connected to the charge box.
- 100 L represents a supply pipe for liquid under pressure, l l' pipes leading to the opposite ends of the cylinder, and l^2 a discharge or return pipe for the liquid. m is a valve casing joining the several pipes L l l' l^2 , and M is a valve of any suitable sort which is movable
- 105 in the casing for controlling the passage of the liquid to and from the rear end of the cylinder K. The valve M shown is of the piston type and has a reduced waist which in the normal position of the valve, shown
- 110 in Fig. 6, connects the pipe l from the rear end of the cylinder with the discharge pipe l^2 , and in the position of the valve shown in Fig. 5 connects the supply pipe L with said pipe l . The front face of the piston K
- 115 has less effective area than the rear face thereof, owing to its connection with the piston rod, so that the liquid exerts differential pressures on opposite sides of the piston. With this construction the pressure
- 120 can be, and preferably is left at all times on the front face of the piston, and the supply pipe L connects with the pipe l' leading to the front end of the cylinder in both positions of the valve by an annular groove m'
- 125 130

in the valve casing, or other suitable connection. When, therefore, the valve is moved to the position shown in Fig. 5, the liquid will enter the rear end of the cylinder K and overcoming the opposing pressure will move the piston and the charge box forwardly to discharge the meal in the charge box into the cake mold. When the valve M is returned to the normal position it will connect the rear end of the cylinder K with the discharge pipe l^2 and the pressure on the forward face of the piston will then move the piston rearwardly and return the charge box to the receiving position beneath the discharge opening of the cooker.

The mechanism shown for actuating the valve M is constructed as follows: N represents a hand lever which is fulcrumed on the frame i^3 with one end extending to a position within convenient reach of the operative at the cake-forming press, and its other end connected by a link n and bell crank lever n' to a stem n^2 projecting from one end of the valve M, so that when the handle-end of the lever N is raised the valve will be moved to the position shown in Fig. 5 for causing the charge box to move forwardly. O, Figs. 1 and 3, is a latch bar connecting a stem at the opposite end of the valve M to a spring O' which is attached to a suitable stationary part of the machine and acts to return the valve to and hold it in its normal position. The latch bar slides in a guide in a suitable bracket or part p of the machine frame. P, Fig. 4, is a latch pivoted on the bracket p , and p' is a spring which holds one end of the latch against the lower edge of the latch bar O. The opposite end of the latch P is connected to a releasing lever Q, Figs. 1, 2 and 4, which is suitably fulcrumed on the machine frame with one end projecting into the path of a releasing cam or device q , Figs. 1 and 2, on the apron i' of the charge box, or other suitable part which moves with the charge box. When the valve is moved to the position shown in Fig. 5 to advance the charge box, the latch P engages a shoulder r on the latch bar O and holds the valve until the charge box reaches the limit of its forward movement, when the release device q strikes the release lever Q and actuates the latch to release the valve. The spring O' then returns the valve to the normal position in which it allows the escape of liquid from the rear end of the cylinder K, whereupon the pressure on the front face of the piston will retract the charge box.

The invention is not limited to the described construction of the valve M and its actuating mechanism, for devices of other construction could be employed which would operate in a similar manner to move the valve to the position for advancing the charge box and hold it in this position until

automatically released by means controlled by the position of the charge box. The hydraulic mechanism described operates the charge box with a very steady motion which is uniform throughout the travel of the box, and is much more desirable and more economical in an oil mill than a steam actuated device. If necessary the operative can readily cause short reciprocations of the charge box over the cake mold to evenly distribute the meal therein after the box has been once, fully advanced by the proper manipulation of the valve-operating lever N.

The operation of the machine is as follows: A press cloth is laid on the ram platen b between the side flanges b' thereof with its ends hanging down over the ends of the platen, as shown in Fig. 12, the press head E and end bars C having been first swung upwardly and rearwardly. The end bars C are then lowered to the horizontal position over the press cloth, as shown in Fig. 12, and the lever N is raised to move the valve M and cause the charge box to move forwardly over the cake mold and distribute its charge of meal therein. The latch P locks the valve in the position to which it is moved and holds the lever N up until the charge box advances far enough for the releasing cam q to strike the release lever Q and release the catch, which permits the spring O' to return the valve and its operating lever N to the initial position and cause the return of the charge box in the manner explained. The operative then pulls the press head down until it is held by the latch G and operates the usual valve (not shown) to raise the ram and press the cake. When the ram is again lowered, he swings the press head E and end bars C up by means of the handle rod c^2 , as explained, folds the hanging ends of the cloth X over the cake, and removes the wrapped cake from the press, when the parts will be in position for forming another cake.

I claim as my invention:

1. The combination of a coöperating platen and press head for molding cakes, said platen having portions forming opposite walls of a cake mold, and movable bars which form opposite walls of the cake mold and are movable to allow the press cloth to be placed on the platen beneath them, substantially as set forth.

2. The combination of a movable platen parts which coöperate with said platen to form walls of a cake mold, said parts being movable with said platen and also movably connected to the platen to move independently thereof, and a press head which operates with said platen to press the cake, substantially as set forth.

3. The combination of a movable platen having raised portions forming opposite walls of a cake mold, bars which form oppo-

site walls of the cake mold and are movable with said platen and also independently thereof, and a press head which coöperates with said platen, substantially as set forth.

5 4. The combination of a movable platen having raised portions forming opposite walls of a cake mold, bars which form opposite walls of the cake mold and are movable with said platen, a press head which co-
10 operates with said platen to press the cake and is movable away from said platen to allow the cake mold to be filled, said bars being movable toward and from said platen independently of said head, substantially as
15 set forth.

5. The combination of a movable platen having raised portions forming opposite walls of a cake mold, bars which form opposite walls of the cake mold and are movable
20 with said platen, a press head which co-operates with said platen to press the cake and is movable away from said platen to allow the cake mold to be filled, said bars

being movable away from said platen with said press head and toward said platen independently of said press head, substantially as set forth. 25

6. The combination of a platen having raised portions forming opposite walls of a cake mold, movable bars which form opposite walls of the cake mold and are movable toward and from said platen, a press head which coöperates with said platen to press the cake and is movable toward and from said platen, a latch for holding said press
30 head in operative position, and a handle rod for said bars arranged to release said latch and move said press head away from said platen with said bars, substantially as set forth. 35

Witness my hand, this 5th day of May, 1908. 40

ALFRED W. FRENCH.

Witnesses:

BLANCHE McMAKEN,
CHARLES B. UPTON.