May 13, 1924.

1,493,752

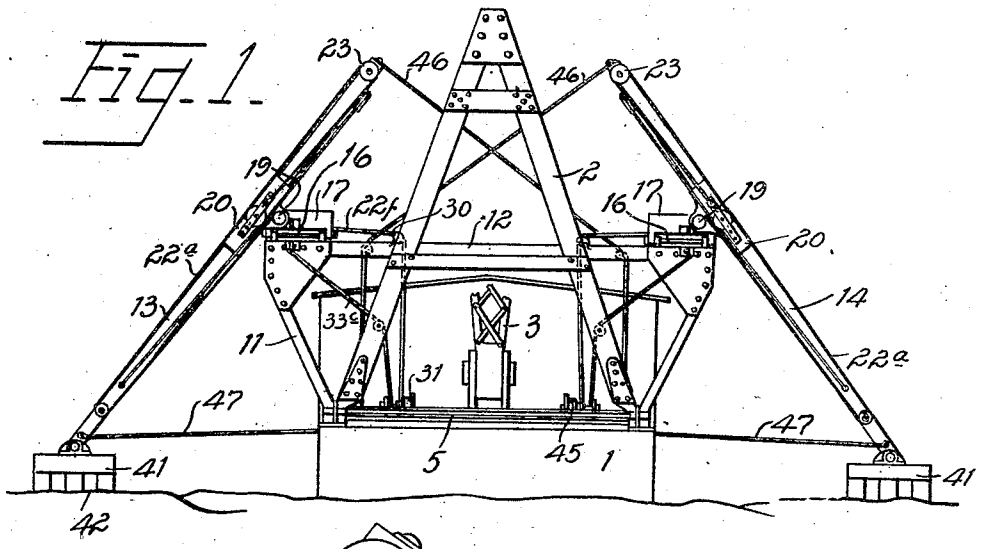
O. KOCHTITZKY

DREDGING APPARATUS

Filed July 23, 1921

3 Sheets-Sheet 1

Fig. 1.



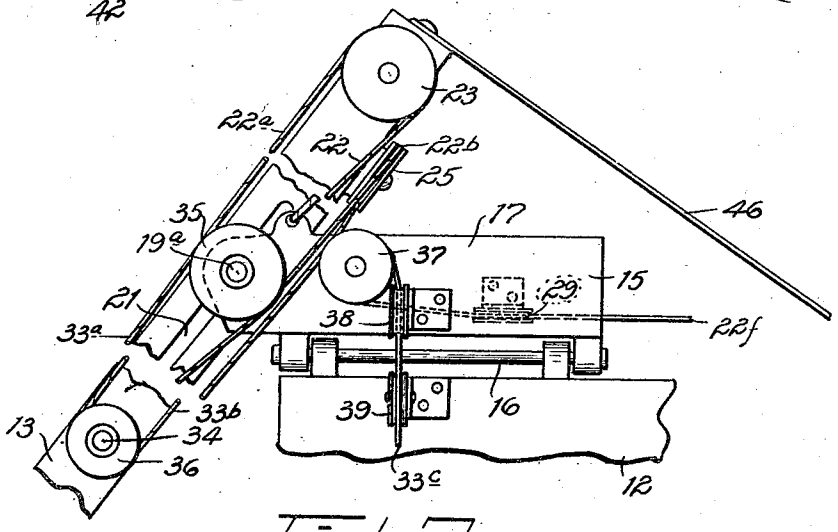


Fig. 2.

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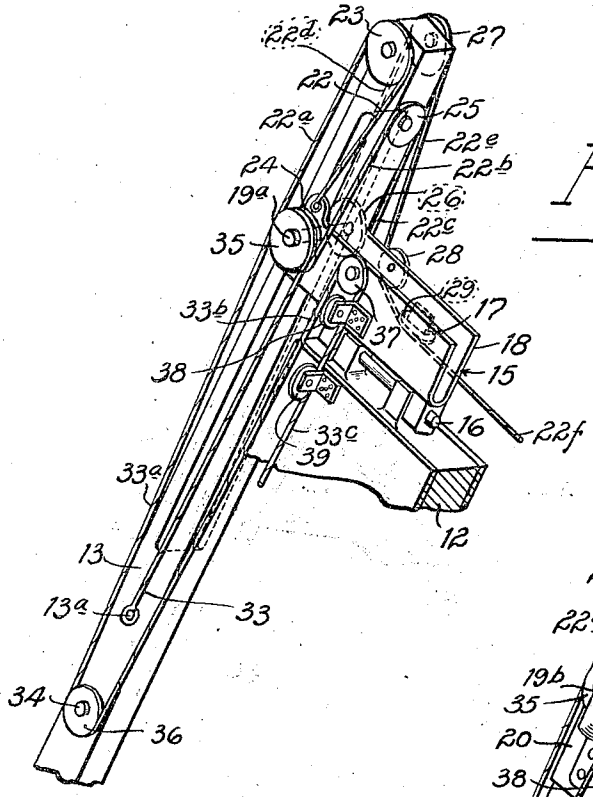


Fig. 3.

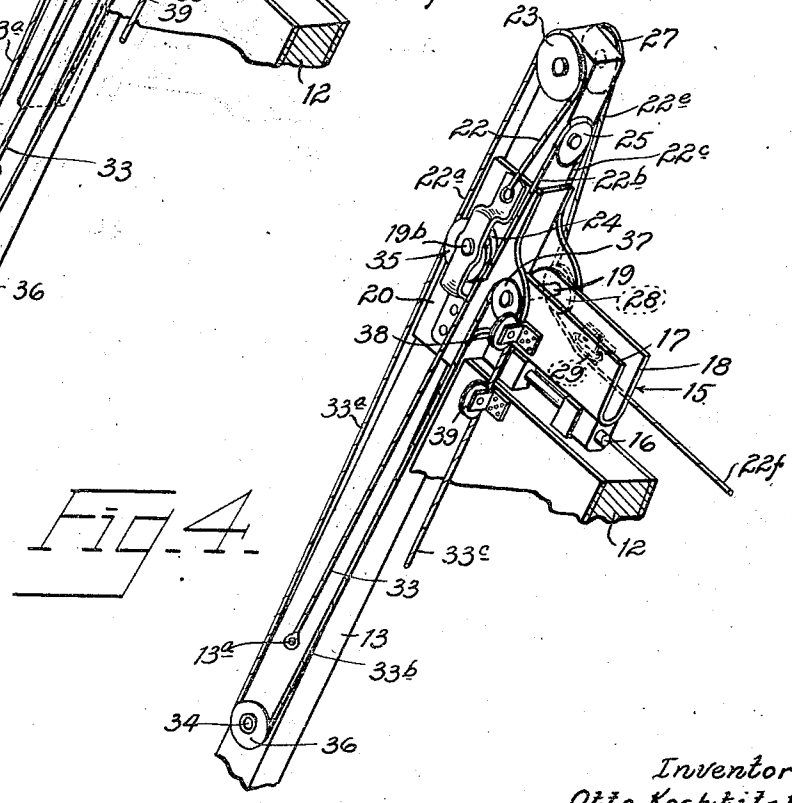


Fig. 4.

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1,493,752

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3 Sheets-Sheet 3

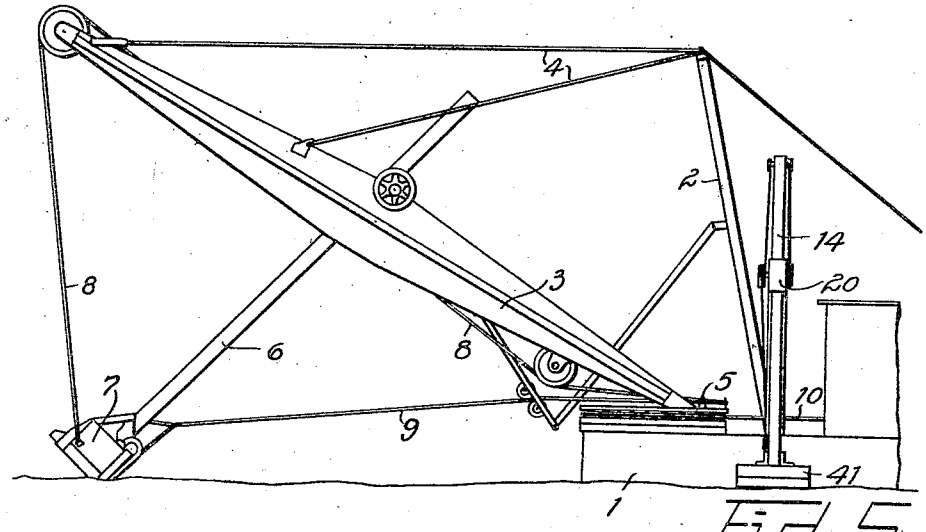


Fig. 5.

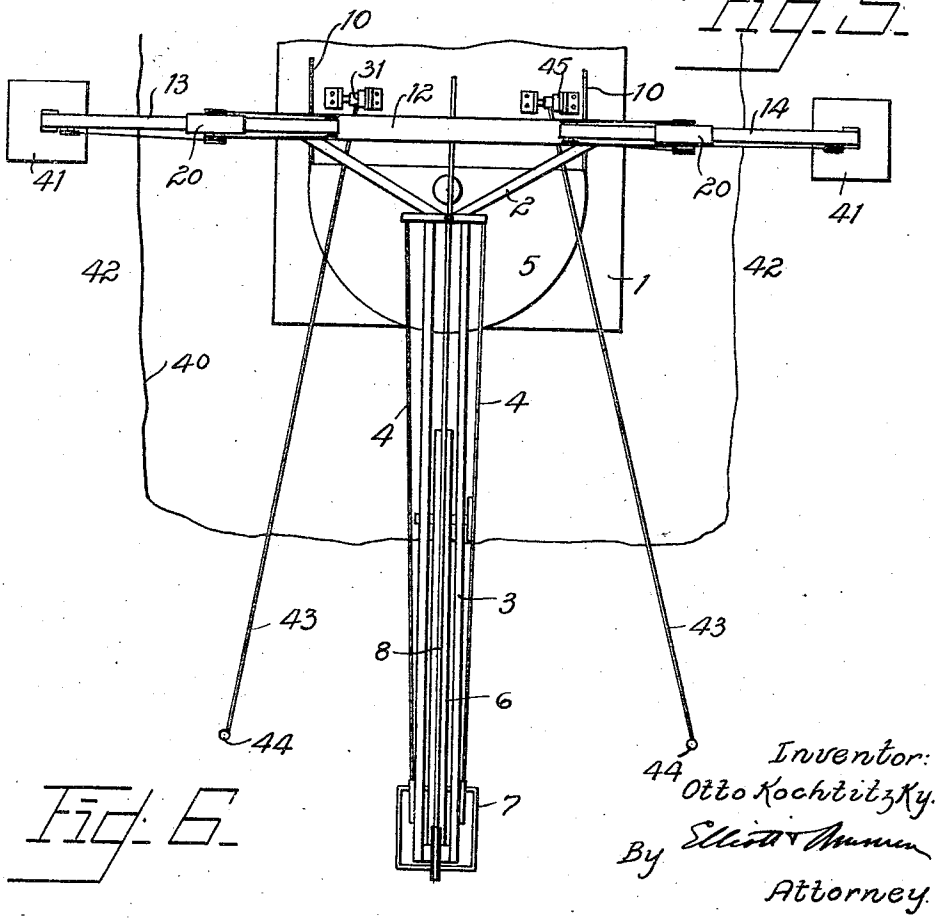


Fig. 6.

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Patented May 13, 1924. 1,493,752

UNITED STATES PATENT OFFICE.

OTTO KOCHTITZKY, OF CAPE GIRARDEAU, MISSOURI.

DREDGING APPARATUS.

Application filed July 23, 1921. Serial No. 487,062.

To all whom it may concern:

Be it known that I, OTTO KOCHTITZKY, a citizen of the United States, residing in Cape Girardeau, in the county of Cape Girardeau and State of Missouri, have invented new and useful Improvements in Dredging Apparatus, of which the following is a specification.

This invention relates to means for steadying or bracing an excavating plant or any apparatus including a platform or base for machinery. The general object of the invention is to provide improved means for mounting a brace or spud to hold or assist in holding a dredging plant or other apparatus, fixed during its operation. While the invention is applicable to a dredging plant of any construction or to any other apparatus embodying a platform carrying machinery, in the present specification I have described it as applied to a dipper dredge of common construction. Sometimes dredging plants must be used in situations where there is hardly sufficient water to float the plant completely, or where there is no water and the dredge is supported on a bed or frame. One of the objects of my invention is to provide a mounting for the spuds on such a plant, which will facilitate moving or shifting the plant by its self-contained power.

A further object has been to provide a flexible mounting for the spud on the frame which will permit a relative movement of spud in a fore-and-aft direction of the machine base, operating to absorb dangerous strains at this point.

Further objects of the invention will appear hereinafter.

The invention consists in the novel features, and in the general combination of parts to be particularly described hereinafter, all of which contribute to produce a simple and efficient dredging apparatus. A preferred embodiment of my invention will be particularly described in the following specification, while the broad scope of my invention will be pointed out in the appended claims.

In the drawing,

Figure 1 is a front elevation of a dredge provided with my dredging apparatus, the upper portion of the dipper boom being broken away;

Figure 2 is a front elevation broken away and particularly illustrating an embodiment of my mounting for carrying the spud on the gantry frame in which the guiding means for the spud is slightly different from that shown in Figure 1;

Figure 3 is a perspective showing the same mounting for the spud as in Figure 2 and particularly illustrating the arrangement of cables which enable the spud to be raised or lowered;

Figure 4 is a view similar to Figure 3 but showing a type of construction which embodies a guide sleeve such as shown in Figure 1, for guiding the spud at the spud connection or mounting on the frame;

Figure 5 is a side elevation showing the forward end of the dredge of the type to which I apply my invention; and

Figure 6 is a plan particularly illustrating the manner in which my invention will facilitate the forward movement of the dredge in a shallow ditch which cannot fully float the hull.

The dredging apparatus includes a base frame, platform, or hull 1 of any desired construction, at the forward end of which an A-frame 2 is provided, from the peak of which cables 4 extend to support the boom 3 (see Figure 5), the lower end of the boom being stepped on the turn-table 5. The boom 3 carries the usual dipper handle 6 carrying a dipper 7 at its forward end which is controlled by cables 8 and 9. The rotation of the turn-table 5 is controlled by cables 10. The dredge construction also includes a gantry-frame 11 which includes a horizontal cross beam 12 (see Figure 1). The ends of the beam 12 project beyond the sides of the hull in the usual way. At these points I provide means for flexible mounting the spuds 13 and 14. It should be understood that the construction for mounting the spuds is duplicated at each side of the dredge so that it will be merely necessary to describe the mounting in detail for one of the spuds, for example, the spud 13.

In order to carry the spud on the frame I provide supporting means which will permit of a rotation of the spuds upon a substatially horizontal axis transverse to the fore-and-aft line of the hull. For this purpose I provide an elongated bracket 15 (see Figure 2) which is connected by a large hinge pin or shaft 16 with the upper side of the beam 12. This bracket is preferably a U-shape in cross-section (see Fig. 4). That is to say, the bracket presents two

oppositely disposed side plates 17 and 18. I provide means for supporting the spud on this bracket so that it can rotate about a horizontal axis extending parallel with the fore-and-aft line of the dredge. For this purpose the outer end of the bracket 15 overhangs the end of the beam 12 and carries a heavy cross-pin 19. On this cross-pin I secure guiding means for the spud 13 in the form of an elongated sleeve 20. The pin 19 extends completely through the bracket. I provide for completely controlling the spud by cables which may be operated from winches or drums on the deck of the hull. I provide a rope or cable for pulling the spud upwardly in its guide 20 and another cable to pull the spud downwardly. Both of the ropes or cables pass from the spud at my flexible connection so that in their operation the spud is not subjected to any forces tending to throw it out of position. I provide other cables leading, respectively, from the upper and lower ends of the spud for controlling its position.

I shall first describe the lowering cable which, when operated, will force the spud downwardly through the guide sleeve 20. This cable is indicated by the numeral 22. One end of the cable is secured to the sleeve (see Fig. 4) and the cable thence passes upwardly around a sheave 23 at the upper end of the spud. From this point it passes downwardly in a run 22^a and passes around the inside sheave 24 which is mounted loosely on the pin 19^b; it passes under this sheave 24 and extends upwardly in a run 22^b passing over the upper edge of a guide sheave 25 attached on the inner side of the spud. From this point it passes downwardly in a run 22^c and passes under a guide sheave 26 mounted on the other side of the sleeve. It then passes upwardly in a run 22^d and passes over the upper edge of a sheave 27 which is mounted on the other side of the spud opposite to the sheave 23. From this point it passes downwardly in a run 22^e and under the edge of a guide sheave 28 on the further side of the side plate 18 of the bracket 15. From this point it passes by another guide sheave 29 with its bracket mounted on the far side of the side plate 18 and extends in a run 22^f along the beam 12 and then over sheave 30 (see Fig. 1) and then down to the drum of a winch 31. Evidently by rotating the drum of the winch in a direction to take up on this cable the spud will be forced downwardly through its guide sleeve 20.

I shall now describe the cable 33 which operates to raise the spud through its sleeve. This cable's end is attached on the side of the spud toward its lower end at 13^a; from this point it extends upwardly and passes over the outside guide sheave 35 which overlies the aforesaid guide sheave 24 and is rotatably mounted on the same pin 19^b. From this point the cable passes down in a run 33^a and under a guide sheave 36 rotatably mounted on the pin 34. From this point the cable passes up in a run 33^b that passes over a guide sheave 37 mounted on the forward side of the bracket 15. From this point the cable passes downwardly to a drum, in a run 33^c, being guided on suitable guide sheaves 38 and 39 mounted respectively on the bracket and on the side of the beam 12. In Fig. 3 no sleeve is employed, but I employ a through pin 19^a and I provide a longitudinal slot 21 in the spud which receives the pin. When the spud is moved up and down it is guided by this pin.

The fact that the mounting of the spud on the frame includes a flexible connection greatly facilitates the setting of the plant in a new position after the bucket or dipper 7 has excavated all the material within reach of the boom. This effect is illustrated in Figure 6 which is a diagrammatic view showing the forward portion of the dredge hull 1 in plan. The line 40 indicates the outline of a ditch which this dredge is supposed to have excavated. I place the feet 41 of the spuds on the bottom of the ditch or on the banks 42, and the cables 22 and 33 are then operated so as to force the spuds downwardly and thereby support a considerable portion of the weight of the hull.

Now by anchoring special cables 43 to stumps 44 on the forward bank these cables 43 can be taken up by means of two winches 31 and 45 on the deck of the hull. This will operate to drag the plant forward when the hull or base is resting upon the earth as in ditch digging or in dry excavating. Such a movement of the hull will not cause any trouble at the mounting of the spud by reason of the fact that each spud can rock on the axis of its transverse shaft or pin 16.

Whenever it is desired to swing the spuds on the pin 19 or 19^a so as to change their angle, this can be accomplished by means of a cable 46 which is attached to the upper end of the spud and which is guided down to a winch on the deck; a similar cable 47 is attached to the spud near its foot and enables the lower end of the spud to be pulled in when desired, and held firmly to prevent the spud from slipping out or spreading when used in operation.

One of the advantages of my invention lies in the fact that the flexible connection between the spud and the frame is not only especially useful in the manner described above but it also operates to relieve any fore-and-aft strains which might be developed in the operation of the dipper.

It is understood that the embodiment of the invention described herein is only one of the many embodiments my invention may

take, and I do not wish to be limited in the practice of my invention nor in my claims, to the particular embodiment set forth.

What I claim is:

1. In a dredging apparatus, the combination of a hull, a frame carried thereby, a spud-holder mounted on the frame, a spud associated with said holder and provided with a longitudinal slot, a pin in said holder extending through said slot, and means for moving said spud longitudinally.

2. In a dredging-apparatus, the combination of a hull, a frame carried thereby, a spud-holder, means for supporting the spud-holder on the frame at an elevated point above the hull to permit the same to rock on an axis disposed transversely to the fore-and-aft line of the hull, and means on the hull for moving the spud with relation to the spud-holder.

3. In a dredging-apparatus, the combination of a hull, a frame carried thereby, a spud-holder, means for supporting the spud-holder on the frame enabling the same to rock on an axis disposed substantially parallel to the fore-and-aft line of the hull and on a second axis disposed transversely to the fore-and-aft line of the hull, and means for moving the spud with relation to the spud-holder.

4. In a dredging-apparatus, the combination of a hull, a frame carried thereby, a bracket mounted on the frame to rock on an axis transverse to the fore-and-aft line of the hull, a spud-holder mounted on the bracket to rock on an axis substantially parallel to the fore-and-aft line, a spud guided by the spud-holder, and means for controlling the position of the spud with relation to the spud-holder.

5. In a dredging-apparatus, the combination of a hull, a frame carried thereby, a bracket mounted on the frame to rock on an axis transverse to the fore-and-aft line of the hull, a spud-holder mounted on the bracket, a spud guided to slide longitudinally up or down on the spud-holder, and means for raising or lowering the spud on the spud-holder.

6. In a dredging-apparatus, the combination of a hull, a frame carried thereby, a bracket mounted on the frame to rock on an axis transverse to the fore-and-aft line of the hull, a spud-holder mounted on the bracket to rock on an axis substantially parallel to the fore-and-aft line, a spud guided to slide longitudinally on the spud-holder, cables controlled from the deck of the hull, guided on the spud for raising and lowering the same, and other cables connected with the spud respectively above and below the spud-holder for regulating the angle of the spud.

7. In a dredging-apparatus, the combination of a hull, a frame carried thereby, a spud located at each side of the frame, means for carrying the spud on the frame to permit a rocking movement of the spud on a substantially horizontal axis transverse to the fore-and-aft line of the hull, and means for guiding the spud to move longitudinally up and down.

8. In a dredging-apparatus, the combination of a hull or base constructed to rest upon the earth, a frame carried thereby, a spud disposed at each side of the frame, constructed to support a portion of the weight of the hull, a bracket carrying each spud on the frame and mounted to rotate on an axis transverse to the fore-and-aft line of the hull, and means for applying power to the hull while the spuds are resting on the ground, to move the hull forward.

9. In a dredging-apparatus, the combination of a hull or base constructed to rest upon the earth, a frame carried thereby, a spud disposed at each side of the frame, means for carrying the spud on the frame and enabling the same to be raised and lowered in a vertical plane and to rock on an axis transverse to the fore-and-aft line of the hull, means for applying power to the spuds to force the same downwardly and thereby cause the spuds to support part of the weight of the hull, and means for applying power to the hull thereafter to effect the forward movement of the same.

10. In a dredging-apparatus, the combination of a hull, or base constructed to rest upon the earth, a frame carried thereby, a spud disposed at each side of the frame, means for carrying the spud on the frame and enabling the same to be raised and lowered in a vertical plane and to rock on an axis transverse to the fore-and-aft line of the hull, means for applying power to the spud to force the same downwardly and thereby cause the spuds to support part of the weight of the hull, and means mounted upon the hull for applying power thereafter to effect the forward movement of the hull.

11. In a dredging apparatus, the combination of a hull or base constructed to rest upon the earth, a frame carried thereby, a spud disposed at each side of the frame, means for carrying the spud on the frame and enabling the same to be raised and lowered in a vertical plane and to rock on axes parallel with and transverse to the fore-and-aft line of the hull, means for applying power to the spuds to force the same downwardly and thereby cause the spuds to support part of the weight of the hull, and means for applying power to the hull thereafter to effect the forward movement of the same.

In testimony whereof, I have hereunto set my hand.

OTTO KOCHTITZKY.