C. E. NEWBOLD.

HYDRAULIC PRESSURE REGULATOR.

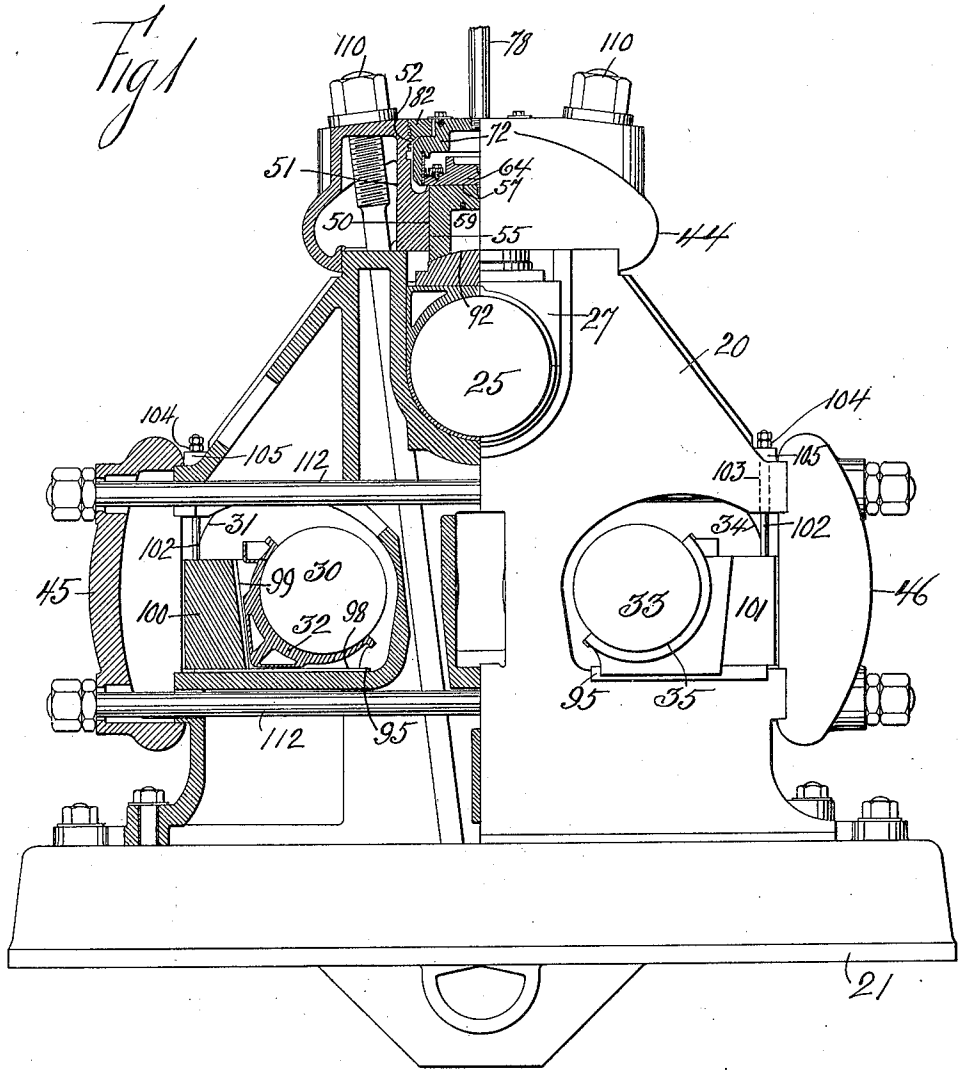
APPLICATION FILED SEPT. 18, 1912.

1,101,757.

Patented June 30, 1914.

3 SHEETS—SHEET 1.

Fig 1



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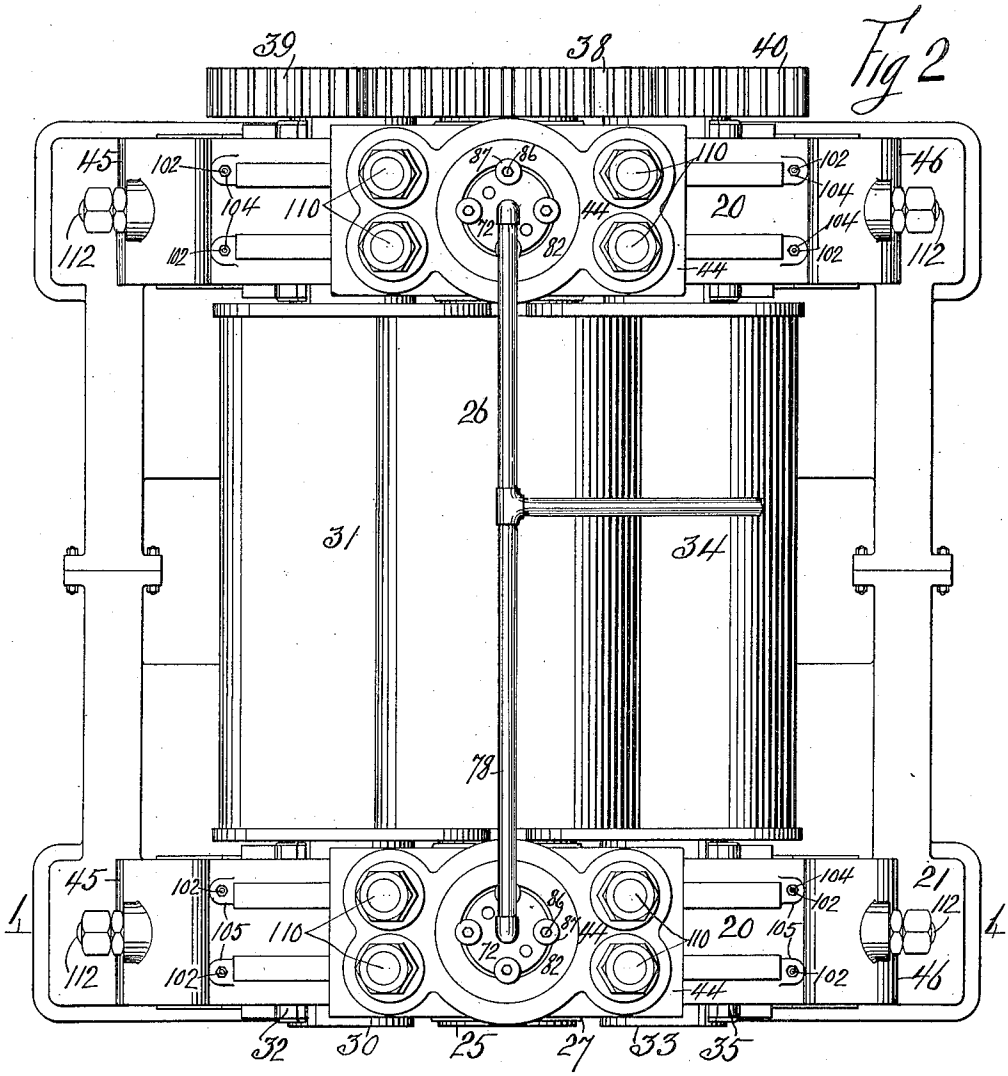
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3 SHEETS—SHEET 2.

Fig 2



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3 SHEETS—SHEET 3.

Fig 4

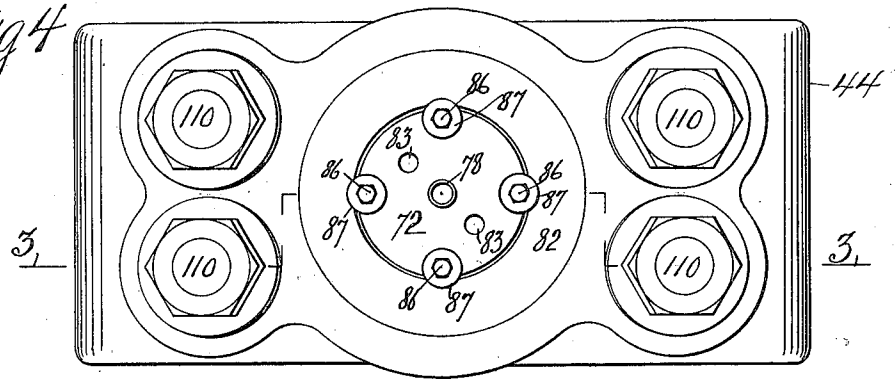
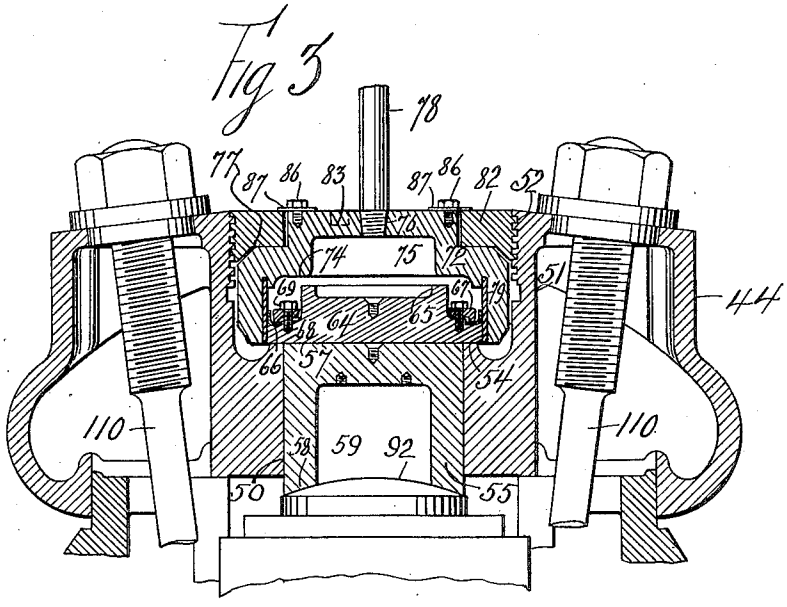


Fig 3



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UNITED STATES PATENT OFFICE.

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HYDRAULIC PRESSURE-REGULATOR.

1,101,757. Specification of Letters Patent. Patented June 30, 1914.

Application filed September 18, 1912. Serial No. 720,932.

To all whom it may concern:

Be it known that I, CHARLES E. NEWBOLD, a subject of Great Britain, and a resident of Habana, Cuba, have invented certain new and useful Improvements in Hydraulic Pressure-Regulators, of which the following is a specification.

This invention relates to hydraulic pressure regulators for the housings for mills and is particularly adapted to the housings for cane mills.

By means of the appurtenances of the invention the radial distances between the surfaces of rolls in mills to which it is applied are automatically adjusted, to allow various thicknesses of material to pass between them, and still maintain a constant pressure on the material.

The hydraulic-regulator is usually only applied to one of the caps of the journals of each housing of the mill, although it may also be applied to the other caps.

The invention also includes novel means for adjusting the other journal bearings of the housings of a mill.

In the accompanying drawings, Figure 1 represents an elevation of a cane mill with a partial section as on the line 1, 1 of Fig. 2 exemplifying the invention, Fig. 2 shows a top plan view of Fig. 1, when not sectioned, Fig. 3 represents an enlarged section on line 3, 3 of Fig. 4, Fig. 4 shows a top plan view of Fig. 3, if not sectioned.

A cane mill is shown with the housings 20, supported and secured to the base frame 21. A top shaft 25 carrying the top roll 26 is journaled in the top bearings 27. A side shaft 30 with the side roll 31 is journaled in the bearing 32, and a side shaft 33 with the side roll 34 is journaled in the bearing 35. The shaft 25 has fastened thereto the gear 38 that meshes with the gears 39 and 40 respectively fastened to the shafts 30 and 33. Each housing has connected thereto the top journal cap 44 to which the hydraulic regulator is applied and the side journal caps 45 and 46 respectively bolted to each housing for the bearings 32 and 35.

In the top journal cap 44 is formed the guide chamber 50 with an enlarged head 51 threaded at the upper end thereof as shown at 52. A shoulder or bearing surface 54 is formed with the guide chamber 50. A plunger 55 is slidably located in the guide chamber 50. The said plunger has the plane top surface 57, the spherical lower face 58 and central cavity 59.

A packing-holder 64 is located upon the top face 57 of the plunger 55, and has formed therewith at its upper end the contracted stop sleeve 65. The holder is shouldered for the cup packing ring 66, preferably of leather and which is clamped to said holder by the follower ring 67 and the studs 68 carrying the nuts 69. An adjustable cylinder 72, with the stop face 74, encircles the upper end of the packing holder 64. The said cylinder 72 has formed therewith the central cavity 75, which connects with the threaded opening 76, and has also formed therewith the shoulder 77. Piping 78 for fluid pressure is connected to the opening 76. A metallic bushing 79, preferably of copper, is carried on the inner lower cylindrical face of the cylinder 72 against which the packing 66 bears.

A lock nut 82, having the cavities 83, is in threaded engagement with the enlarged head 51.

Standing bolts 86, with the washers 87, are carried on the top face of the cylinder 72, the said washers extending over the inner edge of the nut 82, thereby supporting said cylinder 72 upon the lock nut 82.

The plungers 55 each bear upon a spherical cap 92 carried upon the upper member of each journal bearing for the top shaft 25. In the housings 20 are formed supports 95 for the adjustable side journal bearings 32 and 35, carrying respectively the side shafts 30 and 33. The said side journal bearings have each the lower bearing faces 98 and the inclined bearing faces 99. Adjusting wedges 100 and 101 respectively bear between the inclined bearing faces 99 of the side journal bearings 32, 35 and the side journal caps 45, 46. Each of the wedges 100, 101 have extending therefrom the bolts 102 that extend through openings 103 in the housings 20. Nuts 104 on said bolts bear on lugs 105 formed with the housings 20. The cap 44 is held in place by the bolts 110 and the caps 45 and 46 are held in place by the bolts 112.

To operate the mill with the appurtenances of the invention, the material is fed to the rolls in the usual way. As the material passes between the top roll 26 and the side rolls 31, 34, pressure is brought against the spherical surface 58 of the plunger 55

tending to raise said plunger and which is counteracted by the fluid pressure upon the top of the packing holder 64, the said plunger thereby locates itself at a level consistent with the thickness of the material passing between the rolls, and the pressure exerted thereby. The amount of lift or upward stroke of the plunger 55 is limited by the level of the stop face 74 of the adjustable cylinder 72, which latter can be located at different levels by locating the nut 82 at any desired level.

The nut 82 may be lowered to move the cylinder 72, so that the stop face 74 bears against the top face of the stop sleeve 65. With this disposition of parts the hydraulic pressure regulator is inoperative. The side journal bearings 96 and 97 may be adjusted by locating the adjusting wedges 100, 101 at different levels.

The cylinder 72 with the packing holder 64, follower ring 67 and packing ring 66 constitute an entirety or collection of units for the hydraulic regulator, which can be adjusted and tested before being placed in operative position in the enlarged head 51.

Having described my invention, what I desire to secure by Letters Patent and claim is:

1. In a hydraulic pressure regulator the combination of an adjustable cylinder, a plunger coacting with said cylinder, means to exert fluid pressure against one end of said plunger, a roll to which said pressure is communicated and adjustable means coacting with the cylinder to limit one end of the stroke of the plunger.

2. In a hydraulic pressure regulator for the housing of a mill the combination of an adjustable cylinder, a chamber for said cylinder, a plunger extending through one end of the chamber, a packing holder carried upon the plunger, packing means between the said holder and adjustable cylinder and means to exert fluid pressure upon the top face of the packing holder.

3. In a hydraulic pressure regulator for the housing of a mill, a cap for said housing, a guide chamber formed with said cap having an enlarged head with threads at one end of the latter, a plunger extending through the said chamber, a packing holder supported on the plunger, an adjustable cylinder within said enlarged head with the lower end thereof encircling the packing holder, packing carried on the holder bearing against the inner surface of the cylinder, a lock nut bearing upon said cylinder and in threaded engagement with threads of said enlarged head.

4. In a hydraulic pressure regulator for the housing of a mill, a cap for said housing, a guide chamber formed with said cap having an enlarged head with threads at one end of the latter, a plunger extending through said chamber, a packing holder having a stop sleeve supported on the plunger, an adjustable cylinder having an opening within said enlarged head and with the lower end thereof encircling the packing holder, packing carried on the holder bearing against the inner surface of the cylinder, a lock nut connected to and bearing upon said cylinder and in threaded engagement with the threads of said enlarged head, and piping for fluid pressure connected to the opening in the cylinder.

Signed in the borough of Manhattan in the county of New York and State of New York this 7th day of September A. D. 1912.

CHARLES E. NEWBOLD.

Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."