

No. 647,150.

Patented Apr. 10, 1900.

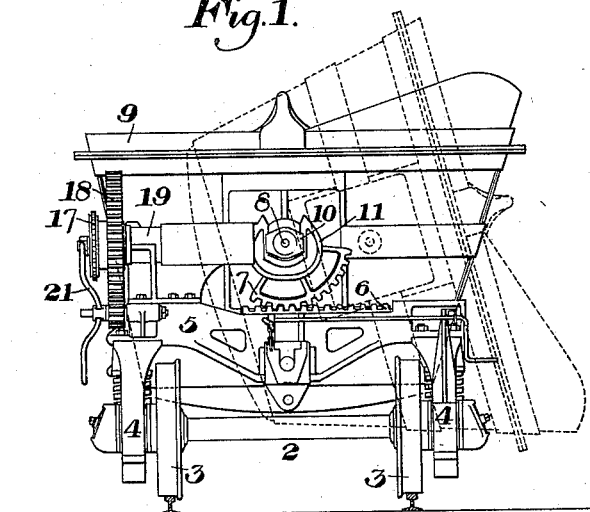
M. A. NEELAND.  
LADLE CAR.

(Application filed July 26, 1899.)

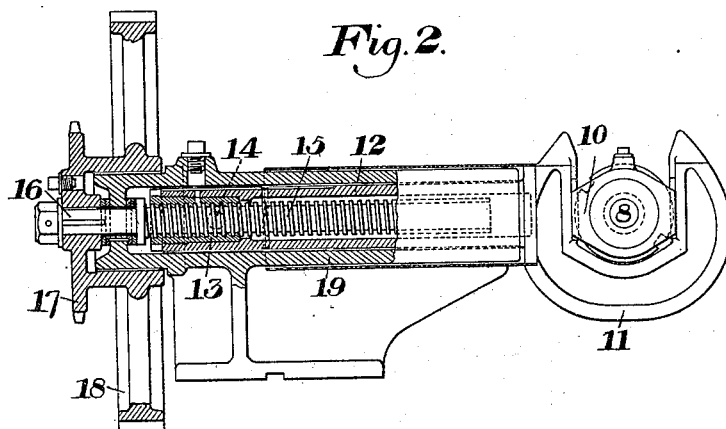
(No Model.)

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*Fig. 1.*



*Fig. 2.*



WITNESSES

*Leo Guthman*  
*Lin E. Thomas.*

INVENTOR

*Marvin A. Neeland.*

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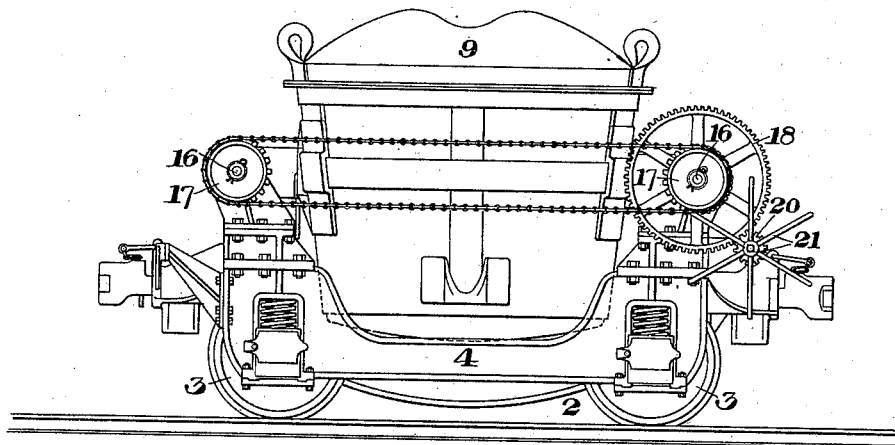
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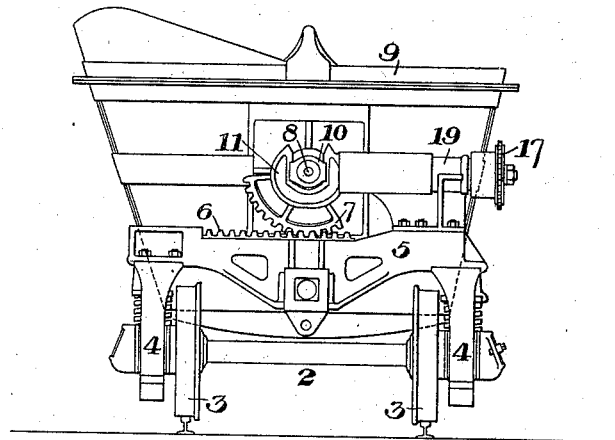
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2 Sheets—Sheet 2.

*Fig. 3.*



*Fig. 4.*



WITNESSES

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# UNITED STATES PATENT OFFICE.

MARVIN A. NEELAND, OF YOUNGSTOWN, OHIO.

## LADLE-CAR.

SPECIFICATION forming part of Letters Patent No. 647,150, dated April 10, 1900.

Application filed July 26, 1899. Serial No. 725,183. (No model.)

*To all whom it may concern:*

Be it known that I, MARVIN A. NEELAND, of Youngstown, in the county of Mahoning and State of Ohio, have invented a new and useful Improvement in Ladle-Cars, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is an end elevation of my improved car. Fig. 2 is an enlarged detail, partly broken away, of the tipping mechanism. Fig. 3 is a side elevation of the car, and Fig. 4 is an elevation of the opposite end to that shown in Fig. 1.

My invention relates to the ladle-cars which are employed for transporting and pouring metal or other molten material, and more especially to that type wherein the ladle is mounted on trunnions adapted to move forward on the car during the tilting operation; and it consists in a simple and effective mechanism for imparting the tipping movements to the ladle, this mechanism being so arranged that the ladle may be removed from the car without removing or disturbing any portion of the tipping mechanism.

It further consists in two mechanisms of this character which are applied at both sides of the ladle and are connected, so as to operate simultaneously, and also in the construction and arrangement of the parts, as herein-after more fully described, and set forth in the claims.

In the drawings, 2 represents a truck or ladle-car carried on wheels 3 and having side frames 4 4 with depressed intermediate portions. The end frames 5 of the car are provided with horizontal rack-bars 6, upon which rest segmental pinions 7, which are secured to the projecting trunnions 8 of the ladle 9. The outer end of each trunnion is carried within a bearing 10, which is slid down vertically within guides in a slotted casting 11, carried at the outer end of a hollow sleeve 12. The sleeve 12 is provided at its inner end with a nut 13, secured thereto by a suitable dowel 14, and this nut is engaged by a screw 15, formed of the inner portions of the shaft 16, carrying a sprocket-wheel 17. One of the sprocket-wheels 17 is formed integrally with the hollow hub of a toothed wheel 18, and the

shafts of both sprocket-wheels are mounted in end bearings of tubular brackets or supports 19, within which the hollow sleeves 12 extend. The toothed wheel 18 is engaged by a pinion 20, whose shaft is provided with a hand-wheel 21. The slotted castings 11 are provided with projecting tubular shields, which surround the tubular brackets and prevent exposure of the inner sleeves 12 during the tipping operation.

The parts being normally in the position shown in full lines, when it is desired to tip the ladle the hand-wheel being operated will simultaneously rotate both screws, and thus exert a forward pressure upon the trunnions. As the segmental gears are keyed or otherwise secured to the trunnions, as the ladle is forced forward it will be tipped by means of the racks. Reverse motion of the hand-wheel will cause the parts to assume their normal position. When the ladle requires relining or for any other reason it is to be removed, it is merely lifted by a crane or similar device without changing in the least the normal positions of the parts. The bearings for the trunnions will be moved up out of the slotted castings, and after the ladle is prepared it can be slipped back into place on the car.

The advantages of my invention result from the ease with which the ladle may be removed and replaced, from the fact that the force is applied directly against the ladle-trunnions, thus rolling and tilting the ladle, and from the compactness and simplicity of the mechanism, the simultaneous operation of both sides, and the protection of the mechanism from dirt or other abrading substances.

Many changes may be made in the form and arrangement of the parts without departing from my invention, since

I claim—

1. A ladle-car having a tilting and rolling ladle thereon, said ladle having trunnions and tipping mechanism movable in the plane of the trunnion, and acting thereon, said mechanism being arranged to allow the removal of the ladle without disturbing or changing the tipping mechanism; substantially as described.

2. A ladle-car having a rolling and tilting ladle thereon, and connected tilting mechanism arranged to act upon both trunnions of

the ladle, and having detachable connection therewith to allow the ladle to be removed without disturbing the tilting mechanism; substantially as described.

5 3. A ladle-car having a rolling and tilting ladle thereon, mechanism arranged to act on both sides of the ladle, and connections between said mechanism arranged to cause them to act simultaneously; substantially as  
10 described.

4. A ladle-car having a ladle provided with trunnions carried on segmental wheels resting on the car, and tipping mechanism movable in the plane of the ladle-trunnions and  
15 arranged to exert a pushing force upon them; substantially as described.

5. A ladle-car having a ladle provided with trunnions, segmental wheels secured to the trunnions, and carried on the car, and power-  
20 actuated pushers movable in the plane of the trunnions having detachable connection with the trunnion-bearings; substantially as described.

6. A ladle-car having a ladle provided with  
25 trunnions having bearings mounted in vertical slots in castings or heads therefor, mechanism for pushing the castings or heads horizontally, and segmental wheels secured to the trunnions and carried upon the car; substan-  
30 tially as described.

7. A ladle-car having a ladle provided with trunnions, horizontally-movable heads arranged to receive the bearings of the trunnions, threaded sleeves secured to the heads,  
35 and screws movable in the plane of the trunnions arranged to act upon the sleeves, the trunnions having segmental wheels secured thereto; substantially as described.

8. A ladle-car having a ladle mounted there-  
40 on, and mechanism for rolling and tilting the ladle, said mechanism containing a screw act-

ing upon the plane of the ladle-trunnion and arranged to exert a pushing force on the trunnion, and being arranged within an inclosed chamber; substantially as described. 45

9. A ladle-car, having a rolling and tipping ladle mounted thereon, and provided with a tipping mechanism, comprising a vertically-slotted head arranged to receive the bearing  
50 of a ladle-trunnion, and a screw connected to the head and lying in a horizontal plane passing through the ladle-trunnion; substantially as described.

10. A ladle-car, having a rolling and tilting ladle mounted thereon, wheels secured to the  
55 ladle-trunnions and carried on the car, inwardly-screw-threaded sleeves having loose connection with the trunnion-bearings, screws within the sleeves, and connections arranged to simultaneously rotate the screws, and exert  
60 a direct horizontal pulling or pushing force on the ladle-trunnions; substantially as described.

11. A ladle-car having a tilting ladle thereon, a sleeve or nut loosely connected with the  
65 bearings, an actuating-screw, and a tubular support within which the sleeve or nut is carried; substantially as described.

12. A ladle-car having a rolling and tipping ladle mounted thereon, and provided with a  
70 tipping mechanism comprising a screw working within a plane passing through the ladle-trunnion, said mechanism being arranged to allow the removal of the ladle without disturbing the tipping mechanism; substantially  
75 as described.

In testimony whereof I have hereunto set my hand.

MARVIN A. NEELAND.

Witnesses:

LEO GUTHMAN,

LEON E. THOMAS.