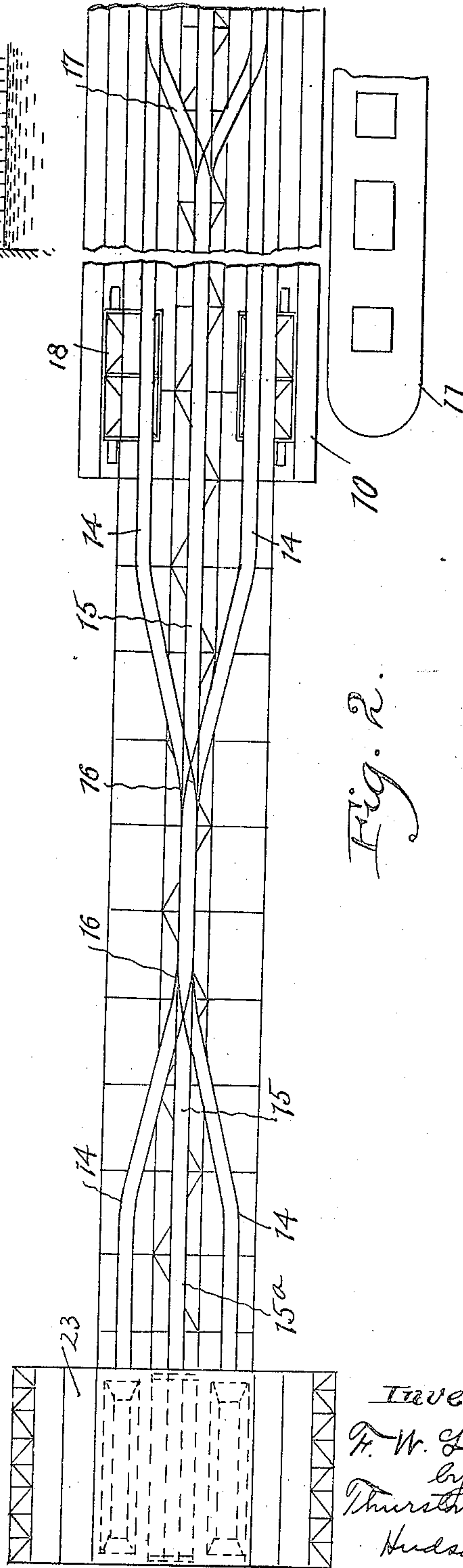
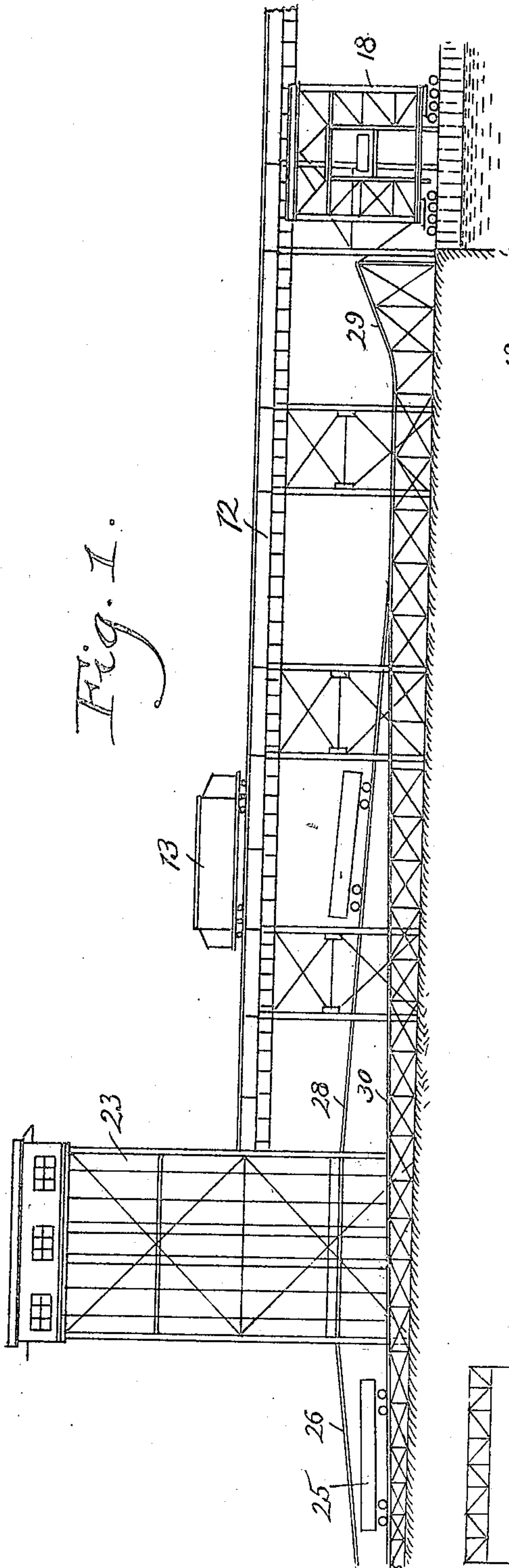


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BOAT LOADING APPARATUS.  
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2 SHEETS-SHEET 1



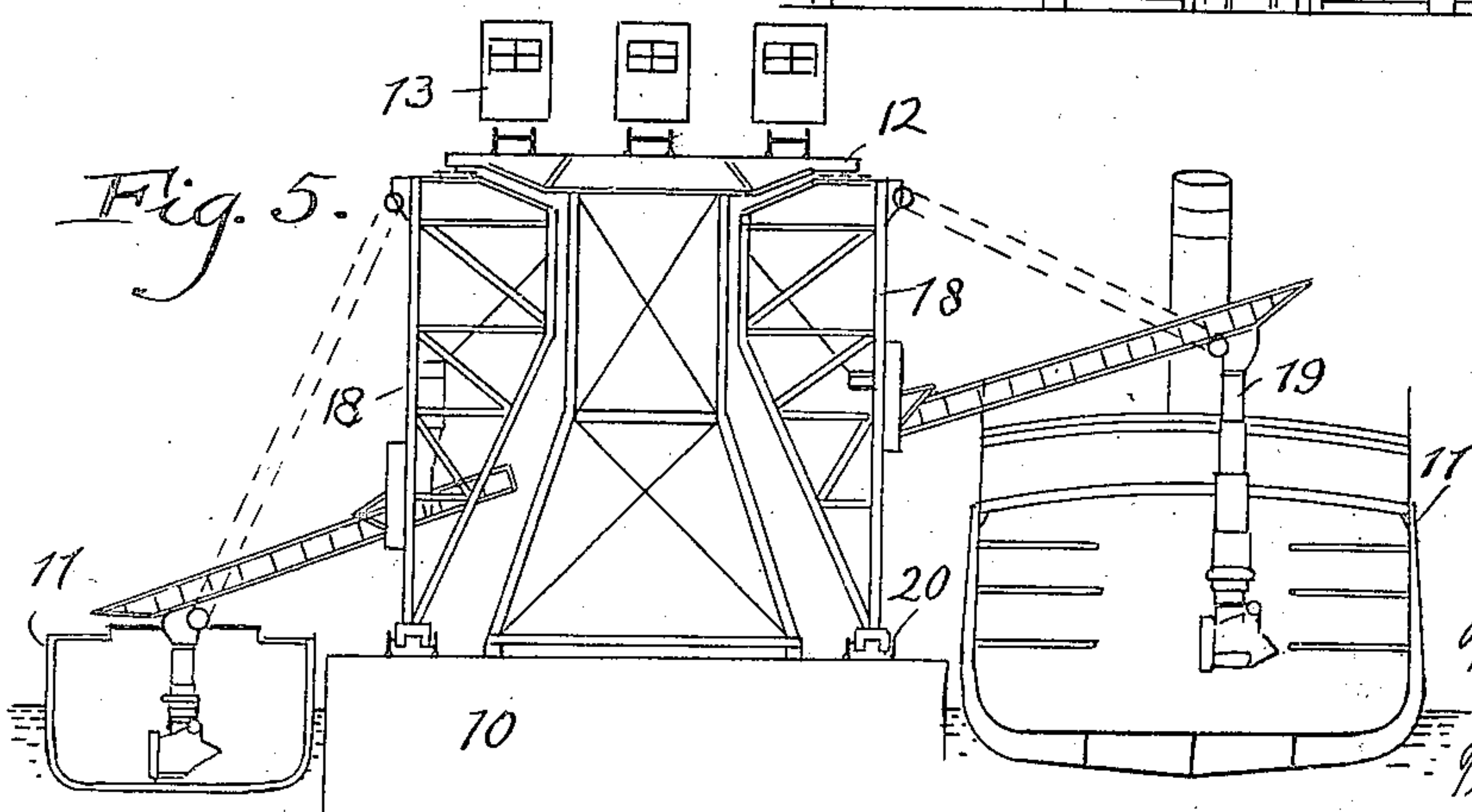
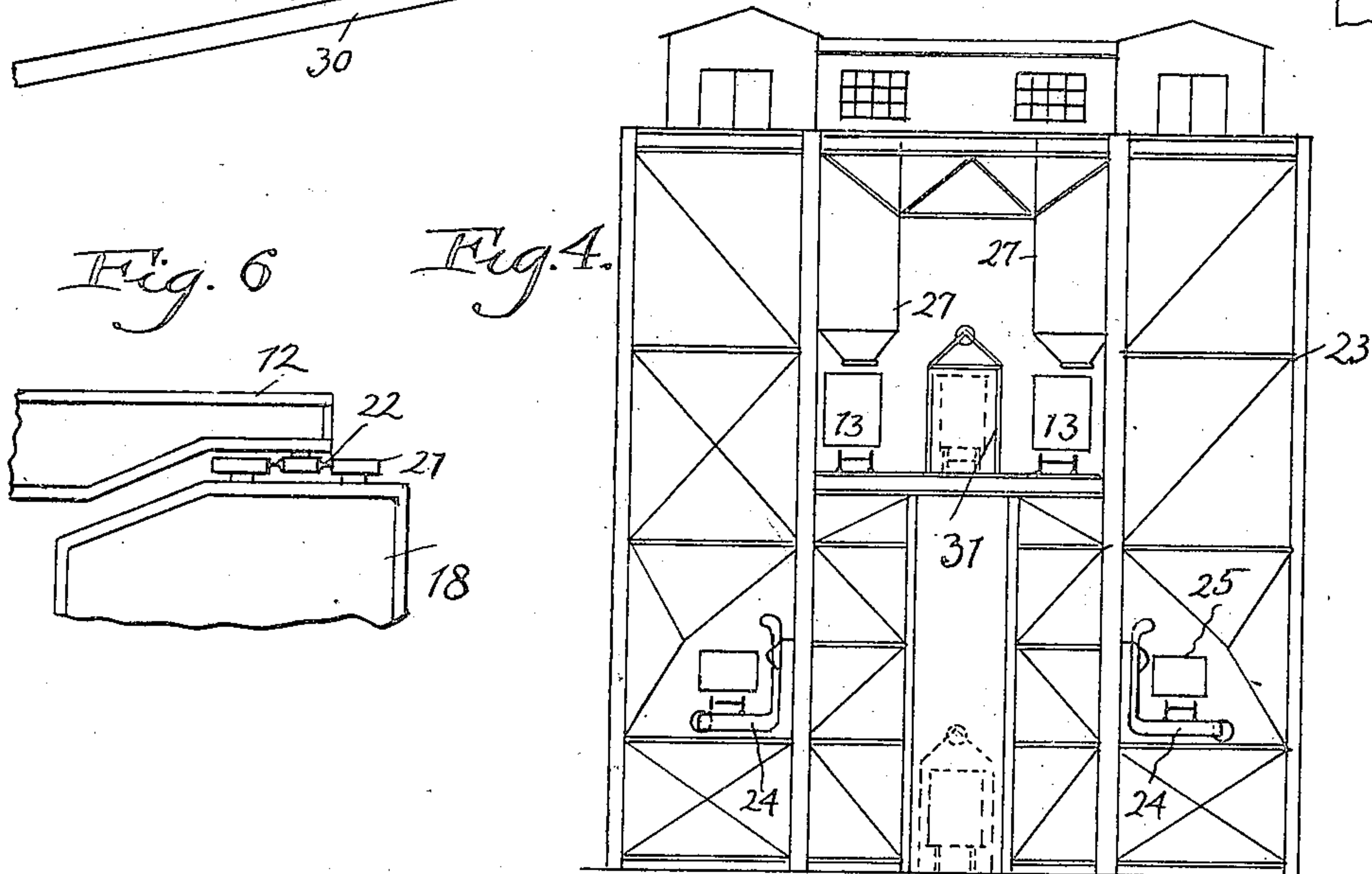
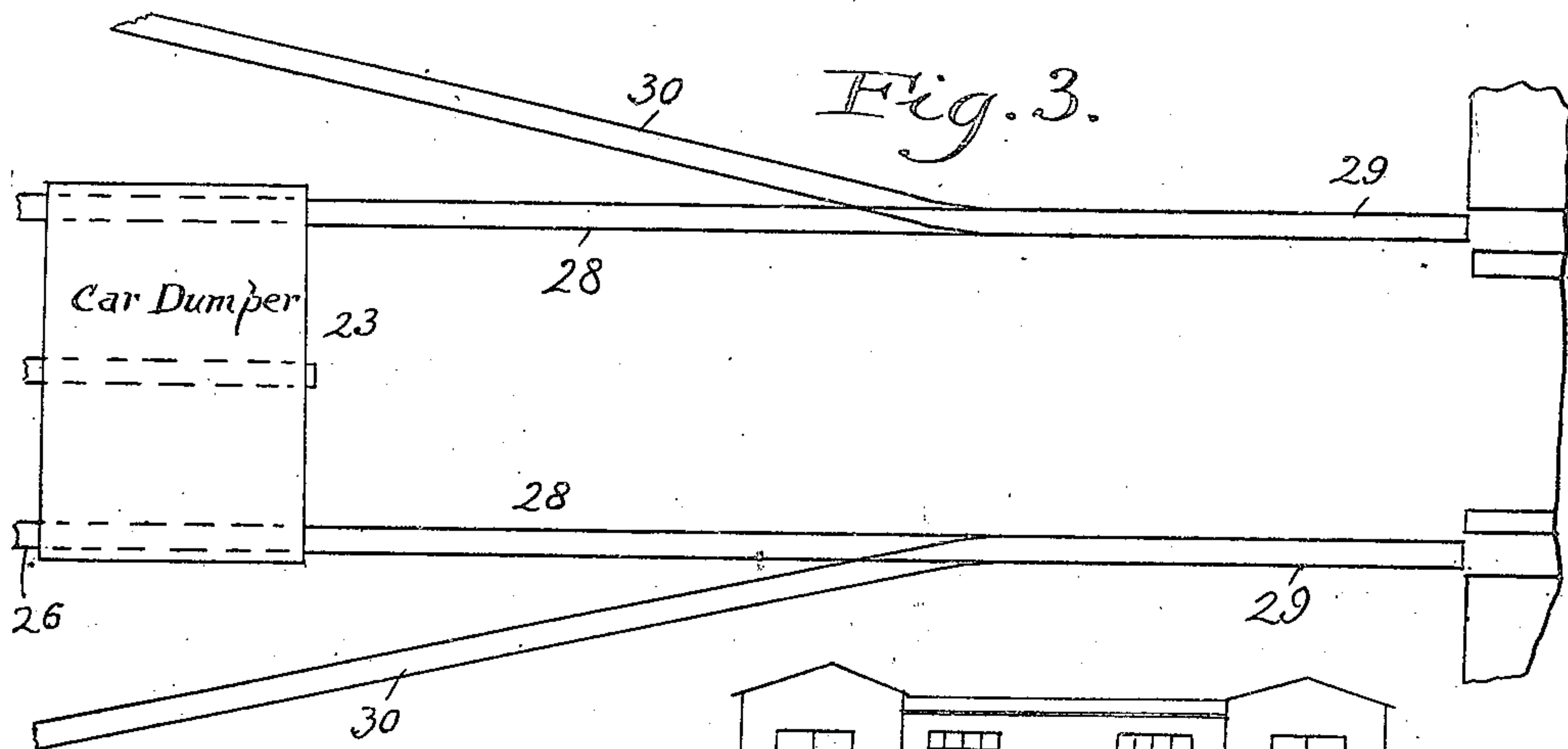
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2 SHEETS-SHEET 2



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Patented Jan. 2, 1923.

1,440,396

# UNITED STATES PATENT OFFICE.

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## BOAT-LOADING APPARATUS.

Application filed June 12, 1920. Serial No. 338,414.

*To all whom it may concern:*

Be it known that I, FREDERICK W. LOVELL, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Boat-Loading Apparatus, of which the following is a full, clear, and exact description.

This invention relates to a boat loading apparatus for loading boats with material such as coal, and has for its object to provide a loading apparatus which is more efficient and less expensive to install and operate than the apparatus used heretofore.

It has been proposed to load vessels at one or both sides of a pier with apparatus including movable hoppers and trimmers adapted to be moved along the sides of the pier lengthwise thereof, and adapted to receive coal from what are known as transfer cars which travel along a trestle and convey the coal from a car dumper which handles ordinary standard gage railway cars. With the system or apparatus heretofore proposed, the loaded cars are pulled up to the cradle of the dumper or to the cradles of two dumpers arranged side by side, and the coal is dumped into transfer cars on the top of the pier, and then these transfer cars are pulled up inclined tracks of the trestle to the upper level of the trestle which is at such a height that the material can be discharged from these transfer cars into the movable hoppers, and from the latter conveyed to the hatches of the boats. The empty transfer cars must be brought down the inclined tracks of the trestle from the upper to the lower level where they are filled in the dumpers.

With the apparatus constituting the subject matter of the present invention, the loaded and empty transfer cars are moved back and forth on level tracks at the top of the trestle, and the railway cars are elevated in the dumper to a height such that the material can be discharged into the transfer cars without requiring that they be lowered or elevated with respect to the level at which they discharge into the movable hoppers, and additionally a system of tracks is provided on the top of the trestle such that loaded and empty cars can be moved without interference in the same general direction, the whole producing an exceedingly efficient apparatus and one which requires

for a given capacity less transfer cars, less operators, a less expensive trestle, and less expensive operating mechanism, particularly hoisting apparatus, than is required for a system such as heretofore proposed.

The invention may be further briefly summarized as consisting in certain novel details of construction and combinations and arrangements of parts which will be described in the specification and set forth in the appended claims.

In the accompanying sheets of drawings, Fig. 1 is a side view of the apparatus which is installed on a pier, and beyond the pier at the shoreward end thereof, the outer end of the pier being omitted; Fig. 2 is a top plan view of the same showing also the outer end of the pier; Fig. 3 is a plan view showing in outline a double or two-cradle dumper and the tracks for the railway cars that are handled thereby; Fig. 4 is an end view of the double dumper; Fig. 5 is a cross-sectional view through the pier and trestle showing particularly the movable hoppers which receive the coal from the transfer cars and the trimming mechanism which is carried by the movable hoppers; and Fig. 6 is a detail view illustrating the manner in which the upper portions of the movable hoppers are guided on the upper overhanging portions of the trestle.

In the drawings, 10 represents a pier alongside of which boats 11 are adapted to be placed to be loaded. On this pier and at the shoreward end of the pier, there is erected an elevated trestle 12, for transfer cars 13 which travel back and forth, always at the same level, or substantially the same level, along tracks including two outer tracks 14 and a central track 15. At a point near the dumper, to be referred to presently, the tracks converge, and through switches 16 the cars can be transferred from one track to any other track, and at the outer end of the trestle which is shown at the right hand of Fig. 2, switch tracks and switches 17 are provided so that the empty cars can be moved from either outer track to the central track.

Movable along the sides of the pier on suitable tracks or runways provided thereon, are loading devices in the form of movable hoppers 18 which are provided with conveying and trimming apparatus 19 adapted to convey material, hereafter termed coal, from



the hoppers to the hatches of the boats. The hoppers are supported on suitably built structures or frames which are provided at the bottom with trucks 20 which run on the tracks on the pier, and at their upper ends these movable hoppers are guided on the trestle by any suitable means such as rollers 21 engaging fixed guide rails 22 of the trestle, as indicated in Fig. 6, so that narrow gauge runways can be utilized, as is desirable for these movable hoppers, while at the same time stability is provided by the engagement of the rollers or wheels at the top of the hoppers with the fixed guideway of the trestle.

As shown in Fig. 5, both sides of the trestle overhang the hoppers, the outer tracks 14 being located over the overhanging portions so that the coal can be transferred directly from the transfer cars into the hoppers, hopper bottom transfer cars being preferably utilized.

At the shoreward end of the trestle 12 is a double car dumper 23 which is provided with two elevating and tilting cradles 24 shown in Fig. 4.

Coal cars such as indicated at 25 in Figs. 1 and 4 are pulled by any suitable haulage system up inclined tracks 26, (see Fig. 1) to the level of the platens of the cradles 24 when the latter are in lowered or car receiving position. Then the cradles elevate the loaded cars and turn or rotate them so as to dump the contents thereof into hoppers 27 near the top of the dumper structure. These hoppers are above the level of the tracks of the trestle on which the transfer cars run so that when the transfer cars are run into the dumper they will receive the coal by gravity direct from these hoppers 27, and this is done without elevating or lowering the transfer cars from the fixed or normal level at which they are adapted to operate.

When the coal cars are dumped, the cradles are lowered and the empty cars run down inclined tracks 28 toward the shoreward end of the pier, and up on what are known as kick-backs 29, and from the latter the empty cars drift down inclined tracks 30 which run off at an angle from the inclined tracks 26 and 28, as shown in Fig. 3. It will be understood that the empty cars can be pushed from the cradles of the dumper by the oncoming loaded cars, and that they run by gravity down the tracks 28 and by gravity from the kick-back down the tracks 30.

A suitable number of transfer cars 13 will be provided on the trestle to receive the coal as fast as it can be handled by the two cradles of the dumper, and in operating these transfer cars the latter are brought from the dumper along either or both outside tracks 14, and from the latter by means of the switches 16 can be conveyed to either or both

of the outside tracks 14 on the pier part of the trestle so that the coal can be delivered from either cradle of the dumper to a movable hopper on either side of the pier, or if desired, to the movable hoppers on both sides of the pier simultaneously. The loaded transfer cars (which are preferably self-propelled) will travel outwardly along the pier by one or both the outer tracks 14, and when these transfer cars have been emptied they will run out to the end of the pier, and then are transferred by the switch tracks 17 to the center track 15 so as not to interfere with the free movement of the outbound loaded transfer cars, and then when the outer track 14 (near the dumper) on which the empty car is to be run is free of a loaded car, the empty car nearest the dumper will be transferred from the center track 15 at the switches 16, and transferred to the desired outer track 14, and will be run into the dumper.

The dumper is provided at the center, as shown in Fig. 4, with an elevator 31 which is not used in the normal operation of the system, but is provided to permit the transfer cars to be removed from or elevated to the top of the trestle as in the event it is necessary to make repairs. For this purpose the upper central track 15 has an extension 15<sup>a</sup> leading beyond the switches 16 to the elevator dumper.

Thus it will be seen that elevating devices are required only for elevating the loaded railway cars to the dumping points above the level of the trestle, and it will be apparent also that in view of the fact that the transfer cars 13 which are much heavier than the railway cars 25 are always maintained at the same level, there is a gain in efficiency by eliminating all apparatus necessary to elevate the transfer cars after they are filled.

Furthermore, the elimination of inclines in the trestle for lowering the empty transfer cars and elevating the filled transfer cars permits the use of a less expensive trestle than that which would otherwise be required, and in the system wherein the transfer cars are always maintained at the same level as compared with one having inclined portions for lowering and elevating the transfer cars, a smaller number of transfer cars and of operators are required so that for these reasons also, there is a gain in efficiency, and economy in construction and operation is attained.

Modifications may be made in details of construction and arrangement without departing from my invention as defined in the appended claims.

Having described my invention, I claim:

1. In a boat loading apparatus for loading boats along a pier, an elevated trestle on the pier, a hopper movable along the side



of the pier, a dumper at the end of the trestle and having means for elevating and then dumping railway cars at a point above the upper level of the trestle, said trestle having at the top thereof transfer car tracks extending at substantially the same level from the dumper outwardly along the pier, and transfer cars movable along said tracks and adapted to receive material discharged from the cars at the dumper and to convey the material to said hopper.

2. In a boat loading apparatus for loading boats along one or both sides of a pier, an elevated trestle on the pier, hoppers movable along opposite sides of the pier beneath the upper part of the trestle, a car dumper at the end of the trestle and having means for elevating and then dumping railway cars, said trestle having transfer car tracks extending from the dumper along opposite sides of the trestle, said tracks extending into the dumper and being at a level such that transfer cars can be filled in the dumper and moved along the trestle and dumped into the movable hoppers without the necessity for elevating the transfer cars when filled, and a plurality of transfer cars movable along said tracks.

3. In a boat loading apparatus for loading boats along a pier, an elevated trestle on the pier, hoppers movable along the sides of the pier, a dumper at the end of the trestle having means for elevating and then dumping railway cars above the top level of the trestle, a plurality of transfer cars movable along the top of the trestle between the dumper and the outer end of the pier, and tracks on the trestle for said transfer cars and including tracks for loaded cars extending along the outer side portions of the trestle, and an inner track for empty transfer cars connected by switches to the outer tracks, said transfer cars adapted to receive material from the cars elevated and dumped in the dumper and convey the material to the hopper.

4. In an apparatus for loading boats along a pier, an elevated track on the pier, a trimming device movable along the side of the pier, transfer cars movable along said track

above the trimming device and adapted to supply coal to the same, and elevating and dumping mechanism to and from which the transfer cars are adapted to be moved so that the latter may convey material from the elevating and dumping mechanism to the trimming device.

5. In apparatus for loading boats along a pier, an elevated trestle having a track for transfer cars extending lengthwise of the pier, a boat trimmer movable along the side of the pier, transfer cars movable along said track and adapted to discharge coal to the trimmer, said track extending for a distance shoreward beyond the pier, and car dumping mechanism adjacent said track, the latter extending from the dumper at or about the level of the portion extending along the pier whereby the transfer cars may receive material elevated and dumped by the dumper and may convey the same to the trimmer.

6. In an apparatus for loading boats along a pier, an elevated track on the pier, a movable hopper and boat trimming device adapted to be shifted along the pier beneath said track, transfer cars movable along said track and adapted to discharge into said hopper, a track for coal cars, a car dumper adapted to receive cars from said second mentioned track and to dump the material therefrom into transfer cars, said first mentioned track for the transfer cars extending substantially horizontally from the car dumper whereby the transfer cars may be loaded and may convey the material therein to the hopper and boat trimming device.

7. In an apparatus for loading boats along a pier, car elevating and dumping mechanism, an elevated track extending substantially horizontally from said mechanism out along the pier, transfer cars adapted to be filled with coal by said mechanism and movable along said track, and a boat trimmer including a hopper movable along the pier beneath said track and adapted to receive coal from the transfer cars.

In testimony whereof, I hereunto affix my signature.

FREDERICK W. LOVELL.