Jan. 20, 1925. 1,523,660

J. W. RENO

APPARATUS FOR RAISING SUNKEN SHIPS

Filed Dec. 27, 1919 3 Sheets-Sheet 1

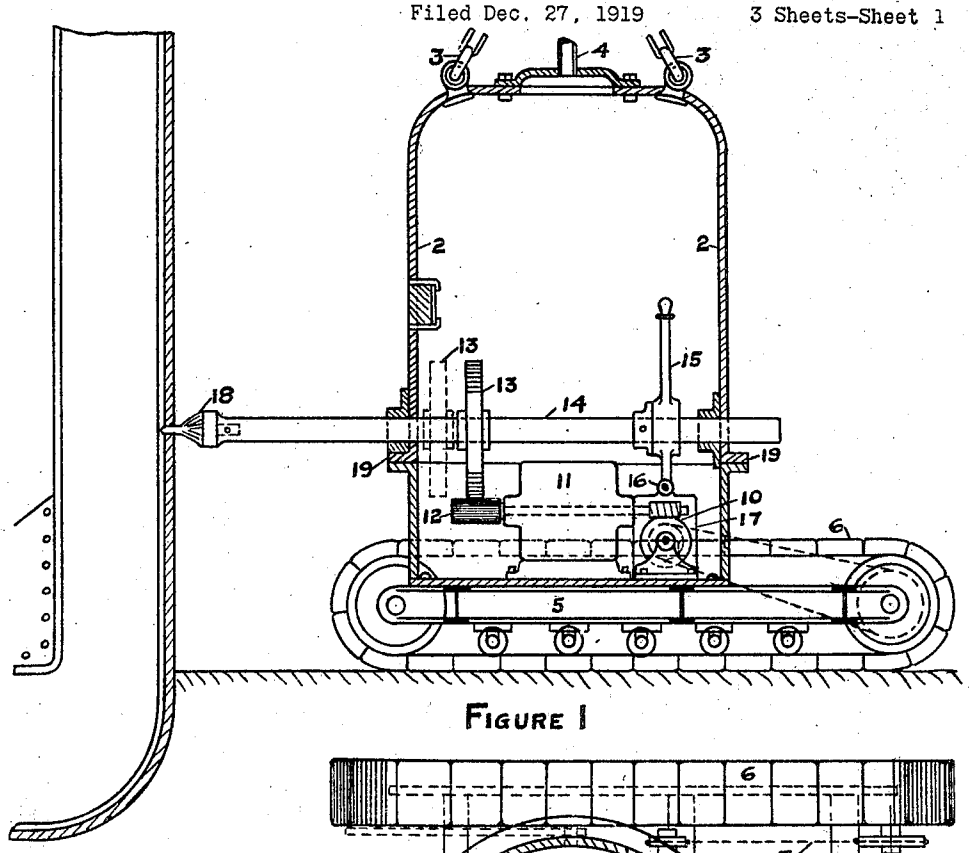


FIGURE 1

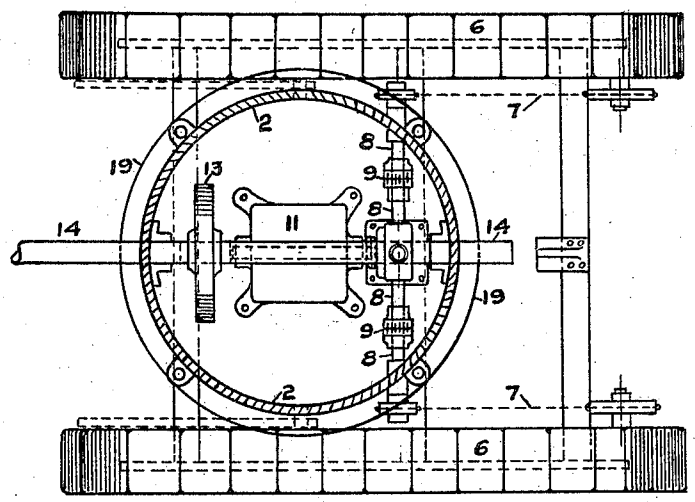


FIGURE 2

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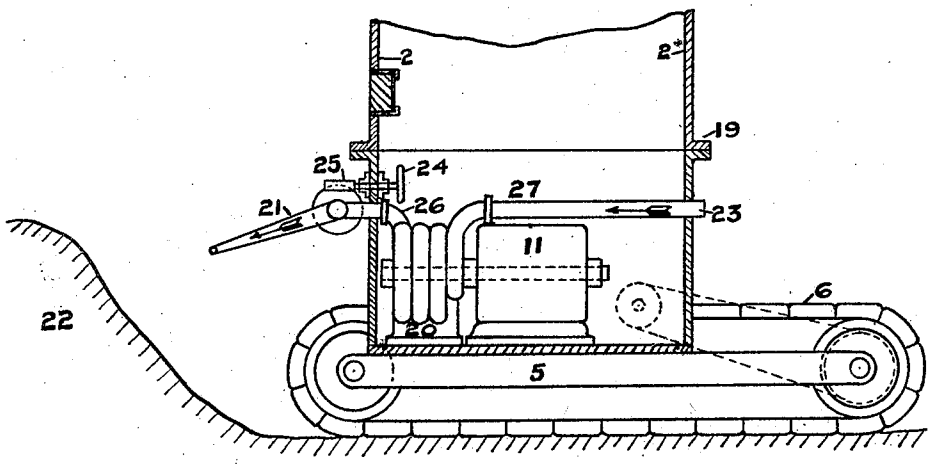


FIGURE 3

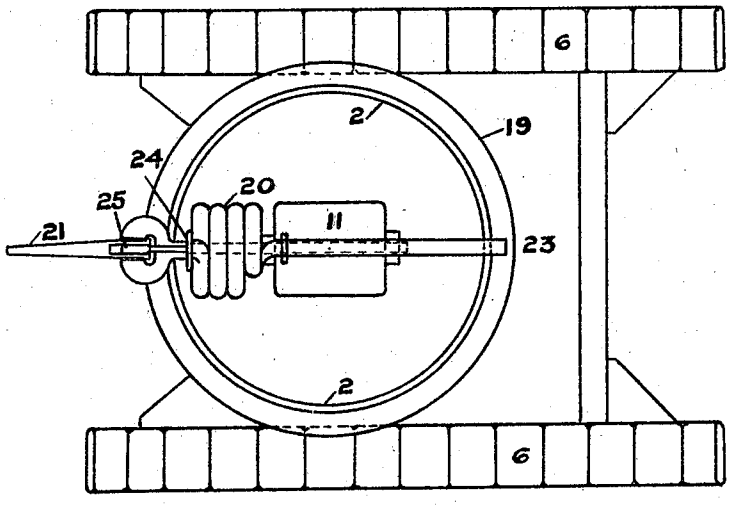


FIGURE 4

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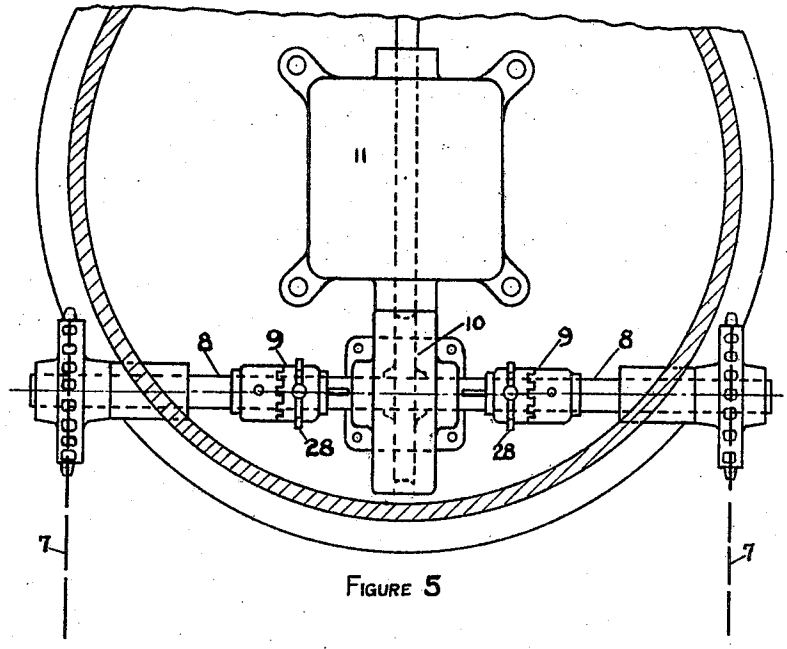


FIGURE 5

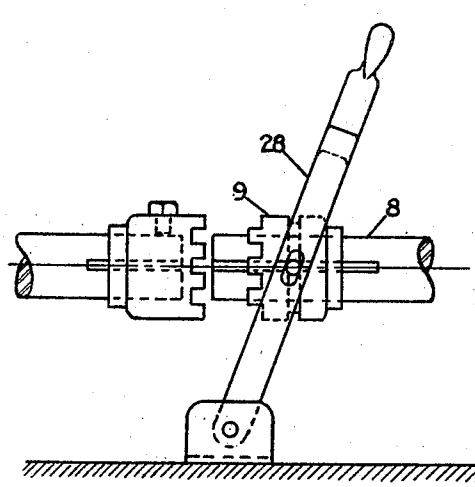


FIGURE 6

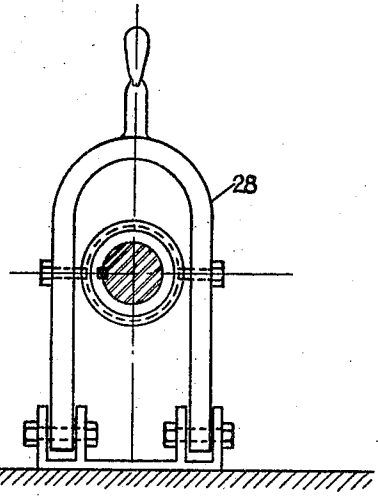


FIGURE 7

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Patented Jan. 20, 1925. 1,523,660

UNITED STATES PATENT OFFICE.

JESSE W. RENO, OF NEW YORK, N. Y.

APPARATUS FOR RAISING SUNKEN SHIPS.

Application filed December 27, 1919. Serial No. 347,764.

To all whom it may concern:

Be it known that I, JESSE W. RENO, a citizen of the United States, residing in New York, in the county of New York and State of New York, have invented a new and useful Improvement in Apparatus for Raising Sunken Ships, of which the following is a specification.

My invention relates to an apparatus to be used in the art of raising sunken ships by means of drilling a number of holes in the sides of the ships by a drill mounted in a water tight casing which in turn is mounted on a mobile tractor which is adapted to be self propelled on the bottom of the sea at the side of the ship to be salvaged. The holes drilled in the sides of the ship are designed and intended to receive hooks suspended from a chain, the opposite end of the chain being fastened to a submerged air tank or pontoon and which cause it to raise the ship by having water expelled from it by air admitted therein and thus raise the ship by buoyant force of the pontoon.

My present invention also involves an improved form of casing, which is divided horizontally with a lower portion to receive a power motor both to propel the tractor and also drive the drill, and an upper portion of the casing to carry the drill, the idea being to render the interior of the casing or working chamber readily accessible for repairs and any other purpose and a further advantage in facility and ease of manufacture of the casing.

My invention also involves certain designs or arrangements of the motor and its driving shaft and the drill and the shaft for driving the tractor.

My invention in the art of wrecking sunken ships submerged in deep water also involves, if found to be needed, the use of an apparatus consisting of a combination of the mobile tractor driven by a power motor and a centrifugal water pump with a directing nozzle, which apparatus will be used to level or wash away or remove any collection of sand or silt around the hull of the ship as sunk; all of which will more fully appear in the specification.

My invention also involves certain other features which will appear in the specification and claims.

The work of drilling holes in the sides of the ship by my apparatus used in the specific art of wrecking sunken ships can be conveniently and rapidly done so that any desired number of holes can be drilled in the sides of the ship so that any desired number of air tanks or pontoons can be readily attached to the said ship and by their buoyant action raise her without strain or stress upon her structure; and in this way ships even of very large size and sunk in deep water can be expeditiously and commercially raised to the surface of the sea and then reclaimed.

In carrying out my method of raising sunken ships, I attain my objects therein by the use of the apparatus illustrated in the accompanying drawings, in which

Fig. 1 is a side elevation of my apparatus partly in vertical cross section in position to drill a hole in the side of the ship at the point desired.

Fig. 2 is a plan view of my apparatus shown in Fig. 1, the upper portion of the working chamber being in horizontal section.

Fig. 3 is a side elevation of my mobile tractor and power motor combined with a circulating water pump with a discharge nozzle.

Fig. 4 is a view in plan of Fig. 3.

Figure 5 is an enlarged plan view of the adjustable clutches and shaft sections in Figure 2.

Figure 6 is a side elevation of the adjustable clutch and shaft sections disengaged.

Figure 7 is an end elevation of one of the forked levers or handles for throwing the adjustable clutch.

Similar letters refer to similar parts throughout the several views.

The mobile drill apparatus, 1, comprises a working air chamber, 2, adapted to be let down from the surface of the sea by chains, 3, to the bottom of the sea. Air is supplied through a tube, 4, to the working chamber under atmospheric pressure. The chamber is made strong enough to withstand the external pressure due to the head of the water at the sea bottom and large enough to give the necessary working space in the interior thereof for the operators, say, for instance, two operators, the dimensions of the working chamber being about six feet in diameter and eight feet to the ceiling or overhead. The chamber is mounted on a suitable frame or chassis, 5, movable by tractor belts, 6, adapted to be operated by sprocket chains, 7, driven by a shaft, 8, located in

the working chamber. The shaft is divided into three parts, adapted to be clutched together by clutches, 9. The shaft, 8, is driven by a worm and gear, 10, the worm being on the end of the motor shaft of a power motor, 11, in this instance, an electric motor. The clutches are of any well known type and are adapted to be operated in any well known way, for instance, by a forked lever or handle, 28, the object of the clutches being to allow the motor to operate and drive the shaft, 8, without driving the tractor, which result is attained by opening the clutches, or on the other hand, to enable the motor to drive the tractor by engaging the clutches. It is obvious that I am not limited to a specific species of power motor, 11; as the more convenient, however, I prefer to use an electric motor. On the end of the shaft of the motor opposite to the worm, I have placed an elongated gear pinion, 12, which in turn meshes with a gear wheel, 13, on the shaft, 14, to turn the shaft axially. The gear wheel, 13, is mounted to slide on the shaft in a lengthwise direction of the shaft in order that the gear wheel, 13 may be disconnected from the gear pinion, 12, if and when desired. The shaft, 14, is mounted in a suitable position in the walls of the working chamber, 1. Both the ends of the shaft extend beyond the outside of the walls of the chamber; in that way, the shaft is balanced by the water pressure. Under one end of the shaft within its working chamber, I place a lever, 15, pivoted at the point, 16, to a frame, 17. The function of the lever is to move the shaft, 14, endwise to and fro in order to feed the drill in its work in drilling a hole in the side of the ship and to withdraw the drill from the hole. I have only indicated the connections of the lever, 15, with the shaft, 14, because the lever is merely typical of the usual feed device for drills. On one end of the shaft, 14, I have placed a reamer drill, 18, and have indicated the point of the drill as having penetrated the plate in the side of the ship. I deem it unnecessary to further describe the drill since it is of a well known type of drill. Thus far I have not touched upon the dimensions of the parts, the pump of the motor or any other similar conditions as those matters are all referable to the designer of the apparatus; but I believe that with a small motor, say, for instance, 20 H. P., I can both propel the tractor to any suitable point at the side of the ship at which it is desired to drill a hole and also drive the drill with sufficient high speed to drill a hole in the side of the ship in a comparatively brief time; which facts greatly add to the desirability of my invention because it enables the work of wrecking the ship to be quickly, economically and certainly done.

I have shown the working chamber longitudinally divided into an upper and lower portion, the lower part of the chamber being mounted on a chassis of the tractor and carrying the motor and shaft for driving the tractor, the upper part of the chamber being shown as carrying the drill shaft and drill and the gear and feed lever for the drill. I have indicated the two parts as flanged at their meeting places, 19. These flanges may be bolted together in the usual way or the two parts of the chamber may be secured together in any well known way; having reference more particularly to allow the upper part to be taken off of the lower part to suit the convenience of the user of the apparatus, in order to get to the parts in the working chamber for repairs; and also to manufacture the chamber very readily and to assemble the parts together to form the working chamber, and at the same time, enable the working parts in the chamber to be easily and conveniently assembled in the chamber or disassembled, as the case may be.

Having reference to my apparatus for leveling or washing away or removing any sand or silt around the hull of the sunken ship in order to facilitate the wrecking of the ship or the approach of my apparatus with the drill, I have shown the apparatus wherein the upper part of the working chamber is free of any apparatus, while the lower part of the working chamber carries the propelling shaft for the tractor, the motor and the circulating pump, 20, and a nozzle, 21, for directing the discharge of the water from the pump onto and against the sand or silt, 22, to be removed. I have only indicated the outline of the pump because it may be of any suitable type and will be driven by a motor to cause the water to be drawn in through an inlet tube, 23, and expelled through the nozzle, 21, to cause the sand, 22, to be leveled or washed away by the stream of water from the nozzle, 21. I have also indicated in the drawing, Figs. 3 and 4, a hand wheel, 24, and worm and gear, 25, for elevating the nozzle, 21. That device is of any well known type, known and used for the purpose.

In describing the construction of my apparatus, I have, in effect, described its mode of operation which is so simple as to be obvious upon inspection of the drawing and therefore I deem it unnecessary to describe the operation of my apparatus in the art of wrecking sunken ships submerged in the sea; I might say, however, that in case it is found that there is sand or silt at the side of the ship which may or will interfere with the operation of my apparatus for drilling the holes in the sides of the ship, I resort to my water power leveling device, already described and shown in Figs. 3 and 4, to re-

move the silt or sand from out of the way of my drilling apparatus; whereupon, the pump can be removed from the working chamber simply by elevating the pump out of the lower half of the chamber, the inlet and outlet tubing of the pump being divided into several parts as indicated at the points, 26 and 27, which allows the pump proper to be separated from the inlet and outlet tubing and lift it out of the working chamber; whereupon the gear pinion, 12, can be slipped over the end of the motor shaft, and the upper portion of the working chamber with the drill be secured to the lower portion of the working chamber, and the drilling apparatus be thereupon brought up to the side of the ship to drill a hole at the point desired.

I claim—

1. In the art of salvaging sunken ships submerged in the depths of the sea, an apparatus for forming holes in the sides of a sunken ship to attach buoyant devices to raise the ship comprising the combination of a mobile tractor, a water-tight working chamber mounted thereon, and a drill mounted in the chamber.

2. In the art of salvaging sunken ships submerged in the depths of the sea, an apparatus for forming holes in the sides of a sunken ship to attach buoyant devices to raise the ship comprising the combination of an automotive tractor, a water-tight working chamber carried by the tractor, and a power drill mounted in the chamber.

3. In the art of salvaging sunken ships submerged in the depths of the sea, an apparatus for forming holes in the sides of the ship to attach buoyant devices to raise the ship, comprising a mobile tractor, a water-tight working chamber on the tractor, a drill in the chamber, a motor to drive the tractor to move the drill to the side of the ship and hold it there while the drill is operating to drill a hole in the side of the ship, means to drive the drill and feed the same in the operation of drilling a hole.

4. In the art of raising ships sunk in the depths of the sea, an apparatus comprising an automotive tractor, an airtight working chamber, a drill rod in the chamber, a motor within the chamber to drive the tractor and drill, the motor comprising a drive shaft divided into sections, adjustable clutches adapted to clutch the sections of the shaft together, sprocket pinions on the end sections of the shaft and sprocket chains engaged with the said sprockets, to drive the belts of the tractor, a gear wheel on the middle section of the said shaft, a worm on the end of the motor shaft engaged with the said gear wheel, a broad-faced gear pinion on the other end of the motor shaft, a narrow-faced gear wheel, mounted on the drill rod, and adapted to mesh with the said pinion, and also slidable on the drill rod to be moved out of mesh with the said pinion, whereby the tractor and drill rod can be driven by the motor conjointly or disjointly.

5. In the specific art of salvaging ships sunk in the depths of the sea by the buoyant force of devices attached to holes drilled in the sides of the ship, an apparatus for drilling the holes comprising a tractor, adapted to be operated on the bottom of the sea at the site of the sunken ship, a water-tight working chamber supported on the tractor, divided into upper and lower parts, the upper part adapted to be lifted off of the lower part, a drill mounted in the walls of the upper part of the chamber its opposite ends projected therefrom and a motor mounted in the lower part of the chamber, to drive the tractor and drill, and gears between the motor and drill.

6. An apparatus adapted to be used under the seat to drill holes at predetermined points in the sides of the sunken vessel to attach buoyant devices thereto to raise it, comprising the combination of a water tight working chamber, a drill mechanism mounted in the chamber, the opposite ends of the drill rod projected through the walls of the chamber to balance the drill hydrostatically against the pressure of the water.

7. In a diving apparatus, the combination with a tractor, of a water tight working chamber, a tool mounted thereon, said tool adapted to operate upon external objects, power means to operate said tractor and tool and means to transmit power from the power means to said tractor and tool independently of each other.

8. In a diving apparatus, the combination with a tractor, of a water tight shell, a tool mounted thereon, adapted to operate upon external objects, a motor to operate said tractor and tool, and power transmission means between the motor, tractor and tool controllable to operate the tractor and tool independently of each other.

In testimony whereof, I have signed my name to this specification.

JESSE W. RENO.