Aug. 14, 1934. P. J. MARCHAUT 1,970,240

PORTABLE CRANE

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Fig. 1

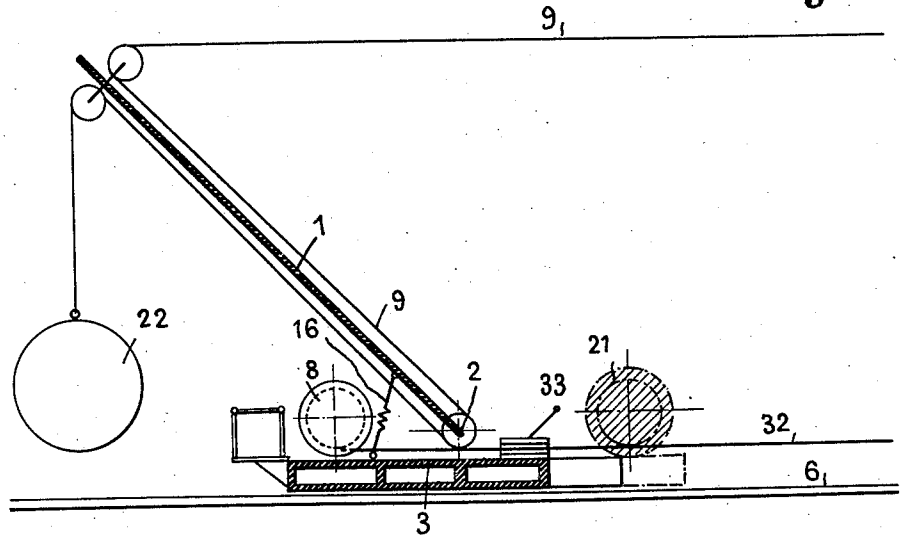
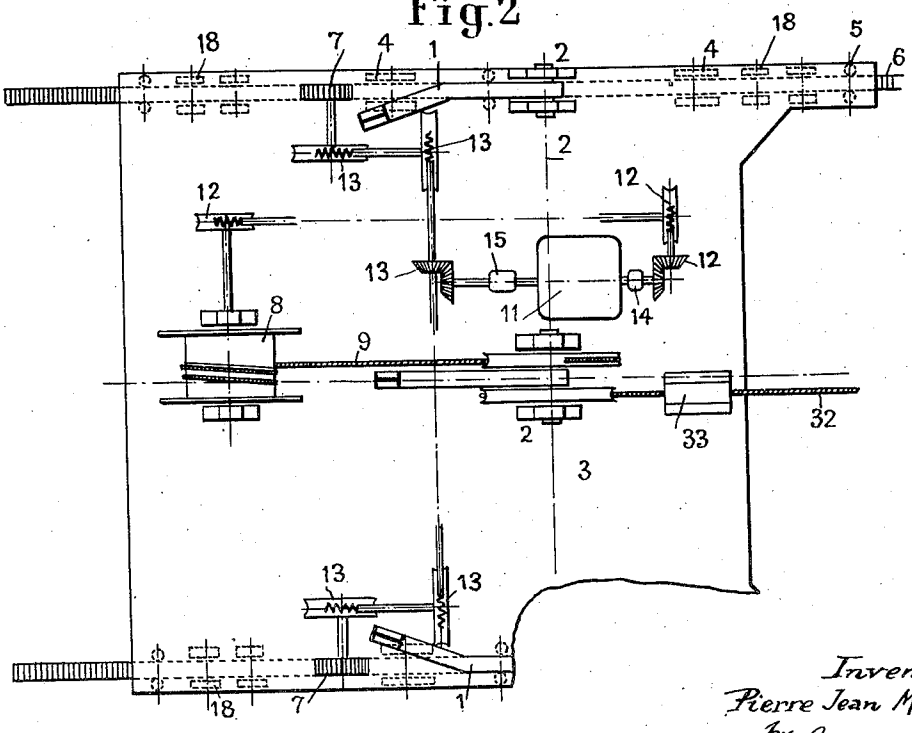


Fig. 2



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Fig. 1a

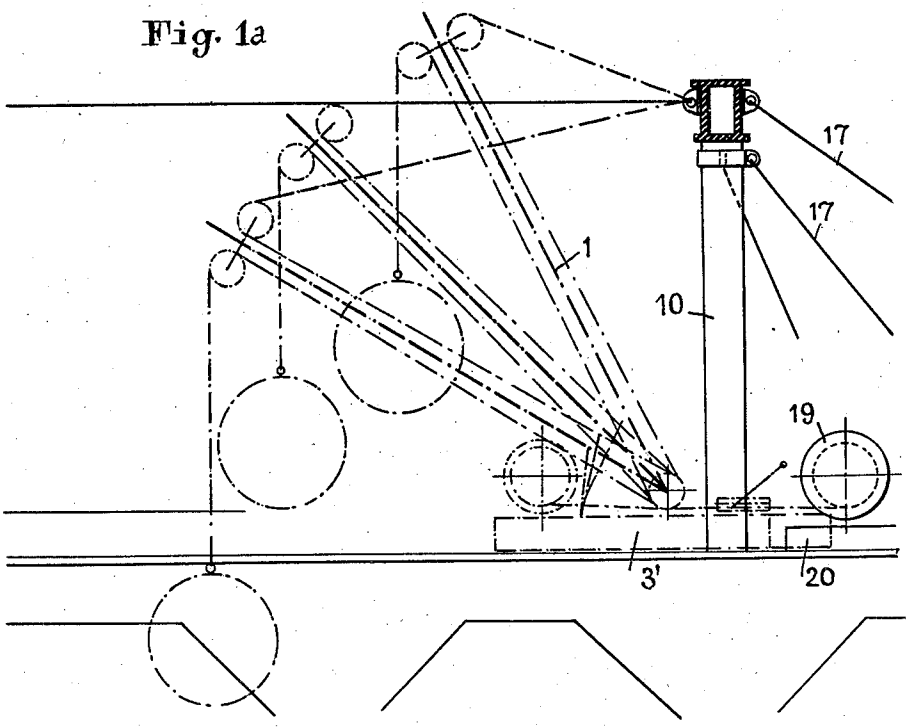
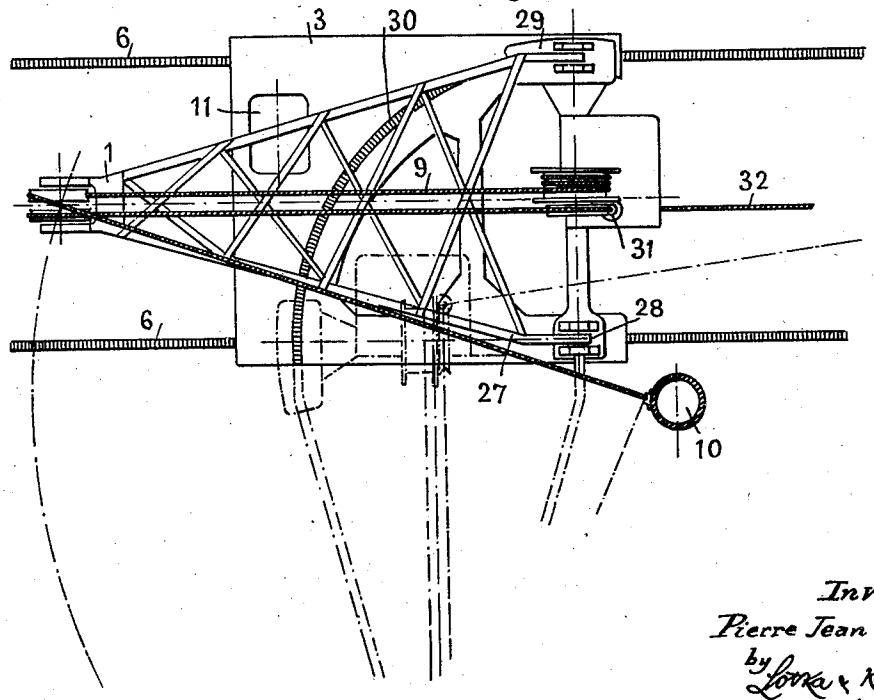


Fig. 3



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Fig. 4

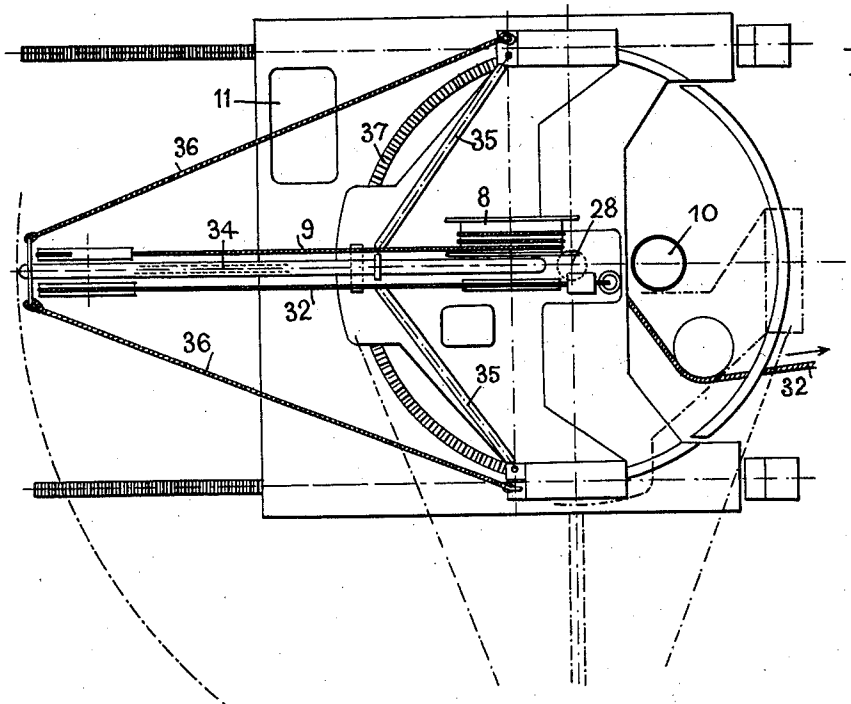
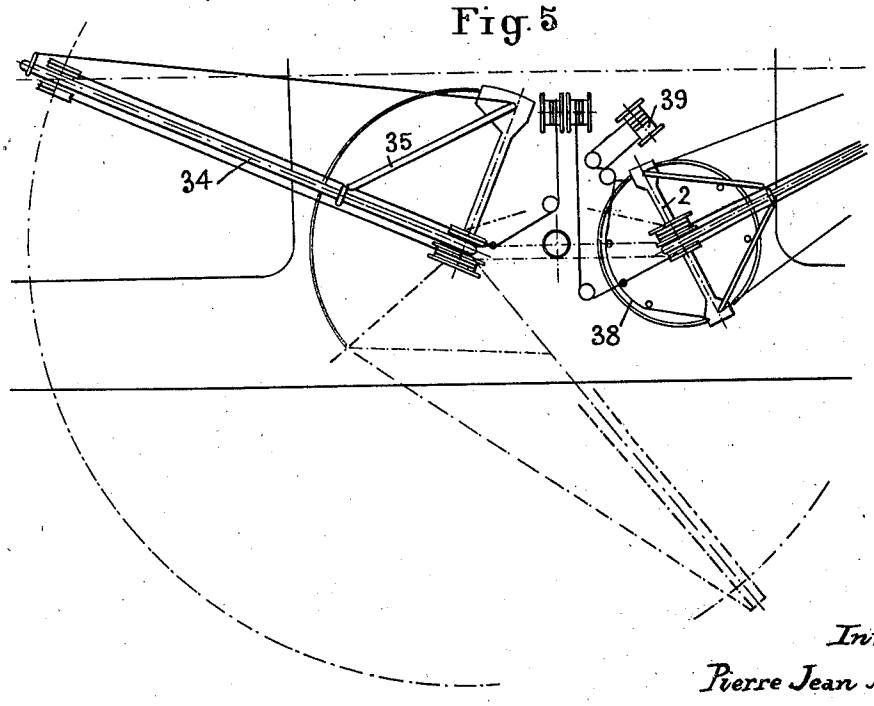


Fig. 5



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UNITED STATES PATENT OFFICE

1,970,240

PORTABLE CRANE

Pierre Jean Marchaut, Saint-Denis, France

Application October 23, 1931, Serial No. 570,578
In France October 29, 1930

4 Claims. (Cl. 212—54)

This invention has for its object a movable and directable hoisting apparatus for the lifting and manipulation of loads.

It comprises more particularly sheers or a similar device mounted if necessary in such a manner as to be able to oscillate on a suitable carriage, itself provided with supporting and guiding rollers with a suitable device for controlling its movement by rack, cable or otherwise, with the object of thus presenting a unit of small weight and little space offering little resistance to the wind and permitting in particular the loading and unloading of loads at the stern of a vessel.

The lifting sheers mounted on its movable platform, may be combined with pneumatic or hydraulic tackle, supplied from a suitable source permitting the manipulation of these devices without the use of winches, reducing the weight of the installation on board and increasing the certainty of the operations as also the stability of the vessel, while, on the other hand, the expenses of installation are considerably reduced.

In the annexed drawings which show diagrammatically examples of construction of the device according to the invention:—

Figs. 1 and 1ª together constitute a general elevation of the lifting device.

Fig. 2 is a plan view showing the movable carriage and the attachment of the sheers.

Fig. 3 is a variation of Fig. 2, according to which the sheers are adapted to turn about one of their points of support.

Fig. 4 is a plan of sheers of a flexible type braced by rigid arms and cables.

And Fig. 5 is a plan of a rotating sheer-leg replacing the ordinary device of a loading mast.

In the embodiment according to Figs. 1 and 2, sheers 1 are hinged on a horizontal axis 2 fixed to a carriage 3 supported by rollers 4 in any desired number and provided with guide rollers 5 situated on each side of racks 6 which engage pinions 7 intended to control the movement of the carriage 3.

A winch 8 mounted on the platform of the carriage 3, with horizontal axis (Figs. 1 and 2) serves, either for the lifting of the sheers 1 rotating about the axis 2, or for winding up a retaining cable 9, the extremity of which is fixed to the end of a fixed mast 10.

A motor 11 actuates, on the one hand, through a worm and wheel transmission gear 12, the winch 8 and, on the other hand, through a similar transmission gear 13, the pinions 7 in continuous engagement with the rack 6. Couplings or clutches 14—15 permit the motor 11 to be placed in engagement either with the winch 8 or with the pinions 7 or with both these members at the same time.

The sheers are provided with a safety device such as chain, cable or rod 16, with or without retention members such as turnbuckles intended to permit the limitation of the angles of lift of the sheers, avoiding the turning over of the sheers, or fixing by means of the cable 9 the angle of inclination of the sheers 1 when the platform 3 is subjected to strong oscillations.

Stays 17, rigid or flexible, are arranged on the fixed mast 10, so as to only cause its mast to work with buckling or with compression.

As will be seen in Fig. 2, the pinions 7 are actuated by a common control, ensuring synchronized movement of the two pinions on the co-operating racks.

Safety rollers such as 18 are mounted on the carriage 3 and travel beneath and in rolling engagement with a suitable guide path, so as to prevent any lifting of the carriage 3.

Due to this arrangement, it is possible to lift and transport loads by the shifting of the carriage 3, by means of a simple sheer-leg such as 1, of little weight, reduced space, and offering little resistance to the wind.

The lifting of the load is effected, for example by a winch 19 mounted on a fixed platform 20 which carries the running path of the carriage 3. This winch may also be mounted at 21 on the carriage 3, as shown in broken lines in Fig. 1.

The platform 3, after lifting a load shown diagrammatically at 22 in Fig. 1, may be brought from the position shown in full lines to the position in broken lines shown at 3' in Fig. 1ª, the position of the sheers 1 being capable of being altered as shown by the various lines dotted in Fig. 1ª.

The movement of the carriage 3 is obtained by actuating through the motor 11 the pinions 7 which mesh with the racks 6, the winch 8 being preferably started at a suitable speed to ensure the winding up of the cable 9 at a speed corresponding to the speed of movement of the platform 3. It will be understood that as these operations take place, the lifting winch 19, if located as shown in solid lines in Fig. 1ª, may be actuated to wind the cable 32 in harmony with the movement of the carriage 3, in which case the load 22 remains suspended without change, or said winch 19 may be operated to either raise or lower said load during the movement of the carriage.

In the embodiment according to Fig. 3, one of the legs 27 of the sheers is mounted on a pivot 28 supported on an auxiliary platform 29, while the other leg is mounted on said auxiliary platform 29, the latter being pivoted in vertical registry with the pivot 28 to the platform 3 for pivotal movement in a horizontal plane; a suitable motor controlling a pinion meshing with a circular rack 30 enables the sheers to be pivoted about the aforesaid vertical pivot located in registry with the pivot 28 to bring them, for example, into the position indicated in broken lines in Fig. 3. In this embodiment there will be arranged a movable tube 31 for guiding the lifting cable 32; a device for holding this cable fixed, such as that shown at 33 in Fig. 1, being intended to maintain the load in a raised position when the hoisting winch 19 does not support it.

In the embodiment according to Fig. 4, the flexible sheers are reduced to a loading mast 34, stayed or otherwise, by rigid arms such as 35, hinged or otherwise, as also by cables 36. In this embodiment, the mast 34 is mounted on a turntable having as its centre of rotation the pivot 28 located at the extremity of the mast 34, and pivotally connecting the turntable with the platform; the pivotal movement may be made in one direction or the other on the circular rack or rim 37.

In the embodiment according to Fig. 5, the sheers 34 similar to those of Fig. 4 comprising a single rigid arm 35, may have their rotation controlled either by a circular rack like 37 in Fig. 4, or by the aid of a winch 39 effecting this rotation by a cable 38. This arrangement permits of replacing the ordinary loading mast device, and offers the advantage that it permits carrying out the rotation mechanically without safety tackle.

The advantages are as follows:—

1st—slight weight relatively to the loads dealt with, since the materials which constitute the parts of the apparatus work under conditions where these permit the smallest dimensions, owing to the manner of applying the stresses.

2nd—small resistance to the wind.

3rd—lower cost than that of the known devices for the same result.

4th—simplicity of manipulation.

5th—possibility of use with safety on a horizontal and stable plane or on a plane subjected to variations of inclination with respect to the horizontal plane as, for example, the bridge of a vessel in rough seas.

These advantages permit the apparatus to be used in all cases where, on land, hoisting and manipulating apparatus such as cranes, travelling bridges, derricks, ordinary sheers, etc., are used.

The apparatus is specially adapted for use on board vessels.

The superiority over the loading masts at present used in the mine field, resides in the fact that it may be controlled reliably and simply under all circumstances, even when the vessel of which it forms a part assumes a marked list. This advantage is due to the omission of the hauling tackle and in the fact that there is no necessity to seek suitable fixed points for the application of such tackle.

The apparatus constitutes, furthermore, a simple and light device permitting the transferring or loading at the stern of the vessel of considerable weights on board such vessels during rough seas, which makes the use thereof available on vessels intended to effect life-saving operations. The loads thus transferred such as life-boats, ship's boats, hydroplanes, etc., may, furthermore, be moved by the apparatus parallel to the axis of the bridge and fixed on this bridge.

The apparatus may also be used efficiently for transferring to the water very heavy objects resting on the bridge of the vessel.

Finally, the apparatus is of use, in the case of operations carried out on land or on floating bodies such as pontoons or special boats.

The novel arrangement makes it possible to utilize pneumatic or hydraulic tackle or presses, thus permitting the omission of winches which necessitate powerful generators of electricity and at the same time, enables, without complications, the reduction of the space occupied by and the weight of the installation on board, increasing the reliability of the manipulation, and improving the stability of the vessel, while reducing the expenses of installation.

The unit formed by these devices permits for a definite lifting force, a considerable reduction in the dimensions of the vessel and, consequently, its cost of establishment and its running expenses. It is also possible, with this installation to raise hydroplanes of great weight and of great spread, a manoeuvre which is dangerous and practically impossible for the ordinary lifting tackle.

It is, of course, possible to combine if necessary pneumatic or hydraulic tackle with the usual control devices by cables or otherwise.

What I claim is:—

1. A portable crane comprising a movable platform, means for propelling said platform, sheers pivotally mounted on said platform, a winch on said platform operatively connected with said propelling means, a retaining cable having its one end fixed relatively to the travelling movements of said platform, and being movably connected with said sheers, said cable being wound on and unwound from said winch coincidentally with the travel of said platform to maintain said sheers in a predetermined position or relatively to said travel to vary said position at will, a hoisting cable connected with said sheers, and means for operating said hoisting cable.

2. A portable crane comprising a movable platform, means for propelling said platform, pivotally movable sheers rotatably mounted on said platform, a retaining cable movably connected with said sheers and having its one end fixed relatively to the travelling movements of said platform, means whereby said retaining cable is adjusted coincidentally with the travel of said platform to maintain said sheers in a predetermined position or relatively to said travel to vary said position at will, a hoisting cable connected with said sheers, and means for operating said hoisting cable.

3. A portable crane comprising a movable platform, means for propelling said platform, an auxiliary platform pivotally mounted on said movable platform and rotatable thereon in a horizontal plane, sheers pivotally mounted on said auxiliary platform, a stationary mast, a retaining cable movably connected with said sheers and having its one end connected with said mast, means whereby said retaining cable is adjusted coincidentally with the travel of said movable platform to maintain said sheers in a predetermined position or relatively to said travel to vary said position at will, a hoisting cable connected with said sheers, and means for operating said hoisting cable.

4. A portable crane comprising a platform movable toward and away from a given point, sheers pivotally mounted on said platform, a retaining cable connected with said sheers having its one end fixed relatively to the travelling movements of said platform, and means with which the other end of the retaining able is connected whereby said retaining cable is adjusted coincidentally with the travel of said platform to and from said given point to maintain said sheers in a predetermined position or relatively to said travel to vary said position.

PIERRE JEAN MARCHAUT.