

Aug. 3, 1965

A. KUNZ

3,198,156

BARGE CONSTRUCTION

Filed Oct. 16, 1963

4 Sheets-Sheet 2

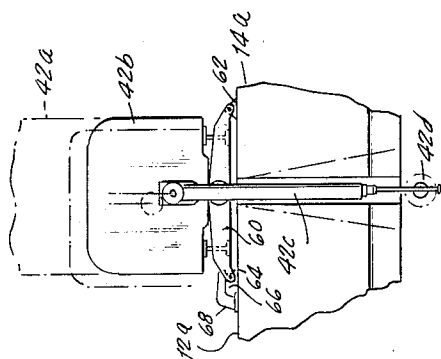


FIG. 6

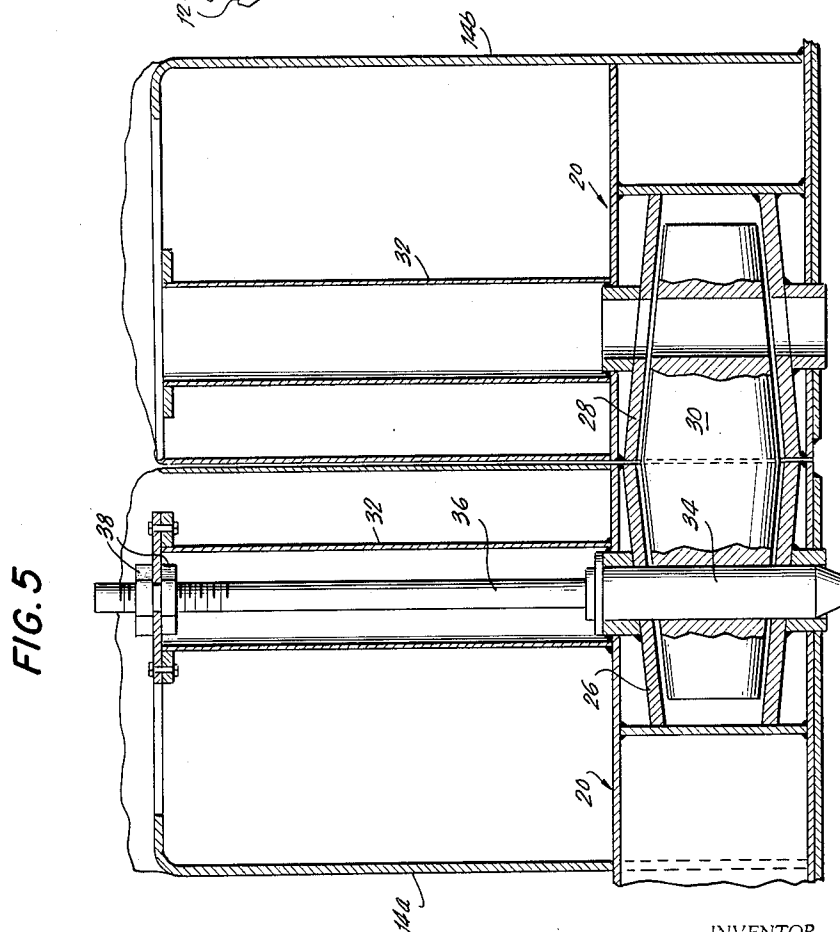


FIG. 5

INVENTOR.
ALFRED KUNZ

BY *McClure and Toren*

ATTORNEYS

Aug. 3, 1965

A. KUNZ

3,198,156

BARGE CONSTRUCTION

Filed Oct. 16, 1963

4 Sheets-Sheet 3

FIG. 7

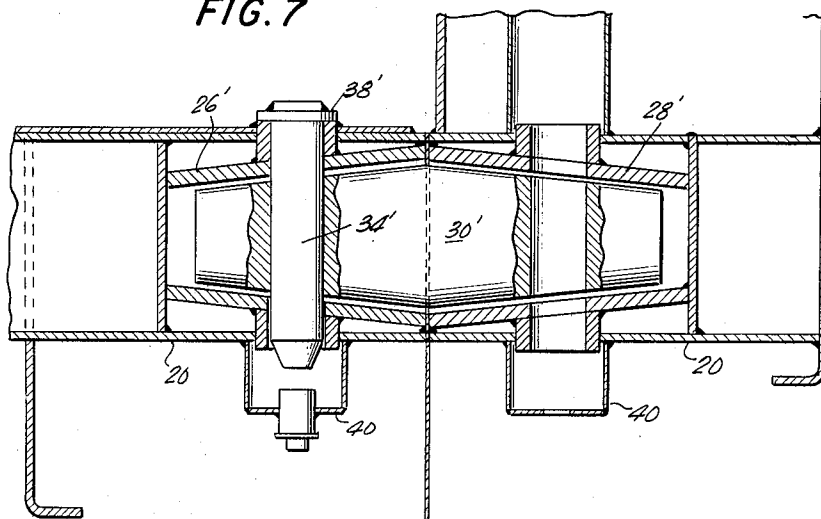
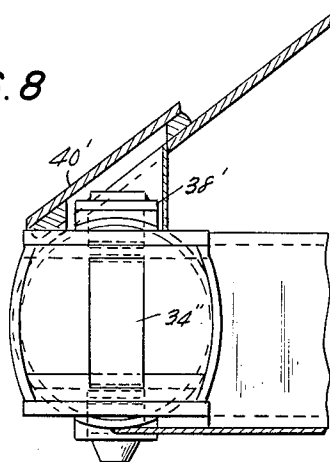


FIG. 8



INVENTOR.
ALFRED KUNZ

BY *McGraw and Toren*

ATTORNEYS

Aug. 3, 1965

A. KUNZ

3,198,156

BARGE CONSTRUCTION

Filed Oct. 16, 1963

4 Sheets-Sheet 4

FIG. 9

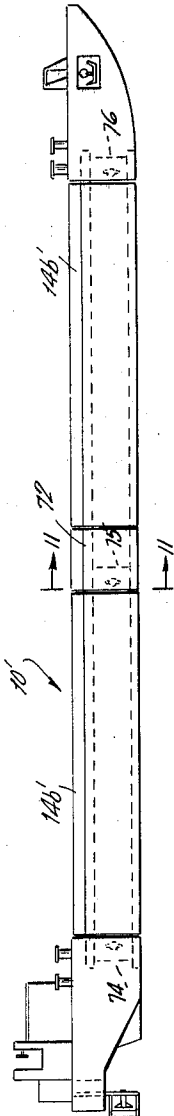


FIG. 10

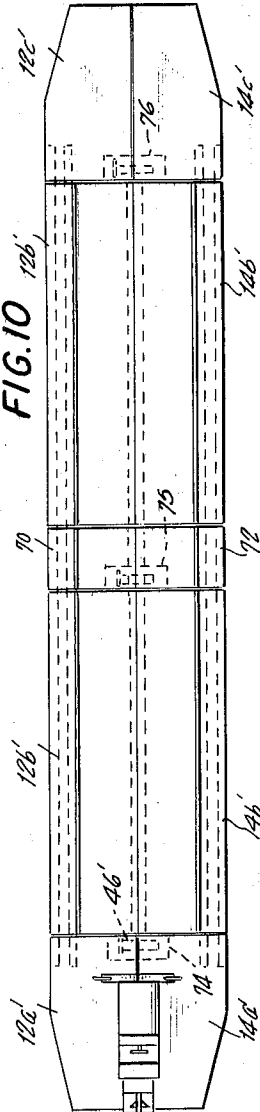
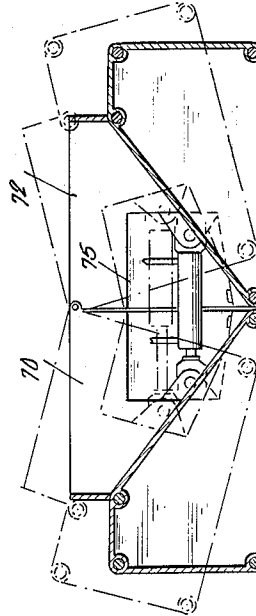


FIG. 11



INVENTOR.
ALFRED KUNZ

BY *McClure and Toren*

ATTORNEYS

1

2

3,198,156

BARGE CONSTRUCTION

Alfred Kunz, Munich, Germany, assignor to Firma Deggen-
dendorfer Werft und Eisenbau, Ges. m.b.H., Deggen-
dorf (Danube), Germany

Filed Oct. 16, 1963, Ser. No. 316,615

Claims priority, application Germany, Oct. 27, 1962,
D 40,154

2 Claims. (Cl. 114—29)

This invention relates in general to barge construction, and in particular to a new and useful hopper barge made up of a plurality of float units which are pivotally connected and which may be shifted outwardly for discharging a hopper load and to an improved barge construction with a propulsion unit mounted thereon in a manner permitting pivotal movement of the floating units.

Most hopper barges, particularly those used for transporting dredged material, are towed or pushed by special craft. In some instances, barges of this nature include their own propulsion units. In addition, barges may be provided with pivotally mounted hoppers to form one or more loading compartments with the hoppers being mounted for articulation in respect to the remaining portion of the hull. With a construction of this nature the driving unit is mounted on a stationary portion of the hull at a location removed from the articulated hoppers.

In accordance with one aspect of the invention, a hopper barge is provided with swing-out hoppers in the form of floating hollow bodies, such as tank elements, arranged over either a portion or the entire length of the barge. With a construction where the entire barge length is made up of pivotal floating units, the invention provides a novel means for sealing the structural elements of the complete barge and also provides an arrangement for the wheel house and propulsion system which permits the outward movement of the floating hollow bodies without materially disturbing the propulsion system. The sealing is advantageously provided by a vertical joint in the front and rear terminal walls of the loading compartment when the latter is closed.

In view of the fact that the deck on the afterbody must contain the propulsion system and must assume an inclined position when the floating bodies are moved outwardly, the invention provides a construction which permits such an arrangement. In order to use a barge of this nature as a self-propelled craft, the driving unit is arranged in a special manner. The driving unit includes a control cabin supported on a stationary pivot affixed to one floating unit on one side of the center line of the barge assembly, and the other side is secured to a pivot element which may be moved backwardly and forwardly in a slot member carried by the other floating unit to permit pivoting of the floating body element and the shifting of the driving motor vertically. In such an arrangement the center line position of the driving unit changes only slightly to permit the pivotal movement of the floating body elements.

A further aspect of the invention consists of a construction of a barge with a plurality of floating body elements which are arranged on each side of the center line of the barge in a series in a longitudinal direction. The construction is such that the two floating bodies at each end are provided with a deck to form fore- and after-bodies, respectively, while the floating bodies in between form the loading compartments. With a construction of this nature the floating body elements, including elements which make up hopper portions, can be manufactured and transported separately and the assembly of the entire barge can be made at a place remote from the manufacturing location. This is of particular importance for use on lakes which can only be reached by land.

The construction of the present invention is such that the floats forming the fore- and after-bodies of the vessel can be used interchangeably with floating body elements which form hoppers of different sizes and loading capacities. The construction permits the manufacture of a corresponding number of identical floats for the fore- and after-body barge assembly which may be joined together with any of a variety of sizes of intermediate floating bodies which form the hopper parts.

In accordance with another embodiment, the barge construction includes, in addition to the fore- and after-floating body elements, a central deck portion for connecting floating body elements on each side thereof to form at least two hopper loading compartments at each end of the vessel.

In accordance with the invention the floating body elements which form the barges are hingedly connected along the longitudinal line, and means such as a fluid pressure-operated piston and cylinder combination, are provided to shift the floating bodies outwardly in respect to a longitudinal pivot connecting their upper inner corners. In this manner the hoppers are opened and closed below the pivot in accordance with whether the barge elements are swung outwardly or inwardly. The construction advantageously includes longitudinal stiffening elements in the form of longitudinally extending pipe members with opposite ends provided with means to receive coupling elements.

Accordingly, it is an object of this invention to provide an improved barge construction.

A further object of the invention is to provide a barge construction having a plurality of floating body elements which are pivotally connected together along a longitudinal center line which may be swung outwardly for the purpose of opening and closing hopper sections formed by such elements.

A further object of the invention is to provide a barge construction made up of at least two floating body elements which are pivoted together along a longitudinal pivot and which may be shifted outwardly and inwardly about the pivot and which includes improved means for mounting a propulsion unit on deck formed by the floating body elements permitting the elements to be pivoted about the longitudinal pivot.

A further object of the invention is to provide a barge construction including longitudinal shifting members with improved coupling means for interconnecting a plurality of floating body elements which make up the barge assembly.

A further object of the invention is to provide a barge construction which is simple in design, rugged in construction and economical to manufacture.

The various features of novelty which characterize the invention are pointed out with particularity in the claims annexed to and forming a part of this specification. For a better understanding of the invention, its operating advantages and specific objects attained by its use, reference should be had to the accompanying drawings and descriptive matter in which there are illustrated and described preferred embodiments of the invention.

In the drawings:

FIG. 1 is a side elevation of a barge construction constructed in accordance with the invention;

FIG. 2 is a top plan view of the barge indicated in FIG. 1;

FIG. 3 is a section taken on the line 3—3 of FIG. 1; FIG. 4 is a section similar to FIG. 3 indicating the mounting of the pilot house and driving unit;

FIG. 5 is a section taken on the line 5—5 of FIG. 3; FIG. 6 is a partial rear elevation taken in the direction of the arrow 6 indicated in FIG. 1;

FIG. 7 is an enlarged section taken on the line 7—7 of FIG. 3 offset by 90° relative thereto;

FIG. 8 is an enlarged section taken on the line 8—8 of FIG. 3;

FIG. 9 is a side elevation of another embodiment of a barge constructed in accordance with the invention;

FIG. 10 is a top plan view of the barge indicated in FIG. 9; and

FIG. 11 is a section taken on the line 11—11 of FIG. 9.

Referring to the drawings in particular, the invention embodied therein, as indicated in FIGS. 1 to 8, comprises a barge generally designated 10 which is made up of two floating body assemblies generally designated 12 and 14 which are hingedly connected together at their upper interior corners at a longitudinal pivot member 16 in a manner permitting the floating body assemblies 12 and 14 to be swung from the solid line closed position indicated in FIG. 3.

In the embodiment illustrated, each of the floating body assemblies 12 and 14 is made up of the stern sections 12a and 14a which form a rear deck, central sections 12b and 14b which form a hopper or loading section, and bow sections 12c and 14c which form a deck at the bow. In accordance with one feature of the invention, the central hopper sections 12b and 14b are reinforced along their entire length by internal pipe elements 18 and 20, portions of which terminate in the stern and bow sections of the barge 10. The hopper sections 12b and 14b include oblique deck portions 22 and 24 which form inclined surfaces for receiving a load, such as bulk material, to be transported.

A further feature of the construction is that the hopper sections 12b and 14b may be made independently from the stern and bow sections 12a and 14a and 12c and 14c, and they may be interconnected and secured together rigidly by connecting elements arranged at corner locations A, B, C, and D, as indicated in FIG. 3. The coupling connections of these tank elements are indicated in detail in FIGS. 5, 7 and 8. As indicated in FIG. 5, the coupling connection at A (see FIG. 3) is formed by hollow conical end portions 26 and 28 made in the reinforcing pipe elements 18 and 20 of the respective elements to be joined together. A solid coupling pin 30 is positioned to extend into the respective conical portions 26 and 28 when the respective parts of such elements, for example the stern portion 14a and the hopper portion 14b, are arranged together. Each portion 14a and 14b includes a vertical tube 32 which extends downwardly to the respective conical portions 26 and 28 from an accessible deck such as a top deck 33 to permit the insertion of a holding pin or dowel 34 through a bore defined in the pin 30 in order to anchor the pin 30 in a holding position. The pin 34 includes an extension 36 to permit its manipulation from the exterior of the associated floating body elements. The extension 36 may be adjusted in a vertical position by means of lock nuts 38.

At the two coupling points B and C located directly below the deck, it suffices, as indicated in FIG. 7, to provide a short coupling pin 34' which is inserted vertically from the deck into the bore of the holding pin 30'. The pin 34' is held by a welded collar 38'. The interior of the respective floating bodies is sealed around the bore used to insert the pin 34' by a hood 40 welded from the bottom on the pipe 20.

At the fourth coupling point D, which is at the same level as the coupling point A, located inside at the bottom joint of the loading hopper portions 12b and 14b, only short coupling pins 34'' are provided. A welded collar 38' anchors the pin 34'' in position. A detachable cover 40' is provided to seal the associated compartment.

In accordance with a further feature of the invention, a combination pilot house assembly and propulsion unit generally designated 42 is connected to associated float assemblies 12 and 14 in a manner permitting the pivotal movement of the float assemblies without requiring re-

moval of the combination pilot house and propulsion unit 42 from an operative position (see FIGS. 4 and 6). As indicated in FIG. 3, the floating body assemblies 12 and 14 are pivoted outwardly to an open position by means of a fluid pressure-operated piston and cylinder assembly generally designated 46.

Two fluid-operated piston and cylinder combinations 46 are carried in niches or recesses 45 and 47 formed in stern portions 12a and 14a and in bow portions 12c and 14c, respectively. The piston and cylinder combinations include a cylinder element 48 which is pivoted to a bracket 50 secured to the assembly 12 and a piston rod 52 which is pivoted to a bracket 54 secured to the floating body assembly 14. A controlling fluid under pressure is supplied from the pilot house through tubes 56 and 58 to selected sides of a piston (not shown) which is secured to connecting rod 52 and operates within the cylinder 48. As indicated in FIG. 3, when fluid is supplied through conduit 58 under pressure, the piston is moved outwardly to cause movement of the piston rod 52 outwardly and the pivoting of the floating body assemblies 12 and 14 about pivot 16. This effectively opens the hopper portions 12b and 14b and permits dumping of the load, for example.

A feature of the construction is that the pilot house assembly 42 is mounted on a supporting stand or bracket 60 which is pivotally connected to fixed bracket member 62 on the stern portion 14a, while the other end carries a roller element 64 which rides in a slot 66 formed by a cleat 68 secured on the stern section 12a. As indicated in FIG. 4, when the stern sections 12a and 14a are pivoted outwardly by actuating the piston and cylinder combination 46, the combination pilot house and driving and propulsion assembly 42 moves upwardly to the dotted line position indicated in FIG. 4. The center line 49 of the driving unit shifts laterally by a small amount, as indicated.

As best indicated in FIG. 6, the combination pilot house and propulsion unit includes an upper pilot house portion 42a and a propulsion motor 42b with a vertically elongated propulsion shaft 42c arranged to rotate a propeller 42d. It can be seen that the shifting of the center line of the drive shaft 42c by the amount indicated in FIG. 4 does not affect its operating position materially and the upright or vertical position is maintained permitting the unit to function in a normal manner to both steer and propel the barge.

It should be appreciated that coupling of the various floating body elements, for example, the elements 12a, 12b and 12c, is made at each end of the center portion 12b in the embodiment illustrated in FIGS. 1 to 8. However, in the embodiment of FIGS. 9, 10 and 11 the barge 10' includes central floats 70 and 72 on each side of which are arranged hopper forming floats 12b', 12b' and hopper forming floats 14b', 14b' which, in turn, are connected to stern forming float members 12a' and 14a' and bow forming floating body members 12c' and 14c'. In this embodiment the combination piston and cylinder members are arranged in recesses or niches 74, 75 and 76, as indicated in FIG. 6 to provide for the pivotal shifting of the hopper forming portions 12b and 14b.

The various floating body elements on one side 12a', 12b', 70, 12b' and 12c', as well as the opposite side elements 14a', 14b', 72, 14b' and 14c', may be coupled together in the manner indicated in the other embodiment. Thus, it can be seen that the basic construction indicated particularly in FIGS. 1 and 2 may be modified in the manner of the structure indicated in FIGS. 9 and 10 by the additional central floating body elements 70 and 72 arranged centrally between pairs of hopper-forming elements 12b and 14b. With the embodiment illustrated in FIGS. 9 and 10, it, of course, would be possible to open only one of the hopper-forming element pairs or both of the hopper-forming element pairs on each side of the central floating body elements 70 and 72.

While specific embodiments of the invention have been

5

shown and described in detail to illustrate the application of the inventive principles, it will be understood that the invention may be embodied otherwise without departing from such principles.

What is claimed is:

1. A barge comprising first and second floating body elements, said floating body elements including separate stern, bow and central portions, coupling means holding said stern, bow and central portions together, means pivotally connecting said first and second floating body elements together adjacent their upper interior corners and permitting their lower interior corners to abut, and means for moving said first and second floating body elements outwardly to pivot said floating body elements about said pivot means for opening said barge, propulsion means mounted on said first and second floating body elements, and means mounting said propulsion means on said floating body elements permitting said elements to be pivoted outwardly while holding said propulsion means in a substantially upright position.

2. A barge comprising first and second floating body elements, said floating body elements including separate stern, bow and central portions, coupling means holding said stern, bow and central portions together, means pivotally connecting said first and second floating body elements together adjacent their upper interior corners and permitting their lower interior corners to abut, and means for moving said first and second floating body elements outwardly to pivot said floating body elements about

6

said pivot means for opening said barge, propulsion means mounted on said first and second floating body elements, and means mounting said propulsion means on said floating body elements permitting said elements to be pivoted outwardly while holding said propulsion means in a substantially upright position including a bracket member pivotally connected to said first floating body element, said bracket having a portion confined by said second body element, said second body element including means defining a slot permitting sliding movement of said portion of said bracket member.

References Cited by the Examiner

UNITED STATES PATENTS

15	649,427	5/00	Barney	114—29
	1,495,428	5/24	Neveling	114—29
	1,832,349	11/31	Beaton	114—29
	2,011,886	8/35	Back	114—29
	2,518,091	8/50	Stopkevyc	114—5
20	2,876,726	3/59	Robishaw	114—5
	3,117,543	1/64	George et al.	114—28

FOREIGN PATENTS

25	216,562	8/61	Austria.
	313,840	6/29	Great Britain.
	896,752	5/62	Great Britain.
	1,149,632	5/63	Germany.
	97	12/13	Holland.

FERGUS S. MIDDLETON, *Primary Examiner.*