Jan. 24, 1956 C. P. KAUFMANN 2,731,741

PORTABLE DREDGE

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2 Sheets-Sheet 1

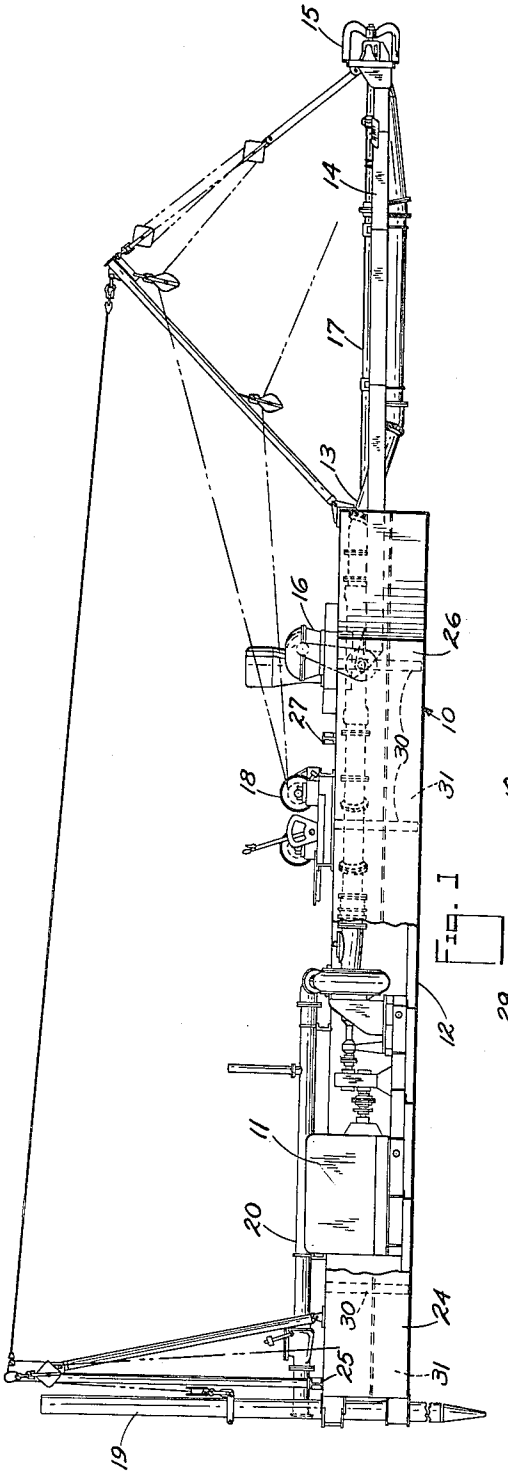


Fig. 1

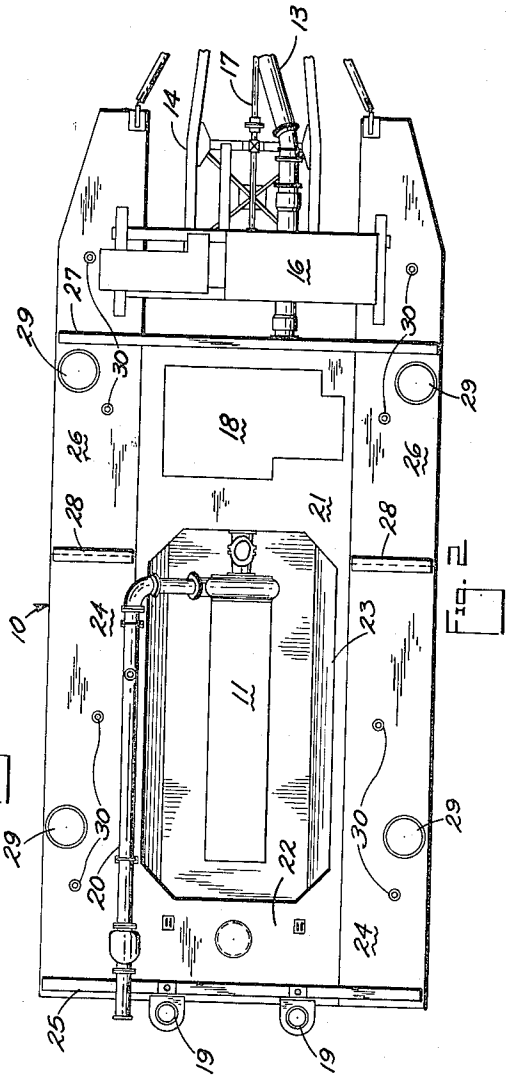


Fig. 2

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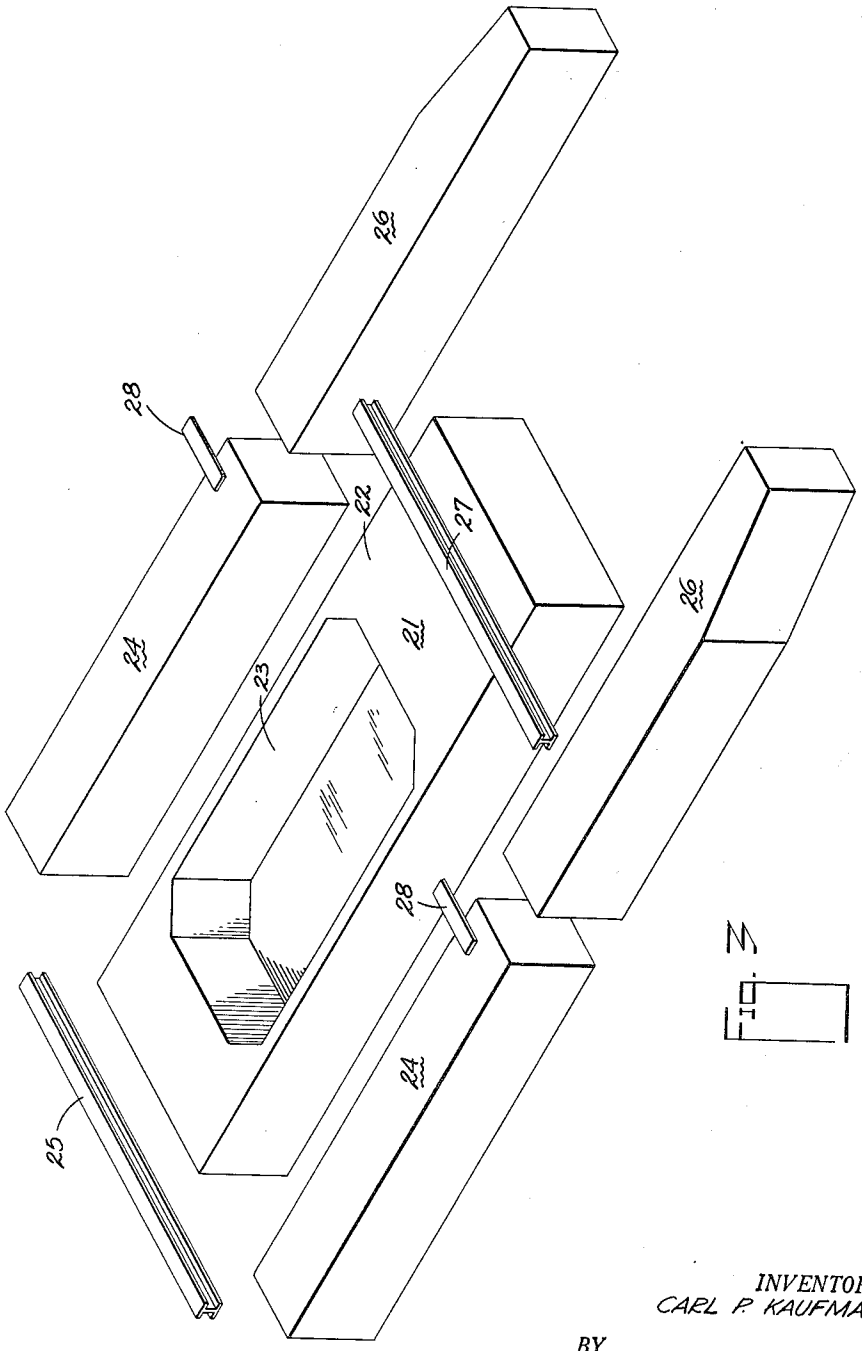
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2,731,741

PORTABLE DREDGE

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4 Claims. (Cl. 37—54)

This invention relates to portable dredging machines, and, more particularly to the hydraulic-type machine mounted on a hull arranged for assembly at the point of use.

The operational characteristics of a hydraulic dredge are well known as well as the problem connected with the assembly of a large floating craft complete with dredge machinery, especially where the machine is to be used on land-locked bodies of water. The ordinary procedure for placing the dredging machine in operation is to transport the structure in small increments and performing the assembly at the launching site. This involves fabrication of parts of the machine under conditions which are not adapted for the purpose.

An object of this invention is to provide a sectional hull structure which may be pre-fabricated at the point of manufacture and transported to the operational site with a majority of the equipment mounted in place.

An object of the invention is to provide a sectional hull structure which has a central section proportioned to provide a displacement exceeding the total weight of the section, pump, and the power unit mounted therein, which will float when launched in the water, during the assembling of the remaining sections of the hull thereto.

A further object of this invention is to provide a dredging machine which is sectionalized in such a manner that ordinary means of transportation such as railroads and trucks may be utilized to move the machine to the desired location.

Another object of the invention is to provide dredging machine which has the operational equipment mounted on a body section of the hull which will float upon being launched without assistance from the remaining sections of the hull.

Another important object is to provide a dredging machine having a central body section of the hull with the operational equipment mounted thereon and auxiliary hull sections 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 required by the operation of the dredging machinery.

The manner in which these objects and advantages of the invention are realized, and other advantages of the invention of more or less ancillary nature will be apparent to those skilled in the art from the description herein of the preferred embodiment of the invention.

In the drawings:

Fig. 1 is a side elevational view of the dredging machine with parts cut away to show the relative location of the equipment;

Fig. 2 is a fragmentary top plan view; and

Fig. 3 is an exploded isometric diagrammatical view of the hull showing the arrangement of parts before assembly.

In the preferred embodiment of this invention illustrated in the drawings, and described in the following specification, the numeral **10** designates the hull on which the dredging equipment is mounted.

A pump and motor drive unit **11** is mounted amidship and on the lower wall **12** of hull **10** thereby locating the center of gravity of the pump and power unit as low as possible and bringing the inlet of the pump **11** to a point adjacent the water line of hull **10**. The water and spoil inlet line **13** projects forwardly from the hull **10**, extends to the end of boom **14** and terminates adjacent to the rotating cutter **15**. The cutter **15** is driven by a power unit **16** through a shaft **17**. Boom **14** is raised and lowered by the winch mechanism **18** which operates the usual boom falls and rigging.

A pair of spuds **19** are mounted for vertical reciprocation on the rearmost portion of the hull **10** and are raised and lowered for engagement with the bottom of the stream or lake as required by the operation of the dredging machine. Discharge line **20** from the pumping unit **11** passes rearwardly over the hull **10** and the contents therein are conducted to the discharge point by a pipe line (not shown).

The hull **10** has a center body section **21** having a deck **22** and a well **23** in which pumping unit **11** is disposed, a pair of rear side sections **24** are joined to the rear portion of section **21**, a cross member **25** attached to the rear of deck **22** extends laterally from section **21** and above the side sections **24**, and transmits the lifting force from the buoyant sections **24** to the body section **21**. A pair of forward side sections **26** are joined to body section **21** immediately ahead of side sections **24** and project forwardly beyond the front of body section **21**. A forward cross member **27** is provided to engage the top of the side members **26** and conduct the buoyant force provided by the side sections **26** to the main body section **21**. A pair of joining plates **28** connect the side sections **24** and **26** together thus providing a unitary structure throughout. It may be noted that, in addition to the plates and cross members for joining the sections of the hull, the base for the power unit **16** serves to connect and stabilize the forward sections **26** of the hull and to provide a mounting for the trunnions which pivotally support the boom **14** below the level of the deck for improved operational characteristics. Each of the sections **24** and **26** is a hollow, water-tight structure in the nature of a pontoon. Man holes **29** are provided in the upper decks of sections **24** and **26** for access to the interior and two pipe connections **30** in the upper deck of each section leading to and allowing water to be pumped to the interior of ballast tanks **31** mounted below the water line to load and reduce the buoyancy of the side sections.

The desirability of fabricating and assembling machinery in the shop is well understood. It is for that reason that the hull and the equipment mounted thereon, as disclosed in this application, have been arranged to allow the complete assembly of the major portion of the dredging machine under shop conditions, and a minor portion of the assembly to be made under field conditions. The main body section **21** is of such size that it may be conveniently handled and transported by truck or railway car.

Its dimensions, therefore, are preferably limited to those allowed for highway travel. The main pump and drive motor unit **11** is mounted in the well **23** before the equipment leaves the shop. Further, the winch mechanism **18** is also installed on the deck of section **21** immediately ahead of the well **23**. All of the fastenings for the rigging and the spuds **19** are also permanently installed at the time the unit is manufactured.

To complete the assembly, the machine is moved to the point of use and the center section **21** is launched into the body of water in which the dredging machine will be used. The section **21** is designed to float the pump and power unit mounted thereon with sufficient freeboard to facilitate handling.

The side sections **24** and **26** are then launched and the ballast tanks **31** inside are filled with water to lower their deck lines to that of the center section **21**. They may then be floated to their operable position adjoining the center section and assembled thereto with conventional fastening means. After the assembly is completed, the water may be pumped from the side sections **24** and **26** whereupon their buoyancy will be returned and they will assist in floating the machinery and the center section **21** at a higher level above the water. Further, the addition of the side sections adds stability to the hull to prevent overturning, and the forward projecting portions of the side sections **26** assist in carrying the weight of the boom and the equipment associated therewith. With the hull in completed form, it is possible to add the rigging, spuds, and other auxiliary equipment as required.

With all of the components in operating position, the boom may be lowered for bringing the cutter **15** and the end of the intake pipe **13** into proximity with the spoil. With the power unit **16** in operation, the cutter **15** is rotated by drive shaft **17**. The pumping unit **11** draws the material to be dredged through inlet pipe **13** and discharges the same through outlet line **20**. The movement of the dredge and the cutter **15** is controlled by the two spuds **19**. A cut is made by swinging the dredge laterally utilizing one of the spuds **19** as a center. Forward movement is accomplished by alternating the spuds as the forward end of the dredge is swung, thereby walking the machine as required by the dredging operation.

When any particular job is completed, the dredging machine may be knocked down to its original sub-assembly units and transported overland to a new location. This feature is particularly important in mining operations where the operations are confined to relatively small bodies of water and the transportation facilities are limited in nature.

It is to be understood that the specific nature of the present disclosure is not intended to be restrictive or confining and that various rearrangements of parts and modifications of design may be resorted to without departing from the scope or spirit of the invention as herein claimed.

What is claimed is:

1. A portable dredge having a hull comprising a main section and a pair of buoyant side sections, a pump and power unit centrally mounted in said main section, said main section being proportioned to provide a displacement exceeding the total weight of the main section plus the weight of the pump and power unit whereby the main section may be separably floatable in a stable up-right position, rigid fastening means connecting said side sections and said main section, said connecting means transmitting a portion of the weight of the main section to the side sections whereby said main section is supported by said side sections so that the assembled hull floats higher out of the water than the main section floating separately.

2. A portable dredge having a hull, a pump and power unit in said hull, said hull comprising a main section and a pair of side sections, said main section being proportioned to provide a displacement exceeding the total weight of the main section plus the weight of said pump and power unit, said pump and power unit being mounted centrally of said main section, each of said side sections

respectively comprising a pair of separable parts arranged end to end, the combined length of the parts exceeds the length of the main section, the main section and side sections being separably floatable and adapted to be joined together while being floated, rigid connecting means connecting said main section and side sections limiting the relative vertical movement of said main section and side sections whereby a portion of the weight of said main section is supported by said side sections when said hull is assembled.

3. A portable dredge having a hull, a pump and power unit in said hull, and a boom, said hull comprising a main section and a pair of side sections, said main section being proportioned to provide a displacement exceeding the total weight of the main section plus the weight of said pump and power unit, said pump and power unit being mounted centrally of said main section, each of said side sections respectively comprising a pair of separable parts arranged end to end, the combined length of the parts exceeds the length of the main section, the main section and side sections being separably floatable and adapted to be joined together while being floated, rigid connecting means connecting said main section and side sections limiting the relative vertical movement of said main section and side sections whereby a portion of the weight of said main section is supported by said side sections when said hull is assembled, said boom being mounted of that portion of the side sections projecting beyond the main section.

4. A portable dredge having a hull, a pump and power unit in said hull, and a boom, said hull comprising a main section and a pair of side sections, said main section being proportioned to provide a displacement exceeding the total weight of the main section plus the weight of said pump and power unit, said pump and power unit being mounted centrally of said main section, each of said side sections respectively comprising a pair of separable parts arranged end to end, the combined length of the parts exceeds the length of the main section, the main section and side sections being separably floatable and adapted to be joined together while being floated, rigid connecting means connecting said main section and side sections limiting the relative vertical movement of said main section and side sections whereby a portion of the weight of said main section is supported by said side sections when said hull is assembled, and means for flooding the side sections whereby the side sections may be lowered into coplaner position relative to the main section and joined to said main section while all sections are floating.

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