

No. 813,252.

PATENTED FEB. 20, 1906.

V. A. STROM.  
DREDGER.

APPLICATION FILED MAR. 31, 1905.

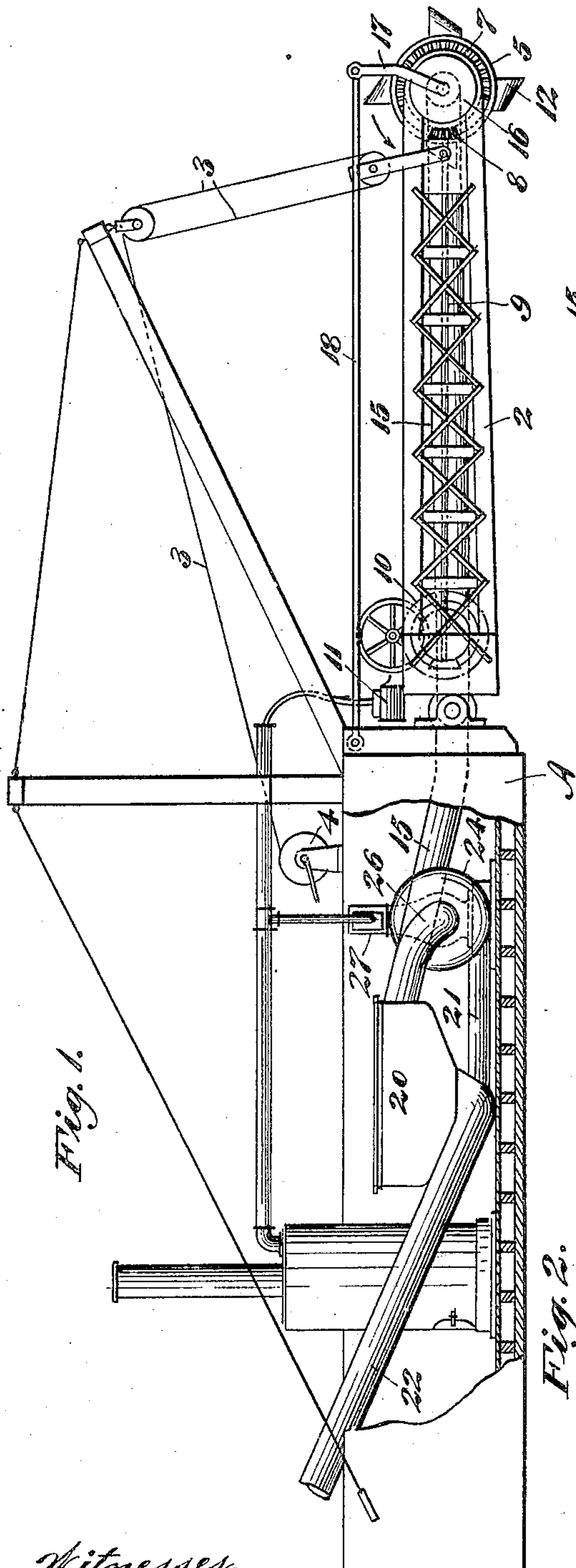


Fig. 1.

Fig. 2.

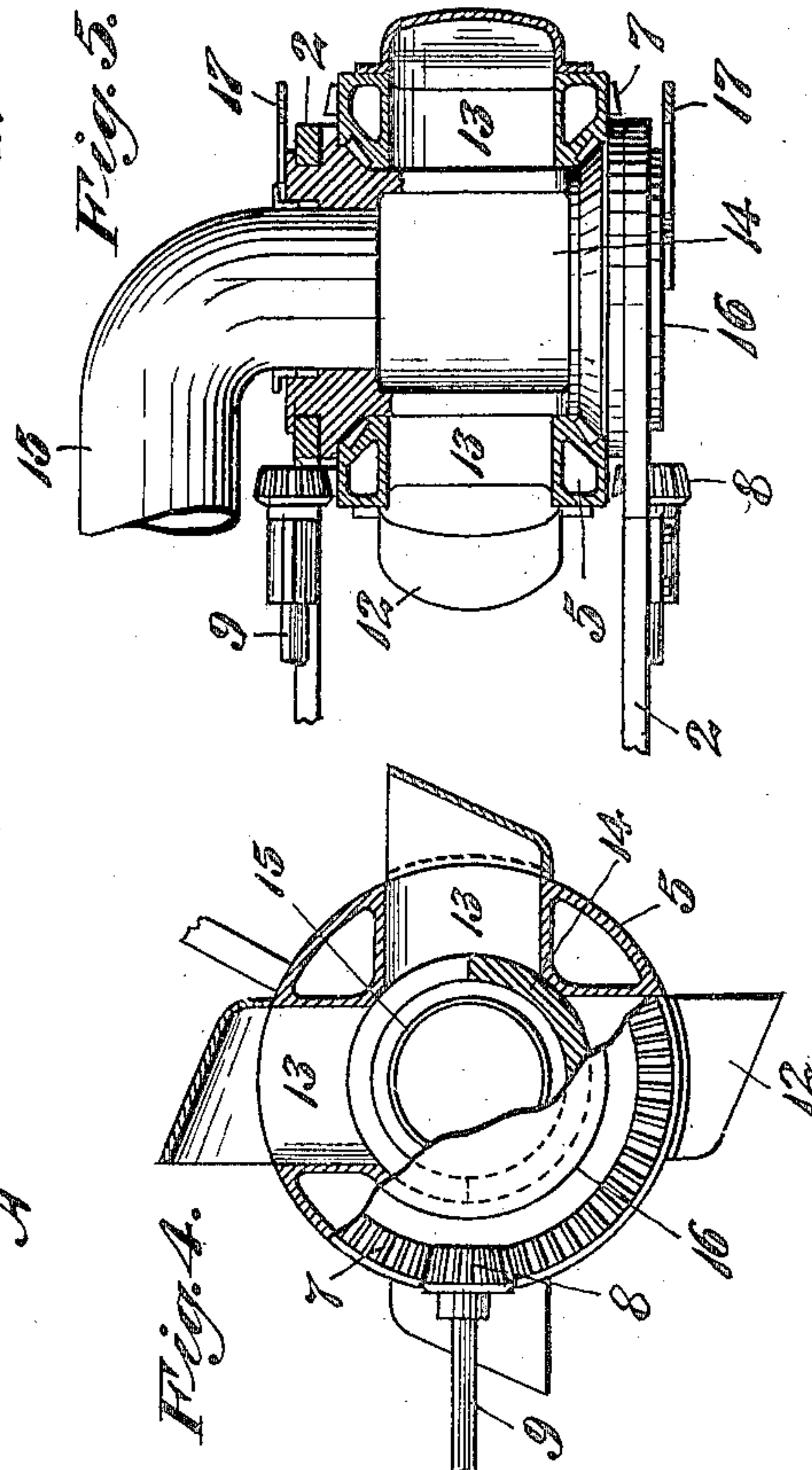


Fig. 3.

Fig. 4.

Fig. 5.

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# UNITED STATES PATENT OFFICE.

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## DREDGER.

No. 813,252.

Specification of Letters Patent.

Patented Feb. 20, 1906.

Application filed March 31, 1905. Serial No. 253,034.

*To all whom it may concern:*

Be it known that I, VICTOR A. STROM, a citizen of the United States, residing at Alameda, in the county of Alameda and State of California, have invented new and useful Improvements in Dredgers, of which the following is a specification.

My invention relates to dredging and digging apparatus. It is especially applicable to the dredging of gravel and material from the beds of watercourses for the purpose of saving any valuable or precious metals which may be associated therewith, and it can also be used for ordinary dredging purposes where earth or material is to be removed.

It consists in the combination of parts and in details of construction, which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a side elevation, partly in section, of my invention. Fig. 2 is a sectional view of the settling-tank. Fig. 3 is a plan view of same. Fig. 4 is an end elevation, partly in section, of drum. Fig. 5 is a plan view, partly in section, of same.

As shown in the drawings, A is a float suitable for supporting the machinery necessary for the operation of the dredge. Hinged or otherwise connected with the front of this float is a "ladder," so called, as at 2, the front end of which may be suspended by cables or chains 3 in any suitable manner from supports carried upon the float, and by means of the cables and a suitable winding apparatus 4 the front of the ladder may be raised and lowered at will. Upon the front of this ladder is journaled the excavating-drum 5. This drum has its shaft turnable in suitable bearings and is revolved by means of gears, as at 7, and pinions 8, mounted upon shafts 9, which are journaled upon the ladder and extend rearwardly, where, by means of suitable gears, as at 10, and an engine or motor (indicated at 11) power may be transmitted to rotate this drum at any desired rate of speed. Upon the periphery of the drum are located buckets 12. These buckets have any suitable scoop-shaped form and are adapted to excavate the material beneath and toward the front as the buckets are brought into contact with such material, and the portions of the buckets which are fixed to the drum are

open and coincide with corresponding openings in the drum, as at 13. Interior to the drum is a segmental drum 14. The lower part of this drum is closed. The upper part is open, so that as the buckets in the outer drum, passing around beneath the inner drum 14, become loaded they are carried up until the discharge-openings correspond with the open portion of the inner drum, where the spoils will fall into this inner drum. As the empty buckets pass beyond the open portion of the segment they will take in a considerable amount of water, which will assist to soften and dilute the more solid material which has been excavated, thus preparing it to be transferred through the suction-pipe 15, which opens through the end of both the drums, as shown. By this construction it will be seen that as the buckets pass around the lower part of their travel they will become filled with the material and will discharge the material into the inner drum when passing through the upper portion of their travel, and finally will supply additional water as they pass around to the point where they again commence digging.

The inner drum has its journaled ends extending through the heads of the outer drum and also through the supports of said outer drum at the front of the ladder, and upon the ends of the inner-drum journals I have shown disks 16, from which arms 17 extend upwardly and are connected with rods 18. These rods extend rearwardly and are suitably pivoted to the front of the dredge-boat, as shown, and the distance between the fulcrum-points of the ladder and the fulcrum-points of these rods is substantially equal to the length of the arms 17 from the center to the point of connection of the rods. These rods and ladder will thus act similarly to a parallel ruler, and as the ladder is depressed the action of the rods will turn the segmental inner drum of the digging apparatus so that its open portion will always remain uppermost and in readiness to receive the material delivered from the buckets, and whether the ladder be nearly vertical, as in deep water, or more nearly horizontal, as in shallow water, the relative position of the receiving-drum and the discharging-buckets will be retained. The spoils are transmitted through the



pipe 15, which extends along the ladder and which has a universal joint in line with the journals of the ladder, so that as the ladder is raised and depressed this joint is maintained in an effectively tight condition, while it is allowed free movement in conjunction with the movements of the ladder. The extension of this pipe 15 leads into the interior of the boat and discharges into what may be termed a "settling-tank," as at 20. This tank is shown as having a funnel-shaped bottom, which delivers any heavy gravel or material of that character downwardly, and it is there received by a powerful jet of water introduced through a pipe 21 and in line with a discharge-pipe 22, so that all this heavy travel and material are delivered by the momentum of the jet of water introduced through the pipe. This jet is produced by means of a powerful rotary pump, as at 24.

25 is a vertical partition or diaphragm located in the receiving-tank 20, and all material which does not drop by gravitation into the discharge-opening at the bottom previously described will pass around the end of this vertical partition, thence into a space or chamber upon the opposite side of the partition from that into which the pipe 15 opens. This last-mentioned space or chamber is in open communication with the suction-pipe 26, and this pipe opens into the centrifugal pump 24, previously described, so that the water containing only the finer material, which is easily held in suspension, will pass through the suction-pump, thence through the discharge-pipe thereof, which, as before stated, is in line with the main discharge-pipe 22, and the spoils will thus all be discharged through this pipe 22, and only the lighter material, which will not be injurious to the pump, will pass through said pump.

It will be understood that a suitable motor will be employed to drive the pump and preferably one independent of the motor which drives the digging apparatus, as previously described. Such a motor is indicated at 27.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a dredger, a float, a hinged ladder projecting therefrom, with means for raising and lowering its front end, an excavator carried upon the front of said ladder, an internal receiver into which the excavator discharges, said receiver having a closed bottom and open top, means whereby the receiver may be turned axially relative to the ladder to maintain its open portion substantially uppermost during the raising or lowering of said ladder, and a suction-pipe connecting with the receiver.

2. In a dredger, a float, a ladder hinged thereto, an excavator consisting of a hollow

revoluble drum, buckets carried upon the periphery of said drum, said buckets having the rear inner portions opening to the interior of the drum, a receiver consisting of a drum closed at the bottom and open at the top and having open communication through the ends of the drums, and means connecting with the second drum for turning said drum relative to the ladder whereby its open top is maintained substantially uppermost during the raising or lowering of said ladder, and a suction-pipe leading from said second drum.

3. In a dredger, a float, a ladder hinged thereto, an excavator journaled upon the front of the ladder, said excavator comprising a drum having openings in the periphery, buckets fixed to the periphery of the drum having the inner rear portions opening and coincident with the openings in the drum, a receiver consisting of a second drum located within the first one having the lower portion closed, the upper portion open and levers connecting said drum with the front of the float whereby the open portion is maintained upon the upper side during the raising or lowering of the ladder.

4. In a dredger, a float, a ladder hinged to the front thereof, mechanism by which the outer end of the ladder may be raised or depressed, a revoluble drum journaled upon the outer end of the ladder having openings in its periphery, scoop-shaped buckets fixed over said openings and adapted to discharge there-through, an interior drum having the upper side open to receive discharged material, arms connected with said interior drum, and rods connecting said arms with the front of the dredge-boat, said arms acting to revolve the interior drum with relation to the outer one so as to present the opening upwardly at any position of the ladder.

5. In a dredger, a float, a ladder hinged thereto, means for raising and depressing the ladder, an excavating apparatus located upon the front of the ladder, a suction-pipe into which material excavated is delivered, said pipe leading along the ladder and into the float, a suction-pump, a closed casing interposed between the pump and the suction-pipe, said casing having an opening in the bottom through which heavy material will drop by gravitation and a connection with the pump in line with the main discharge-pipe.

6. In a dredge, a float, a ladder hinged thereto, means by which the ladder is raised or depressed, an excavating apparatus carried upon the front of the ladder, a suction-pipe extending from said apparatus into the float, a suction-pump, a receiver into which the suction-pipe delivers, a discharge-opening in the bottom of said receiver through which heavy material falls by gravitation,

connection between the suction-pump and  
the receiver out of line with the main suction-  
pipe, a discharge-pipe connecting with the  
bottom of the receiver into which pipe the  
5 spoils deliver, and a jet-tube discharge from  
the suction-pump in line with the main dis-  
charge-pipe.

In testimony whereof I have hereunto set  
my hand in presence of two subscribing wit-  
nesses.

VICTOR A. STROM.

Witnesses:

M. S. TAYLOR,  
JOHN F. BUTTRICK.