

W. T. DONNELLY.
FLOATING DRY DOCK.

APPLICATION FILED FEB. 19, 1912. RENEWED DEC. 11, 1912.

1,052,225.

Patented Feb. 4, 1913.

3 SHEETS—SHEET 1.

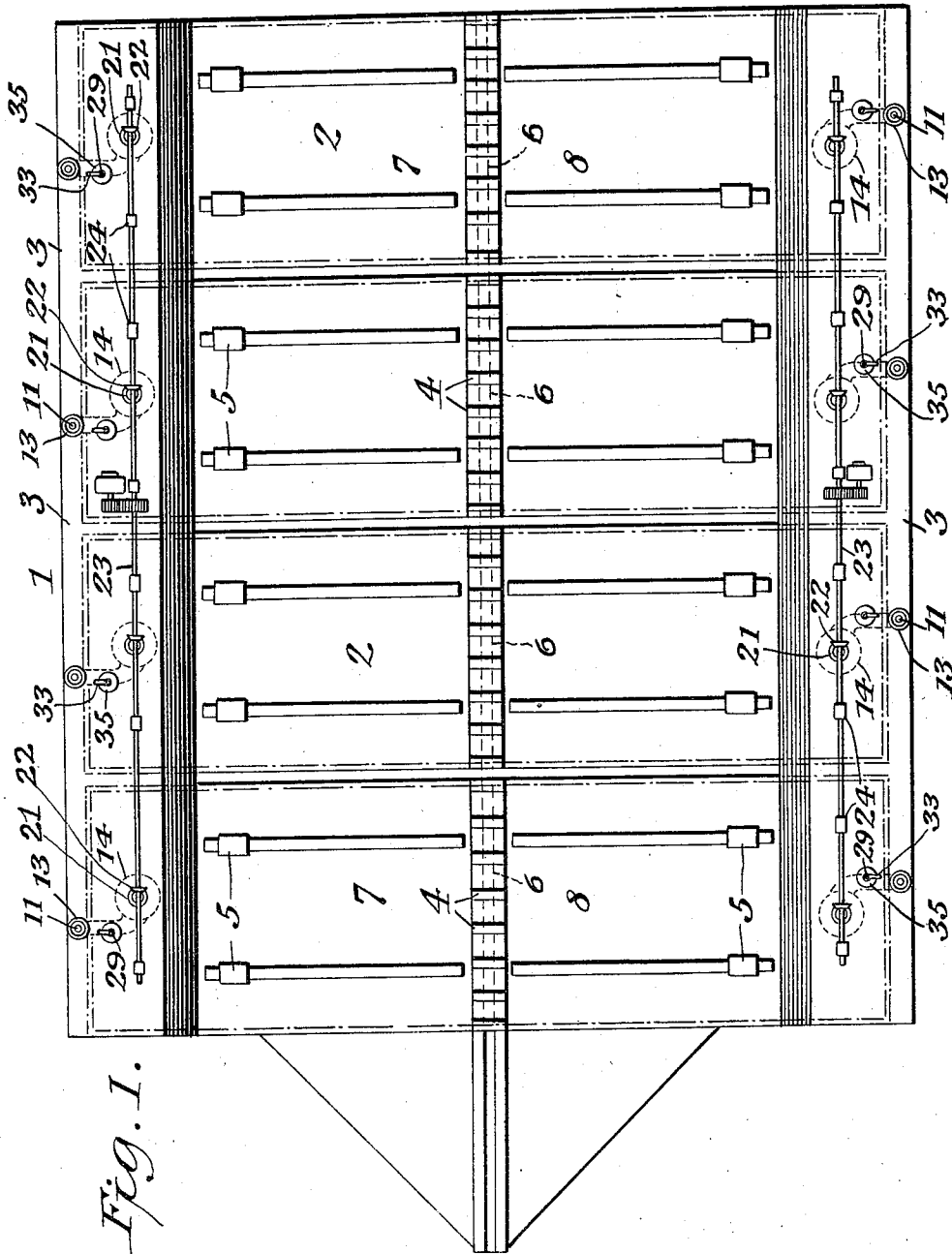


Fig. 1.

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Inventor
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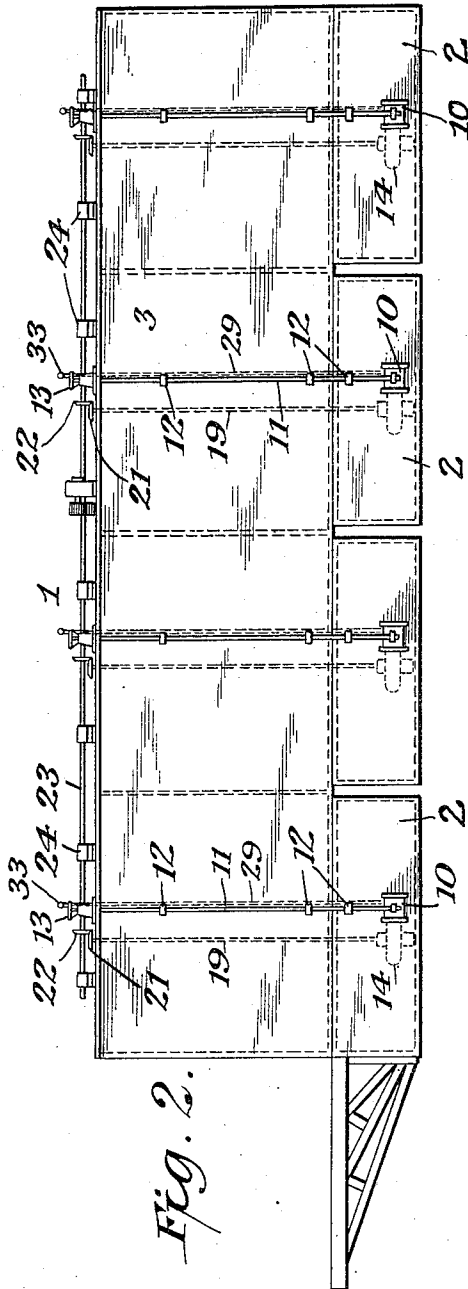


Fig. 2.

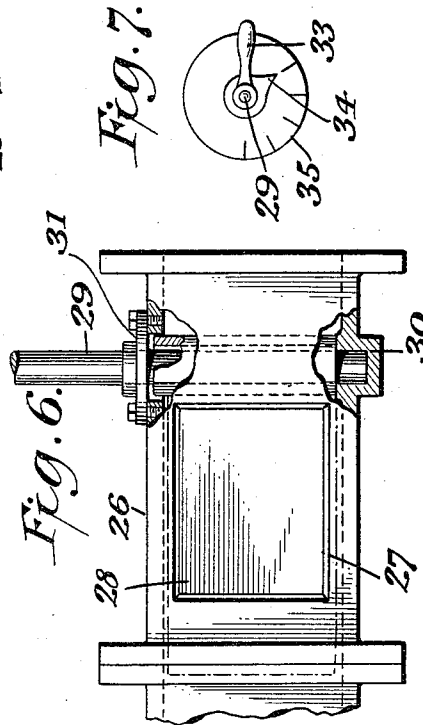


Fig. 6.

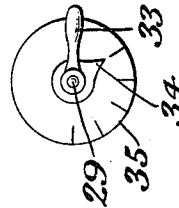


Fig. 7.

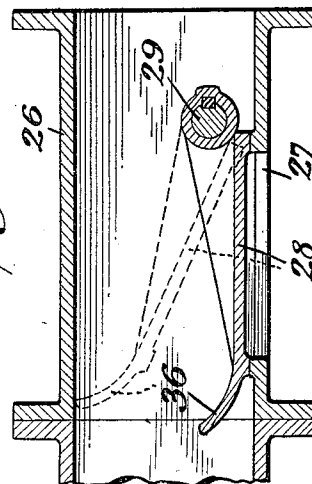


Fig. 5.

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3 SHEETS—SHEET 3.

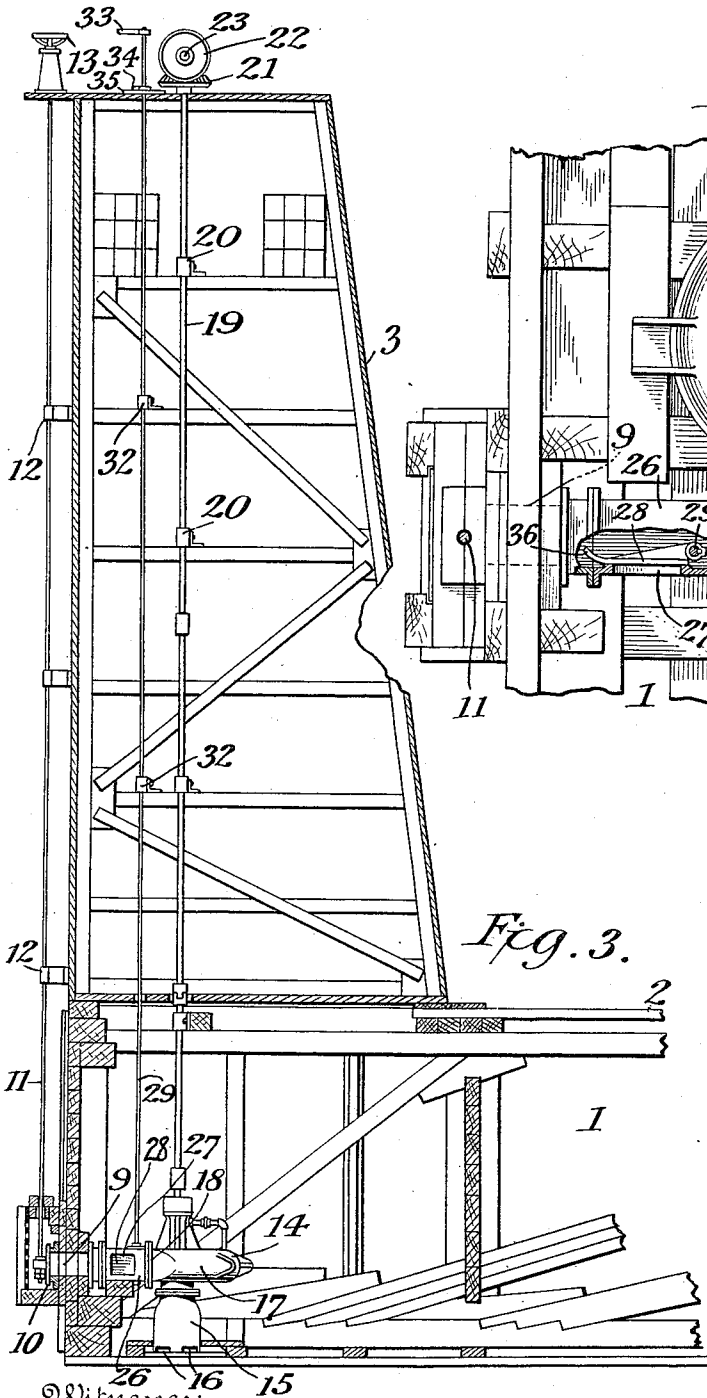


Fig. 3.

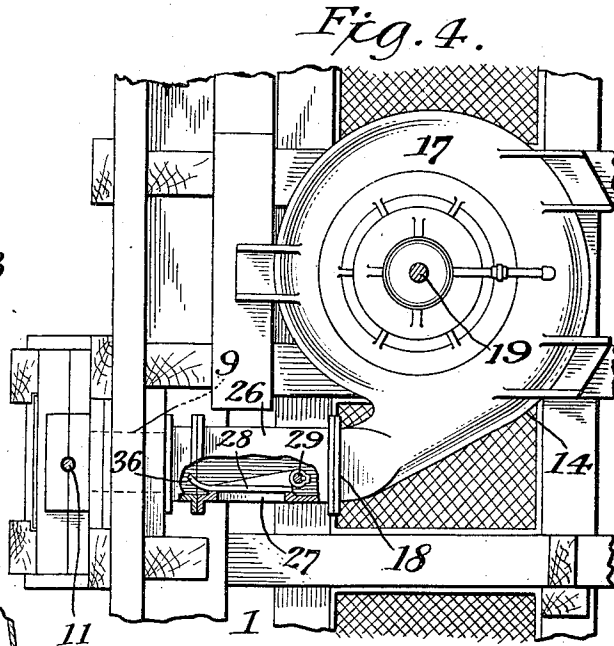


Fig. 4.

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UNITED STATES PATENT OFFICE.

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FLOATING DRY-DOCK.

1,052,225.

Specification of Letters Patent.

Patented Feb. 4, 1913.

Application filed February 19, 1912, Serial No. 678,440. Renewed December 11, 1912. Serial No. 736,235.

To all whom it may concern:

Be it known that I, WILLIAM THOMAS DONNELLY, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Floating Dry-Docks, of which the following is a specification.

My invention relates to improvements in floating dry docks.

In the floating dry docks which I have most recently designed and constructed I have employed centrifugal pumps in the water compartments in communication with the combined inlets and outlets of said compartments and the docks are lowered by opening the gates of the combined inlets and outlets and allowing water to pass through the pumps into the compartments and are raised by starting the pumps and forcing the water out of the compartments through said pumps. While the employment of the above mentioned means has greatly simplified the operation of raising and lowering floating dry docks, by obviating the necessity for the employment of complicated machinery and a great number of men, yet I have found that the blades of the pumps interfere with the introduction of water through the pumps and that the time required to lower floating dry docks can be greatly lessened by admitting the water directly into the dock; that is, by causing it to be admitted into the compartments of the dock without passing through the pumps.

My invention therefore has for its object to provide valves, intermediate the combined inlets and outlets of the compartments of the dock and the centrifugal pumps therein, which are automatically and manually operable to interrupt communication between the combined inlets and outlets of the compartments and the pumps therein and simultaneously establish direct communication between the combined inlets and outlets and the compartments, so as to admit water directly into the compartments of the dock; that is, without passing through the pumps, and which are automatically and manually operable to establish communication between the combined inlets and outlets of the compartments and the pumps therein and simultaneously interrupt communication between the combined inlets and outlets and

the compartments, so as to cause the water to be exhausted from the compartments, by the pumps when they are started. By means of these valves, operable as above described, water can be admitted into the compartments of the dock in the minimum length of time and thus lower the dock in the minimum length of time and water is allowed to pass through the pumps only outwardly from the compartments.

It has for a further object to provide means whereby the position of the valves and the action of the pumps can, at all times, be accurately known.

In the drawings: Figure 1 is a plan view of a floating dry dock having my invention applied. Fig. 2, a side view thereof. Fig. 3, a transverse vertical sectional view, on an enlarged scale and partly in section, of a portion of a floating dry dock having my invention applied. Fig. 4, a fragmentary plan view, on an enlarged scale, of a portion of a floating dry dock having my invention applied. Fig. 5, a sectional view, on an enlarged scale, of one of the pipes having the automatically and manually operable valves therein. Fig. 6, a side view thereof partly broken away. Fig. 7, a detail plan view of one of the dials, the upper end of one of the shafts for operating the pump valve, the handle for operating said valve and the dial finger.

Referring to the drawings illustrating my invention in which like reference characters designate corresponding parts, 1 designates the floating dry dock which, as shown in the accompanying drawings, comprises a plurality of hollow pontoons 2 connected at their ends by hollow sides or wings 3 secured upon their decks in any suitable manner.

Keel blocks 4 and bilge blocks 5 are provided upon the decks of the pontoons for supporting a vessel thereon. Each pontoon is divided interiorly, by a transverse watertight bulkhead 6 into two compartments 7 and 8. In the end walls the pontoons are provided with combined inlet and outlet openings 9 opened and closed by gates 10 raised and lowered by rods 11 mounted in brackets 12 on the sides or wings, the lower ends of said rods being secured to the gates and the upper ends thereof being screw-threaded and having hand wheels 13 thereon for operating them.

In each compartment of the pontoons is mounted a centrifugal pump 14, the base or foot 15 of which is provided with openings 16 serving as inlets to the pump from its compartment and the body 17 thereof is provided with an outlet opening 18 therefrom. The wheels of the pumps are secured on the lower ends of vertical shafts 19 mounted in bearings 20 on the wings and having bevel gears 21 on their upper ends meshing with bevel gears 22 on horizontal shafts 23 mounted in bearings 24 on the tops of the sides or wings and driven by any suitable power, for instance, electricity or compressed air, thereby affording means for driving all the pumps on each side of the dock at once.

The outlet 18 of each pump is connected with the combined inlet and outlet of its compartment by a pipe 26 which is rectangular in transverse cross-section and is provided with a lateral outlet opening 27 therefrom into its compartment. A valve 28 is provided within each pipe 26 and keyed upon the lower end of a vertical shaft 29 extending into said pipe and mounted in bearings 30 and 31 therein and bearings 32 on the sides or wings, the upper end of said shaft being provided with a handle 33 to afford means whereby it can be manually operated and a finger 34 adapted to be moved over the face of a dial 35 when the shaft 29 is operated to afford means whereby the position of the valve can be accurately ascertained. The valve 28 in each pipe 26 is provided with a laterally extending portion 36 adapted to receive the force of the water admitted into the combined inlet and outlet opening and automatically operate the valve to open the outlet 27 in the pipe and simultaneously close the outlet 18 of the pump thereby admitting the water directly into the compartment through the outlet 27, and the valve 28 is automatically operated by the force of the water exhausted through the pump, to open the outlet 18 from the pump and simultaneously close the outlet 27 in the pipe 26.

It being assumed that the dock is raised and ready for sinking and the keel and bilge blocks are in the proper position to receive the vessel, the operation of handling a vessel is as follows: If desired to operate the valves 28 manually they are turned by means of the handles 33 to open the outlets 27 in the pipes 26 and simultaneously close the outlets 18 of the pumps and the gates are then opened, or the gates may first be opened on both sides of the dock and the valves will be automatically operated, by the force of the water admitted through the combined inlets and outlets against the laterally extending portions 36 to open the outlets 27 in the pipes and simultaneously close the outlets 18 of the pumps. With

the valves 28 in the position just described the water admitted through the combined inlets and outlets will pass directly into the compartments, without passing through the pumps, and if the dock does not sink level, the gates are adjusted on the low side to closed or partially closed position until it levels up. When the dock has been lowered to the required depth, the gates are closed, the vessel centered in the dock, the valves 28 operated, manually if desired, to open the outlets 18 of the pumps and simultaneously close the outlets 27 in the pipes and the gates then opened on both sides of the dock, or the pumps first started and the gates then opened on both sides of the dock, whereupon the force of the water exhausted through the pumps will open the outlets 18 thereof and simultaneously close the outlets 27 in the pipes 26 and the water will be discharged from each compartment of the pontoons causing the dock to rise and if it does not rise level the gates are adjusted on the high side to closed or partially closed position until it levels up. When the dock has raised sufficiently to bring the hull of the ship out of the water the gates are closed.

I do not wish to be understood as limiting myself to the details of construction and arrangement as herein described and illustrated, as it is manifest that variations and modifications may be made in the features of construction and arrangement in the adaptation of the device to various conditions of use without departing from the spirit and scope of my invention and improvements. I therefore reserve the right to all such variations and modifications as properly fall within the scope of my invention and the terms of the following claims.

I claim:

1. In a floating dry dock having water compartments, combined inlets and outlets for said compartments, gates for said combined inlets and outlets, centrifugal pumps in said compartments in communication with said combined inlets and outlets and valves interposed between the combined inlets and outlets of said compartments and their pumps, said valves being operatable to admit water directly into the compartments and being operatable automatically in exhausting water from the compartments, substantially as described.

2. In a floating dry dock having water compartments, combined water inlets and outlets for said compartments, gates for said combined inlets and outlets, centrifugal pumps in said compartments communicating with said combined inlets and outlets and valves interposed between the combined inlets and outlets of said compartments and their pumps and operatable automatically to admit water directly into the compart-

ments and to exhaust water from the compartments through their pumps, substantially as described.

3. In a floating dry dock having water compartments, combined water inlets and outlets for said compartments, gates for said combined inlets and outlets, centrifugal pumps in said compartments communicating with said combined inlets and outlets and valves interposed between the combined inlets and outlets of said compartments and their pumps and operatable automatically and manually to admit water directly into the compartments and to exhaust water from the compartments through their pumps, substantially as described.

4. In a floating dry dock having water compartments, combined water inlets and outlets for said compartments, gates for said combined inlets and outlets, centrifugal pumps in said compartments communicating with said combined inlets and outlets and valves having laterally extending portions at their free ends and being interposed between the combined inlets and outlets of said compartments and their pumps and operatable to admit water directly into the compartments and to exhaust water from the compartments through their pumps, substantially as described.

5. In a floating dry dock having water compartments, combined inlets and outlets for said compartments, gates for said combined inlets and outlets, centrifugal pumps in said compartments communicating with said combined inlets and outlets and valves interposed between the combined inlets and outlets of said compartments and their pumps and operatable automatically to establish direct communication between said combined inlets and outlets and said compartments and simultaneously interrupt communication between said combined inlets and outlets and the pumps and operatable automatically to establish communication between said pumps and said combined inlets and outlets and simultaneously interrupt direct communication between said combined inlets and outlets and said compartments, substantially as described.

6. In a floating dry dock having water compartments, combined inlets and outlets for said compartments, gates for said combined inlets and outlets, centrifugal pumps in said compartments communicating with said combined inlets and outlets and valves interposed between the combined inlets and outlets of said compartments and their pumps and operatable automatically and manually to establish direct communication between said combined inlets and outlets and said compartments and simultaneously interrupt communication between said combined inlets and outlets and the pumps and

operatable automatically and manually to establish communication between said pumps and said combined inlets and outlets and simultaneously interrupt direct communication between said combined inlets and outlets and said compartments, substantially as described.

7. In a floating dry dock having water compartments, combined inlets and outlets for said compartments, gates for said combined inlets and outlets, centrifugal pumps in said compartments communicating with said combined inlets and outlets and valves having laterally extending portions at their free ends and being interposed between the combined inlets and outlets of said compartments and their pumps and operatable to establish direct communication between said combined inlets and outlets and said compartments and simultaneously interrupt communication between said combined inlets and outlets and the pumps and operatable to establish communication between said pumps and said combined inlets and outlets and simultaneously interrupt direct communication between said combined inlets and outlets and said compartments, substantially as described.

8. In a floating dry dock having water compartments, combined water inlets and outlets for said compartments, gates for said combined inlets and outlets, centrifugal pumps in said compartments, pipes connecting said inlets and outlets with said pumps and provided with water outlets into said compartments and valves in said pipes operatable automatically to open the combined inlets and outlets in said pipes and simultaneously interrupt communication between said pipes and said pumps and operatable automatically to establish communication between said pumps and said pipes and simultaneously close the outlets in said pipes, substantially as described.

9. In a floating dry dock having water compartments, combined water inlets and outlets for said compartments, gates for said combined inlets and outlets, centrifugal pumps in said compartments, pipes connecting said inlets and outlets with said pumps and provided with water outlets into said compartments and valves in said pipes operatable automatically and manually to open the combined inlets and outlets in said pipes and simultaneously interrupt communication between said pipes and said pumps and operatable automatically and manually to establish communication between said pumps and said pipes and simultaneously close the outlets in said pipes, substantially as described.

10. In a floating dry dock having water compartments, combined water inlets and outlets for said compartments, gates for said combined inlets and outlets, centrifugal

gal pumps in said compartments, pipes connecting said inlets and outlets with said pumps and provided with water outlets into said compartments and valves in said pipes
5 having laterally extending portions at their free ends and being operatable to open the combined inlets and outlets in said pipes and simultaneously interrupt communication between said pipes and said pumps and
10 operatable to establish communication between said pumps and said pipes and simultaneously close the outlets in said pipes, substantially as described.

11. In a floating dry dock having water
15 compartments, combined water inlets and outlets for said compartments, gates for said combined inlets and outlets, centrifugal pumps in said compartments communicating with said combined inlets and outlets,
20 valves interposed between the combined inlets and outlets of said compartments and their pumps and operatable automatically to admit water directly into the compartments and to exhaust water from

the compartments through their pumps and means indicating the position of said valves, substantially as described. 25

12. In a floating dry dock having water compartments, combined water inlets and outlets for said compartments, gates for
30 said combined inlets and outlets, centrifugal pumps in said compartments communicating with said combined inlets and outlets, valves interposed between the combined inlets and outlets of said compartments and their pumps and operatable automatically and manually to admit water directly into the compartments and to exhaust
35 water from the compartments through their pumps and means indicating the position of
40 said valves, substantially as described.

In testimony whereof I have signed my name in the presence of two subscribing witnesses.

WILLIAM THOMAS DONNELLY.

Witnesses:

GEORGE M. EISENBRANY,
GUNNAR ENGSTRAND.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."