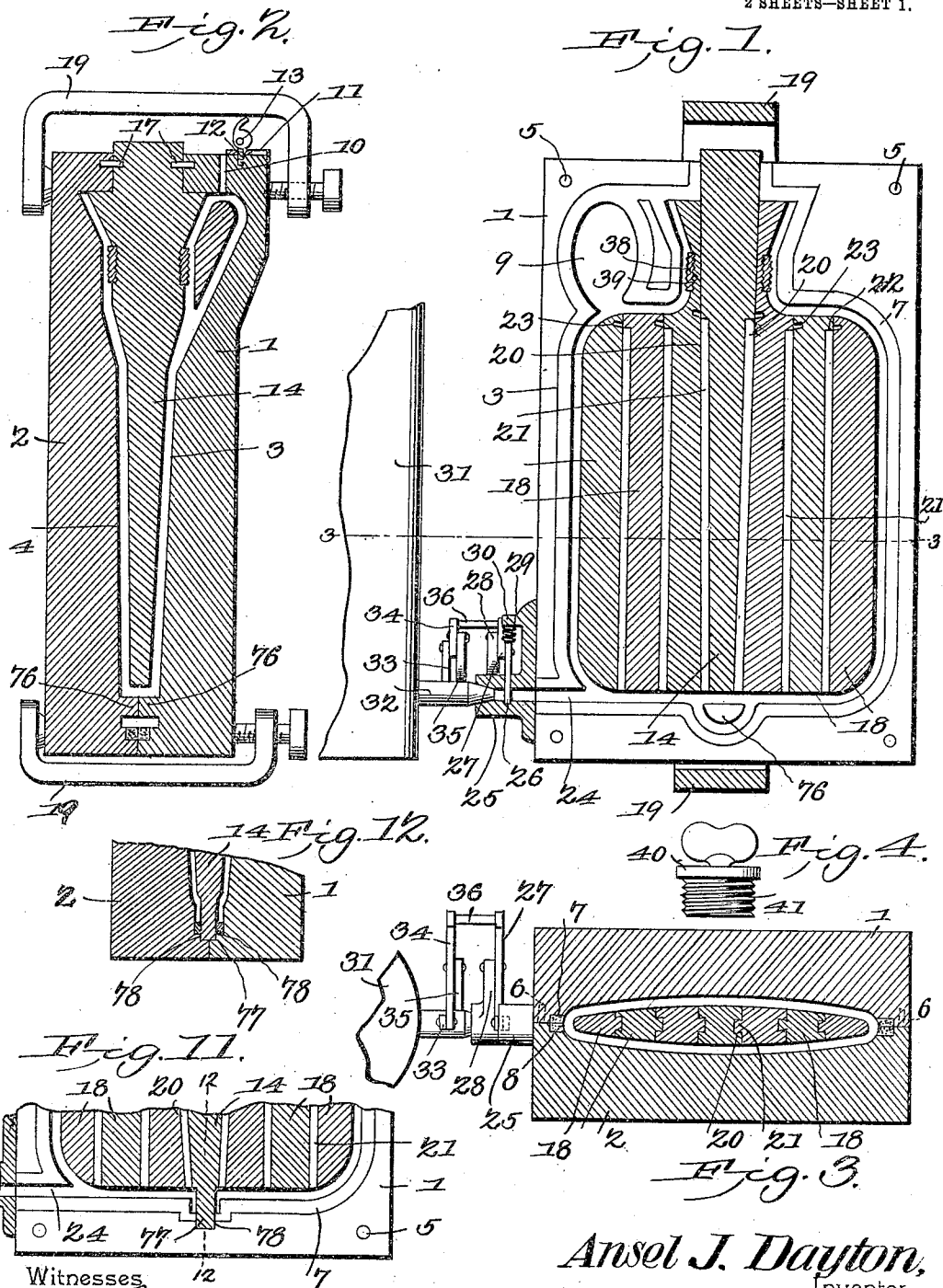


A. J. DAYTON.

MOLD.

APPLICATION FILED DEC. 16, 1904.

2 SHEETS—SHEET 1.



Witnesses  
*E. H. Stewart*  
*R. J. Shepard*

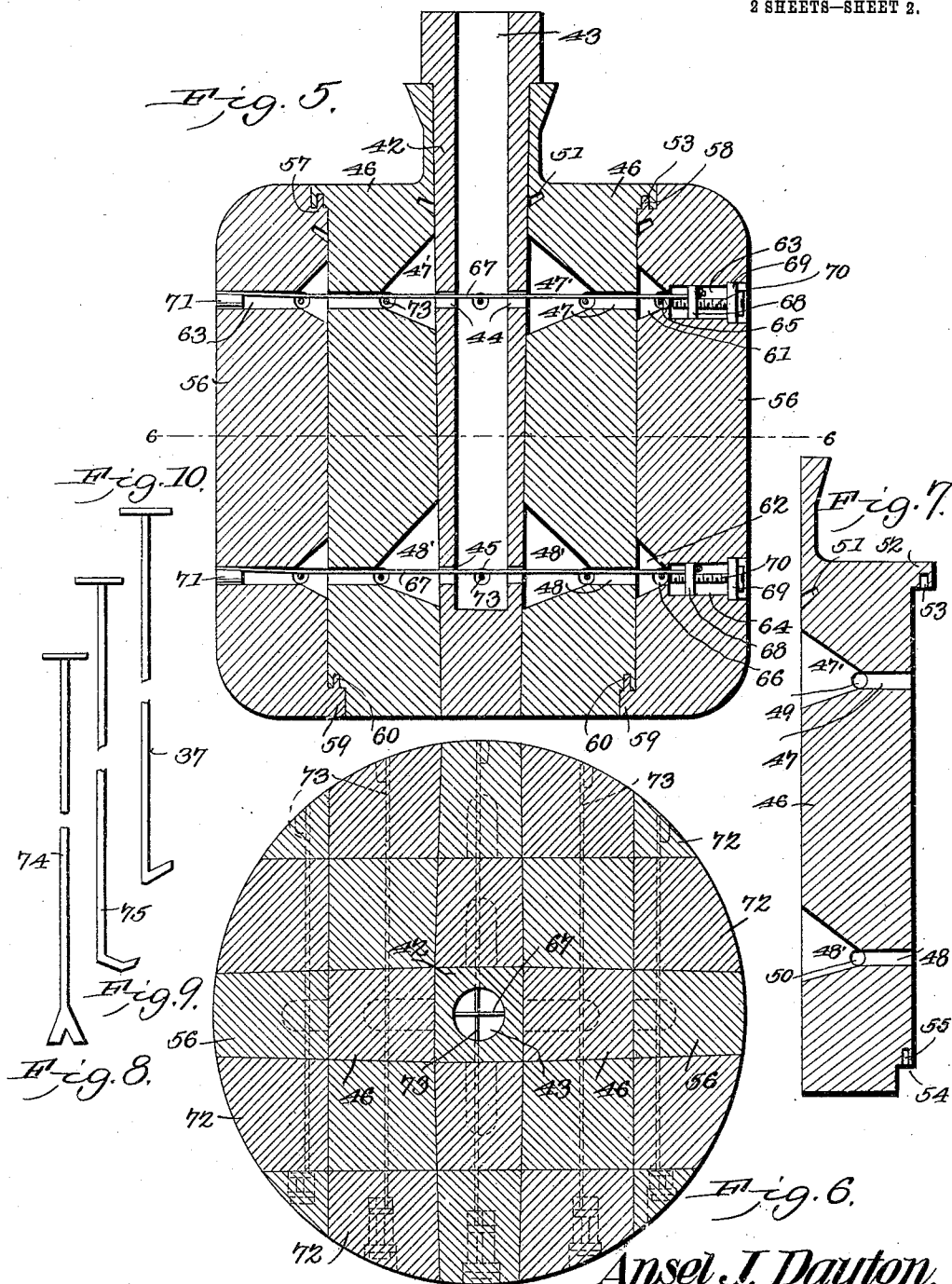
Ansel J. Dayton,  
 Inventor

by *Cash & Co*  
 Attorneys

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*Ansel J. Dayton,*  
Inventor

Witnesses

E. J. Stewart  
H. J. Shepard

by *C. A. Knowlton*  
Attorneys

# UNITED STATES PATENT OFFICE

ANSEL JACOB DAYTON, OF TACOMA, WASHINGTON.

## MOLD.

No. 806,783.

Specification of Letters Patent.

Patented Dec. 12, 1905.

Application filed December 16, 1904. Serial No. 237,136.

*To all whom it may concern:*

Be it known that I, ANSEL JACOB DAYTON, a citizen of the United States, residing at Tacoma, in the county of Pierce and State of Washington, have invented a new and useful Mold, of which the following is a specification.

This invention relates to the art of casting hollow articles, and while capable of general application is particularly designed for the production of rubber articles—such, for instance, as water-bottles and the like.

It is furthermore designed to provide for conveniently setting up the core and assembling the same with the flask and also to facilitate the removal of the core from the mouth or opening of the cast article. In this connection it is proposed to produce an improved sectional core with its sections arranged to prevent displacement thereof under the influence of the molding material when filling the flask, while at the same time to enable the convenient separation of the core-sections to permit individual removal thereof after the completion of the casting operation.

A further object is to maintain a pressure upon the material in the flask after the same has been filled to permit the escape of air during the filling of the flask, so as to obviate air-bubbles in the cast and to effect an automatic supply of material to compensate for shrinkage, and thereby produce a strong homogeneous article.

With these and other objects in view the present invention consists in the combination and arrangement of parts, as will be hereinafter more fully described, shown in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that changes in the form, proportion, size, and minor details may be made within the scope of the claims without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings, Figure 1 is a longitudinal sectional view of an apparatus of the present invention, the core being in section and one of the flask members in elevation. Fig. 2 is a longitudinal sectional view at right angles to Fig. 1. Fig. 3 is a cross-sectional view on the line 3 3 of Fig. 1. Fig. 4 is a detail elevation of the preferred form of stopper employed in connection with the form of water-bottle which is produced by the present embodiment of this invention. Fig. 5 is a longitudinal sectional view of a modified form of core. Fig. 6 is a cross-sectional view thereof on the line 6 6 of Fig. 5.

Fig. 7 is a detail sectional view of one of the modified core-sections. Figs. 8 and 9 are detail views of implements for cutting the connections between the core-sections shown in Fig. 5. Fig. 10 is a detail view of the implement for use in removing the core-sections. Fig. 11 is a detail sectional view similar to Fig. 1, showing a modification. Fig. 12 is a detail sectional view on the line 12 12 of Fig. 11.

Like characters of reference designate corresponding parts in each and every figure of the drawings.

The flask of the present invention includes a pair of supplemental members 1 and 2, the inner faces of which are provided with sockets or recesses 3 and 4, shaped in accordance with the shape of the article to be produced, the inner face of one of the members being provided with sockets or seats 5 for the reception of dowel-pins 6, carried by the other section to prevent lateral separation thereof. The cast-recesses 3 and 4 are provided with linings of packings 7 and 8, the edges of which come into mutual contact and produce a tight joint at the meeting faces of the flask members. In addition to the recess for the reception of the material to be cast each flask-section is provided with a chamber 9 in communication with the cast-recess to receive surplus material, as will be hereinafter explained. In the top of one of the flask-sections there is a passage or opening 10, communicating with the cast recess and constituting an air-vent, there being a closure therefor consisting of a plate 11, pivotally connected to the top of the flask-section by means of a threaded pin 12, upon the upper end of which is a handled cam 13, the plate 11 capable of being swung across the opening and clamped thereagainst by the cam, so as to close the opening whenever desired.

One embodiment of the core for use in connection with the present flask has been shown in Figs. 1, 2, and 3 and consists of a central core-section 14, having its upper end projected above the top of the flask for convenience in removing the same. The central core-section is supported at its upper end by means of pins 17, which are carried by the flask-sections and enter suitable recesses or sockets in the top of said section. At opposite sides of the central core-section 14 are other core-sections 18, the central core-section being provided at opposite sides with longitudinal dovetailed

grooves 20 for the reception of corresponding tongues 21 upon the adjacent core-section 18, there being a similar connection between the other core-sections. Each of the dovetailed  
 5 grooves is open at its lower end, but terminates short of the top of the section, so as to produce a shoulder 22, the corresponding tongue or rib being terminated short of its section, so as to engage the shoulder 22, and thereby prevent  
 10 upward displacement of the core-section having the tongue. Above each tongue 21 each section is provided with an upwardly-inclined socket or seat 23 for use in removing the core-section, as will be hereinafter explained.

15 Preparatory to forming the cast the core is assembled and placed in one of the flask-sections, after which the other section is fitted in place and the two sections held together by clamps 19 or any other suitable means. It  
 20 will here be explained that the air-chamber 9 should be located at the top of the flask and the material to be cast introduced into the mold at the bottom thereof in order that the material entering the mold may operate to  
 25 compress the air in the chamber 9, whereby the compressed air in the chamber 9 produces a pressure upon the material when hardening, so as to insure a homogeneous cast. To effect the filling of the mold at the bottom  
 30 thereof, each section is pierced by an inlet-passage 24, extending through one edge of the section in substantial alinement with the bottom of the cast recess or cavity therein, there being an inlet-spout 25 carried by one  
 35 of the sections and arranged to communicate with the registered passages 24 of the flask-sections when the latter are assembled. A slide-valve 26 controls the spout 25 and is actuated by means of a lever 27, fulcrumed intermediate of its ends upon a post or support  
 40 28, rising from the spout, there being a helical spring 29 bearing against the top of the lever and a shoulder 30 carried by the flask and overhanging the inner end of the lever. The  
 45 material to be cast is contained in a suitable receptacle 31, which is provided with a discharge-nozzle 32, having its outer end tapered to fit within the tapered or funnel-shaped outer end of the spout 25 and provided with a slide-  
 50 valve 33, connected to a lever 34, which is fulcrumed intermediate of its ends upon a post or support 35, rising from the nozzle, and has a pin 36 to enter an opening in the lever 27, and thereby connect the two levers for simultaneous operation. When the flask-sections  
 55 and the core have been assembled and the supply tank or receptacle 31 connected to the mold, pressure is applied downwardly at the joint between the levers 27 and 34, so as to  
 60 elevate the two valves 26 and 33, whereby the material in the tank or receptacle 31 will flow into the mold, and when the latter has been filled pressure is removed from the levers and the two valves are automatically closed by the  
 65 spring 29. During the filling of the mold the

vent 10 is of course open, so as to permit of the escape of air, and when the mold has been filled the vent is closed, and as the inlet 25 is closed by the valve 26 the material in the mold  
 70 is under the pressure of the compressed air in the chamber 9, which is a very important advantage of the present apparatus. Moreover, as the material hardens and shrinks the excess material which has entered the air-chamber 9 runs back into the cast-chamber, so as  
 75 to compensate for shrinkage, which, together with the pressure of the air within the chamber 9, insures a homogeneous complete article. After the cast has been completed the flask-sections are removed, so as to disengage  
 80 the pins 17, (shown in Fig. 2,) and thereby permit of the center core-section 14 being withdrawn from the cast, and then the hooked implement 37 (shown in Fig. 10) is introduced  
 85 into the neck or opening of the cast article and engaged with the seat or socket 23 of either of the core-sections 18, so as to draw the same from the cast, the other core-sections being removed in a similar manner. This operation  
 90 is permissible by reason of the fact that the shoulders 22 of the core-sections 14 and 18 overhang the tops of the dovetailed tongues 21, and therefore the core-sections may be successively removed from the center section to the outer section.  
 95

When the center core-section 14 is provided with a reduced stem or projection, as in Figs. 11 and 12, an opening is formed in the bottom of the article for the reception of a tubular threaded coupling, as is commonly employed  
 100 for fountain-syringes, the coupling of course being applied after the completion of the cast.

In the production of a water-bottle or the like by means of the present invention it is proposed to cast a metallic threaded ring within the neck of the bottle for the reception of the usual closure-plug, and to accomplish this object, as indicated in Fig. 1 of the drawings, an internally and externally threaded ring 38 is placed upon the upper extremities of the  
 105 core-sections 18 before the latter are assembled upon the center core-section 14, the neck portion of each section 18 being provided with an external annular recess 39 to accommodate the ring and permit of the internal threads of  
 110 the latter being exposed at the inner periphery of the neck of the bottle when completed. As ordinarily constructed the threaded rings of water-bottles and the like are provided with inner annular flanges at their lower ends,  
 115 against which the closure-plugs are designed to engage; but I propose to omit such flange in order that the ring may be placed upon the core-sections and cast in the bottle, the upper edge of the ring being projected a sufficient  
 120 distance into the neck-opening of the bottle to form a seat against which the annular flange 40 at the upper end of the screw-threaded closure-plug 41 (shown in Fig. 4 of the drawings) may be engaged.  
 125  
 130

A modified form of core has been shown in Figs. 5 to 7, inclusive, wherein the core has been shown circular in cross-section; but it will of course be understood that any shape of core may be employed in accordance with the desired shape of the article to be produced. The central core-section 42 is provided with a longitudinal bore 43, open at its top and closed at its bottom and pierced by upper and lower sets of substantially radial openings 44 and 45. Against each face of the center core-section is another core-section 46, which is pierced by upper and lower openings 47 and 48, registering with corresponding openings 44 and 45 in the center section 42, the inner end of the openings 47 and 48 being flared upwardly and downwardly, as indicated at 47' and 48'. The opening 47 is intersected by an opening 49 at substantially right angles thereto, and an opening 50 intersects the opening 48 in the same manner. In the inner edge of the section 46, adjacent its upper end, there is an upwardly-inclined socket or recess 51 for engagement by the implement shown in Fig. 10 in removing the section. At the outer edge of the section and at its upper end there is a projected shoulder 52, in the under side of which there is a socket or recess 53. The lower end of the section 46 is notched at its outer edge to produce a shoulder 54, in which is formed a recess or socket 55. The outer core-section 56, which is adjacent the section 46, is notched at the upper end of its inner edge to produce a shoulder 57, underlapping the shoulder 52 and provided with a pin or projection 58 to enter the recess 53, while the lower end of the section 56 is provided with a projected shoulder 59 to fit beneath the shoulder 54 and having a pin or projection 60 to enter the recess 55, whereby the section 56 is held against upward displacement and the two sections are held against lateral displacement. In the inner edge of the section 56 are upper and lower flared openings 61 and 62 to register with the openings 47 and 48 of the section 46, there being comparatively large openings 63 and 64 intersecting the outer edge of the section 56 and communicating with the respective openings 61 and 62. Other openings 65 and 66 intersect the openings 61 and 62 at substantially right angles. To connect the several core-sections to the center section, so as to prevent lateral separation thereof, a tie element 67, either a cord or a wire, is passed through the aligned openings of the several core-sections, with one end connected to a shiftable member 68, preferably a nut non-rotatably fitted in the opening 63, but capable of play longitudinally thereof. A stationary washer or abutment 69 is fitted in the outer end of the opening 63, and a screw or threaded stem 70 rotatably pierces the abutment and engages the nut to move the latter back and forth. The opposite end of the cord or wire is fixed in the

opening 63 of the opposite outer core-section in any suitable manner—as, for instance, by means of a plug 71—whereby upon manipulation of the screw 70 to move the nut 68 outwardly a suitable tension will be applied to the cord 67 to maintain the core-sections in intimate relation. A similar arrangement of cord and tightening means therefor is provided for the lower portion of the core. As best indicated in Fig. 6, it will be seen that the center core-section has been shown rectangular in shape, wherefore the several core-sections 46 and 56 produce cross or radial blades, and the spaces between adjacent pairs of core-sections 46 and 56 are filled up by other core-sections 72, which are pierced by cords or wires 73, the outer sections 72 being segmental in shape to properly fill out the circular cross-sectional shape of the core, some of them having plugs to anchor the cord 73 and others having the tightening means hereinbefore described. To remove this form of core, a cutting implement 74 (shown in Fig. 8) is thrust down into the bore 43 of the center core-section 42, so as to sever the cords or wires 67 and 73, whereupon the center core may be removed. A hook cutting implement 75 (shown in Fig. 9) is then introduced into the core, so as to cut the cords or wires 73 in the core-sections 46, and then the implement 75 is engaged with the recess 51 of one of the sections 46 to draw the same into alinement with the neck or opening in the cast article, and then said core-section is withdrawn, these operations being repeated until all of the core-sections have been withdrawn.

In Figs. 1 and 2 of the drawings the mold-sections are provided at the bottoms of the cast-recesses with corresponding segmental projections 76 for producing a loop-shaped handle at the bottom of the molded article.

When it is desired to produce an opening in the bottom of the water-bottle for the reception of a pipe-coupling, the central core-section 14, as shown in Figs. 11 and 12, is provided at its lower end with a reduced extension 77, and the mold-sections are provided with corresponding recesses 78 for the reception of the projection, whereby the desired opening is formed in the bottom of the bottle.

Having fully described the invention, what is claimed is—

1. A mold for forming hollow articles having a core made up of separable sections capable of being individually withdrawn through an opening in the molded article, one of the core-sections being projected through an opening in the molded article and accessible from the exterior thereof, the other core-sections being provided in their inner edges with sockets for the reception of means introduced through an opening in the molded article to individually withdraw the core-sections.

2. A mold comprising a flask, made up of longitudinal sections, means to interlock one

of the sections with the flask, and means to successively interlock the sections with one another and the first-mentioned core-section, said means capable of being disengaged from the exterior of the mold when the first-mentioned core-section has been withdrawn.

3. A mold comprising a flask, a core made up of longitudinally-separable sections, means to interlock one of the core-sections with the flask, and said core-section capable of being withdrawn when disengaged from the flask, and the core-sections being provided with interengaging shoulders to successively interlock the same with one another and the first-mentioned core-section, said interengaging shoulders capable of being disengaged when said first-mentioned core-section is withdrawn from the mold to permit withdrawal of the other core-sections.

4. A mold comprising a flask and a core made up of separably-connected sections, the central section being projected through an opening in the flask and having a detachable connection with the latter and capable of being withdrawn through an opening in the molded article when disconnected from the flask, the successive outer core-sections having shoulders underlapping corresponding shoulders upon the successive inner core-sections to prevent endwise separation of the core-sections in one direction.

5. In a molding apparatus, the combination of a mold having a filling-spout, a slide-valve for the spout, a controlling-lever fulcrumed intermediate of its ends and connected to the valve, a filling-receptacle having a discharge-spout connected to the filling-spout of the mold and provided with a slide-valve, a lever connected to said valve and also to the first-mentioned lever for simultaneous operation of the two valves, and a spring to yieldably maintain the valves closed.

6. In a mold, the combination of a flask made up of separably-connected sections having complementary cast-chambers provided with portions intersecting one side of the flask and having a filling-inlet at the opposite side of the flask, and a core made up of longitudinal sections connected against lateral separation, the center core-section being projected outwardly through that portion of the cast-chamber

which intersects one side of the flask and capable of removal therefrom, the remaining core-sections being successively connected to one another from the outermost sections inwardly against endwise separation by the incoming molding material.

7. A mold comprising a flask provided at one end with a filling-opening, a core made up of longitudinal sections, one of the sections being projected beyond the other sections to reduce an opening in the molded article, means to detachably connect said core-section to the flask, and others of the sections being successively detachably interlocked with the extended section against endwise displacement by the introduction of the molding material.

8. A mold comprising a flask provided at one end with a filling-opening, a core made up of longitudinal sections, the center core-section being extended beyond the other sections to form an opening in the molded article, means to detachably connect the center section to the flask and the other sections being detachably interlocked successively with the center section and with one another against endwise displacement by the introduction of the molding material, the center section and the other sections capable of being successively withdrawn through the opening formed in the molded article by the center section.

9. A mold comprising a flask having separably-connected sections provided with complementary cast-chambers, and a core made up of longitudinal substantially parallel separably-connected sections, each pair of adjacent sections having a tongue-and-groove slidable connection, the several grooves being open at one and the same end of the core and closed at the opposite end of the core with the tongues abutted against the respective shoulders to prevent endwise separation of the sections in one direction, said sections being separable endwise in the opposite direction.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

ANSEL JACOB DAYTON.

Witnesses:

SWAN SAMSON,  
G. F. SETTLEMIER.