No. 610,790. Patented Sept. 13, 1898.

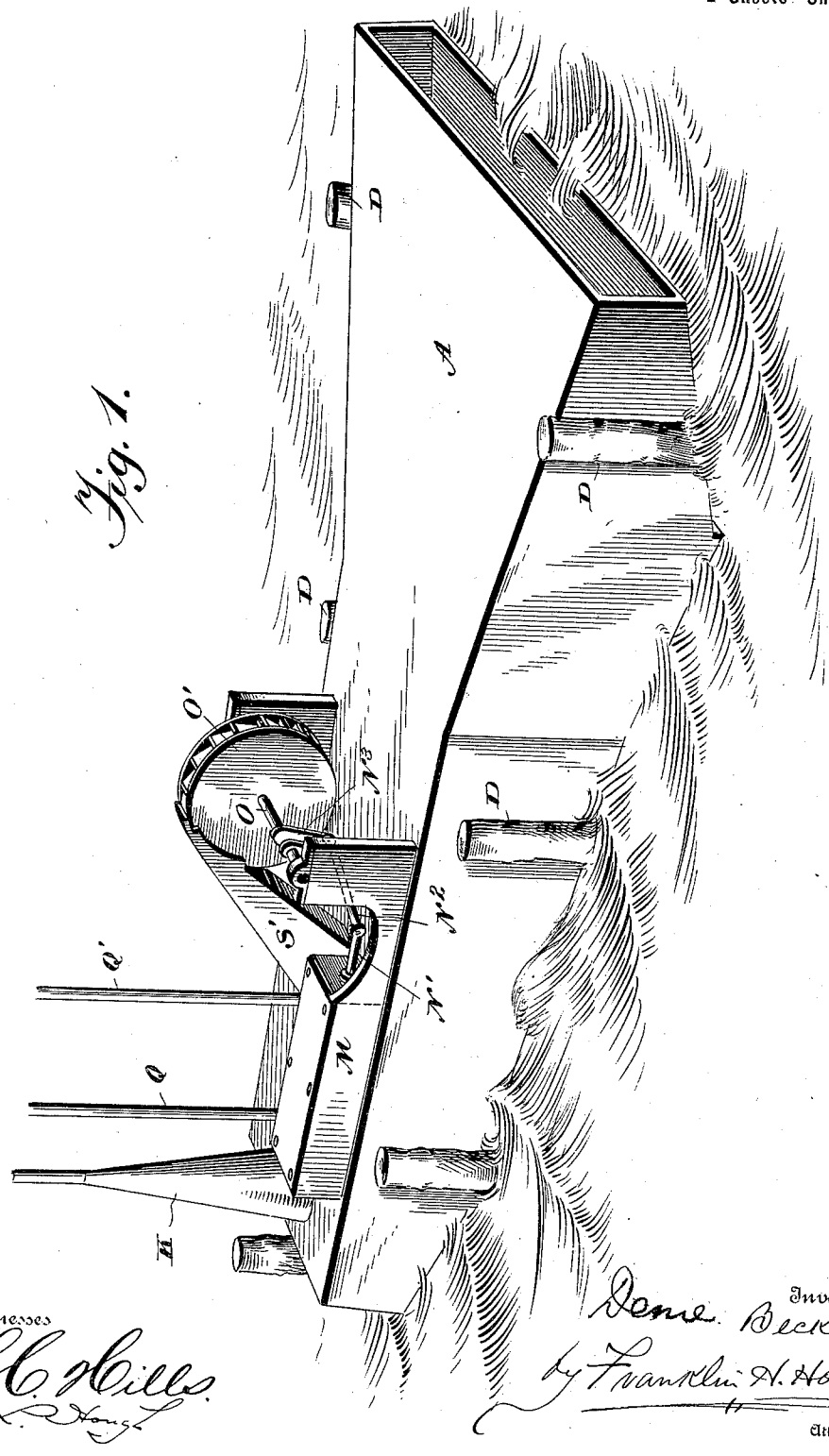
D. BECKERS.

TIDE WATER AIR COMPRESSOR.

(Application filed Oct. 18, 1897.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.



Witnesses
L. C. Hills
A. L. Hough

Inventor
Dane. Beckers,
by Franklin H. Hough
Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 610,790.

Patented Sept. 13, 1898.

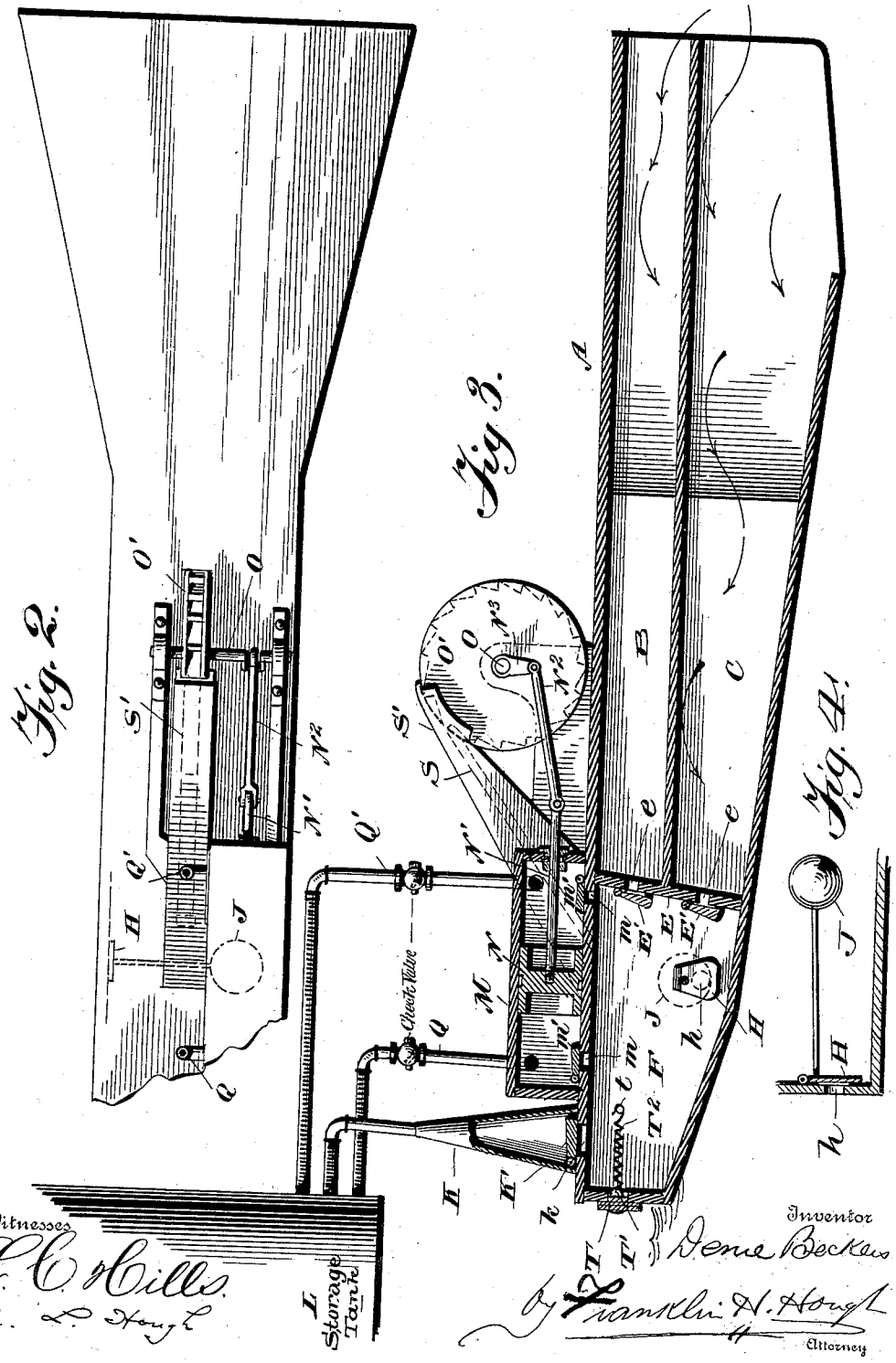
D. BECKERS.

TIDE WATER AIR COMPRESSOR.

(Application filed Oct. 18, 1897.)

(No Model.)

2 Sheets—Sheet 2.



THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

DENIE BECKERS, OF SAN PEDRO, CALIFORNIA.

TIDE-WATER AIR-COMPRESSOR.

SPECIFICATION forming part of Letters Patent No. 610,790, dated September 13, 1898.

Application filed October 18, 1897. Serial No. 655,625. (No model.)

To all whom it may concern:

Be it known that I, DENIE BECKERS, a citizen of the United States, residing at San Pedro, in the county of Los Angeles and State of California, have invented certain new and useful Improvements in Tide-Water Air-Compressors; and I do 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, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in tide-water floats or apparatus for utilizing the force of the waves to compress air for storage purposes; and it consists in the provision of a compartment-float open at one end and into which compartments the waves are designed to travel, forcing within the same air, which is conducted through valve-regulated apertures into a receiving-chamber, from which it is allowed to pass into a storage-tank through suitable communicating pipes.

A further part of the invention resides in the provision of a float which is so arranged that air may be forced into a receiving-chamber by the impact of the waves, the air thus brought under pressure in the receiving-reservoir to actuate a wheel, which in turn operates a plunger working in a cylinder into which the air from the receiving-reservoir is drawn, and thence forced from the cylinder into a storage-tank, where it may be held in readiness for any use for which it may be adapted.

To these ends and to such others as the invention may pertain the same consists, further, in the novel construction, combination, and adaptation of parts, as will be hereinafter more fully described and then specifically defined in appended claims.

The invention is clearly illustrated in the accompanying drawings, which, with the letters of reference marked thereon, form a part of this specification, and in which drawings similar letters of reference indicate like parts throughout the several views, in which—

Figure 1 is a perspective view of my improved apparatus, showing the float on the surface of the water and the mechanism for operating the plunger in the air-cylinder. Fig. 2 is a top plan view of the float. Fig. 3 is a central vertical section longitudinally through the float and air cylinder and valves. Fig. 4 is a detail view of the float-controlled valve.

Reference now being had to the details of the drawings by letter, A designates the casing of the float, which is made up of two compartments B and C, which are separated by a horizontal partition, as shown in Fig. 3 of the drawings. This float, which is preferably of the shape illustrated, may be anchored or suitably held between piles D, as seen in Fig. 1, so arranged as to allow a slight vertical play to the float. Disposed at a suitable location between the upper and lower walls of the float is a substantially vertical partition E, which separates the compartments B and C from the air-reservoir F. In the wall of the said vertical partition E are the apertures *e*, which are controlled by the valves E′, which valves open into the air-reservoir F, there being one aperture above and one below the partition between the compartments or chambers B and C. In one side wall of the reservoir F is an aperture *h*, which is controlled by a valve H, and secured to the said valve H is a float J, being connected to said valve by a rod, as shown clearly in dotted lines in Fig. 2 of the drawings. This valve is adapted to operate when there has been a sufficient quantity of water forced within the air-chamber to cause the float F to open the said valve H and allow the water thus confined to escape.

Mounted on the upper side of the float, near the rear end thereof, is a funnel-shaped pipe K, the under side of which is fitted over an aperture *k*, which aperture is controlled by the valve K′. This pipe is provided to convey the air which may pass through the valve-controlled aperture *k* into the storage-tank L. Mounted in front of the said pipe K and preferably over the reservoir F is the cylinder M, which contains the plunger N, which is connected by a piston-rod N′ with a pitman N^2, which latter is secured to a crank N^3, mounted on the shaft O, to which shaft is keyed the wheel O′. Opening into the said

cylinder are the apertures *m*, and said apertures are controlled by the valves *m'*. These valves open into the said cylinder and are disposed one on each side of the plunger, which is adapted to reciprocate in the cylinder. Leading from the cylinder, near each end of the same, are the pipes Q and Q', which are provided to convey the air from the cylinder to the storage-tank as the air is compressed in one end of the cylinder or the other as the piston works back and forth.

In order to propel the motor-wheel O', a duct S is provided, which is mounted in a suitable casing S' and conveys the air from the reservoir F to the periphery of the said wheel, and thus affords the motive power to operate the said wheel by the impact of the air against or into the pockets disposed about the circumference of the wheel.

At the rear end of the reservoir F is a valve T, which is provided as a safety-valve to allow the escape of the air from said reservoir when it reaches a certain pressure. This valve is seated over an aperture T' and is connected with a spring T^2, which spring is connected to one side of the reservoir, as at *t*. This spring is of such a tension as to cause the valve to be seated, excepting under an excessive pressure.

From the foregoing it will be seen that a float constructed in accordance with my invention will allow the force of the waves when running in a low sea to enter the lower compartment, and thus force the air into the receiving-chamber, or when the waves are running higher to force the air in front of the same in the upper compartment in the receiving-reservoir. Any water which has accumulated in the receiving-reservoir will be allowed to escape through the float-controlled valve, and a constant supply of air under pressure, while the chamber F is filled with air and under pressure, will cause a constant rotation of the wheel O', which will force the air which passes into the cylinder M through the said pipes Q and Q' into the receiving-tank.

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

1. An air-compressing float, comprising a casing having compartment-chambers open at their outer ends, an air-reservoir having valve-controlled, communicating apertures between the same and the said compartments, combined with a valve H and float secured thereto, whereby to allow the escape of the water that may enter the said reservoir as set forth.

2. In combination with a float as described the air-reservoir, the cylinder mounted thereon, valve-controlled apertures communicating between the interior of the said cylinder and the air-reservoir, the plunger working in said cylinder, and the motor-wheel and connections with the said plunger, comprehending the casing S', the duct S therein leading from the said cylinder in the circumference of the wheel, portions of the edges of the said casing extending over the ends of the motor-wheel, as set forth.

3. In combination with the float having the reservoir and compartments as described, the cylinder mounted over the air-reservoir and communicating with the same through valve-controlled apertures, a plunger working in said cylinder, a motor-wheel having offsets or pockets about its circumference, pitman and piston-rod connections between the crank of the said wheel and said plunger, an air-duct leading from the reservoir to a location adjacent to the path of the circumference of the wheel, and the pipes communicating between the said cylinder and the storage-tank, as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

DENIE BECKERS.

Witnesses:

GUSTAV SPITTKOC,

E. C. WELAT.