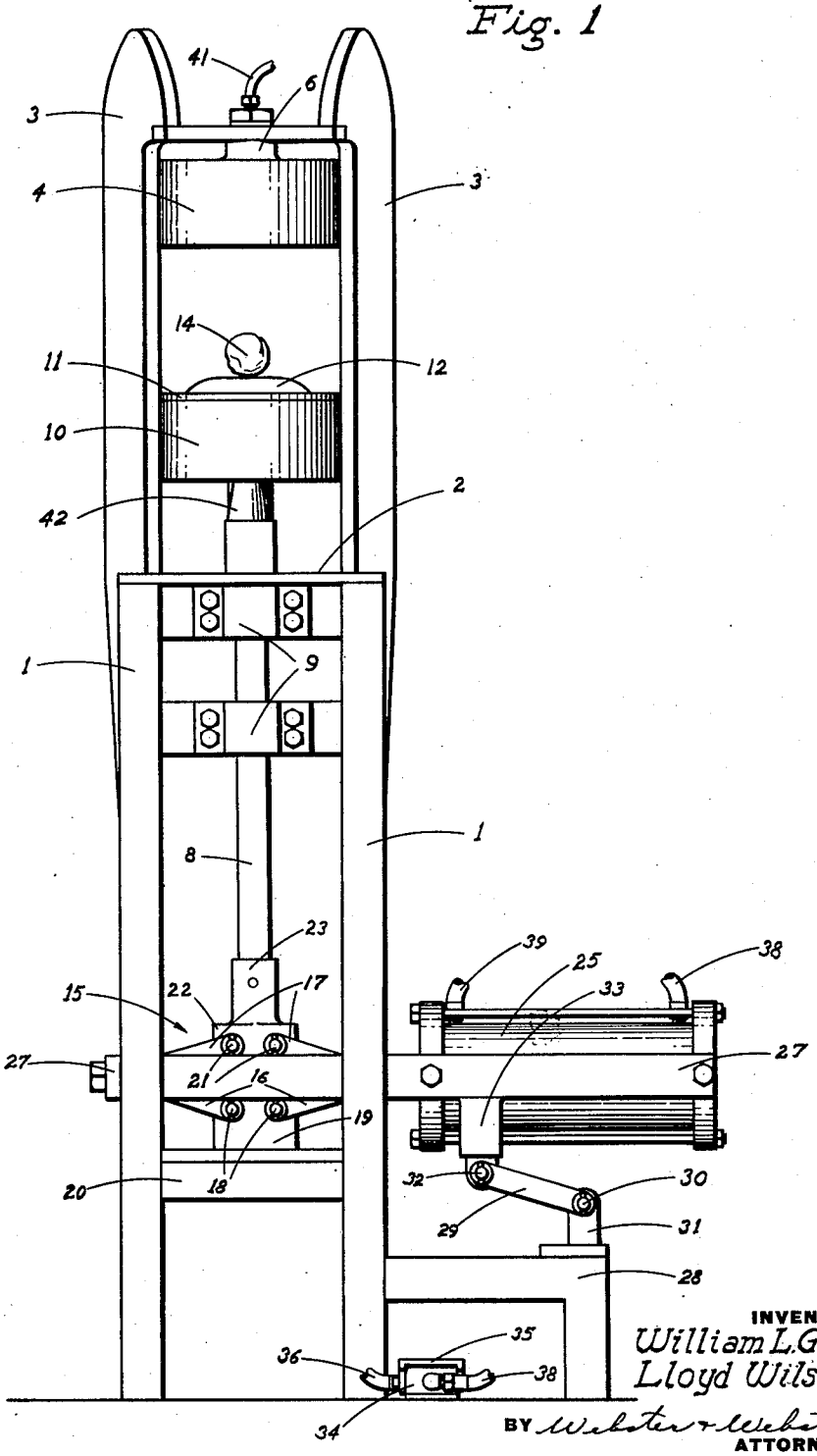
June 15, 1954 W. L. GLAAB ET AL 2,680,893

POTTERY FORMING DEVICE

Filed Oct. 15, 1951 3 Sheets-Sheet 1

Fig. 1



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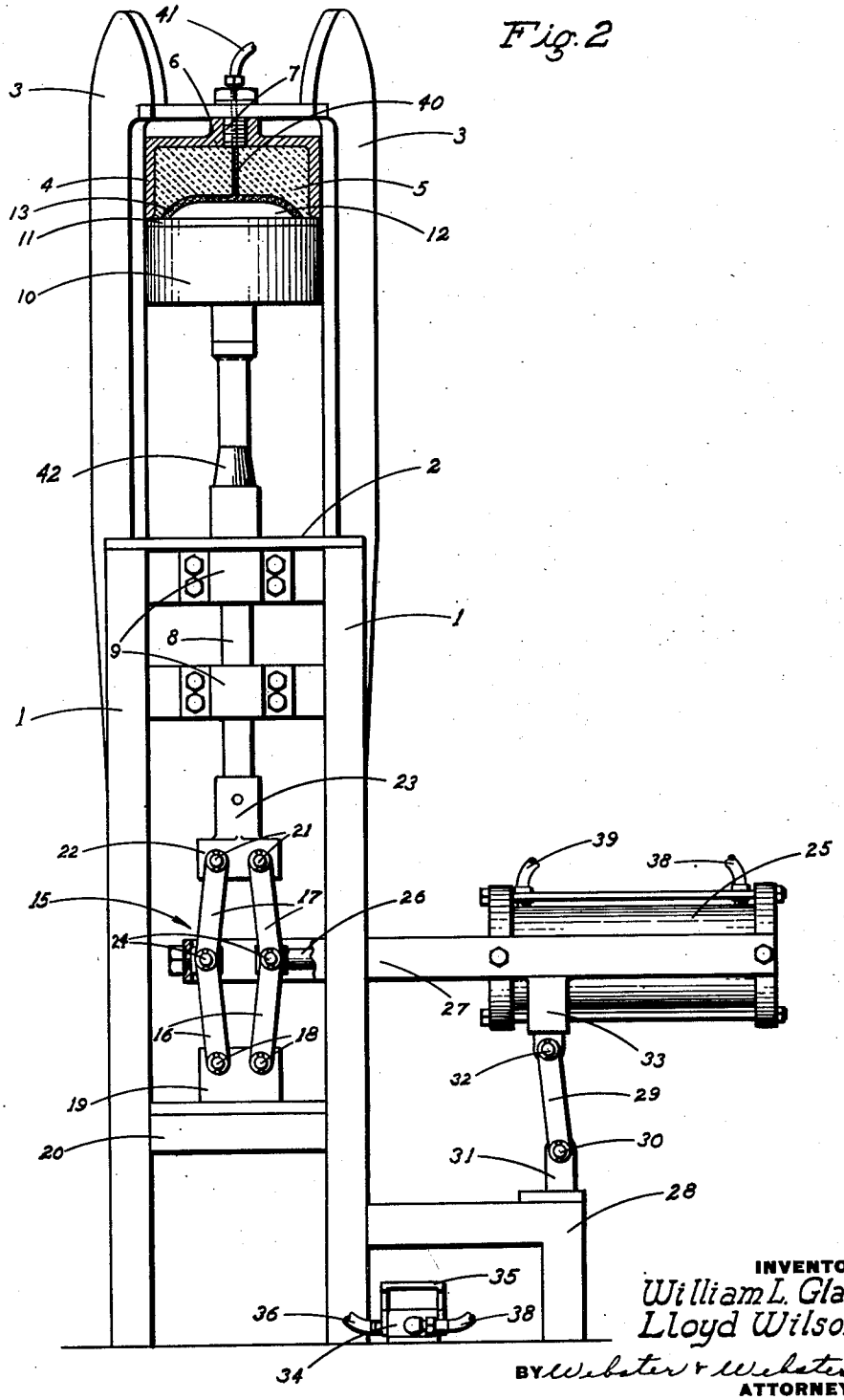
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POTTERY FORMING DEVICE

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Fig. 2



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POTTERY FORMING DEVICE

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Fig. 3

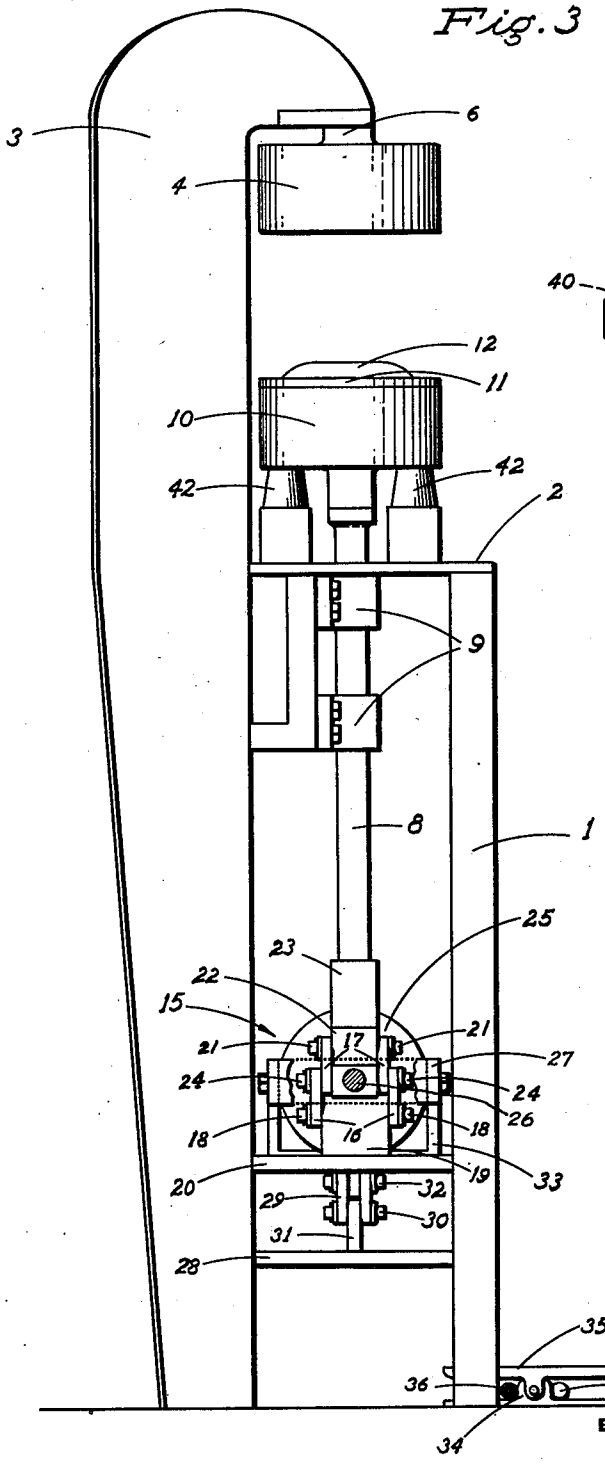
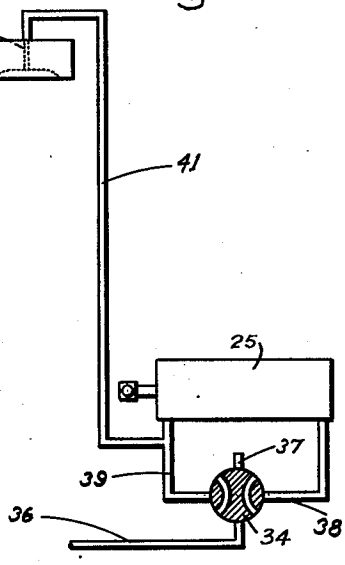


Fig. 4



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2,680,893

POTTERY FORMING DEVICE

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Application October 15, 1951, Serial No. 251,372

2 Claims. (Cl. 25—27)

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The present invention relates generally to equipment for use in a pottery; the invention being directed in particular to, and it is a major object to provide, a novel power actuated device for initially forming plates or the like from soft or moldable clay.

Another important object of the invention is to provide a pottery forming device which embodies vertically alined die retainers, one retainer being fixed and the other axially reciprocable relative thereto, whereby such retainers can be caused to closely approach each other so that the dies form a pottery piece therebetween; there being novel power actuated mechanism connected to the movable die retainer in a manner to reciprocate the same.

A further object of the invention is to provide power actuated mechanism, as above, and for the purpose described, which is operative to impart progressively greater axial thrust to the movable die retainer as it approaches the fixed die retainer; relatively great axial thrust at such time being of substantial advantage to the proper formation between the dies of the pottery piece.

A still further object of the invention is to provide power actuated mechanism, as in the preceding paragraphs, which includes—in novel assembly—a vertically disposed pantograph linkage, a horizontally disposed power cylinder connected to such linkage in actuating relation, and a plunger rod projecting upwardly from said linkage; the arrangement being such that the power cylinder may float vertically to compensate for vertical movement of the point of connection with the pantograph linkage as the latter is extended or retracted.

An additional object of the invention is to provide a novel automatic air blast arrangement adapted to aid in the freeing of the formed pottery piece from the fixed die as the movable die begins to retract therefrom.

It is also an object of the invention to provide a pottery forming device which is designed for ease and economy of manufacture; the device functioning positively and smoothly when in operation, and requiring a minimum of maintenance or repair.

Still another object of the invention is to provide a practical and reliable pottery forming device, and one which will be exceedingly effective for the purpose for which it is designed.

These objects are accomplished by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claims.

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In the drawings:

Fig. 1 is a front elevation of the pottery forming device in its starting position; i. e. with the plunger in lowered position, and with a ball of clay on the lower die.

Fig. 2 is a front elevation, partly in section, of the device with the parts in their advanced or pottery forming position.

Fig. 3 is a side elevation of the pottery forming device in its starting position.

Fig. 4 is a diagram of the fluid pressure conduit system.

Referring now more particularly to the characters of reference on the drawings, the novel, pottery forming device comprises a rigid upstanding main frame 1 which is substantially waist-height and includes a top plate 2.

A rigid gooseneck 3 is fixed in connection with the back side of the main frame 1 and overhangs the top plate 2 in spaced relation. The gooseneck 3 is fitted, in rigid relation, with a cylindrical retainer 4 which opens downwardly and which contains the fixed die 5; such fixed die 5 being of ceramic material and comprising the female element of the die assembly.

The retainer 4 is formed at the top with a central hub 6 threaded onto a supporting stem 7.

As so mounted, the retainer 4 depends in rigid relation from the gooseneck 3.

A vertical plunger rod 8 is carried in bearings 9 in the upper portion of the main frame 1; such plunger rod 8 projecting upwardly through the top plate 2, and at its upper end said rod is fixed to a cylindrical plunger 10 axially alined with the retainer 4, and which plunger carries the retainer 11 for the lower die 12. The lower die 12 is the male element of the die assembly and likewise is of ceramic material; the dies 5 and 12 being adapted to cooperate to form a pottery piece therebetween, as for example a plate 13.

The cylindrical plunger 10 is initially in a lowered position, as in Fig. 1, at which time a ball of clay 14 is placed on the lower die 12, follower by a forceful upward stroke of the plunger rod 8 and plunger 10, which—as the dies 5 and 12 come into cooperative relation—forms the pottery piece 13.

The present invention provides a novel power actuated mechanism for thrusting the plunger rod 8 upwardly from its lowered starting position to an advanced or pottery forming position; such mechanism comprising the following:

A vertically disposed, laterally workable pantograph linkage, indicated generally at 15, is disposed in the main frame 1 below the plunger

rod 8; such pantograph linkage 15 including bottom links 16 and top links 17.

The bottom links 16 are pivoted, as at 18, on a foot block 19 secured to a cross member 20 in the main frame 1. The top links 17 are pivoted, as at 21, to a top block 22 having an upstanding socket 23 in which the lower end of the plunger rod 8 is secured.

At their adjacent ends the bottom links 16 and top links 17 are pivotally connected, as at 24. A fluid pressure actuated power cylinder 25 is disposed laterally of the main frame 1 in horizontal alinement with the link pivots 24; such power cylinder 25 including an inwardly extending piston rod 26 connected to the adjacent pivot 24.

An elongated yoke 27 is fixed to the power cylinder 25 and extends lengthwise therefrom toward and spans about the pantograph linkage 15; such yoke at its outer or closed end having suitable connection with the related pivot 24.

It will thus be recognized that upon operation of the power cylinder 25, which is of double-acting type, the pantograph linkage 15 can be caused to forcefully contract or extend; the piston rod 26 and yoke 27 having—in effect—opposed motions.

As the pivots 24 of the pantograph linkage 15 fall and rise with contraction and extension of said linkage, respectively, it is also necessary that the power cylinder 25 be permitted to have similar vertical motion. This is accomplished by supporting the power cylinder 25 from a base platform 28 by means of an upstanding, laterally swingable link 29 pivotally connected at its lower end, as at 30, to a bracket 31 on platform 28, and pivoted at its upper end, as at 32, to a central point on a cradle 33 rigid with the yoke 27. Thus, as the pantograph linkage pivots 24 work up or down, likewise can the cylinder 25 move; the link 29 swinging in a laterally vertical plane.

Link 29 is the same length as links 16, and is disposed at the same angle as the link 16 furthest from the cylinder 25, as shown in Figs. 1 and 2, so that link 29 and said link 16 form a parallel linkage assuring a straight horizontal movement of the cylinder and yoke.

The power cylinder 25 is controlled by a valve-regulated, fluid pressure conduit system, as follows:

A four-way valve 34 is mounted on the floor to one side of the main frame 1 and ahead of the base platform 28; such valve being in connection with, and adapted to be actuated by, a foot pedal 35; the latter having a central position with the valve 34 wholly closed.

The valve 34 is connected between a fluid pressure supply pipe 36, a vent 37, and conduits 38 and 39 which lead to opposite ends of the power cylinder 25. With depression of the foot pedal 35 at one end, the valve 34 is actuated to connect the fluid pressure supply pipe 36 with the conduit 38, and the conduit 39 with the vent 37, with the result that the power cylinder 25 is actuated in a direction to advance the piston rod 26 and relatively retract the yoke 27 whereby to extend the pantograph linkage 15 and raise the plunger rod 8. As the pantograph linkage 15 is thus extended, the axial thrust on the plunger rod 8 becomes progressively greater, being very forceful at the moment that the lower die 12 reaches the limit of its advancing stroke.

With depression of the foot pedal 35 at the opposite end, the valve 34 is worked to connect fluid pressure supply pipe 36 with conduit 39, and

conduit 38 with vent 37, resulting in the power cylinder 25 acting in a direction to retract the pantograph linkage 15 so that all of the parts return to their initial or starting position. When this occurs the lower die 12 is retracted from the fixed upper die 5; the formed pottery piece 13 being carried downwardly on said die 12.

In order to assure that the pottery piece 13 breaks cleanly away from the upper die 5, the following fluid pressure blast arrangement is provided:

An axial passage or duct 40 extends through the die 5 and through the stem 7, having communication with a conduit 41 which connects to the conduit 39. When the conduit 39 is in communication with the fluid pressure supply pipe 36, to cause actuation of the power cylinder 25 in a direction to lower the die 12, fluid pressure also feeds through the duct 40, acting on the formed pottery piece 13 to aid in its freeing from said die 5.

The fluid pressure preferably employed is air, and the power cylinder 25 is a pneumatically actuated type.

Bumpers 42 upstand from the top plate 2 in a position for engagement by the cylindrical plunger 10 at the end of the down stroke.

With the above described pottery forming device, pottery pieces can be formed rapidly, smoothly, and positively by the assembly of the dies 5 and 12 working in response to extension and contraction of the pantograph linkage 15 by cylinder 25.

From the foregoing description it will be readily seen that there has been produced such a device as substantially fulfills the objects of the invention, as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations from such detail may be resorted to as do not form a departure from the spirit of the invention, as defined by the appended claims.

Having thus described the invention, the following is claimed as new and useful, and upon which Letters Patent are desired:

1. A pottery forming device, comprising an upstanding frame, a pair of complementary dies axially alined vertically, means securing the upper die in rigid connection with the frame, means including a dependent plunger rod mounting the lower die in connection with the frame for reciprocation between a lowered retracted position some distance below the upper die and a raised working position closely adjacent the upper die, a vertically disposed pantograph linkage below the rod and comprising upper and lower links pivoted together, means attaching the upper links at the top to the rod, means attaching the lower links at the bottom to the frame, a substantially horizontal power cylinder disposed laterally of the linkage and including a piston rod connected to the near central pivot of the linkage, a yoke secured on and projecting lengthwise from the cylinder and connected to the far central pivot of said linkage, and an upstanding laterally swingable link supporting the yoke for vertical motion with said linkage, said last named link being the same length as and parallel to the lower link of the pantograph linkage furthest from the cylinder.

2. A pottery forming device, comprising an upstanding frame, a pair of complementary dies axially alined vertically, means securing the upper die in rigid connection with the frame,

means including a dependent plunger rod mounting the lower die in connection with the frame for reciprocation between a lowered retracted position some distance below the upper die and a raised working position closely adjacent the upper die, a vertically disposed pantograph linkage below the rod and comprising upper and lower links pivoted together, means attaching the upper links at the top to the rod, means attaching the lower links at the bottom to the frame, a substantially horizontal power cylinder disposed laterally of the linkage and including a piston rod connected to the near central pivot of the linkage, a yoke secured on and projecting lengthwise from the cylinder and connected to the far central pivot of said linkage, and means between the frame and yoke supporting the latter

for combined vertical and horizontal movement with said linkage.

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