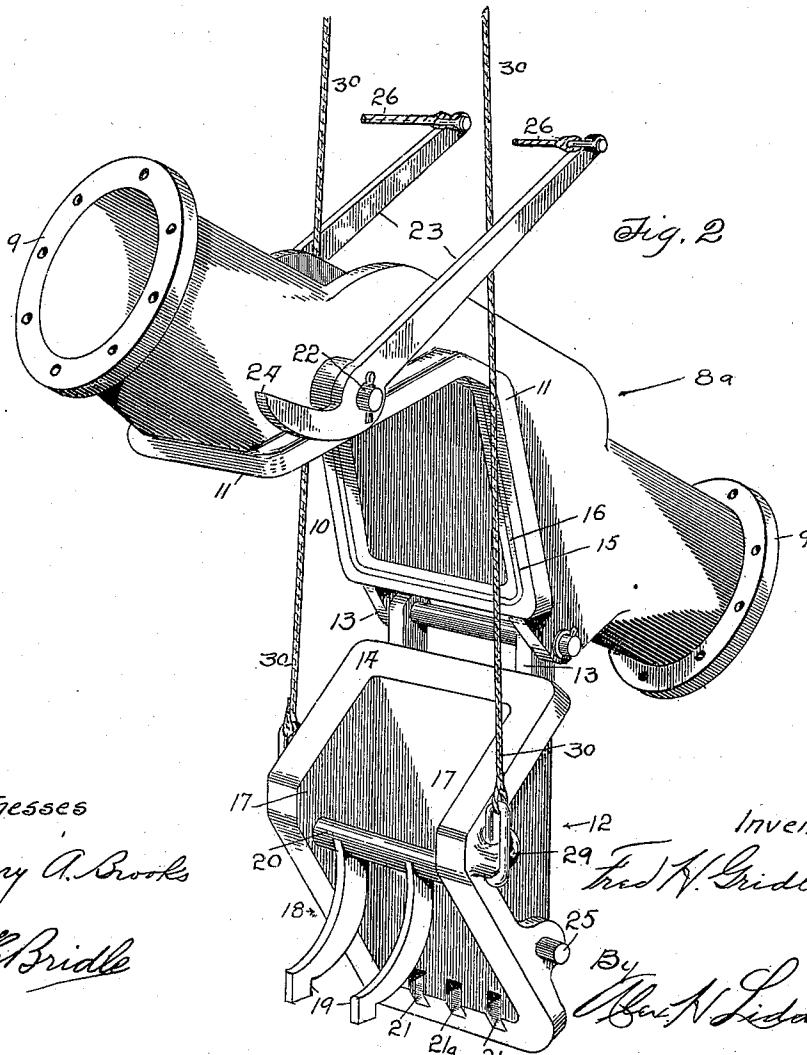
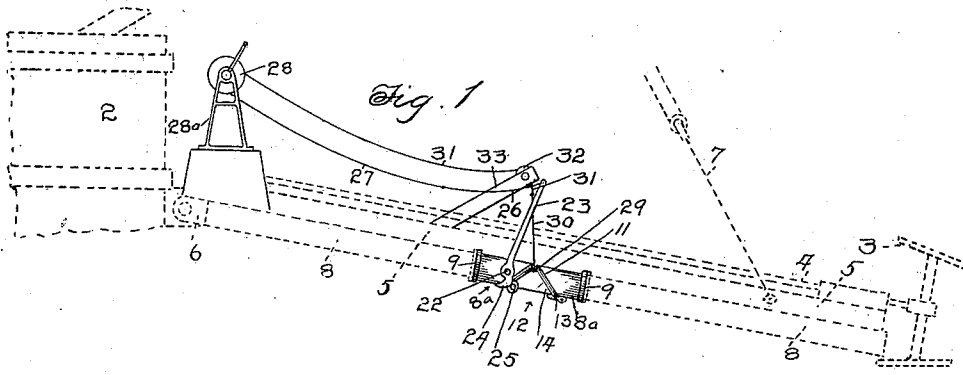


F. H. GRIDLEY.
HYDRAULIC DREDGING APPARATUS.
APPLICATION FILED JAN. 11, 1911.

996,237.

Patented June 27, 1911.



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UNITED STATES PATENT OFFICE.

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HYDRAULIC DREDGING APPARATUS.

996,237.

Specification of Letters Patent. Patented June 27, 1911.

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To all whom it may concern:

Be it known that I, FRED H. GRIDLEY, a citizen of the United States of America, residing at Longbeach, in the county of Los Angeles, State of California, have invented certain new and useful Improvements in Hydraulic Dredging Apparatus; 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 hydraulic dredging apparatus, more particularly to means for preventing obstructions such as stones or the like from passing through the suction pipe of said dredging apparatus to cause injury to the machinery thereof, and it may be said to consist in the novel and improved construction, arrangement and combination of parts as will appear from the description and claims hereinafter.

It is an object of the invention to provide simple and effective means of this class that may operate without the necessity of stopping the suction pump and with a minimum discontinuation of the operation of the dredging apparatus.

It is also an object of the invention to provide means whereby the parts of the stone arrester may be readily actuated and controlled in operation by the operator.

Further objects and the advantages of the invention will be apparent to those skilled in the art from a consideration of the following description of one form of construction in which the invention may be embodied, taken in connection with the accompanying drawings, in which,

Figure 1 is a side elevation of apparatus having the invention applied thereto, and Fig. 2 is a perspective view of the stone arrester with parts thereof in discharging position.

Referring more particularly to Fig. 1, the dredge 2 may be of any approved construction and be provided with the cutter 3 operated by shaft 4 supported by frame 5 which is connected to the dredge by hinge 6 and is supported by tackle 7. The suction pipe 8 has inserted in its length, preferably at a point normally below the water line, a housing 8^a which may be provided at

its ends with flanges 9 for attachment to the said pipe.

Referring now to Fig. 2, the central part of housing 8 is preferably rectangular in section and is cut away at its sides and bottom to provide a port 10 around the edges of which may be provided a flange 11 to serve as a seat for the closure 12 which is preferably connected to the housing by hinges 13. Closure 12 is provided at its point of contact with flange 11 with a similar flange 14. Flange 11 may have a groove 15 in which may be embedded a strip of resilient material 16 which, when the parts are in the position shown in Fig. 1, renders the joint between the closure and the housing substantially water-tight. Between the sides 17 of closure 12 may be positioned a grid 18 preferably formed of fingers 19 attached to a bar 20 hingedly supported by the sides 17. In the closed position of the device the ends of fingers 19 rest in pockets 21 formed in the bottom of closure 12. If desired, the central pocket 21^a may be used for a substitute grid having but one finger. At each side of housing 8 is supported on a stud 22 a lever 23 the lower end 24 of which is adapted to contact with and press downward a pin 25 carried by closure 12. The upper ends of levers 23 have attached thereto cables 26 which may be connected to a cable 27 passing around the drum 28 of a small winch 28^a. At each side of closure 12 may be arranged an ear 29 having attached thereto a cable 30 which cables may be joined to a cable 31, Fig. 1, which may pass over a pulley 32 supported by an arm 33 attached to frame 5. Cable 31 is preferably wound upon drum 28 in a reverse direction to that in which the cable 27 is wound.

The mode of operation of the invention may be as follows: The parts being in the position indicated in Fig. 1, cable 31 being momentarily tightened to hold the closure 12 to shut port 10, the dredging machinery may be set in operation to rotate the cutter 3 and draw the loosened material through pipe 8. When the closure 12 covers port 10, the fingers 19 extend into the pockets 21 and are locked in position therein by abutting against flanges 11. Should stones or other obstructions become lodged against the grid 18, this condition being indicated

by diminished discharge, winch 28^a may be operated to pull cable 27. This moves levers 23 causing their ends 24 to press pins 25 downwardly and thus start closure 12 from its seat and thereby breaking the suction in pipe 8; whereupon the weight of said closure causes it to swing downwardly to the position shown in Fig. 2 so that the stones, etc., lodged against the grid 18 may force the ends of fingers 19 away from the bottom of closure 12 and drop therefrom. The parts may be restored to the normal position by operating winch 28^a to draw the closure 12 to its seat where it will be retained, by the pressure external to the pipe, until the operation of discharging stones, etc., is repeated. It is, of course, understood that a basket or other receptacle may be disposed below housing 8 to receive the stones, etc., discharged through port 10. Again, it will be evident that if desired the grid may be affixed in the housing 8^a at the end of port 10 nearest the pump, or, it may be affixed to the closure at the end thereof remote from the pump, but preferably arranged so that it will be inclined to the vertical when the closure is open.

While the preferred form of construction in which the invention may be embodied has been illustrated and described, there are various changes and modifications thereof that will readily occur to those skilled in the art, wherefore the right is reserved to all such changes and modifications as do not depart from the spirit and scope of the invention.

I claim:

1. The combination with the suction apparatus of a hydraulic dredge, of a suction pipe having a port therein, a closure for said port normally held to its seat by fluid pressure external to said pipe, and means associated with said closure for preventing solids above a certain size from passing through said pipe.

2. The combination with the suction apparatus of a hydraulic dredge, of a suction pipe having a port therein, a closure for said port normally held to its seat by fluid pressure external to said pipe, means adjacent to said port for arresting the passage of solids through said pipe, and devices for starting said closure from its seat and for returning it to its seat.

3. The combination with the suction apparatus of a dredge, of a suction pipe having a port therein, a closure for said port,

said closure normally held to position by fluid pressure external to said pipe, a grid adjacent to said port, and means to force said closure from its seat.

4. In combination with the suction apparatus of a dredge, a suction pipe having a port therein, a closure for said port, a winch, means connected with said winch to force said closure from its seat and means connected with said winch to return said closure to its seat.

5. A stone arrester for hydraulic dredges comprising in combination, a housing adapted to be connected into and form part of the suction pipe of said dredge, said housing having a port therein, a grid adjacent to said port, a closure for said port, said closure normally held to place by fluid pressure external to said pipe but adapted to move from said normal position when the excess of external pressure is removed.

6. A stone arrester for hydraulic dredges, comprising, in combination, a housing adapted to be connected into and form part of the suction pipe of said dredge, a port in said housing, a closure for said port, and a grid carried by said closure.

7. In a stone arrester, the combination of a housing having a port therein, a closure for said port, and a grid movably supported between the sides of the closure.

8. In a stone arrester, the combination of a housing having a port therein, a closure for said port hingedly mounted on the housing, a grid movably supported between the sides of the closure, and means on said housing adapted to coact with means on said closure to move the closure away from the housing.

9. In a stone arrester, the combination of a housing having a port therein, a closure for said port, said closure provided with a pocket therein, and a grid movably supported between the sides of the closure, said grid including a finger adapted to extend into said pocket and be locked in position therein under predetermined conditions.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses at Los Angeles, county of Los Angeles, State of California, this 24th day of December A. D. 1910.

F. H. GRIDLEY.

Witnesses:

CHARLES F. GUTHRIDGE,
HARRY A. BROOKS.