This invention relates to ladle tilting apparatus, and more particularly to automatic connecting hook mechanism for ladle tilting apparatus, and has for its object the provision of a hook mechanism for apparatus of this class which will automatically engage with and disengage from the ladles to be tilted or dumped.

Another object is to provide a hook mechanism having the novel design, construction and combination of parts hereinafter described and illustrated in the accompanying drawings.

In the drawings:

15 Figure 1 is a side elevation of a ladle tilting apparatus embodying this invention.

20 Figure 2 is an enlarged side view of the hook and stand.

25 Figure 3 is an enlarged fragmentary plan showing the automatic hook mechanism in position to engage the ladle.

Figure 4 is a detail front elevation of the tilting hook.

25 Referring more particularly to the drawings, the numeral 2 designates the ladle to be tilted or dumped, which is of standard design and is supported on a truck 3 by trunnions 4. The truck or car 3 is adapted to travel on track rails 5 which are provided with recesses or hollows (not shown) to receive the wheels of the car and thus center or position the ladle for tilting. The ladle 2 is provided on each side with a tilting bar 6 secured in brackets 7, and adapted to be engaged by the elevating or dumping hook of the ladle tilting or dumping mechanism.

35 The ladle 2 and its truck, being of standard and well-known design and not forming any part of my invention, will not be further described.

An elevating mechanism for lifting the ladle is positioned at the side of the track on which the ladle travels and comprises an upwardly and forwardly inclined bridge member 10, the forward legs or chords 11 of which form track members on which a sheave-carriage 12 is adapted to travel. A plurality of sheave-wheels 13 are journaled on shaft 13 mounted in the carriage 12, and a second series of sheave-wheels 14 are mounted on a shaft 15 journaled in bearings 16 at the top of the bridge 10.

55 A suitable cable 17 is trained over the sheaves 13 and 14 and has its one end secured to a power operated drum 18 at the lower end of the bridge 10 so that when the drum is operated to take up the cable 17, the carriage 12 will be caused to travel upwardly along the tracks 11, and when the drum is reversed to let out the cable 17, the carriage 12 will move downwardly.

A supporting block or base 20 is fixedly mounted in front of the bridge 10 and is provided with undercut flanges 21 along each upper side edge. A hook supporting block or stand 22 having a dovetailed projection 23 on its lower or bottom side, is mounted on the base 20 with the projection 23 slidably engaged between the flanges 21. The stand 22 is provided with a screw-threaded aperture 24 to receive a threaded adjusting rod 25 which is journaled in a projection 26 on the base 20. Rotation of the rod 25 will cause the stand 22 to move to or from the ladle 2 relative to the base 20.

A hook 28 having a pivot pin 29 projecting through its shank intermediate its ends is adapted to normally rest on the stand 22. The rear end of the shank of the hook 28 is pivotally connected by a pin 30 to a connecting link or bar composed of a hook engaging portion 31, a carriage engaging portion 32 and adjustable connecting rods 33. The carriage engaging portion 32 is U-shaped and has its leg portions pivotally mounted on the shaft 13 in the carriage.

The pin 29 extends a material distance beyond the side faces of the hook 28 and has rollers 35 journaled thereon.

90 The top of the stand 22 is provided with a pair of upstanding side bearing or track flanges 36 which are inclined downwardly and forwardly and terminate at their forward ends in recesses or bearing notches 37 adapted to form bearing seats for the rollers 35.

In operation, after the ladle has been positioned for tilting or dumping, the drum 18 will be operated to take up cable 17, thus causing carriage 12 to move upwardly along the bridge 10, thus causing the connecting link composed of parts 31, 32 and 33 to pull upwardly on the end of the shank of the hook 28. The hook will fulcrum on the pin or rod 29, and its head will move down and engage around the tilting bar 6 of the ladle. Continued operation of the drum 18 will cause the carriage 12 to continue its upward movement to lift the hook 28 clear of the stand 22,
and to elevate the hook and the lower end of the ladle 2, causing the ladle to fulcrum on its trunnion 4 until tilted sufficiently for dumping.

After the ladle is dumped, the drum 18 will be reversed to let out the cable 17 and permit the carriage 12 to move downwardly along the bridge 10. As the carriage 12 moves down, the ladle 2 will be lowered to its normal position by gravity, and the hook 28 will lower until its pin 29 engages the track flanges 36 of the stand 22. The hook will then be pushed forwardly along the flanges 36 by the weight of the carriage 12 and parts 31, 32 and 33 until its pin 29 is engaged in the recesses 37, and the hook is revolved about the pin 29 to disengage it from the tilting bar 6 on the ladle.

It will thus be seen that the hook 28 is automatically connected to and disconnected from the bar 6, and the necessity for hand manipulation is entirely dispensed with.

While I have shown and described one specific embodiment of my invention it will be understood that I do not wish to be limited thereto, since various modifications may be made without departing from the scope of my invention as defined in the appended claims.

I claim:

1. In a ladle tilting apparatus, a support, a hook pivotally mounted on said support, an elevating carriage, a connecting arm pivotally connected to said hook and said carriage, and means for elevating said carriage.

2. In a ladle tilting apparatus, a support, a hook pivotally and removably mounted on said support, an elevating carriage, a connecting arm pivotally connected to said hook and said carriage, and means for elevating said carriage.

3. In a ladle tilting apparatus the combination with an upwardly and forwardly inclined track, a carriage on said track, and means for moving said carriage on said track, of a fixed support, a hook removably and pivotally mounted on said support, and means connecting said hook and said carriage, whereby said hook will be moved about its pivotal mounting to engage with a ladle to be tilted, and then moved upwardly to tilt the ladle when said carriage is moved upwardly along said track.

4. In a ladle tilting apparatus the combination with an upwardly and forwardly inclined track, a carriage on said track, and means for moving said carriage on said track, of a fixed support, a hook removably and pivotally mounted on said support, and an adjustable link connecting said hook and said carriage, whereby said hook will be moved about its pivotal mounting to engage with a ladle to be tilted, and then moved upwardly to tilt the ladle when said carriage is moved upwardly along said track.

5. In a ladle tilting apparatus the combination with an upwardly and forwardly inclined track, a carriage on said track, and means for moving said carriage on said track, of a fixed support, a hook, a pivot pin secured in said hook intermediate its ends, said support being provided with suitable bearing recesses to receive said pin and form a pivotal and removable support for said pin, and an adjustable link connecting the rear end of said hook with said carriage, whereby said hook may be moved about its pivotal mounting to engage with a ladle to be tilted and then moved upwardly to tilt the ladle when said carriage is moved upwardly along said track.

6. In a ladle tilting apparatus the combination with an upwardly and forwardly inclined track, a carriage on said track, and means for moving said carriage on said track, of a fixed support, a hook operatively connected to said carriage, and means for automatically causing said hook to move relative to said carriage so as to engage said hook with the ladle to be tilted when said carriage is moved upwardly, and for disengaging said hook from the ladle after said carriage has been lowered to return the ladle to normal position.

In testimony whereof, I have hereunto signed my name.

THEODORE A. REPPER.