

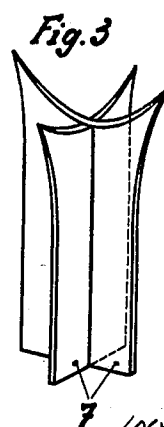
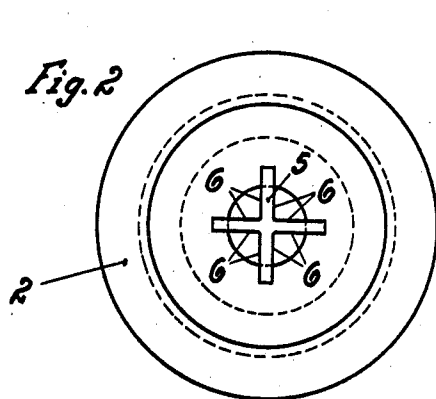
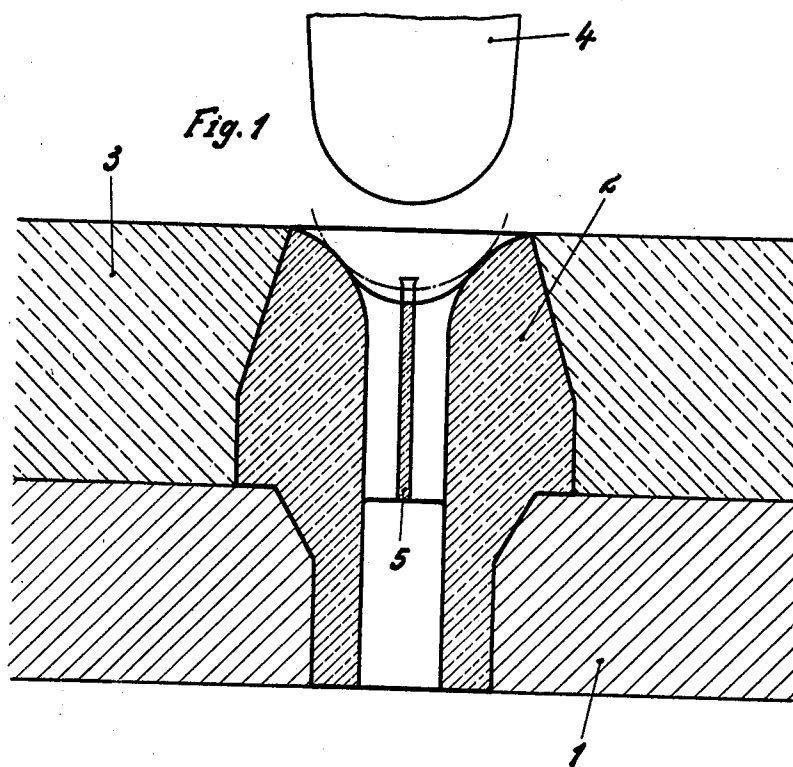
Nov. 16, 1937.

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2,098,937

LADLE FOR CASTING FLUID METAL

Filed Jan. 8, 1936



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UNITED STATES PATENT OFFICE

2,098,937

LADLE FOR CASTING FLUID METAL

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Application January 8, 1936, Serial No. 58,196
In Germany March 2, 1934

2 Claims. (Cl. 22-84)

In the casting of metal, more particularly top casting, trouble is caused by upward spirting which occurs at the moment in which the stream of metal impinges on the bottom of the mould or, as the stream spreads against the wall of the mould. The spirted metal is deposited on the walls of the mould, cools very rapidly and causes scaly ingots.

With a view to overcoming this disadvantage it has already been proposed to provide, when casting ingots in the ingot mould, a ladle capable of being moved upwards and downwards, into which the stream of metal flows and from which the fluid metal is further conveyed into the ingot mould from a relatively small height. This known proposal necessitates the provision of a complicated motion-imparting device for enabling the ladle to be moved upwards in accordance with the level of the fluid metal, as it rises in the mould. For this reason the known device has not been generally adopted.

It has already been proposed to guide the stream of metal in a special way. According to this suggestion the valve cone is provided with special guiding grooves, so that the fluid metal enters the outflow opening in a definite direction. It follows from the peculiar construction of the valve cone, that the fluid stream is forced together again from a large cross-sectional area to a small cross-sectional area, so that, owing to the transition from the large cross-section to the small cross-section, eddies occur and consequently the danger of spirting is not avoided. In the known arrangement the formation of eddies is increased owing to the fact that the transition from the conically downwardly tapering passage cross-section below the valve cone to the cylindrical outflow opening is sudden, so that behind this transition there is a contraction of the stream.

According to other known proposals the stream of metal is divided up by the employment of a crossed bridging piece into a plurality of separate streams. This dividing up of the stream of metal has the disadvantage that the surface of the stream is greatly increased, corresponding to the dividing-up, so that the contact surface with the air and consequently the absorption of oxygen also becomes many times greater than with a single stream. In consequence thereof, in the known casting process the quality of the steel suffers. Furthermore, the solidifying and segregating conditions become unsatisfactory.

The invention is concerned with a bottom outlet with guiding surfaces in casting ladles for fluid metal, in which the outflow passage beyond

the guiding surfaces is straight-lined. Owing to this arrangement the metal flows out in a non-eddying, round stream. By this means the surface of the stream is reduced to a minimum, so that the absorption of oxygen is also small. In order that already existing ladle outlets may be converted in accordance with the invention, the guiding surfaces are suitably made in the form of a separate insertion which is adapted to be subsequently inserted into the outflow opening. Experiments have shown, that the guide surfaces need only be provided in the first part of the outflow and that the metal stream flowing out without eddies will continue to flow out without eddying. Furthermore, spirting of the metal will cease as soon as there is a certain quantity of metal in the casting mould, for instance the chill mould, so that an eddyless outflow is no longer essential. It is thus not necessary in making the guiding surfaces to use high quality material, more particularly refractory material, and they may simply be made of metal, so that they will gradually become fused during the outflow of the metal.

A constructional example of the invention is illustrated in the accompanying drawing,

Fig. 1 being a cross-section,

Fig. 2 a plan view of an outlet and

Fig. 3 a metal guiding device.

At the bottom of the casting ladle is disposed the outflow 2 made of moulded bricks and the refractory lining 3. The outflow 2 is closed and opened by the plug 4 which is actuated by means of a bar. A cross-shaped guiding device 5 with the guiding surfaces 6 is formed in the outflow or inserted therein.

The metal guiding device shown in Fig. 3 consists of two pieces of sheet-metal 7, connected together cross-wise. This guiding device may be made very cheaply and be inserted in any existing outflow. The internal currents and eddies of the outflowing fluid metal will be braked by the guiding surfaces 6, so that the metal will flow out of the outflow without eddying.

It is to be noted that the mouth of the upper portion of the outflow 2 is flared outwardly to form a seat for the plug 4 and also for the outwardly curved upper parts of the pieces or ribs 7 of the metal guiding device 5, especially when the latter is in the form of an insert. Incidentally the upper edges of the guiding device are of a curvature corresponding to the adjacent curved portions of the flared seat of the outflow 2 to permit proper seating of the plug 4.

It is obvious that the guiding member may

also be made of ceramic material instead of metal.

What I claim is:—

1. In a casting ladle for metal, a ladle body
5 having an outflow opening in the bottom thereof
and a subsequently insertable guiding member
arranged in the upper portion of the outflow
opening, said guiding member consisting of cross-
wise arranged thin-walled ribs extending in the
10 longitudinal direction of the outflow opening
and in fixed relation thereto, the portion of the
outflow opening below the said guiding member
having straight sides and the same diameter as
the upper portion.
- 15 2. In a casting ladle for metal, a ladle body
having an elongated outflow opening in the bot-

tom thereof, the lower part of the opening hav-
ing straight sides and of uniform diameter, the
upper part of the opening terminating in an out-
wardly flared mouth forming a seat adapted to
coact with a closure plug, a guiding member con-
sisting of thin-walled ribs arranged to form a
cross in cross section and insertable longitudinally
in the upper portion of the outflow opening, the
side edges of the ribs adjacent the upper ends be-
ing curved outwardly to embrace the seat so as to
hold the lower edge of the guiding member above
the lower edge of the outflow opening, and the
upper edges of the guiding member being curved
correspondingly to the curvature of the flared
mouth.

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