W. W. MARSH.

OIL PRESS.

No. 16,391. Patented Jan. 13, 1857.

Fig. 1.

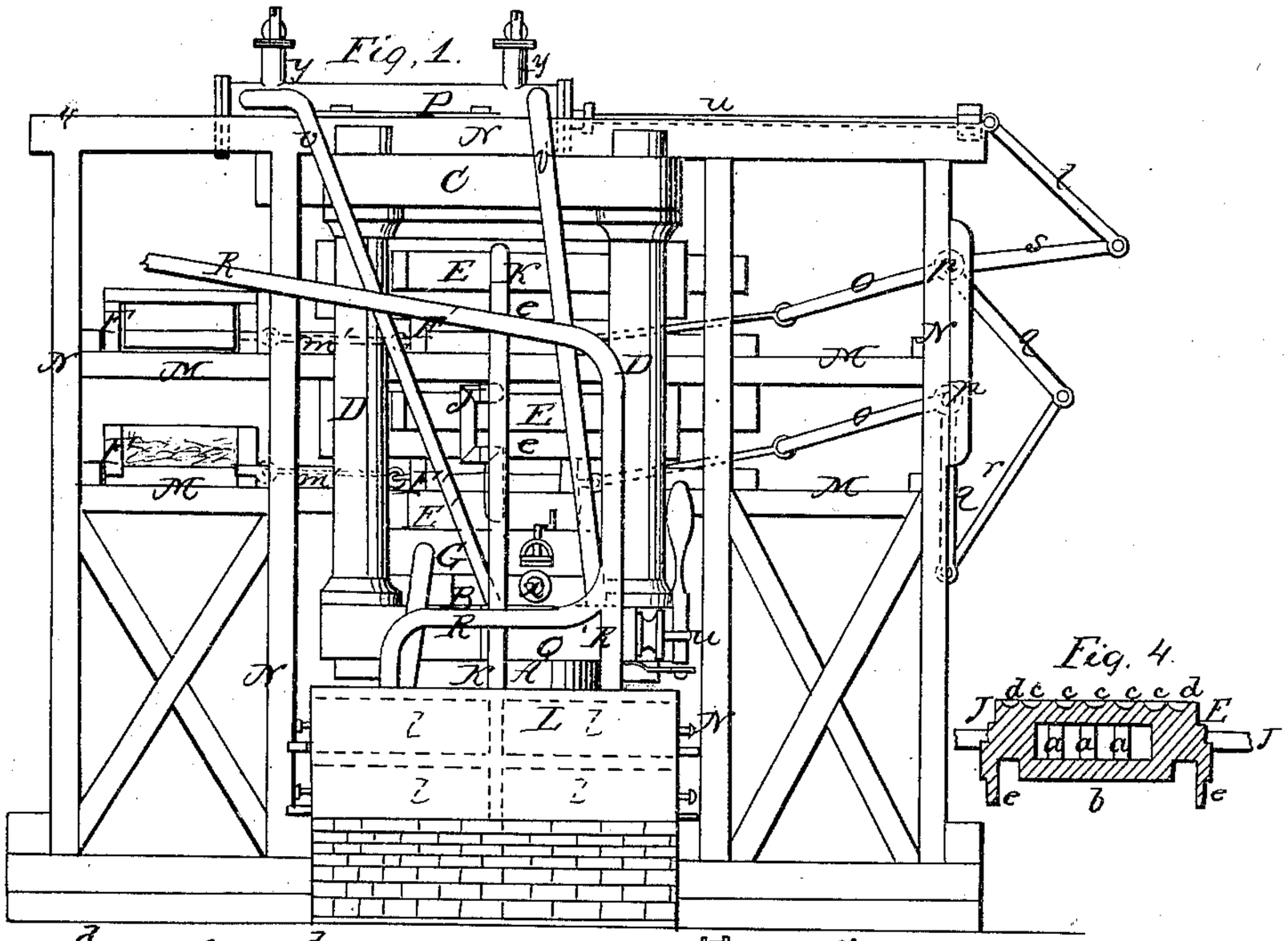


Fig. 4.

Fig. 3.

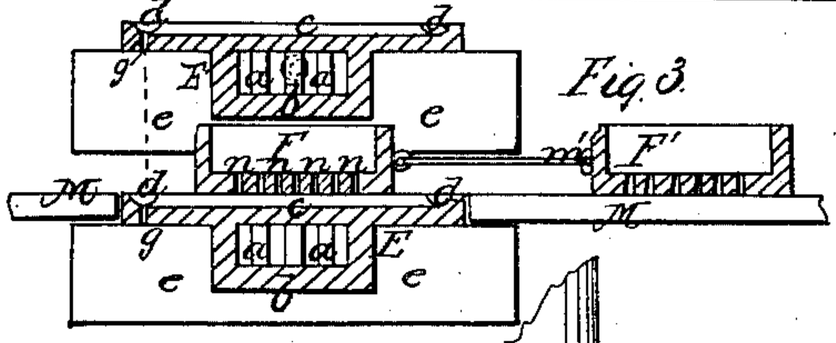


Fig. 2.

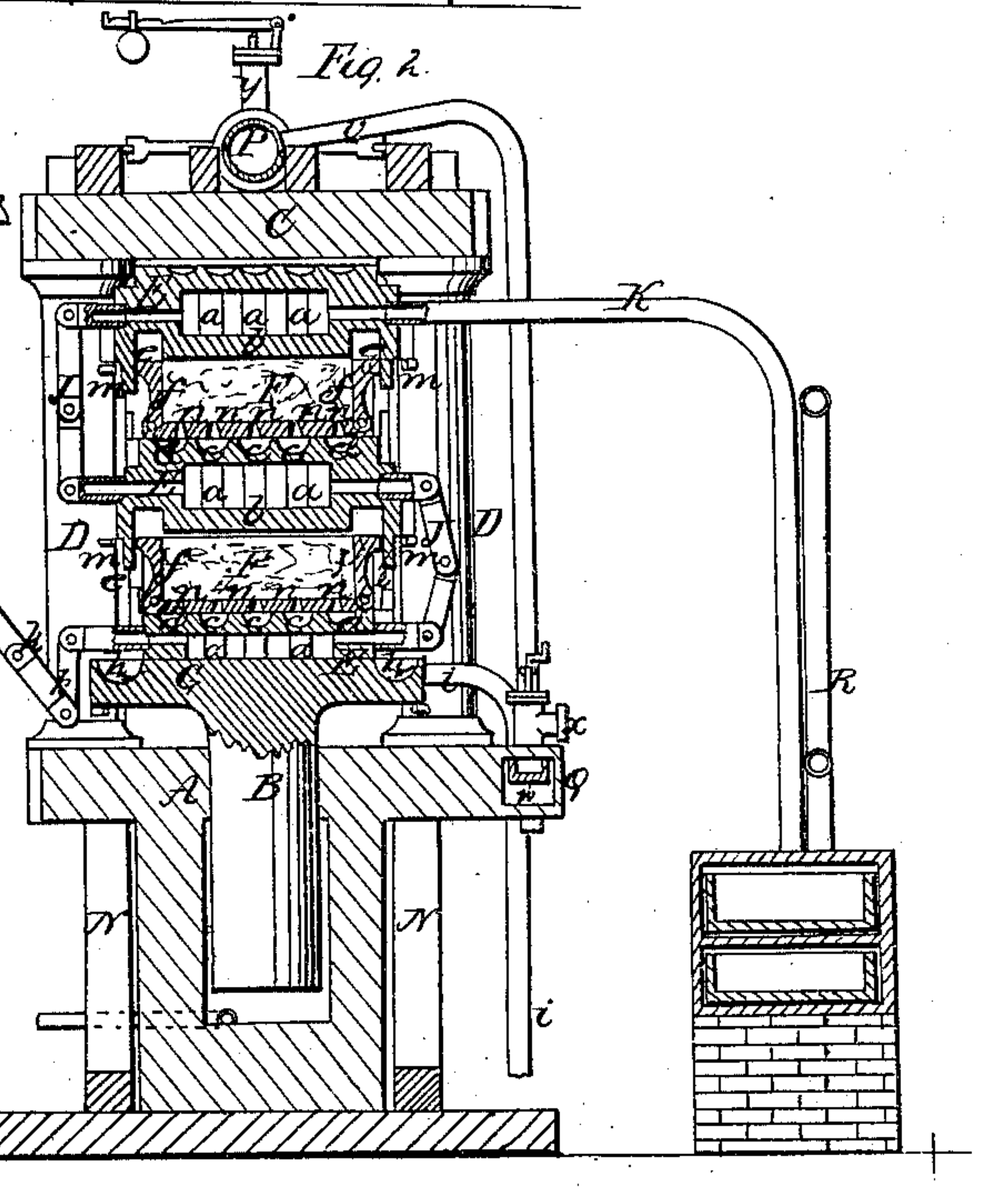
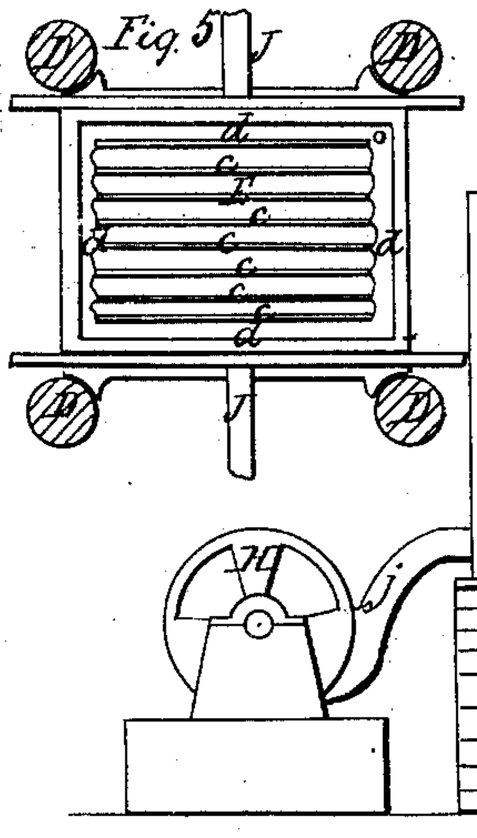


Fig. 5



UNITED STATES PATENT OFFICE.

WILLIAM W. MARSH, OF JACKSONVILLE, ILLINOIS.

OIL-PRESS.

Specification of Letters Patent No. 16,391, dated January 13, 1857.

To all whom it may concern:

Be it known that I, WILLIAM W. MARSH, of Jacksonville, in the county of Morgan and State of Illinois, have invented certain new and useful Improvements in Oil-Presses; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1, is a side elevation of an oil press constructed according to my invention, and its appurtenances. Fig. 2, is a vertical section of the same at right angles to Fig. 1. Fig. 3, is a longitudinal section of two of the trusses and the interposed meal or seed box. Fig. 4, is a transverse section of one of the trusses, and Fig. 5, is a plan of the same.

Similar letters of reference indicate corresponding parts in the several figures.

This invention consists in providing the lower or piston portions of oil presses with two vertical flanges or projections, and in leaving a space between the said flanges and the sides of the pistons, sufficiently wide to receive the hinged sides of the meal boxes; the said flanges projecting below the line of the bottom of the pistons, so that when the pistons enter the boxes, the flanges will pass down upon the outside of the hinged sides of the boxes, and support the said sides, while the sides will enter the space between the flanges and piston, whereby the said hinged sides are kept in an upright position, during the operation of pressing; all injury to the hinged sides by the outward pressure from within is prevented; and increased convenience and rapidity is obtained.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

A and B, represent the cylinder and plunger of a hydro-static press of the common kind arranged vertically.

C is the top plate or head of the press connected with the cylinder in the usual manner, by means of four pillars D, D, which serve as guides to the cast-iron trusses E, E, E′. The trusses E, E, of which there may be any suitable number are all alike, of the construction shown in Figs. 3 and 4. They are made hollow for the purpose of receiving hot air to keep them heated during the pressing operation, but strengthened by internal columns *a*, *a*, to enable them to resist the pressure. Their bottoms are made with square pistons *b*, *b*, to fit into the meal boxes F, F, F′, F′, to press the meal contained therein when the boxes are placed within them, and they have overlapping side pieces *e*, *e*, to fit over the hinged sides *f*, *f*, of the meal boxes, as shown in Fig. 2, a space being left between the said side pieces or flanges, *e*, *e*, and the piston surface *b*, into which space the hinged sides *f*, *f*, of the meal boxes pass, when the pistons descend. The space between the piston surface, *b*, and the side pieces or flanges, *e*, *e*, should be of just sufficient width to receive the hinged sides, *f*, *f*, of the boxes. The piston thus formed, with the flanges or side pieces, serves the important office of always keeping the hinged sides, *f*, *f*, of the meal boxes in an upright position, and of supporting the hinges of the sides, *f*, *f*, from the lateral or bursting pressure occasioned by the action of the piston upon the meal. It should be observed that the side pieces or flanges, *e*, *e*, project below the bottom surface of the piston, *b*, and thus afford the greatest support to the sides, *f*, *f*, when the pressure within the boxes is the strongest. By this method of protecting the hinged sides from injury, the meal boxes are always in a convenient position for removal when the pistons rise, cake may be rapidly removed from them, and the general operations of the press thus facilitated.

If it were required to place the boxes within cavities, as in other oil presses, or to provide boxes of such strong metal as to be capable of resisting the pressure of the pistons, it is manifest that much time and labor would be lost, in removing the boxes from the cavities, or that the labor of handling and transporting the boxes would be very great, and the operations of the press be much impeded. The upper surfaces of the trusses contain a number of parallel grooves or gutters *c*, *c*, all communicating with another gutter *d*, which extends all around them. The upper parts of the trusses which contain the gutters are long enough to hang over the ends of the meal boxes, as shown in Fig. 3, so that the oil which is expressed from the meal by the action of the pistons *b*, *b*, in the boxes below them and forced through the perforated bottom of the boxes into the gutters of the next

truss below may drop from one truss to another through holes *g*, *g*, provided for the purpose as shown in Fig. 3.

The bottom truss E′, differs from the other trusses E, E, in having no piston. It is attached directly to the follower plate G, at the top of the plunger B, and is grooved or provided with gutters *c*, *c*, which are open at the ends so that the oil expressed from the lower box may run into a large gutter *h*, made around the follower plate. This gutter also receives the oil that drops from all the trusses above and is furnished with a pipe *i*, to convey it away to a suitable receptacle. The trusses may be severally made in two parts for the purpose of forming the air chambers in them or in any other convenient and suitable manner. Their upper and lower faces and the sides of their pistons are intended to be planed or otherwise faced up truly. As the top truss may be always stationary, it is held up to the top plate or head C, of the press by resting upon pins or studs *m*, *m*, which are screwed into the pillars D, D. Similar pins or studs are provided for the other trusses to rest upon when the plunger B is down and the press is open. The cavity within the lower truss E, receives a constant supply of hot air by a pipe *j*, which comes from a blower H and passes through a furnace I, to heat the air on its way to the press. This pipe is provided with one or more elbows and stuffing box-joint connections *k*, *k*, to admit of the rising and falling of the truss. Pipes J, J, with elbows and stuffing box joint connections had from the cavity of one truss to that above it, throughout the whole series and an escape pipe K, leads from the top truss to a heating box containing a number of drawers *l*, *l*, in which the meal is dried before being subjected to the action of the press. By this arrangement a constant stream of hot air is made to pass through all the trusses and afterward is used to extract the moisture from the meal. After circulating around all the drawers *l*, *l*, of the heating box, the hot air escapes by a pipe R to the atmosphere unless there be any convenient means of using the heat still remaining in it.

The principal reason why I heat the trusses with hot air instead of steam, is that I can obtain a high degree of heat without a dangerous pressure and in case of a crack or other defect in a truss, an escape of air into the meal, would be no injury, but an escape of steam would be highly injurious.

The meal boxes F, F, F′, F′, have their bottoms and ends cast solid, but have their sides *f*, *f*, hinged or otherwise so attached to the bottom, that when the boxes are withdrawn from between the trusses, after the pressing operation, their sides can be let down or thrown open to take out the cake. The bottoms have perforations *n*, *n*, arranged in lines over the gutters.

F, F, are one complete set of boxes and F′, F′, another complete set, each set consisting of one box less than the number of trusses. One set of these boxes is intended to have the cake taken out and to be refilled with meal or seed while the contents of the other are being subjected to the pressing operation and for that purpose the boxes of the two sets are connected together by rods, *m′*, *m′*, in pairs, one of one set and one of the other set constituting a pair, and stationary horizontal ways M, M, erected upon a framing N, N, are provided for each pair of boxes, the upper faces of said ways being in the same planes as the upper faces of the several trusses when the press is open, so that the boxes can slide off the trusses on to the ways. The length of the connections *m′*, *m′*, is such, that when a box F is between the trusses in position for operation, its fellow F, stands on the ways at the left hand of the press, as shown in Fig. 1, in a convenient position for filling and when F′, is in the press F will be on the ways at the right hand of the press. The connections must be of such character as to admit of the necessary upward movements of the boxes with the trusses, as the press is closed. Each pair of boxes F, F′, is connected with a crank *o*, on one of a number of horizontal shafts *p*, *p*, arranged in bearings at one end of the framing N, N. These shafts are furnished with arms *q*, *q*, and are severally connected together by rods *r*, attached to the said arms, which are arranged in such manner, that the boxes of the other set F, F, or F′, F′ stand vertically one above the other, so that a whole set will be in the press at the same time while the other set are in a position to be refilled. The upper crank shaft *p*, has another arm *s*, which is connected by a connecting rod, *t*, with the piston rod, *u*, of a piston that works in a small horizontal steam cylinder P, on the top of the press. This cylinder receives steam at either end, as may be desired, by means of one or other of two pipes *v*, *v′*, which lead from a steam chest Q which is supplied with steam from a boiler, by a pipe *x*. The steam being admitted to either pipe at pleasure, by means of a slide valve *w*, in the steam chest. This valve needs no representation as it is of well known character. Near either end of the cylinder P, there is an escape valve *y*.

The operation of the press is as follows. The press being open with one set of boxes filled with meal or seed and in proper position under or between the trusses, the pump is started and the plunger rises, lifting the several trusses in succession and causing the pistons *b*, *b*, to enter the interposed boxes and express the oil from the meal or seed,

therein, which, passing through the perforations *n*, *n*, in the bottoms of the boxes into the gutters *c*, *c*, and thence into the gutters *d*, *d*, drops through the holes *g*, *g*, from one truss to another and is all collected in the bottom gutter *h*, from whence it escapes by the pipe *i*, into the receptacle provided for it. During the time that this operation has been in progress the other set of boxes have been emptied and refilled. When a sufficient pressure is obtained to extract all the oil, the pump is stopped and the water allowed to escape and the plunger to descend allowing the press to open, after which steam is admitted to the proper end of the cylinder P to act upon the piston to drive the set of boxes out of the press and the other ones in. The steam is then shut off and the pump of the press started to repeat the pressing operation which proceeds as before described while the cake is being removed from the first set of boxes, and the said boxes are refilled from the drawers *l*, *l*. When the last mentioned pressing operation is finished, the press is opened and the steam let into the other end of the cylinder to act upon the piston to bring the newly-filled boxes into the press. In this way, the operation of the press proceeds without any of the delay that is necessary for the fitting of other presses, as the change of the boxes is performed instantaneously as soon as the press is opened and then all is ready to commence pressing again, and by this means, a press of a given power will extract in a given time, nearly double the amount of oil that can be obtained by a common press.

It is intended that the drawers *l*, *l*, shall each contain the quantity of meal or seed to fill one of the boxes of the press, so that the drawer may be emptied directly into the box.

I am aware that boxes having hinged sides or ends have long been used in connection with various kinds of presses, and I therefore distinctly disclaim them. But I am not aware that the pistons of oil presses have been provided with flanges or side pieces, extending below the line of the bottom of the piston surfaces, for the purposes herein set forth; and therefore—

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

Providing the lower or piston surfaces, (*b*) of the trusses (E) with vertical flanges or side pieces (*e*) (*e*), when a space is left between said side pieces and the bottom piston surfaces (*b*), in the manner and for the purposes specified.

WILLIAM W. MARSH.

Witnesses:
MARTIN H. CAPELL,
JOHN T. CASSELL,
JAS. BERDAN.