Aug. 23, 1932. O. L. COFFEY 1,873,549

FOUNDRY LADLE

Filed Aug. 18, 1930

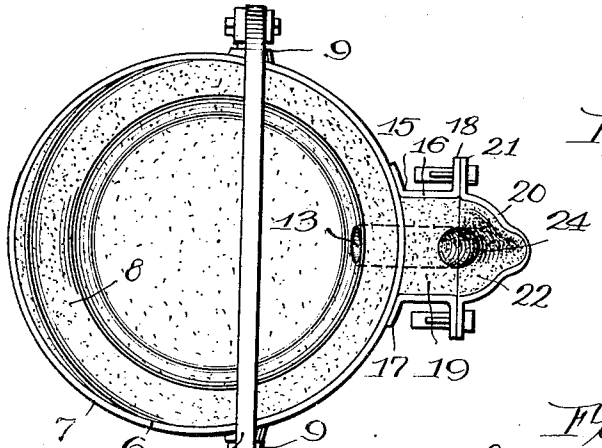


Fig. 1

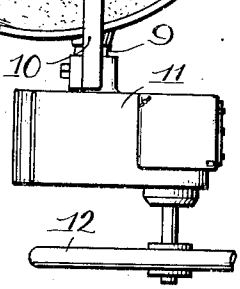


Fig. 2

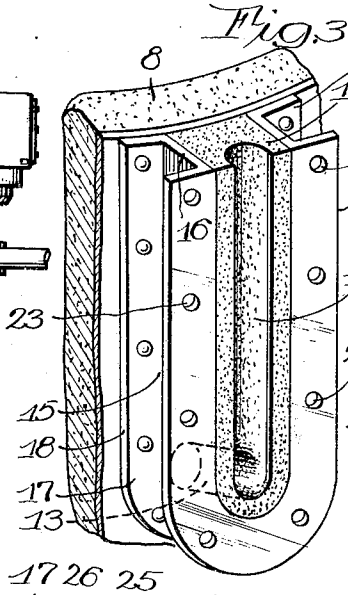


Fig. 3

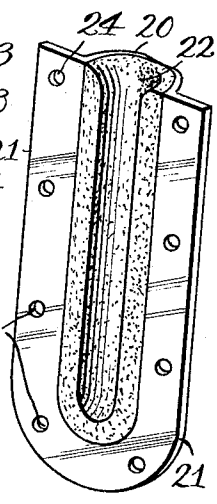
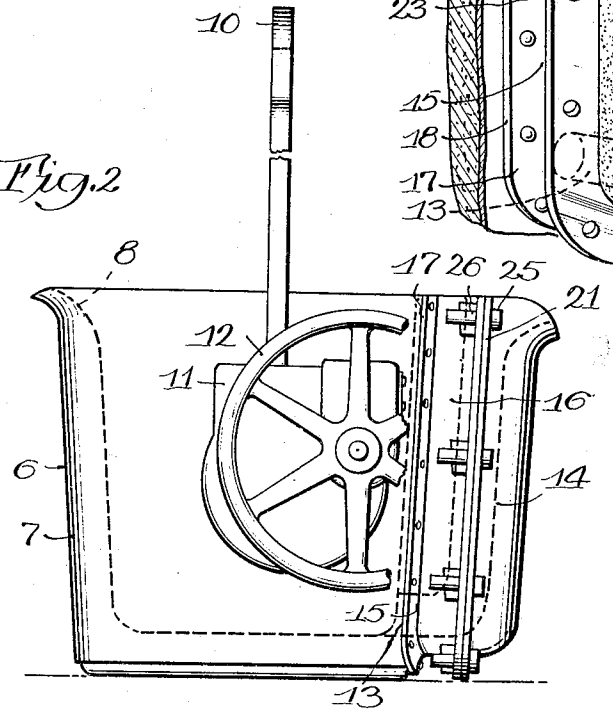


Fig. 4



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UNITED STATES PATENT OFFICE

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FOUNDRY LADLE

Application filed August 18, 1930. Serial No. 475,936.

The invention relates generally to foundry ladles. More particularly the invention relates to that type of ladle which is designed for use in foundries in connection with the pouring of molten metal into molds and is known as a "tea pot" ladle.

In practice it has been found in connection with the use of a ladle of this type that cold heats and delays cause the molten metal and slag to freeze in the restricted duct in the spout of the ladle and results in the formation of skulls which cannot be easily removed and frequently render it necessary to destroy the entire ladle-lining in removing them.

One object of the invention is to provide a ladle of the type under consideration which embodies an improved spout construction whereby it is possible to remove the skulls, without destroying the spout-lining. Another object of the invention is to provide a foundry ladle of the "tea pot" type in which the spout consists of separable sections of novel design and is constructed that access may be readily had to the duct or opening between the interior of the ladle and the entrance or inlet end of the spout.

Other objects of the invention and the various advantages and characteristics of the present ladle construction will be apparent from a consideration of the following detailed description.

The invention consists in the several novel features which are hereinafter set forth and more particularly defined by the claims at the conclusion hereof.

In the drawing which accompanies and forms a part of this specification or disclosure and in which like numerals of reference denote corresponding parts throughout the several views: Fig. 1 is a plan of a ladle embodying the invention. Fig. 2 is a side elevation, parts being omitted for purposes of illustration. Fig. 3 is a perspective of the portion of the pot which is provided with the fixed section of the spout. Fig. 4 is a perspective of the removable section of the spout.

The ladle which forms the subject matter of the invention is adapted to be used in foundries in connection with the pouring of molten metal into molds and comprises a pot 6. The latter consists of a metal jacket or shell 7 and a refractory lining 8 and is pivotally supported by trunnions 9 in a bail 10 so that it may be tilted to discharge the metal therefrom, by suitable gearing which is enclosed in a casing 11 and is operable by a hand-wheel 12. The manner of pivotally supporting the ladle and the mechanism or gearing for effecting the desired tilting may be of any suitable construction, as well understood in the art.

In addition to the pot, the ladle comprises a spout. The metal flows to the spout through an outlet duct 13 which is located immediately above the bottom of the pot and extends through the lining 8 and the shell 7, to avoid discharging the slag on the top portion of the molten metal. A discharge duct 14 leads upwardly from the duct 13 to a point adjacent to the top of the pot so the metal will be drawn from the bottom of the pot and be discharged on a line approximately level with the top of the pot. In practice it has been found that cold heats or delays frequently cause the metal or slag to freeze in the ladle and this freezing usually starts in the outlet duct 13 and the discharge duct 14 because of the comparatively small cross sectional area of the latter. When skulls or slag freeze in the ducts 13 and 14, it is necessary to remove them and in doing so where a fixed spout is used, the spout and pot linings are broken away therewith, so that in most instances the entire lining of the pot and spout must be replaced. So that the spout may be cleared and its lining separated from the lining in the pot, the spout is disposed outside of the shell 7, and is split or formed with a removable section. One section of the spout is formed of a plate of metal 15 which is shaped to extend under the duct 13 and extends upwardly, as at 16, to form the sides of the fixed section of the spout which are adapted to retain a portion of the spout-lining outside of the shell 7. The plate 15 is provided with a flange 17 to fit the outer periphery of the shell 7 and is riveted thereto. It is also flanged, as at 18, along a vertical plane intersecting the duct 14 longitudinally. The fixed section of the spout contains, outside of the

shell 7, a lining 19 of suitable refractory material for the duct 13 and the portion of the duct 14 that is adjacent to the pot. The outer side or section of the spout extends vertically and consists of a metal plate 20 which is provided with integral side flanges 21 and supports a refractory lining 22. The side flanges 21 register with the flanges 18 of the plate 15. The upper end of plate 20 and its lining 22 are curved outwardly to form a discharge lip for directing the metal outwardly away from the spout while it is being poured. The flanges 18 on the fixed spout section are provided with holes 23 and the flanges 21 on the removable section are provided with corresponding holes 24. Pins 25 having heads at their outer ends, are adapted to pass through holes 23 and 24, and wedge-keys 26 in slots in the pins are adapted to draw the pins to secure the flanges together and thus lock the removable spout section to the fixed section. The refractory lining in the spout is usually coated with a mud or canister wash which seals the joint between the lining and the sections when the removable spout section is drawn into place by the wedge keys 26.

Whenever skulls form in the spout, the wedge keys 26 are removed from the pins 25 to release the plate 20 and lining 22 so they can be removed from the ladle. When the separable spout section has been removed, the opening duct 13 is readily accessible so the slag or skulls can be removed therefrom by a suitable tool inserted from the outside. The skulls or slag adhering to the linings 19 and 22 can be easily removed because they are readily accessible when the removable spout section has been disconnected from the pot 6. The greatest accumulation of skulls usually forms in the spout and sometimes in their removal, the linings 19, 22 are destroyed but it is not necessary to destroy the pot lining in doing so. It is only necessary to replace the spout lining because it is outside of the pot so that the pot lining will not be destroyed in the removal of skulls and lining from the spout. The spout sections when separated can be easily relined. In replacing the removable spout section, the meeting faces of the lining 19, 22 in the section are coated with mud or canister as previously pointed out so as to form a seal between them.

The invention exemplifies a pouring ladle of the "tea pot" type which is provided with a spout of improved design having a lining which can be removed without destroying the pot lining.

The invention is not to be understood as restricted to the details set forth, since these may be modified within the scope of the appended claims, without departing from the spirit and scope of the invention.

I claim:

1. A foundry ladle of the "tea pot" type, comprising a shell having an open top and provided with a hole in the lower portion thereof, a refractory lining in the shell having an outlet duct in registry with the hole in the lower portion of the shell, a spout extending upwardly from the aforesaid hole and consisting of a pair of complementary sections, one of the sections being U-shaped and having an inner, outwardly extending U-shaped flange fitting against and secured to the shell and an outer, outwardly extending, U-shaped flange in laterally spaced relation with respect to the inner flange, the other section having a marginal flange shaped conformably and secured removably to the outer U-shaped flange of the said one section, and a lining for the spout held removably between the two sections and embodying an upwardly extending discharge duct, the lower end of which is positioned to register with the outlet duct in the shell lining.

2. A foundry ladle of the "tea pot" type, comprising a shell having an open top and provided with a hole in the lower portion thereof, a refractory lining in the shell having an outlet duct in registry with the hole in the lower portion of the shell, a spout extending upwardly from the aforesaid hole and consisting of a pair of complementary sections, one of said sections being U-shaped and having an inner outwardly extending, U-shaped flange fitting against and secured fixedly to the shell and an outer, outwardly extending, U-shaped flange in spaced relation with respect to the inner flange, the other section being provided with an upwardly extending, open-sided recess and embodying a marginal flange shaped conformably and secured removably to the outer U-shaped flange, and a two-piece refractory lining for the spout, consisting of a piece in the U-shaped spout section having a transverse duct in its lower portion in communication with the duct in the shell lining and formed so that the outer face thereof is substantially flush with the outer U-shaped flange and embodies a groove extending upwardly from the transverse duct, and a piece in the recess in the said other spout section, fitting against the first mentioned lining piece and having an upwardly extending groove in registry with the first mentioned groove and forming with the latter a discharge outlet for the spout.

Signed at Harvey, Illinois, this 11th day of August, 1930.

OSCAR L. COFFEY.