H. MUELLER.

POTTERY PRESS.

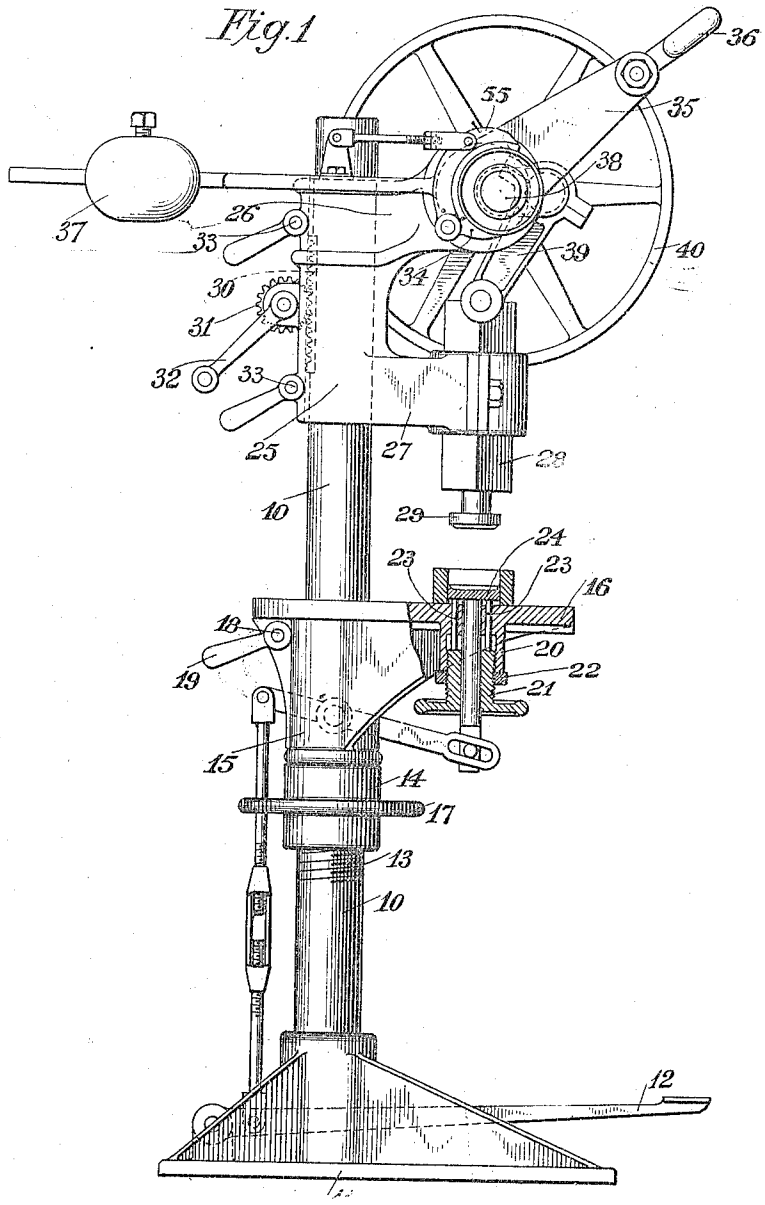
APPLICATION FILED SEPT. 10, 1914.

1,233,390.

Patented July 17, 1917.

2 SHEETS—SHEET 1.

Fig. 1



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2 SHEETS—SHEET 2.

Fig. 2

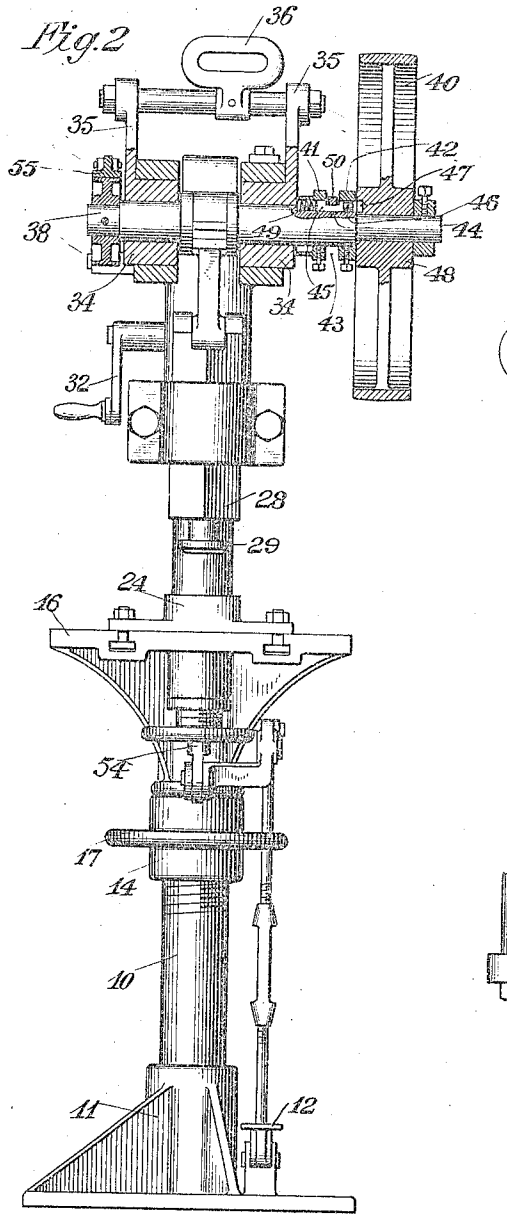


Fig. 4

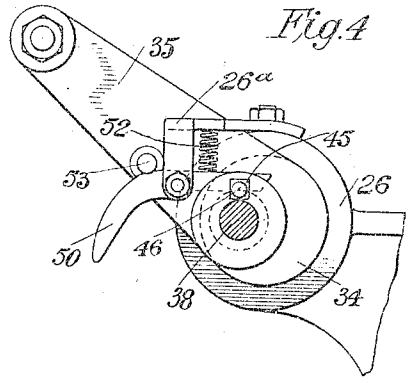
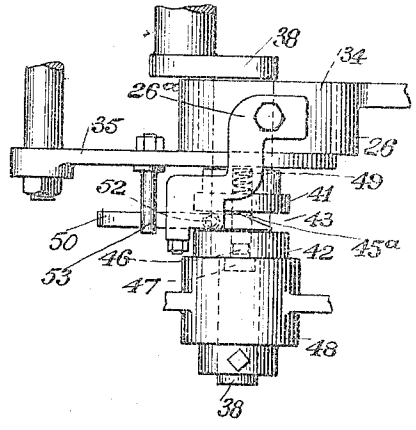


Fig. 3



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UNITED STATES PATENT OFFICE.

HILMAR MUELLER, OF TRENTON, NEW JERSEY, ASSIGNOR TO THE COOK & MUELLER COMPANY, OF TRENTON, NEW JERSEY, A FIRM COMPOSED OF CHARLES HOWELL COOK, PAUL G. DURYEA, HAROLD P. HUMPHREY, ANTHONY COMFORT, AND HILMAR MUELLER, ALL OF TRENTON, NEW JERSEY.

POTTERY-PRESS.

1,233,390. Specification of Letters Patent. Patented July 17, 1917.

Application filed September 10, 1914. Serial No. 860,972.

To all whom it may concern:

Be it known that I, HILMAR MUELLER, a citizen of the United States, residing at Trenton, in the county of Mercer and State of New Jersey, have invented certain new and useful Improvements in Pottery-Presses, of which the following is a full, clear, and exact description.

In the manufacture of porcelain and similar articles by the so-called "dust method", the argillaceous material, in a finely divided condition, is placed in a die or mold and then pressed in the die by means of another die part usually carried by a reciprocatory plunger. The apparatus employed is known as a "press", and heretofore the plunger carrying the movable part of the die has been actuated by a screw which the workman rotates manually. This operation is exceedingly laborious, and at the same time requires a high degree of skill, especially when the article to be molded or pressed is complicated in form or structure.

The argillaceous material in the die or mold being loose and uncompacted it contains a considerable amount of air, and when the plunger first comes down this entrapped air is compressed throughout the body of the article. Then when the plunger is raised, the compressed air expands more or less and causes a crack in the molded article. It is therefore necessary for the workman to bring the plunger down again for the purpose of compacting the material after the air previously entrapped in its pores has escaped. This process is known as "airing", and obviously, it materially increases the time and labor involved in molding the article.

My present invention has for its chief object to provide a press in which the "airing" or release of the entrapped air is in effect automatic and does not require repeated manual operations even when the press is actuated by hand.

Another object of the invention is to provide a machine which can be actuated by power, thereby reducing to practically nothing the muscular effort required of the operator or attendant. A still further object is to provide for the power driven machine a system of manual control which will enable the operator to produce, with all necessary exactitude, the pressure-variations, sometimes very delicate, required in the molding of certain articles and heretofore obtainable only by those workmen who possess a very high degree of skill.

The preferred embodiment of the invention is illustrated in the accompanying drawings, in which—

Figure 1 is a side view and Fig. 2 a front view of the machine.

Figs. 3 and 4 are detail plan and cross-sectional views, respectively, the former on an enlarged scale, of the manual controlling mechanism.

The standard 10, on which the various parts of the machine are mounted, is supported by a base 11, provided with a treadle 12 for the purpose hereafter described. Above the base the standard is threaded, as at 13, to receive an internally threaded sleeve 14 on which rests a split sleeve 15 surrounding the standard and carrying a forwardly extending table 16. The sleeve 14 is provided with a hand wheel 17 by which it can be turned to raise or lower the table to the position most convenient for the workman, after which the split sleeve 15 is clamped firmly to the column or standard by means of a binding screw 18 actuated by a hand lever 19.

On the underside of the table 16 is an internally threaded boss 20, in which works a screw 21 having a lock nut 22. Two or more pins 23, on which the movable bottom of the female die-member 24 is supported, extend down through the table and rest on the screw 21, so that by rotating the screw in the boss the bottom of the said die member can be raised or lowered independently of the table 16.

Above the table is a bracket composed of a split sleeve 25, encircling the column or standard 10, and a pair of upper arms 26 and lower arm 27; the latter constituting a guide for the vertically reciprocatory plunger 28 which carries on its lower end the male die-member 29 to coöperate with the die member 24 above mentioned. Inside the sleeve 25 the standard is provided with rack teeth 30, meshing with a pinion 31 which can be rocked by a suitable handle 32, for easy and accurate adjustment of the bracket. When the bracket is brought to the proper posi-

tion the sleeve 25 can be bound firmly upon the standard by means of the clamping screws 33.

In the arms 26 is a pair of circular bearing-blocks 34, rigidly connected on the outside to the lever-frame 35 provided at the front with a handle 36 and at the rear with an adjustable counter-weight 37. The crank shaft 38, the crank of which is connected with the plunger 28 by a pitman 39, is journaled eccentrically in the bearings 34, and is driven by a pulley 40.

From the foregoing it will be seen that, while the stroke of the plunger 28 is constant relatively to the shaft 38, the extent of approach of the plunger to the table 16 depends upon the extent of which the operator rocks the bearings 34. With the bearings in the position shown in Fig. 1, the die-member 29 will penetrate a certain distance into the member 24 and will produce a corresponding compression of the argillaceous material therein. If this compression is not sufficient the operator can increase it to any desired extent by depressing the frame 35, thereby rocking the bearing blocks 34 and moving the shaft 38 downward. The rotation of the shaft then moves the plunger down farther, with correspondingly greater compression of the material in the mold 24. Inasmuch as each rotation of the shaft produces one compression, successive compressions will be produced as long as the shaft rotates. Also, the first compression or series of compressions can be as light as desired, and the succeeding compression or series of compressions can be successively heavier, so that the material in the mold is compacted progressively until the desired density is produced. The operation is thus at all times under the control of the operator, and this control is far more accurate than any that is possible with the prior machines.

In explanation of the "airing" process mentioned hereinbefore, consider a single revolution of the crankshaft. The first effect is to drive the die-member 29 into the member 24, compressing the argillaceous material and also compressing the air entrapped therein. As the crank passes the lowest point in its path the plunger, rises, permitting the compressed air to expand and escape from the material until the pressure therein is reduced to atmospheric. If the shaft were then stopped, the article would be imperfect; but a second revolution of the shaft again compresses the material of which the article is composed, this time without compressing the air in its pores (the excess air having escaped) or at most with too slight a compression of the air to cause injury to the article when the pressure is relieved by the upward movement of the plunger. The mold is therefore "aired" at each rise of the plunger; and as many airings and compressions as may be required to produce a perfect article can be given merely by letting the shaft rotate a sufficient number of times. Moreover, while these airings are being given, the extent of compression can be progressively increased by depressing the shaft through the medium of the lever 35.

I prefer to control the rotation of the crankshaft 38 by means of the lever 35, in such manner that the shaft will rotate as long as the lever is held below a certain position. This result can be conveniently attained by means of the mechanism illustrated in Figs. 3 and 4, which will now be described.

On the shaft 38 at the right-hand end thereof are two collars 41, 42, spaced apart as shown, to provide a circumferential groove 43, and both the collars and the shaft are grooved axially as at 44. In this axial groove is a sliding bolt or pin 45 having its outer end 46 rounded to fit into a corresponding hole 47 in the hub 48 of the pulley 40, which latter is loose on the shaft and is constantly driven by belt. A spring 49 urges the bolt rightwardly into the hub 48; and it is evident that so long as the bolt is in engagement with the hub the shaft 38 will be rotated. The bolt 45 is provided with a transverse notch or slot 45^a.

On the adjacent arm 26 is a bracket 26^a carrying a pivoted dog 50, having a beveled end (shown in plan in Fig. 3) which is normally held in the groove 43 and notch 45^a by a spring 52. This holds the bolt 45 out of engagement with the hub 48, with the result that the pulley revolves idly. On the adjacent arm of the frame 35 is a stud 53 above the dog 50. Now when the operator rocks the frame 35 to depress the shaft, the stud 53 swings the dog on its pivot and raises the beveled end thereof out of the notch 45^a, thus allowing the spring 49 to shift the bolt rightwardly and carry the end 46 thereof into the hole 47 as soon as the latter comes opposite the bolt. The shaft and the pulley are thus connected and the former begins to revolve, continuing its rotation as long as the dog is held out of the groove 43. When, however, the operator releases the frame 35, allowing the spring 52 to swing the dog back into the groove, the left edge or face of the notch 45^a (which was not quite closed by the rightward shifting of the bolt by the spring 49) strikes the beveled end of the dog as the bolt revolves with the shaft, and is cammed back, thereby shifting the bolt out of engagement with the hub. The pulley is then free again, and revolves idly until the next actuation of the controlling frame 35. To bring the shaft and the parts actuated thereby quickly to rest after release of the bolt from the driv-

ing pulley a brake 55 is provided, which is released by the downward movement of the frame or lever 35 and applied automatically when the frame reaches its uppermost position.

From the foregoing it will be seen that the shaft revolves, and reciprocates the plunger, as long as the controlling handle 36 is held down, thereby giving repeated airings and compressions of the article in the die 24. Moreover, the operator can depress the shaft farther after it begins to revolve, and while it is revolving, thus making the successive compressions heavier and heavier, as already described.

To remove the pressed article from the die 24 the movable bottom thereof can be raised by pressure on the treadle 12, which lifts the rod 54 (movable vertically in the screw 21) and thereby raises the bottom of the die until the molded article is exposed above the top. Release of the treadle after removal of the article permits the bottom to return to its initial position.

It is to be understood that the invention is not limited to the construction herein specifically illustrated and described, but can be embodied in other forms within the scope of the following claims.

What I claim is:

1. In a pottery press, in combination, a support for a lower die-member, a vertically reciprocating plunger adapted to carry an upper die-member on its lower end to cooperate with a lower die-member on said support, a rotary shaft connected with said plunger to actuate the same, circular bearing members in which said shaft is eccentrically journaled, supporting means for the bearing members, and manual means for rotating the bearing members to shift the plunger and shaft toward the lower die-member support, as and for the purpose set forth.

2. In a pottery press, in combination, a support for a lower die-member, a vertically reciprocatory plunger adapted to carry an upper die-member for coöperation with a lower die-member on said support, a rotary shaft connected with the plunger to actuate the same, manual means to depress the plunger and shaft toward the said support, power-driven means to rotate the shaft, automatic mechanism to connect the shaft with said power-driven means when the shaft is depressed and to disconnect the same when the shaft is raised to initial position, and automatic braking means operating to brake the shaft when the same is raised to initial position, as and for the purpose set forth.

3. In a pottery press, in combination, a vertical standard, a support for a lower die-member extending forwardly from the standard, a bracket extending forwardly from the standard to overhang the said support and having a vertical guide, a plunger reciprocating vertically in said guide and adapted to carry an upper die-member to cooperate with a lower die-member on said support, circular bearing members rotatably mounted in the bracket, a rotary shaft journaled eccentrically in the bearing members and connected with the plunger to reciprocate the same, and manual means for rotating the bearing members to shift the plunger shaft toward the said lower die-member support, as and for the purpose set forth.

In testimony whereof I affix my signature in the presence of two subscribing witnesses.

HILMAR MUELLER.

Witnesses:

CHAS. HOWELL COOK,

S. S. DUNHAM.