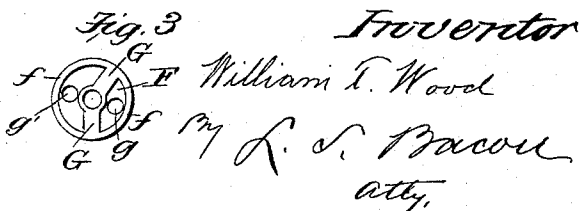
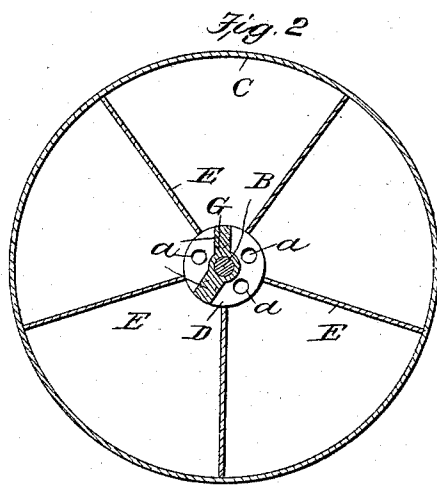
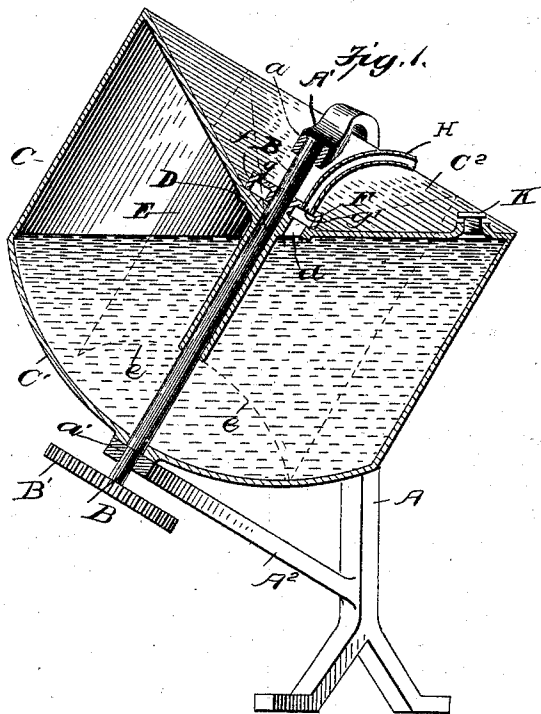


(No Model.)

W. T. WOOD.
HYDROSTATIC AIR COMPRESSOR.

No. 485,853.

Patented Nov. 8, 1892.



Witnesses
J. R. Cornwall,
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att'y.

UNITED STATES PATENT OFFICE.

WILLIAM THOMAS WOOD, OF NASHVILLE, TENNESSEE, ASSIGNOR TO J. C. MCCRORY AND W. P. HOUZE, OF SAME PLACE.

HYDROSTATIC AIR-COMPRESSOR.

SPECIFICATION forming part of Letters Patent No. 485,853, dated November 8, 1892.

Application filed February 6, 1892. Serial No. 420,547. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM THOMAS WOOD, a citizen of the United States, residing at Nashville, in the county of Davidson and State of Tennessee, have invented certain new and useful Improvements in Hydrostatic Air-Compressors; and I do hereby 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.

My invention relates to an improvement in hydrostatic air-compressors; and it consists in the construction and arrangement of parts hereinafter described, and definitely pointed out in the claims.

The object or purpose of this invention is the provision of improved means whereby a body of water or other liquid may be employed or utilized to compress a body of air for creating an air current or blast.

This invention is more particularly adapted for use in connection with gas-making apparatus, which require a constant supply of oxygen.

This object is attained by the construction illustrated in the accompanying drawings, wherein like letters of reference indicate corresponding parts in the several views, and in which—

Figure 1 is a longitudinal vertical section of the device. Fig. 2 is a top plan view showing the cap or cover removed and the cross-bar of the valve in section, and Fig. 3 is a detail view of the valve.

In the drawings, A represents a fixed support having an inclined arm A' on its upper end and an inclined arm A² on or near its lower end of a length greater than the length of the upper arm, so that a line drawn through the end of each arm will be oblique to the vertical. In the outer ends of the arms A' and A² are formed bearing-boxes *a* and *a'*, in which is journaled an oblique shaft B, extending from one arm to the other and having on its outer lower end a pinion B', through which motion is transmitted to the shaft from any suitable power.

Rigidly secured on the shaft B between the arms A' and A² is the compressing-cylinder

C, formed of a cylindrical metallic casing having an outwardly extended and rounded bottom C' and a concaved or conically-recessed top C², the walls of which are inclined from the upper edges of the sides of the cylinder to a point at or near the center thereof, at which point they terminate and are rigidly secured or fixed to the outer edges of a circular plate D, through which the shaft B passes, to which the plate is rigidly secured. The plate D has a series of perforations *d* therein.

The interior of the cylinder C has a series of radial partitions E, extending from the hub or cylinder in which the hub is secured to the outer walls of the cylinder proper. These partitions are seamed or secured to the top, side, and a portion of the bottom to prevent the passage of either air or water between, and their lower edges are cut away in the arc of a circle, as at *e*, forming a communicating space at the bottom of the cylinder and between the respective compartments formed by the partitions E. This space is for the purpose of permitting the liquid to pass from one chamber to another as the cylinder revolves.

Closely fitted on the top of the plate D is a cap-plate F, having depending flanges *f* around its edges closely fitting on the top of the outer edges of the plate D. Extending across the interior of the cap F between the flanges is a cross-bar G, radiating from the center in an indirect line, as shown in detail in Fig. 4. This bar G is formed integral with the cap and has an even lower face arranged to engage and closely fit the upper face of the plate D to prevent the escape of air from one side of the cap to the other, and the inclination of the respective arms of the cross-bar is such as to cover two of the apertures of the cap-plate at one time. On opposite sides of the cross-bar G in the cap-plate are formed openings *g g'*, the former representing an ingress and the latter an egress opening, and to which latter a suitable conduit or pipe H is led, firmly secured to the cap at the edge of the opening. This conduit is extended to any suitable point of discharge. The cap-plate F is secured in any suitable manner so that the same will be

at all times held stationary as the cylinder revolves, preferably by means of the rigid connection with the conduit H.

In operation power is applied to the shaft
 5 B, the inclined cylinder thereon having previously been filled with water to a line on a plane with the lowest or horizontal point of the top, as shown in Fig. 1, the water being inserted through the stopper K. As the cylinder
 10 is revolved the air contained in the uppermost chambers is compressed by the water seeking its level in said chamber, and as the cylinder continues to revolve the aperture leading from said chamber is closed by cross-
 15 bar G, and as it passes the cross-bar the pressure of the liquid forces the air out through the opening g' , while at the same time the air is admitted to the other chambers through the perforations in the cap-plate on the opposite
 20 side of the cross-bar, there being one perforation in the plate D for each chamber. By this means I obtain a constant uniform air-blast through the pipe H and am enabled to operate the device without waste of the liquid
 25 therein contained, it being understood that the compression of the air in the respective chambers is caused by the hydraulic pressure of the liquid, which creates an exhaust on one side of the cross-bar and a partial vacuum on
 30 the opposite side, tending to draw the air into the apparatus. By arranging the cross-bar as described I get an exhaust from two chambers at once, while the supply is limited to one chamber at a time. This inequality serves
 35 to reduce the friction and increases the exhaust as well as equalizing the same.

I am aware that many minor changes in the construction and arrangement of the parts of my device can be made and substituted for
 40 those herein shown and described without in the least departing from the nature and principle of my invention.

Having thus described my invention, what I claim as new, and desire to secure by Letters
 45 Patent, is—

1. In a hydrostatic air-compressor, the combination of a liquid-holding cylinder, means for supporting the same at an inclination, a series of radial partitions within the cylinder,
 50 having cut-away lower edges, a perforated plate at the upper end of the cylinder, and a stationary cap-plate having perforations therein arranged on and in close contact with said first-named plate, substantially as described.
 55

2. In a hydrostatic air-compressor, the combination, with a support, of an obliquely-arranged liquid-containing cylinder having a concaved upper face, a shaft on which said

cylinder is mounted, a series of radial partitions within the cylinder, having cut-away lower edges to form a communicating passage, a perforated plate in the top of the cylinder, and a stationary perforated cap-plate, substantially as described. 60 65

3. In a hydrostatic air-compressor, the combination, with a standard, of an obliquely-arranged liquid-holding cylinder mounted on the standard, means whereby the cylinder is rotated, a series of chambers formed within
 70 the cylinder, having a communicating passage at their lower ends, and a valve on the upper end of the cylinder permitting the ingress and egress of air, substantially as described. 75

4. In a hydrostatic air-compressor, the combination, with a standard, of an obliquely-arranged rotary cylinder, a series of chambers formed within the same, communicating with each other at their lower ends, a conical-
 80 shaped top for the cylinder, and a valve in the top, substantially as described.

5. A hydrostatic air-compressor consisting of a cylinder arranged obliquely, means for rotating the cylinder, a series of radial partitions within the cylinder, forming chambers and having suitable passages formed therein, a perforated plate on the upper face of the cylinder, a stationary cap-plate having perforations therein and formed with a cross-bar
 90 leading from said cap, substantially as described.

6. In a hydrostatic air-compressor, the combination, with a support, of an obliquely-arranged cylinder on the support, means for rotating the cylinder, a series of communicating compartments formed within the cylinder, inlet and outlet ports in the cylinder, and a valve for controlling said ports, substantially
 95 as described. 100

7. In a hydrostatic air-compressor, the combination, with a standard, of a liquid-containing cylinder mounted thereon, having a curved outwardly-extending lower end and a concaved upper end, a series of partitions within the cylinder, dividing the same into a series of compartments, the partitions extending to a point slightly above the bottom at the cylinder, and a valve for controlling the ingress
 105 and egress of air to and from the respective compartments, substantially as described. 110

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

WILLIAM THOMAS WOOD.

Witnesses:

J. E. SMITH,

S. G. CAMPBELL.