Aug. 28, 1934. P. HAESSLER 1,971,652

DEVICE FOR CASTING UNDER PRESSURE

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Fig. 1

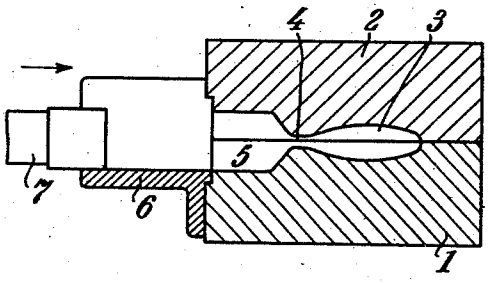


Fig. 2

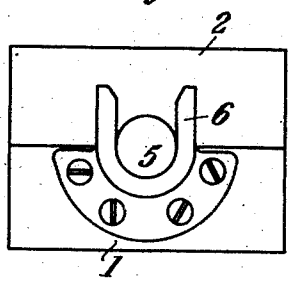


Fig. 3

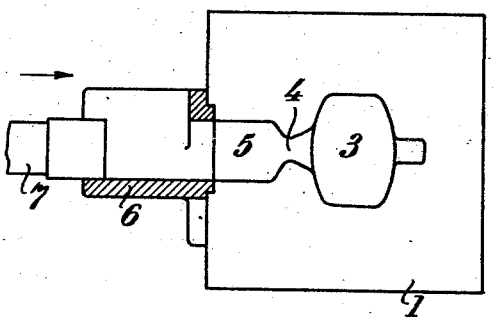


Fig. 4

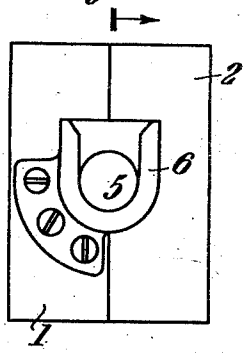


Fig. 5

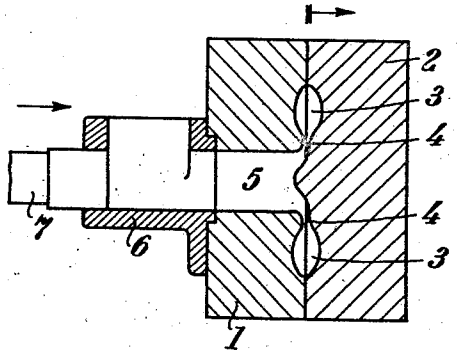
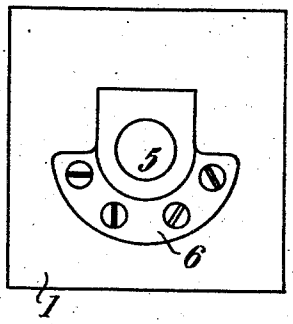


Fig. 6



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DEVICE FOR CASTING UNDER PRESSURE

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Fig. 7

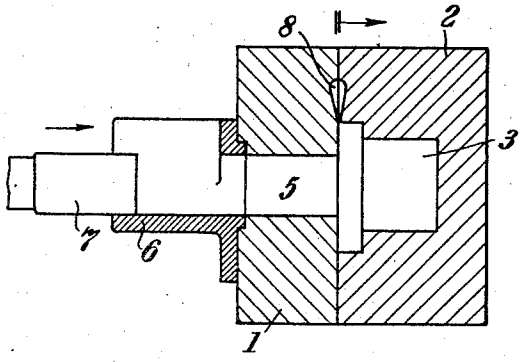


Fig. 8

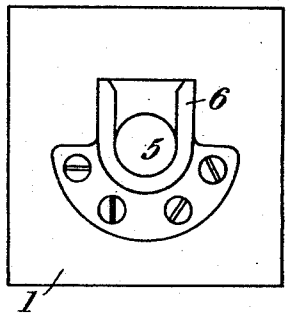


Fig. 9

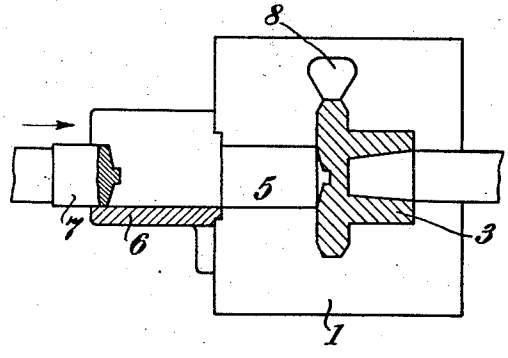
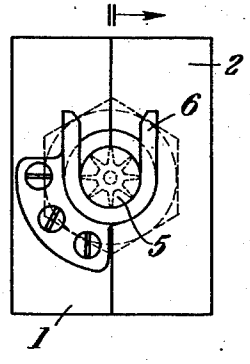


Fig. 10



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Patented Aug. 28, 1934 1,971,652

UNITED STATES PATENT OFFICE

1,971,652

DEVICE FOR CASTING UNDER PRESSURE

Paul Haessler, Nuremberg, Germany

Application August 22, 1931, Serial No. 558,693
In Germany May 11, 1931

1 Claim. (Cl. 22—68)

Devices for casting under pressure in which the material to be pressed is pressed into a press cylinder bore provided in the mold or into a fore-chamber communicating with the mold by a channel and then pressed, are known.

The devices of the first mentioned kind possess the advantages, that the material to be treated is standing directly in front of the ingate into the mold negative so that long travels and losses from cooling and pressure connected therewith are avoided and the metal remainder in the press cylinder can be expulsed from the mold together with the molded article and without any severing work. That the mold has to remain open for filling in the material to be pressed and that consequently before the pressing of the material an operation, i. e. the closing of the mold has to be carried out, whereby the working speed is reduced, is inconvenient, as it is consequently necessary to charge the press cylinder with metal heated to a higher temperature than absolutely necessary for the pressing.

In the devices of the second kind the press cylinder or the fore-chamber can be charged with metal independently of the position of the mold, so that the working speed is higher, the long travel between press cylinder and mold negative causing however serious losses of pressure and heat. The connection channel between press cylinder and mold must be shut off at the filling in of the material, and the shutting off element must be of such construction that, on the one hand, it liberates this channel at a certain pressure and, on the other hand, it is capable to sever, when the pressing proceeding has terminated, the metal remainder in the connection channel from the metal remainder in the press cylinder and to expulse this latter remainder from the fore-chamber in upward or downward direction. The severing of the remainders causes high loading and rapid wear of the shearing edges on the shutting element and on the fore-chamber.

The remainder in the connection channel can be removed without difficulty only if any formation of burr at the sheared off point is avoided. This device does further not permit of constructing the press piston in such a manner that, penetrating into the mold negative, it may be used as core for a bore or cavity of the molded article or as a part of the mold itself.

Both these devices possess the common inconvenience, that it is impossible to free from gases the filled in material so that it is rather difficult to produce absolutely tight molded articles. The specific pressures, which up to the present have been applied in both these methods, do not exceed 2000 kgs. per square centimetre.

By this invention the inconveniences of the above deserибed devices are obviated, their advantages being completely preserved.

The invention consists chiefly in that the material to be pressed is brought on to a guide path of any suitable shape situated on the outer side of the mold and serving as guide for the press piston. This guide path is made in one piece with the mold, or it is fixed on the same. It merges directly into the press cylinder bore, worked into the mold, which communicates with the mold negative by the ingate. The press piston, when moving forward, pushes in front of it the material to be pressed. The displacement alterations of form and pressure effects produced in the material by this movement expulse gases, which might be enclosed in the material.

The material to be pressed is put under pressure in the press cylinder bore and forced through the ingate into the mold negative.

In some devices it is possible to construct the press piston as core for a bore or cavity in the pressed article or as part of the mold itself. In this case the ingate can be omitted; the press piston penetrating into the mold negative displaces and presses into the mold the material to be pressed situated in front of it.

Chambers are provided in these cases in the mold, in order to obtain uniform wall thicknesses, said chambers being destined to hold the material in excess after the pressing.

The device is suitable for working any metal and plastic masses.

Five embodiments of the invention are illustrated by way of example in the accompanying drawings.

Fig. 1 shows in longitudinal section a closed mold with device in which the press cylinder bore is arranged in the horizontal dividing surface.

Fig. 2 is an end view of Fig. 1.

Figs. 3 and 4 are similar views showing the second form of construction of the device, the press cylinder bore being situated in the vertical division face of the mold.

Fig. 3 is an elevation on the stationary mold plate of the device, the sliding gutter being shown in section.

Fig. 4 is an end view of the closed mold.

Fig. 5 shows in longitudinal section and

Fig. 6 in end view a third form of construction of the device, in which the press cylinder bore is arranged in the stationary mold plate of the mold subdivided in vertical direction.

Fig. 7 shows in longitudinal section and Fig. 8 in end view a device of a fourth form of construction, in which the press piston penetrates into the mold negative and forms at the same time the core for the bore of the pressed article.

Fig. 9 shows in elevation the stationary mold plate of a device of a fifth form of construction, in which the press piston forms a part of the mold, the end face of the piston carrying an engraved mark designed to be pressed into the pressed article, the slide path being shown in section.

Fig. 10 is an elevation on the end face of the device.

In this device the molded article is shown lying in the mold, in order to show the engraving of the article.

In all the figures 1 designates the stationary mold plate, 2 the movable mold plate, 3 the mold negative, 4 the ingate, 5 the press cylinder bore, 6 the slide path, 7 the press piston and 8 the chamber for the material in excess.

The operation of the device is as follows:—

The form 1, 2 is closed or in course of being closed, the press piston 7 is in its extreme outer position. The material to be pressed is fed in measured quantity, by hand or automatically, to the slide path 6, and the press piston 7 is then immediately moved forward so that it pushes in front of it the material in the slide path 6 into the press cylinder bore 5 forming an extension of the slide path. During these movements gases which might be contained in the material are expulsed. The ingate 4 opposes considerable resistance to the passing of the material, so that the material to be pressed is preliminarily compressed. In the further course of the piston movement the metal flows into the mold negative 3 and is pressed at specific pressures between 2000 and 10,000 kilograms per square centimetre or more. The mold 1, 2 is opened immediately after the pressing proceeding, if desired with the aid of the press piston, existing cores are withdrawn, and the pressed article is ejected.

To open the mold with the aid of the press piston, the closing pressure is removed and the press piston moved further in the pressing direction. The press piston projecting from the press cylinder bore bears against the movable mold part and pushes the same in front of it.

The material remaining in the press cylinder bore 5 is expelled with the pressed article in molds, in which the cylinder bore 5 is situated in the plane of division. If the press cylinder 5 is arranged in the stationary mold part 1, the press piston 7 is further advanced and thereby the remaining material expulsed from the bore.

In the form of construction of the device shown in Figs. 7 to 10 the ingate 4 may be omitted. The press piston 7, pushing in front of it the material to be pressed, penetrates into the mold negative. In order to avoid formation of burrs and irregular wall thicknesses, chambers 8 are provided in the mold, designed to receive the material to be pressed which remains over after the pressing.

The new device possesses besides the advantages of the device above described, i. e. that the material to be pressed is directly in front of the ingate, that the remainder of metal can be expulsed together with the molded article and without any severing work, that the mold may be charged independently of the closing position of the same wherefrom results a higher working speed, and that it is possible to construct the press piston as a core or as a part of the mold negative itself, the other advantages of freeing the metal from gases and the omission of fore-chambers, shutting off and severing devices with the sources of disturbance resulting from the same.

The practice has shown, that by downwardly inclining the slide gutter towards the press piston, it is possible to absolutely prevent metal from running prematurely into the ingate and in solidifying clogging the same or moving ahead of the press piston and causing disturbances.

I claim:—

A device for casting under pressure, comprising in combination a mold, a pressure cylinder formed in one side of said mold, a piston adapted to slide into and out of said cylinder, and a slide path open in upward direction along its entire length and mounted on said mold extending from said cylinder, said slide path adapted to receive the molten material to be cast, to guide said piston and to ventilate the molten material during the forward movement of said piston.

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