June 17, 1958 R. M. WILKINSON 2,839,067

METHOD OF CLEANING BARGE BOTTOMS

Filed Feb. 14, 1956 3 Sheets-Sheet 1

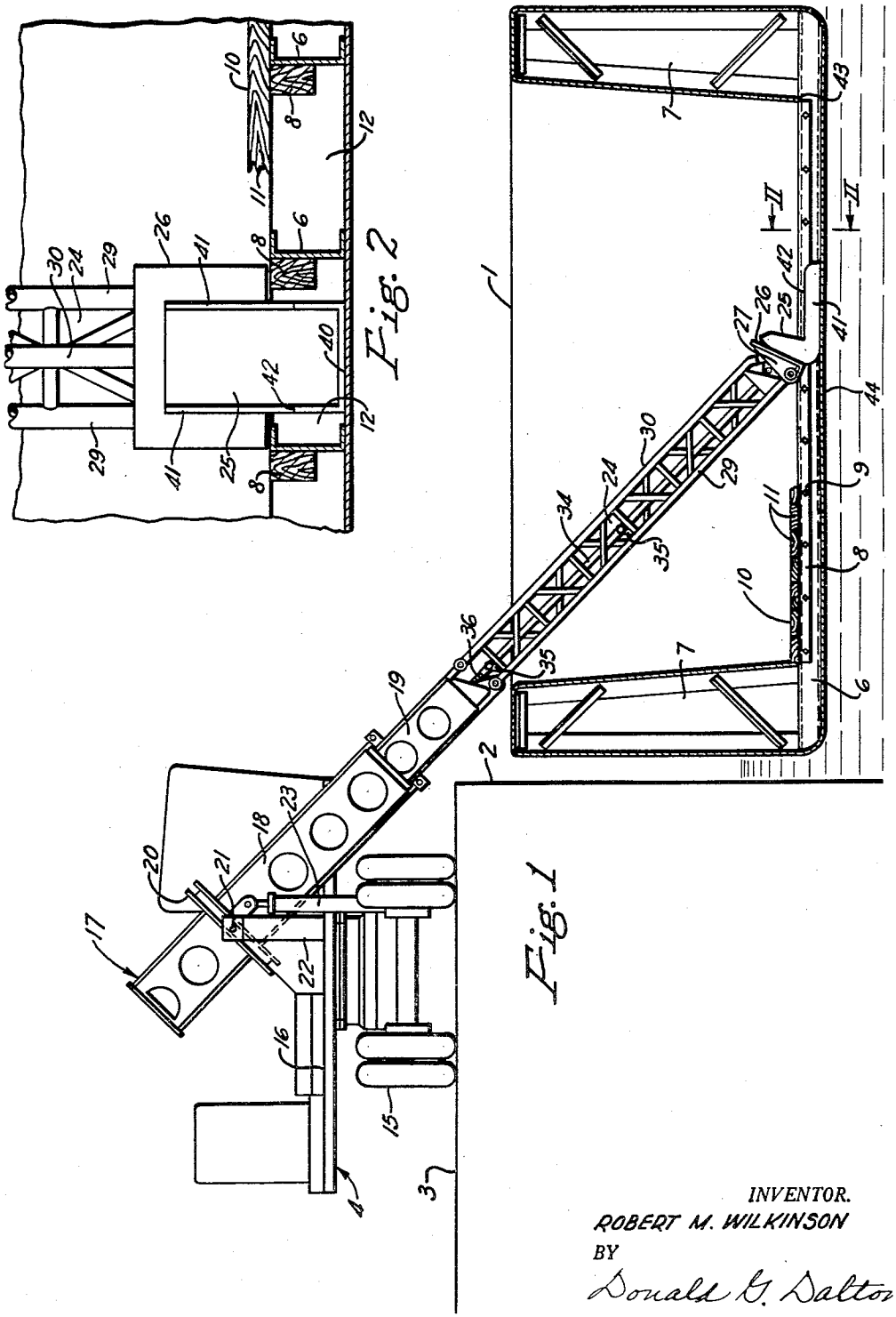


Fig. 1

Fig. 2

INVENTOR.
ROBERT M. WILKINSON
BY
Donald G. Dalton
HIS ATTORNEY

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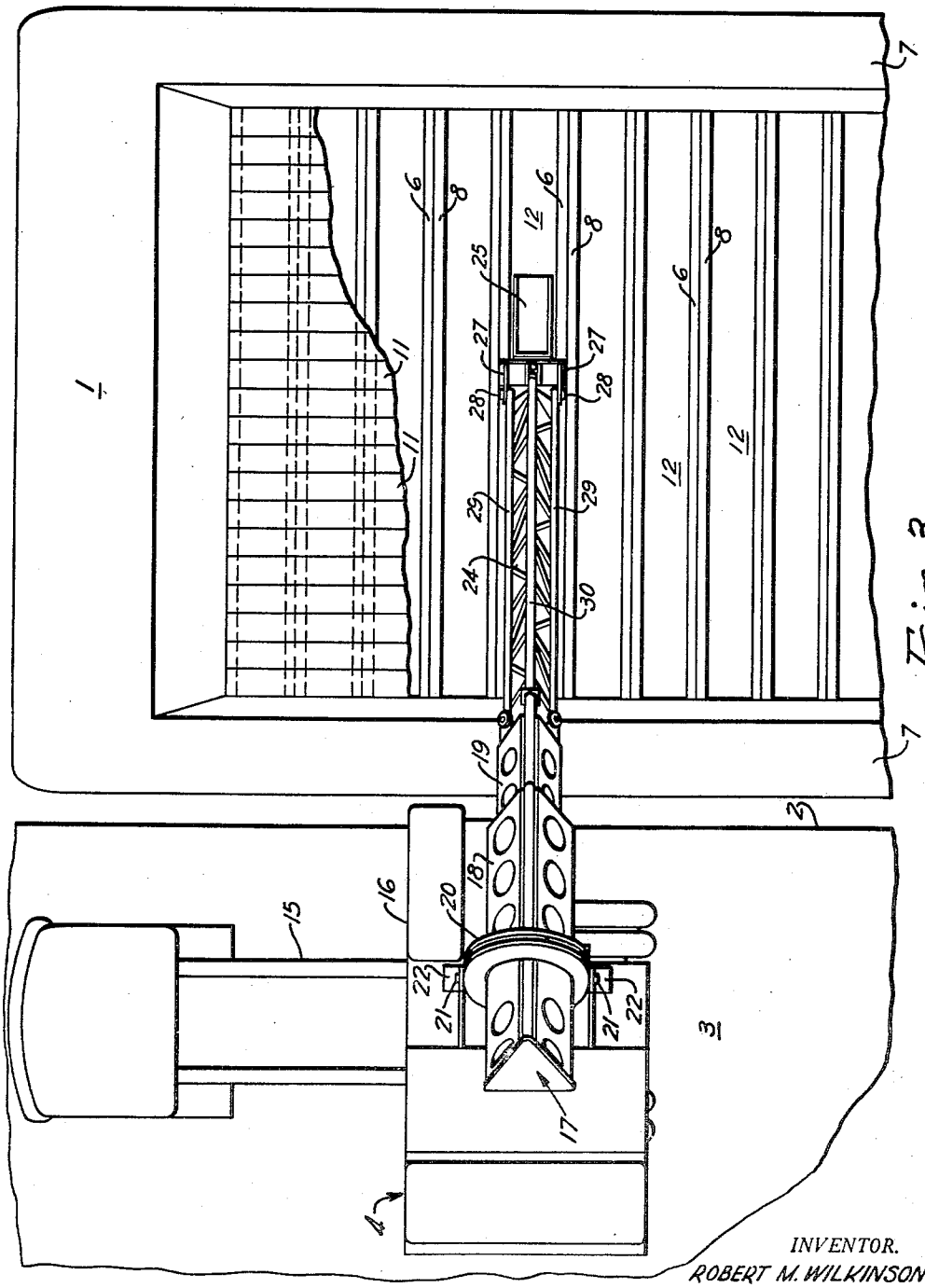


Fig. 3

INVENTOR.
ROBERT M. WILKINSON
BY
Donald G. Dalton
HIS ATTORNEY

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Fig. 5

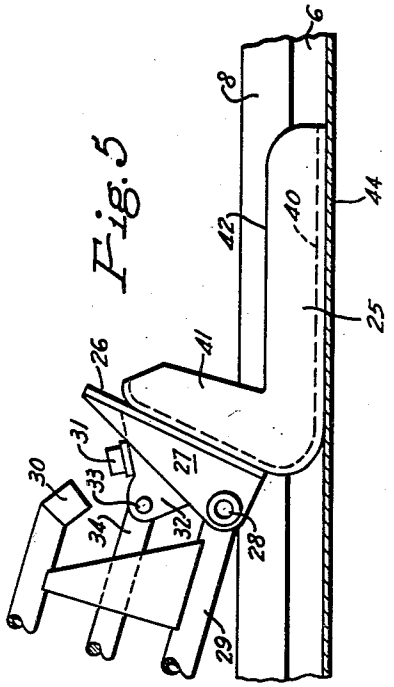
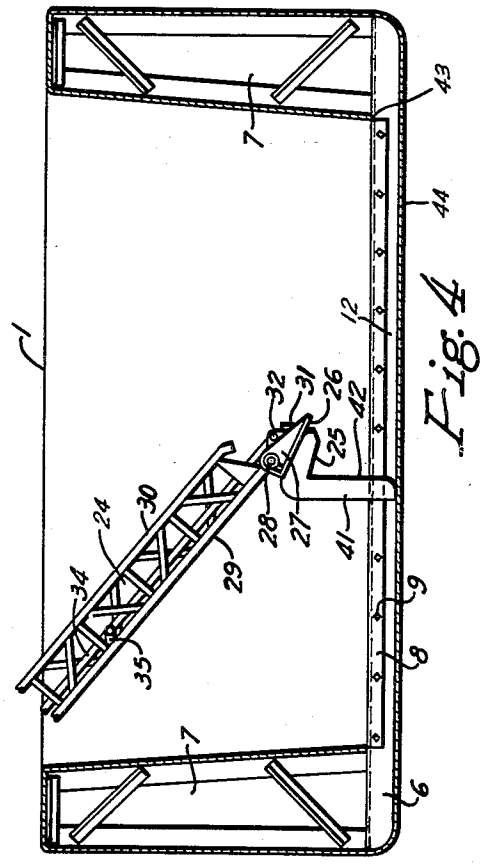


Fig. 4



INVENTOR.
ROBERT M. WILKINSON
BY
Donald G. Dalton
HIS ATTORNEY

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METHOD OF CLEANING BARGE BOTTOMS

Robert M. Wilkinson, Pittsburgh, Pa., assignor to United States Steel Corporation, a corporation of New Jersey

Application February 14, 1956, Serial No. 565,438

1 Claim. (Cl. 134—8)

This invention relates, as indicated, to a method of removing accumulations of coal or other materials from the deck structure of a barge preliminary to replacement of the wood planks which form the surface thereof.

Barges are commonly constructed with wood inner bottoms of three inch planks which extend lengthwise of the barge. These planks are secured in place by nailing to transversely extending timbers (6" x 4" nailers) which are bolted to the sides of spaced parallel reinforcing channels. During normal barge operation, dust particles of fine coal or other materials fall through cracks between the deck planks and accumulate in the space between the deck reinforcing channels on which the planks are supported. These accumulations must of course be removed when replacement of the deck planks is required. Since as much as 90 tons of coal will accumulate in a coal barge having a length of 175', width of 26' and depth of 11' during the average five year life of its wood deck, its removal is an expensive and time-consuming operation when effected manually by pick and shovel according to conventional practice.

One of the principal objects of this invention is to provide a method which will reduce the time and cost of clearing barge decks of accumulated coal or other materials preliminary to replacement of the deck planks.

A further object of the invention is to provide a method of clearing a barge deck of accumulated coal or other materials which utilizes conventional road building or grading equipment for moving a shovel through the deck spaces containing the accumulated material.

Other objects and advantages of the invention will be apparent from the following description.

In the drawings, there is shown a preferred form of apparatus for practicing the method of this invention. In this showing:

Figure 1 is a transverse sectional view of a barge arranged alongside a dock on which is shown somewhat diagrammatically an apparatus for removing accumulations of material from the barge deck structure in accordance with the principles of this invention;

Figure 2 is an enlarged detail sectional and elevational view taken substantially along the line II—II of Figure 1;

Figure 3 is a plan view of the barge and apparatus shown in Figure 2;

Figure 4 is a partial view of the structure shown in Figure 1 which illustrates the relative position of its shovel with respect to the barge at the beginning of its operation to remove material from one of the deck spaces in which it accumulates; and

Figure 5 is an enlarged fragmentary view of the material removing shovel and a portion of the supporting structure shown in Figure 1.

Figures 1 and 2 of the drawings show a barge 1 in position beside a dock 2 having a roadway surface 3 on which there is shown a conventional traction vehicle supported apparatus 4 for removing accumulated material from the deck structure of the barge 1 in accordance wtih the principles of this invention. The deck structure of the barge 1 is comprised of spaced parallel channels 6 extending transversely of the barge sides 7 and to which wood nailer strips 8 are secured by bolts 9 with the upper surfaces of the channels 6 and strips 8 flush as best shown in Figure 2. The surface 10 of the deck structure is formed by wood planks 11 extending longitudinally of the barge and parallel to its sides 7, as best shown in Figure 3, which are secured by nailing to the nailer strips 8. During normal operation of the barge in the transportation of bulk materials including coal, dust and fine particles of the material falling through the cracks between the planks 11 is accumulated in and eventually fills the spaces 12 between the channels 6. This accumulated material must of course be removed when the planks 11 are replaced. In accordance with the principles of this invention and in a manner to be described, removal of material from the spaces 12 is effected by the apparatus which has been designated as a whole by the numeral 4.

As best shown in Figure 1, the roadway surface 3 on the dock 2 is at a level slightly above the upper edge of the barge 1. The apparatus 4 supported thereon is a conventional type, commonly known by its trade name "Gradall," which is used in road building and grading operations and has been shown in the drawings somewhat diagrammatically. It comprises a truck chassis 15 on which a turntable 16 is supported for rotation about a vertical axis. The turntable 16 carries an extensible boom 17 which is comprised of telescoping members 18 and 19 of triangular shape, the member 19 being telescopically received in the member 18. The member 18 has a rotational support in a mounting ring 20 which provides for rotation of the boom 17 about the axis of the ring 20. The ring 20 in turn is mounted for movement about a horizontal axis by a pair of pivots 21 at opposite sides thereof, the pivots 21 being supported by vertical standards or uprights 22 projecting upwardly from the table 16. When the table 16 is in the position shown in the drawings, the axis of the pivots 21 is parallel to the sides 7 of the barge. A fluid pressure motor 23 is provided for adjusting the position of the boom 17 about the pivots 21, other fluid pressure motors (not shown) being provided for rotating it in the ring 20 and for controlling the rotation of the table 16 and the extension of the boom member 19 relative to the member 18.

A frame 24 is secured at its inner end to the boom member 19 and forms an extension for the boom 17. A shovel assembly including a shovel 25 of a construction specially adapted for movement through the spaces 12 in a manner to be described and a mounting head 26 is pivotally connected with the outer end of the frame 24. The pivotal mounting of this assembly comprises a pair of laterally spaced brackets 27 projecting rearwardly from the shovel assembly head 26 and respectively carrying trunnions 28 which have bearing supports on the outer ends of the lower frame members 29. The outer end of the upper frame member 30 provides an abutment for engagement with a stop 31 mounted on a bracket 32 arranged centrally of the shovel head 26 to limit pivotal movement of the shovel assembly about the axis of the trunnions 28. A pivot 33 on the bracket 32 connects the shovel assembly with the outer end of an actuating rod 34 which is mounted for movement on the frame 24 by pivot links 35. An operating link 36 is pivotally connected to the inner end of the rod 34 and is actuated by a fluid pressure motor (not shown) for moving the rod 34 to impart pivotal movement to the shovel assembly.

The shovel 25 is open at its front and top and is comprised of an L-shaped bottom plate 40 and L-shaped side plates 41 projecting upwardly from the edges thereof, the plates 41 and 40 being secured at their inner ends to

the mounting head 26. The outer ends of the side plates 41 have a height such that their upper edges 42 will move under the lower edge 43 of a barge side plate when the shovel is moved along the barge bottom 44 so that it can be used to remove material from the space below the barge sides 7. The width of the shovel 25 as determined by the lateral spacing of its side plates 41 is less than the distance between a nailer strip 8 and a channel 6 and such that it can be inserted easily in a space 12. The dimensions and configuration of the shovel 25 are of course determined by the size of the deck spaces 12.

In accordance with the principles of this invention, accumulated material is removed first from one side and then from the other side of the barge. The removal operations from opposite sides of the barge are effected by moving the shovel 25 through each space 12 from a point adjacent the center of the barge toward the side 7 which is remote from the dock 2. After the accumulated material has been removed in this manner from a portion of each of the spaces 12 along one side of the barge, the barge is turned around or has its position reversed alongside the dock 2 so that the material in the remaining portions of the spaces 12 at the other side of the barge may be removed in a similar manner.

Operation of the shovel 25 by the apparatus 4 to remove accumulated material from the deck spaces 12 in this manner is effected by first placing the vehicle 15 alongside the dock 2 in the relative position shown in the drawings with the axis of the pivots 21 parallel to the edge of the dock 2 and the sides 7 of the barge, and with the axis of the boom 17 extending along the centerline of the space 12 from which this material is to be removed. With the shovel tilted about its mounting trunnion pivots 28 to the relative position shown in Figure 4, the telescoping member 19 is retracted to provide the shortest effective length of the boom 17 which will provide for movement of the shovel 25 into a space 12 at the point shown in Figure 4. As viewed in Figure 4, this point is to the left of the centerline of the barge and adjacent the side 7 of the barge next to the dock 2. By a combined lowering of the bom extension frame 24 and a pivotal movement of the shovel 25 in a counter-clockwise direction as viewed in Figure 4 together with an extension of the effective length of the boom 17 by an outward movement of the member 19 relative to the member 18, the shovel 25 is moved to the relative position shown in Figure 5 with its bottom plate 40 resting on the barge bottom 44. Movement of the shovel 25 in this manner from the position shown in Figure 4 to the position shown in Figure 5 is effective to collect material from a space 12 with a scooping action. A further extension of the length of the boom 17 by moving the member 19 outwardly with respect to the member 18 moves the shovel 25 to the right, as viewed in Figure 5, in a direction parallel to the channels 6 and along the barge bottom 44 to remove material from the space 12 in which it is positioned. After operation of the shovel 25 in this manner to clear a portion of one of the spaces 12 along one side of the barge, the truck 15 is moved along the dock to position the shovel 25 over an adjoining space 12 for removal in a similar manner of the material accumulated therein. Repeating these operations will remove the material from the right side of the barge as viewed in the drawings. To remove material from the other side of the barge, the barge must be turned around to a position which is reversed to that shown in the drawings so that the removal operations described above may be repeated.

While a preferred practice of the method of this invention has been described in conjunction with a showing of a preferred embodiment of apparatus for effecting its practice, it will be apparent that such practice may be modified and other apparatus may be used without departing from the scope of the following claim.

I claim:

A method of removing accumulations of material from the spaces between the parallel deck channels of a barge which comprises arranging an extensible boom in a vertically inclined position relative to the barge with its lower end adjacent the deck of the barge at a point centrally thereof and with its upper end upwardly and outwardly of the upper edge of one side of the barge, supporting said upper boom end for pivotal movement about a stationary horizontal axis parallel to the longitudinal centerline of the barge, connecting a shovel to said lower boom end for pivotal movement about a second and movable horizontal axis parallel to said stationary axis, and extending said boom to move said second axis toward the other side of the barge and to thereby move said shovel through one of said spaces in a direction parallel to said channels for removing the material accumulated therein.

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