

J. CRITCHLOW.

FILTER PRESS.

(Application filed Apr. 30, 1900.)

(No Model.)

4 Sheets—Sheet 2.

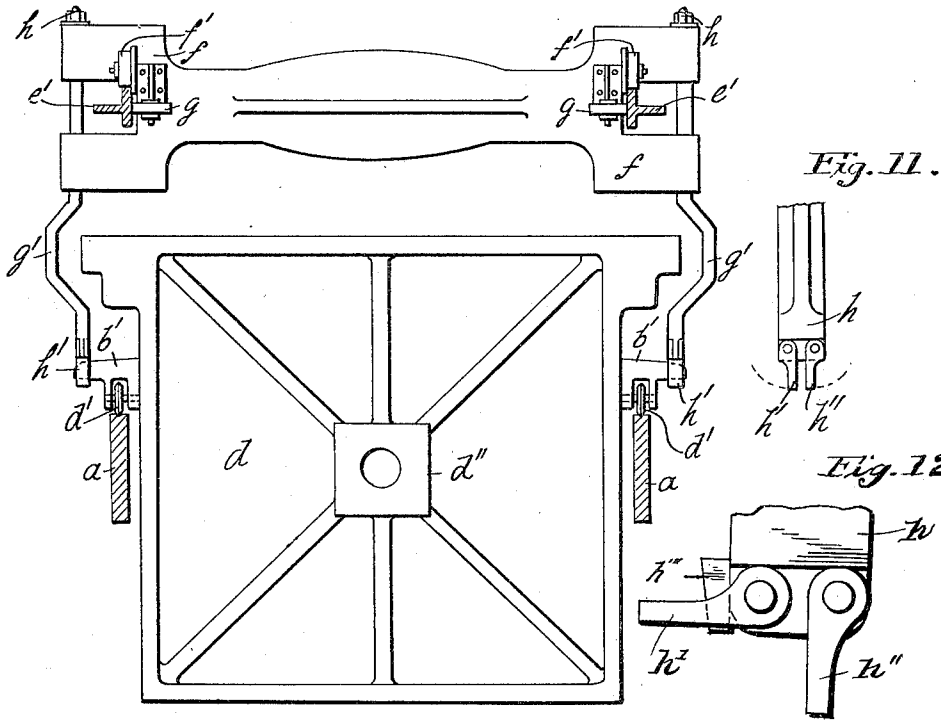


Fig. 6.

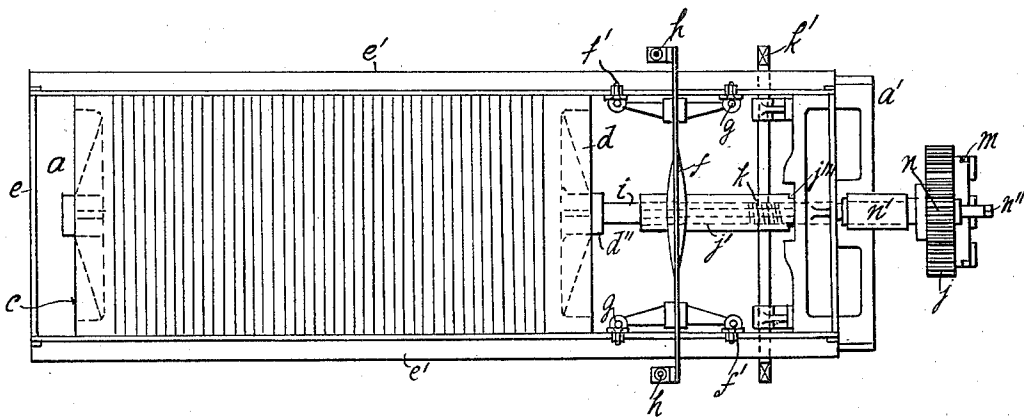


Fig. 2.

Witnesses

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4 Sheets—Sheet 3.

Fig. 8.

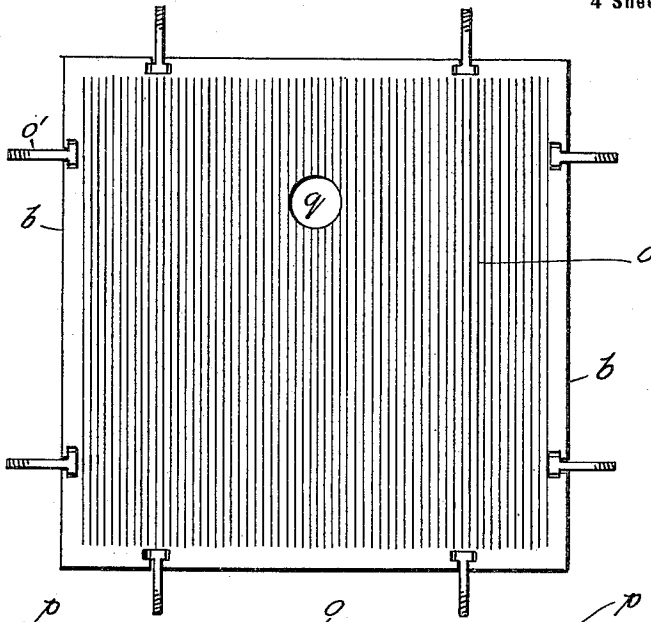


Fig. 7^a.

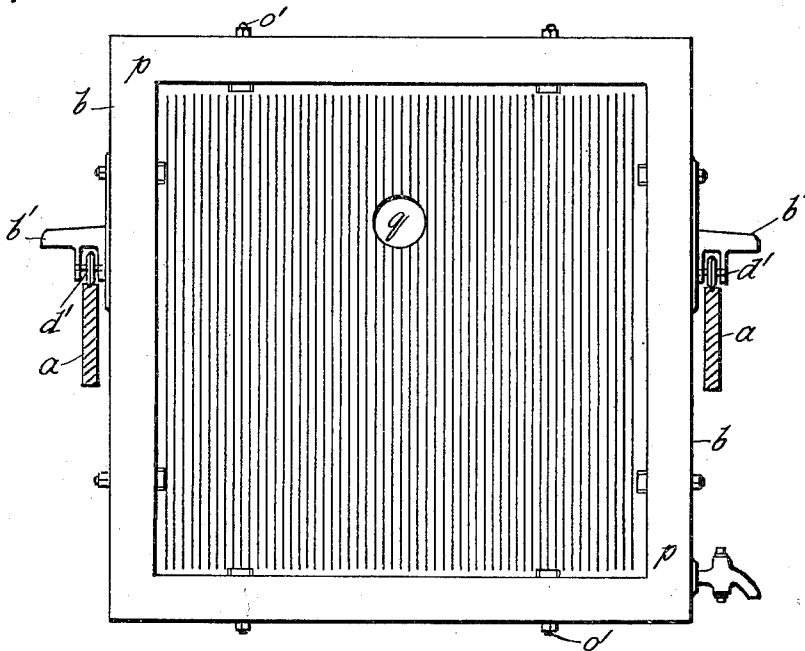


Fig. 7.

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No. 672,505.

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FILTER PRESS.

(Application filed Apr. 30, 1900.)

(No Model.)

4 Sheets—Sheet 4.

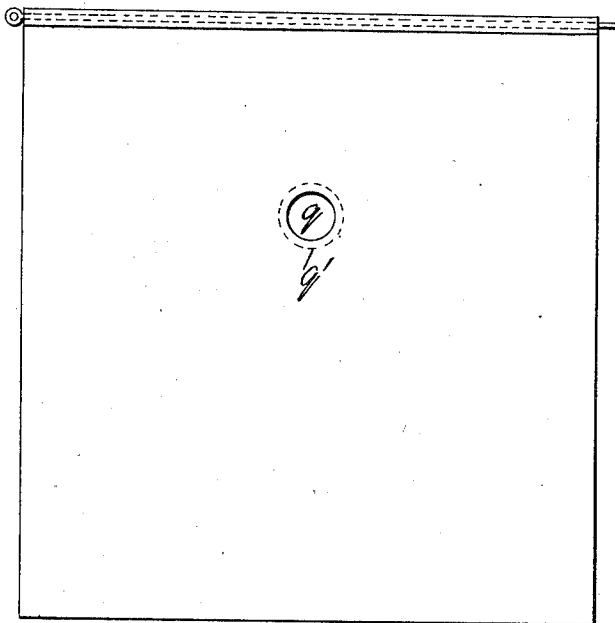


Fig. 9.

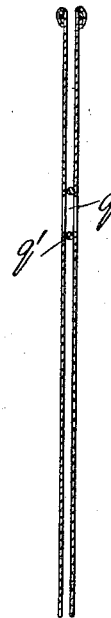


Fig. 10.

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UNITED STATES PATENT OFFICE.

JOHN CRITCHLOW, OF STOKE-UPON-TRENT, ENGLAND.

FILTER-PRESS.

SPECIFICATION forming part of Letters Patent No. 672,505, dated April 23, 1901.

Application filed April 30, 1900. Serial No. 14,946. (No model.)

To all whom it may concern:

Be it known that I, JOHN CRITCHLOW, engineer, a subject of the Queen of Great Britain and Ireland, residing at 3 Campbell road, Stoke-upon-Trent, in the county of Stafford, England, have invented certain new and useful Improvements in and Applicable to Filter-Presses, of which the following is a specification.

The invention relates to improvements in and applicable to filter-presses for potters' use, the objects being to construct a press of a lighter character than hitherto, one in which the trays can be readily moved backward and forward, and in general a press designed to attain better filtration of the slip and a greater output of such, while at the same time economizing both time and labor.

The improvements comprise means for moving the trays backward and forward on their supporting-frame from either end of the latter, means for rapidly forcing up and withdrawing the movable press-head, and means for increasing the pressure of the movable head when up against the trays, and sundry other detail improvements, all of which will be hereinafter referred to.

The invention will be fully described with reference to the accompanying drawings, in which—

Figure 1 is a side elevation of a filter-press of the class referred to with my improvements applied; Fig. 2, a plan of same; Fig. 3, an end elevation; Figs. 4 and 5, detail views of the screw and holding arrangement for the screw for forcing the trays together; Fig. 6, an enlarged end elevation, partly in section, of the means for moving the trays backward and forward; Figs. 7 and 7^a, side elevation and section of an improved filter-tray, and Fig. 8 a side elevation of improved plate for filter-tray. Figs. 9 and 10 show front and sectional views of the filter-cloths. Figs. 11 and 12 are enlarged detail views of the catches.

Referring principally to Figs. 1 to 3 and 6, *a* is the ordinary framing of the filter-press. *b* represents the filter-trays, *c* the stationary head, and *d* the movable head. Each of the trays has formed on or fixed at each side a projecting arm *b'*, in which is journaled a small roller *d'*, the rollers resting upon the longitudinal side frames. Similar

arms and rollers are carried by the movable head *d*, and in each case are to enable the trays and head to be easily moved along the frame either singly or two or more at a time. Hitherto these trays have been operated by hand, one man being stationed at one side of the press and another at the other. To dispense with the services of one man and to enable the other to perform the operation of moving the trays by himself, I arrange above the main frame *a* a subsidiary frame *e* of a suitable character, but always having two side rails *e'* parallel with each other and with the frame *a*. Upon the rails *e'* I mount a light carriage *f*, the latter being supported by wheels *f'* and prevented from getting askew by similar wheels *g*, that bear against the inner sides of the rails *e'*. The carriage is free to be moved backward and forward on the rails *e'* by means of handles attached to or formed on it. At present I arrange the handles in the form shown, as represented by *g'*, in which they consist of bars *h*, passed through and secured to the carriage *f* by nuts. The lower ends of the bars *h* have pivoted to them swiveling catches *h'* *h''*, which may be locked by wedges or pins *h'''*, so as to swivel in one direction only and remain rigid or in line with the bar *h* in the other. Thus assuming the carriage *f* in Fig. 1 was moved to the left, the catches *h'* being previously lifted up, catches *h''* coming in contact with the arms *b'* would ride over them and having passed drop down behind one or more of the latter. On moving the carriage in the reverse direction the catches remain rigid and move the trays toward the movable head of the press, so that the filtered slip can be removed from them in the usual way. To bring the trays together again prior to a pressing and filtering operation, the pins or wedges are placed at the opposite sides of the bars *h*.

By means of the arrangement described the trays *b* can be readily and quickly moved about quite parallel to the face of the movable and stationary heads of the press by one man or boy, thus economizing labor and increasing the production of the press.

In presses hitherto in use the movable head has been moved forward or withdrawn from the trays *b* by means of a screw only, thus making the operation a long one. To obvi-

ate this, I employ means whereby the head can be moved very rapidly in either direction. These means are indicated in Figs. 1, 2, 4, and 6, the latter being in section. Referring to these, *i* is a central shaft coupled at its inner end to the boss *d''* of the head *d*, but capable of revolving therein. The outer end of the shaft passes through a boss in the end frame *a'* and carries a wheel *j*, fixed to it, and near the wheel the shaft is screwed for a portion of its length, such screwed portion engaging with a chased thread formed in the end of a sleeve *j'*, surrounding the shaft, the sleeve having a sliding fit in the hole of frame *a'*. The outer end of the shaft *i* is supported by a bush or gland *i'*, fitted in the frame *a'*. On the under side the sleeve *j'* is provided with rack-teeth, with which a pinion *k* engages. The latter is mounted on a shaft *k'*, carried in bearing-brackets beneath the side frames of the machine and is provided at one or both ends with squared shoulders or wheels or levers by means of which it can be turned around. The rotation of the shaft *k'* in one or other direction causes the sleeve *j'* and shaft *i*, with its wheel *j*, to be moved bodily and simultaneously toward or from the trays *b* very rapidly and easily.

To put further pressure on the trays *c* after the head *d* has been moved forward, I form the sleeve *j'* with grooves *j'''*, as shown more clearly in Fig. 5. These grooves are just inside the framing (see Fig. 2) when the head *d* is against the trays *b*, and in order that it may be held in this position I provide a horse-shoe-shaped stop *l*, which is hung from a lever *l'*, carried by a bracket attached to the frame *a'* of the machine. The stop *l* holds the screw from moving endwise and also prevents it turning around. The further pressure is now applied by means of the wheel *j*, which is provided on one of its faces with holes *m*, into which a lever may be inserted for the purpose of turning the wheel around and the shaft on which it is mounted. The shaft is thus screwed through the sleeve and pressure put on the trays. When sufficient pressure is not obtained in this way, I may use additional means to put on the final pressure. These means may consist of a pinion *n*, fixed on a short stud passed loosely through a bracket *n'*, carried by the framing *a'*. The front end of the pinion is arranged so that a winch handle or lever *n''* may be easily placed thereon. By these means further pressure may be obtained on the central shaft *i*. As the stud on which the pinion *n* is mounted is capable of moving endwise it can be brought into gear with the wheel *j* as and when required or be disengaged therefrom. It will thus be seen that the mechanism described provides very ready means for rapidly applying pressure to the trays *b* and for increasing such pressure, as required. It should be said that the stop *l* receives the end pressure and transmits it to the end frame *a'*, and that prior to opening out the trays it is lifted and held out of

contact with the sleeve *j'* by means of the lever to which it is coupled.

A further part of my invention relates to an improved construction of filter-tray. This is indicated in Figs. 7 and 8, the former being a side elevation of a complete tray and the latter a similar view of the plate. I make the central plate *o* of a non-corrosive cast, stamped, or rolled metal sheet, grooved in the usual manner. The plate is formed on each side with slots to take the heads of one or more bolts or studs *o'*, screwed at their outer ends and passed through holes in a wooden frame-work *p*, which is internally provided with grooves to admit the edges of the plate. The frame *p* and plate *o* are rigidly held together by nuts on the bolts *o'*. The grooves in the plates *o* on one side are opposite to the projections on the other side and are arranged to extend from the under edge of the top part of the frame *p* to within a short distance of the upper edge of the bottom portion of the frame.

In referring to a further detail improvement I should say that the filter-cloths have been generally sewed together around the slip-hole, a method which leaves the edge of the hole somewhat irregular. I also sew them together around the slip-hole *q*, Figs. 9 and 10, but with this difference—namely, a metal ring *q'* is securely fastened in the sewing, thereby preserving the clearness of the hole and enabling the slip to pass more readily therethrough.

In conclusion I would have it understood that the details of construction may be departed from without affecting the spirit of the invention and that all the parts may be made of any material suitable for the purpose.

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

1. In a filter-press for potters' use a subsidiary frame rising above the main frame, rails located on said subsidiary frame, a carriage movable backward and forward on said rails, arms projecting downwardly from the carriage and provided with pivoted catches substantially as and for the purposes described.

2. In a filter-press for potters' use the means for putting pressure on the filter-trays consisting in a shaft coupled to the movable head of the press at one end and carrying a wheel at the other, a screw-thread formed on said shaft, a sleeve surrounding the shaft and provided with a thread engaging with the thread on the shaft and externally with rack-teeth and with grooves at one end, a rotatable pinion mounted on a shaft and engaging with rack-teeth on sleeve, an embracing stop engaging with grooves in sleeve and frame for supporting the mechanism substantially as described.

3. In a filter-press, a frame, a stationary head and a movable head mounted thereon, a shaft coupled to the movable head, a sleeve threaded on said shaft and slidably mounted in the frame, rack-teeth formed on the sleeve,

and a pinion on the frame meshing with the rack-teeth, substantially as described.

4. In a filter-press, a frame, a stationary head and a movable head mounted thereon,
5 a shaft coupled to the movable head, a sleeve threaded on said shaft, and slidably mounted in the frame, rack-teeth formed on the sleeve, a pinion journaled in the frame and meshing with the rack-teeth, and means for locking
10 the sleeve to the frame, substantially as described.

5. In filter-presses a tray comprising in combination a non-corrosive grooved metal plate,

a wooden frame surrounding said plate and bolts for securing the plate to the frame substantially as described. 15

6. In filter-cloths for filter-presses the combination therewith of metal rings sewed thereinto to form the slip-hole substantially as described. 20

In witness whereof I have hereunto set my hand in the presence of two witnesses.

JOHN CRITCHLOW.

Witnesses:

WILLIAM H. TAYLOR,

JAS. STEWART BROADFOOT.