No. 664,010. Patented Dec. 18, 1900.

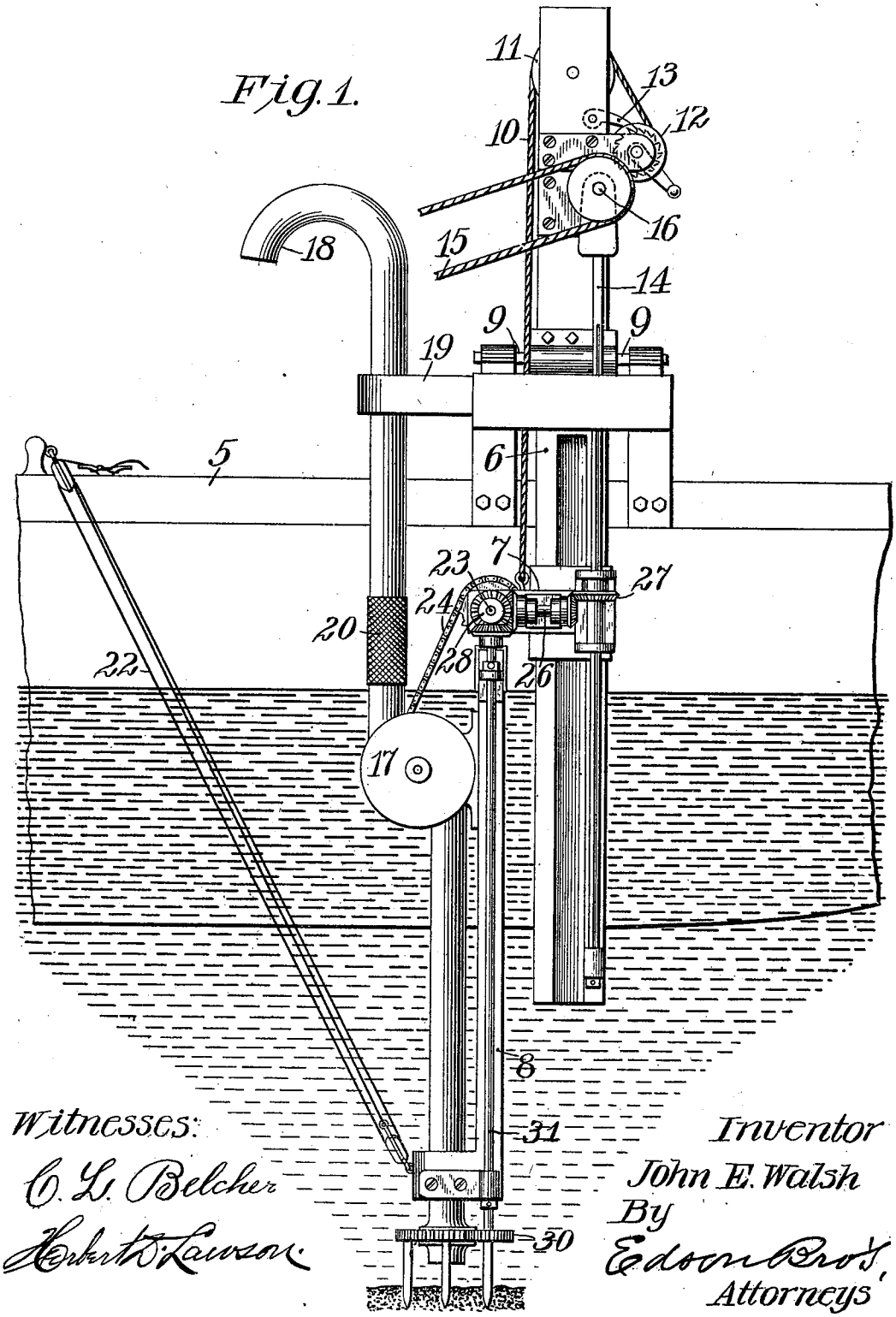
J. E. WALSH.

SUBMARINE EXCAVATOR.

(Application filed July 15, 1899.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.



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Fig. 2.

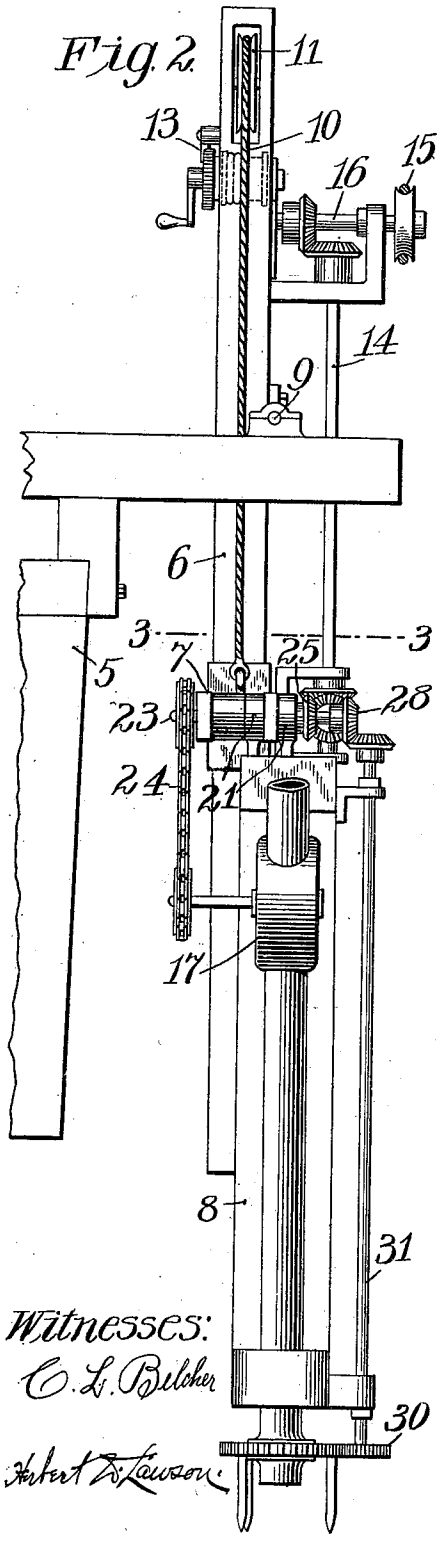


Fig. 3.

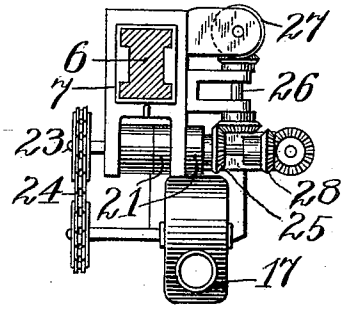
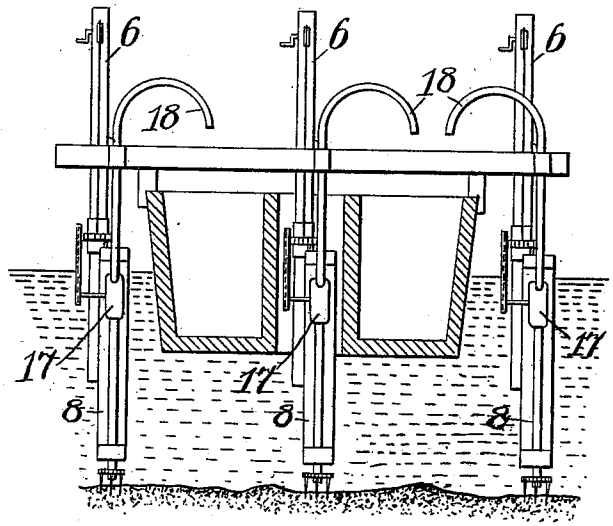


Fig. 4.



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UNITED STATES PATENT OFFICE.

JOHN E. WALSH, OF NEW YORK, N. Y.

SUBMARINE EXCAVATOR.

SPECIFICATION forming part of Letters Patent No. 664,010, dated December 18, 1900.

Application filed July 15, 1899. Serial No. 723,985. (No model.)

To all whom it may concern:

Be it known that I, JOHN E. WALSH, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Submarine Excavators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to dredging apparatus, and particularly to that class of said apparatus wherein excavation is effected by means of a pump.

One object of the present invention is the production of a pumping apparatus for dredging purposes in which the parts thereof will readily adjust themselves to the movements of the vessel to which they are attached, thereby preventing the many mishaps which at present occur with pump-excavators.

Another object of the invention is the construction of a pumping apparatus for dredging purposes which may be readily adjusted for different depths and shifted to different positions without stopping the operation thereof and of which the pump portion may be readily swung out of the water when the vessel carrying it is to be moved away any considerable distance. It is not necessary to lift the pump from the water when the vessel is moved in its regular course of dredging.

Another object of the invention is the production of a pumping apparatus for dredging purposes, which I have termed a "submarine excavator," which is simple and durable as to construction and which can be readily and easily manipulated and maintained in constant operation.

With these objects in view the invention consists in the construction, combination, and arrangement of parts, substantially as hereinafter described, and set forth in the claims.

In the accompanying drawings, which form a part of this specification, Figure 1 represents in elevation the improved submarine excavator as mounted upon the side of the vessel. Fig. 2 is an elevation of said apparatus as viewed from the stern of the vessel. Fig. 3 is a horizontal section taken in the plane indicated by the line 3 3, Fig. 2. Fig. 4 is an outline sketch representing a vessel with three of the improved excavators mounted upon it, one at either side and one through the well of the vessel.

The improved excavator may be connected to or mounted upon any suitable vessel, either the one into which the excavated material is discharged or to one used solely for dredging, in which instance the excavator will discharge into scows attached alongside in the usual manner. Such a vessel is indicated at 5.

The framework of the excavator consists of a guide, as 6, a slide, as 7, mounted to run upon said guide, and a frame, as 8, hinged to said slide.

The guide 6 may be connected to the vessel in any suitable manner, but is preferably mounted thereon by means of horizontal trunnions, as indicated at 9. These trunnions preferably extend longitudinally of the vessel, so as to allow the guide to swing in a plane at right angles to that of the vessel.

The slide 7 may be in any desired form and may or may not be provided with antifriction devices, whereby its movement upon the guide is facilitated. The slide 7 may be moved vertically on the guide by means of any satisfactory mechanism, but is preferably connected thereto by a rope or cable 10, which passes over the sheave 11, mounted on or in the upper end of the guide 6, thence over a suitable drum, as 12, which may be operated by a crank, as shown, and held by a suitable detent, as that indicated at 13.

Upon the guide 6 there is mounted a motor-shaft 14, to which power may be applied in any suitable way, as by means of the cable 15, the horizontal shaft 16, and the pair of bevel-gears by which said shaft is connected to the motor-shaft.

Upon the frame 8 there is mounted, at any suitable point thereof, a pump, as 17, preferably of the rotary form. The suction-pipe of this pump passes through a bracket at the lower end of the frame 8 and is protected

throughout its length by the frame. The delivery-pipe 18 extends upwardly and is recurved at its upper end. This pipe passes, preferably, through the guide, as 19, and is provided at or near the pump with a flexible section, as 20.

The frame 8 is hinged to the slide 7, as indicated at 21. By means of this hinge said frame and the parts carried thereby may be moved in a vertical plane extending longitudinally of the vessel and may be held at any suitable angle or raised entirely out of the water by means of the tackle, (indicated at 22.)

Through the hinge by which the frame is connected to the slide passes a shaft 23, from which power is conveyed to the pump by means of belt or chain 24.

Upon the shaft 23 there is a bevel-gear 25, with which meshes a like gear mounted on the shaft 26, the latter being journaled in bearings on the slide 7. On the opposite end of the shaft 26 is another pinion, which meshes with the pinion 27, which is feathered upon the motor-shaft 14. Also upon the shaft 23 there is a pinion 28, through which power is transmitted to the agitator or stirrer at the lower end of the suction-pipe. The agitator here shown is of a form heretofore used by me and consists of a ring-gear journaled upon the lower end of the suction-pipe and provided with downwardly-projecting pins. With said gear meshes the pinion 30, which is carried upon the lower end of the agitator-shaft 31, said shaft having at its upper end a bevel-gear in mesh with bevel-gear 28. The shaft 31, with its gears, is journaled in suitable bearings upon the frame 8.

From the above description and drawings it will be seen that by the rotation of the motor-shaft 14 power is transmitted simultaneously to both the pump and the agitator. It will also be seen that such transmission of motion will continue no matter what angle the frame 8 may take about its hinges with the slide 7. It will also be noticed that such transmission of motion will continue no matter what may be the elevation of the slide 7 upon the guide 6. It will also be noted that by means of the trunnion 9 and the hinge 21 universal movement is provided for the lower end of the suction-pipe. Further than this, by the flexible connection by means of which the slide 7 is suspended perfect freedom of vertical movements is provided for the suction-pipe and agitator. By means of these joints and slides there is provided for the apparatus perfect compensation with respect to wave motion and other movements of the vessel to which the excavator is attached.

Any desired number of these excavators may be mounted upon the same vessel, alongside or astern, or in case of a vessel provided with a central well, as in Fig. 4, they may be located within said well likewise.

One advantage gained by constructing the apparatus as above is found in the fact that the pump may operate under water, or if the place being dredged is shallow, so that the pump will be above water, the pump may be primed readily by swinging up the framework and lowering the pump into the water until well started.

Many changes may be made in the construction of parts shown and also in the proportions thereof and in their relation to one another without departing from the spirit of the invention.

I claim as my invention—

1. A pumping apparatus for dredging purposes having a pump suspended upon a hinged guide and vertically movable thereon.

2. In a dredging apparatus the combination, with a vertical guide extending into the water, of a pump mounted thereon, and means whereby the relation of the suction end of the pump to the water-bed remains unchanged during the rocking of the vessel to which the apparatus is attached.

3. In a dredging apparatus, a vertical guide mounted on the vessel by horizontal trunnions, and a pump mounted on the guide by horizontal trunnions at right angles to those sustaining the guide, whereby a universal movement is provided for the suction end of the pump.

4. The combination with a vessel, of a suction-pipe and a laterally and longitudinally pivoting and sliding connection arranged between said vessel and said suction-pipe, substantially as specified.

5. In a dredging apparatus, the combination with a vertical guide or support hinged to the vessel, of a pump-frame mounted to move vertically thereon and having a hinge connection therewith, a stirring mechanism or agitator mounted on the pump-frame, and gearing for operating the pump and agitator simultaneously.

6. The combination with the guide or support, of the motor-shaft mounted thereon, the pump-frame hinged to a slide upon the guide, the agitator-shaft mounted on said frame, gearing connecting said two shafts at said slide and operable whatever the position of said frame, gearing for driving the pump connected to the agitator-gearing on said slide, whereby the agitator and pump are driven simultaneously, substantially as set forth.

7. The combination with the vessel, of the vertical guide mounted thereon, a motor-shaft on said guide, a slide also mounted on the guide, means for raising and lowering the slide, a frame hinged to the slide and carrying the pump, and gearing on the slide for connecting the pump with the motor-shaft.

8. The combination with the vessel, of the vertical guide mounted thereon, a motor-shaft on said guide, a slide also mounted on the guide, means for raising and lowering

the slide, a frame hinged to the slide and carrying the pump, an agitator mounted on said frame, a shaft for operating it extending to the slide, and gearing on the slide for connecting the pump and the agitator-shaft with the motor-shaft, substantially as set forth.

Signed at New York, in the county of New York and State of New York, this 14th day of July, A. D. 1899.

JOHN E. WALSH.

Witnesses:
DELBERT H. DECKER,
J. E. LUDLOW.