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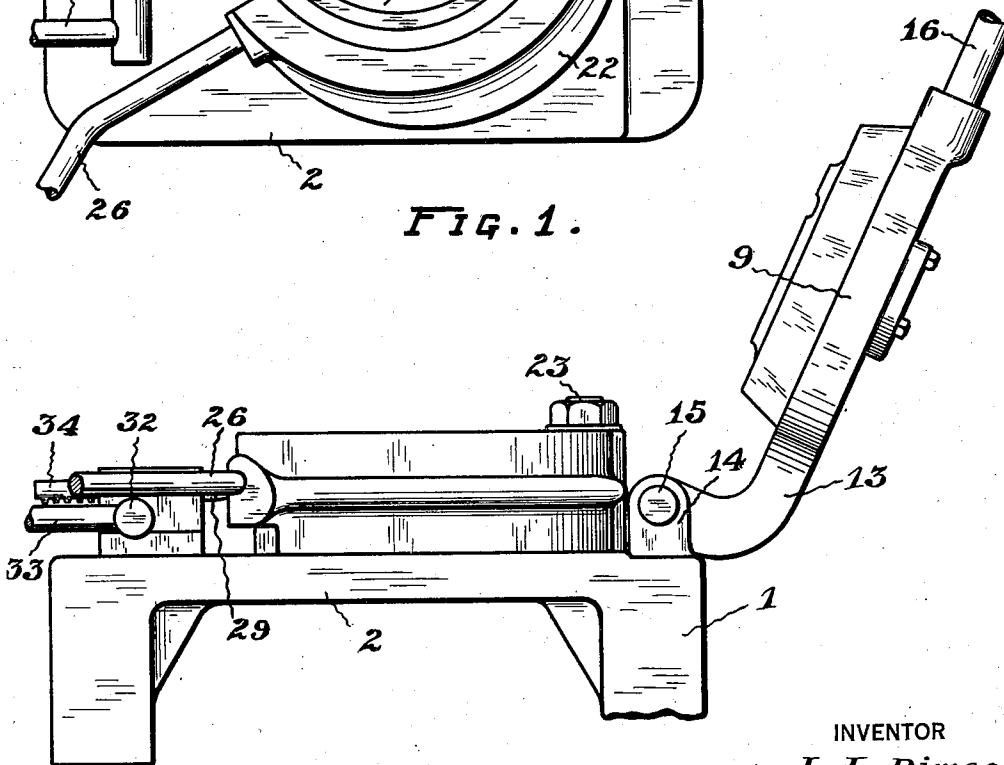
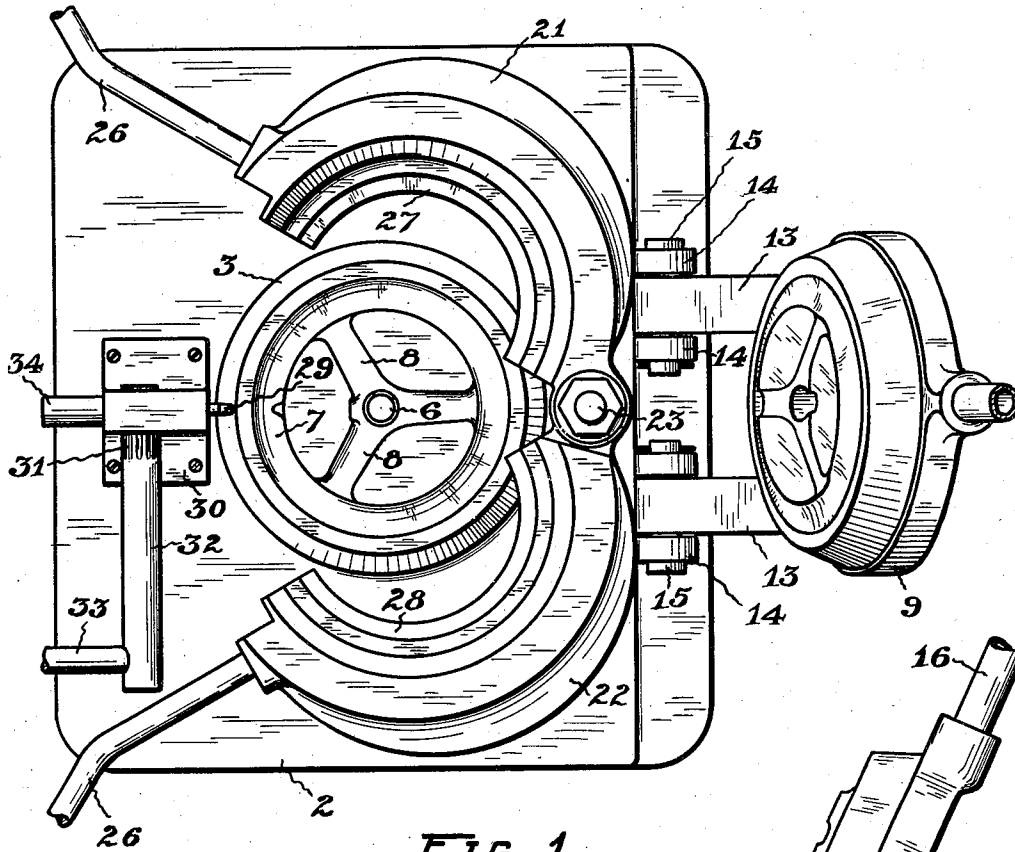
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1,745,891

APPARATUS FOR CASTING METAL ARTICLES

Filed Sept. 11, 1926

3 Sheets-Sheet 1



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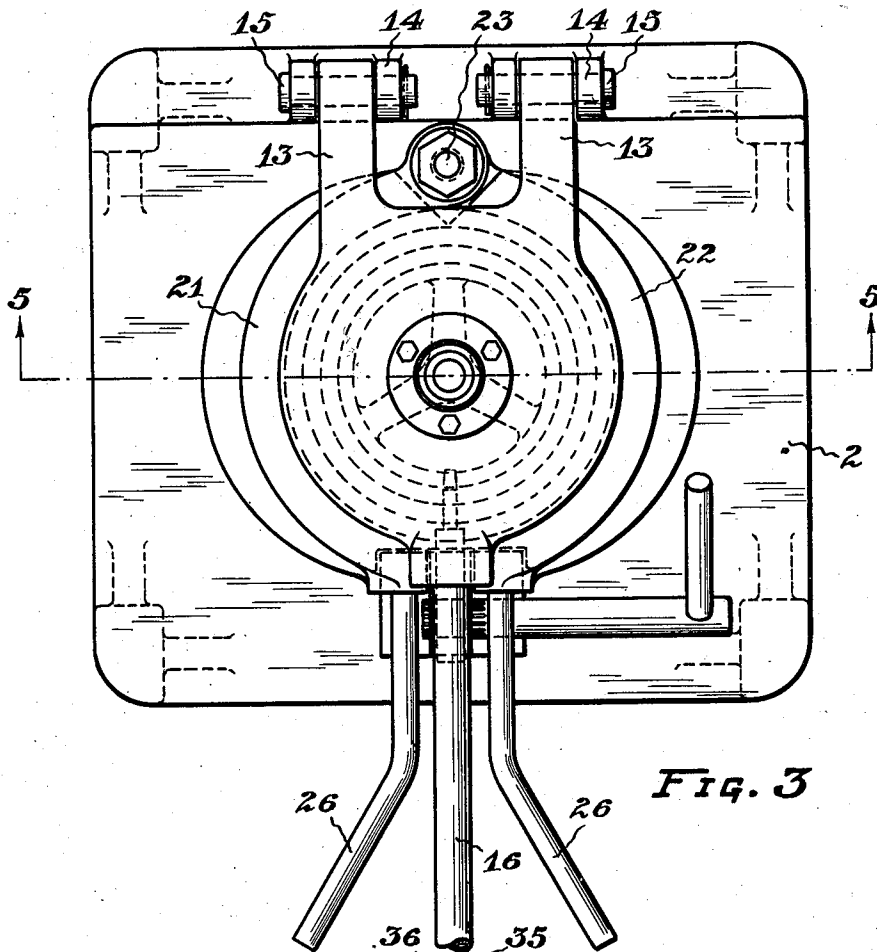


FIG. 3

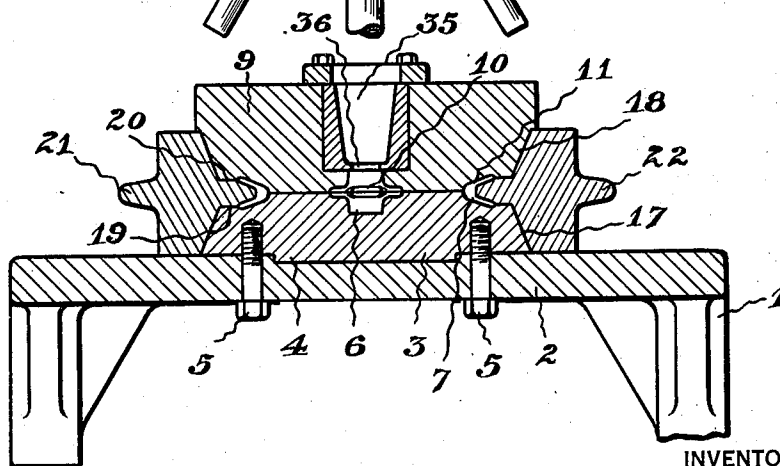


FIG. 5.

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FIG. 4.

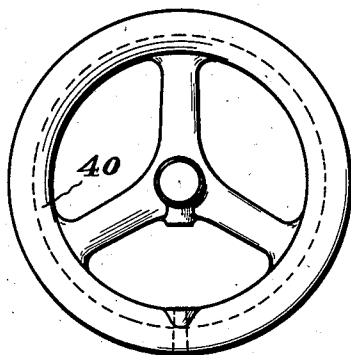
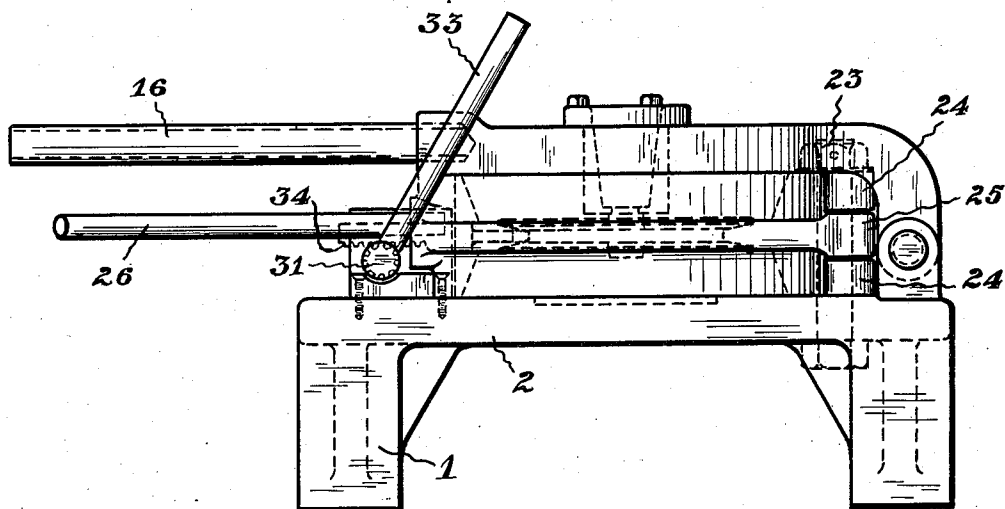


FIG. 7.

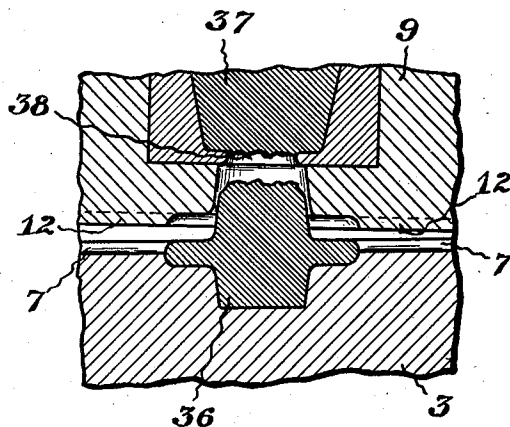


FIG. 6.



FIG. 8.

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APPARATUS FOR CASTING METAL ARTICLES

Application filed September 11, 1926. Serial No. 134,894.

This invention relates to a method and apparatus for casting metal articles and particularly to a method and means by which aluminum or aluminum alloy castings of substantially circular form can be expeditiously made.

It is an object of the present invention to provide a method of making articles of substantially circular form such as a wheel, in which very little machining is required to finish the article after casting. More specifically, it is an object of the invention to cast the article by a method such that the sprue can be readily broken from the body of the casting at a point close to the body so that the sprue does not have to be cut off and only a small portion of the surface of the casting needs to be machined.

A further object is to provide a mold formed of separable sections permitting the casting to be readily freed therefrom and to so form the gate of the mold that the sprue will be broken from the body of the casting when the mold sections are separated.

A further object is to provide a mold for substantially circular articles in which the gate opens into the casting cavity at the axis thereof. More specifically, it is an object of the invention to provide a wheel mold in which the casting is formed with its sprue joined to the hub of the wheel, and further to so form the axially disposed gate of the mold that the sprue can be easily broken from the body of the casting.

In accordance with the method of the present invention the articles are cast in a suitable mold formed of separable sections and provided with a gate which is restricted adjacent the mold cavity to form a sprue with a reduced portion which is readily breakable adjacent the body of the casting. The gate is preferably formed wholly in one of the mold sections, so that when the mold sections are moved apart, the reduced portion of the sprue will break off immediately adjacent the surface of the body of the casting, so that the trimming of the casting is greatly facilitated. The mold sections are preferably separated before the casting is fully cooled and hard-

ened, and consequently, very little force is required to break off the sprue.

The invention is illustrated herein as applied to the casting of wheels such as pulley wheels having a central hub, spokes and grooved rim. It is to be understood, however, that the invention may be employed in making castings of various forms, the accompanying illustration showing only one of many specific applications thereof.

With the above and other objects in view, the invention may be said to comprise the method and apparatus as illustrated in the accompanying drawings, hereinafter described and specifically set forth in the appended claims together with such variations and modifications thereof as will be apparent to one skilled in the art to which the invention appertains.

Reference should be had to the accompanying drawings forming a part of this specification in which:

Figure 1 is a top plan view of the mold in open position.

Fig. 2 is a side elevation of the mold in open position.

Fig. 3 is a top plan view of the mold in closed position.

Fig. 4 is a side elevation of the mold in closed position.

Fig. 5 is a transverse vertical section through the mold taken on the line indicated at 5—5 in Fig. 3.

Fig. 6 is a fragmentary vertical section showing the central portion of the mold and of a casting therein.

Fig. 7 is a plan view of a casting formed in the mold.

Fig. 8 is an edge elevation of the casting.

Referring to the accompanying drawings, the mold which is preferably composed of separable metal sections, is shown mounted upon a suitable frame or base member 1 which has a flat top 2 upon which is fixedly secured a drag 3, which has upon its under side a boss 4 fitting in a recess in the top. The drag 3 is preferably detachable from the frame 1 and is secured to the top 2 of the frame by means of suitable bolts 5 as shown in Fig. 5. The mold shown herein is designed for

casting pulley wheels and the drag 3 is, therefore, provided with recesses corresponding to the half of a wheel to be formed which lies to one side of its center plane. In this instance the wheel has a hub, a rim and connecting spokes and the drag 3 is circular in form and has a relatively deep hub recess 6 at the center thereof, an annular groove or rim recess 7 adjacent the outer edge thereof concentric with the recess 6, and radial grooves or spoke recesses 8 connecting the recess 6 with the annular recess 7, as shown in Fig. 1.

The mold also has a cope 9 which is also of circular form and is provided on its under face with hub, rim and spoke recesses 10, 11 and 12 complementary to the hub, rim and spoke recesses of the cope. Between the spoke recesses, the drag and cope have flat faces which are in contact when the mold is closed as shown in Fig. 5.

The cope 9 is provided with parallel integral arms 13 which are connected at their outer ends to bearing lugs 14 by means of coaxial pivot pins 15 and, diametrically opposite the pivotal axis thereof, the cope 9 is provided with a rigid handle 16 by means of which it may be swung about its pivot.

The drag 3 and cope 9 have oppositely beveled edges 17 and 18, and the edge portions 19 and 20 of the opposed faces thereof between the rim grooves and beveled edges are in parallel planes offset with respect to the engaging faces of the drag and cope within the rim recesses thereof, so that, when the cope is in place on the drag, these edge portions 19 and 20 are spaced apart for a purpose which will presently be explained.

To form the groove in the rim of the pulley a pair of semicircular core sections 21 and 22 are provided which are adapted to fit together around the cope and drag. The core sections 21 and 22 are carried by the frame 1 and are pivoted together and to the frame by a fixed vertical pivot post 23 extending through knuckles 24 and 25 projecting from adjacent ends of the sections. The free ends of the core sections are provided with rigid handles 26 by which the sections may be swung to and from closed position. The core sections 21 and 22 are provided on the inner sides thereof with beveled faces adapted to fit against the beveled faces 17 and 18 of the drag and cope and between the beveled faces with inwardly projecting core forming ribs 27 and 28 which are semicircular and adapted to fit between the edge portions 19 and 20 of the opposed faces of the drag and cope. The ribs 27 and 28 serve to close the periphery of the casting cavity of the mold and the inner edges of these ribs lie between the rim forming grooves 7 and 11 of the drag and cope, the ribs being rounded and providing a continuous peripheral core which forms the pulley groove.

The mold may also be provided with a core pin 29 for forming a radial aperture in the rim of the wheel. The core pin 29 is slidably mounted in a bracket 30 fixed to the top 2 of the supporting frame immediately adjacent the meeting ends of the core sections 27 and 28, the pin 29 being movable to a position in which it projects into the mold cavity between the abutting ends of the core sections, the ends of said sections being suitably grooved to receive the pin. For retracting the pin 29, a pinion 31 is provided on a shaft 32 which is provided with a handle 33, the pinion 31 engaging a rack 34 attached to the pin.

The cope 9 is provided at the center thereof with a gate 35 which has a restricted opening 36 at its lower end through which metal flows into the mold cavity. The molten metal flows through the gate 35 into the mold cavity, filling the same and forming a casting 40 such as shown in Figs. 7 and 8. The metal remaining in the gate 35 forms a sprue 37 as shown in Fig. 6, and this sprue is connected to the body of the casting by a restricted neck portion 38 formed in the restricted opening 36 of the gate.

After pouring, the mold is opened as soon as the casting has cooled sufficiently to hold its shape but before it has fully hardened. Since the gate is formed in the cope, the lifting of the cope will carry the sprue with it, the upward and lateral movement of the cope about its pivot breaking the sprue in the reduced portion 38 thereof away from the body of the casting, which is retained on the drag by the core sections.

The core sections may then be swung apart and the casting removed from the mold.

Furthermore, it is to be understood that the particular forms of apparatus shown and described, and the particular procedure set forth, are presented for purposes of explanation and illustration and that various modifications of said apparatus and procedure can be made without departing from my invention as defined in the appended claims.

What I claim is:

1. In a permanent mold, in combination, a lower substantially horizontal mold section recessed to define the lower radial surface of a wheel casting, a plurality of upstanding intermediate mold sections arranged to cooperate with each other and with said lower mold section, said intermediate mold sections being recessed to define together the complete peripheral surface of the casting, and an upper mold section recessed to define the upper radial surface of the casting and arranged to cooperate with the other mold sections to define the casting cavity, said upper mold section being recessed to define a sprue cavity communicating with the portion of the casting cavity forming the center or hub portion of the casting, whereby

a casting may be formed having a substantially smooth peripheral surface and whereby substantially the only trimming required is on one radial surface of the casting at the center or hub thereof.

2. In a permanent mold, in combination, a lower substantially horizontal mold section recessed to define the lower radial surface of a wheel-shaped casting, a plurality of upstanding intermediate mold sections arranged to cooperate with said lower mold section, said intermediate mold sections being recessed to define together the complete peripheral surface of the casting, and a top mold section hingedly mounted for movement in a vertical plane, recessed to define the upper radial surface of the casting, and arranged to cooperate with other mold sections to complete the casting cavity, said top mold section being recessed to define a sprue cavity communicating through a relatively smaller gate opening with the center or hub portion of the casting cavity whereby a substantially wheel-shaped casting may be formed with a peripheral surface requiring no trimming and whereby the sprue may be severed from the casting upon raising the top mold section.

3. In a permanent mold, in combination, a lower substantially horizontal mold section recessed to define the lower radial surface of a substantially wheel-shaped casting, a pair of upstanding, intermediate, substantially semi-cylindrical mold sections pivoted for movement in a horizontal plane and arranged to cooperate with each other and with said lower mold section, said intermediate mold sections being recessed to define together the complete peripheral or circumferential surface of said casting, and an upper mold section arranged to cooperate with the other mold sections and recessed to define the upper radial surface of the casting, said upper mold section being recessed to form a sprue cavity communicating with the casting cavity substantially at the center thereof.

4. In a permanent mold, in combination, a base, a lower substantially horizontal mold section secured to said base and recessed to define the lower radial surface of a substantially wheel-shaped casting, a pair of upstanding, intermediate, substantially semi-cylindrical mold sections hingedly secured to said base for movement in a horizontal plane and arranged to cooperate with each other and with said lower mold section, said intermediate mold sections being recessed to define together the complete peripheral surface of said casting, and an upper mold section hingedly secured to said base for movement in a vertical plane, recessed to define the upper radial surface of the casting, and arranged to cooperate with said other mold sections to complete the casting cavity, said upper mold section being recessed to define

a sprue cavity communicating with the casting cavity at the center thereof whereby a casting may be formed requiring trimming only at the center or hub portion on one side thereof.

In testimony whereof I affix my signature.

JAMES J. DIMEO.

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