July 12, 1960 C. P. KAUFMANN 2,944,352

PORTABLE DREDGE

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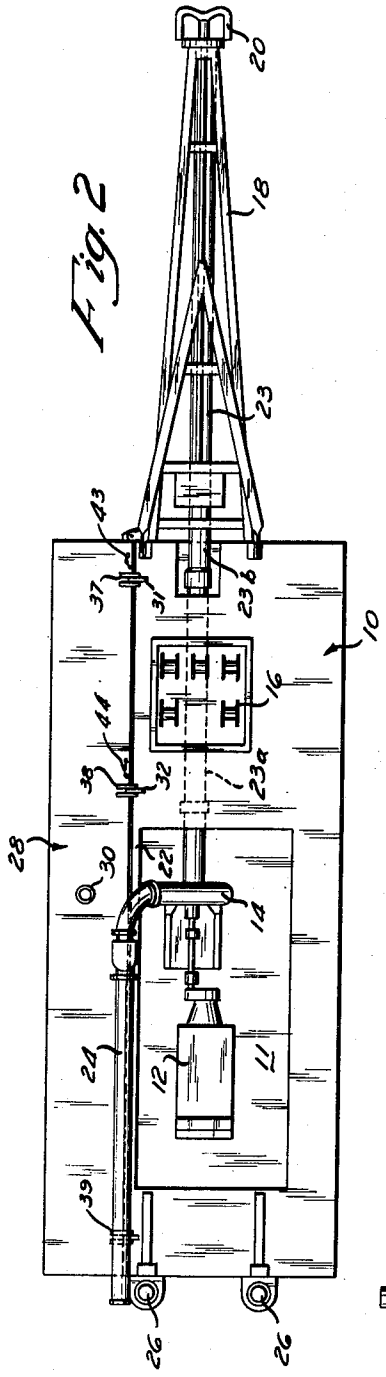


Fig. 2

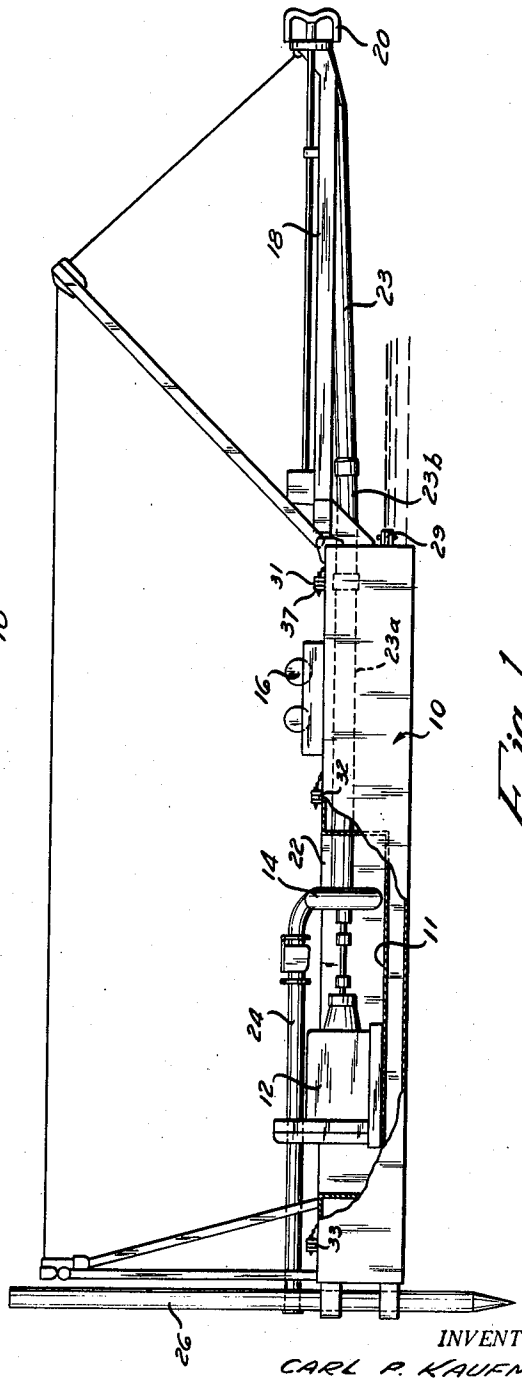


Fig. 1

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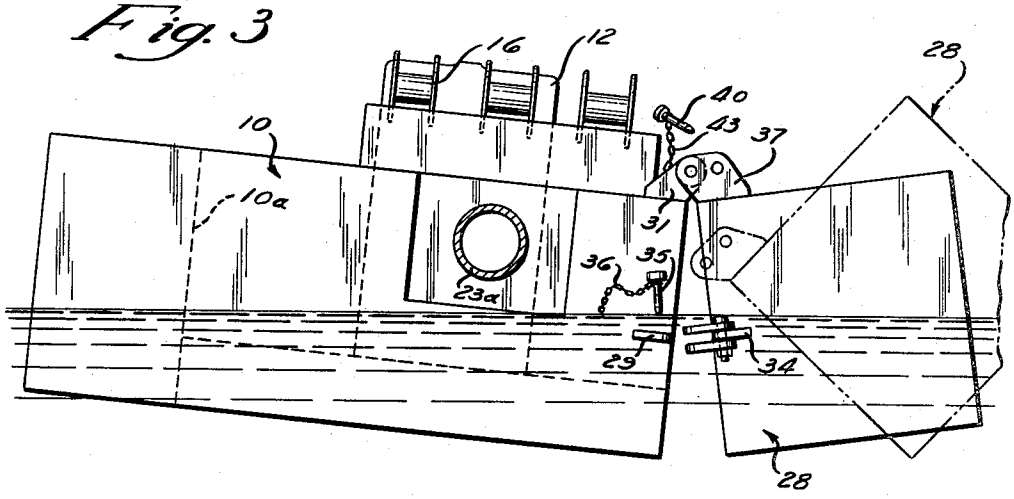
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PORTABLE DREDGE

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Fig. 3



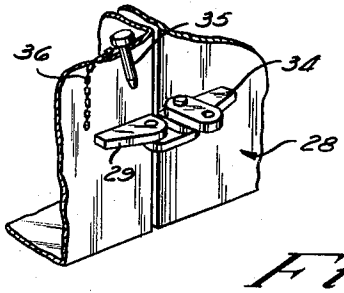


Fig. 5

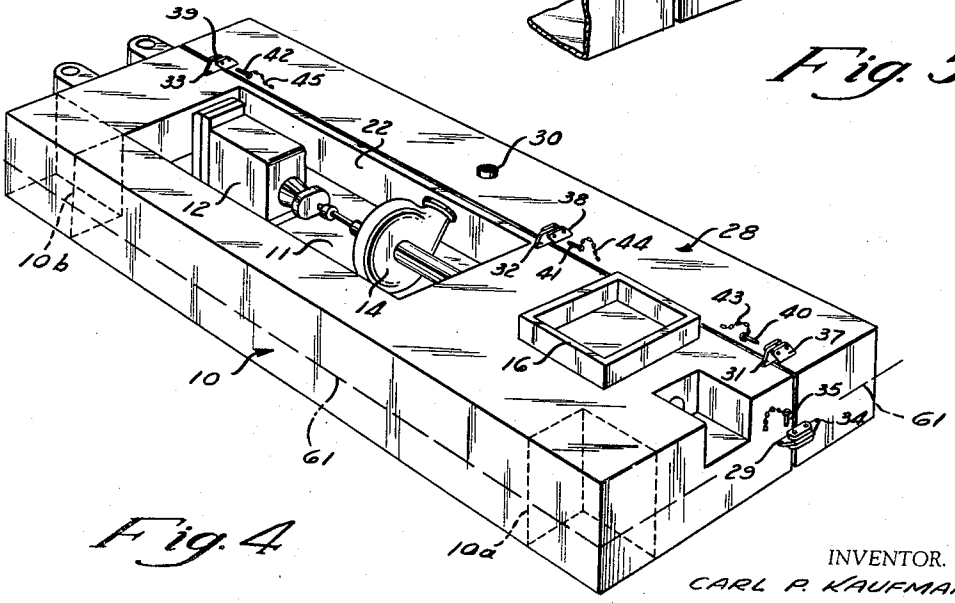


Fig. 4

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2,944,352

PORTABLE DREDGE

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4 Claims. (Cl. 37—54)

This invention relates to a portable dredging apparatus and more particularly to a bipartite hull for supporting such an apparatus adapted for assembly into a composite hull at the location of use.

Broadly stated, this invention comprehends the provision of a first buoyant dredge hull portion of predetermined width having various components of a dredge apparatus, such as an engine, pump, boom, etc. mounted thereon with their center of gravity transversely removed from the longitudinal axis or center line of the first hull portion and a second buoyant dredge hull portion securely attachable to the first hull portion to provide a composite, unitary rigid dredge hull having the various dredge components disposed with their center of gravity substantially along the longitudinal axis of the composite hull.

In dredging operation, it is often necessary to operate a dredge in a lake, stream, or other waterway and thereafter to transport the dredge to another site of operation by appropriate vehicles adapted for highway or rail operation. As may be readily understood, certain limitations of width of vehicles and load necessarily restrict the width of a dredge hull that may be so transported. In the past, it has been conceived to provide dredge hulls of multi-partite construction to overcome these restrictions with respect to width, whereby the same may be dismantled for transportation and reassembled for use at a site of operation. As disclosed in applicant's Patent No. 2,731,741 granted January 24, 1956 and assigned to Ellicott Machine Corporation of Baltimore, Maryland, a hull comprising a main section of a predetermined width and a pair of side sections attachable to respective sides of the main section has been provided and utilized with considerable success. According to the present invention, a single main hull portion is provided and a single side hull portion attachable to the main hull portion is also provided, whereby only a single attaching operation need be performed at the site of operation in order to prepare the dredge for operation facilitating quicker and easier assembly and disassembly thereof.

It is an object of this invention to provide a sectional dredge hull structure which may be prefabricated at the point of manufacture and transported to the various operational sites with a major portion of the operation equipment mounted in place thereon.

It is another object of the invention to provide a sectional hull structure which has a main section proportioned to provide a displacement of water equal to the total weight of the section, pump and other operational units mounted thereon.

It is another object of this invention to provide a sectional hull structure which has a main section having the pump, power unit and other operational units mounted transversely offset with respect to the longitudinal axis of the hull section.

It is another object of this invention to provide a dredge apparatus which is sectionalized in such a manner that ordinary means of transportation, such as railroad cars and

trucks, may be utilized to move the machine to various locations.

It is another object of this invention to provide a dredge apparatus having a central body section of the hull with the operational equipment mounted thereon and a single auxiliary hull section which may be floated into place and joined to the body section to complete the hull and give the machine the necessary buoyancy and stability characteristics for operation of the dredging machinery.

It is another object of this invention to provide a pair of complementary buoyant hull sections, one section designed to list about 12 degrees when floated alone and having ballast tanks for receiving a suitable ballast to float at nearly an even trim and a second section adapted to be secured to the one section by a first attachment along respective top portions thereof, addition of ballast to the second section to bring sides of the sections together for attachment along the sides and finally removal of excess ballast from each of the sections.

Other and further objects and advantages of this invention will occur from a more detailed description thereof taken with the accompanying drawings in which:

Fig. 1 illustrates a side elevation view of the dredging machine with parts cut away to show the location of various units of the equipment;

Fig. 2 is a top view of the dredging machine shown in Fig. 1;

Fig. 3 is an end elevational view of the two dredge hull sections showing the disposition of various components at the stage of attachment of the two sections; and

Fig. 4 is a perspective view of the composite hull structure.

Fig. 5 is an enlarged detail view in perspective of a link attachment along the sides of the hull sections.

In the preferred embodiment of this invention illustrated in the drawings, **10** represents the main hull section of the dredge having a pump well **11** at a level lowered with respect to the deck of the hull for receiving and mounting a power unit **12**, which may be an internal combustion engine for driving a pump **14** through appropriate shafts and couplings and for further operating a winch **16** adaptable to raise and lower and otherwise maneuver a boom **18** at the end of which is mounted a rotary cutter **20**. A vertical wall **22** extending along the side of the dredge hull prevents overflow of water on to the dredge. A rigid water and soil inlet pipe **23** terminating adjacent cutter **20** communicates with the inlet of pump **14** through a rigid pipe **23***a* and a flexible pipe **23***b* to accommodate swinging movement of boom **18**. A discharge line **24** is provided for communication with a discharge receptacle (not shown) at the after end of the dredge. Cutter **20** is driven by a suitable fluid motor (not shown) deriving its power from the power unit **12** and boom **18** is raised and lowered by winch **16** which operates the usual falls and rigging. A pair of spuds **26** are mounted for vertical reciprocation at the after end of the hull **10** and are raised and lowered for engagement with the bottom of the waterway being dredged for selectively securing the dredge in place or allowing movement of the same. The various units including power unit **12**, pump **14** and boom **18** are mounted eccentrically on the dredge portion **10** as shown in Figs. 2, 3, and 4. As shown in Figs. 3 and 4, hull **10** is provided with a forward ballast tank **10***a* and an aft ballast tank **10***b* for a purpose to be made clear hereinbelow.

A single auxiliary hull portion **28** is provided for attachment to the side of main hull portion **10**, whereby a composite dredge hull is provided with the power unit **12**, pump **14**, boom **18** and other dredge components disposed substantially along the longitudinal center line of the composite hull.

Auxiliary hull portion **28** is made watertight and is provided with a manhole **30** on top at mid-length of said

auxiliary hull 28. Water ballast is admitted into hull portion 28 through manhole 30, and water in also removed through manhole 30 by means of a hand pump provided for this purpose. Hull 28 is removably attachable to main hull portion 10 and for facilitating such an attachment, hull 10 is provided with a plurality of apertured lugs 29, 31, 32 and 33 secured along edge of hull 10, adjacent to hull 28 when the same is attached. Cooperative with lug 29 is a complementary link type lug 34 secured to auxiliary hull 28, having an aperture alignable with the aperture in lug 29 to receive a pin 35 also attached to hull 10 by a chain 36. Cooperable with lugs 31, 32 and 33 are respective clevis type brackets 37, 38 and 39 secured to auxiliary hull 28, spaced so lugs 31, 32 and 33 pass between the bracket plates and are secured by cross pins 40, 41 and 42 extendable through apertures in lugs 31, 32 and 33 and brackets 37, 38 and 39. Pins are attached to hull 10 by suitable chains 43, 44 and 45.

As shown more clearly in Fig. 3, the hull portion 10, when placed in water without auxiliary portion 28 attached, assumes a listing position wherein the top surface is approximately 12 degrees from a horizontal position since the center of gravity of the hull and operational units mounted thereon is offset with respect to the longitudinal center line of the hull. Flooding the forward ballast tank 10*a* and the aft ballast tank 10*b* will remove the greater portion of the list and will facilitate assembly of auxiliary hull tank 28. When auxiliary hull 28 is secured to the main hull section 10, the composite hull assumes an even, level position as shown more clearly in Fig. 4 of the drawings.

In securing auxiliary unit 28 to main hull section 10 as shown in Fig. 3 of the drawing, the forward ballast tank 10*a* and the aft ballast tank 10*b* are partially filled with water ballast to lessen list of main hull 10. Auxiliary portion 28 which normally floats as shown in dotted lines in Fig. 3 is pulled to main hull 10 as shown in Fig. 3 of the drawings. Brackets 37, 38 and 39 are aligned with lugs 31, 32, 33 and cross pins 40, 41 and 42 are inserted into aperture opening of brackets 37, 38 and 39 and lugs 31, 32 and 33. Auxiliary hull portion 28 is partially flooded with water ballast to facilitate closing and pinning lower link type lug 34 to the lug 29 on main hull portion 10 by means of pin 35. Thereafter, ballast is removed from hull 28 whereby the composite hull, being increased in buoyancy, floats evenly in water at the level indicated by line 61 shown in Fig. 4. Pin 35 is placed through lugs 34 and lug 29, and a similar pair of lugs at the other end of the hull at the same level are similarly secured together.

As clearly shown in Fig. 3 of the drawings, according to one embodiment of the invention, hull 10 and various units thereon are sized, proportioned and disposed so that hull 10 when freely floating lists at approximately 12 degrees. It is readily apparent, however, that the relative sizes and proportions of the hull and operational units and the relative disposition of the same may be varied considerably and that the angle of list of hull 10 when freely floating may be different from 12 degrees without deviating from the scope of the invention.

According to this invention, the assembly, disassembly and transportation of a dredge from one location of operation to another is greatly simplified and improved by reducing to a minimum the number of separate hull sections employed for forming a composite dredge hull. By means of attachment or detachment of a single auxiliary hull section, a dredge is conditioned either for operation or for transportation.

Having thus described this invention in such full, clear, concise and exact terms as to enable any person skilled in the art to which it pertains to make and use the same, and having set forth the best mode contemplated of carrying out this invention, I state that the subject matter which I regard as being my invention is particularly pointed out and distinctly claimed in what is claimed, it being understood that equivalents or modifications of, or substitutions for, parts of the above specifically described embodiment of the invention may be made without departing from the scope of the invention as set forth in what is claimed.

I claim:

1. A portable dredge comprising a hull having a main section and a side section wherein said main section is provided with a well for the pump and power unit, said well having a width substantially less than the width of the main section and one side of the well forming one side of said main section, the other side of said well being spaced from the other side of said main section, said main section having a deck flush with the top of the well and enclosing the top of the main section to provide a buoyant space around the well, ballast tanks within said buoyant space on that side of the main section remote from the well, said side section having a length corresponding substantially to the length of the main section, pivotal means for interconnecting said side section and said main section along that side of the main section most nearly adjacent the well whereby both of said sections may be floated in water and are independently buoyant so that the ballast tanks in the main section may be utilized to decrease the list of the main section due to the eccentricity of the well, and said side section may be ballasted to facilitate connecting the side section to the main section in the water and wherein said ballast tanks in the main section and said side section may be pumped out to bring the connected units to a stable upright position with sufficient free board for operating the dredge.

2. A portable dredge comprising a rectangular main section and a side section wherein the main section is provided with a rectangular well having one side wall coincident with one side wall of the main section, said well having the upper edges of the side walls flush with the upper edges of the main section in a horizontal plane and a deck enclosing the space between the walls of the well and the side walls of the main section, a pump and power unit in said well, said main section being proportioned so as to be independently buoyant in the water and to float at a list toward the side of the main section nearest to the well, ballast tanks in said main section adjacent the side wall thereof most remote from the well whereby water may be introduced to the ballast tanks and reduce the list, said side section being independently buoyant and having side walls of substantially the same height as the side walls of the main section, said side section having a deck enclosing the top thereof and brackets carried by the deck along one edge of said side section, complementary brackets carried by the deck of said main section along the edge thereof adjacent the well, means to interconnect said brackets, and complementary locking means on the exterior side walls of the main section and side section whereby said sections may be locked together with the decks in a co-planar relationship in the water and whereby ballast water may be removed so that the entire hull is stable, buoyant and upright with sufficient free board for operating the dredge.

3. A portable dredge comprising a hull having a rectangular main section and a rectangular side section wherein said main section is provided with a well for the pump and power unit, said well having the width substantially less than the width of the main section and one side wall of the main section forming one side wall of said well, the opposite side wall of said well being spaced from the other side wall of said main section, said main section having a deck flush with the top of the well and enclosing the top of the main section to provide a buoyant U-shaped space around the well, ballast tanks within said buoyant space on that side of the main section most remote from the well, said side section having a length corresponding substantially to the length of the main section, means for interconnecting said side section and said main section along that side of the main section

most nearly adjacent the well whereby both of said sections may be floated in water and are independently buoyant and the ballast tanks in the main section may be utilized to decrease the list of the main section due to the eccentricity of the well.

4. A portable dredge comprising a rectangular main section and a side section wherein the main section is provided with a rectangular well along one side wall of the main section, said well being shorter and narrower than the main section and having a deck enclosing the space between the side walls of the well and the side walls of the main section, a pump and power unit in said well, said main section being proportioned with respect to the well and the weight of the pump and power unit so as to be independently buoyant in the water and to float at a list toward the side of the main section adjacent the well, ballast tanks in said space in said main section adjacent the side wall thereof most remote from the well whereby water may be introduced to the ballast tanks and reduce the list, said side section having side walls of substantially the same height as the side walls of the main section, said side section having a deck enclosing

the top thereof to form a water-tight pontoon and fastening means carried by the deck along one edge of said side section, complementary fastening means carried by the deck of said main section along the edge thereof adjacent the well, pin means to interconnect said fastening means when the fastening means on the sections are at the same level and means to introduce ballast water to said side section to lower same and means to lock the sections together when the decks thereof are coplanar.

References Cited in the file of this patent

UNITED STATES PATENTS

1,619,850	Casey	Mar. 8, 1927
2,200,661	Templeton	May 14, 1940
2,289,260	Gerken	July 7, 1942
2,731,741	Kaufmann	Jan. 24, 1956
2,747,536	Russell	May 29, 1956

FOREIGN PATENTS

708,551	Germany	July 24, 1941