July 4, 1950 P. E. VELDHUIZEN 2,513,696

LOADING OR CHARGING GEAR

Filed Nov. 12, 1948

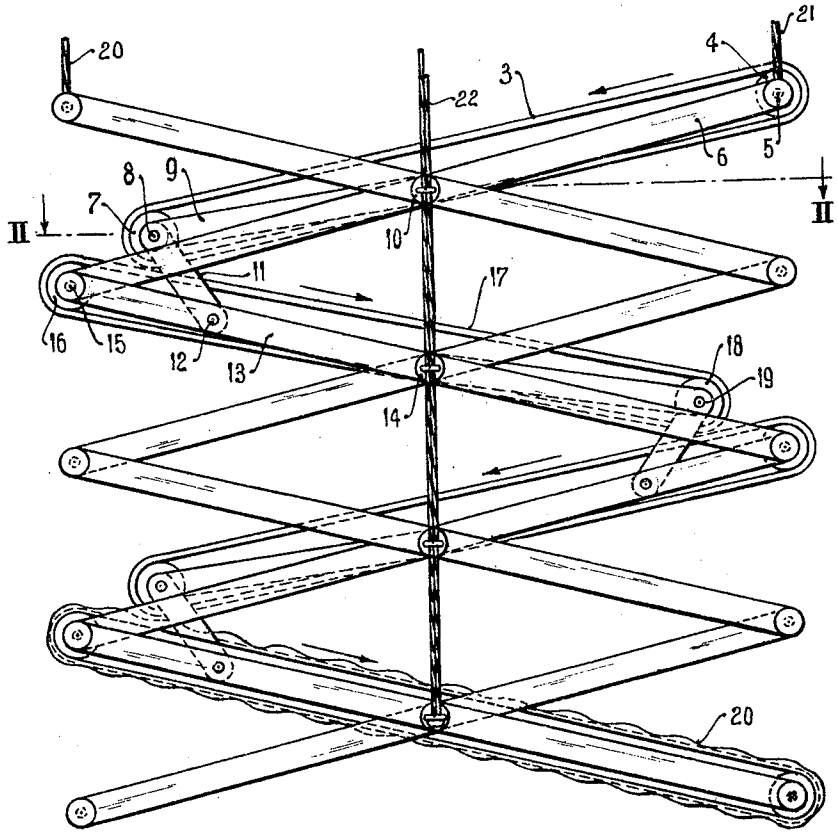


FIG.1

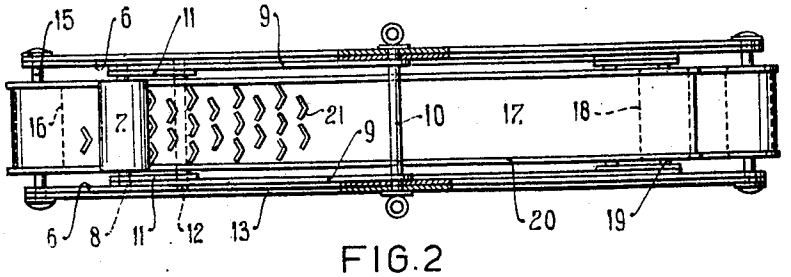


FIG.2

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Patented July 4, 1950

2,513,696

UNITED STATES PATENT OFFICE

2,513,696

LOADING OR CHARGING GEAR

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Application November 12, 1948, Serial No. 59,710
In the Netherlands May 14, 1948

3 Claims. (Cl. 198—84)

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This invention relates to loading or charging gear for general use, although it is particularly suitable for bunkering and like purposes.

The ordinary practice in loading a ship with coal is allowing the coal to slide down into the hold along a chute, in which the coal assumes a relatively high velocity so as to be liable to be disintegrated and pulverized, so that in many cases a proportion of about 20% of coal thus handled is degraded.

In accordance with the invention, which enables the loading of ships or other means of conveyance with coal or other material, either in bulk or packed in bags, cases or the like without the goods being exposed to degradation or damage otherwise, the gear comprises a pair of suitably interconnected vertical lazy tongs supporting a plurality of conveyor belts arranged in zig-zag relation in such manner that the top roller of each belt is rotatable about the axis of the top fulcrum of a link of the lazy tongs and the bottom roller of said belt is rotatable about the axis of the fulcrum of a toggle joint lever, having arms of unequal lengths, the end of the longer arm being rotatably mounted about the central fulcrum of said link and the shorter arm being rotatably connected to the next lower link of the lazy tongs at a point intermediate the top and the central fulcrum of said next lower link.

With the proper ratio between the lengths of the arms of the toggle link lever it is ensured that the distance from the lower end of each conveyor belt to the top end of the next lower conveyor belt will have a substantially invariable small value, irrespective of the magnitude of the angle between the links of the lazy tongs, so that the materials or goods will never have to fall through greater distance than they are able to withstand without being disintegrated or damaged to any appreciable extent.

A loading or charging gear in accordance with the invention may be suspended, for instance, through cables engaging the free ends of the top links from the jib of a crane mounted on a pontoon, in such manner that the gear is adapted to be positioned vertically above the (or a) hatchway of the ship to be loaded, other cables being provided whereby the lazy tongs can be allowed to extend until the lower end of the lower conveyor belt is almost at a level with the bottom of the hold to be charged, and gradually collapse as the hold is filled. It is advisable to also provide for a substantially horizontal belt conveyor within the hold, by means of which the material without being trimmed, can be stowed below the decks.

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The diagrammatic drawing illustrates, by way of example, a gear in accordance with the invention, Fig. 1 being a side elevation view and Fig. 2 a plan view thereof.

Fig. 1 shows the gear with the lazy tongs and the conveyor belts, supported thereby in zig-zag relation, in partly extended position. The top roller 4 of the upper conveyor belt 3 is rotatably mounted in the top end 5 of the top link 6 of the lazy tongs, and the lower roller 7 thereof is rotatable about the axis 8 of the fulcrum of a toggle link lever, whose longer arm 9 is rotatable about the central fulcrum 10 of link 6, the shorter arm 11 of said toggle link lever being rotatably connected at 12, to the link 13, which is hinged to the lower end of link 6, point 12 being located between the central fulcrum 14 of said link 13 and the fulcrum 15 between both links 6 and 13.

Rotatable about the axis of fulcrum 15 is the top roller 16 of the next lower conveyor belt 17, whose bottom roller 18 is rotatable about the axis of the fulcrum 19 of a second toggle link lever, which is the equivalent of toggle link lever 9, 11, and so on. 20 and 21 are the cables from which the gear is suspended, and 22 are the cables by means of which the lazy tongs may be allowed to be extended and collapsed.

Each conveyor belt is adapted to be driven by an electric motor (not shown) accommodated within its top or bottom roller. It may be provided with side flanges 20 for preventing the material or the goods from falling off the belts, and also with laterally extending ridges 21 preventing relative displacement of the granules or the material, even if the belts should have a considerable inclination.

What I claim is:

1. An adjustable loading and charging device comprising, in combination, a pair of vertical lazy tongs formed from two series of interconnected links, the links of each series being pivotally connected at their ends and the links of one series being pivotally connected to the links of the other series at their respective central fulcra, a plurality of belt conveyors arranged in zig-zag relation, each of said belt conveyors being rotatable about a pair of rollers, the top roller of each belt being rotatable about the axis of the end pivotal connection of two links of said lazy tongs and the bottom roller of each pair being supported and rotatable about the axis of the fulcrum of a toggle joint lever, said lever having arms of unequal length, the longer of said arms

being mounted at the central fulcrum of the adjacent link and the shorter arm being pivotally connected to the next lower link of the lazy tongs at a point between the upper end and the central fulcrum thereof, at least one roller of each belt being positively driven.

2. An adjustable loading and charging device comprising, in combination, a pair of vertical lazy tongs formed from two series of interconnected links, the links of each series being pivotally connected at their ends and the links of one series being pivotally connected to the links of the other series at their respective central fulcra, a plurality of belt conveyors arranged in zig-zag relation, each of said belt conveyors being rotatable about a pair of rollers, the top roller of each belt being rotatable about the axis of the end pivotal connection of two links of said lazy tongs and the bottom roller of each pair being supported and rotatable about the axis of the fulcrum of a toggle joint lever, said lever having arms of unequal length, the longer of said arms being mounted at the central fulcrum of the adjacent link and the shorter arm being pivotally connected to the next lower link of the lazy tongs at a point between the upper end and the central fulcrum thereof, at least one roller of each belt being positively driven, and means connected with the upper ends of the top links of said lazy tongs for adjusting the degree of inclination of the links.

3. An adjustable loading and charging device comprising, in combination, a pair of vertical lazy tongs formed from two series of interconnected links, the links of each series being pivotally connected at their ends and the links of one series being pivotally connected to the links of the other series at their respective central fulcra, a plurality of belt conveyors arranged in zig-zag relation, each of said belt conveyors being rotatable about a pair of rollers, the top roller of each belt being rotatable about the axis of the end pivotal connection of two links of said lazy tongs and the bottom roller of each pair being supported and rotatable about the axis of the fulcrum of a toggle joint lever, said lever having arms of unequal length, the longer of said arms being mounted at the central fulcrum of the adjacent link and the shorter arm being pivotally connected to the next lower link of the lazy tongs at a point between the upper end and the central fulcrum thereof, at least one roller of each belt being positively driven, vertical suspension means for said device connected to the lowermost central fulcrum of the lazy tongs and slideably connected at each of the upper central fulcra, and means connected to the upper ends of the top links of the lazy tongs for adjusting the inclination of the links.

PIETER E. VELDHUIZEN.

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