

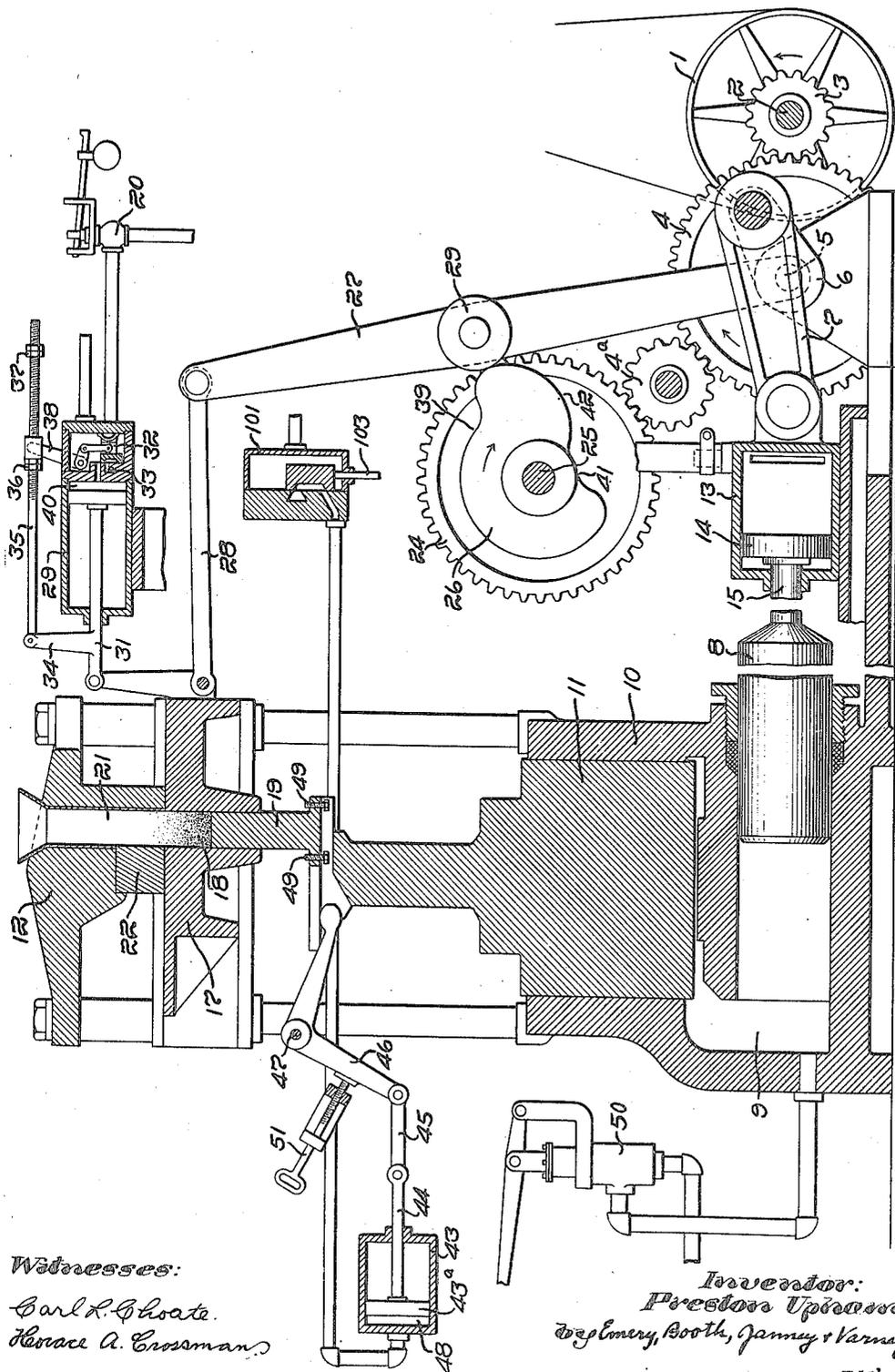
P. UPHAM,

PRESS.

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1,270,569.

Patented June 25, 1918.



Witnesses:

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UNITED STATES PATENT OFFICE.

PRESTON UPHAM, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO INTERNATIONAL PAVEMENT COMPANY, OF HARTFORD, CONNECTICUT, A CORPORATION OF CONNECTICUT.

PRESS.

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To all whom it may concern:

Be it known that I, PRESTON UPHAM, a citizen of the United States, residing in Boston, Suffolk county, State of Massachusetts, have invented an Improvement in Presses, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

My invention, one embodiment of which is illustrated in the accompanying drawings and herein described, relates to certain improvements in block-forming presses which improvements possess many features of novelty and invention which are useful either in combination with each other as disclosed, or as used separately in any type of press. One of these features is my pressure creating and pressure transmission system. Another is my improved construction for operating and timing my mold opening, filling, and closing means. Many other features of novelty will be explained hereinafter.

The drawing shows a diagrammatic view of the press.

In the embodiment of my invention disclosed in this drawing the driving pulley 1, driven by a belt from any suitable source of power, such as a motor, is shown keyed on the shaft 2, to which is keyed the pinion 3. The pinion 3 meshes with the gear 4 keyed on the timing shaft 5 so that said belt and gearing constitute one type of motor for said shaft 5. The timing shaft 5 is provided with a crank 6. A connecting rod 7 connects said crank, through the medium of one form of pressure determining or limiting means to be hereinafter described, with a displacing plunger 8 which reciprocates in a part of a chamber 9 of the hydraulic cylinder 10. In lieu of the crank 6, I may, without departing from the spirit of my invention, use any other suitable pressure actuator preferably one having a fixed throw, as for example, an eccentric or cam, altering the connection with the plunger 8 to correspond. The hydraulic cylinder 10 is provided with pressure responsive means herein shown as a ram 11. The receptacle or chamber between the displacing plunger 8 and the ram 11 is filled with a normally substantially constant body or fixed quantity of liquid. It will readily be seen that revolution of the tim-

ing shaft 5 will produce reciprocation of the ram 11 and that the pressure applied to the displacing plunger 8 will be multiplied when transmitted to the ram 11 in the same ratio as the respective areas of the displacing plunger and ram.

The pressure system, one form of which is herein disclosed, is designed primarily to cooperate with a mold and mechanism to open the mold for the ejection of material and mechanism to close the mold for compression. While it is immaterial how this opening and closing is effected whether by movement of the mold, or the mold cover or both, I prefer that the before described pressure system should cooperate an automatically operating mold, for the compression of blocks, bricks, tiles and the like made from asphaltic or other plastic material. I have shown in the drawings a mold containing member 17 having a mold 18, and a plunger 19 operable by the ram 11. To fill this mold 18, to cover it when the material therein is being pressed and to uncover it when said mold is being emptied, it is necessary to provide operating means to move the mold relative to the mold cover. In the embodiment herein described, I have shown a sliding mold adapted to be moved relative to the filling neck 21 and the mold cover or pressure receiving block 22. The operating means for moving and positioning the sliding mold will be more fully described hereafter.

In order that excessive resistance to compressive movement of the ram may not stall the timing shaft or break any of the parts, and also herein to provide a dwell or period of high compression, I have provided between the crank 6 and the displacing plunger 8, pressure determining or limiting means herein shown as the steam cylinder 13 containing a piston 14 and provided with a piston rod 15 connected to the displacing plunger 8. Elastic fluid is introduced to one end of this cylinder in such a manner as to force the displacing plunger 8 away from the pressure actuator 6. This constitutes one form of compensative means which compensates for any variance in stroke between the fixed throw of the pressure actuator and the variable stroke of the mechanism actuated by the fixed throw actuator.

The operating means for moving the slid-

ing mold into filling, pressing and mold emptying positions in the illustrative embodiment herein disclosed are as follows:

Meshing with the gear 4 is a pinion 4^a which meshes with a gear 24 keyed on a shaft 25 on which is mounted a cam 26. I provide a lever 27 fulcrumed at any suitable point herein shown as on the shaft 5. This lever is connected to the sliding mold 17 by a connecting rod 28. At any suitable point of the lever 27 I provide a roller 29 adapted to cooperate with the cam 26. A fluid pressure cylinder 29 is provided preferably mounted on a connection from the abutment 12. This fluid pressure cylinder contains a piston 30 which is connected to the sliding mold 17 by any suitable connection herein shown as the piston rod 31. The cam 26 moves the mold in one direction and the steam in one end of the cylinder 29 moves the mold in the opposite direction. The cam 26 is preferably so shaped that it will at all times determine the positions of rest of the mold for filling, pressing and emptying.

In order that the cam 26 in moving the mold may not have to work against the full pressure of the steam in the cylinder 29 which obtains when the latter is the actuator for moving the mold, I may provide the cylinder 30 with a valve chest 31^a, a slide valve 32 and an exhaust port 33. The slide valve 32 may be operated as follows: Attached to the piston 31 is a lug 34 to which is connected a rod 35 having tappets 36 and 37. Any suitable connection as illustrated at 38, adapted to be operated on by these tappets, may connect this rod with the slide valve 32. The operation of specific embodiment of the mold moving mechanism which is herein described is as follows: Starting with the mold in filling position as illustrated, the clockwise revolution of the shaft 25 permits the roller 29 to follow the contour of the cam 26 into the depression 39. The roller will follow the contour of the cam because of the steam pressure in the end 40 of the steam cylinder 29. This will move the mold into pressing position under pressure receiving member 22. After the pressing operation is completed the roller 29 follows the depressing 41 permitting the fluid pressure to move the mold into its extreme left position for ejection of the compressed material therein. This ejection or mold emptying will be hereinafter explained. Just before the mold reaches its emptying position, the tappet 37 strikes the connection 39 causing the slide valve 32 to connect the end 40 of the cylinder 29 with the exhaust port 33. I prefer to provide the connection from this exhaust port 33 with a safety valve 20 so that a small pressure may be maintained in the end 40 of the cylinder 29. After complete ejection of the

compressed block, the rise 42 on the cam 26 strikes the roller 29 causing the head to be moved back into the starting position illustrated in the drawing. Just before the mold reaches the position illustrated, the tappet 36 strikes the connection 38, shutting off the exhaust and permitting the steam pressure in the valve chest 31 to enter the end 40 of the cylinder 29 so that the higher pressure may be operative to move the mold on its next movement to pressing position.

The ejecting mechanism before referred to is in the illustrative embodiment herein disclosed constructed as follows: A steam cylinder 43 mounted on any suitable support is provided with a piston 43^a, a piston rod 44 operating a connecting rod 45 connected to the bell crank 46 mounted on the shaft 47. One end of this bell crank is positioned to be beneath the mold plunger 19 when the latter is in ejecting position. At such time steam is admitted to the end 48 of the cylinder 43 actuating the piston and connecting rod and bell crank to move up the plunger 19 to eject the compressed block. Any suitable stop herein shown as the set screws 49 may serve to limit the upward stroke of the compressing plunger 19 so that its upper surface is flush with the top of the sliding mold. The control of pressure to the cylinder 43 may be performed by a slide valve in any suitable steam chest 101 which, as herein illustrated, is actuated and timed by any suitable mechanism such as a cam preferably mounted on the shaft 25 through suitable connections 103.

Any suitable liquid replenishing means herein illustrated as the manually operable pump 50 may serve to force additional liquid into the chamber 9 to compensate for any liquid which may leak or otherwise escape from that chamber.

The operation of the embodiment of my invention herein described is as follows: Starting with the press in filling position after the filling of the mold as illustrated, the mold is now moved into pressing position by the fluid pressure in the cylinder 29 as before described. The crank 6 now starts the displacing plunger 8 on its inward stroke producing compressing movement of the plunger 19 through the liquid in the chamber 9 and the ram 11. When a predetermined pressure has been reached on the contents of the mold, the displacing plunger 8 will remain substantially stationary but the cylinder 13 may still be moved forward by the crank 6 against the pressure contained in that cylinder. This allows the actuator to complete its inward stroke. After the actuator has advanced on its return stroke sufficiently to permit the piston 14 and cylinder 13 to resume their normal relative positions, the mold is moved, as before explained, into its extreme left position so that the top of the

mold is uncovered. The block is then ejected by raising the plunger 19 by operation of the cylinder 43. The cam 26 now moves the mold back into filling position, the block being held by the force of the pressure receiving block 22. When the filling position is reached, the steam is exhausted from the cylinder 48 by means of the slide valve 100. This permits the plunger 19 to fall and the mold to be filled with material from the neck 21. To vary the thickness of the block compressed or to keep it of uniform thickness with varying material, means are provided to regulate the drop of the plunger 19. As herein shown, this comprises a screw 51 manually operable and acting on the bell crank 46.

Claim:

A press comprising, in combination, a bed plate carrying bearings, a horizontal shaft rotatably mounted in said bearings and providing a crank, a crank pin for said crank, a connecting rod connected at one end to

said crank pin; an elastic fluid pressure cylinder connected to the other end of said 25 connecting rod and rectilinearly slidable longitudinally of said bed plate, a piston in said cylinder, a piston rod connected to said piston, a displacing plunger connected to said piston rod, a hydraulic cylinder receiving one end of said displacing plunger, a 30 ram above said displacing plunger and vertically reciprocable in said hydraulic cylinder, means for maintaining a constant amount of liquid in said cylinder and means 35 providing for the constant admission of elastic pressure fluid between said piston and the rear of said elastic pressure fluid cylinder.

In testimony whereof, I have signed my 40 name to this specification in the presence of two subscribing witnesses.

PRESTON UPHAM.

Witnesses:

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