April 24, 1928. 1,667,219

J. REAM

DREDGING APPARATUS

Filed Nov. 29. 1926

Fig. 2

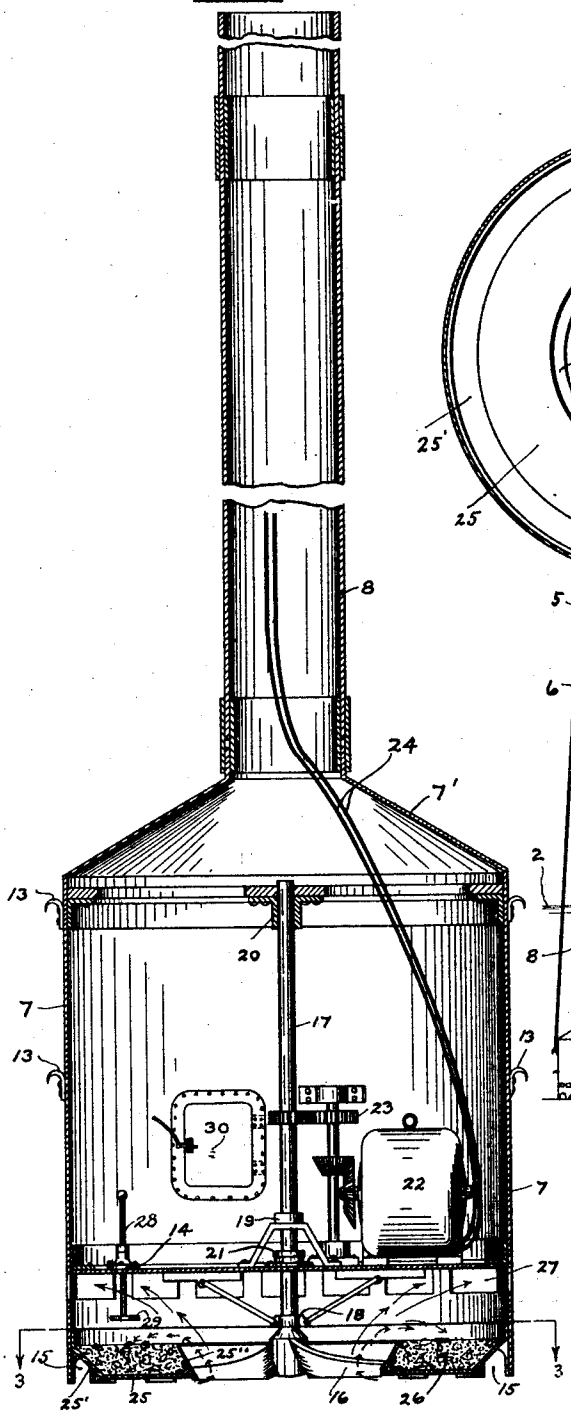


Fig. 3

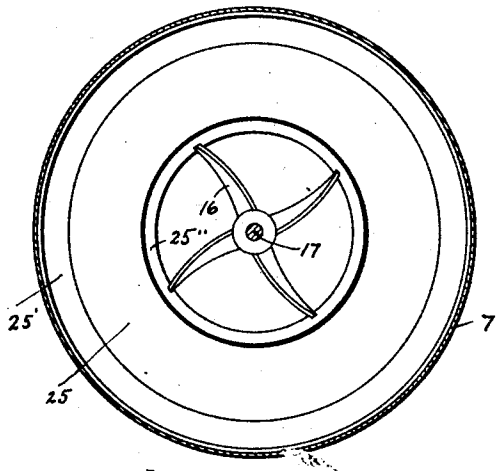
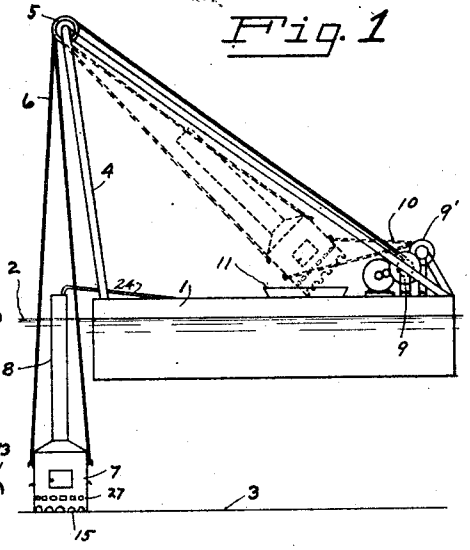


Fig. 1



INVENTOR.

JOHN REAM

BY Miller & Boyken

His ATTORNEYS

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UNITED STATES PATENT OFFICE.

JOHN REAM, OF SACRAMENTO, CALIFORNIA.

DREDGING APPARATUS.

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This invention relates to dredging apparatus in general and in particular to apparatus for dredging gravel and sand from bed rock below water level.

The objects of the invention are to provide an auxiliary to a gold dredge, either mounted on the same hull or on a separate scow, which will facilitate the recovery of gravel and sand lying below the reach of the regular bucket gold dredge, in fact to clean the very bed rock itself, so as to recover the large proportion of gold or other values which accumulate on this lower stratum. Also such apparatus which may be lowered into any depth of water and which may easily be emptied of its recovered values.

Briefly described my invention comprises a cylindrical steel watertight shell with a vertically extending pipe, and which shell may be lowered to the bottom of a river already dredged of its larger gravel, and the shell mounting apparatus which will gather up by means of a revolving fan the finer loose material in its vicinity and retain the same in a receptacle under the shell so that by hauling the shell out of the water the receptacle may easily be emptied and the shell again lowered to repeat the operation.

The watertight compartment of the shell carries the machinery which operates the device and also provides space for men to start and stop the machinery and determine when the receptacle is filled and to give the signal for hauling up.

In the drawing accompanying this specification the device is shown mounted on a scow which as stated may or may not be the scow of a gold dredge.

Fig. 1 shows in full lines the scow with apparatus lowered to the river bottom, and in dotted position the apparatus hauled to the deck in emptying position over a pan.

Fig. 2 is an enlarged vertical section of the shell showing its operating machinery within and suction gravel fan below.

Fig. 3 is a cross section of the shell as taken from the lines 3—3 of Fig. 2.

In further detail at 1 is a dredger scow floating in a river 2, the bottom or bed rock below which is indicated at 3.

The scow mounts a derrick frame 4 provided with a head sheave 5 over which haulage ropes 6 suspend the shell 7 here shown as resting on the bottom of the river and with the pipe 8 of the shell projecting above the water.

From the head sheave 5 the ropes extend to a suitable hoist 9 so that the shell may be raised or lowered in the water, and when raised is, through proper manipulation of the hoist, pulled over to the dotted position by a rope 10 then secured to the shell and passing to another drum 9′ of the hoist, and when in this position the shell lies at an angle with its lower edge in a heavy tray 11 or its equivalent, such as a sump in the deck of the scow.

In detail Figures 2 and 3 show the shell 7 to be cylindrical with a conical top 7′ from which extends the stand pipe 8 made in sections like a well casing so that one section after the other may be screwed on to provide the necessary length depending on the depth of water being operated in.

At the outside of the shell are any desired number or style of rope attaching hooks or bales as at 13 and the shell is provided with a recessed bottom 14 providing a considerable space to the lower edge of the shell and which lower edge is provided with openings or scallops as at 15 through which the loose material is drawn inwardly by a revolving fan 16 mounted on a vertical shaft 17 supported in bearings 18—19—20 and provided with a stuffing box 21 to prevent leakage above the bottom plate or floor 14.

This shaft 17 and fan 16 are driven at high speed by any desired means, but preferably by an electric motor 22 mounted within the device and suitably geared to the shaft as indicated at 23. The motor receiving its power through service wires 24 extending up the pipe 8 and to the scow for tapping to its power source.

The fan 16 has three or more blades and operates in a circular opening in an annular pan like receptacle 25 provided with outer and inner inwardly and downwardly slanting walls 25′ and 25″ respectively and the ends of the fan blades are shaped to work close to this inner beveled or conical wall, and the blades, of which there are three or more, are so shaped as to produce a powerful suction along a small space left between the bottom of the receptacle 25 and the lower edge of the cylindrical shell 7 so that the water, small gravel and sand are thrown upwardly and outwardly through the fan with a result that the material 26 takes the course of the small arrows and falls into the receptacle while the water takes the course of the longer arrows and is centrifugally dis-

charged through a series of the openings 27 cut through the shell just below the bottom plate or floor 14.

The amount of material within the receptacle is determined from time to time by a man (not shown) within the compartment above the floor by means of a slidable gage rod 28 packed watertight and carrying a plate 29 at its lower end, and when judged by him to be full he stops the motor and signals the scow to be hauled up.

A suitable watertight door or manhole is provided as at 30 operative from within the compartment so that a man may open the same and step out before the device is tipped to the dotted position, tho it is contemplated that men may enter or leave through the stand pipe 8 if desired either by means of a suitable rope lift or ladder not shown.

I claim:

1. Dredging apparatus comprising a cylindrical watertight casing, a vertical shaft revolvably supported therein and extending through the bottom thereof, a propeller-like fan mounted on the lower end of said shaft, means within the casing for driving said fan and an annular receptacle surrounding the fan adapted to receive material drawn through the fan upon revolving the same.

2. Dredging apparatus comprising a cylindrical watertight casing, a vertical shaft revolvably supported therein and extending through the bottom thereof, a propeller-like fan mounted on the lower end of said shaft, means within the casing for driving said fan, an annular receptacle surrounding the fan adapted to receive material drawn through the fan upon revolving the same, said receptacle provided with a bottom spaced above the lower edge of the casing and said casing provided with openings around its lower edge.

3. Dredging apparatus, comprising a cylindrical watertight casing, a vertical shaft revolvably supported therein and extending through the bottom thereof, a propeller-like fan mounted on the lower end of said shaft, means within the casing for driving said fan, an annular receptacle surrounding the fan adapted to receive material drawn through the fan upon revolving the same, said receptacle provided with a bottom spaced above the lower edge of the casing and said casing provided with openings around its lower edge and a row of openings above the receptacle.

4. In a structure as specified in claim 1, said annular receptacle being provided with a central opening in which the fan revolves surrounded by a wall slanting inwardly and downwardly.

5. In a structure as specified in claim 1, said annular receptacle being provided with a central opening in which the fan revolves surrounded by a wall slanting inwardly and downwardly and the ends of the fan blades being slanted to fit closely thereagainst.

6. Dredging apparatus comprising a cylindrical casing, a stack extending therefrom, means for lowering the casing into water, a prime mover within the casing and gravel gathering apparatus mounted under the bottom of the casing operated by said prime mover.

7. Dredging apparatus comprising a cylindrical watertight casing provided with a bottom, an annular receptacle for gravel spaced below said bottom, means for gathering gravel and depositing same into said receptacle and a slidable gage extending through said bottom adapted for gaging the amount of material therein deposited.

JOHN REAM.