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LADLE CONSTRUCTION

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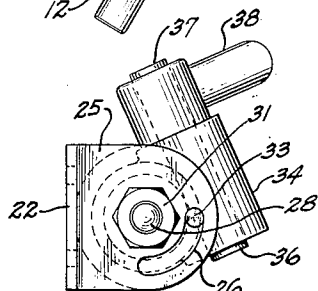
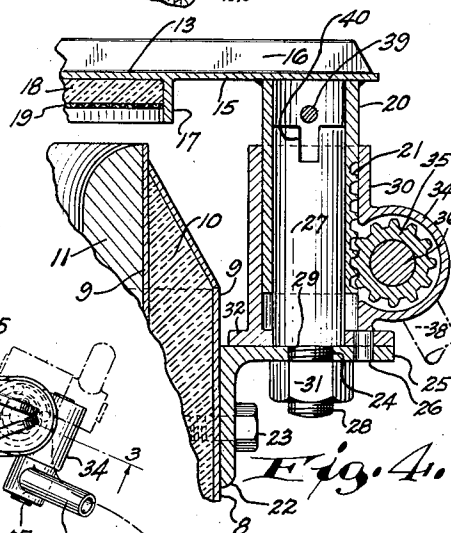
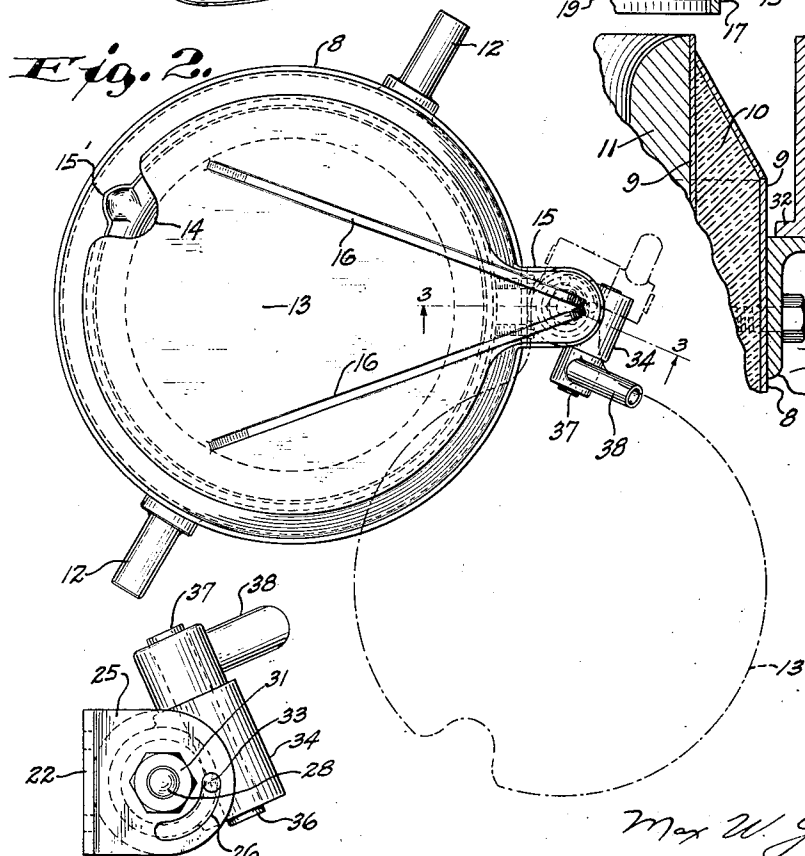
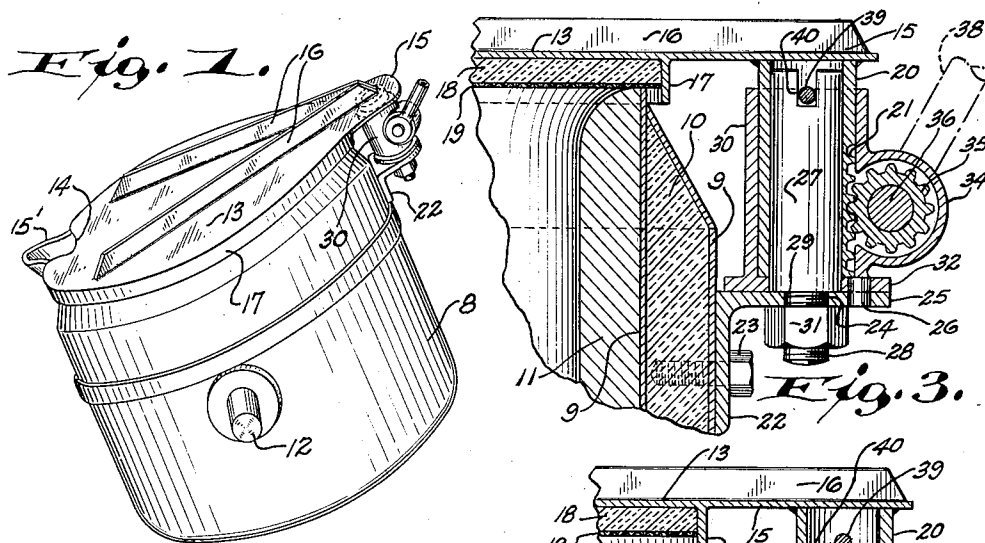


Fig. 5.

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LADLE CONSTRUCTION

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9 Claims. (Cl. 22—81)

This invention relates to improvements in ladle construction.

Heretofore in foundry practice it has been customary to utilize relatively small size ladles which hold only a limited quantity of molten metal. Necessarily, therefore, these ladles must be frequently refilled and a large number kept in constant use in order to handle mold requirements. Thus a relatively large number of attendants are needed to take care of the plurality of small ladles which results in high overhead. It has been impractical heretofore to utilize ladles of larger size as the large quantity of molten metal would radiate an excessive amount of heat, making it impossible for attendants to remain near enough to take care of the pouring operations. Furthermore, in view of the large capacity, the ladles could not be emptied rapidly enough to prevent solidification therein.

The present invention comprehends means whereby the use of large ladles is rendered entirely practical and this result is brought about through the use of insulation and through the use of a protecting cover. The present application relates more particularly to the cover construction, the insulating feature forming the subject matter of a companion case.

It is, therefore, one of the objects of the present invention to provide a ladle which can be furnished in large sizes so that a single filling of the ladle will take care of the pouring of a large number of molds which number would ordinarily require the use of several times as many small ladles and the use of a corresponding number of attendants.

A further object of the invention is to provide an improved ladle having a cover adapted to protect the attendants from radiating heat and adapted to maintain the metal in molten condition until it has all been poured.

A further object of the invention is to provide in a device as above described, means for facilitating movement of the cover to open position, this requiring a special type of construction due to the excessive size and weight of the cover.

A more specific object of the invention is to provide a common means for first elevating the cover vertically out of engagement with the container and for subsequently swinging it to a position to expose the container top for filling purposes.

A further object of the invention is to provide a ladle which is relatively simple in construction, strong and durable, and well adapted for the purpose described.

In the accompanying drawing illustrating one complete embodiment of the preferred form of the invention in which the same reference numerals designate the same parts in all of the views:

Fig. 1 is a perspective view of the ladle showing the cover in closing position;

Fig. 2 is a plan view thereof, the dotted lines indicating the position of the cover when it has been swung to open position;

Fig. 3 is an enlarged fragmentary sectional view taken on line 3—3 of Fig. 2, showing the cover in lowered position;

Fig. 4 is a similar view showing the cover in raised position ready to be swung horizontally; and

Fig. 5 is a bottom view of the cover operating mechanism.

Referring more particularly to the drawing, the numeral 8 designates a ladle which consists preferably of a pair of spaced metallic walls 9 having insulating material 10 in the space therebetween. The ladle may also be lined with fire clay or other refractory material 11. In addition the ladle may have the usual trunnions 12 for cooperation with a ladle carrying device.

The improved cover 13 is generally of the same shape as the ladle and slightly larger in diameter than the top thereof and said cover has a front recess 14 for cooperation with the spout 15 of the ladle to permit pouring while the cover is in closed position. The cover is also formed with a rearward projection 15 and has integral reinforcing ribs 16 extending from said rear extension in diverging relation. The lower side of the cover has a depending annular flange 17 and within said flange and adjacent the bottom of the cover is a lining of insulating material 18 held in place by suitable means such as wire mesh 19.

Suitably welded to the lower side of the extension 15 of the cover is a tubular member 20 having horizontally extending parallel rack teeth 21 in the rear portion thereof.

An L-shaped bracket 22 is secured by means of a bolt 23 or other suitable means to the side of the ladle and has an aperture 24 formed in its horizontal portion 25. Said horizontal portion is also provided with an arcuate slot 26 (see Fig. 5). A rod 27 has a threaded stem 28 projecting from its lower end through an aperture 29 in an outer sleeve 30 and through the aperture 24 of the bracket 22. A nut 31 is threaded on the lower end of the stem 28 to hold the rod 27 in position. The sleeve 30 has an enlarged base portion 32 which rests on the horizontal part 25 of the

bracket 22 and which is formed with a depending pin 33 movable in the arcuate slot 26. The sleeve 30 is further formed with an extension 34 forming a housing for a pinion 35. The latter is mounted rigidly on a short shaft 36 which has an end 37 projecting exteriorly of the housing 34. A tubular handle receiving member 38 is rigidly mounted on said end 37 of the shaft 36.

The tube 20 depending from the cover has an interior pin 39 near its upper end which pin is normally engageable with a slot 40 as shown in Fig. 3 formed in the upper end of the rod 27.

In use when it is desired to fill the ladle with metal a handle is inserted in the handle receiving member 38 and said handle is depressed to move the member 38 from the position shown in Fig. 3 to the position shown in Fig. 4. This causes partial rotation of the pinion 35 and in view of the engagement of the pinion with the rack teeth 21, raising of the tubular member 20 and cover to a position wherein the pin 39 clears the slot 40 and to a position where the flanges 17 of the cover are out of engagement with the top of the ladle. Next, the handle is pushed laterally to cause rotation of the sleeve 30 and tube 21 around the rod 27, the turning movement being limited by the length of the arcuate slot 26 shown in Fig. 5. This turning movement carries the elevated cover from the full line position of Fig. 2 to the dotted line position of said figure. When the ladle has been filled with metal the cover is swung back to a position centered over the top of the ladle which position will be attained when the pin 33 is in the end of the slot 26 shown in Fig. 5. When in this position the transverse pin 39 will be parallel with the slot 40 of the rod 27 so that it can enter said slot. The ladle cover can then be readily lowered through the operation of the pinion and rack from the position shown in Fig. 4 to the position shown in Fig. 3.

It will therefore be seen that the construction is such as to furnish support for the cover in all positions through the use of the long sleeve 30 while permitting the relatively heavy cover to be quickly and easily raised and swung to open position, both the swinging and raising operations being accomplished through manipulation of the same control handle fitted within the handle receiving member 38.

When metal is being poured into the molds the cover is kept in the closed position and the recessed portion 14 permits pouring from the spout 15'. The cover, however, remains over the molten metal to protect the operator from excessive heat and also to keep the metal in molten condition until the entire contents of the large ladle has been consumed.

It will thus be seen that one man operating this relatively large ladle can accomplish the same amount of work as a number of men operating a plurality of smaller ladles thus materially reducing overhead expense. It will further be seen that the pouring can be done more quickly as the large ladle does not have to be frequently refilled. Due to the insulated construction of the ladle and cover the heat is effectively retained inside of the ladle to further protect the operator and maintain the metal in molten form.

Any features shown and described herein but not claimed, form the subject matter of a separate application Serial No. 47,560, filed October 31st, 1935.

Although only one form of the invention has been disclosed herein it is obvious that various changes and modifications may be made and all

of such changes and modifications are contemplated as may come within the scope of the claims.

What I claim is:

1. In combination, a ladle, a cover for said ladle having an extension, a pair of substantially vertically disposed telescoping members, one depending from said cover extension and the other being mounted on an adjacent portion of the ladle, and means fixed against elevating movement engaging said telescoping member of the cover extension to elevate the latter and cover, said means being freely rotatable in a horizontal plane to cause rotating movement of the cover extension and cover after elevation.

2. In combination, a ladle, a cover pivotally connected to said ladle for horizontal swinging movement, and a common manually operated means for first elevating said cover and for subsequently causing swinging movement thereof, said means including a rack in connection with the cover and a pinion in connection with the ladle, said pinion being bodily movable with the cover during swinging movement of the latter.

3. In combination, a ladle, a cover for said ladle having an extension, a pair of telescoping members one depending from said cover extension and the other being mounted on an adjacent portion of the ladle, means for causing elongating movement of said telescoping members to elevate the cover, said telescoping members then permitting swinging movement of the cover in a horizontal plane to expose the top of the ladle, and means embodied in said telescoping members for preventing said swinging movement prior to elevation of the cover a predetermined distance and for centering the cover with respect to the ladle on return movement and during lowering.

4. In combination, a ladle, a cover for said ladle having an extension, a tubular member depending from said extension, a bracket carried by said ladle, a rod projecting upwardly from said bracket on which said tubular member is slidable, and a common means rotatably mounted on said bracket and fixed against elevating movement for causing elevating movement of said tubular member and cover on said rod and for swinging the cover in a horizontal plane.

5. In combination, a ladle, a cover for said ladle having an extension, a tubular member depending from said extension, a bracket carried by said ladle, a rod projecting upwardly from said bracket on which said tubular member is slidable, and a common lever operated means rotatably mounted on said bracket and fixed against elevating movement for causing elevating movement of said tubular member and cover on said rod and for swinging the cover in a horizontal plane.

6. In combination, a ladle, a cover for said ladle having an extension, a tubular member depending from said extension and having rack teeth thereon, a bracket carried by said ladle, a rod projecting upwardly from said bracket on which said tubular member is slidable, a sleeve loosely surrounding said tubular member, a pinion rotatably carried by said sleeve and engageable with the rack teeth of the tubular member to elevate the latter and cover, said sleeve being then rotatable around the rod to cause horizontal swinging movement of the cover, and means for operating said pinion.

7. In combination, a ladle, a cover for said ladle having an extension, a tubular member de-

pending from said extension and having rack teeth thereon, a bracket carried by said ladle and having an arcuate slot, a rod projecting upwardly from said bracket on which said tubular member is slidable, a sleeve loosely surrounding said tubular member, a pinion rotatably carried by said sleeve and engageable with the rack teeth of the tubular member to elevate the latter and the cover, said sleeve and tubular member being then rotatable around the rod to cause horizontal swinging movement of the cover, a pin projecting from the bottom of the sleeve and engageable with said arcuate slot to limit said swinging movement, and means for operating said pinion.

8. In combination, a ladle, a cover for said ladle having an extension, a tubular member depending from said extension and having an interior transverse pin near its upper end, a bracket carried by said ladle, a rod projecting upwardly from said bracket on which said tubular member is slidable, said rod having its upper end formed

with a vertical slot for receiving said transverse pin, and a common means mounted on said bracket for causing elevating movement of said tubular member and cover on said rod and for swinging the cover in a horizontal plane, said pin and slot preventing said swinging movement prior to elevation of the cover a predetermined distance.

9. In combination, a ladle, a cover pivotally connected to said ladle for horizontal swinging movement, a common manually operated mechanism having a single control for first applying elevating force to said cover and for subsequently causing swinging movement thereof, guiding means embodied in said manually operated mechanism for preventing said swinging movement prior to elevation of the cover a predetermined distance and stop means cooperable with said guiding means for centering the cover with respect to the ladle on return movement and during lowering.

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