Jan. 22, 1929. 1,699,592

A. KADOW

PROCESS OF CASTING METAL

Filed March 15, 1926

Fig 1

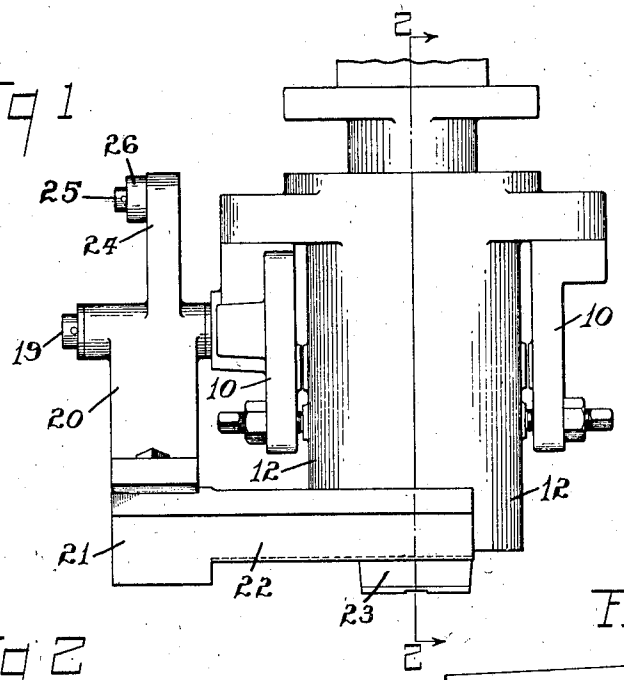



Fig 2

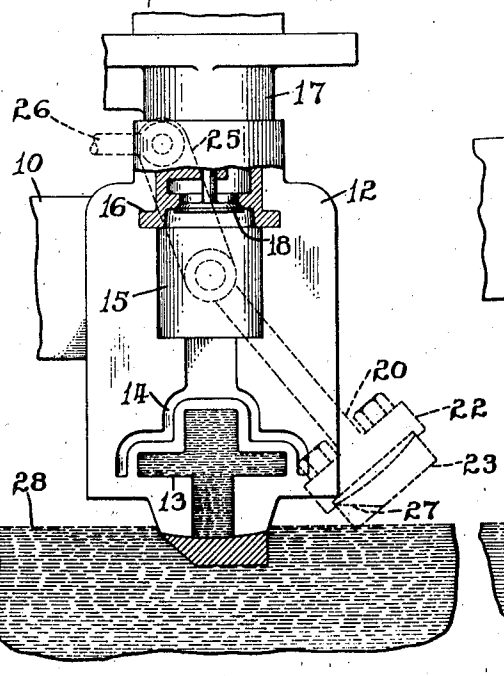
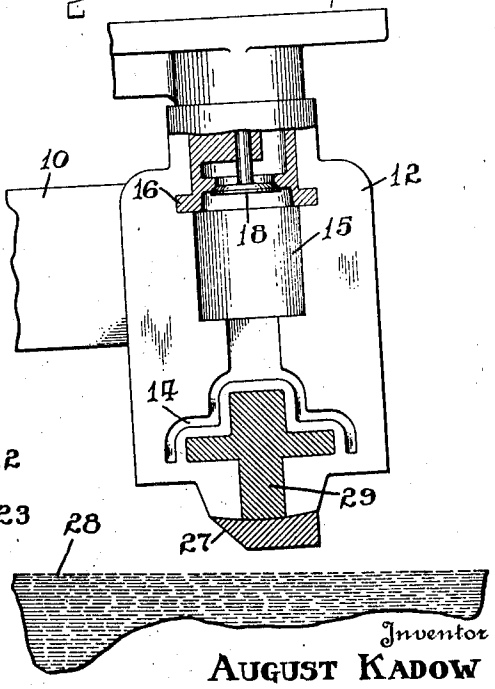



Fig 3




Inventor

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# UNITED STATES PATENT OFFICE.

AUGUST KADOW, OF TOLEDO, OHIO, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO THE VACUUM CASTING COMPANY, OF TOLEDO, OHIO, A CORPORATION OF OHIO.

## PROCESS OF CASTING METAL.

Application filed March 15, 1926. Serial No. 94,714.

My invention relates to a process of casting metal, and more particularly to a process wherein metal is driven by atmospheric pressure into a mold from which the air had been exhausted.

The object of my invention is to provide a process whereby metal which is liquid when molten may be sucked into permanent molds and retained in the molds until it solidifies.

The details of my process and minor objects thereof will appear as the description proceeds.

In the accompanying drawing forming a part of this specification, Figure 1 is a side elevation of a mold suitable for use in carrying out my invention; Fig. 2 is a section on the line 2—2 of Fig. 1, but showing the mold in casting position, and with the gate closed; and Fig. 3 is a view similar to Fig. 2, but showing the mold raised and the casting therein solidified.

In the construction shown, there are mold-supporting arms 10, each of which carries a mold section 12. The mold sections are constructed to meet along the plane of line 2—2 on Fig. 1, and each section has cut-out portions in its face, the cut-out portions registering, when the mold is closed, to form a mold cavity 13, vacuum channels 14, a vacuum cavity 15, and a cavity 16 adapted to receive the lower end of a vacuum head 17. Preferably, the faces of the sections are ground away slightly between mold cavity 13 and vacuum channels 14.

Vacuum head 17 is connected in any convenient way to a suitable means for exhausting air, and a valve 18, operable by any convenient means, is provided for admitting air from cavity 15 into the head, when it is desired to exhaust air from the mold.

One of the mold-supporting arms is provided with a horizontal pivot 19 upon which is mounted the vertical arm 20 of a substantially L-shaped gate-carrier 21. The horizontal arm 22 of the gate-carrier 21 carries a gate 23. A lug 24, upstanding from and rigid with arm 20, carries a pivot 25 to which is connected an operating link 26. One edge of the gate is beveled, as shown at 27.

It will be understood that the mold-carrying arms and the vacuum head are supported in any suitable manner by means not shown, and the several elements are operated by manual or power-operated means, not shown, which may be of any well known or obvious construction.

Normally, the gate is swung to one side, as shown in dotted lines on Fig. 2. After the mold has been closed and dipped in a bath 28 of liquid molten metal, valve 18 is operated to exhaust air from the mold and allow the liquid metal to fill the cavity, as shown in Fig. 2. Thereafter, gate 23 is swung to the position in which it shows in full lines in Fig. 2.

The bevel of the gate at 27 is for the purpose of avoiding undue disturbance of the bath. There is no need of sharpening the edge of the gate, because the metal is liquid and there is no cutting action.

Because the metal is liquid, the gate is closed before the mold is lifted from the bath. This is a vital feature of the process, as otherwise the metal runs out of the mold when the mold is lifted from the bath while the metal in the mold cavity and inlet opening is still liquid, the inlet opening being large enough to admit bubbles of air through the molten metal into the mold, if the mold is lifted with the gate open and the metal still liquid. The gate is retained in position until the metal casting 29 becomes solidified, as shown in Fig. 3, after which the mold may be opened, the casting removed, and the process repeated.

Where the small size of the mold cavity or of the inlet into the mold or the character of the material being molded results in such solidification of the metal as to prevent its running out when the mold is lifted with the inlet open, my present method does not apply, as there is no need of a gate under such circumstances. My improved process applies where the molten metal is liquid and the casting and mold inlet are of such size as to interfere with speedy solidification of the metal in the inlet.

The construction of the mold and the shape of the various cavities form no part of my present invention, the apparatus being shown merely by way of illustration.

What I claim is:

1. The process of casting liquid molten metal which comprises passing molten metal

from a supply thereof into a mold through an inlet in the lower portion of the mold, separating the molten metal within the mold from said supply by closing the inlet, and thereafter moving the mold away from the supply while at least part of the metal within the mold is liquid.

2. The process of casting liquid molten metal, which comprises immersing in molten metal an inlet opening in the lower part of a mold, filling the mold with molten metal through said opening, closing said opening, and thereafter removing the inlet from the metal in which it was immersed.

3. The process of casting liquid molten metal, which consists in connecting a mold-inlet with a source of liquid molten metal, evacuating the mold and allowing the metal to enter, closing the inlet after the mold is filled and simultaneously discontinuing the connection between the mold and said source, and moving the closed mold away from said source while there is liquid metal in the mold.

4. The process of casting liquid molten metal, which consists in dipping into a bath of liquid molten metal the underside of a mold having an inlet in said underside, evacuating the mold cavity and allowing the metal to fill it, closing the inlet opening, and thereafter lifting the mold from the bath.

5. The process of casting liquid molten metal, which consists in dipping into a bath of liquid molten metal the underside of a mold having an inlet in said underside, evacuating the mold cavity and allowing the metal to fill it, closing the inlet opening, and lifting the mold from the bath after the inlet is closed and before the metal within the mold has completely solidified.

6. The process of casting liquid molten metal, which consists in dipping into a bath of liquid molten metal the underside of a mold having an inlet in said underside, evacuating the mold cavity and allowing the metal to fill it, closing the inlet opening, lifting the mold from the bath after the inlet is closed and before the metal within the mold has completely solidified, and maintaining said inlet closed until the metal within the mold is completely solidified.

In testimony whereof, I have hereunto signed my name to this specification.

AUGUST KADOW.