J. MILLER.

FILTER PRESS AND THE LIKE.

APPLICATION FILED JUNE 3, 1919.

1,331,350.

Patented Feb. 17, 1920.

3 SHEETS—SHEET 1.

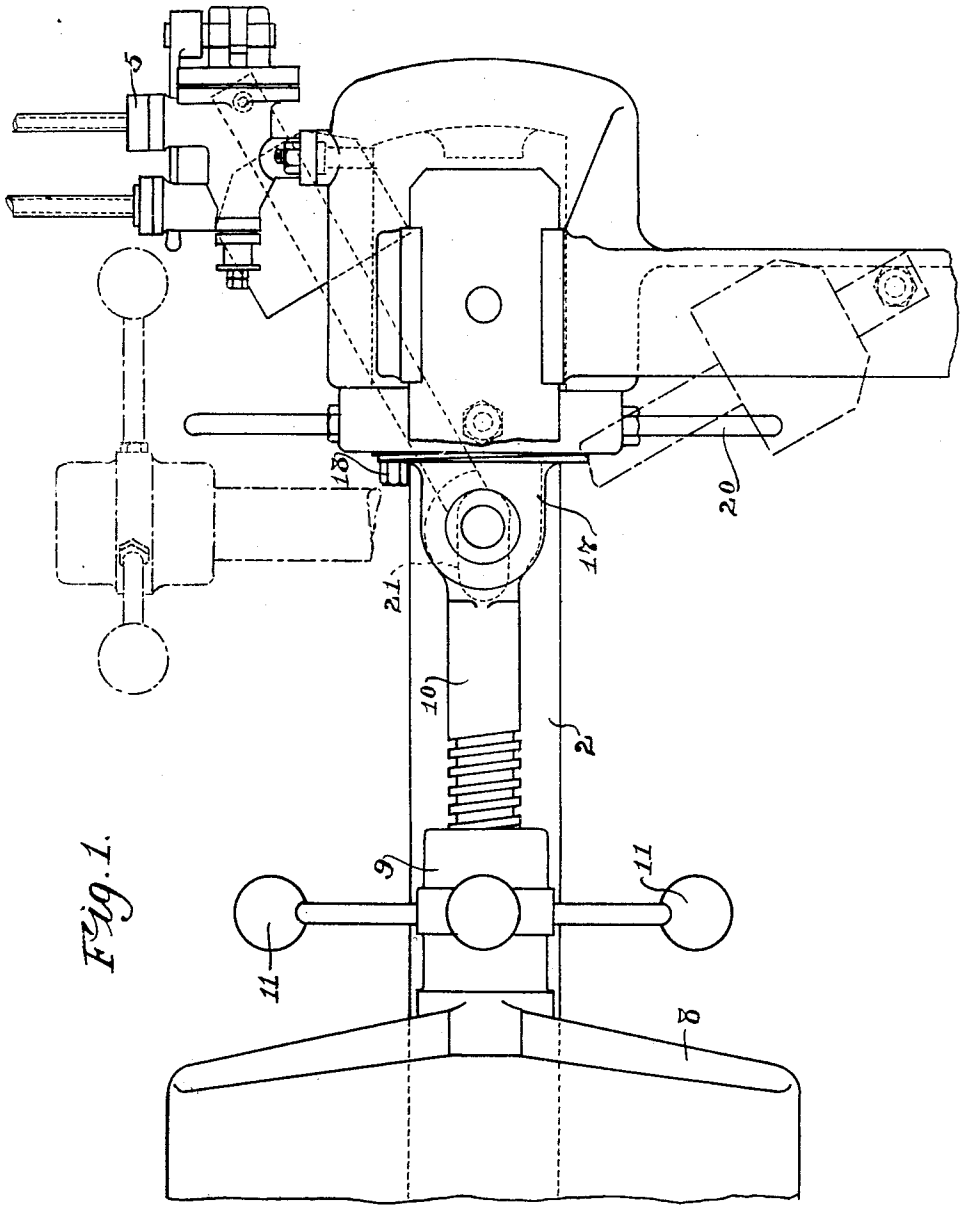


Fig. 1.

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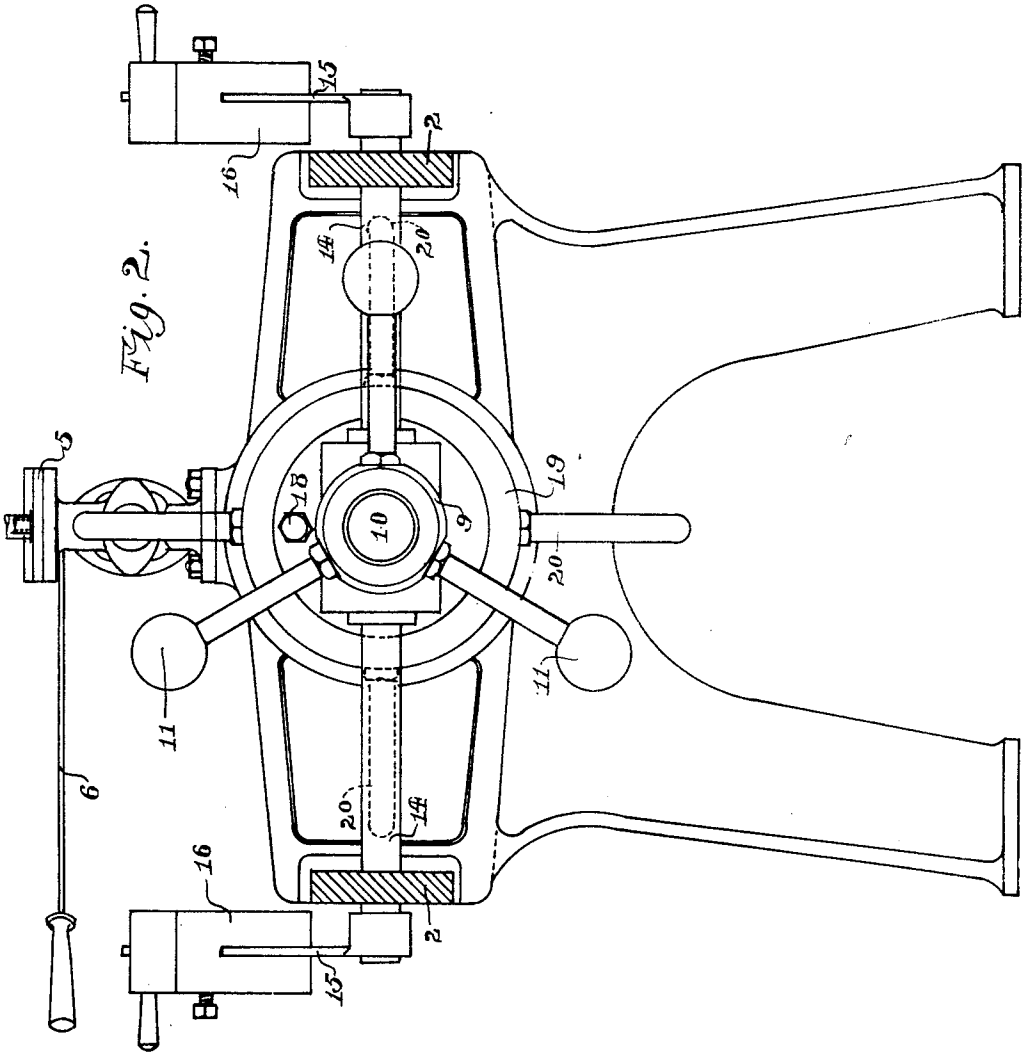
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3 SHEETS—SHEET 2.

Fig. 2.



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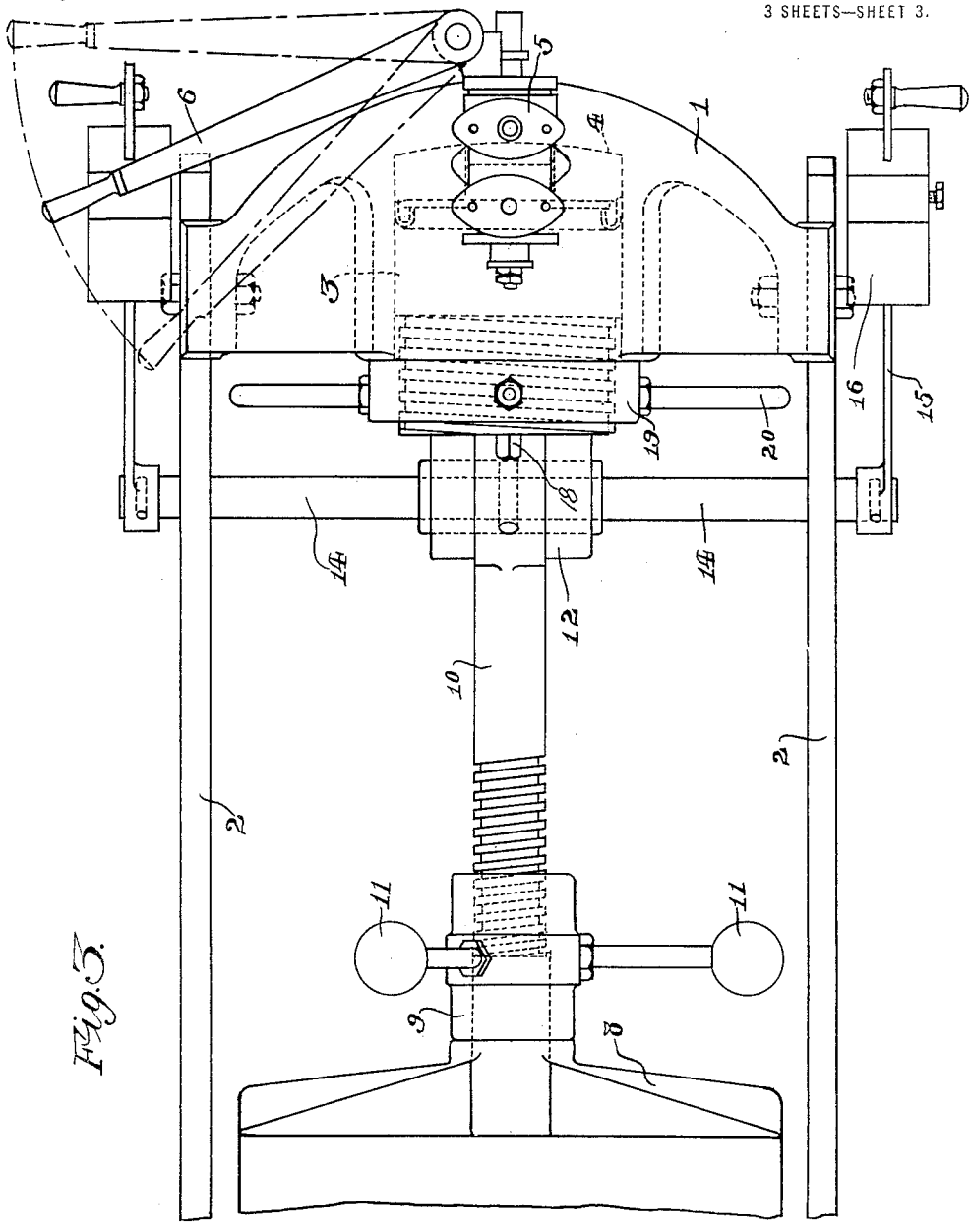


Fig. 5.

Witnesses

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UNITED STATES PATENT OFFICE.

JAMES MILLER, OF DERBY, ENGLAND, ASSIGNOR OF ONE-HALF TO GEORGE FLETCHER & COMPANY LIMITED, OF DERBY, ENGLAND.

FILTER-PRESS AND THE LIKE.

1,331,350. Specification of Letters Patent. **Patented Feb. 17, 1920.**

Application filed June 3, 1919. Serial No. 301,402.

To all whom it may concern:

Be it known that I, JAMES MILLER, subject of the King of Great Britain, residing at Derby, in the county of Derby and Kingdom of England, have invented certain new and useful Improvements in and Relating to Filter-Presses and the like, of which the following is a specification.

The present invention relates to improvements in apparatus for the closing of filter and the like presses where it is desired to rapidly open or bring together plates of a filter press and obtain a tight joint of these and the end plates of the chambers.

Devices of this kind have hitherto comprised rails upon which the filter plate element could be slid and a screw head or ram operating upon a follower plate which in certain cases has been combined with an hydraulic ram to obtain a final closing pressure.

According to the present invention, on an operating head there is mounted a pair of united ram elements, one capable of the application of a final pressure while the other has a larger motion and is pivoted to the former so that it may be rapidly swung into and out of position. This allows for a very rapid opening and re-assembling of the press.

The invention is more particularly described with reference to the accompanying drawings in which:—

Figure 1 is a partial elevation of a filter press, having closing means according to this invention,

Fig. 2 is a corresponding end view,

Fig. 3 is a corresponding plan view.

The press is provided as usual with a head-stock or thrust-bearing 1 united by tension rods 2 in the usual manner to the opposite end of the press. This head-stock contains a hydraulic plunger 3 moving in a cylinder 4 to which hydraulic pressure can be applied through a central valve 5 by the operation of a lever 6. By this means final closing pressure can be applied to the follower 8 or end plate of the filter chamber.

Against this follower 8 the nut portion 9 of a screw ram is adapted to abut. This portion 9 being displaceable along the threaded portion of the ram spindle 10 by operating the hand spokes 11. The spindle 10 is hinged to lugs 12 on the plunger 3 by means of a hinge or a pivotal bolt 14 carrying operating levers 15 having counter weights 16. The inner end of the spindle 10 has a snug 17 formed on its lower end so that the spindle 10 and ram head 9 may be held in a horizontal position; a bolt head 18 forms a stop to limit the movement of the spindle when passing into the vertical position as shown in dotted lines in Fig. 1.

The outer end of the ram head 3 is threaded to receive a locking nut 19 having hand spokes 20 so that after the final pressure has been applied by means of the hydraulic, the ram 3 can be locked in this position by operation to the nut 19.

For the purpose of convenience the shafts 14 pass freely through slots 21 arranged in the tension members 2.

No means need be provided to restrain the ram spindle 10 from turning as it is found that the friction of the cup leather on the hydraulic ram 3 in its cylinder is sufficient for this purpose.

In the closing of the press the filter plates will be slid along their rails and the follower plate 8 run up to them when the spindle 10 is dropped into the horizontal position by raising either of the balance levers 15. The fly nut 9 is then rotated on the spindle 10 until its end bears on the follower plate, and this screwing is continued until the resistance offered to closing necessitates the employment of hydraulics.

Pressure is then admitted to the ram cylinder by operating the lever 6, whereupon the locking nut 19 is operated to bear upon the ram cylinder so that ram plunger 3 is locked in position. The pressure can then be removed in the cylinder 4 by moving the valve to the exhaust position by means of the lever 6. It is of course desirable that as much space should be taken up by means of the ram head 9 as possible to maintain the travel on the hydraulic ram to a minimum.

When opening the press it will be necessary to momentarily allow pressure into the cylinder 4 so that the nut 19 can be freed. The nut 9 is then rotated as for a further closing of the press so as to bring the ram head 3 to its initial position.

If desired a mechanical means, for applying an increased pressure after the preliminary pressure has been applied by the screw ram 9 and 10, may be substituted for the hydraulic ram and cylinder 3, 4.

It will be seen that by the present invention an arrangement is provided whereby a filter press or the like can be extremely rapidly brought into action and then closed and as rapidly opened.

I declare that what I claim is:—

1. A filter press closure comprising means to apply a preliminary pressure, means to apply a final pressure, a pivot connecting said means, means to guide said final pressure applying means and means to swing such preliminary pressure means about a pivot rapidly into and out of position.

2. A filter press closure comprising a screw ram to apply preliminary pressure, a hydraulic ram to apply final pressure, a pivot connecting said rams, a cylinder for hydraulic ram and means to swing the screw ram about a pivot on the hydraulic ram to bring it rapidly into and out of position.

3. A filter press closure comprising means to apply a preliminary pressure, means to apply a final pressure, a pivot connecting said means, means to guide said final pressure applying means and means to swing such preliminary pressure means about a pivot rapidly into and out of position and a counterweight balancing said preliminary pressure means.

4. A filter press closure comprising a screw ram to apply preliminary pressure, a hydraulic ram to apply final pressure, a pivot connecting said rams, a cylinder for hydraulic ram and means to swing the screw ram about a pivot on the hydraulic ram to bring it rapidly into and out of position and a counterweight mounted on said pivot to balance said screw ram.

5. A filter press closure comprising a screw ram, a hydraulic ram, a cylinder guiding said hydraulic ram, a pivot connecting said screw ram and said hydraulic ram, a follower against which said screw ram abuts, a pivot connecting said screw ram and said hydraulic ram and a counterweight keyed on said pivot to balance said screw ram.

In witness whereof I have hereunto signed my name this 24th day of April, 1919, in the presence of two subscribing witnesses.

JAMES MILLER.

Witnesses:
FANNY H. WALLETT,
THOMAS H. COOK.