

E. H. MUMFORD.
MOLDING APPARATUS.
APPLICATION FILED JAN. 30, 1914.

1,122,409.

Patented Dec. 29, 1914.
2 SHEETS—SHEET 1.

Fig. 1.

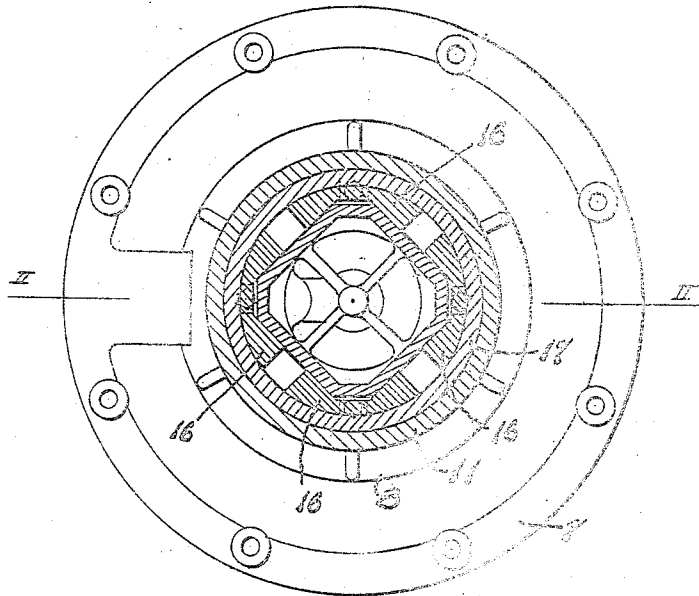
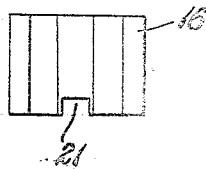


Fig. 3.



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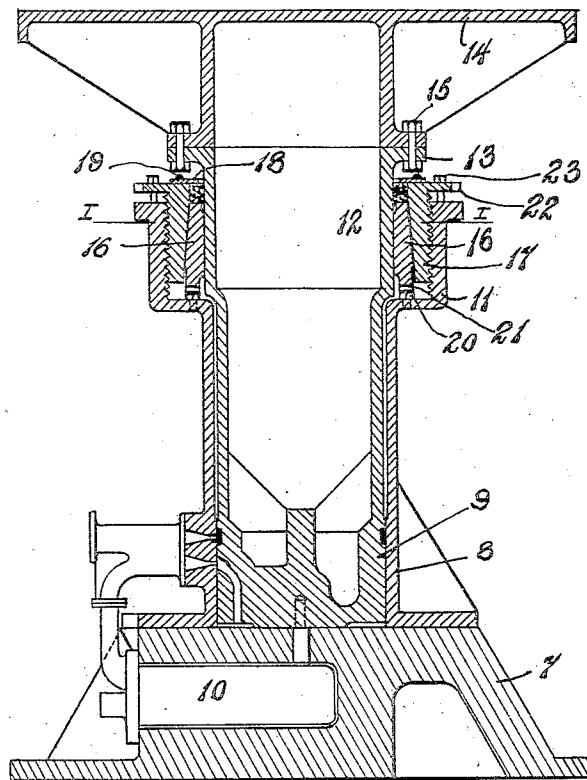
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2 SHEETS-SHEET 2.

Fig. 2.



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UNITED STATES PATENT OFFICE.

EDGAR H. MUMFORD, OF PLAINFIELD, NEW JERSEY.

MOLDING APPARATUS.

1,122,409.

Specification of Letters Patent.

Patented Dec. 29, 1914.

Application filed January 30, 1914. Serial No. 815,442.

To all whom it may concern:

Be it known that I, EDGAR H. MUMFORD, a citizen of the United States, residing at Plainfield, county of Union, and State of New Jersey, have invented certain new and useful Improvements in Molding Apparatus, of which the following is a specification.

This invention relates to molding apparatus and more particularly to forms of molding apparatus in which cylinders and plungers or pistons are used, such for example as jolt ramming machines, squeezers and the like. Among the primary objects of the invention are the provision of an improved arrangement of guide means for molding machines which makes it possible to greatly simplify and cheapen the construction of the cylinder and the plunger, or their equivalents; the provision of improved plunger guide means for maintaining the plunger central in the cylinder in which it operates; and the provision of improved plunger guide means which is capable of adjustment to compensate for wear, and which, at the same time, automatically maintains the plunger in proper alinement regardless of the amount of adjustment made.

My invention further contemplates an improved guide means of the character described which is readily accessible and simple in construction, and which provides a novel and effective means for securing lubrication of the moving parts.

The foregoing together with such other objects as may hereinafter appear, or are incident to my invention, I attain by means of a construction; the preferred embodiment of which I have illustrated in the accompanying drawings, wherein—

Fig. 1 is a horizontal section taken through a jolt ramming machine embodying my invention on the line I—I of Fig. 2; and Fig. 2 is a vertical section through the machine on the line II—II of Fig. 1, and Fig. 3 is a side elevation of one of the guide members.

The machine comprises the usual base casting 7 to which is secured the cylinder 8 within which the plunger 9 reciprocates. Mounted in the side of the base 7 is a block 10 in which is carried a valve mechanism (not shown) adapted to control the fluid pressure supply. The bore of the cylinder at the top is considerably increased by en-

larging the upper portion of the cylinder into the form of a cupped head 11. The upper portion 12 of the plunger 9 is of a polygonal shape, and I prefer to make it square with the corners beveled off. The upper end of the squared portion 12 of the plunger is provided with a flange 13 to which the mold table 14 is secured by the bolts 15. The plunger is guided by a plurality of gibs or guide members 16 which are mounted in the cupped head 11 and rest freely on the bottom thereof and which engage the sides of the squared portion 12. In the embodiment shown, I employ four gibs which are diagonally disposed and of which each engages two sides of the squared portion adjacent to a beveled corner, but it is so constructed as to clear the beveled corner, so that the gibs can move in upon the plunger as wear takes place. The gibs are maintained in engagement with the top of the plunger by a means preferably in the form of a gland 17 which is threaded into the cupped head 11 of the cylinder. The engaging faces of the gibs and gland are oppositely inclined so that when the gland is turned down, the gibs will be moved inwardly on the plunger. It will be clear that a considerable range of adjustment is provided by the gland 17, and it will also be noted that the construction is such that the plunger will always be maintained central in the cupped head of the cylinder. By threading the gland into the head, the gland descends squarely, which also tends to secure and maintain proper alinement of the parts regardless of the change in the relative position of the parts which takes place when adjustment is made.

One of the advantages incident to the construction resides in the fact that the greater part of the machining of the cylinder and plunger, which is necessary in the usual construction employed in molding machines, is done away with. It is only necessary to machine the cylinder and plunger adjacent to the bottom portions thereof for a distance slightly greater than the length of the stroke of the plunger, and to machine a portion of the squared end of the plunger. In other words it is necessary only to support the plunger at the ends thereof and my arrangement affords a simple and effective means for accomplishing this.

In order to protect the joint between the gland and the gibs I secure an annular ring

to the top of the gland in such manner as to project inward covering the joint. The ring, which I have designated by the numeral 18, is detachably secured to the gland by means of screws 19, and serves to retain oil-soaked waste in the annular space above the gibs and between the gland and the squared end of the plunger. The oil gravitates to the bottom of the cylinder and lubricates all working surfaces.

As a means for preventing the plunger 9 from rotating in the cylinder, I provide studs 20 which are driven into the bottom of the head 11 and project into recesses 21 cut into the bottom faces of the gibs. The studs prevent the gibs from turning in the head 11 and the gibs prevent rotation of the plunger. The gland 17 is flanged at the top and is also provided with a plurality of lugs 22 by means of which the gland can be readily turned. Rotation of the gland with respect to the head 11 is prevented by means of screws 23 which are removed when it is desired to adjust the gland to take up wear.

Because of the vibration or shuddering of the plungers it has been customary to have the plunger bear substantially throughout its length on the interior of the cylinder in order that the plunger may be adequately supported. In jolting machines of the type shown, the vibration or shuddering occurs largely at the top, particularly where the impact is at the bottom of the plunger. By my construction it is necessary to provide bearing surfaces only at the top and bottom of the plunger, and my improved divided guide means affords a bearing for the top of the plunger which is readily adjusted to compensate for the increased wear incident to the shuddering of the plunger.

It will be obvious that changes can be made in structure without departing from the spirit of my invention.

What I claim is:

1. In sand molding apparatus, the combination of a relatively movable cylinder member and a plunger member, and means for guiding one of the members comprising a plurality of gibs concentric with the other member and adapted to move radially with respect to said first member.

2. In sand molding apparatus, the combination of a relatively movable cylinder member and a plunger member, means for guiding one of the members comprising a plurality of gibs adapted to move radially with respect to said member and concentric with the other member, and a common means for shifting the radial position of the gibs.

3. In sand molding apparatus, the combination of a relatively movable cylinder member and a plunger member, means for guiding one of the members comprising a

plurality of gibs concentric with said member and adapted to move radially with respect to said member, and means for simultaneously shifting the radial position of the gibs.

4. In sand molding apparatus, the combination of a cylinder, a plunger reciprocating in said cylinder, and means for guiding the plunger comprising a plurality of gibs interposed between the cylinder and the plunger and adapted to move radially inward on the plunger to take up wear.

5. In sand molding apparatus, the combination of a cylinder, a plunger reciprocating in said cylinder, means for guiding the plunger comprising a plurality of gibs interposed between the cylinder and plunger and concentric with the former and adapted to move radially inward on the plunger, and means for moving the gibs inwardly.

6. In sand molding apparatus, the combination of a cylinder, a plunger reciprocating in said cylinder, means for guiding the plunger comprising a plurality of gibs interposed between the cylinder and plunger and concentric with the latter and adapted to move radially inward on the plunger, and an annular wedge member interposed between the gibs and the cylinder for shifting the radial position of the gibs.

7. In sand molding apparatus, the combination of a cylinder, a plunger reciprocating in said cylinder, means for guiding the plunger comprising a plurality of gibs interposed between the cylinder and plunger and concentric with the latter and adapted to move radially inward on the plunger, and wedging means for shifting the radial position of the gibs.

8. In sand molding apparatus, the combination of a cylinder, a plunger therein having a polygonal portion, and a plurality of gibs concentric with the cylinder and engaging the sides of the polygonal portion.

9. In sand molding apparatus, the combination of a cylinder, a plunger therein having a polygonal portion, a plurality of gibs concentric with the cylinder and engaging the sides of the polygonal portion, and means for preventing the gibs from revolving in the cylinder.

10. In sand molding apparatus, the combination of a cylinder having a cupped head, a plunger in the cylinder having a polygonal portion adjacent to said cupped head, a plurality of gibs engaging the polygonal portion, and a gland threaded into the head and engaging the outer faces of the gibs.

11. In sand molding apparatus, the combination of a cylinder member and a plunger member, one being movable relative to the other, and means for guiding one of said members and preventing rotation of

said member with respect to the other comprising a plurality of gibs engaging said member and movable radially with respect to said member.

5 12. In sand molding apparatus, the combination of a cylinder, a plunger reciprocating therein, and a divided circumferential guide means for the plunger interposed between the cylinder and the plunger, the
10 members of which engage the plunger and are free to move radially inward on the plunger.

13. In sand molding apparatus, the com-

bination of a cylinder member, a plunger member, and a divided circumferential guide means for one of said members having a bearing in the other member freely movable radially with respect to said first member to take up wear.

In testimony whereof I have hereunto signed my name in the presence of the two subscribed witnesses.

EDGAR H. MUMFORD.

Witnesses:

REGINA BRADY,
LAURA E. SMITH.