

Aug. 20, 1935.

H. BACK

2,011,886

DUMPING SCOW

Filed March 26, 1932

2 Sheets-Sheet 1

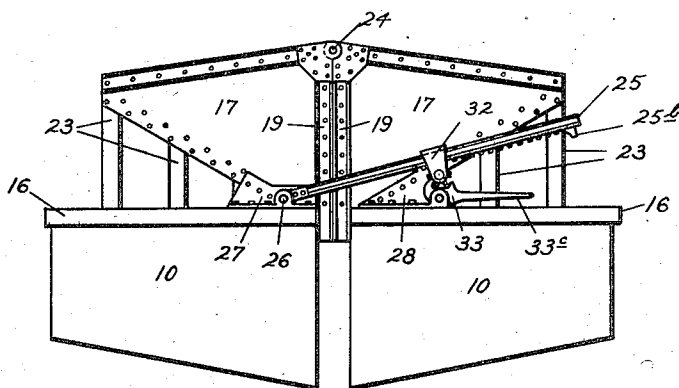
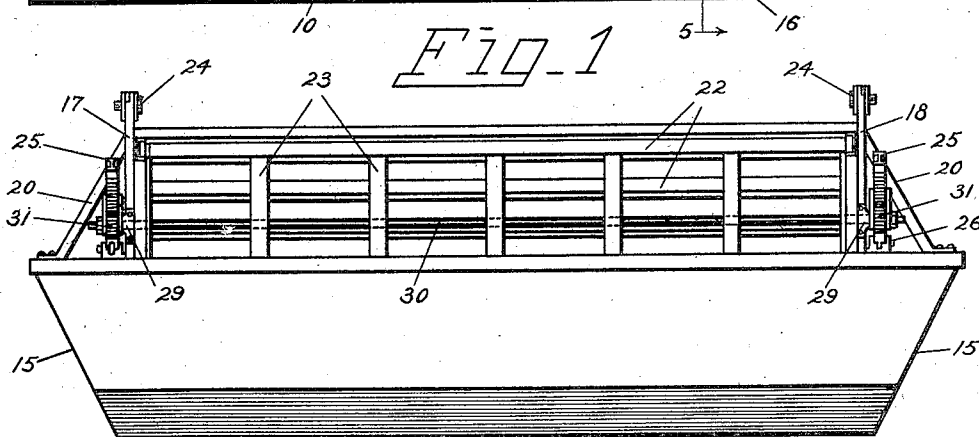
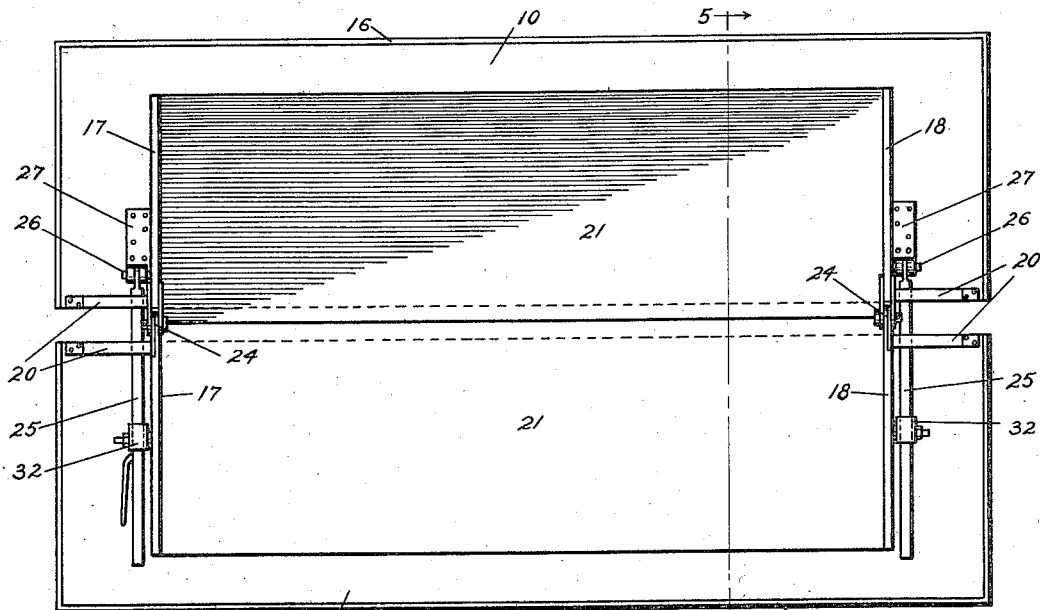


Fig. 3

Fig. 2

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Fig. 4

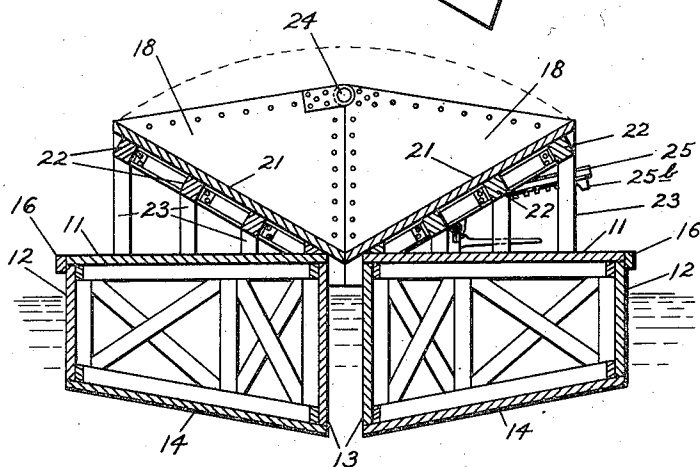
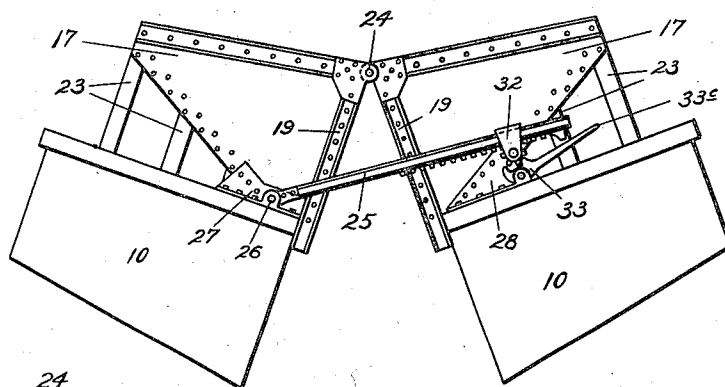


Fig. 5

Fig. 6

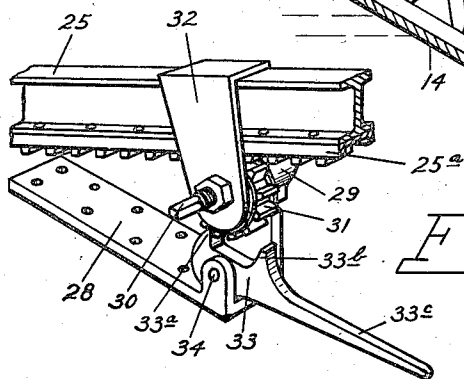
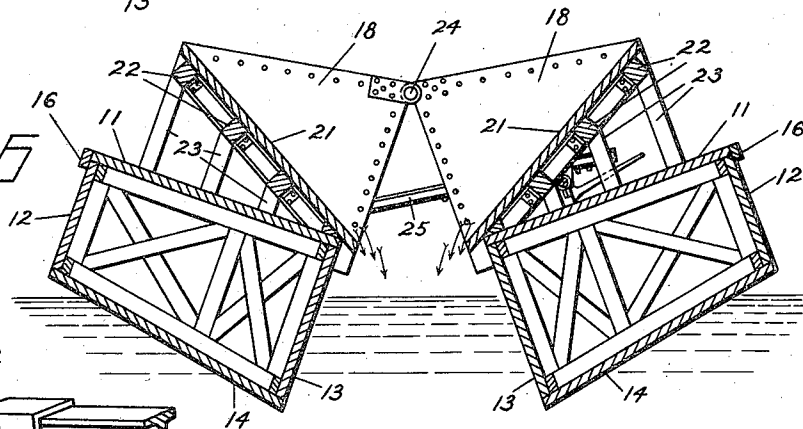


Fig. 7

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UNITED STATES PATENT OFFICE

2,011,886

DUMPING SCOW

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3 Claims. (Cl. 114—29)

My present invention relates to improvements in dumping scows of a type intended for use in transporting materials such as sand, gravel, stone, garbage, etc., on the water and being adapted to permit of quickly discharging such materials into the water at a selected place.

A primary object of the invention is to provide a scow comprising a pair of complementary buoyant pontoons, being normally held in substantially close parallel position with respect to one another, and having a longitudinally divided hopper structure mounted on said pontoons to provide a receptacle or hold for the material to be transported, and being adapted when complementary parts are unrestrained to automatically assume an attitude in which the hopper will be opened, thereby dumping the contents thereof into the water between the pontoons, and being further adapted to automatically assume an attitude in which the hopper will be closed after completion of the dumping operation.

A further object of the invention is to provide a scow of the character set forth, and in which the pontoons are so designed and constructed as to advantageously utilize the principles of buoyancy in effecting an automatic return of the parts of the scow from an opened to a closed position.

A still further object is to provide a scow, of the character above set forth, in which means are employed for retaining the parts of the scow in an opened or dumping position until a full and complete discharge of the hopper contents has been effected, and wherein said means constitute a common medium for retaining the complementary parts of the scow in both opened and closed positions.

A still further object is to provide a scow adapted to attain the above objects and in which the hopper comprises two sections abutting one another on a plane longitudinally of the scow, parallel with and intermediate the pontoons, and being hinged together at the top of the hopper rather than at the deck line of the pontoons, in order that the pontoons are not required to tilt in an extreme position for the purpose of effecting sufficient opening of the hopper to allow a discharge of the contents thereof.

A still further object is to provide a scow of the character and for the purposes set forth and in which means are provided for the purpose of retaining the complementary pontoons against relative endwise movement with respect to each

other, especially when the scow is being conducted over rough bodies of water.

The invention thus resides in certain novel combinations and arrangements of parts as will hereinafter be more fully set forth and described.

In the accompanying drawings, to which I now refer, I have illustrated one example of the physical embodiment of my invention wherein the parts are combined and arranged according to the mode which I consider most practical for the application of the principles of my invention.

Figure I is a top plan view of my improved dumping scow.

Figure II is a view in side elevation of the scow, disclosing certain parts not seen in Figure I.

Figure III is a view in elevation of one end of the scow in closed position, it being pointed out that both ends of the same are identical in construction except that a similar view of the opposite end would disclose the restraining mechanism in transposed position.

Figure IV is a view in elevation of one end of the scow, being similar to Figure III, but illustrating the scow in an opened position and showing the manner in which the restraining mechanism may hold the same in such position.

Figure V is a transverse vertical sectional view of the scow in closed position, as at line 5—5 of Figure I, and illustrating the scow as floating on the water, and also indicating by an upper dotted line the approximate top of a load of material placed in the hopper thereof.

Figure VI is a transverse vertical sectional view similar to Figure V, except that the scow is shown in the dumping position, and illustrating by small arrows the manner of discharging the transported material through the bottom of the hopper and into the water between the pontoons.

Figure VII is an elaborated view in perspective of the mechanism adapted to restrain the complementary parts of the scow in either the opened or the closed positions, and with only a fragment of certain parts being shown in order to accommodate the view to the sheet.

In the practical application of the principles of my invention I employ a pair of complementary buoyant pontoons 10, 10, being arranged in parallel relation with respect to one another and being spaced apart sufficiently in the normal or closed position of the scow to allow a water passageway between the pontoons, which arrangement facilitates the forward progress of the scow upon the water. Each pontoon is constructed with suitable framing to support a deck wall 11, outer

side wall 12, inner side wall 13, bottom wall 14 and end walls 15. The pontoons may be constructed of any suitable materials and may be internally braced as shown in Figures V and VI, to secure the desired strength and rigidity, and guard rails 16 may be provided to serve as bumpers to protect the sides of the pontoons and to further strengthen the same. The pontoons are so designed that in the normal or closed position of the scow, as seen in Figures III and V, the decks 11 lie in a level or horizontal plane and the side walls 12, 13, occupy vertical positions, but the bottom walls 14 are inclined inwardly and downwardly from the outer side walls 12 to the inner side walls 13. This arrangement constitutes one of the prime features of the invention wherein the pontoons are given a greater depth toward their inner sides, and this feature further augments an inherent tendency of the scow to automatically close after the hopper contents have been discharged, as will hereinafter be more fully described.

A hopper is provided for the reception of the material to be transported and this hopper is built completely above the decks of the pontoons and equally positioned on each of the pontoons. The hopper is constructed with a pair of complementary end walls 17, 17, at one end of the scow and a second pair 18, 18, at the opposite end thereof and each wall of a pair is mounted on and secured to one of the pontoons. The complementary pairs of end walls abut each other on a vertical plane intersecting the longitudinal center line of the scow, intermediate the pontoons, and are preferably provided at their abutting edges with angle or channel irons 19 to reinforce the walls at this point and also to provide wide faces for the abutting edges of the walls. Suitable braces 20 are also provided, which extend from the decks of the pontoons to the upper edges of the end walls 18, 19, near their abutting edges, to strengthen and support the walls against the weight of heavy materials which may be placed in the hopper and also for a further purpose hereinafter set forth, and these braces 20 are shown in Figures I and II only, to avoid complication of parts shown in the end views of the scow.

A bottom is provided for the hopper, and this bottom comprises two walls or floors 21, 21, which extend between the end walls 18, 19, and which slope inwardly and downwardly from the upper, outer corners of the end walls to a plane approximately level with the decks of the pontoons, where they converge and abut each other at the longitudinal center line of the scow, thereby forming a V-shaped bottom for the hopper unit as a whole. The floors 21 are reinforced and supported in proper position by any suitable structure, but preferably by a structure of the type shown in Figures V and VI, where purlins 22 extend between the end walls 18, 19, the purlins 22 being in turn supported by pillars 23 which extend vertically between the decks of the pontoons and the aforesaid purlins.

It will be apparent thus far, from the foregoing description, that the invention contemplates two separate buoyant pontoons, each having mounted on and above the deck thereof one-half of a hopper unit, thus forming two individual complementary pontoon and hopper units being adapted when positioned and held together, as seen in Figures I, III and V, to provide a hopper unit capable of receiving and retaining any material to be transported therein and having a V-shaped

bottom for said hopper unit, for a purpose which will presently be described.

The two complementary pontoon and hopper units are pivotally connected together at the upper, inner corners of the hopper end walls by suitable hinges 24, and by virtue of being so pivotally connected are permitted to swing apart from a closed position, as seen in Figures III and V, to an opened or dumping position, as shown in Figures IV and VI. With the complementary parts of the scow in the normal or closed position a load may be placed in the hopper thereof and the top outline of such a load is indicated by the upper dotted line of Figure V. It will be understood of course, that means are required to secure the parts of the complete scow in the proper position to receive and retain a load of material to be transported therein, and such means will be hereinafter set forth. When it is desired to discharge the contents of the hopper the restraining means may be released and the weight of the hopper contents, being concentrated in the V-bottom thereof, will exert a downward and outward force against the floors 21 of the hopper, thereby forcing the pontoons 10 outward and at the same time opening the hopper in such manner that the contents thereof will be discharged into the water between the pontoons. The attitude of the scow during the dumping action is shown in Figures IV and VI, particularly in Figure VI, where small arrows indicate the manner in which the hopper contents are discharged.

After a full and complete discharge of the contents of the hopper the buoyant pontoons 10 will rise in the water and due to their particular shape will tend to seek positions in which they are riding on more or less even keel. Since the two complementary parts of the scow are hinged together, as described, this action automatically effects a return of the parts to the closed or normal position as shown in Figures III and V, provided, however, that the parts have not been permitted to swing apart beyond a predetermined limit and beyond which limit the weight of the hopper units would offset the tendency of the pontoons to right themselves. Considering the pontoons 10 individually, it will be apparent that their natural tendency is to float in a balanced position with respect to their shape and the distribution of weight throughout each pontoon. Inasmuch as the pontoons, as herein provided, are of greater depth toward their inner sides, an added buoyancy is imparted to these sides of the pontoons, and were they completely disconnected from one another they would float with their inner sides projecting much higher above the surface of the water. This added buoyancy being concentrated toward the inner sides of the pontoons imparts an increased lifting effort at these sides, materially augmenting the tendency of the scow to automatically assume a closed position after completion of the dumping operation.

Suitable means are provided for the purpose of retaining the complementary parts of the scow in either the normal or closed position as shown in Figures I, III and V, or the opened position as shown in Figures IV and VI, and these means are also effective in preventing the opening of the scow beyond a predetermined limit during the dumping operation. While it will be apparent that various suitable mechanisms may be employed for this purpose I prefer to use the mechanism shown in the drawings, parts of which are advantageously illustrated in Figure VII.

This mechanism includes a pair of arms 25, 25, 75

preferably made from steel H-beams, each having an end thereof adapted to be pivotally connected, as at 26, to brackets 27, which are mounted on one of the pontoons at either end thereof and adjacent the hopper walls 18, 19, and which are firmly secured to the pontoon and the hopper walls. Mounted on the other pontoon, at opposite ends thereof and adjacent the hopper walls 18, 19, are a second pair of brackets 28, which are provided with bearing mountings 29 in which a shaft 30, extending between the said brackets, is rotatably mounted. Pinion gears 31 are mounted on and secured to the shaft 30 adjacent the outer sides of the bearings 29, these pinions 31 being adapted to engage cog racks 25a which are carried by the arms 25. The cog racks 25a of the arms 25 are adapted to be held in contact with the pinions 31 by means of yokes 32 which are mounted on the shaft 30 in a position straddling the pinions and which have surfaces bearing against the upper surfaces of the arms 25. The arms 25 are of sufficient length to maintain a constant contact between the pinions 31 and the cog racks 25a, whether the scow be in a closed position or an opened position, and the cog racks are provided at their outer ends with depending lugs 25b to provide a stop for the movement of the racks over the pinions, thereby preventing the complementary parts of the scow from opening beyond a predetermined limit. It will be apparent that if the pinions 31 are locked against rotation the arms 25 will likewise be held against movement over the pinions and by such action the complementary parts of the scow may be restrained in any given position, whether such position be a closed or fully opened position or any position intermediate thereof. To attain this object I employ a double pawl member 33 which is pivotally mounted on a pin 34 supported by one of the brackets 28 and which is provided with pawls 33a and 33b adapted to engage one of the pinions 31 at opposite sides of its axis when the member 33 is actuated through the medium of an integral lever 33c.

From the description of the restraining means thus far it will be seen that the complementary parts of the scow may be held in a closed position, as seen in Figures III and V, when the pawl 33a engages one of the pinions 31, and which engagement is normally retained due to the weight of the actuating lever 33c. By lifting the lever 33c until both pawls 33a and 33b clear the pinion 31 the arms 25 will be free to slide through the yokes 32, thereby permitting the free opening action of the scow due to the weight of the hopper contents, as previously described. When the complementary parts of the scow have tilted apart, as seen in Figures IV and VI, the pawl actuating lever 33c may be further raised until the pawl 33b engages the pinion 31 at the opposite side of its axis, locking the pinion 31 against rotation, and thereby restraining the parts of the scow in the opened or dumping position until a full and complete discharge of the hopper contents has been effected. After completion of this operation the lever 33c may be actuated to again allow the pawls 33a and 33b to clear the pinion 31, thereby permitting the pinions to rotate and the arms 25 to pass thereover, and the scow as a whole will automatically assume a closed position by reason of inherent tendencies incorporated therein, as previously explained. While the drawings and description set forth the use of one pawl member 33 it will be understood that identical members may be employed for the

purpose of operatively engaging both of the pinions 31, according to the strength required in restraining mechanisms for scows of different sizes and capacities. However, the use of one pawl member renders it possible for one operator to control the operation of the scow from a single station.

It is essential that the various units of the scow be strongly and rigidly constructed as scows of this character are often towed in rough water and the force of waves impinging against the various surfaces of the pontoons would soon destroy or impair a weak structure. In this connection it is pointed out that the braces 20, shown in Figures I and II, serve a further purpose than that of reinforcing the end walls of the hopper against the weight of heavy materials inside of the hopper. Referring to the drawings, and to previous description, it will be seen that one end of the braces 20 is secured to the end walls of the hopper near the hinges 24 and the opposite ends thereof are secured to the decks of the pontoons or, to any rigid member of the pontoon structures. Provided that the hinges 24 are strongly constructed, it is readily understandable that the braces 20 serve also to offset any force tending to shift the pontoons longitudinally with respect to one another. Other means may be provided which would serve the same function, but the means shown serve a twofold purpose and are easily installed and readily accessible for repairs if necessary.

From the foregoing description it will be apparent that I have set forth the salient features of a vessel adapted to efficiently perform its various functions and which offers considerable advantage over previous types of scows or vessels intended for similar purposes, in that its dumping and closing actions when unrestrained are fully automatic, thereby rendering the use of power operating means unnecessary.

Having thus fully described my invention, I claim:

1. A dumping scow comprising a pair of complementary buoyant pontoons, a hopper structure mounted on the decks of said pontoons and having upright end walls and walls extending between the end walls and converging inwardly and downwardly toward the center of the scow to provide a V-shaped bottom for the hopper, said hopper being divided longitudinally on a plane intermediate said pontoons to form a pair of complementary hopper sections each of which is independently mounted on and secured to one of said pontoons, pivotal means connecting said hopper sections together near the upper edges of the hopper end walls whereby said pontoons and the respective hopper sections mounted thereon may swing apart when unrestrained, and common operable means for detachably holding said pontoons and hopper sections in a fully closed or fully opened position as well as any position intermediate thereof.

2. A dumping scow comprising a pair of parallel complementary buoyant pontoons being normally spaced apart, a hopper structure mounted on said pontoons and having upright end walls and walls extending between said end walls and converging at the center-line of the scow to provide a V-shaped bottom for the hopper, said hopper being divided longitudinally on a plane intermediate the pontoons to form a pair of complementary hopper sections each of which is carried by and secured to one of the pontoons,

- pivotal means connecting the hopper sections together near the upper edges of the hopper end walls in order that the hopper sections and the pontoons secured thereto may swing apart about said pivotal connection and operable means for holding said hopper sections and pontoons in positions wherein said hopper sections register or in any of a plurality of selected positions wherein they are spaced apart.
- 10 3. A dumping scow comprising a pair of parallel complementary buoyant pontoons being normally spaced apart and being of greater depth at their inner adjacent sides, a hopper structure mounted on said pontoons and having end walls and walls extending between the end walls and converging inwardly and downwardly toward the center-line of the scow to provide a V-shaped bottom for the hopper, said hopper being divided longitudinally and vertically on a plane intermediate said pontoons to provide a pair of complementary hopper sections each of which is carried by and secured to one of the pontoons, pivotal means connecting the hopper sections together near the upper edges of the hopper end walls, arms having one end thereof pivotally secured to one of the pontoons, racks secured to said arms and having lugs depending from the outer ends thereof, pinions rotatably mounted on the opposite pontoon and with which the racks carried by said arms are operatively associated and pawl members pivotally mounted in operable relation with said pinions and having a pair of pawls adapted to engage said pinions at opposite sides of their axis.
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HANS BACK.