

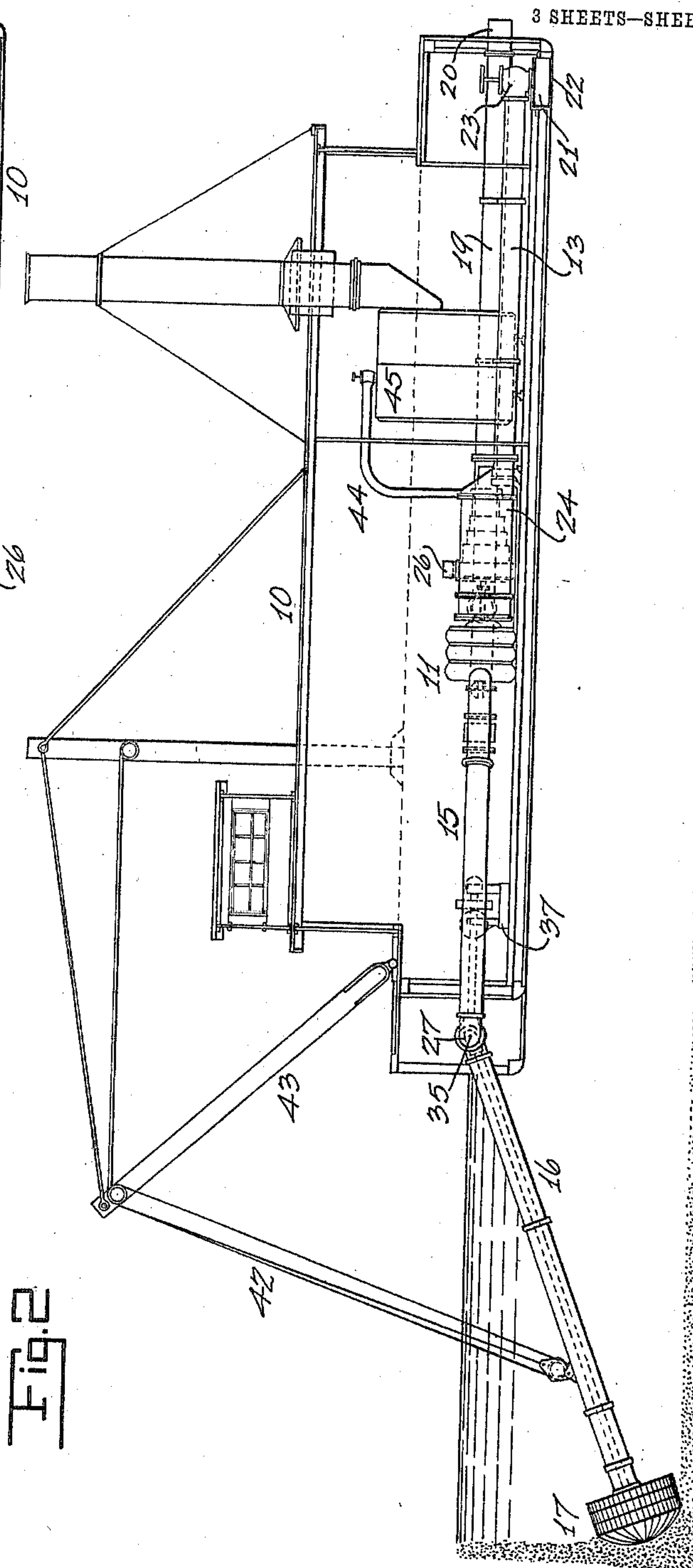
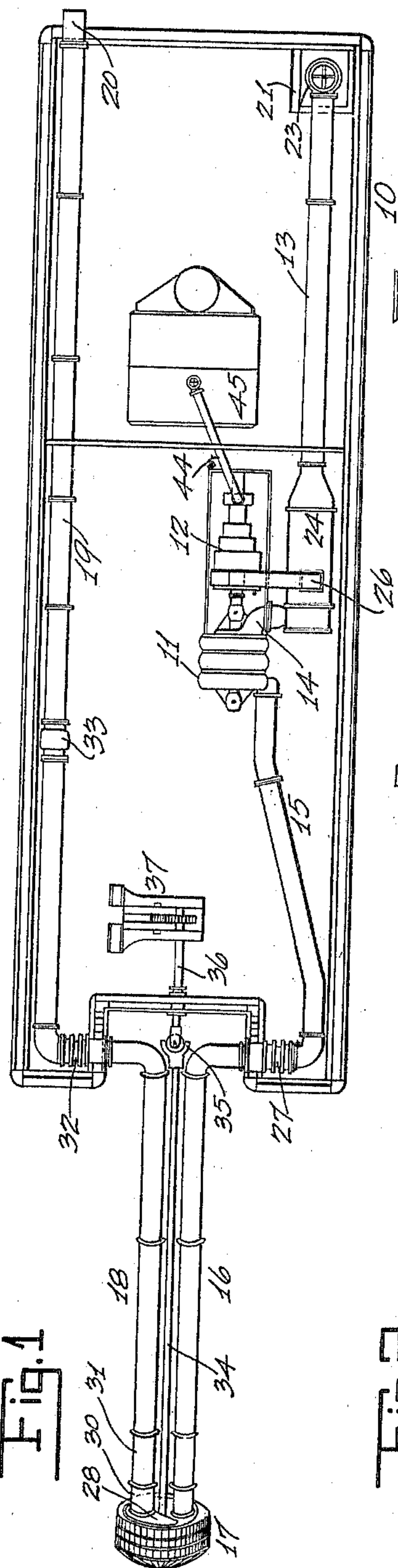
No. 821,669.

PATENTED MAY 29, 1906.

L. S. PARKER.  
DREDGE.

APPLICATION FILED FEB. 21, 1906.

3 SHEETS—SHEET :



Witnesses  
L. R. Compton  
R. A. Wolff

Levin S. Parker Inventor  
By his Attorney Chas. C. Gill

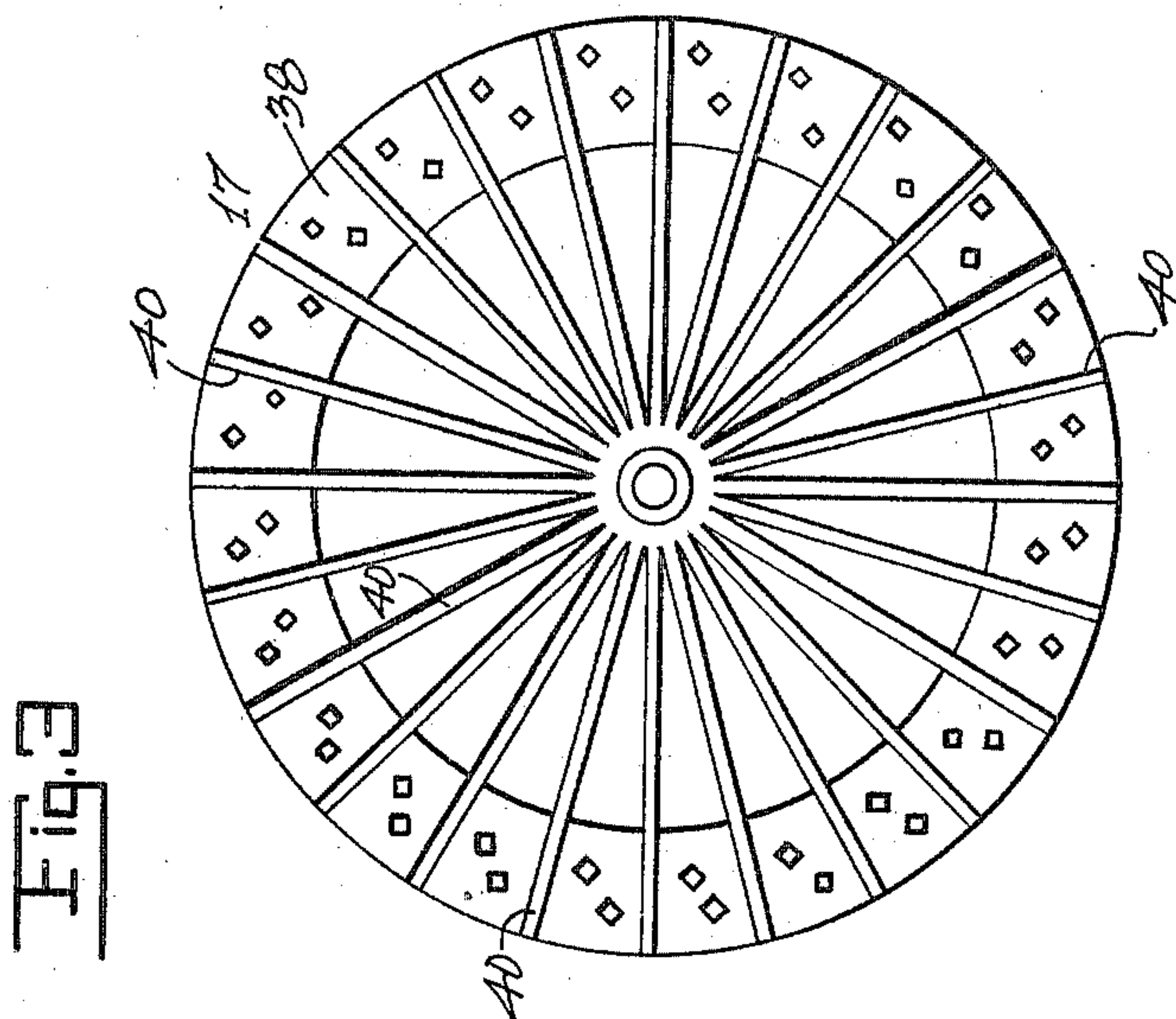
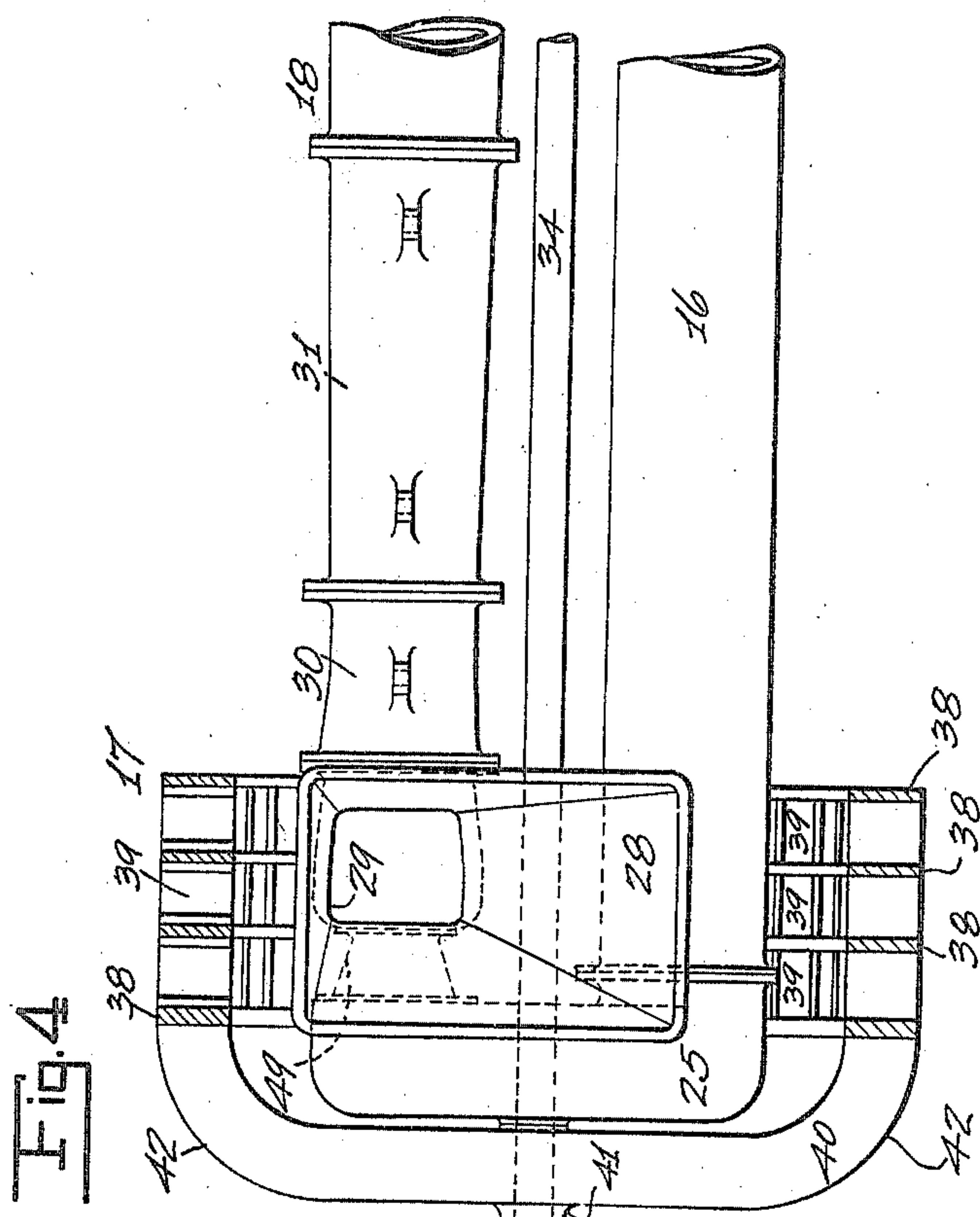
No. 821,669.

PATENTED MAY 29, 1906.

L. S. PARKER.  
DREDGE.

APPLICATION FILED FEB. 21, 1906.

3 SHEETS—SHEET 2.



Witnesses  
L. R. Compton  
R. A. Wolff.

Inventor  
Levin S. Parker,  
By his Attorney Chas. C. Gill



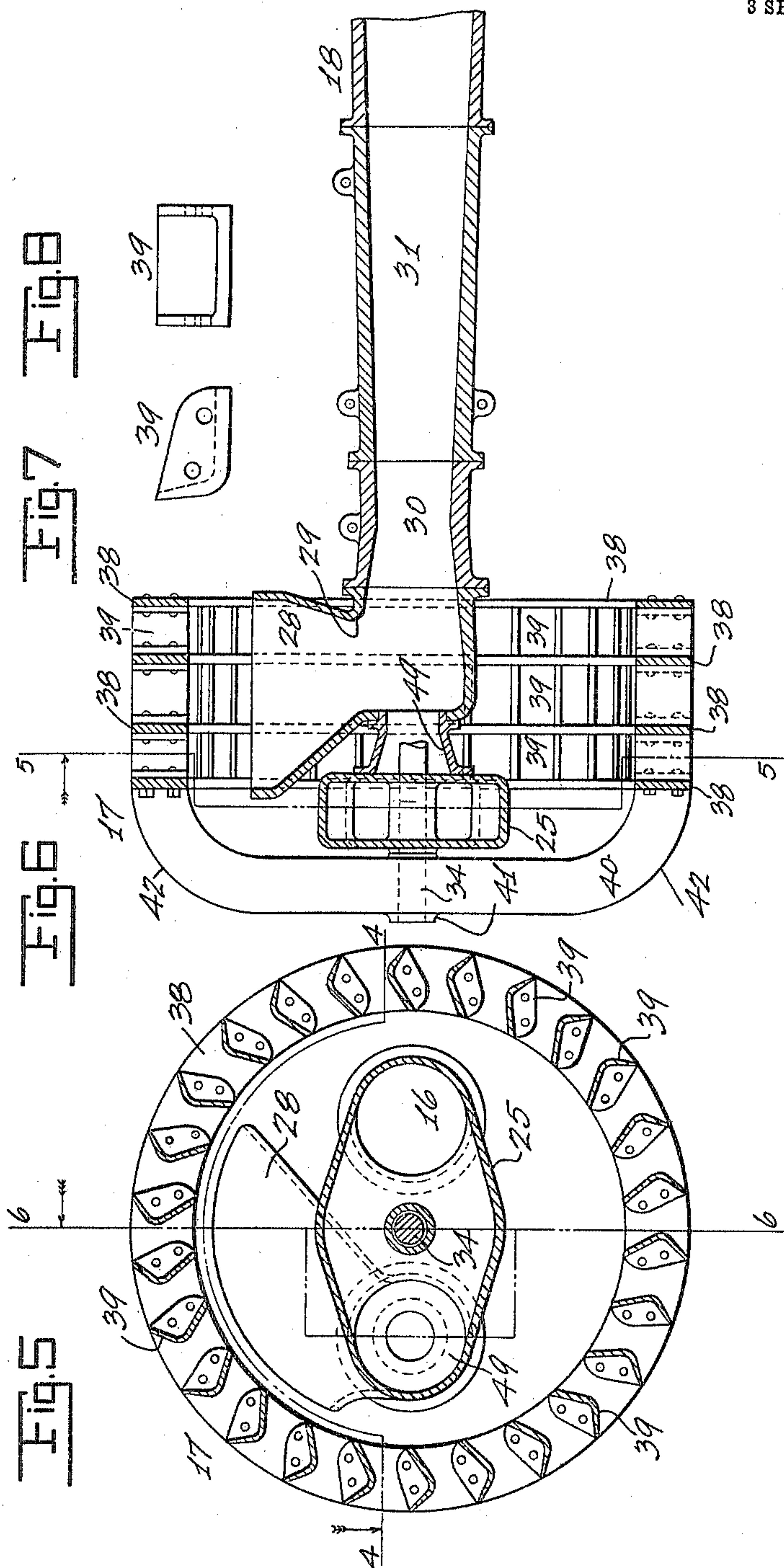
No. 821,669.

PATENTED MAY 29, 1906.

L. S. PARKER.  
DREDGE.

APPLICATION FILED FEB. 21, 1906.

3 SHEETS—SHEET 3.



Witnesses  
L. R. Compton  
R. A. Woff

Levin S. Parker, Inventor  
By his Attorney Chas. C. Gill



# 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. 821,669.

Specification of Letters Patent.

Patented May 29, 1906.

Application filed February 21, 1906. Serial No. 302,158.

*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 produce a highly-efficient dredge whereby sand and gravel may be removed from the bottom of a river or channel and delivered to the shore or other point in a steady and 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 rotator to be lowered into contact with 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 the chamber about said rotator and then ascend through said delivery-pipe, carrying with it to the pontoon pipe-line the sand, gravel, and other material loosened up and deposited by said rotator into the path of the water flowing from the supply into said delivery pipe.

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

Figure 1 is a longitudinal plan view of a dredge equipped with my invention, the deck of the dredge being omitted. Fig. 2 is a side elevation of same, the side of the hull being omitted for the purpose of disclosing the dredge mechanism. Fig. 3 is an enlarged detached end view of the rotator. Fig. 4 is a top or plan view of the adjoining outer end portions of the supply and delivery pipes with the rotator shown in section. Fig. 5 is a vertical section of same on the dotted line 5 5 of Fig. 6. Fig. 6 is a longitudinal vertical section

of same on the dotted line 6 6 of Fig. 5. Fig. 7 is a detached end view of one of the buckets of the rotator, and Fig. 8 is a front projection of same.

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 rotator at the lower end of said outboard discharge-pipe section; 18, the upcast-section of the delivery-pipe leading from said rotator, 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 rotator 17 and supplying water under pressure to the chamber thereat as the "supply-pipe" and the entire line of pipe leading from said chamber 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 a sea-chest 21 opening into the river or other body of water and protected by a perforated plate or strainer 22, and said end of said pipe-section is provided with a suitable shut-off valve 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 rotator 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 the outer end of said section 16 may be raised and lowered at will.

The lower end of the outboard pipe-section 16 is connected with and delivers into a water-chest 25, Figs. 4, 5, and 6, and the like end of the upcast pipe-section 18 has secured upon it a hopper 28, whose lower part constitutes a portion of said section 18, Fig. 6, and whose upper part has flaring walls which converge downwardly and inwardly to a throat 29, through which the sand, gravel, and other material delivered to the hopper by the rotator 17 fall into said pipe-section 18. The water-chest 25 is connected by a nozzle 49 with the lower part of the hopper 28 or end of pipe-section 18 below the throat 29, and the water from said chest is by said nozzle delivered to the pipe-section 18 in the form of a jet, which acts directly against the material descending through the throat 29.

Adjacent to the hopper 28 the upcast-pipe 18 has a section 30 of contracted bore and which I term a "contractor," Fig. 6, and adjacent to this contractor 30 said pipe 18 has a section 31, which, commencing at its lower end, has a bore which gradually expands from the contractor 30 to the general diameter of the bore of the pipe 18, and this section 31 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 32 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 33, 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.

Intermediate the overhanging pipe-sections 16 18 I mount a shaft 34, whose lower end is journaled in a sleeve formed in the water-chest 25 and has secured to it, beyond said chest, the rotator 17, which is actuated by said shaft. The upper end of the shaft 34 is connected by a universal or ball-and-socket coupling 35 with a shaft 36, which is driven by a suitable engine or motor 37 and imparts motion to the shaft 34 for actuating the rotator 17.

The rotator 17 is in the form of a hollow circular frame or wheel housing and adapted to rotate around the hopper 28 and water-chest 25 at a right angle to the longitudinal line of the pipe-sections 16 18, and said rotator 17 comprises a series of corresponding vertically-disposed rings 38, spaced apart and having secured between them the series

of buckets 39, which during the rotation of said rotator are adapted to fill themselves with the material with which they pass into contact at the lower side of the wheel and elevate the same to the upper side thereof and dump, due to their then inclination, said material thus elevated into the hopper 28, whence said material will by gravity descend through the throat 29 into the path of the jet issuing from the nozzle 49. The buckets 39 may be of any convenient form and construction, but are preferably in the outline of scoops, as shown, and as may be seen from Fig. 6 all of the buckets 39 during the rotation of the wheel pass over the hopper 28, whose upper edge, as shown in Fig. 5, is on the arc of a circle and somewhat extended, so as to allow the buckets 39 every opportunity for depositing the material elevated by them into said hopper. Upon the outer side of the outer ring 38 is provided a series of radial blades 40, extending from a hub 41, through which the shaft 34 passes and within which the end of said shaft is secured. The blades 40 radiate from the hub 41 to the outer ring 38 and are rounded at their outer portions, as at 42, so as to enable them to conveniently and properly bore into the material to be excavated, as approximately illustrated in Fig. 2.

The rotator 17 thus comprises the rings 38, buckets 39, and blades 40, the latter being in the form of a rosette adapted to bore into and loosen the sand and gravel and the buckets being adapted to receive such sand and gravel and elevate the same to the hopper 28, into which such material falls by gravity. The rings 38 are open at their center, so that they may pass upon the hopper 28 and adjoining ends of the pipes 16 18, and also so that the sand and gravel loosened up by the blades 40 may enter within the inner outline of said rings and be caught by the buckets 39 during the motion of the rotator 17. The buckets 39 may thus gather the material to be dredged, both at the lower side of the rotator 17 and also within the inner outline of the rings 38. The blades 40 are separated by open spaces through which the sand and gravel loosened up by them may pass to the space defined by the inner periphery of the rotator.

The overhanging pipe-sections 16 18, shaft 34, and rotator 17 may be raised and lowered at will, due to the swivel-joints 27 32 and ball-and-socket joint 35, by means of a suitable block-and-fall rigging 42, supported by a derrick 43.

The engine or motor 12 takes its steam through a pipe 44 from the boiler 45.

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 to be excavated is loosened up by the blades 40 of the rotator 17 and deliv-



ered by the buckets 39 of said rotator into the hopper 28, through which said material falls by gravity into the lower end of the delivery pipe-line for excavated material. 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 49 and by the lower end of the hopper 28 into the contractor 30 and expander 31, and thence through the main delivery-pipe-line sections 18 19 to the pontoon connection 20. The material delivered to the hopper 28 by the buckets 39 falls into the path of the jet issuing from the nozzle 49 and is carried into the contractor 30, where the sand becomes thoroughly mixed with the water and is carried out therefrom in suspension to the expander 31, 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 31 the same velocity in the water is maintained. The delivery of the supply-water under pressure by the pump 11 to the nozzle 49 is constant, and hence during the operation of the rotator 17 there will be a constant flow of the dredged material and water up through the delivery-pipe sections 18 19 to the pontoon pipe-line, and, as will be understood, all of the dredged material is carried through a pipe which is independent of the pump 11 and none of said material passes into contact with the parts of said pump. In the operation of the dredge only enough water is taken in at the throat 29 of the hopper 28 to enable the sand to slide to the jet emerging from the nozzle 49, and it is not my purpose to utilize water coming through the hopper 38 for conveying the dredged material through the delivery pipe-line.

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 dredged, a water-chest connecting adjacent ends of said pipe-lines, a hopper adjacent to said water-chest to receive the material to be carried away, and means adapted to elevate said material to said hopper, combined with a pump connected in said supply pipe-line for pumping the water to itself and then, under pressure, driving the water through said line and into said chest and thence through said delivery pipe-line, the volume of water under pressure passing be-

low said hopper and carrying with it the material descending through the same; substantially as set forth.

2. A dredge comprising a water-supply pipe-line, a delivery-pipe for the material dredged, a water-chest connecting adjacent ends of said pipe-lines, a hopper adjacent to said water-chest to receive the material to be carried away, and means adapted to elevate said material to said hopper, a jet-nozzle being formed at the outlet end of said chest to direct the water below and by the throat of said hopper, combined with a pump connected in said supply pipe-line for pumping the water to itself and then, under pressure, driving the water through said line and into said chest and thence through said delivery pipe-line, the volume of water under pressure passing below said hopper and carrying with it the material descending through the same; substantially as set forth.

3. A dredge comprising a water-supply pipe-line, a delivery pipe-line for the material dredged, a water-chest connecting adjacent ends of said pipe-lines, a hopper adjacent to said water-chest to receive the material to be carried away, and means adapted to elevate said material to said hopper, a jet-nozzle being formed at the outlet end of said chest to direct the water below and by the throat of said hopper, and said delivery-pipe beyond said nozzle having a contracted bore, whence the bore of said pipe expands to the general diameter of the main bore through said pipe, combined with a pump connected in said supply pipe-line for pumping the water to itself and then, under pressure, driving the water through said line and into said chest and thence through said delivery pipe-line, the volume of water under pressure passing below said hopper and carrying with it the material descending through the same; substantially as set forth.

4. A dredge comprising a water-supply pipe-line, a delivery pipe-line for the material dredged, a water-chest connecting adjacent ends of said pipe-lines, a hopper adjacent to said water-chest to receive the material to be carried away, a rotator having buckets adapted to elevate said material and deposit the same into said hopper, and means for actuating said rotator, combined with a pump connected in said supply pipe-line for pumping the water to itself and then, under pressure, driving the water through said line and into said chest and thence through said delivery pipe-line, the volume of water under pressure passing below said hopper and carrying with it the material descending through the same; substantially as set forth.

5. A dredge comprising a water-supply pipe-line, a delivery pipe-line for the material dredged, a water-chest connecting adjacent ends of said pipe-lines, a hopper adjacent to



said water-chest to receive the material to be carried away, a rotator having buckets adapted to elevate said material and deposit the same into said hopper, and means for actuating said rotator, a jet-nozzle being formed at the outlet from said chest to direct the water below and by the throat of said hopper, combined with a pump connected in said supply pipe-line for pumping the water to itself and then, under pressure, driving the water through said line and into said chest and thence through said delivery pipe-line, the volume of water under pressure passing below said hopper and carrying with it the material descending through the same; substantially as set forth.

6. A dredge comprising a water-supply pipe-line, a delivery pipe-line for the material dredged, a water-chest connecting adjacent ends of said pipe-lines, a hopper adjacent to said water-chest to receive the material to be carried away, a rotator having buckets adapted to elevate said material and deposit the same into said hopper, and means for actuating said rotator, a jet-nozzle being formed at the outlet from said chest to direct the water below and by the throat of said hopper, and said delivery-pipe beyond said nozzle having a contracted bore, whence the bore of said pipe expands to the general diameter of the main bore through said pipe, combined with a pump connected in said supply pipe-line for pumping the water to itself and then, under pressure, driving the water through said line and into said chest and thence through said delivery pipe-line, the volume of water under pressure passing below said hopper and carrying with it the material descending through the same; substantially as set forth.

7. A dredge comprising a water-supply pipe-line, a delivery pipe-line for the material dredged, a water-chest connecting adjacent ends of said pipe-lines, a hopper adjacent to said water-chest to receive the material to be carried away, a rotator or open wheel encompassing said hopper and comprising the series of buckets to elevate and deposit said material into said hopper and, on its outer side, the series of blades adapted to loosen up the sand and the like preparatory to the same being taken by said buckets, and means for actuating said rotator, a jet-nozzle being formed at the outlet from said chest to direct the water below and by the throat of said hopper, combined with a pump connected in said supply pipe-line for pumping the water to itself and then, under pressure, driving the water through said line and into said chest and thence through said delivery pipe-line, the volume of water under pressure passing below said hopper and carrying with it the material descending through the same; substantially as set forth.

8. A dredge comprising a water-supply pipe-line, a delivery pipe-line for the material dredged, a water-chest connecting adjacent ends of said pipe-lines, a hopper adjacent to said water-chest to receive the material to be carried away, a rotator or open wheel encompassing said hopper and comprising the series of buckets to elevate and deposit said material into said hopper and, on its outer side, the series of blades adapted to loosen up the sand and the like preparatory to the same being taken by said buckets, and means for actuating said rotator, a jet-nozzle being formed at the outlet from said chest to direct the water below and by the throat of said hopper, and said delivery-pipe beyond said nozzle having a contracted bore, combined with a pump connected in said supply pipe-line for pumping the water to itself and then, under pressure, driving the water through said line and into said chest and thence through said delivery pipe-line, the volume of water under pressure passing below said hopper and carrying with it the material descending through the same; substantially as set forth.

9. A dredge comprising a water-supply pipe-line, a delivery pipe-line, a water-chest connecting adjacent ends of said pipe-lines, a hopper adjacent to said water-chest to receive the material to be carried away, a rotator having means to loosen up the material and buckets to deliver the same to said hopper, and means for actuating said rotator, a jet-nozzle being formed at the outlet from said chest to direct the water below and by the throat of said hopper, combined with a centrifugal multistage high-pressure pump connected in said supply pipe-line for pumping the water to itself and then, under pressure, driving the water through said line and into said chest and thence through said delivery pipe-line, the volume of water under pressure passing below said hopper and carrying with it the material descending through the same; substantially as set forth.

10. A dredge comprising a vessel, a water-supply pipe-line having a section mounted on said vessel and an outboard section swiveled thereto, a delivery pipe-line having a section mounted on said vessel and an upcast section swiveled thereto and at its lower end being in communication with said outboard section, a hopper at the lower end of said upcast section, an open rotator encompassing said hopper and having buckets for elevating the material to be carried away and delivering the same to said hopper, a shaft extending between said outboard and upcast pipe-sections and upon the lower end of which said rotator is secured, means on said vessel for driving said shaft, and means on said vessel for raising and lowering the outer ends of said outboard and upcast sections and said



5 shaft with said rotator, combined with a pump connected in said supply pipe-line for driving the supply-water through said line and up through and along said delivery pipe-line, said water passing, under pressure, below the outlet from said hopper and carrying with it the material descending through the same; substantially as set forth.

Signed at New York city, in the county of New York and State of New York, this 20th 10 day of February, A. D. 1906.

LEVIN S. PARKER.

Witnesses:

CHAS. C. GILL,  
ARTHUR MARION.