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C. C. INMAN

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TIDE AND WAVE AIR COMPRESSOR

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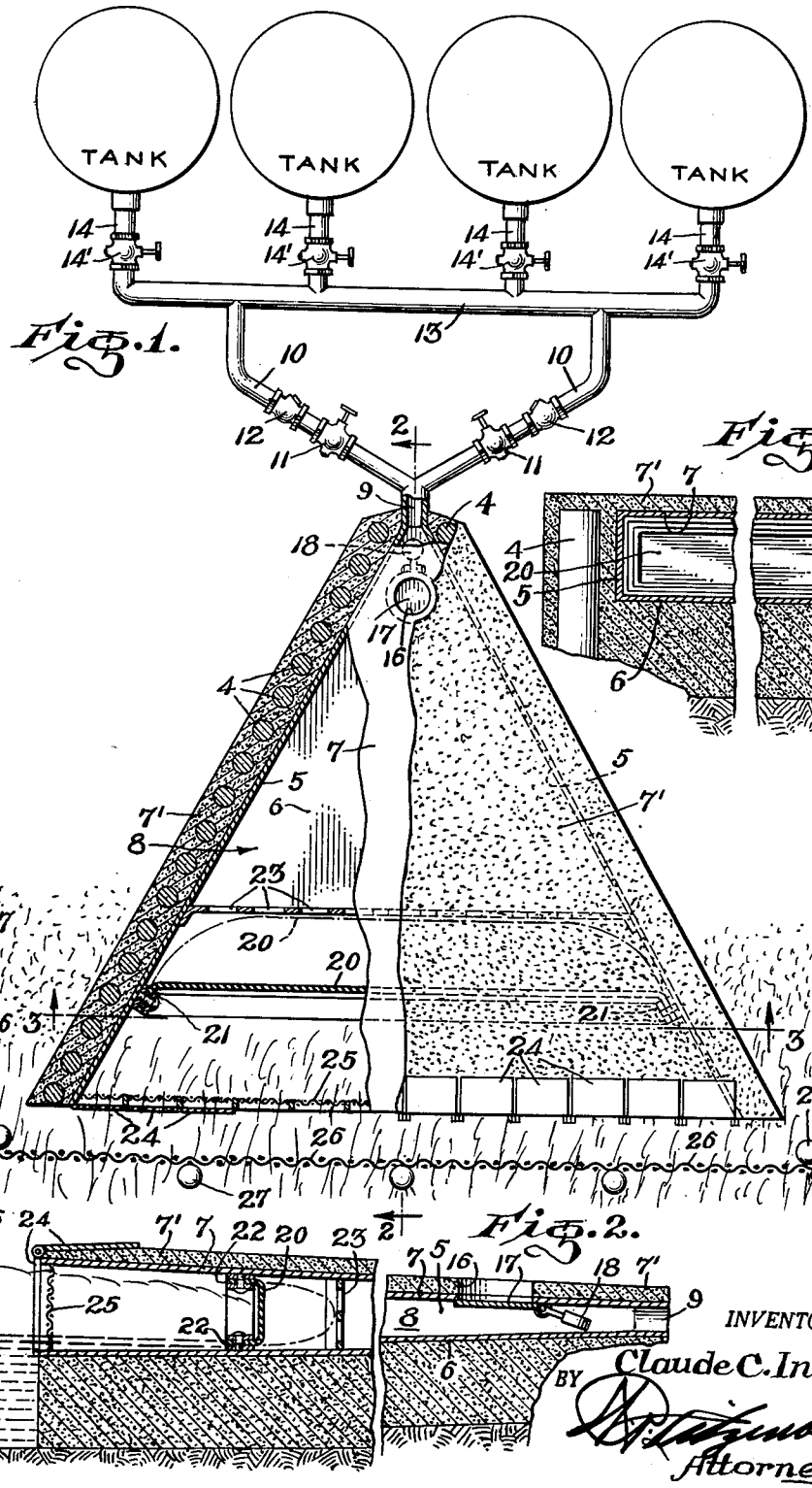


Fig. 1.

Fig. 3.

Fig. 2.

INVENTOR.

Claude C. Inman

BY

Attorney

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TIDE AND WAVE AIR COMPRESSOR

Claude C. Inman, Redondo Beach, Calif.

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4 Claims. (Cl. 230—61)

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This invention relates to tide and wave air compressors, and more particularly to certain improvements therein in which the movements of a body of water to and fro will be utilized to compress air into a container for use where pneumatic or air power is desired.

It is old in the art to make use of floats and the movements of a piston for the purpose of forcing air into a container as the result of the movements of a body of water.

In the present invention, I make use of a heavy structure, strongly anchored in the ground, at the edge of the water, said structure having therein a power chamber of tapering form, with a wide open mouth into which the inflowing water is gathered with a great deal of force, said chamber tapering to a small outlet pipe which leads to storage tanks.

I also make use of a new feature for pumping air into storage tanks, and that is: a flexible diaphragm anchored around its edges in and across a chamber which is open on its side toward the water, whereby as said water enters the chamber it engages and moves said diaphragm inwardly therewith, stretching said diaphragm in such a way that it will force the air ahead of it into a storage tank connected with the small pipe outlet from the small end of the tapering chamber.

In order to explain my invention more fully, I have shown on the accompanying sheet of drawings, one practical embodiment thereof, which I will now describe:

Figure 1 is a plan view of a structure in which is a power chamber of tapering form, with a portion of the top removed and with parts shown in section, and also showing storage tanks in front elevation with pipe connections therefrom to the small end of said chamber;

Figure 2 is a longitudinal sectional view, taken on line 2—2, on Fig. 1, with a portion broken out to reduce the size of the view; and

Figure 3 is a transverse vertical sectional view taken on line 3—3, on Fig. 1, with a part broken out to reduce the size of the view.

Referring now in detail to the drawings, a V-shaped structure is provided with its wide mouth open to the water, said structure being shown as made with piles driven into the earth in two converging rows, as 4, 4, with suitable fillings of stone, concrete or other wall building materials, whereby to provide two strong converging walls, as 5, 5, with bottom or floor, as 6, and with top or ceiling, as 7, and providing an air tight chamber 8 between said converging walls, floor and ceiling.

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At the converging end of said chamber 8, a small pipe 9 is connected, as shown, which connects, in the present showing, with two diverging pipes, as 10, 10, each having therein manually operable valves, as 11, 11, and also having therein check valves, as 12, 12, to prevent back flow, said pipes 10, 10 being connected with a head pipe 13, which in turn is connected by means of four short pipes, as 14, 14, with storage tanks, as shown. Said short pipes 14, 14 are provided with control valves, as 14', 14', as clearly indicated in the drawing.

Said diverging pipes 10, 10, can, of course be provided with any desired valves or connections. In the top or ceiling 7, is shown a vent opening, as 16, with a butterfly or flap valve 17, normally held closed by a weight 18, connected therewith, as seen in Fig. 2. This valve can be opened inwardly by inflowing air or water into the chamber 8, as will be understood.

Across the mouth of the chamber 8, I have provided a sheet of flexible material, designated 20, properly anchored at its opposite sides, as at 21, 21, and also secured at its top and bottom, as at 22, 22, Fig. 2, said material being sufficiently elastic and strong to be expanded inwardly with each inflow of the body of water which moves thereagainst, as indicated in the light broken line, Fig. 1, until it reaches a perforated guard or stop wall 23, to limit the inward movement of said expansible wall, as indicated.

At the mouth of said structure, I have indicated a series of hinged doors, as 24, 24, which can be down, or which can be lifted up and folded back over the top of the ceiling structure, as indicated in Figs. 1 and 2.

A suitable screen, as 25, is stretched across the mouth of said structure to prevent inflow of objects which would injure the flexible wall, or fill up the mouth of the chamber.

An outer screen structure, as 26, with spaced piling 27, is shown for the purpose of guarding the approach to the power structure, as will be understood from the showing made in the drawings.

So far as I am aware, I am the first to provide a permanent, strong structure, made of piling and stone and wall materials and providing a conical shaped chamber having its open mouth exposed to inflowing tide and wave action, whereby the inrushing water, which comes with great force, is corralled and forced into small space with such force that it would be forced a great distance through the small pipe leading up to a storage tank or reservoir with each inrush of tide

or wave, and particularly with heavy wave action.

However, in providing a flexible, strong wall of the character described, across the mouth of this power chamber, said flexible wall is caused to force the air ahead of it, through said outlet pipe, and into the storage tanks, as before described.

I do not limit my invention to the details shown for purposes of explanation, except as I may be limited by the hereto appended claims, forming a part of this specification.

I claim:

1. A tide and wave air compressor including a body structure anchored to the ground and forming a pump chamber having an open mouth toward the water and tapering to a small end, a pipe connection connected with said small end, a reservoir for storing air, a pipe connecting said pipe connection with said reservoir, an elastic fabric forming a wall in and across the open mouth of said pump chamber, whereby to close the entrance into said chamber with said flexible wall, positioned in the way of a body of water moving to and from the same, a check valve in the wall of said chamber to permit inflow of air and to prevent outflow thereof, whereby the movement of water into the mouth of said chamber forces said elastic fabric wall inwardly to force the air in said chamber out through said pipe connection and to said reservoir.

2. In an air compressing apparatus of the character referred to, a permanent structure anchored to the ground at the edge of a body of water and having formed therein a conical chamber having a wide mouth open toward the water, whereby said water intermittently moves into said chamber, said chamber being of tapering form and having a small end, a pipe connected to said small end, a storage tank with which said pipe connects, and a flexible and expansible fabric wall across and within the open mouth of said chamber, anchored around its edges to said structure, whereby to form a movable wall in the mouth of said chamber to be forced inwardly with each inflow of water thereinto, said wall forcing the air therein ahead of it through said pipe to said storage tank.

3. In an air compressing apparatus, in combination: a rigid structure, anchored in the ground, and having therein a tapering chamber having a wide open mouth toward a source of water, and having a small end provided with a pipe connection, a flexible diaphragm wall within and across said mouth, said diaphragm being expansible, whereby inrushing water moves and stretches said diaphragm inwardly and forces air ahead of it through said pipe connection, a storage tank, a pipe connecting said storage tank with said pipe connection, check valve means in said pipe to prevent back flow of air, and check valve means in said chamber wall to permit inflow of air as said diaphragm recedes.

4. An air compressing apparatus as set forth in claim 3 in which a screen is provided at the mouth of said structure to prevent inflow of floating articles.

CLAUDE C. INMAN.

REFERENCES CITED

The following references are of record in the file of this patent:

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