

D. W. MESICK.
MOLDING APPARATUS.
APPLICATION FILED APR. 27, 1912.

1,068,259.

Patented July 22, 1913.

2 SHEETS—SHEET 1.

Fig. 1

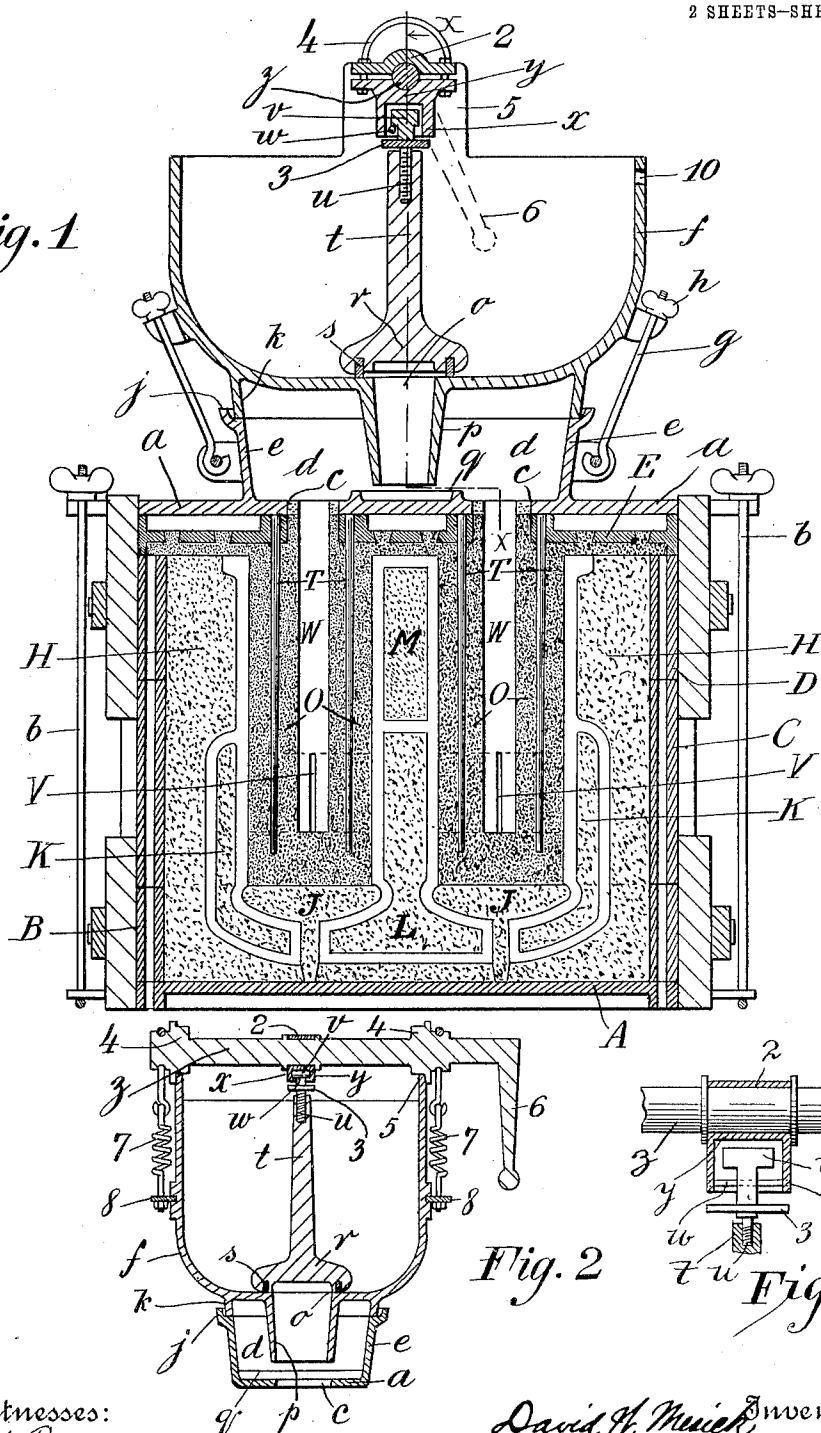


Fig. 2

Fig. 8.

Witnesses:
M. W. Pimmann
A. C. Carham

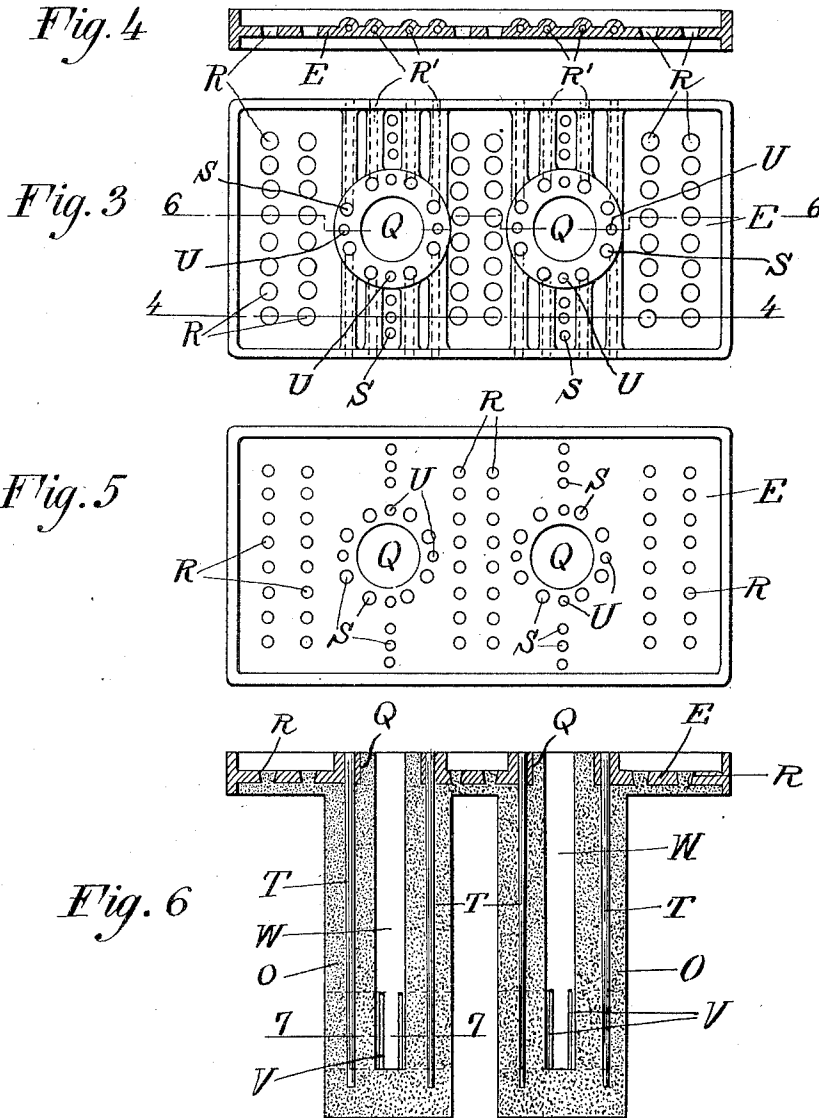
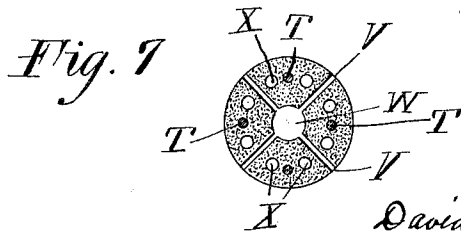
David H. Mesick Inventor
By his Attorney
Robert H. Ogden

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2 SHEETS—SHEET 2.



Witnesses:
W. M. Pienaar
A. C. Carham

David H. Mesick Inventor
By his Attorney
Harbert E. Ogden

UNITED STATES PATENT OFFICE.

DAVID W. MESICK, OF NEW YORK, N. Y.

MOLDING APPARATUS.

1,068,259.

Specification of Letters Patent.

Patented July 22, 1913.

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To all whom it may concern:

Be it known that I, DAVID W. MESICK, a citizen of the United States, and a resident of the borough of Brooklyn, county of Kings, city and State of New York, have invented certain new and useful Improvements in Molding Apparatus, of which the following is a specification, accompanied by drawings.

This invention relates to molding apparatus and the objects of the invention are to enable objects, especially motor cylinders, to be cast from metal with the greatest efficiency and with the minimum of defects; by reducing the liability of flaws from the scum on the molten metal by an improved construction of mold and cores; by introducing purified metal by bottom pouring under suitable pressure and temperature through sprue holes and gates formed in the cores or sand mold, so that the metal passes through the cores or sand mold to the bottom and rises through the mold; and by combining the various parts as hereinafter set forth.

To all these ends the invention consists of the apparatus shown in its preferred forms in the accompanying drawings, in which—

Figure 1 is a longitudinal sectional elevation of a molding apparatus; Fig. 2 is a detail transverse sectional view of the pouring basin and form strap or binder on line $x-x$ of Fig. 1, looking in the direction of the arrow; Fig. 3 is a detail top plan view of the cope plate; Fig. 4 is a longitudinal sectional view on line 4—4 of Fig. 3; Fig. 5 is a bottom plan view of the cope plate; Fig. 6 is a longitudinal sectional view of the cope plate and cores on line 6—6 of Fig. 3; Fig. 7 is a transverse sectional view of one of the body cores on line 7—7 of Fig. 6; and Fig. 8 is an enlarged detail sectional view of a portion of Fig. 2.

Referring to the drawings, and more especially to Fig. 1, A represents the bottom plate of a flask of which B is the nowel. C and D in this instance represent lower and upper cheeks and E is a cope plate of special construction, as will hereinafter appear. While I have shown a nowel and

cheeks forming the flask, it is to be understood that any suitable construction of flask may be provided. In the drawing a duplex cylinder casting is shown in the process of being cast, but my invention applies to casting cylinders in general and I have selected a duplex casting by way of illustration. A suitable sand mold H is formed in the flask and suitable cores J, K, L, and M are provided to form the casting.

One important feature of the invention relates to the construction in one piece of the cope plate E and the body cores O. The cope plate and body cores are shown in detail in Figs. 3 to 7 inclusive and in accordance with this invention the body cores O of which there may be one or more of sand or other suitable core material, are formed or molded upon the cope plate E and secured thereto in any suitable manner, whereby the body cores are suspended or supported from the cope plate in the flask when the cope plate is placed in position as shown on Fig. 1. By this means the body cores are centered without injury to the mold and held securely in correct position during the pouring, thereby greatly aiding in obtaining accurate castings. The body portion of the cope plate E is provided in this instance with the apertures Q, and other apertures R and S which are vent apertures. Vent apertures R', are also preferably formed extending inwardly from the sides of the plate to the body core vents S. In molding the body cores upon the cope plate reinforcing rods T are secured in the apertures U in the cope plate and the body cores O are molded around sand reinforcing rods T and around the apertures Q partially filling said apertures as shown. The reinforcing rods T are therefore embedded in the body cores and the sand or core material also fills or partially fills the vent holes R in the cope plate, thereby affording additional means for locking the body cores to the cope plate. In forming the body cores O, outwardly extending gates V are formed in the length of the core at the lower portion of the cores, said gates opening on the circumference of the core and the metal is poured through the sprue holes W of the cores and

passes out through the gates V and rises in the mold to form the casting. The vent holes X, Fig. 7, in the body cores are also preferably formed in the process of molding the cores.

Another important feature of the invention consists in the improved apparatus for pouring the metal and as shown in Figs. 1 and 2, a form strap or binder *a* is secured upon the cope plate E as by means of the bolts *b* at the sides of the flask. This form strap or binder is provided with the pouring apertures *c* adapted to register with the apertures Q in the cope plate, and the binder is also provided with the intermediate receptacle or distributing basin *d* formed by the walls or flange *e*. A pouring basin *f* is removably mounted upon the flange *e* and connected thereto as by means of the hook bolts *g* having the wing nuts *h*. The flange *e* is preferably provided with the seat or flared rim *j* upon which the flange *k* of the pouring basin is seated forming a joint which may be packed or not as conditions warrant. The pouring basin is provided with the pouring aperture *o* with or without the depending spout *p* extending downwardly into the distributing basin *d* and into proximity to the bottom of said receptacle. Transverse flanges *q* preferably extend upwardly from the binder or strap at the sides of the lower end of the flange or spout *p*.

Suitable means are provided for controlling the outlet aperture *o* of the basin *f* and in this instance a valve *r* is shown having the packing *s* of any suitable material. Means are provided for raising and lowering the valve *r* by lever, cam, or other means. The valve stem *t* is screw threaded to the bolt *u*, the head *v* of which can be loosely held as by means of a pin *w* in the socket *x* of the strap *y* partially encircling the shaft *z*. The other half 2 of the strap is suitably secured to the portion *y*. A pin 3 is preferably provided through bolt *u* to aid in forcing valve *r* to its seat. The shaft *z* is provided with suitable cams 4 adapted to be rotated in the bearings 5 provided on the pouring basin *f* and a suitable crank arm 6 affords means for rotating the shaft and cams. Retaining springs or other means are provided connected to the shaft *z* and to lugs 8 on the pouring basin for holding down the valve and shaft during rotation through a partial revolution and thus automatically holding the valve open.

In the operation of the apparatus, the pouring basin *f* is filled with the molten metal, the valve *r* being closed, and the capacity of the pouring basin should be such that the required amount of metal will be contained therein for casting the object desired. The pouring basin *f* may be provided with the overflow opening 10 up to which

point the basin should be filled. By rotating the shaft *z* through a partial revolution, the valve *r* is lifted sufficiently to permit the molten metal to pass out through the outlet aperture *c* and through the hollow body cores O, passing out through the gates V to fill the mold.

The utility of the apparatus will be apparent, for bottom pouring is practised throughout and the slag and impurities will remain on top of the metal in the pouring basin *f*, so that metal free of scum will be deposited in the intermediate receptacle *d* and here again bottom pouring may be practised, so that any slag that may have formed in the distributing basin will rise to the surface and pure metal will flow to the body cores. The metal is poured through the said body cores and the danger of shaving sand from the mold is obviated. The construction of cope plates and body cores is such that the body cores are held firmly without danger of dislodging sand and castings of accurate thickness and true alinement are thus obtained, thus obviating the necessity of the cumbersome apparatus heretofore used in the endeavor to obtain the best results.

Accurate and clean castings are obtained, with the minimum of sandless overiron, that is, the iron left over is clean and free from sand. The cores are correctly located, the cooling strains are reduced to a minimum, because of the quick and even distribution of the metal from the center gates, and the reduction of the dimensions of the flask aids in the rapidity of handling and manufacture. Short pouring is avoided, because the amount of metal is measured, the metallic basin avoids the cutting action of the usual sand basin, and with the aid of the measuring basin the pouring temperature may be controlled.

The entire construction is extremely light and simple, and as a result of forming the cope and core in one piece, and previously forming the vents in the cores, the formation of the vents is facilitated, and they are protected from the metal, and furthermore the number of joints is reduced.

I claim and desire to obtain by Letters Patent the following:

1. Molding apparatus comprising a form or flask, a sand mold, a metal plate having an aperture, and a body core of sand or other suitable core material molded on said plate around said aperture and forming an integral part of the continuous, unbroken sand surface of the plate, said sand surface being adapted to contact directly with said sand mold, said body core having a sprue hole communicating with the aperture in said metal plate, and the sprue hole being closed by a portion of the body core at the end opposite said aperture in the plate and being

gated outwardly in the length of the core, said gates opening on the circumference of the core.

2. Molding apparatus comprising a form
5 or flask, a plate having a main aperture, additional surrounding apertures, and transverse venting passage-ways in the plane of the plate communicating with said surrounding apertures, a body core of sand or
10 other suitable material having an outwardly gated sprue hole, said gates opening on the circumference of the core, said body core being formed integrally with the mold surface on the said plate, with the sprue hole
15 registering with the main aperture in the plate, whereby the core material penetrates the said surrounding apertures and locks the body core to the said plate.

3. Molding apparatus for casting metal
20 cylinders comprising a form or flask, a sand mold, a metal plate forming the entire cope and having a main aperture, additional surrounding apertures and transverse venting

passage-ways in the plane of the plate communicating with said surrounding aper- 25
tures, a body core of sand or other suitable core material molded on said plate around said main aperture and forming an integral part of the continuous, unbroken sand surface of the plate, said body core having a 30
sprue hole communicating with said main aperture and said sprue hole being closed by a portion of the body core at the end opposite said main aperture and being gated
35 in the length of the core, said gates opening on the circumference of the core, whereby the said metal plate forming the cope, together with the body core, is separate from the main sand mold.

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

DAVID W. MESICK.

Witnesses:

HENRY SHELDON,
HERBERT G. OGDEN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."