

A. J. FISHER.
LADLE FOR CASTING CAR WHEELS.

No. 537,568.

Patented Apr. 16, 1895.

Fig. 1.

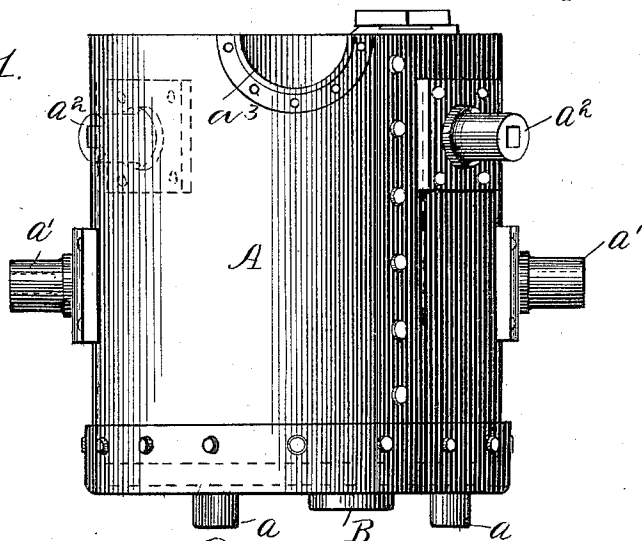


Fig. 2.

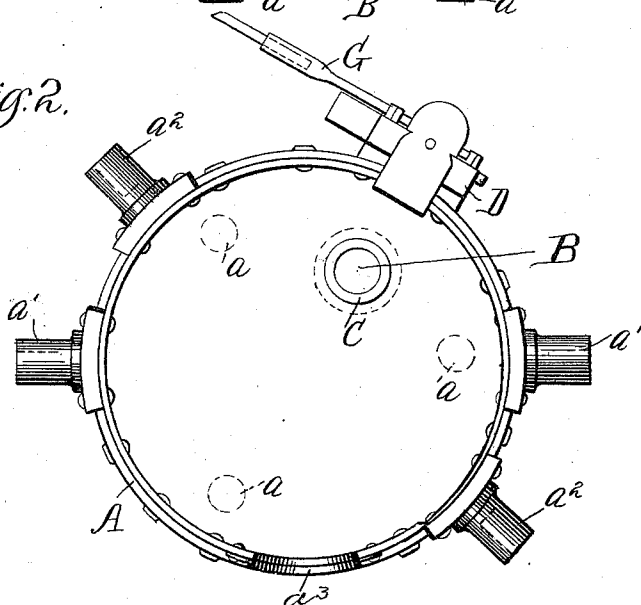
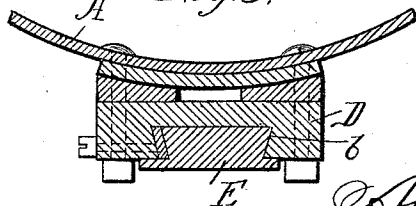


Fig. 3.



Witnesses.

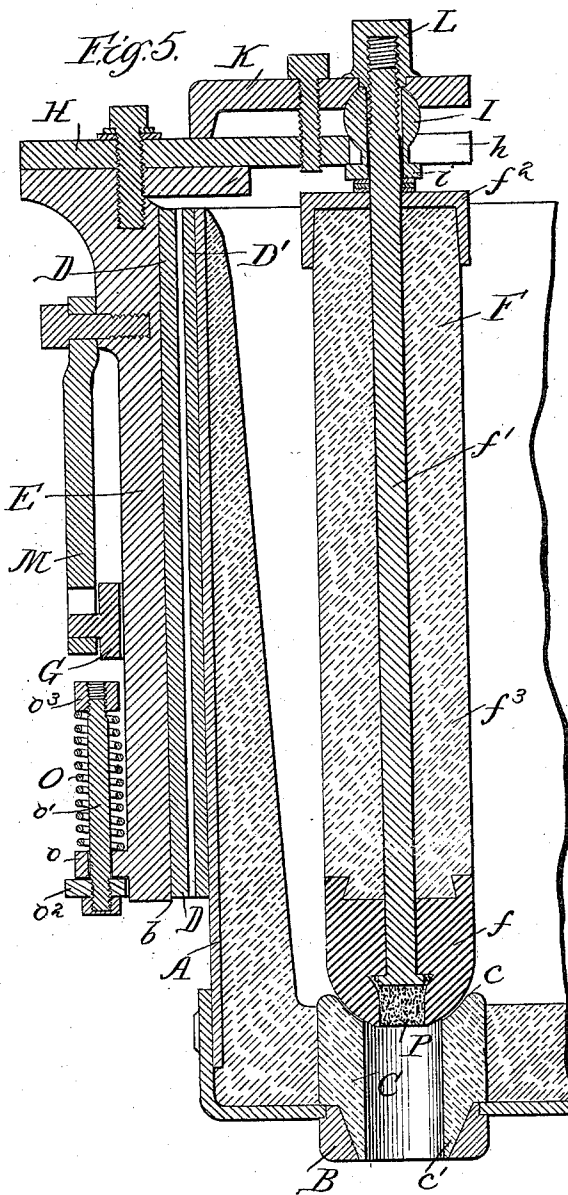
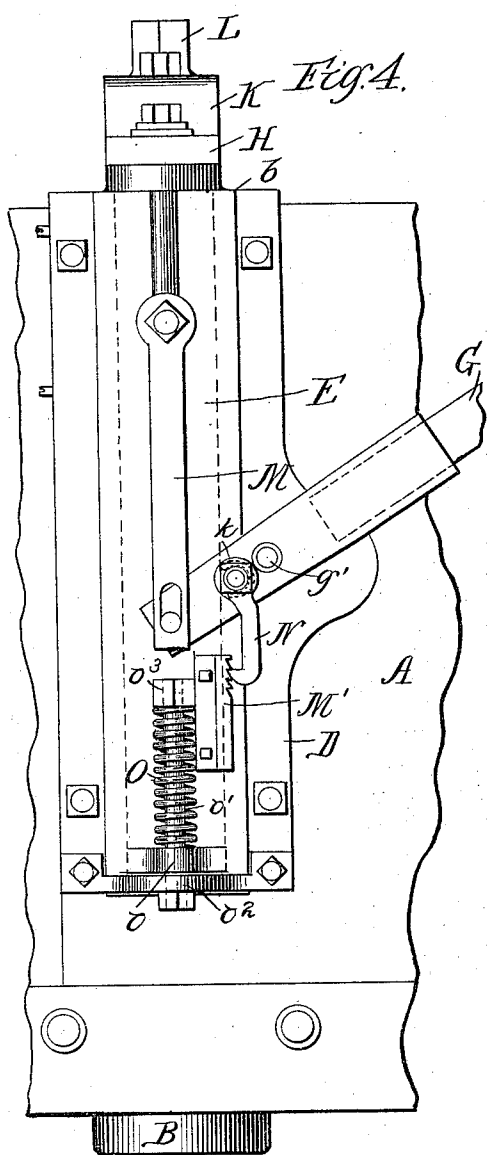
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UNITED STATES PATENT OFFICE.

ALVA J. FISHER, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE GRIFFIN WHEEL COMPANY, OF SAME PLACE.

LADLE FOR CASTING CAR-WHEELS.

SPECIFICATION forming part of Letters Patent No. 537,568, dated April 16, 1895.

Application filed June 29, 1894. Serial No. 516,073. (No model.)

To all whom it may concern:

Be it known that I, ALVA J. FISHER, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have
5 invented certain new and useful Improvements in Ladles for Casting Car-Wheels, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.
10

This invention is an improved ladle for casting car wheels and similar objects, one of the main features being that it pours from the bottom instead of from the top, as usual.

15 The object of my invention is to provide a ladle of this description that will project a steady stream into the mold and one that can be readily centered above the mold.

Another object is to provide novel constructions for the nozzle, stopper and operating parts, the said parts being so arranged that the stopper is first raised slowly and then rapidly so that the discharge of the melted metal will be retarded at first, a very essential feature in casting car wheels; and another object of my invention is to provide
20 protective coverings for certain parts of the device whereby they are prevented from being burned out, and still another object is to so construct the stopper that the strain thereon will not be placed upon the rod, thus preventing said rod from being bent or upset.
25

With these various objects in view, my invention consists, broadly, in a ladle having
30 an opening in the bottom thereof, a stopper for closing the said opening and in the peculiar construction of the operating lever, whereby a retarded and accelerated motion of the stopper is acquired, and my invention also includes a nozzle protective compound.
35

My invention consists, also, in certain details and combinations hereinafter fully described and claimed, reference being had to the accompanying drawings, in which—
40

45 Figure 1 is a side elevation of my improved ladle. Fig. 2 is a top plan view of the same. Fig. 3 is a detail sectional view showing the rest and the slide therein. Fig. 4 is an elevation showing the stopper-operating mechanism in detail. Fig. 5 is a sectional view of
50 the stopper, slide and connecting parts.

In constructing a ladle in accordance with my invention, I employ a cylindrical ladle A, to which are suitably secured three legs *a* to rest on, and two trunnions *a'* for carrying
55 the ladle. I also employ two trunnions *a''* for tilting the ladle to pour from the lip *a'''*, should the opening in the bottom become stopped up at any time. This ladle has a suitable fire-proof lining at the sides and bottom, and in
60 said bottom is made an opening B, through which the metal passes, said hole being arranged to one side of the center, so that it can be readily centered over a hole, and it also facilitates pouring from a large into a
65 smaller ladle. A nozzle C is arranged in the opening or hole B, said nozzle being of a composition hereinafter described, and at the upper end is formed with a seat or recess *c*, while at the lower end, below the ladle proper,
70 it is provided with a nipple *c'*, which increases its length, projects a steadier stream and permits the use of a thinner lining on the ladle bottom.

A slide rest D is bolted to one side of the ladle, said rest having a dove-tailed groove *b* extending throughout its entire length, and in said rest is held a vertical slide E which, at its upper end, is connected with the stopper F, within the ladle and is operated by means
80 of a lever G to raise and lower said stopper. This stopper F comprises a small head *f* of graphite which fits in the seat or recess of the nozzle and closes the orifice of the same. Connected with this head *f* is a wrought iron
85 rod *f'* which projects upward above the top of the ladle and carries near its upper end a cap or plate *f''*, and surrounding the rod between the cap and head is a protective covering *f'''*, which prevents the rod getting so hot
90 that it will bend. A horizontal rod or bar H is bolted to the top of the slide E and projects sufficiently inward to embrace the upper end of the rod *f'*, and to do this, I slot the end of
95 said bar, as shown at *h*. Surrounding the rod *f'* and seated upon the bar H, is a ball-bearing I, said bearing being essentially spherical in shape and having the flange *i* at its lower

end which fits below the bar H, forming a rest therefor. An angled plate K is clamped to the bar H above the same, said plate being perforated to admit the passage of the rod f' and recessed to form a seat for the upper end of the bearing I. A top nut L is screwed upon the upper end of the rod f' and thus completes the connection between the slide E and stopper F.

- 10 The lever G which operates the slide E, and in turn the stopper F, is pivoted to the rest D at g' and at the extreme end is connected with the slide through the medium of a pitman M, which is slotted at the lower end to receive a
15 pin on the end of said lever, and connected at its upper end with the slide E. The lever G is also connected with the slide by means of a pawl N mounted on the lever, near its pivot, and a ratchet plate M', mounted upon the slide
20 E. The object of this dual connection is to enable the operator to move the slide and stopper slowly at first and then rapidly as explained hereinafter.

To hold the stopper and slide normally
25 down, I provide a stout spring O, which bears upon the lug o upon the lower end of the slide, said spring encircling a rod o' , which is fastened to a lug o^3 on the rest, and carries at its upper end a nut o^3 against which the spring
30 bears to hold the slide down. The ladle proper is preferably made of steel, while the rest and slide are made of cast iron, and between the rest and ladle I usually interpose a strip of asbestos, D', as shown in Fig. 5. The rod and
35 connecting parts are preferably of wrought iron, and in the graphite head of the stopper is made a dove-tailed recess P, which is filled with sand and protects the end of the rod f' .

The protective covering I prefer to make of
40 a composition consisting of four parts molding sand, four parts ganister, and one part fire clay, as I have found this particularly adapted for the purpose.

In operation, the parts are arranged as
45 shown in Figs. 4 and 5, and the ladle is ready to receive its charge of molten metal. The spring O holds the stopper down in the nozzle and prevents the same from rising. When it is desired to discharge the contents into a
50 mold, the handle of the lever is thrown down. This brings the pawl N into action and being in engagement with the ratchet plate on the slide, said slide is moved upward slowly, inasmuch as the pawl is so close to the fulcrum
55 of the lever. The slot in the end of the pitman permits this slow movement until the pin on the lever reaches the head of the slot. Then the rapid motion begins, and this pawl becomes disengaged, said pawl having a spring
60 k , shown in dotted lines, Fig. 4, which throws the pawl outward as soon as the lever reaches a certain angle. This retarded motion, at first, permits a small stream to flow through the ladle and then the increased motion permits a rapid discharge, the necessary arrange-

ment in casting car wheels and the like. When the stopper is elevated all the strain falls upon the top nut and bearing I, and when it is lowered the strain falls upon the bearing and the cap or plate, so that all compression strain is taken from the rod f' and it is thus prevented from bending or becoming upset.

Having thus described my invention, what I claim is—

1. An improved ladle, having an opening in its bottom, a stopper arranged in said ladle, a lever for operating said stopper, and means connected with the lever at different points beyond the fulcrum whereby a differential motion is imparted to the stopper, substantially as shown and described.

2. In a ladle, a stopper-operating mechanism comprising a slide arranged upon the exterior of the ladle, a lever, pivoted also to said ladle, a pitman connected to said slide and also to the lever, a pawl connected to the lever adjacent to its fulcrum, a ratchet plate attached to the slide and a spring for returning said slide to its lower position, substantially as shown and described.

3. An improved ladle having an opening in its bottom, a stopper for closing the same, a slide, a lever for operating the stopper connected with the slide at two points at different distances from the pivot of the lever, whereby said slide is given a differential movement, substantially as described.

4. The combination of a ladle having an opening in its bottom, a stopper for closing the same, a slide and connections between the slide and stopper, and a lever pivoted upon the ladle and connected with the slide at its end and also at an intermediate point, substantially as set forth.

5. The combination of the ladle constructed as described, of the stopper located therein, the vertical slide arranged upon the exterior of the ladle, and connected at its upper end with the stopper, the operating lever arranged also upon the exterior of the ladle, the pitman having a slot at its lower end and connecting the lever and slide, the pawl pivoted to the lever and the ratchet plate secured to the slide, all arranged substantially as set forth and described.

6. The combination with the stopper having a central rod, of the slide, and horizontal bar attached thereto, the ball-shaped joint, angle plate and top nut, all arranged substantially as described.

7. In a ladle, a protective covering for stopper rods consisting of four parts molding sand, four parts ganister and one part fire clay, in combination with a stopper and operating mechanism substantially as set forth.

8. In a ladle, the combination with the ladle proper, of the stopper arranged within the ladle the slide rest secured upon the exterior of the ladle, the slide operating therein and

connected at its upper end with the stopper
within the ladle, the lever pivoted to the rest,
a pitman connected with the slide and slot-
ted at its lower end, a pin upon the end of the
5 lever and resting in said slot, a pawl carried
by the lever adjacent to the fulcrum and a
ratchet plate secured to the slide and adapted

for engagement with said pawl, substantially
as set forth and described.

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Witnesses:

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