Mar. 20, 1923. 1,449,097

M. GUYOT

MULTIPART CORE

Filed Aug. 20, 1921 2 sheets-sheet 1

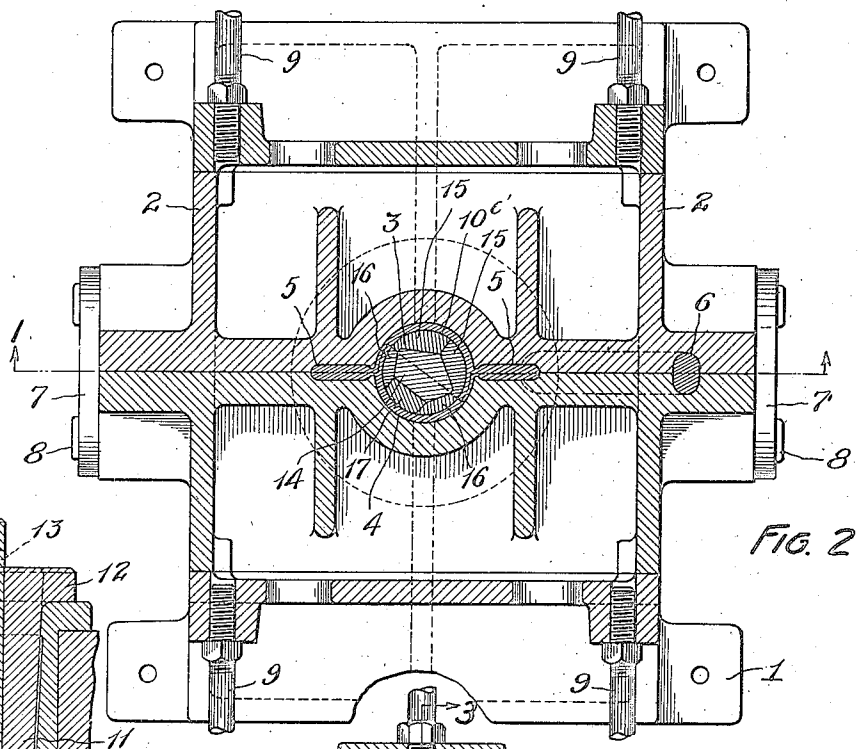


FIG. 2.

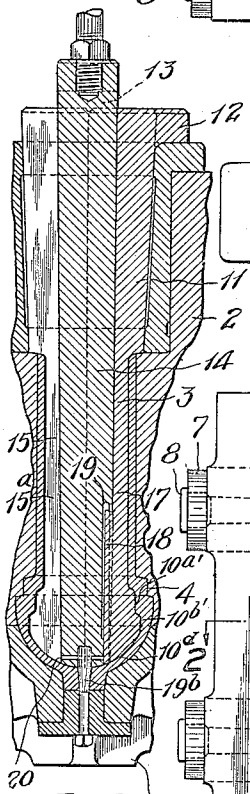


FIG. 3.

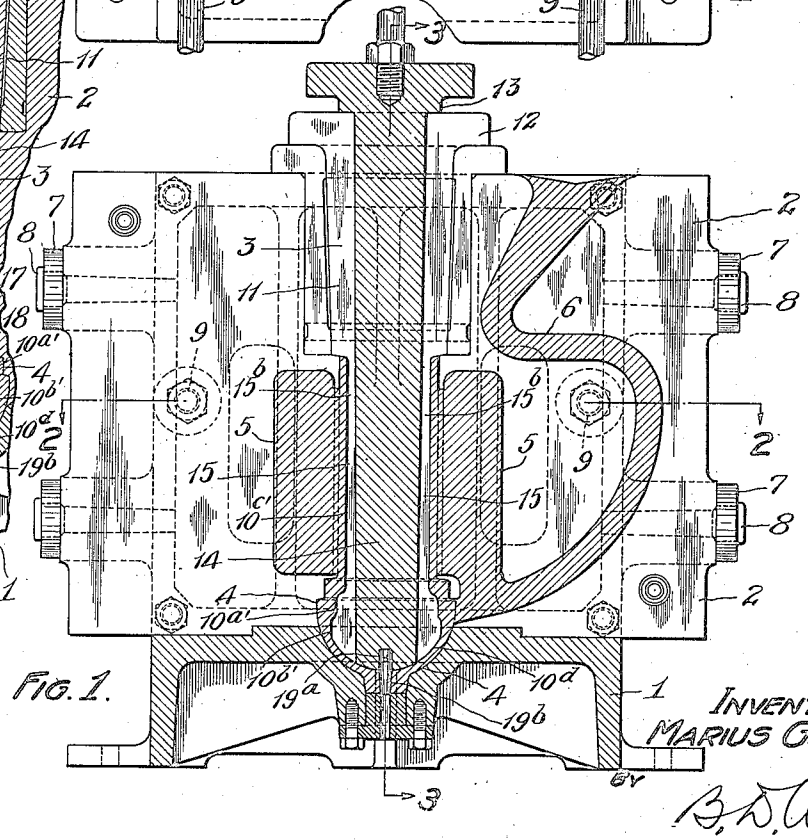


FIG. 1.

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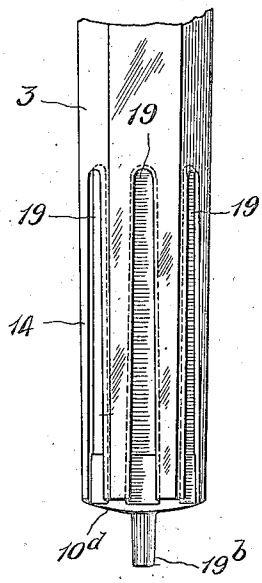


FIG. 9.

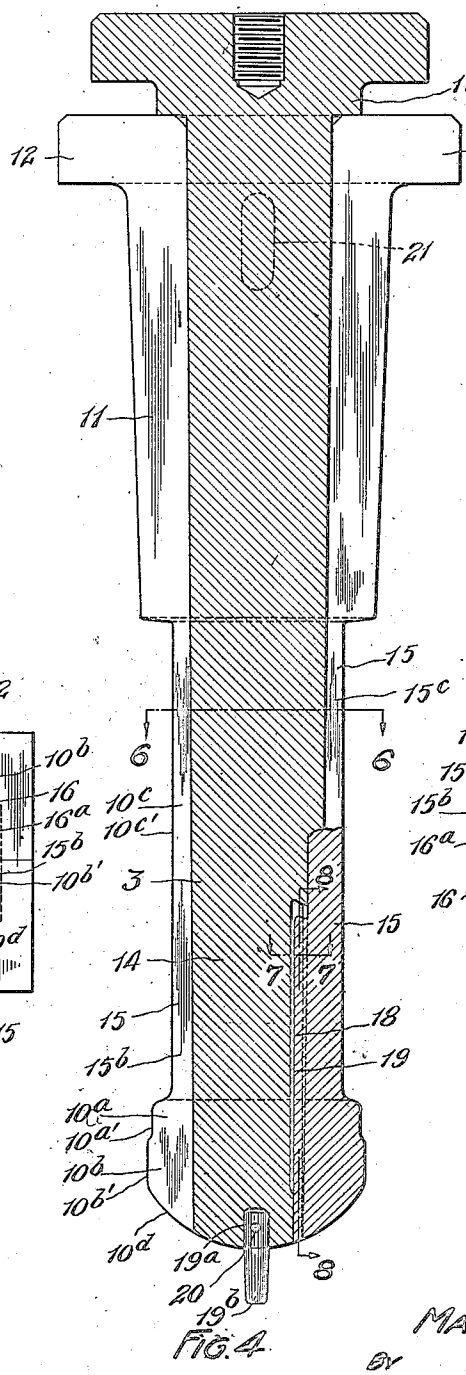


FIG. 4.

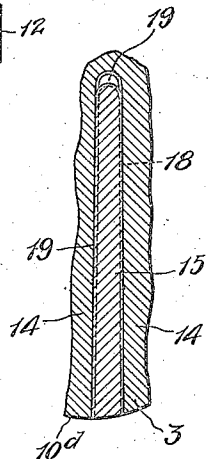


FIG. 8.

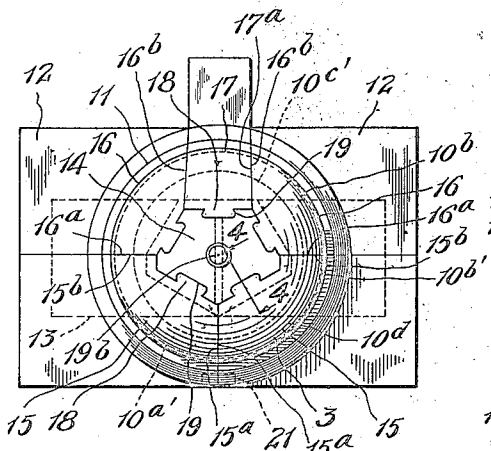


FIG. 5.

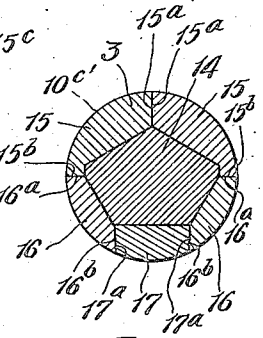


FIG. 6.

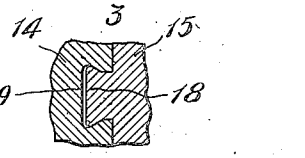


FIG. 7.

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Patented Mar. 20, 1923. 1,449,097

UNITED STATES PATENT OFFICE.

MARIUS GUYOT, OF CLEVELAND, OHIO, ASSIGNOR TO ALUMINUM MANUFACTURES, INC., OF CLEVELAND, OHIO, A CORPORATION OF DELAWARE.

MULTIPART CORE.

Application filed August 20, 1921. Serial No. 494,029.

To all whom it may concern:

Be it known that I, MARIUS GUYOT, a citizen of France, and a resident of Cleveland, county of Cuyahoga, State of Ohio, have invented certain new and useful Improvements in Multipart Cores, of which the following is a specification.

This invention relates in general to multipart permanent cores for metal molds and is especially concerned with such cores for making hollow metallic castings having recesses enlarged interiorly and relatively restricted at their open ends.

The chief object of the invention is to construct a permanent core for making articles provided with recesses or hollowed out spaces which are restricted at their open ends and enlarged interiorly.

Another object is to construct a permanent core for casting elongated cup-shaped articles having inwardly diverging inner walls.

Another object is to construct a permanent core for making cup-shaped articles in which the greatest diameter of the hollow space is adjacent the closed end of the article.

Other objects will appear and be pointed out hereinafter.

In the drawings attached hereto and forming a part of this specification:

Figure 1 is a vertical section of a mold for making elongated cup-shaped castings, taken on line 1—1 of Fig. 2.

Fig. 2 is a plan section of the assembled mold taken on line 2—2 of Fig. 1.

Fig. 3 is a vertical section of the core taken on line 3—3 of Fig. 1.

Fig. 4 is an enlarged view of the core as shown in Fig. 1 certain parts being in section as taken on line 4—4 of Fig. 5.

Fig. 5 is a bottom plan view of the assembled core.

Fig. 6 is a cross-section of the core taken on line 6—6 of Fig. 4 showing the cross-sectional configuration of the core parts.

Fig. 7 shows on an enlarged scale the tongue and groove interlocking arrangement of the central core part with each of the outside core parts as taken on line 7—7 of Fig. 4.

Fig. 8, taken on line 8—8, Fig. 4, is another view of the tongue and groove connections; and

Fig. 9 is a side elevation of the inner end of the central core part.

Although my invention is equally applicable to tubes and similar articles it will be described in detail, for purposes of illustration only, as embodied in a mold for making elongated cup-shaped castings.

Figs. 1 and 2 show a permanent metal mold comprising a base 1, two side members 2 mounted thereon and a multipart core designated as an entirety at 3. 4, 5, and 6 designate, respectively, casting, riser and gate cavities formed in the meeting faces of the side members 2, the casting cavity being also partly formed in the base 1. Clamps 7, which engage bolts 8, serve to secure the side members in assembled position while handles 9 provide means for readily separating the side members to remove the casting. Inasmuch as the mold base and side members constituting the mold body are similar in substantially all particulars, including shape, coordination of parts, arrangements for heating, and gate, riser and casting cavity formation and venting, to the well-known piston molds typified by U. S. Letters Patent 1,296,597 issued March 4, 1919 to F. A. Parkhurst, such parts will be described here only briefly. The core, 3, however, which is one embodiment of my invention will be described more fully. When assembled and in position in the casting cavity the outer surface of the inner end of the core constitutes the inner wall of the casting cavity, against which the molten metal solidifies. The part of the core which enters the casting cavity is substantially cylindrical, with the inner end composed of one or more portions 10^a, 10^b having greater diametrical dimensions then the remaining portion 10^c thereof. The inner end surface 10^d of the core which is substantially hemispherical merges into the cylindrical side surface $10^{b'}$ of portion 10^b, the latter being connected by a smooth curving surface to surface $10^{a'}$ of portion 10^a which in turn merges with surface $10^{c'}$ of portion 10^c. The core is thus adapted to provide a cored-out space or recess in the casting which is larger at its inner end, or interiorly with respect to its open end, than the open end itself.

The outer end portion 11 of core 3 is enlarged to form the upper end wall of the casting cavity and fits within and is gripped and held in assembled relation by the side members 2 when these members are held together by clamps 7. Outstanding flanges 12 and 13 on the individual outer and central core sections, respectively, seat upon the top

surfaces of side members 2, thus supporting the core sections in the casting cavity.

Core 3 is divided longitudinally into six separate parts, namely, a centrally arranged part 14, two similar outer parts 15, two other similar outer parts 16 and a single outer part 17. Part 14 is substantially an irregular pentagon in cross-section, the side faces thereof being of different sizes. To permit ready assembly and disassembly of the core, this part is tapered from its outer end to its inner end.

Side surfaces 15^a, 15^b of parts 15 and 16^a of parts 16 substantially coincide with longitudinal diametrical planes of the core while side surfaces 16^b of parts 16 and 17^a of part 17 extend at an angle to such planes, the part 17 having side walls which diverge from the circumference of the core toward the central part thereof. By reason of the divergence of the side walls of part 17, this part is the first one of the outer core parts to be removed from the casting.

Interlocking tongues 18 and grooves 19, connect the inner end of part 14 with each of the outer parts and effectually tie the core parts together, thereby preventing warping and separation of the parts.

The tongues 18 which are preferably carried by the outer core parts, taper in width, and increase in height above the surface of the core parts from the inner end of the tongue to the outer end thereof. In cross-section, each tongue is substantially wedge-shaped with the wide side outermost. The grooves 19 correspond in shape and size to tongues 18, one being cut in each side face of core part 14 and are adapted to engage the tapering tongues 18 thereby drawing the outer core parts into close engagement with central core part 14, as will be readily apparent from drawings.

In assembling the mold and core herein disclosed, the mold side members 2 are locked together in position on base 1. Core parts 15, 16 and 17 are first arranged around the circumference of the casting cavity, each being supported by its flange 12 resting on side members 2, and then core part 14 is inserted in the central opening between the core parts and is driven into assembled relation therewith.

It will be noted in Fig. 2 that the core is so positioned in the casting cavity that one of the heavy parts 15 is located opposite gate and riser cavities 5 and 6. To insure proper location of the core in the casting cavity the meeting faces 15^a of parts 15 are cut away near the outer end thereof to form a keyway 21 which engages with a key (not shown) secured to the mold member 2. A further positioning means is shown at the inner end of core 3 where pin 19^b is secured in recess 19^a in core part 14, as by a rod 20. In assembled position in the mold, pin 19 extends into an opening in base 1 and acts both to prevent slight shifting or tilting of the core and to form a hole thru the otherwise closed end of the casting.

After molten metal has filled the casting cavity and has solidified therein, the core is removed from the casting as follows. First the clamp 7 on mold members 2 are released slightly. Central part 14 is then lifted vertically out of the casting. Outer part 17, due to its tapered side walls, is next moved laterally into the space normally occupied by part 14 until its outer surface is clear of the inner wall of the casting, when it is lifted vertically out of the casting. The remaining parts 16 and 15 are then removed successively and one at a time by moving each transversely of the casting until freed from the casting walls and then vertically out of the casting.

To those skilled in the art it will be obvious that my invention makes possible the casting of tubes and similar articles as well as cup-shaped articles, each having recesses with smaller open ends or mouths than interiors. Accordingly I do not wish to have my invention limited to the illustrative details set forth above but to have its scope defined by what is claimed.

What is claimed:

1. A multipart core for hollow articles which comprises, in combination with other core parts, a part substantially pentagonal in cross-section.

2. A multipart core for hollow articles which comprises an elongated central core part substantially an irregular pentagon in cross-section and a plurality of outer core parts surrounding the sides of the said central core part.

3. A multipart core for hollow articles which comprises an elongated central core part substantially pentagonal in cross-section and a plurality of outer core parts surrounding the sides of the said central part and having interlocking engagement therewith.

4. A multipart core for a hollow article having a recess enlarged interiorly and relatively restricted at its open end which comprises a central tapered core substantially pentagonal in cross-section and a plurality of outer core parts, the assembled core being enlarged adjacent its inner end.

5. A multipart core for a cup-shaped article having a recess of enlarged diameter adjacent the closed end thereof which comprises an elongated central part, substantially an irregular pentagon in cross-section, and a plurality of outer parts surrounding the sides of the said central part, the inner end of the assembled core being enlarged adjacent its inner end.

6. A multipart core for a cup-shaped article having a recess interiorly enlarged and

relatively restricted at its open end which comprises a central core part tapered toward its inner end, and substantially pentagonal in cross-section, and a plurality of outer core parts surrounding the sides of the said central core part, the cross-sectional area of the assembled core being enlarged at points remote from the outer end thereof.

7. A multipart core for an elongated cup-shaped casting having a recess enlarged near the closed end thereof and relatively restricted at its open end, which comprises an elongated central core part irregularly pentagonal in cross-section and tapered from its outer end toward its inner end, each side face of the said central core part being provided with grooves at the inner end thereof and a plurality of elongated outer core parts surrounding the said central part and having tongues for wedging engagement with the said grooves, the cross sectional area of the assembled core near the inner end thereof being greater than at the outer end thereof.

8. A multipart core for hollow articles which comprises a central core section substantially pentagonal in cross section and a plurality of outer core sections each having inner surfaces to engage the said central core section and side surfaces to engage adjacent outer core sections, one of the said outer core sections having inwardly diverging side surfaces.

9. A multipart core for hollow articles which comprises a central core section substantially pentagonal in cross section and a plurality of outer core sections, each of the said outer core sections having an inner surface to engage the said central core section and side surfaces to engage adjacent outer core sections, certain of the side surfaces being formed on planes substantially diametrical of the said core and other side surfaces being formed on planes inclined to diametrical planes of the said core.

In testimony whereof I affix my signature.

MARIUS GUYOT.