Oct. 29, 1929. E. T. MEAKIN 1,733,381

PRESS FOR THE EXTRACTION OF LIQUIDS

Filed July 12, 1921 2 Sheets-Sheet 1

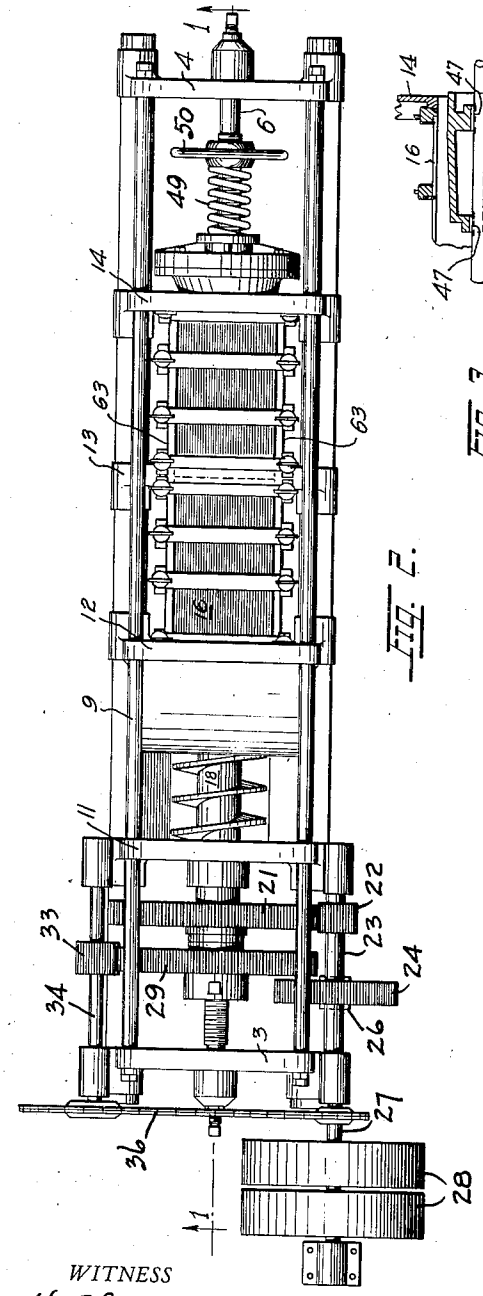


Fig. 2.

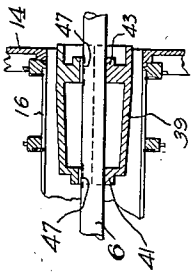


Fig. 3.

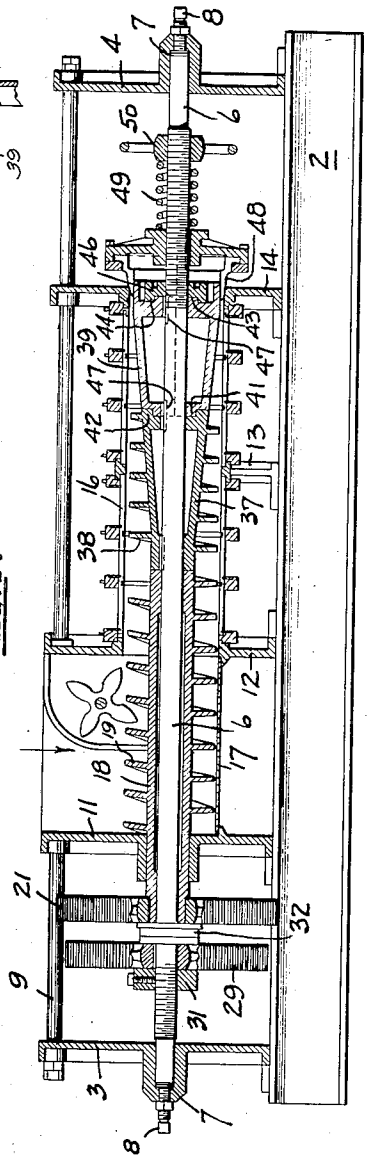


Fig. 1.

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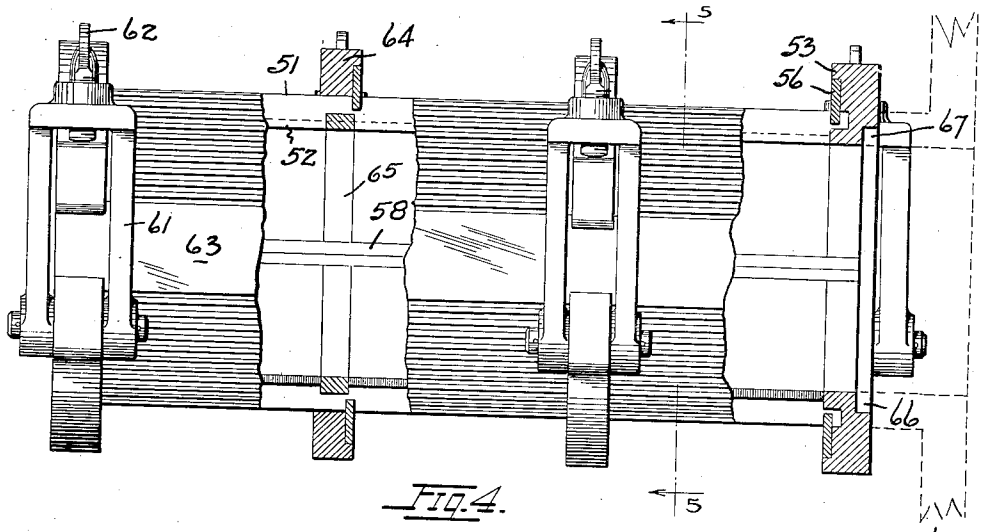


Fig. 4.

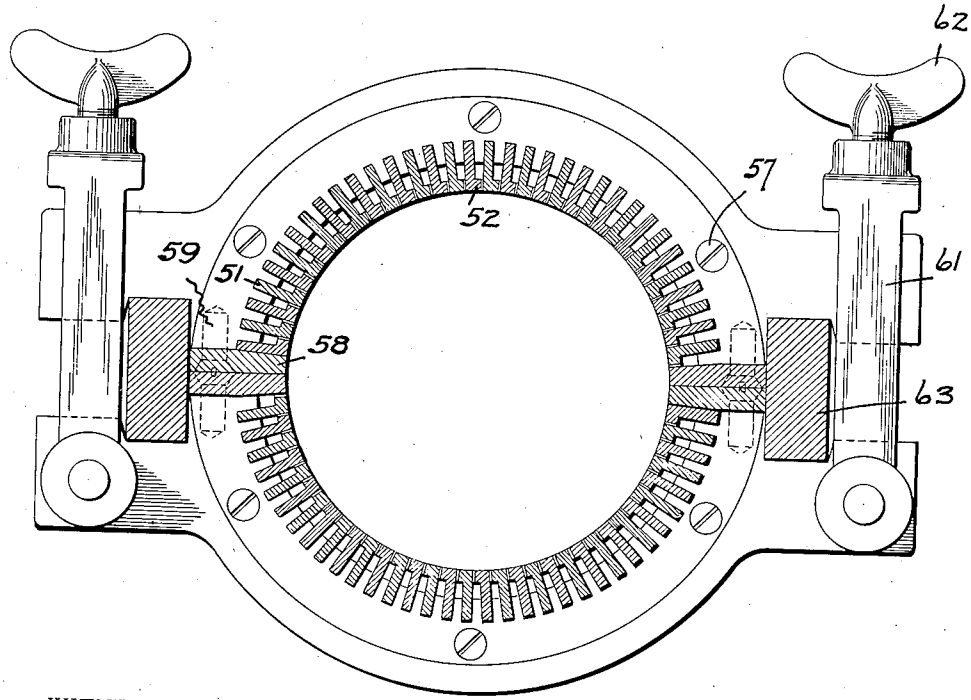


Fig. 5.

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UNITED STATES PATENT OFFICE

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PRESS FOR THE EXTRACTION OF LIQUIDS

Application filed July 12, 1921. Serial No. 484,103.

My invention relates to presses for extracting liquids from material and particularly to that type of press which includes a helical pressure screw. One of the objects of the invention is the provision of a press having feed and pressure screws arranged in the press casing, in which improved means is provided for carrying the stress tending to separate the two screws on the shaft upon which the screws are mounted.

Another object of the invention is the provision of a built up press casing of improved design characterized by superior strength, ease of opening, disassembling and cleaning, and low cost of manufacture.

My invention possesses other objects and features of advantage, some of which, with the foregoing, will be set forth in the following description of my invention. It is to be understood that I do not limit myself to the showing made by the said description, as I may adopt variant forms of my invention within the scope of the claims.

Referring to the drawings: Fig. 1 is a vertical sectional view taken longitudinally thru the center of my press. Fig. 2 is a plan view of the press. Fig. 3 is a detail in vertical section showing one of the interchangeable pressure heads of my press. Fig. 4 is an elevation partly in section of one unit of the press casing. Fig. 5 is a vertical sectional view thru the press casing, the plane of section being indicated by the line 5—5 of Fig. 4.

My press is arranged upon the channel or I-beam 2 and comprises end frames 3 and 4 in which the shaft 6 is journalled. Longitudinal movement of the shaft is controlled by bearing plates 7 fixed by adjusting the screw 8 in each end frame. Strain rods 9 connect the upper portions of the end frames. Intermediate the end frames 3 and 4 are frames 11, 12, 13 and 14 in which the press casing generally designated by the character 16 and the feed casing 17 are mounted. Journalled in the frame 11 and also upon the shaft 6 is a sleeve 18, provided with helical threads 19 which sweep the inner surface of the feed casing 17. The left-hand end of the sleeve as viewed in Fig. 1 is provided with a gear 21 keyed thereto and in mesh with pinion 22 on the shaft 23. Also fixed on the shaft 23 is the gear 24 driven by the pinion 26 fixed on the drive shaft 27 on the outer end of which the tight and loose pulleys 28 are arranged for belt drive from any suitable source of power. Keyed to the shaft 6 adjacent the end of the sleeve is a gear 29 securely held in place by the collar 31. Between this gear and the end of the sleeve is arranged a thrust bearing 32 of any desired type such as a roller bearing or graphite plate. This bearing 32 takes the thrust of the sleeve 18 and transmits it via the shaft 6 to the main thrust bearing 7. The gear 29 is driven by the pinion 33 mounted on the shaft 34 connected by chain 36 with drive shaft 27. The proportion of the gears and the arrangement of the parts is such that the shaft 6 and the sleeve 18 revolve at different speeds. Keyed to the shaft 6 at the right end of the feed screw, as seen in Fig. 1, is a conical pressure screw comprising the conical sleeve 37 upon which the helical threads 38 are formed. The feed screw lies in the feed casing and extends into the end of the press casing. The pressure screw occupies the middle portion of the press casing, the right-hand end as viewed in Fig. 1 containing the pressure head 39. The purpose of the pressure head is to positively restrict the discharge opening in the end of the press casing and in a given press outfit there are several of these heads varying in diameter, and interchangeable one with the other so that the proper head may be assembled on the shaft to give the desired size of escape passage in accordance with the character of the material being pressed. The pressure head is formed in two parts so that it can be assembled over the shaft readily. One end is provided with a projection 41 adapted to seat within the annular flange 42 formed on the adjacent end of the pressure screw. The opposite end of the pressure head is formed with a projection 43 adapted to seat within the annular flange 44 of the collar 46 which is threaded on the shaft. The desired size of pressure head is assembled on the shaft 6 over suitable keys 47 so that it

turns with the shaft and pressure screw, and when the collar 46 is tightened up the pressure head, pressure screw and shaft are rigidly locked together. Slidably arranged on the shaft 6 and projecting into the annular space between the end of the press casing and the pressure head is a ring 48. Resilient pressure is exerted against the ring to force it into the annular discharge space by means of a spring 49, the tension of which is regulated by the hand wheel 50 also threaded on the shaft. The ring 48 retains material in the press casing until the pressure thereon is sufficient to overcome the resistance of the spring 49, the passage is then automatically opened to permit the material to discharge. This mechanism facilitates the maintaining of a constant pressure in the press casing.

Referring now to Figs. 4 and 5, the press casing between the frames 12 and 14 consists of two units each unit comprising the cylindrical structure illustrated in Fig. 4. This structure is assembled in halves which may be readily separated to permit access to the interior of the press casing. Each half comprises a plurality of transversely grooved bars 51. The bars are arranged in cylindrical assembly, each bar lying in a plane passing thru the axis of the casing, that is to say the bars are assembled radially. On the inner end each bar is formed with a flange 52 adapted to lie contiguous to the flat surface of the succeeding bar as shown in Fig. 5. The contiguous face of the flange is slotted or grooved to provide passages thru which the liquid may flow. The ends of the bars are socketed in end rings 53 and are retained therein by the lock ring 56 secured to the end ring by means of screws 57 and seated in notches, as shown in Fig. 4, formed in the end of the bars. Because of the L-form of the bar the length of the passage formed by the transverse groove is short and the spaces on the outside of the flanges between the bars provide ample clearance so that clogging of the passages is avoided. At the same time it is obvious that the strength of the casing, that is the resistance to expansion, is very great and may be measured in terms of the width of the bars. The edge of each half casing is formed by edge bars 58 secured to the end rings 53 by screws 59. When the half casings are assembled the edge bars on each side are contiguous and complete the cylindrical wall formed by the grooved bars 51. The end rings are formed in halves as shown in Fig. 5 and connected by clamp yokes 61 which are tightened by means of wing screws 62. In order to carry the torsional stresses on the casing, a torsion rod 63 is provided on each side. The torsion rods are seated in appropriate sockets cut in each half of the end ring and when the halves of the casing are clamped together by the screw 62, they are at the same time clamped upon the torsion rods. In order to provide additional support for the central portion of the casing, intermediate rings 64 are provided and preferably reenforcing rings 65 are assembled in suitable grooves formed in the bars and extending around the casing on the inside. The rings 64 are also made in halves which may be clamped together in the same manner as the end rings and by similar means.

The outer face of each end ring is provided with a rabbet 66 adapted to seat on the annular flange 67 formed on the supporting frame. In order to have access to the interior of the casing it is merely necessary to loosen the clamps 61 and lift off the upper end of the casing.

The advantages of my transversely grooved bar structure are apparent. The manufacture of the bar with very fine and very closely spaced grooves is a simple matter involving no unusual expense. When assembled a press casing of great strength is provided, and one having a very large number of apertures which may be fine or coarse as desired and which will not readily clog.

I claim:

1. In a press for the extraction of liquids, a plurality of grooved bars, clamp rings for holding said bars to form a casing, and torsion rods mounted with said bars in said clamp rings to prevent twisting of the casing.

2. In a press for the extraction of liquids, a frame, a plurality of grooved bars, rings in which the ends of said bars are mounted, and formed complementary to said frame to support the bars thereon, and torsion rods mounted in said rings.

3. In a press for the extraction of liquids, a plurality of groved bars, an end ring in which the ends of said bars are socketed, and a lock ring secured to said end ring and interlocked with said grooved bars.

4. In a press for the extraction of liquids, a supporting frame, half rings formed complementary to said frame, a plurality of grooved bars mounted at their ends in said half rings, clamp means for securing said half rings together and upon said frame, and torsion rods mounted in said half rings.

5. In a press for the extraction of liquids, a plurality of grooved bars, half-rings in which the ends of said bars are mounted, torsion rods adapted to be engaged at each end between said half-rings, and means for clamping the half-rings at each end of said bars together and upon said torsion rods.

6. In a press, a casing, a shaft longitudinally disposed in said casing, a pressure screw fixed for rotation with said shaft, a feed screw rotatable on said shaft, and a thrust bearing on said shaft interposed between said shaft and said feed screw.

7. In a press, a casing, a shaft longitudinally disposed in said casing, a pressure screw

fixed for rotation with said shaft, a feed screw rotatable on said shaft, and a thrust bearing for taking the stress tending to separate said screws arranged on said shaft.

8. In a press, a casing, a shaft longitudinally disposed in said casing, a pressure screw fixed for rotation with said shaft, a sleeve rotatably mounted on said shaft, a feed screw on said sleeve, and a thrust bearing arranged between the shaft and the end of the sleeve.

9. In a press, a casing, a pressure screw in said casing, a pressure regulating head in the end of the casing and comprising two halves interlocked at one end with the pressure screw, and means for releasably securing the opposite ends of said halves.

10. In a press, a casing, a shaft in said casing, a pressure screw on said shaft, a pressure regulating head in the end of the casing and comprising two halves interlocked at one end with the pressure screw, and a flanged collar threaded on said shaft for releasably securing the opposite ends of said halves.

11. In a press, a casing, a pressure screw in said casing, a pressure regulating head in the end of the casing, a plug ring for closing the discharge passage about the regulating head, and means for resiliently seating said plug ring.

12. In a press, a casing, a pressure screw in said casing, a pressure regulating head in the end of the casing, a plug ring for closing the discharge passage about the regulating head, means for resiliently seating said plug ring, and means for varying the degree of resilient pressure on said plug ring.

13. In a press, a casing, a shaft in said casing, a pressure screw on said shaft, a pressure regulating head in the end of the casing, a plug ring for closing the discharge passage about the regulating head mounted on said shaft, a coil spring for seating said plug ring, and a collar on said shaft for varying the tension of said spring.

In testimony whereof, I have hereunto set my hand.

EDGAR T. MEAKIN.