A spud lorry for a floating dredger has wheel shafts whose bearings are spring mounted each by a pair of vertically aligned springs disposed one above and one below the shaft.

4 Claims, 3 Drawing Figures
SPUD LORRY FOR A FLOATING DREDGER

The invention relates to a spud lorry for a floating dredger. Such a lorry is on the one hand provided with one or more guideways surrounding the spud and on the other hand with wheels in order to displace the lorry with respect to the dredger.

When dredging, once the spud has been lowered and the vessel anchored off, the vessel when dredging is advanced in such a way by manipulating the anchor chains that the vessel swings about the spud as a fixed point.

Due to the pressure that is exerted on the bottom to be dredged by the dredger during dredging, the spud is subjected to shear and flexure. When the sea start dragging and/or there is a swell, the load may even be increased by the waves.

The deformation of the spud caused by said pressure is determined by the way in which the spud is gripped. Usually, in the conventional structures, the spud may be considered to be substantially rigidly gripped, because of which the rigidity of the spud lorry construction is relatively great and great loads may occur.

It is the object of the invention to provide an embodiment of the lorry which meets the above-mentioned problem.

This object is achieved according to the invention by the fact that the lorry is capable of tilting in all directions.

The shaft bearings of the lorry are preferably spring-mounted. This spring-mounted arrangement may be such that there are two vertical springs on opposed sides of the wheel shaft, which springs are secured to said wheel shaft, these springs are preferably spiral springs.

According to a preferred embodiment the force of said springs is adjustable. By this it is ensured that the springs can be pre-compressed, as a result of which the lorry will only start tilting when the set precompression is exceeded, i.e., when a given threshold value is exceeded.

The invention will now be further elucidated with reference to an embodiment of the invention shown in the drawings.

In the drawing:

FIG. 1 shows a diagrammatic, elevational view of the apparatus according to the invention.

FIG. 2 shows, in cross section, the position of the apparatus according to the invention when the spud is subjected to a relatively small load.

FIG. 3 shows, in cross section, the position of the apparatus according to the invention when the load to which the spud is subjected has exceeded the set threshold value.

In FIG. 1 the reference numeral 1 indicates the lorry which is present in a recess in the stern of the dredger. In said recess the lorry 1 can be displaced by means of four wheels 2, the wheels being positioned two by two on a wheel shaft 3. The wheels can be moved along rails 4 which are provided in the wall of the dredger and are shown in FIG. 1 by chain lines.

The lorry 1 is on the one hand provided with at least one guideway 5 in which a spud 6 is accommodated with some play, while on the other hand the lorry 1 is under the influence of a displacement element 7 of a preferably hydraulic system for controlling the displacement of the lorry 1 with respect to the dredger. Viz. when operating, the spud 6 is lowered into the seabed 8, while during the dredging operation, the dredger is swung about the spud as a fixed point through an angle, the bisector of which coincides with the centerline of the area to be dredged.

When dredging, the dredger is always advanced in the direction of said centerline with respect to the spud as a fixed point by displacing the lorry in the opposite direction. It will be apparent that owing to the pressure that has to be exerted on the bottom to be dredged, the spud 6 is subjected to considerable working loads, as a result of which the upper part of the spud is deflected beyond the centerline of the spud. In addition to those lateral, normal working loads, the spud 6 is subjected to loads that are caused by the wash of the waves or swell, which loads may originate from various directions.

In order to maintain the loads produced by the above-mentioned circumstances in correlation between the lorry and dredger within permissible limits, the lorry 1 is supported in such a way according to the invention that the lorry may be tilted.

Although this tilting capacity may be obtained in various ways, said tilting capacity is preferably obtained by mounting a resilient element in the zone 9 of the wheel shafts between the lorry frame and the wheel shaft.

This element may consist of a pair of vertical, spiral springs 10 which are accommodated in recessed portions 11 in the wall of the lorry. One of each pair of vertical, spiral springs 10 bears on the lower side of the wheel shaft, while the other member of the pair bears on the upper side thereof.

If the dredger should be displaced beyond the centerline of the area to be dredged by said working loads and/or the swell, the spud will bend and the lorry will make a tilting movement when great loads occur.

In this instance it is advantageous to mount the spiral springs in such a way that the spring force produced by said springs 10 is adjustable.

This will ensure that the tilting capacity of the lorry is limited to a certain extent, i.e., that a set spring force—a threshold—will have to be exceeded by the torque occurring between the spud 6 and the guideways 5 before the lorry will start tilting.

This condition is shown in the FIG. 3. FIG. 2 shows the position in which only normal working loads will occur. In this instance the dredger 12 is displaced with respect to the initial position, which is determined by the spud 6 which is vertically nestled in the seabed 8, over a distance a. The springs 10 are precompressed to such an extent that the lorry 1 will not make a tilting movement. Because of the displacement of the vessel over the distance a, the spud 6 is deflected to such an extent that the axis of the upper part of the spud will be beyond the central axis of the remainder of the spud.

If, however, the vessel should be displaced a distance b in addition to the distance a, for instance by the waves and/or the swell, the forces occurring between the lorry 1 and the spud 6 are so great that the set precompression of the springs 10 will be exceeded by them; the threshold will be exceeded and the lorry 1 will start tilting, whereby the spud will assume a bent shape.

I claim:

1. A dredger having a spud lorry, means for mounting a spud on the spud lorry, wheel means mounting the lorry for movement on and relative to the dredger, said wheel means including a wheel shaft, and means mounting the lorry on the shaft for movement relative to the shaft in a plurality of directions, and horizontal rails carried by the dredger and disposed above and below said wheel means and along which said wheel means move.

2. A dredger as claimed in claim 1, said means mounting the lorry on the shaft comprising spring means.

3. A dredger as claimed in claim 2, said spring means comprising at least a pair of vertical springs that bear against opposite sides of the shaft.

4. A dredger as claimed in claim 3, there being a plurality of said shafts with the lorry spring-mounted on them, there being a pair of said springs adjacent each end of each shaft, there being wheels at each end of each shaft and rails above and below each said wheels.