Oct. 29, 1929. W. GILLHAUSEN 1,733,661

CENTRIFUGAL CASTING

Filed May 23, 1927

Fig. 1.

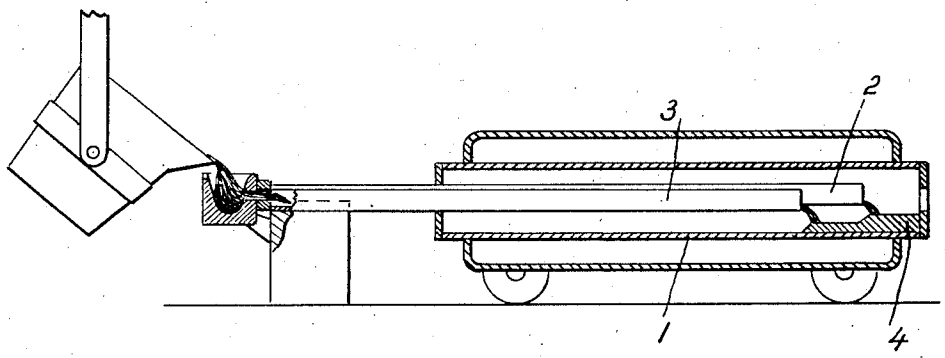
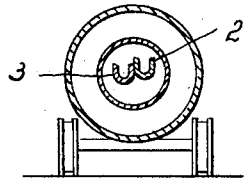


Fig. 2.



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UNITED STATES PATENT OFFICE

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CENTRIFUGAL CASTING

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My invention relates to improvements in centrifugal castings, and more particularly aims at providing means for the production of hollow castings, such as for instance pipes of all kinds, whereby more castings can be produced per unit of time than was hitherto possible.

In the production of hollow castings by centrifugal action in molds rotating about a horizontal axis it has already been suggested to cast the metal in two or more superposed layers. However, this mode of casting as hitherto suggested consumes much time.

It has further been suggested to introduce the metal into the mold laterally from a pair of tipping troughs so that the pipe is built up rather in the form of spiral sheets by sheet-like discharges of molten metal over the edges of the troughs upon simultaneously or consecutively rotating the troughs about their longitudinal axes.

It is the object of this invention to produce hollow castings by centrifugal action in which the hollow casting is built-up helically in two or more superposed layers, in distinction from a sheet-like discharge, without requiring any more time than by casting in a single layer. This is achieved by providing troughs adapted to discharge the molten metal therefrom in the form of jets whereby the molten metal is deposited into the rotating mold in the form of a plurality of helical windings which are fused together while in course of formation. In other words, the second or inner layer is being deposited on the inner surface of the outer layer while this outer layer is still in course of formation.

In order to produce castings according to this new method I prefer using a plurality of metal troughs capable of axial displacement relative to the mold. Preferably a separate casting metal trough is used for each individual layer. The troughs can all be disposed on the same level but they may also be arranged on different levels, means being provided for adjusting the level and rate of displacement of each trough so that the drop of the metal from each trough can be adjusted during the casting operation. Preferably the troughs can also be displaced relative to each other in the longitudinal direction in order to allow the distance between the several metal jets and layers to be controlled in such manner that the metal layer formed by one jet has the quality required for causing this layer to combine and melt together with the metal layer formed by the second or third jet. To this distance between the several jets also corresponds the interval of time between the commencement of the formation of the several layers. Therefore the present invention enables me to cast a hollow body in several layers with a single stroke of the several metal troughs. Obviously instead of displacing the troughs relative to the mold, I can also displace the mold relative to the troughs. Casting can thus be carried through very rapidly and castings of any desired wall thickness can be obtained, the castings produced in such manner having a particularly homogeneous structure. For this reason the new process is particularly adapted for the casting of thickwalled hollow bodies, such as tubular blanks.

In the drawings affixed to this specification and forming part thereof an apparatus adapted for the carrying out of the new process is illustrated diagrammatically by way of example.

In the drawings

Fig. 1 is a longitudinal section, and

Fig. 2 is a cross section.

Referring to the drawings, 1 is the centrifugal mold arranged in horizontal position, and 2, 3 are two metal troughs extending side by side axially into the mold, the trough 2 being disposed at a slightly higher level than the trough 3 and being staggered relative to the trough 3, its inner end extending farther into the mold than the inner end of the trough 3. Obviously the axial distance between the inner ends of the troughs can easily be varied to suit the requirements of each individual case.

In the present instance the mold is shown as being displaceable axially on wheels relative to the metal troughs 2, 3, which are shown stationary, metal being poured into the outer ends of the troughs from a ladle, as is well

known to those skilled in the art. The two jets of molten metal issuing from the inner ends of the two troughs 2, 3 will, as shown in the drawing, form two superposed layers of molten metal, the inner layer being formed by the trough 2, and on the mold being displaced axially to the right in the drawing, the inner surface of the mold will be covered with two concentric layers of molten metal formed substantially simultaneously.

Obviously the number of metal troughs used in the production of a single casting may vary according to the requirements, and it is also possible to cast different metals by means of different troughs, so that castings consisting of concentric layers of different metals can be produced.

If desired, the different metal troughs may also project into the mold from different ends.

I wish it to be understood that I do not desire to be limited to the exact details of construction shown and described, for obvious modifications will occur to a person skilled in the art.

I claim:—

1. The method of casting metal centrifugally which comprises helically depositing a layer of molten metal upon the inner face of a rotating mold, and helically depositing a second layer of molten metal upon the first while the latter is still in course of formation, whereby the two are fused together.

2. The method of casting metal centrifugally which comprises introducing a jet of molten metal at one end of a rotating mold, building up the casting helically by a relative axial movement between the jet and the mold, and simultaneously introducing a second jet of molten metal upon the metal deposited by the first before the latter has completely formed, whereby an integral structure is formed.

3. The method of casting metal centrifugally which comprises introducing a plurality of axially spaced jets of molten metal into a rotating mold and building up a casting composed of superposed concentric layers of metal by a unidirectional axial displacement of the mold relative to the jets.

4. The method of casting metal centrifugally as claimed in claim 3, the axial distance between the several jets corresponding to the interval of time between the commencement of the formation of the several layers, so that each inner layer fuses with the next adjacent outer one.

In testimony whereof I affix my signature.

WERNER GILLHAUSEN.