Aug. 1, 1944. A. JADACH 2,354,996

LADLE BAIL BEARING AND PROTECTOR

Filed March 26, 1943 2 Sheets-Sheet 1

Fig. 1.

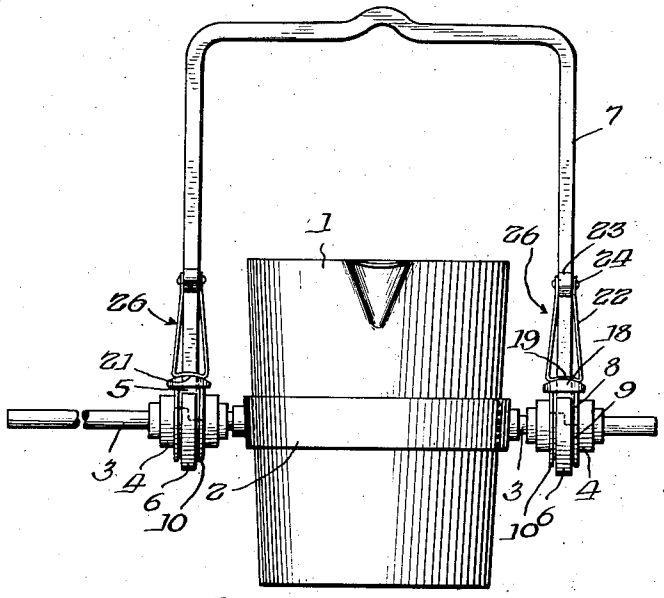


Fig. 2.

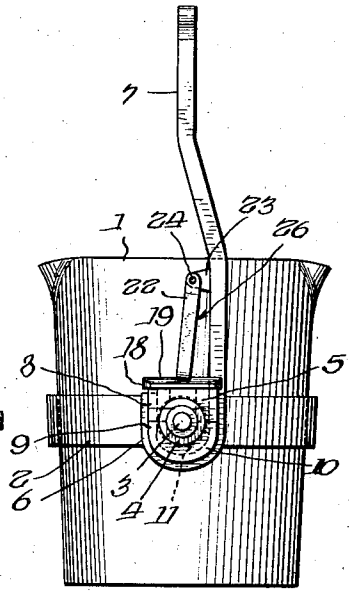


Fig. 3.

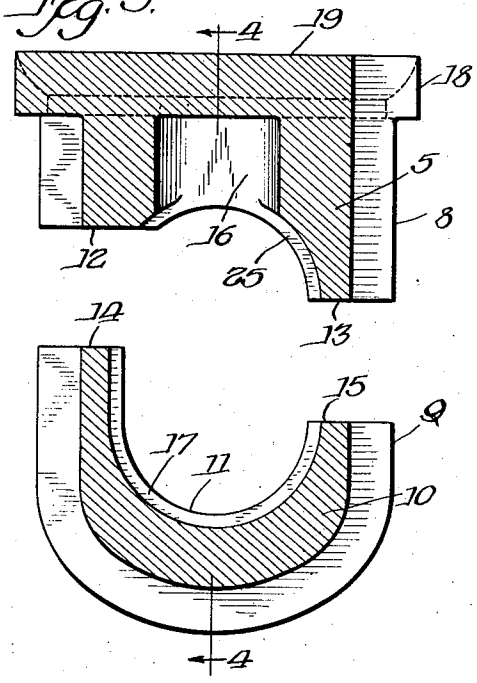
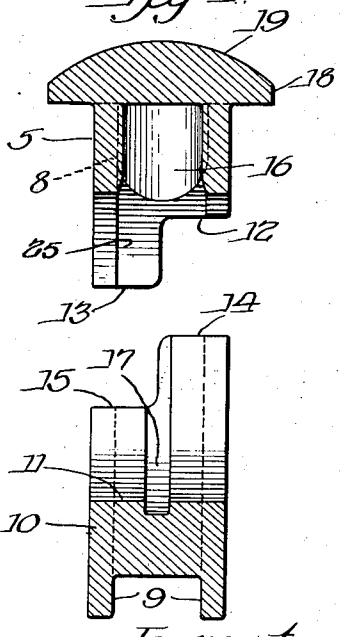


Fig. 4.



Inventor:
Andrew Jadach:
By Joseph O. Lange Atty.

Aug. 1, 1944. A. JADACH 2,354,996

LADLE BAIL BEARING AND PROTECTOR

Filed March 26, 1943 2 Sheets-Sheet 2

Fig. 5.

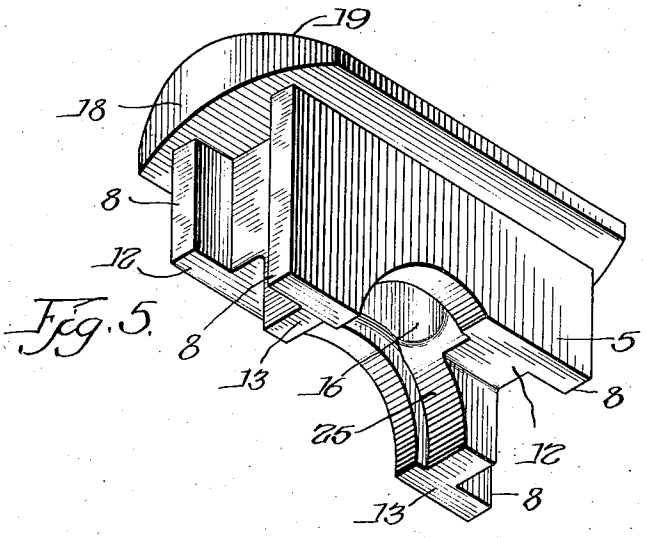


Fig. 6.

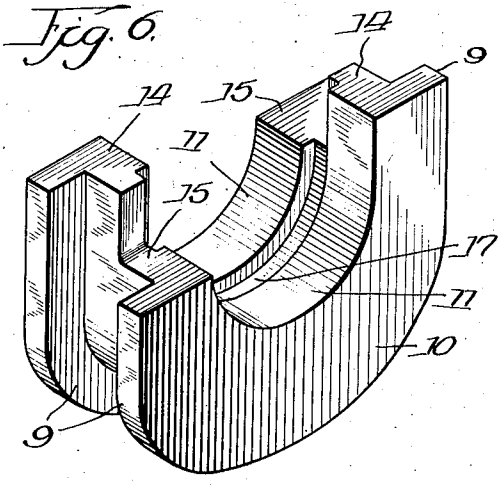
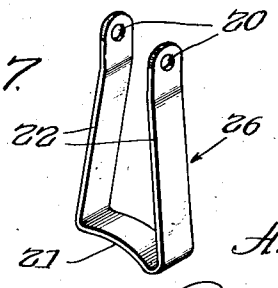


Fig. 7.



Inventor:
Andrew Jadach:
By Joseph O. Lange Atty.

Patented Aug. 1, 1944

2,354,996

UNITED STATES PATENT OFFICE

2,354,996

LADLE BAIL BEARING AND PROTECTOR

Andrew Jadach, Cicero, Ill., assignor to Crane Co., Chicago, Ill., a corporation of Illinois

Application March 26, 1943, Serial No. 480,702

12 Claims. (Cl. 308—74)

Broadly, this invention relates to a foundry device and more particularly applies to a novel ladle bail bearing and protector.

It has long been a problem in the foundry in connection with the pouring and handling of metal in the usual bail-suspended ladle to safeguard the supporting bearing between the ladle and the bail against the entry of foreign matter, such as the usual foundry dust and sand, and also against the spattering or spilling of molten metal from the ladle onto such shank bearing to interfere with the satisfactory trouble-free performance of the latter assembly. It has been recognized that in this manner substantial interference with the free and convenient pouring of molten metal from the ladle occurred, and further affected the bearing itself detrimentally so that frequent, expensive shut-downs and metal losses have resulted, with the obvious danger, too, of causing personal injury to the ladle operator when filling molds. Also the amount of physical effort required in tilting the ladle when pouring metal therefrom into a mold has been unduly heavy due to the increased frictional resistance in the ladle bail bearing. Accordingly the resultant fatigue of the operator has increased during the course of a day's work and foundry output has been reduced substantially.

In striking contrast to the objectionable performance as just described, I have found that by the use of the novel device hereinafter described the protection furnished will increase the life of the wearing surfaces of the ladle bail bearing many fold, in addition to increasing the ease and the accuracy of the metal pouring operation from the ladle into the molds.

A more specific object of this invention is to provide a convenient means for applying lubrication to the bearing surface between the ladle holder shank and the ladle bail, thereby not only facilitating ease of operation in tilting the ladle from time to time as the metal is poured into the mold but also by reason of such lubrication serving as a means for excluding from such bearing surfaces the usual deposits of foreign matter as above referred to.

Another object of my invention is to provide a device of this character which can be conveniently and quickly assembled to regular equipment and from the standpoint of replacement and repair doing so without necessitating objectionable and frequently expensive delays.

Another general and important object is to provide a device which by its construction lends itself to affording greater securing and safety to the foundry operator or ladle man.

A further important object is to provide a device in which by the suitable selection of materials for meeting normal wear, greater economies in performance and in uninterrupted service are furnished.

Other important objects and advantages of the article will become more readily apparent upon proceeding with the following specification read in light of the drawings, in which

Fig. 1 is an exterior general assembly view of a ladle and bail embodying my invention.

Fig. 2 is a side exterior view of the assembly referred to in Fig. 1.

Fig. 3 is a combined sectional view in spaced-apart relation of the respective upper and lower members embodying my invention.

Fig. 4 is a sectional view taken on the line 4—4 of Fig. 3.

Fig. 5 is a perspective exterior view of the novel shank collar or upper member embodying my invention.

Fig. 6 is a perspective exterior view of the shank bearing or lower member embodying my invention.

Fig. 7 is a perspective exterior view of a spring preferably employed for holding the assembly in position.

Similar reference numerals refer to similar parts throughout the several views.

Referring now to Fig. 1, the conventional ladle 1 for carrying molten metal to the molds is shown mounted in the usual banded circular holder 2 encircling the tapered outer surface of the ladle. The said holder is provided with the transversely extending, oppositely disposed shanks or rod extensions 3, each of which latter members projects through or may be an integral part of the shouldered bearing members 4. The latter members are preferably journally supported within the respective assembled split members hereinafter described. The latter consist of the upper or shank collar member 5 and the lower or shank bearing member 10 assembled preferably in superposed relation in the order named within the curved hooked portions 6 of the inverted U bail member 7.

In order to assist in obtaining the proper positioning of the shank collar 5 and the shank bearing 10 upon the hook 6, it is preferable to provide each of the latter members with the transversely extending flanges 8 and 9, respectively. Thus it will be apparent that the shank collar 5 and the shank bearing 10 by use of their respec-

tive flanges may be securely mounted or nested upon the bail hooks 6. It will also be apparent that the outer cylindrical surface portion of the bearing members 4 is journally supported upon the surface 11 of the shank bearing 10. It has been found desirable, although not absolutely necessary, to make the surface 11 or even the entire bearing 10 of hardened wear resisting material as hard iron, for example, in order to impart improved performance in handling the heavy transverse loads encountered.

The upper member or shank collar 5 is not necessarily required to closely encircle or to bear snugly upon the outer peripheral surface portion of the member 4 as is true of the lower member, but instead the upper member 5 is preferably assembled so that the respective surfaces 12 and 13 will contact or bear in abutting relation upon the surfaces 14 and 15 respectively of the shank bearing 10. It is apparent that while I have shown the respective surfaces 12, 13, 14 and 15 in oppositely disposed relieved relation, the latter arrangement is merely used as a preferred form which permits of a single form of casting being employed for either the right or the left side of the ladle bail and which also tends to align the shank collar 5 with the shank bearing 10. Obviously, surfaces in the same plane and in abutting contact relation may be used without departing from the spirit of this invention. Thus referring now to Fig. 5 and Fig. 6, the upper member 5 may be simply lowered in superposed relation upon the lower bearing 10 subsequent to actual assembly of the latter member upon the bail hooks 6 to receive the bearing members 4 and the shanks or rod extensions 3 of the ladle holder. Mention should be made at this point that, as shown in the upper halves of Figs. 3 and 4, the upper member or shank collar 5 is provided with a chamber 16 and that the lower member or shank bearing 10 is provided with the annularly extending groove 17, the latter groove substantially located so as to divide the bearing surface 11 with an enlarged connecting groove 25 between the groove 17 and the upper chamber 16. The primary purpose of the latter arrangement is to permit applying a suitable lubricant, such as a relatively heavy bodied grease to the chamber 16, the connecting groove 25, the bearing surface 11 and the lower groove 17 thereby facilitating the uniform distribution of the lubricant around the rod extensions 3 of the bail holder 2 within the transverse limits of the upper and lower members 5 and 10. It will be apparent that under the influence of the temperatures normally encountered during the metal pouring operation the lubricant is spread upon the bearing surface 11 to thus reduce substantially the usual frictional resistance encountered and concurrently enabling the grease to act as a means for preventing the entry of foreign matter from sources exterior of the described assembly.

In the latter connection, it will further be noted upon referring to the upper portions of Figs. 3 and 4 relative to the shank collar construction, that the latter member is preferably provided with an extended roof or top portion 18 which extends substantially perimetrically over the respective flanged portions 8 and 9 and the grooves formed thereby in both the upper and lower members 5 and 10 when the latter are positioned in assembled relation upon the bail hooks 6. The roof portion 18 serves two purposes: first, it serves to block or prevent the objectionable deposit of the usual molten metal upon the flanges 8 and 9 and particularly between the hook portions 6 and the members 5 and 10 which would obviously interfere seriously with the operation of the journaled members 3 and 4; and second, the roof portion 18 is preferably made rounded slightly in its cross-section, as indicated at 19 in Fig. 4, so that when assembled upon the hook 6, as more clearly shown in Fig. 2, the rounded surface 19 is engaged by a similarly curved portion 21 between the upstanding arms 22 of the spring 26, the latter being pivotally mounted upon the bail 7 by means of the lugs 23 and the pins 24 extending through the spring aperture 20 to hold the assembly securely in position upon the hook 6. Thus it will be clear that by the simple pivotal movement of the spring 26 outwardly and away from the bail 7, the assembled upper and lower portions may be taken apart for replacement, repair or inspection and upon re-assembly thereafter held in locked position upon the bail hooks 6 by simply moving the spring 26 inwardly toward the bail 7. This arrangement obviously prevents the journaled members 3 and 4 from being displaced accidentally during the course of the metal pouring operation which might easily be dangerous as well as wasteful.

The shanks or rod extensions 3 at either side or both may of course be provided with the usual forked type of handle (not shown) for use in tilting the ladle in a desired direction when pouring the metal into the mold from the ladle. Also the spring 26 while shown in a sheet metal form may be of a coiled type or other form if desired. It will also be apparent that while in the foregoing description, specific mention has been made of the bearing member 4 about which the shank collar and shank bearing are mounted, it is obvious that under certain conditions it may be desirable to dispense with the use of such member and simply mount the shank bearing 10 and the collar 5 directly around the shank 3, since the member 4 merely serves as a strengthening or reinforcing means for the shank 3 in supporting the relatively heavy weight of the ladle when filled with molten metal.

As previously pointed out, my invention is capable of other modifications which will readily occur to those skilled in the art. Therefore the particular form of the various elements described is not primarily essential as it is obvious that numerous variations may be used without departing from the spirit of the invention.

It is intended therefore to be limited only to the extent defined by the scope of the appended claims.

I claim:

1. In a ladle bail bearing or the like, the combination including a bail, a carrier for a ladle, the said bail having hooked portions for engagement by the carrier, the said carrier having shank means for support by the bail, divided means assembled with the hooked portions of the bail comprising a shank collar and a shank bushing and substantially surrounding a portion of the shank means, the said shank collar and bushing being assembled in matched relation whereby the shank means of the said carrier is journaled within an aperture formed by the assembly of the said shank collar and shank bushing upon the said bail hooked portions.

2. In a ladle bail bearing and protector of the character described, the combination including a bail having lower depending hooked portions, a ladle carrier with extended rod portions, means

engaging said hooked portions comprising shank collars and shank bushings assembled in complementary relation within said hooked portions, the said shank collars and said shank bushings having means for engaging the said hooked portions, the said shank collars and shank bushings having hollow portions forming complementary apertures therebetween when assembled whereby the extended rod portions of the said ladle carrier are journaled within the aperture thus formed.

3. In a ladle bail bearing or the like, the combination including a bail, a holder for a ladle, the said bail having hooked portions cooperating with the said holder, shank means on the holder for engagement by the bail, split journaling means mounted upon the hooked portions of the bail comprising a shank collar and a shank bushing, the said shank collar and bushing being assembled in separable relation upon the hooked portions of the said bail whereby the shank means of the said holder is journally supported within the said bushing.

4. In a ladle bail bearing and protector of the character described, the combination including a bail having lower depending hooked portions, ladle holding means with rod-like extensions, means engaging said hooked portions comprising a shank collar and a shank bushing assembled in aligned relation within said hooked portions to form apertures therebetween, the said shank collar and said shank bushing having flanged means for engaging a side of the said hooked portions, whereby portions of the rod-like extensions of the said ladle holding means are contained within the assembly of the said shank collar and shank bushing.

5. In a ladle bail bearing or the like, the combination including a bail, a holder for a ladle, the said bail having hooked portions for engagement by the holder, shank means on the holder for support of the ladle, divided means engaging the hooked portions of the bail and providing journaling means for the shank means of the holder, the said divided means comprising a shank collar and a shank bushing, the said shank collar and bushing being assembled in superposed relation upon the hooked portions of the said bail.

6. In a ladle bail bearing and protector of the character described, the combination including a ladle holder, a bail having lower depending hooked portions for support of the ladle holder, means for journaling the said ladle holder and engaging the hooked portions of the bail comprising a shank collar and a shank bushing assembled in superposed relation within said hooked portions, the said shank collar and shank bushing having means for mounting upon the said hooked portions, the said shank collar and shank bushing having hollow portions therewithin forming chamber and distributing means for a lubricant applied therebetween.

7. In a ladle bail bearing and protector of the character described, the combination including a ladle holder, a bail having substantially semicircular hooked portions, means interlockably engaging the said hooked portions of the bail including upper and lower hollow members assembled in vertical aligned relation to engage journaled portions of the said ladle holder.

8. In a ladle bail bearing and protector, the combination including a bail having lower depending rounded portions for support of the ladle, a ladle holder, means adapted to be supported within the said rounded portions of the bail, the said latter means including upper and lower members in superposed relation and providing a bearing therebetween for the journaled support of the said ladle holder.

9. In a ladle bail bearing and protector, the combination including a bail having lower depending rounded portions for support of the ladle, a ladle holder with journaling means, means adapted to be supported within said rounded portions of the bail, the said latter means including upper and lower members in superposed relation enclosing a portion of the said ladle holder journaling means, the upper member having an overhanging portion to shield the area adjacent the ladle holder journaling means against accidental deposits of foreign matter and molten metal.

10. In a ladle bail bearing and protector of the character described, the combination including a ladle holder, a bail having depending supporting means for the ladle holder, means interlockably engaging the said depending supporting means of the bail including upper and lower hollow members in superposed relation, the lower member having a portion of a substantially harder material than the upper member for the journaled support of the ladle holder.

11. In a ladle bail bearing and protector of the character described, the combination including a ladle holder, a bail having substantially rounded portions for support of the ladle holder, superposed means mounted upon the said rounded portions of the bail including upper and lower hollow members providing a bearing therebetween for engagement by a journaling portion of the said ladle holder, means cooperating with the bail for maintaining said upper and lower hollow members in substantially locked relation upon the rounded portions of the said bail.

12. In a ladle bail bearing and protector, the combination including a bail having lower depending portions for support of the ladle, a ladle holder with rod extensions, means adapted to be mounted within said depending portions of the bail, the said latter means including divided upper and lower members in aligned relation and having means whereby grease may be packed therewithin to provide for lubrication of the rod extensions of the said ladle holder projecting within the assembly of the said upper and lower members.

ANDREW JADACH.