June 19, 1923.

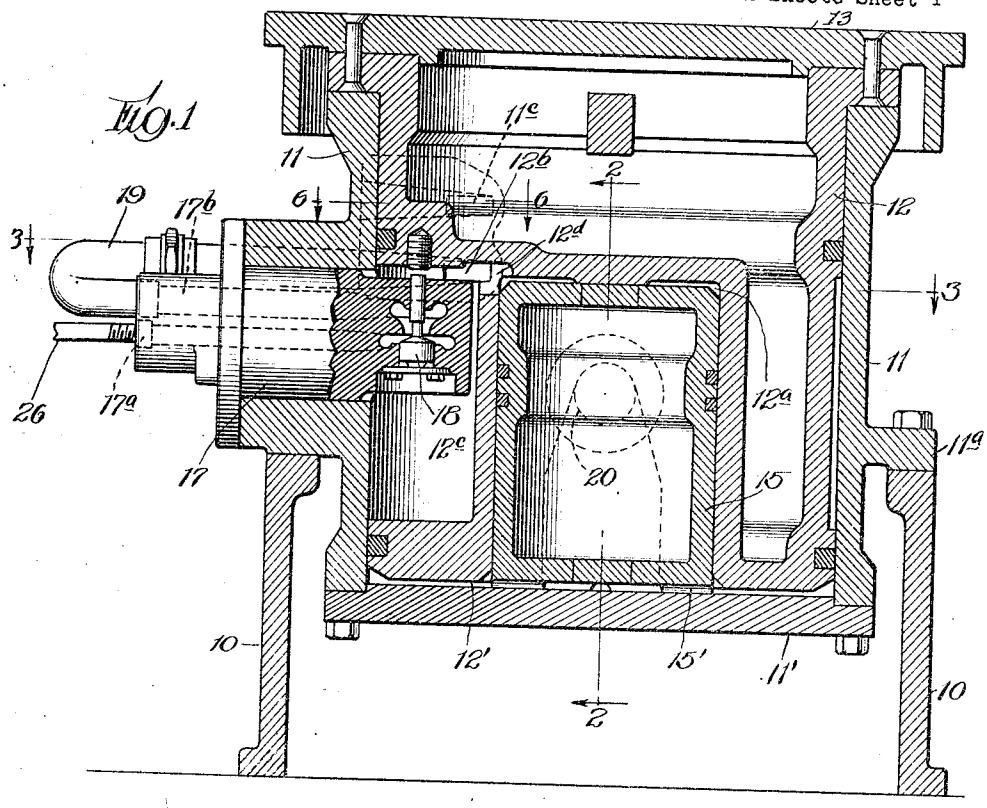
1,459,221

W. P. KRAUSE

MOLDING MACHINE

Filed Feb. 12, 1921

2 Sheets-Sheet 1



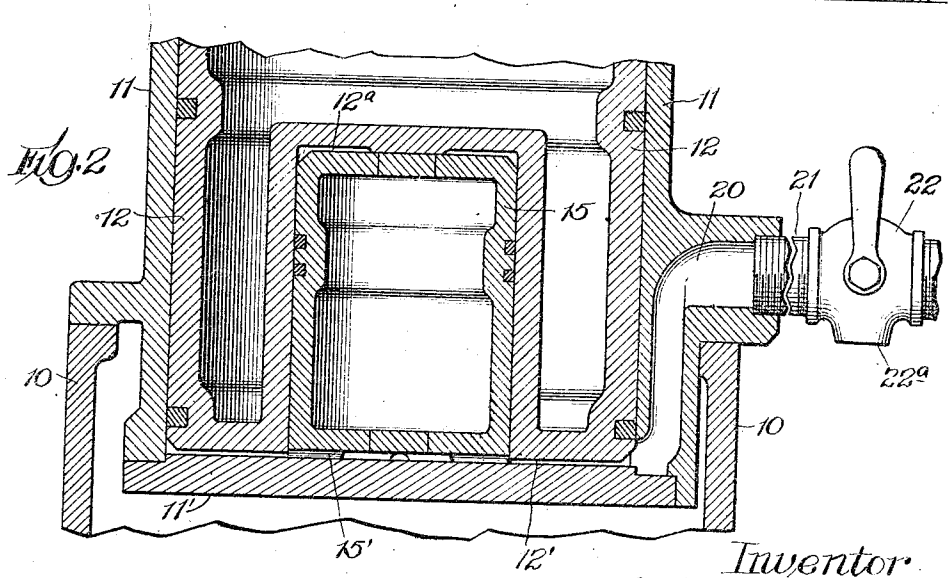


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Fig. 3

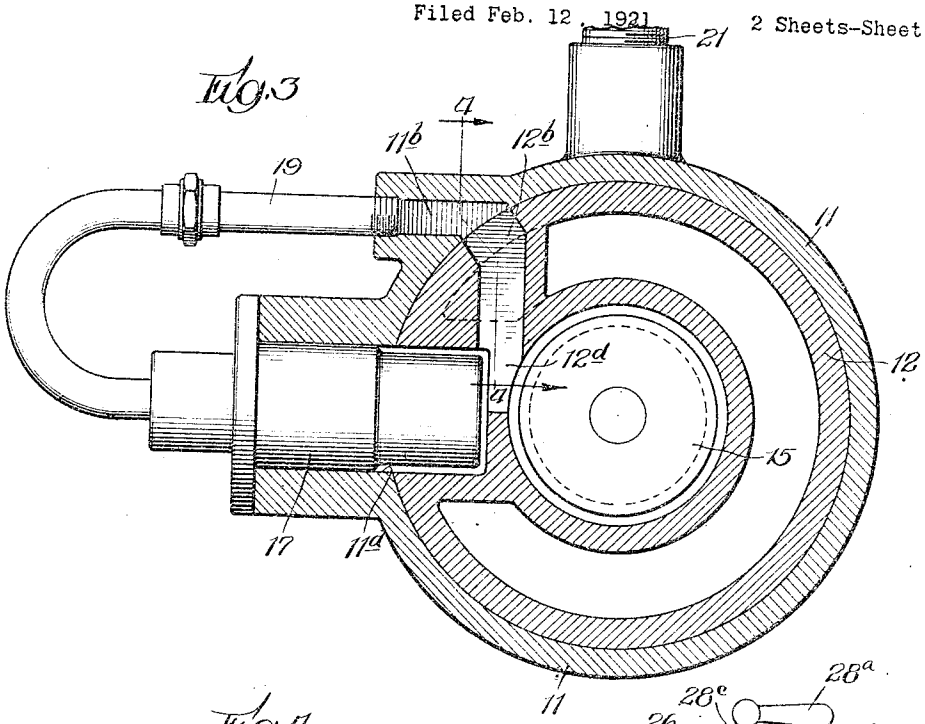
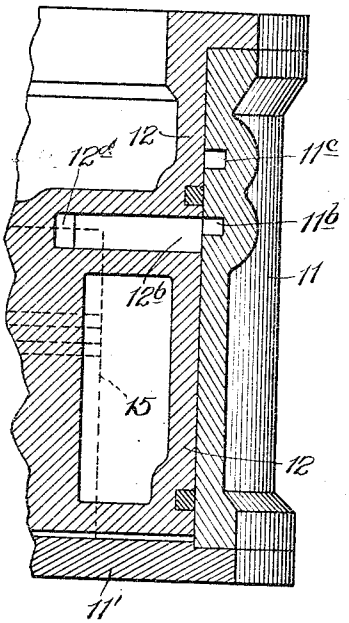


Fig. 4



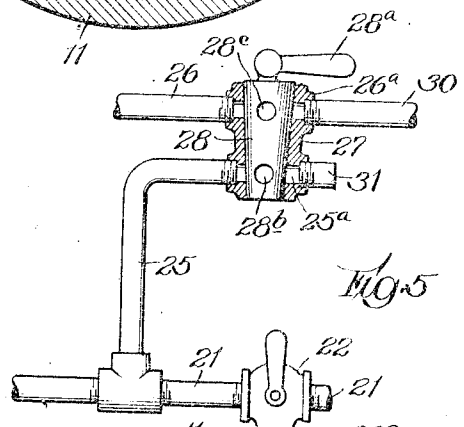


Fig. 5

Fig. 6

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UNITED STATES PATENT OFFICE.

WILLIAM P. KRAUSE, OF CHICAGO, ILLINOIS, ASSIGNOR TO HANNA ENGINEERING WORKS, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

MOLDING MACHINE.

Application filed February 12, 1921. Serial No. 444,340.

To all whom it may concern:

Be it known that I, WILLIAM P. KRAUSE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Molding Machines, of which the following is a specification.

This invention relates to improvements in molding machines and has for its object to provide a new and efficient combination machine i. e. a machine which will both jolt and squeeze.

This and other objects will be more fully set forth and described in the following specification and shown in the accompanying drawings in which—

Figure 1 is a vertical section through my improved machine;

Fig. 2 is a similar section at right angles thereto along the line 2—2 of Fig. 1.

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

Fig. 4 is a detail along the line 4—4 of Fig. 3;

Fig. 5 is a detail of the piping; and

Fig. 6 is a horizontal section showing the jolting exhaust port.

Like numerals refer to like elements throughout the drawings in which—

10 indicates generally a supporting base upon which is carried a cylinder 11 having the cylinder head 11′ bolted to the bottom thereof and provided with a peripheral flange 11^a bolted or otherwise suitably secured to it upon the supporting base 10. The cylinder 11 is further provided with the inlet port 11^b and an outlet port 11^c.

Reciprocably mounted in the cylinder 11 is the plunger 12 upon which is carried the table 13 or other superstructure upon which in turn is supported the flask and pattern not shown. The plunger 12 is centrally recessed, as indicated by numeral 12^a, and is further provided with suitable ribs or projections 12′ on its lower face to permit access of lifting fluid therebeneath.

On its exterior the plunger 12 is provided with an elongated recess 12^c from which leads the aperture 12^d to the recess 12^a. This recess 12^a constitutes a subordinate cylinder in which is reciprocably mounted a floating post 15 which also has suitable raised portions 15′ on its lower face (see Fig. 1) for the circulation of actuating fluid.

The plunger 12 is provided with the duct 12^b leading from its exterior to recess 12^c and aperture 12^d (see Fig. 3). This duct 12^b is alinable with either of the ports 11^b or 11^c and these will be more fully explained hereinafter.

The cylinder 11 is provided with the flanged bore 11^d in alinement with the recess 12^c, and into this bore projects the valve block 17 in which is reciprocably mounted the jolt valve 18, shown as of the Mumford-Huggins type as illustrated in patent to Mumford et al 1,167,511, patented January 11, 1916. An inlet duct 17^a extends through the block 17 to permit the flow of actuating fluid under pressure, and an exhaust duct 17^b leads through the block 17 to a pipe 19 which in turn communicates with the inlet port 11^b (see Fig. 3), this permitting of the flow of actuating fluid from the valve block into the recess 12^c, the flow being automatically permitted and prevented by the valve 18. A duct 20 leads to beneath the plunger 12 (see Fig. 2) and is in communication with a supply pipe 21 in which is inserted a manually controlled three-way valve generally indicated by numeral 22. This valve is of well known construction and when in one position will permit flow of actuating fluid to cylinder through duct 20. When in a second position it permits exhaust of such fluid through a suitable outlet and when in neutral position as in Fig. 2, it closes duct 20 both for flow and exhaust of squeezing air. From the pipe 21 between the cylinder 12 and valve 22 leads a by-pass tube or pipe 25. An actuating fluid supply pipe 26 leads from the inlet 17^a of the jolt valve block to the plug valve casing 27 which is provided with the ducts 25^a and 26^a therethrough, pipe 25 being in communication with duct 25^a and pipe 26 with duct 26^a. A tapered plug valve 28 is seated in the casing 27 and is provided with the operating handle 28^a. This valve 28 is provided with the transverse ducts 28^b and 28^c. When the plug valve 28 is in position shown in Fig. 5, flow through pipes 25 and 26 will be prevented. When the valve 28 is rotated 90°, the pipe 26 will be thrown in communication with the fluid supply pipe

30 and actuating fluid under pressure may flow to the jolt valve. Also pipe 25 will be thrown into communication with the open ended nipple 31 for the purpose to be described below.

In the operation of my improved machine, assuming the valve 22 to be in closed position and actuating fluid to flow through duct 17^a, pipe 19, port 11^b, such actuating fluid will thereafter flow through the duct 12^b into recess 12^c and subordinate cylinder 12^a above the post 15. This actuating fluid will operate to lift the plunger 12, the post 15 being retained in position shown in Fig. 1. As soon as the port 12^d of plunger 12 has passed out of alinement with port 11^b, cutting off of the jolting fluid will take place and thereafter during its rise duct 12^b will aline with exhaust port 11^c permitting exhaust of the greater portion of the entrapped actuating fluid, whereupon plunger 12 will drop to impact with the cylinder, at the same time positively moving the valve 18 to open position for repetition of the cycle. This insures a comparatively rapid jolting until the supply of actuating fluid to inlet 17^a is cut off. The by-pass tube 25 permits the flow of air to and from beneath the plunger 12 during this jolting so as to destroy any vacuum or compression by providing a free surge of air.

Assuming the jolting to be completed, the jolting fluid is cut off by closing valve 28, whereupon port 31 will be closed and, the valve 22 being opened, actuating fluid will flow through duct 20 beneath the plunger 12 and the post 15, resulting in the simultaneous lift or raise of both of these elements for the squeezing operation, at the conclusion of which valve 22 may be closed to cut off further flow and to permit exhaust of the squeezed air through port 22^a.

It will be obvious that my invention is susceptible of modifications and improvements and I do not wish to be restricted to the form shown and described, except as defined in the appended claims.

What I claim is:

1. A machine of the class described, comprising a main cylinder, a plunger reciprocable therein, said plunger being recessed to provide a subordinate cylinder, a post reciprocable in said latter cylinder, means to supply actuating fluid beneath said plunger and post to raise them together, and means to supply actuating fluid to said subordinate cylinder to raise said plunger relative to said post.

2. A machine of the class described, comprising a main cylinder, a plunger reciprocable therein, said plunger being recessed to provide a subordinate cylinder, a post reciprocable in said latter cylinder, means to supply actuating fluid beneath said plunger and post to raise them together, means to supply actuating fluid to said subordinate cylinder to raise said plunger relative to said post, and an automatic valve means controlling said last named fluid supply.

3. A machine of the class described, comprising a main cylinder, a plunger reciprocable therein, said plunger being recessed to provide a subordinate cylinder, a post reciprocable in said latter cylinder, means to supply actuating fluid beneath said plunger and post to raise them together, means to supply actuating fluid to said subordinate cylinder to raise said plunger relative to said post, an automatic valve means controlling said last named fluid supply, and means to admit and cut off said first named supply of actuating fluid.

4. A machine of the class described, comprising a main cylinder, a plunger reciprocable therein, said plunger being recessed to provide a subordinate cylinder, a post reciprocable in said latter cylinder, means to supply actuating fluid beneath said plunger and post to raise them together, means to supply actuating fluid to said subordinate cylinder to raise said plunger relative to said post, an automatic valve means controlling said last-named fluid supply, means to admit and cut off said first-named supply of actuating fluid, and a breather means communicating with said main cylinder to permit flow of air to and from beneath said plunger during reciprocation of said plunger by admission and exhaust of actuating fluid to and from said subordinate cylinder.

5. A machine of the class described, comprising a main cylinder, a plunger reciprocable therein, said plunger being recessed to provide a subordinate cylinder, a post reciprocable in said subordinate cylinder, said plunger being exteriorly recessed, an aperture leading from said last-named recess to said subordinate cylinder, means to supply actuating fluid to said recess, and a valve means projecting into said recess and operable to automatically control the flow of actuating fluid to said recess.

6. A machine of the class described, comprising a main cylinder, a plunger reciprocable therein, said plunger being recessed to provide a subordinate cylinder, a post reciprocable in said subordinate cylinder, said plunger being exteriorly recessed, an aperture leading from said last-named recess to said subordinate cylinder, means to supply actuating fluid to said recess, a valve means projecting into said recess and operable to automatically control the flow of actuating fluid to said recess, and an exhaust port leading from said cylinder, said port being normally closed by said plunger.

7. A machine of the class described, comprising a main cylinder, a plunger reciprocable therein, said plunger being recessed to provide a subordinate cylinder, a post recip-

rocable in said subordinate cylinder, said plunger being exteriorly recessed, an aperture leading from said last-named recess to said subordinate cylinder, means to supply actuating fluid to said recess, a valve means projecting into said recess and operable to automatically control the flow of actuating fluid to said recess, a shut-off valve for said fluid supply, an exhaust port leading from said cylinder, said port being normally closed by said plunger, a duct to supply actuating fluid beneath said plunger and post, a valve operable to permit or prevent such flow, and a port controllable by said shut-off valve to permit flow of air to and from beneath said plunger.

8. A machine of the class described, comprising a cylinder, a plunger reciprocable therein, said plunger being recessed to form a subordinate cylinder, a post reciprocable in said subordinate cylinder, said plunger being provided with a recess in its exterior, an aperture leading from said recess to said subordinate cylinder, said cylinder being further provided with a duct leading from its exterior to said recess, said cylinder being provided with an inlet port and an exhaust port, a jolt valve projecting into said recess in said plunger and having a duct to convey actuating fluid to said inlet port, means to convey actuating fluid to said cylinder beneath said plunger and post, and a valve to permit or prevent such flow.

9. A machine of the class described, comprising a cylinder, a plunger reciprocable therein, said plunger being recessed to form a subordinate cylinder, a post reciprocable in said subordinate cylinder, said plunger being provided with a recess in its exterior, an aperture leading from said recess to said subordinate cylinder, said cylinder being further provided with a duct leading from its exterior to said recess, said cylinder being provided with an inlet port and an exhaust port, a jolt valve projecting into said recess in said plunger and having a duct to convey actuating fluid to said inlet port, means to convey actuating fluid to said cylinder beneath said plunger and post, a valve to permit or prevent such flow, and means to permit flow of air to and from beneath said plunger.

In testimony whereof, I have subscribed my name.

WILLIAM P. KRAUSE.