No. 821,670. PATENTED MAY 29, 1906.

L. S. PARKER.

DREDGE.

APPLICATION FILED MAR. 29, 1906.

3 SHEETS—SHEET 1.

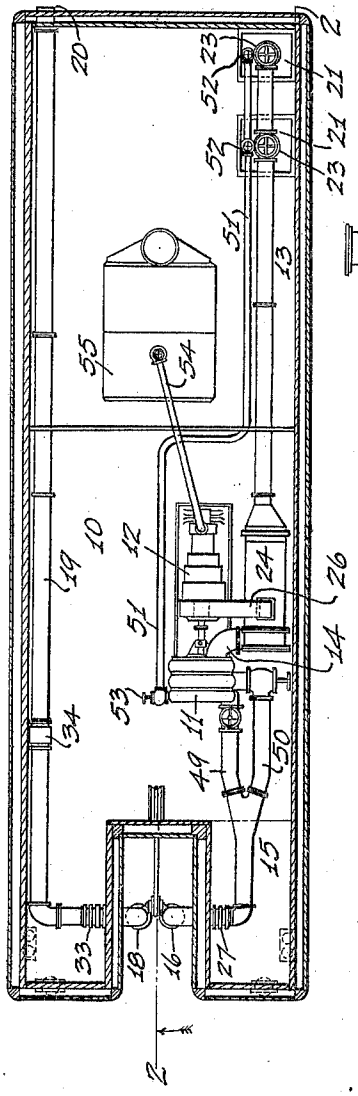


Fig. 1

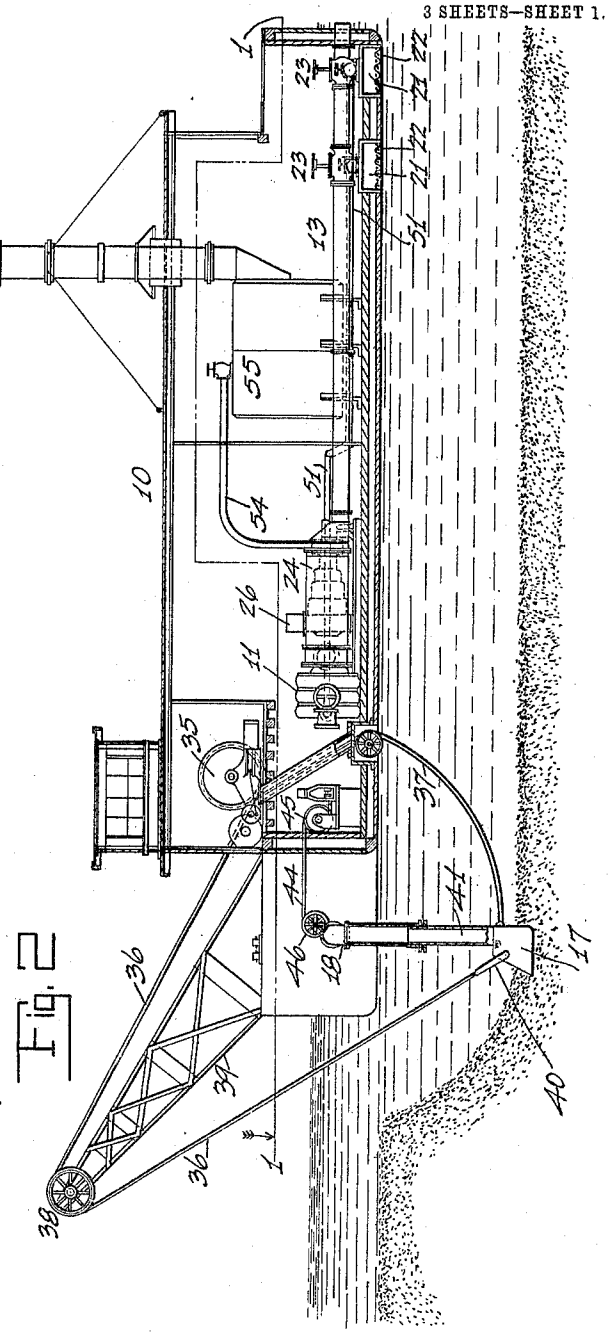


Fig. 2

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3 SHEETS—SHEET 2

Fig. 3

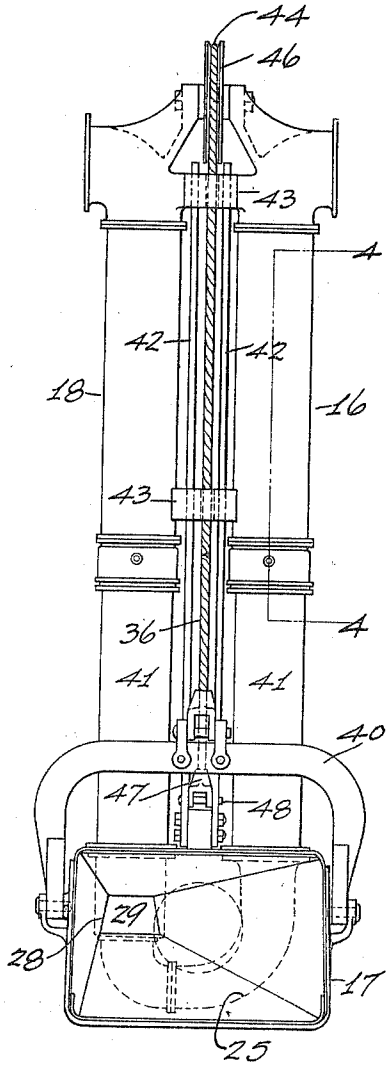
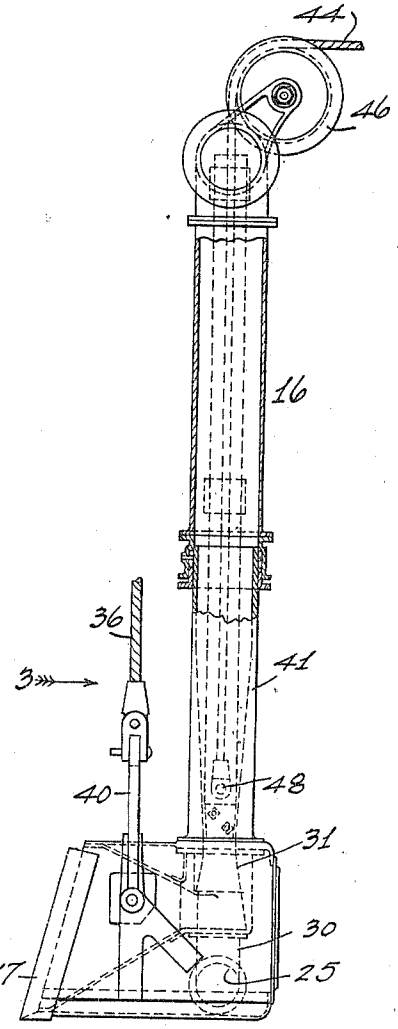


Fig. 4



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3 SHEETS—SHEET 3.

Fig. 6

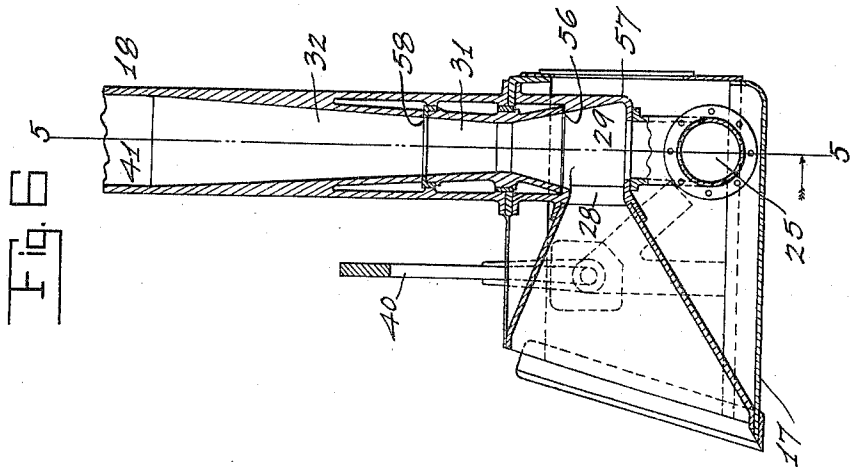
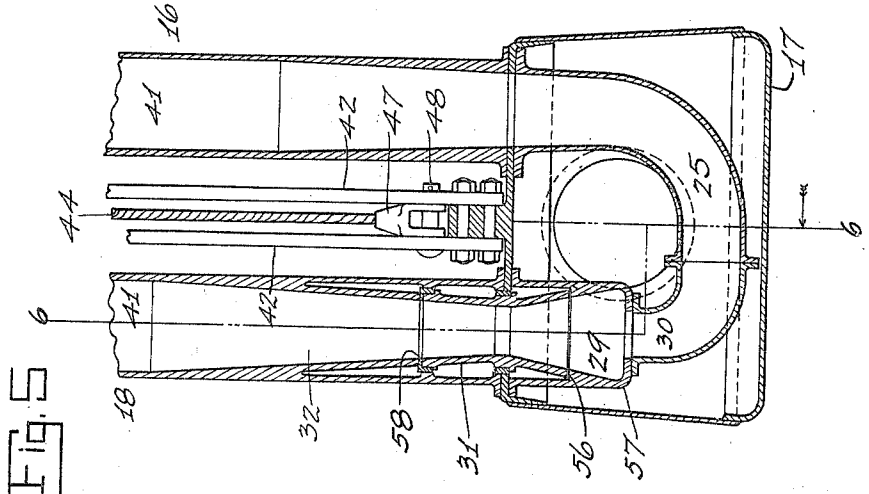


Fig. 5



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UNITED STATES PATENT OFFICE.

LEVIN S. PARKER, OF NEW YORK, N. Y., ASSIGNOR TO THE JAMES REILLY REPAIR AND SUPPLY COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

DREDGE.

No. 821,670. Specification of Letters Patent. Patented May 29, 1906.

Application filed March 29, 1906. Serial No. 308,644.

To all whom it may concern:

Be it known that I, LEVIN S. PARKER, a citizen of the United States, and a resident of New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Dredges, of which the following is a specification.

The invention relates to improvements in dredges; and it consists in the novel features hereinafter described, and particularly pointed out in the claims.

The object of the invention is to provide a highly-efficient scoop-dredge whereby sand, gravel, and other material may be removed from the bottom of a harbor, river, or channel and delivered to the shore or other point in an economical manner without the sand and gravel coming into contact with the pump.

In carrying out my invention I provide the vessel with two connected pipes, one being a supply-pipe leading to a specially constructed and arranged oscillatory scoop to be moved along and at the same time cut into the bottom to be dredged and the other being a delivery-pipe leading therefrom to a pontoon pipe-line, said supply-pipe being connected with a centrifugal multistage or high-pressure pump by which water is pumped from the river or stream and caused under adequate pressure to pass through the supply-pipe to a chamber in rear of an inner discharge-orifice from said scoop and then ascend through said delivery-pipe, carrying with it to the pontoon pipe-line the sand, gravel, and other material taken up by said scoop and passing through the same into the path of the water flowing from the supply into said delivery pipe.

The invention will be readily understood from the detailed description hereinafter presented, reference being had to the accompanying drawings, in which—

Figure 1 is a longitudinal plan view, partly in section on the dotted line 1 1 of Fig. 2, of a dredge equipped with my invention. Fig. 2 is a vertical longitudinal section of same on the dotted line 2 2 of Fig. 1. Fig. 3 is a detached enlarged end view looking at the left-hand end of Figs. 1 and 2, of the connected oscillatory outboard discharge-section of the supply-pipe leading to the scoop and the upcast section of the delivery-pipe leading from said scoop. Fig. 4 is a side elevation, partly in section, of same, the section being on the dotted line 4 4 of Fig. 3. Fig. 5 is a vertical section, partly broken away, of same, the section being on the dotted line 5 5 of Fig. 6; and Fig. 6 is a vertical section of same on the dotted line 6 6 of Fig. 5.

In the drawings, 10 designates a vessel of usual or any suitable construction; 11, the multistage centrifugal high-pressure pump, of commercial construction; 12, a high-speed turbine-engine or other suitable motor for driving said pump; 13, the suction-section of the supply-pipe; 14, the inlet for the supply-water to said pump; 15, the inboard discharge-section of the supply-pipe leading from said pump; 16, the outboard discharge-section of said supply-pipe; 17, the scoop at the lower end of said outboard discharge-pipe section; 18, the upcast section of the delivery-pipe leading from said scoop; and 19 the main section of the delivery-pipe leading to the pontoon-pipe-line connection 20. I thus designate the entire line of pipe leading to the scoop 17 and supplying water under pressure to the chamber thereat as the "supply-pipe" and the entire line of pipe leading from said scoop and conveying the sand and gravel to the pontoon pipe-line as the "delivery-pipe."

The suction-section 13 of the supply-pipe is connected at its forward end with sea-chests 21, opening into the river or other body of water and preferably protected by perforated plates or strainers 22, and said end of said pipe-section is provided with suitable shut-off valves 23.

The pipe-section 13 leads to a suitable surface-condenser 24 through the many tubes within which the water passes and then enters the inlet-pipe 14, whence said water passes into the pump 11, by which it is under increased pressure driven into and through the inboard discharge-pipe section 15 and outboard discharge-pipe section 16 to the water-chest 25 adjacent to the discharge from the scoop 17 and thence up through and along the delivery-pipe, as hereinafter more fully described, to the pontoon pipe-line.

The exhaust-steam from the engine 12 passes through a pipe 26 to the shell of the

condenser 24 and is cooled by the supply-water passing through the tubes of said condenser, the water resulting from the cooling of the exhaust-steam being withdrawn from the lower part of the condenser, as usual.

The adjoining portions of the inboard pipe-section 15 and outboard pipe-section 16 are connected together by a swivel-joint 27 of usual construction, so that said section 16 may be moved on the arc of a circle or have an oscillatory movement imparted to it.

The lower end of the out-board pipe-section 16 is connected with and delivers into a water-chest 25, Figs. 3, 4, 5, and 6, connected with the upcast section 18, and the lower ends of said pipe-sections 16 18 have secured upon them the scoop 17, whose inner converging walls lead to a discharge-orifice 28 at the inner end of the scoop in line with a chamber or hopper 29 at the lower end of said upcast section 18, into which chamber the sand, gravel, and other material taken up by the scoop pass. The water-chest 25 is connected by a nozzle-section 30, Fig. 5, with the lower end of the chamber 29, and the water from said chest is by said nozzle delivered to the chamber 29 and pipe-section 18 in the form of a jet, which acts directly against the material escaping from the scoop through the orifice 28. Immediately above the chamber 29 the upcast pipe 18 has a section 31 of contracted bore and which I term a "contractor," Fig. 5, and adjacent to this contractor 31 said pipe 18 has a section 32 whose bore gradually expands from the contractor 31 to the general diameter of the bore of the pipe 18, and this section 32 I designate as an "expander."

The adjoining portions of the upcast pipe-section 18 and main delivery-pipe section 19 are connected together by a swivel-joint 33, of usual construction, corresponding and in line with the swivel-joint 27 in the water-supply pipe-line, and in the said pipe-section 19 I provide an automatic check-valve 34, which opens freely in a direction toward the delivery end of said pipe, but closes under any tendency of the material to return through the same, as might be the case upon the stoppage of the pump 11.

The swivel-joints 27 33 enable me to impart to the connected outhanging pipe-sections 16 18 the requisite movements for causing the scoop 17 to cut away the bottom on the arc of a circle, as represented in Fig. 2. The means employed for imparting to the pipe-sections 16 18 and scoop 17 their oscillatory movements comprise a windlass 35, to be driven by an engine, and two cables 36 37, one arranged to pay out while the other is wound in. The cable 36 passes from one end of the windlass 35 over a pulley 38, supported by a projecting crane 39, and thence extends down to the scoop, whereon is provided a pivoted bail 40 to receive the end of said cable. The cable 37 passes from the other end of the windlass 35 to the rear side of the scoop 17. The cable 36 is used to draw the scoop 17 up the bank of earth and the cable 37 to draw it back to its initial position, and there is no special novelty in the windlass 35 and cables 36 37.

The outhanging swiveled pipe-sections 16 18 are telescopic—that is, the lower lengths 41 of said sections may be slid longitudinally within the upper lengths of same—whereby the length of said sections 16 18 may be varied at will to suit the conditions to be met in dredging operations. Upon the top of the scoop 17 between the pipe-sections 16 18 are secured the lower ends of guiding and stiffening bars 42, which extend upwardly through slots in blocks 43, secured to said pipe-sections, Figs. 3 and 5. When the scoop 17 and lower lengths 41 are moved in line with the length of the pipe-sections 16 18, the bars 42 move through the blocks 43. The means I provide for raising and lowering the lower lengths 41 of the pipe-sections 16 18, so as to vary the length of said sections, comprise a cable 44 and windlass 45, the latter to be driven by a small engine or other suitable means, and the outer portion of said cable being passed over a pulley-wheel 46 and thence downwardly between the pipe-sections 16 18 and bars 42, its lower end being held by a clamp 47, secured on a bolt 48, Fig. 5, mounted in said bars. An upward pull on the cable 44 will result in shortening the pipe-sections 16 18, and when said cable is paid out the scoop 17 and lower lengths 41 of said sections will descend by gravity.

In order that I may vary the pressure of the water delivered by the pump 11 to the inboard discharge-pipe section 15 and thence to the outhanging pipe-sections 16 18, I connect said section 15 with the pump by two independent branches 49 50, Fig. 1, each of which is controlled by a valve and one, 50, of which leads from an intermediate pump-chamber, while the other leads from the final pump-chamber or one of greatest pressure.

I preferably employ two sea-chests 21 for the supply-pipe 13, so that one thereof may be cleaned out while the other is continued in use. During the employment of the dredge grass and other refuse will gather on the lower surface of the screens 22 and probably plug up said screens, and as providing an effective means for cleaning out said screens and driving the grass and other matter therefrom I lead a pipe 51, Fig. 1, from the high-pressure chamber of the pump 11 to the sea-chests 21 and thereat provide said pipe with valves 52. When it is desired to clean the sea-chests 21 or their screens 22, the valve 53 in the pipe 51 close to the pump 11 will be opened, so that the water under high pressure may upon the opening of the valves 52

enter the chests and drive all grass and other matter from the screens 22.

The engine or motor 12 takes its steam through a pipe 54 from the boiler 55.

The contractor 31 will preferably be formed of manganese steel and seated on a shoulder 56, formed in the casting 57, creating the chamber 29, said contractor being encompassed partly by the said casting and partly by the lower length 41 of the pipe-section 18, which length affords a shoulder 58, engaging the upper edges of said contractor.

I have hereinbefore described all of the mechanical features of the dredge, and the operation of the dredge will be largely understood from the description hereinbefore presented. The material taken up by the scoop 17 is directed through the rear discharge-orifice 28 of the scoop and passes into the chamber 29 directly over the jet-nozzle 30, and the water for inducing the movement of the excavated material through the delivery pipe-line (represented by the sections 18 19) is taken from the sea or other suitable source through the pipe 13 and drawn into the multistage high-pressure centrifugal pump 11, by which the supply-water under increased pressure is driven through the supply-pipe sections 15 16 and water-chest 25, whence it passes under pressure through the nozzle 30 and chamber 29 and by the scoop discharge-orifice 28 into the contractor 31 and expander 32 and thence through the main delivery-pipe-line sections 18 19 to the pontoon connection 20. The material delivered to the chamber 29 from the scoop passes into the path of the jet issuing from the nozzle 30 and is carried into the contractor 31, where the sand becomes thoroughly mixed with the water, and is carried out therefrom in suspension to the expander 32, at which point the velocity due to the gradually-increasing area in cross-section of the expander is reduced to a speed just sufficient to prevent the dredged material from settling to the bottom of the delivery-pipe sections, through the full extent of which beyond the expander 32 the same velocity in the water is maintained.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A dredge comprising a water-supply pipe-line, a delivery pipe-line for the material to be dredged, said pipe-lines having outhanging swiveled sections, a water-chest connecting the lower ends of said sections, and a scoop carried at the lower ends of said sections to take up the material to be carried away and having an inner discharge-orifice through which the material passes into said section of the delivery pipe-line, combined with a pump connected in said supply pipe-line for pumping the water to itself and then, under pressure, driving the same through said line and into said chest and thence through said delivery pipe-line, the volume of water under pressure meeting and carrying with it the material discharging from said scoop; substantially as set forth.

2. A dredge comprising a water-supply pipe-line, a delivery pipe-line for the material to be dredged, said pipe-lines having outhanging swiveled sections, a water-chest connecting the lower ends of said sections, and a scoop carried at the lower ends of said sections to take up the material to be carried away and having an inner discharge-orifice through which the material passes into said section of the delivery pipe-line, a jet-nozzle being formed at the outlet from said chest to direct the water upwardly by the discharge from said scoop, combined with a pump connected in said supply pipe-line for pumping the water to itself and then, under pressure, driving the same through said line and into said chest and thence through said delivery pipe-line, the volume of water under pressure meeting and carrying with it the material discharging from said scoop; substantially as set forth.

3. A dredge comprising a water-supply pipe-line, a delivery pipe-line for the material to be dredged, said pipe-lines having outhanging swiveled sections, a water-chest connecting the lower ends of said sections, and a scoop carried at the lower ends of said sections to take up the material to be carried away and having an inner discharge-orifice through which the material passes into said section of the delivery pipe-line, a jet-nozzle being formed at the outlet from said chest to direct the water upwardly by the discharge from said scoop, combined with a pump connected in said supply pipe-line for pumping the water to itself and then, under pressure, driving the same through said line and into said chest and thence through said delivery pipe-line, the volume of water under pressure meeting and carrying with it the material discharging from said scoop; substantially as set forth.

4. A dredge comprising a water-supply pipe-line, a delivery pipe-line for the material to be dredged, said pipes-lines having outhanging swiveled sections, a water-chest connecting the lower ends of said sections, and a scoop carried at the lower ends of said sections to take up the material to be carried away and having an inner discharge-orifice through which the material passes into said section of the delivery pipe-line, combined with a centrifugal high-pressure multistage-pump connected in said supply pipe-line for pumping the water to itself and then, under pressure, driving the same through said line and into said chest and thence through said delivery pipe-line, the volume of water under pressure meeting and carrying with it the material discharging from said scoop; substantially as set forth.

5. A dredge comprising a water-supply

pipe-line, a delivery pipe-line for the material to be dredged, said pipe-lines having outhanging swiveled sections, a water-chest connecting the lower ends of said sections, and means carried at the lower ends of said sections for taking up the material and conducting the same to the outhanging delivery-pipe section, combined with a centrifugal high-pressure multistage-pump having two independent valved branches leading from separate chambers thereof and connected in said supply pipe-line for pumping water to itself and then, under pressure, driving the same through said line and into said chest and thence through said delivery pipe-line, the volume of water under pressure meeting and carrying with it the dredged material; substantially as set forth.

6. A dredge comprising a water-supply pipe-line, a delivery pipe-line for the material to be dredged, said pipe-lines having outhanging swiveled sections, a water-chest connecting the lower ends of said sections, and means carried at the lower ends of said sections for taking up the material and conducting the same to the outhanging delivery-pipe section, said outhanging sections having lower lengths adapted to telescope with respect to the upper lengths thereof, whereby said sections may be adjusted as to their reach, combined with means for adjusting the said lower lengths of said sections, a pump connected in said supply pipe-line for pumping water to itself and then, under pressure, driving the same through said line and into said chest and thence through said delivery pipe-line, the volume of water under pressure meeting and carrying with it the dredged material; substantially as set forth.

7. A dredge comprising a water-supply pipe-line, a delivery pipe-line for the material to be dredged, said pipe-lines having outhanging swiveled sections, a water-chest connecting the lower ends of said sections, and means carried at the lower ends of said sections for taking up the material and conducting the same to the outhanging delivery-pipe section, combined with a pump connected in said supply pipe-line for pumping water to itself and then, under pressure, driving the same through said line and into said chest and thence through said delivery pipe-line for carrying away the dredged material, a sea-chest in communication with the suction-section of said supply pipe-line, and a pipe leading from said pump to said sea-chest for conducting the water under pressure to the same for cleaning the same out when required; substantially as set forth.

8. A dredge comprising a water-supply pipe-line, a delivery pipe-line for the material to be dredged, said pipe-lines having outhanging swiveled sections, a water-chest connecting the lower ends of said sections, and means carried at the lower ends of said sections for taking up the material and conducting the same to the outhanging delivery-pipe section, combined with a pump connected in said supply pipe-line for pumping water to itself and then, under pressure, driving the same through said line and into said chest and thence through said delivery pipe-line for carrying away the dredged material, a plurality of independent sea-chests in communication with the suction-section of said supply pipe-line, independent valves in said section for cutting off one of said sea-chests while the other is in use, and a valved pipe leading from said pump to said sea-chests for conducting the water under pressure to the same for cleaning the same out when required; substantially as set forth.

9. A dredge comprising a water-supply pipe-line, a delivery pipe-line for the material to be dredged, said pipe-lines having outhanging swiveled sections, a water-chest connecting the lower ends of said sections and having a jet-nozzle at its discharge end, means forming a chamber 29 above said jet-nozzle, a mangenese-steel contractor 31 seated in the delivery-pipe section directly above said chamber, and means carried at the lower ends of said sections for taking up the material dredged and conducting the same to said chamber 29, combined with a pump connected in said supply pipe-line for pumping the water to itself and then, under pressure, driving the same through said line and into said chest and thence through said nozzle, chamber, contractor and delivery pipe-line, the volume of water under pressure meeting and carrying with it the dredged material; substantially as set forth.

Signed at New York city, in the county of New York and State of New York, this 28th day of March, A. D. 1906.

LEVIN S. PARKER.

Witnesses:
CHAS. C. GILL,
ARTHUR MARION.