Aug. 5, 1924. 1,503,575

H. P. WILLIAMS

MUD PRESS

Filed March 19, 1923

FIG. 1

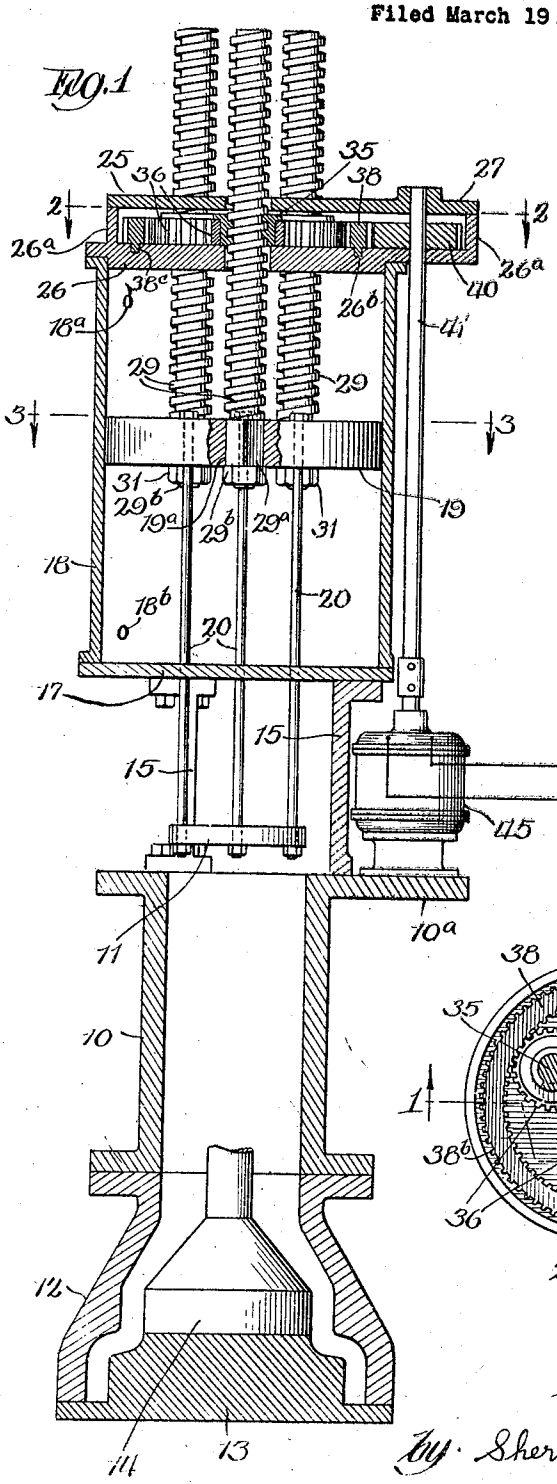


FIG. 3

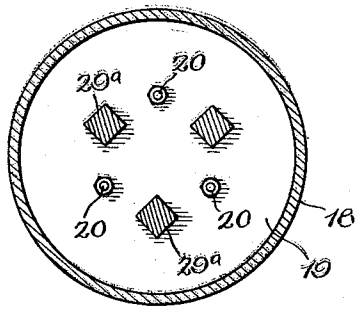
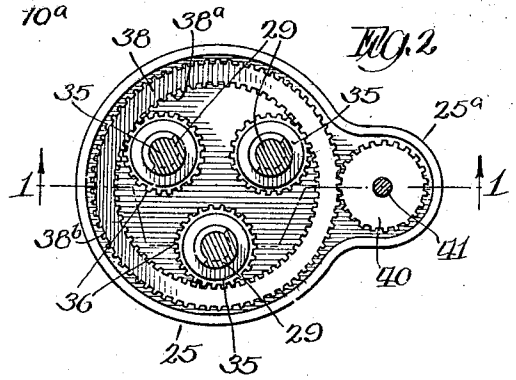


FIG. 2



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UNITED STATES PATENT OFFICE.

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MUD PRESS.

Application filed March 19, 1923. Serial No. 626,241.

To all whom it may concern:

Be it known that I, HERMAN P. WILLIAMS, a citizen of the United States, residing at St. Louis, State of Missouri, have invented certain new and useful Improvements in Mud Presses, of which the following is a specification.

This invention relates to improvements in mud presses and has for its object to provide a construction of that character actuated by an electric motor, either reversible or provided with a reversing clutch to afford reciprocation of the press plunger. Present day mud presses on the most part are actuated by steam cylinder and plunger mechanism, which entails the laying of steam under pressure to points distant from the generating source, which is a matter of expense and inefficiency. My invention contemplates the use of an electric motor, as stated, which may be attached to the press, the supply of current thereto being a matter of ease and convenience. Another object of my invention is to provide a structure which will permit the ready adaptation of the motor and actuating means to existing steam or similarly actuated presses.

Another object consists in the provision of means to cushion the reciprocating mechanism at one or both limits of travel.

Another object consists in the details of construction and mechanism hereinafter disclosed.

These and other objects will be more fully described in the following specification and shown in the accompanying drawings, in which—

Figure 1 is a vertical section along the irregular line 1—1 of Fig. 2;

Fig. 2 is a plan view along the line 2—2 of Fig. 1; and

Fig. 3 is a horizontal section along the line 3—3 of Fig. 1.

Like numerals refer to like elements throughout the drawings.

10 designates generally a press cylinder which is adapted to reciprocate the press plunger 11. Located beneath the cylinder 10 is the forming die 12, in which is the removable head forming bell 13, and body forming die 14, all of well known construction. Superimposed upon the cylinder 10 are the supporting legs 15 between which the mud or clay is fed into cylinder 10. As is well known, the plunger 11 may be withdrawn a sufficient distance from the pressing cylinder 10 to permit the charging thereof. Mounted upon the legs 15 is the partition 17 ordinarily forming the lower cylinder head of steam cylinder 18, in which is reciprocally mounted the piston 19 functioning as a guide and coupling in my construction. The press plunger 11 is secured to piston 19 by means of spaced rods 20. Supplanting the ordinary cylinder head of the steam cylinder is the case 25 having the base plate 26 fitting into and secured to the cylinder 18, as shown in Fig. 1. This plate 26 is provided with a peripheral upward extending flange 26^a forming the side of the case 25. The cover plate 27 rests upon and is secured in suitable manner by bolts or the like to the flange 26^a.

A plurality of screw-threaded rods 29 are provided having noncircular lower extremities 29^a, see Figs. 1 and 3. These extremities 29^a are seated in noncircular sockets or apertures 19^a of guide or piston 19, the portions 29^a being cut down as will be obvious, so that shoulders are provided on the rods 29. Below the non-circular portions 29^a, the rods 29 are reduced and threaded, as indicated by numeral 29^b for engagement by the nuts 31, which secure the rods 29 in nonrotating relation to the piston or guide 19. These rods 29 extend upwardly through suitable apertures in the base plate 26, also through similar apertures in the cover 27, and are engaged by the threaded bushings 35 of pinions 36, which are nonreciprocably held in the casings 25 and rotated with the bushings 35.

Meshing with these pinions 36 is the annular gear ring 38 internally toothed at 38^a and externally toothed at 38^b. The internally toothed portion meshes with the pinions 36 to uniformly and simultaneously rotate the same. The casing 25 is provided with the bulged or extended portion 25^a, in which is rotatably located the drive gear 40 carried by the shaft 41, which in turn is actuated by reversible motor 45 mounted on platform bracket 10^a. This driving gear meshes with the externally toothed portion 38^b of gear ring 38, as shown in Figs. 1 and 2. The base plate 26 is provided with the annular groove 26^b in which is seated a flange 38^c formed on gear ring 38, this construction serving to insure true rotation of the gear ring, as will be obvious.

In the embodiment shown, current is supplied to motor 45 from the line wires 48,

through a reversing switch 49, this construction permitting the reversal of the motor to obtain reciprocation of the press plunger 11. It is obvious that a reversing clutch or other means can be used in lieu thereof to obtain the necessary reciprocation.

Cylinder 18 is provided with vents 18[a], 18[b] near the top and bottom thereof, these vents permitting escape or admission of air during movement of the guide 19 and serving to cushion either stroke thereof, as a result of the air entrapped after cutoff of the vent. This is especially desirable on the pressing stroke during which the plunger 11 is working against resistance, which may be removed on the completion of the tile, and which would ordinarily result in a heavy impact upon the partition 17. The entrapped air, however, prevents this, substantially neutralizing it in obvious manner.

In the operation of my machine, the plunger 11 having been withdrawn or retracted a sufficient amount to permit charging of the cylinder 10, the motor 45 is actuated in the proper direction and its rotation transmitted through shaft 41 and gear ring 38 to pinion 36. This pinion will in turn advance the threaded shafts 29 downwardly, the engagement of the latter with the guide or piston 19 preventing their rotation. This downward movement is transmitted through guide 19 to the press plunger, 11, which forces the "mud" out of the cylinder 10 over the forming dies in well known manner.

After the completion of the forming or press stroke, motor 45 is reversed to withdraw the plunger 11 to permit recharging of the cylinder.

I do not wish to be restricted to the embodiment of my invention shown and described, except as defined in the appended claims.

What I claim is—

1. In a device of the class described, a press cylinder, a plunger reciprocal therein, an electrically actuated motor, means interposed between said motor and plunger actuatable by said motor to reciprocate said plunger, said means comprising a reciprocable threaded shaft, a pinion in mesh therewith, means to rotate said pinion to axially move said shaft, said last named means comprising a gear rotatable by said motor, and a toothed gear ring meshing with said gear and said pinion.

2. In a device of the class described, a press cylinder, a plunger reciprocal therein, an electrically actuated motor, means interposed between said motor and plunger actuatable by said motor to reciprocate said plunger, said means comprising a reciprocable threaded shaft, a pinion in mesh therewith, means to rotate said pinion to axially move said shaft, said last named means comprising a gear rotatable by said motor, and an internally and externally toothed gear ring meshing with said gear and said pinion.

3. In a device of the class described, a press cylinder, a plunger reciprocal therein, an electrically actuated motor, means interposed between said motor and plunger actuatable by said motor to reciprocate said plunger, said means comprising a reciprocable threaded shaft, a pinion in mesh therewith, means to rotate said pinion to axially move said shaft, said last named means comprising a gear rotatable by said motor, a toothed gear ring meshing with said gear and said pinion, and a supporting plate carrying said ring.

4. In a device of the class described, a press cylinder, a plunger reciprocal therein, an electrically actuated motor, means interposed between said motor and plunger actuatable by said motor to reciprocate said plunger, said means comprising a reciprocable threaded shaft, a pinion in mesh therewith, means to rotate said pinion to axially move said shaft, said last named means comprising a gear rotatable by said motor, a toothed gear ring meshing with said gear and said pinion, and a supporting plate carrying said ring, said plate being grooved, said ring being flanged to engage said groove.

5. In a device of the class described, a press cylinder, a plunger reciprocal therein, an electrically actuated motor, means interposed between said motor and plunger actuatable by said motor to reciprocate said plunger, said means comprising a reciprocable threaded rod, a pinion in mesh therewith, means to rotate said pinion to axially move said rod, and means to prevent rotation of said rod.

6. In a device of the class described, a press cylinder, a plunger reciprocal therein, an electrically actuated motor, means interposed between said motor and plunger actuatable by said motor to reciprocate said plunger, said means comprising a reciprocable threaded shaft, a pinion in mesh therewith, means to rotate said pinion to axially move said shaft, said last named means comprising a gear rotatable by said motor, a toothed gear ring meshing with said gear and said pinion, and a casing enclosing said gear, gear ring and pinion.

7. In a device of the class described, a press cylinder, a plunger reciprocal therein, an electrically actuated motor, means interposed between said motor and plunger actuatable by said motor to reciprocate said plunger, and means to cushion said reciprocating plunger at the limit of press movement.

8. In a device of the class described, a press cylinder, a plunger reciprocable there-

in, means to reciprocate said plunger comprising a plurality of screw threaded rods, rotatable pinions engaging said rods, a gear ring meshing with said pinions and a rotatable driving gear meshing with said ring.

9. In a device of the class described, in combination a press cylinder, a plunger reciprocable therein, a second cylinder superimposed upon said press cylinder, a piston reciprocable therein, means rigidly connecting said piston and plunger, a threaded shaft non-rotatably engaging said piston and means to reciprocate said shaft.

10. In a device of the class described, in combination a press cylinder, a plunger reciprocable therein, a second cylinder superimposed upon said press cylinder, a piston reciprocable therein, means rigidly connecting said piston and plunger, a threaded shaft non-rotatably engaging said piston, means to reciprocate said shaft, said last named means comprising an electric motor, a pinion threaded to engage said shaft and gearing interposed between said motor and pinion.

11. In a device of the class described, in combination a press cylinder, a plunger reciprocable therein, a second cylinder superimposed upon said press cylinder, a piston reciprocable therein, means rigidly connecting said piston and plunger, a plurality of threaded shafts non-rotatably engaging said piston and means to simultaneously reciprocate said shafts, said last named means comprising an electric motor, a plurality of pinions threaded to engage said shafts, a common gear member engaging all of said pinions and actuated by said motor.

12. In a device of the class described, in combination a press cylinder, a plunger reciprocable therein, a second cylinder superimposed upon said press cylinder, a piston reciprocable therein, means rigidly connecting said piston and plunger, a plurality of threaded shafts non-rotatably engaging said piston and means to simultaneously reciprocate said shafts, a gear ring internally and externally toothed meshing with all of said pinions, a pinion operatively connected to said motor and meshing with said gear ring.

In testimony whereof, I have subscribed my name.

HERMAN P. WILLIAMS.