

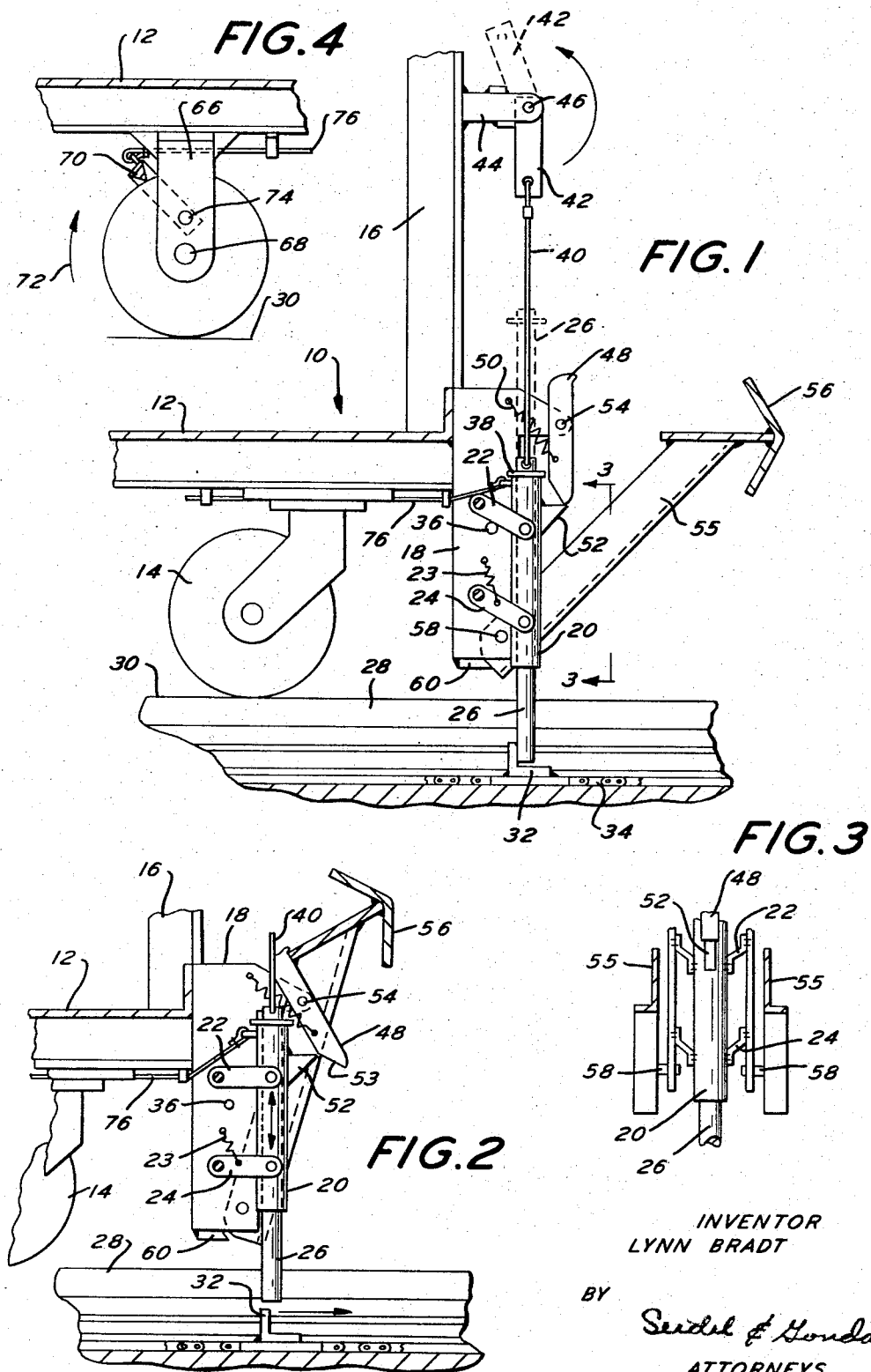
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TOW TRUCK

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TOW TRUCK

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This invention relates to a tow truck and, more particularly, to a tow truck which may be caused to accumulate along a main slot.

This invention relates to a tow truck adapted to be utilized in systems wherein a reciprocally upright tow pin on a material handling truck has one end portion entering a main slot in a reference surface. The reference surface may be a floor, the uppermost surface of a channel member supported on the floor, a ceiling, etc. A conveyor means is disposed on the opposite side of the surface with respect to the truck. The conveyor means is adapted to cooperate with the tow pin to propel the tow pin and truck along the main slot. Tow trucks of this type have been proposed heretofore.

In the tow truck of the present invention, the tow pin is provided with a guide structure which is supported at the front end of the body of a truck by at least two parallel links. A latch means is provided to maintain the tow pin guide structure in a lowermost position. The latch means is adapted to be actuated by an accumulation bumper on the truck. When the latch means is so-actuated by the bumper, the tow pin and its guide structure may be caused to move upwardly in an upright direction by the force imparted to the tow pin from a dog on a conveyor.

When the tow pin and its guide structure have moved upwardly for a sufficient distance so as to be clear of the dog, they may drop due to gravity to their normal position. The tow pin and the guide structure remain in an upright disposition at all times. Hence, contact between the lowermost end of the tow pin and the next dog on the conveyor will be such that the relationship between the dog and the tow pin corresponds to that which normally exists when the tow pin is being driven by the dog. If the tow pin structure were supported by a single link or mounted for pivotable movement about a single axis, the lowermost end of the tow pin would not remain upright at all times and will eventually flatten out the uppermost edge of the contact surface on the dog.

It is an object of the present invention to provide a novel material handling truck.

It is another object of the present invention to provide a material handling truck having a novel tow pin guide support.

It is another object of the present invention to provide a tow truck having a tow pin guide support which eliminates the formation of a bevel at the upper edge of a pusher dog of a conveyor.

Other objects will appear hereinafter.

For the purpose of illustrating the invention, there is shown in the drawings a form which is presently preferred; it being understood, however, that this invention is not limited to the precise arrangements and instrumentalities shown.

FIGURE 1 is a partial sectional view of a front end of a tow truck in accordance with the present invention.

FIGURE 2 is a view similar to FIGURE 1 but illustrating the components in another position.

FIGURE 3 is a view taken along the line 3-3 in FIGURE 1.

FIGURE 4 is a partial sectional view illustrating one of the rear wheels on the truck of the present invention.

Referring to the drawing in detail, wherein like numerals indicate like elements, there is shown in FIGURE 1 a front end portion of a tow truck 10. The tow truck

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10 is provided with a generally conventional body including platform 12 and upright portion 16 at the front end thereof mounted on wheels 14.

On the front end of the body of the truck 10, there is provided a pair of spaced brackets 18. The brackets 18 project forwardly of the upright portion 16 and are substantially equidistant from the side edges of the truck 10. Tow pin guide structure 20, in the form of a hollow cylindrical sleeve, is mounted on the brackets 18 by links 22 and 24. Each of the links 22 and 24 has one end pivotably coupled to guide structure 20 and has the other end pivotably coupled to the brackets 18. A tow pin 26 extends freely through the guide structure 20. Spring 23 extending between bracket 18 and link 24 biases the guide structure 20 and tow pin 26 upwardly and forwardly.

The truck 10 is adapted to be supported on a reference surface such as floor 30 having a main slot 28 therein. The lowermost end of the tow pin 26 is adapted to extend through the main slot 28 and into contact with a pusher dog 32 on a conveyor, such as dragline 34. As is well-known to those skilled in the art, the conveyor is provided with a pusher dog at spaced points therealong, any one of which may be in abutting contact with the tow pin 26 to propel the truck 10 along the slot 28 for subsequent diversion to a shunt slot. When the tow pin 26 is in its lowermost position for contact with dog 32, limit stop 36 on one of the brackets 18 contacts link 22. A limit stop to effect such disposition of the tow pin may be effected in a variety of manners. For example, a limit stop may be provided on the bracket 18 for contact with the guide structure 20.

The tow pin 26 is provided with a radially outwardly directed flange 38 at its upper end which overlies the uppermost end of the guide structure 20. One end of a flexible member 40, such as a chain or a cable, is connected to the uppermost end of the tow pin 26. The other end of flexible member 40 is connected to a handle 42. Handle 42 is pivotably supported by bracket 44 for rotation about the longitudinal axis of pin 46 which in turn extends in a horizontal direction transversely across truck 10. When handle 42 is manually moved to the phantom position in FIGURE 1, the tow pin 26 moves to the phantom position illustrated in FIGURE 1. Limit stops are provided on the bracket 44 to limit the solid line position of the handle 42 and the inoperative phantom position of the handle 42. When the tow pin 26 is in the phantom position in FIGURE 1, the lowermost end thereof is still disposed within the guide structure 20.

In order to retain the guide structure 20 in the solid line position in FIGURE 1, a latch means is provided. Such latch means includes the latch 48 mounted for rotative movement about the longitudinal axis of pin 54 which extends in a horizontal direction transversely across a front portion of the truck 10. Pin 54 is supported in turn by the brackets 18. Spring 50, which extends between one of the brackets 18 and latch 48, is stronger than spring 23, and biases the latch to the solid line position in FIGURE 1. When the latch 48 is in the solid line position in FIGURE 1, upward movement of the guide structure 20 is prevented by contact between abutment 52 thereon and the latch 48. An accumulation bumper 56 having struts 53 and 55 is provided.

The accumulation bumper 56 is rotatably supported at the front end of the truck 10 by pins 58 on the brackets 18. In the forward position of the bumper 56, strut 55 contacts the limit stop 60. When the accumulation bumper engages an obstruction, it is caused to rotate about a horizontal axis extending transversely across the truck 10, and thereby assume the position in FIGURE 2. In doing so, the latch 48 is rotated to the position illustrated in FIGURE 2, thereby permitting the guide structure 20 to move upwardly and forwardly of the truck 10

with abutment 52 contacting cam surface 53 on latch 48. Such movement of the guide structure 20 is effected by the dog 32 pushing the tow pin 26.

With the latch 48 in the position illustrated in FIGURE 2, the tow pin 26 and guide structure 20 are permitted to move forwardly without simultaneous movement of the truck 10. Accordingly, the tow pin 26 remains in an upright position but moves forwardly due to the specific mounting of the guide structure 20 provided by the links 22 and 24. In doing so, the lowermost end of the tow pin 26 is raised about the dog 32. Thereafter, the tow pin 26 and guide structure 20 would normally descend due to gravity to the position in FIGURE 1 while at all times remaining in an upright position. This spring 23 prevents descent and retains the guide structure 20 and tow pin 26 in the position shown in FIGURE 2. It will be noted that links 22 and 24 are of sufficient length so that the tow pin 26 will be raised through a distance sufficient to enable it to clear the contact surface on dog 32.

So long as the latch 48 is caused to assume the position illustrated in FIGURE 2, the forward and upward movement of the tow pin 26 and guide structure 20 would be repeated due to contact between the tow pin 26 and the next dog on the conveyor in the absence of spring 23. When bumper 56 and tow pin 26 are permitted to assume the position in FIGURE 1, spring 50 biases latch 48 to the position illustrated in FIGURE 1 thereby camming guide structure 20 and tow pin 26 downwardly so that the next dog will contact tow pin 26 and propel truck 10 along slot 28.

If the tow pin 26 and guide structure 20 are mounted for pivotable movement about a single axis, the tow pin 26 would not be upright during its movement and would cause the uppermost leading edge of the dog 32 to become flattened after extended use and thereby decrease the tow pin contact surface on the dog 32. Such undesirable wear on the dog 32 is avoided by the mounting for the tow pin 26 and guide structure 20.

As shown more clearly in FIGURE 4, the rear wheel 64 is rotatably supported by bracket 66 for rotation about the axis of pin 68. A self locking brake member 70 is provided to prevent the truck 10 from rolling backwards except when the tow pin 26 is elevated without interfering with rotation of wheel 64 in the direction of arrow 72 when the truck 10 is moving from left to right in FIGURE 1.

Member 70 is rotatably supported at one end by pin 74 on bracket 66. Member 70 is U-shaped and straddles wheel 64. Member 70 has a triangular wear surface at its bight portion for engagement with the periphery of wheel 64. When wheel 64 rotates in the direction of arrow 72, member 70 due to friction has a tendency to rotate in a clockwise direction in FIGURE 4. When wheel 64 tends to rotate in a counterclockwise direction in FIGURE 4, member 70 rotates in a similar direction about the axis of pin 74. Since member 70 is shorter than the radius of wheel 64, member 70 quickly binds against the periphery of wheel 64 to prevent truck 10 from rolling backwards, that is from right to left in FIGURES 1 and 4.

A cable 76 is coupled at one end to member 70 and at its other end to a stud at the flange 38. The intermediate portion of cable 76 is guided by loops on the underside of the platform 12. When tow pin 26 by itself or in conjunction with guide structure 20 is raised, cable 76 rotates member 70 clockwise in FIGURE 4 so that member 70 cannot interfere with backward movement of the truck 10.

In view of the general state of the art of tow trucks, a further description of the manner in which the tow truck 10 is propelled along the main slot and/or diverted to a shunt slot therefrom is not deemed necessary.

The present invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof and, accordingly, reference should be

made to the appended claims, rather than to the foregoing specification as indicating the scope of the invention.

What is claimed is:

1. A tow truck comprising a body adapted to be mounted for movement along a guide path, an upright tow pin having one end adapted to enter a slot for engagement with a conveyor means, guide structure for the tow pin, means including two link members mounting said guide structure and the tow pin at one end of said body, each link member having a first end portion pivotably connected to said guide structure, and each link member having a second end portion pivotably coupled to said body, whereby said tow pin and guide structure may move forwardly and upwardly with respect to said body while remaining in an upright position.

2. A tow truck in accordance with claim 1 including latch means on said body opposing such movement of said guide structure and tow pin, and means on said body for rendering said latch means ineffective when an obstruction is encountered by the body.

3. A tow truck in accordance with claim 2 wherein said last-mentioned means is a bumper pivotably mounted on said body, said bumper having a forward position and a rearward position, said bumper cooperating with said latch means to render the same ineffective when said bumper is in its rearward position and means operable when said bumper is in its rearward position for moving said tow pin and guide structure upwardly.

4. A tow truck in accordance with claim 1 wherein said guide structure is cylindrical in configuration, said tow pin extending through said guide structure, handle means on said body above said guide structure, and a flexible member extending between said tow pin and said handle means.

5. A tow truck comprising a body mounted on wheels, an upright tow pin having one end adapted to enter a slot for engagement with a conveyor means, guide structure for the tow pin, means mounting said guide structure and tow pin at a front end of said body for movement forwardly and upwardly with respect to said body while remaining in an upright position, said mounting means including at least one link having one end pivotably connected to said guide structure and the other end pivotably connected to said body latch means on said body opposing such movement of the guide structure and tow pin, a bumper on said body mounted for movement between a forward and a rearward position, said bumper being structurally interrelated with said latch means to render the same ineffective in preventing such movement of the guide structure and tow pin when the bumper is in its rearward position, and means for moving said tow pin and guide structure upwardly when said bumper is in its rearward position.

6. A truck in accordance with claim 5 wherein said mounting means for said guide structure and tow pin includes at least two links, each link having one end pivotably connected to said guide structure, and each link having another end pivotably connected to a portion of said body.

7. A tow truck comprising a body, an upright tow pin having one end adapted to enter a slot for engagement with a conveyor means, guide structure, said tow pin extending through said guide structure, means including two link members mounting said guide structure and tow pin on one end of said body, each link member having a first end portion pivotably connected to said guide structure and a second end portion pivotably connected to a portion of said one end of said body, whereby said tow pin and its guide structure may move upwardly and away from said body, and selectively releasable means on said body opposing such movement of said tow pin and its guide structure.

8. A truck in accordance with claim 7 including cooperating surfaces on said tow pin and its guide structure

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to limit the extent to which said tow pin can extend through said guide structure.

9. A tow truck comprising a body mounted on wheels, an upright tow pin having one end adapted to enter a slot for engagement with a conveyor means, guide structure for the tow pin, means mounting said guide structure and tow pin at a front end of said body for movement forwardly and upwardly with respect to said body while remaining in an upright position, said mounting means including at least two link members each pivotably connected to the guide structure and a portion of said body spring means on said body biasing said guide structure and tow pin forwardly and upwardly with respect to said body, latch means on said body opposing such movement of the guide structure and tow pin, a bumper on said body mounted for movement between a forward and a rearward position, said bumper being structurally interrelated with said latch means to render the same ineffective in preventing such movement of the guide structure and tow pin when the bumper is in its rearward position.

10. A tow truck comprising a body adapted to be mounted for movement along a guide path, an upright tow pin having one end adapted to enter a slot for engagement with a conveyor means, guide structure for the tow pin, means including two link members mounting said guide structure and the tow pin at one end of said body, each link member having a first end portion pivotably connected to said guide structure, and each link member having a second end portion pivotably coupled to said body, whereby said tow pin and guide structure may move forwardly and upwardly with respect to said body while remaining in an upright position, a locking brake on said body for cooperation with wheels on said

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body to only prevent movement of said body in a rearward direction and means coupled between said brake and tow pin for releasing said brake when the tow pin is moved upwardly.

11. A tow truck comprising a body adapted to be mounted for movement along a guide path, an upright tow pin having one end for cooperation with guide structure of said path for guiding said body along said path, means mounting said tow pin on said body so that said tow pin may move in an upright direction between a driving position and a non-driving position, an accumulation bumper means on said body and coupled to said tow pin so that contact by the bumper means with an abutment along said path may move said tow pin from its driving position to its non-driving position, and a locking brake on said body for cooperation with wheels on said body to only prevent movement of said body in a rearward direction, and means extending between said brake and tow pin for releasing said brake when the tow pin has moved from its driving position toward its non-driving position, whereby said body is movable in forward and rearward directions when said tow pin is in its non-driving position.

References Cited by the Examiner

UNITED STATES PATENTS

2,936,719	5/1960	Rodd	104—172
3,015,284	1/1962	Klamp	104—172
3,119,347	1/1964	Dehne	104—172

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