July 30, 1940. J. HAUCK 2,209,400

APPARATUS FOR THE PRODUCTION OF GOODS BY CENTRIFUGAL CASTING

Original Filed May 15, 1937

Fig. 1

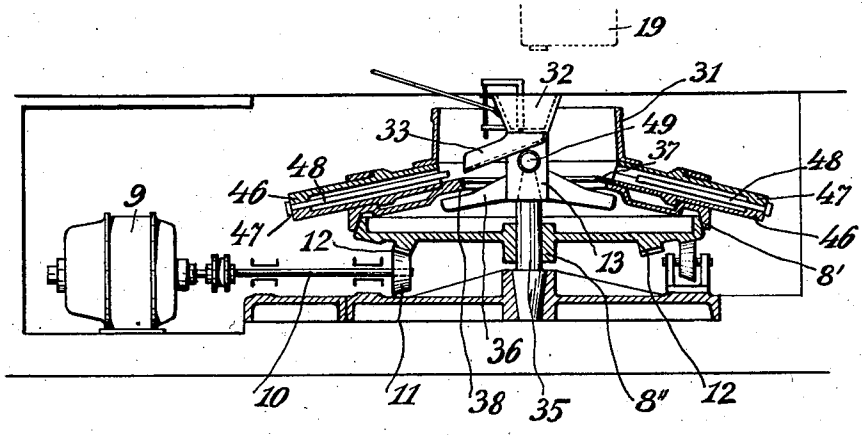
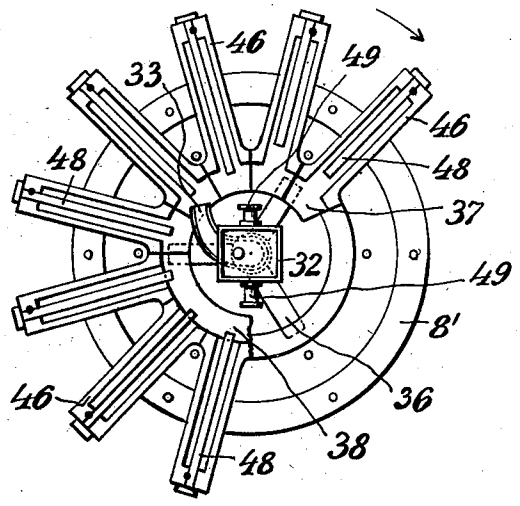


Fig. 2



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APPARATUS FOR THE PRODUCTION OF GOODS BY CENTRIFUGAL CASTING

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Original application May 15, 1937, Serial No. 142,842. Divided and this application January 6, 1938, Serial No. 183,684. In Austria May 20, 1936

3 Claims. (Cl. 22—65)

The invention refers to an apparatus for commercial mass-production, especially of semi-manufactures (for example bars, billets, blooms, vessels, etc.) by means of centrifugal casting, in which certain difficulties that were encountered heretofore are avoided as far as possible. The new apparatus is a division of my application Serial No. 142,842, filed May 15, 1937, and is intended to allow the casting of the metal in moulds which are arranged so as to be permanently inclined downwardly with respect to the vertical axis, the inclination preferably corresponding to the direction of the resultant of the centrifugal and gravitational forces acting upon the metal which is being cast, and room being left for the air contained in the moulds to escape unhindered.

In order to facilitate the pouring and the control thereof, it is provided according to the invention to use between the moulds proper and the ladle or pan containing the molten metal to be cast, an intermediate vessel or receptacle which may form either an auxiliary ladle or an intermediate funnel. There is no substantial difference between an auxiliary ladle and such a funnel in certain cases, especially if the said funnel is provided with a shutter or similar controlling organ.

There are at least two advantageous effects to be attained, namely the possibility to replace or spare a pouring head and leads as heretofore used, or a complete conical distributor as specified in my copending application of even date, Ser. No. 183,733, furthermore the possibility to avoid the large runners or dead heads hitherto experienced or at least to keep them as small as possible, since the pouring may be effected by running first into the said intermediate vessel only so much metal at a time as it required just to fill the moulds once and, if desired, to form a small runner.

In one species of my new apparatus, the intermediate vessel or receptacle is provided with a spout of special shape and construction, thereby facilitating the pouring and its control. The said spout is according to the invention inclined downwardly substantially to the same degree as are the moulds which latter are, as known, preferably inclined downwardly approximately in the direction of the resultant of the centrifugal and gravitational forces acting upon the molten metal to be cast. It is furthermore advantageous to give to the said spout a curved shape so as to lead the stream of molten metal leaving the spout, in a direction not being radial in the proper sense, but rather approximating to the direction of rotation, that is approximately the direction of the resultant of the radial and circumferential velocities so that the entering of the metal into the moulds will take place in a very quiet and efficient manner.

In another species of my new apparatus the intermediate vessel or receptacle is provided with means adapted to engage under the plate or base member which carries the series of moulds, as set forth in my copending application of even date, Ser. No. 183,733, the said carrying element preferably being not integral with the intermediate vessel according to the invention, nor with the base or the driving means of the apparatus, but being only loosely fitted together with the said parts so that the moulds and the carrying elements may be removed from the apparatus independently of the said vessel, but that when the latter is lifted and removed from its seat, the plate or base member, either carrying the moulds or being freed therefrom, will also be removed. This latter fact allows of a quick and easy handling of the apparatus in practical operation.

In a further embodiment of my apparatus the bottoms of the moulds have each a projection at the pouring aperture. In place of these projections at the bottom of the moulds, the base member which carries the moulds can have an extension which projects beyond the pouring apertures of the moulds. Hereby the effectiveness of the use of the said intermediate vessel or receptacle and its spout will be still increased since the said projections or extension will be adapted to receive the metal being cast and lead it into the moulds.

Figs. 1 and 2 show by way of example an embodiment of my invention, a plurality of species thereof being, for the sake of simplicity, illustrated in the same figure.

Fig. 1 is an elevation of a device for the centrifugal casting of semi-manufactures, whilst Fig. 2 is the corresponding plan view. The apparatus comprises a base member being composed of a lower part 8'' and a superposed upper part 8', both being rotationally arranged on a vertical driving shaft 35 which forms the axis of rotation for the moulds 46 that are borne in a circular row adjacent to each other on the upper base member 8', as is clearly to be seen in Fig. 2. In this example the moulds 46 are provided with a core 48 fixed at the outer ends 47 thereof, for production of hollow castings open at both ends, but moulds without a core may be used as well. The moulds 46 are divided each along their longitudinal axes in order to allow rapid emptying, but

this forms no part of the present invention. In Fig. 2 the moulds 46 are shown in open state that is with the upper halves taken away. Upon the circle of moulds 46, concentrically with respect to the axis of rotation, a tubular piece 31 is placed loosely but fixed in a suitable way (not shown) forming a safety ring 31 during the pouring operation. The drive may be effected by a motor 9 through a shaft 10 having a pinion 11 which meshes with a spur gear 12 at the bottom side of the base element 8''.

The molten metal is contained in the main pan or ladle 19 which is only outlined in the drawing, and poured into an intermediate vessel or receptacle which is shown as a kind of funnel positioned upon the central shaft 35 by means of a suitable sleeve or the like 13 which also may be provided with lateral studs 49 to be gripped by the organs of a crane or the like for lifting and lowering the aforesaid parts. The funnel 32 is provided with a spout 33, which, in its preferred form illustrated, is bent or curved into the direction of the resultant of radial and circumferential velocities of the metal entering the moulds 46. The funnel 32 or the spout 33 may be provided with a shutter or the like (not shown) allowing to collect a certain amount of molten metal in the vessel so that it forms an intermediate or auxiliary ladle. The dimension of the funnel or ladle 32 may be chosen according to the actual requirements in the special cases of use. The vessel or receptacle 32 is shown as being at the circumference of its carrying sleeve 13 provided with three arms or brackets 36 engaging under the base member 8'. When the funnel 32 is lifted and removed, the member 8' is simultaneously removed from its base 8''.

In order to facilitate the pouring of the metal from the spout 33, the individual molds 46 may be, at their ends toward the axis of rotation, provided with extensions 37 constituting a kind of platform level with the bottom edge of the opening of the mould. The extensions 37 are so shaped that, when all of the moulds 46 are placed in a circle, the extensions 37 of all these moulds form a complete circular rim being little beneath the level of the outer end of the spout 33 and thus adapted to receive from there the stream of molten metal.

In another embodiment of the same inventive idea which is shown in the left part of Fig. 1 and in the lower part of Fig. 2, the moulds 46 have no extensions 37 but these are replaced by an equivalent projection of the base member 8' constituting a protruding rim 38 which also forms a circular platform level with the bottom edge of the inside opening of the moulds placed upon that base member.

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.

What I claim is:

1. A centrifugal casting apparatus for the production of goods, particularly semi-manufactures, comprising, in combination, a plurality of molds arranged radially about and spaced from a vertical axis, a ring shaped support having a central opening, said support being common to all said molds and supporting them from below, a vessel open at its top for receiving molten material and provided with means for feeding said material to said molds, said vessel arranged within the space enclosed by said molds and provided with means extending through said center opening of said support outwardly below the latter, and rotatable means for effecting centrifugal casting provided with a seat each for said vessel and support, so that upon lifting and removing said vessel from its seat said support and said molds are also removed.

2. In an apparatus as described in claim 1, said molds provided with inlet openings at their front side facing said axis and with rims projecting from said front side below said openings towards said axis under said feeding means and complementing each other to form a ring, said rims having upper surfaces sloping downwards to said inlets so that metal can be fed from said feeding means upon said sloping surfaces by centrifugal action.

3. In an apparatus as described in claim 1, said support provided with a ring-like rim projecting into said space enclosed by said molds, said rim provided with an upper conical surface sloping downwards to the inlets of said molds and ending substantially level with a lowermost point of said inlets, said feeding means of said vessel ending above said sloping surface so that molten metal can be fed through said feeding means upon said conical surface by centrifugal action.

JULIUS HAUCK.