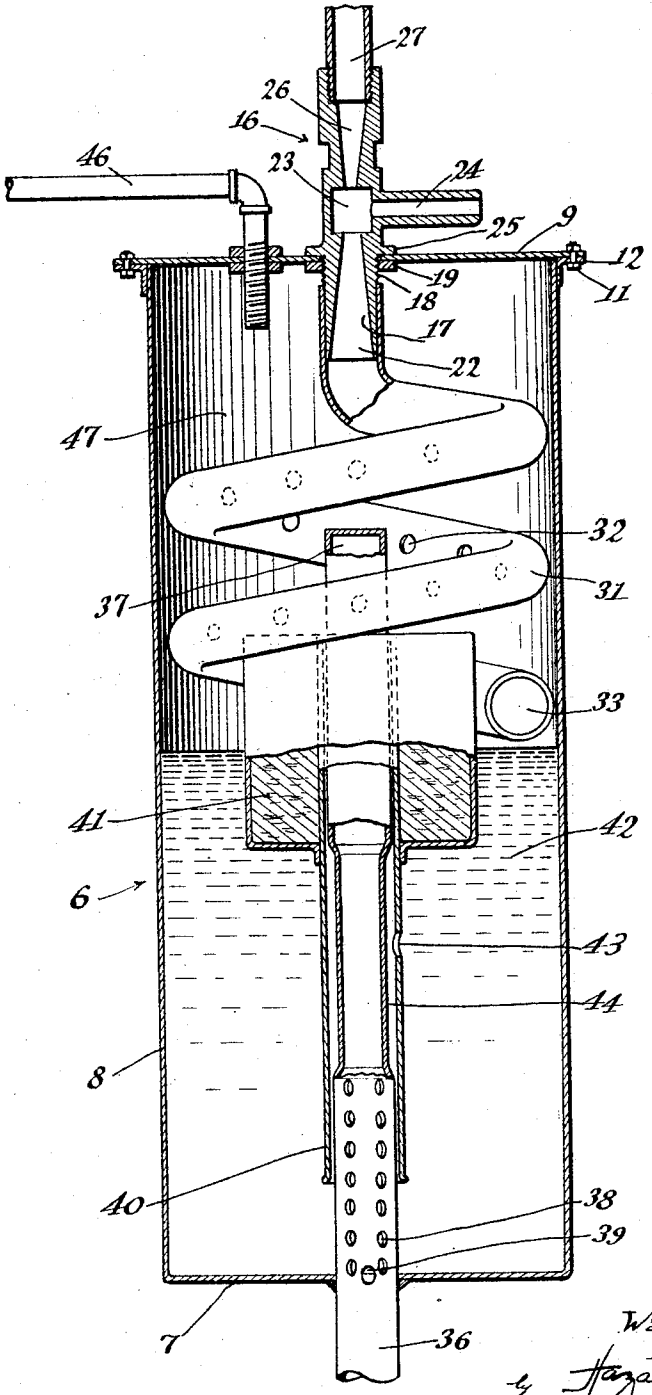
April 7, 1931. H. GILBERT ET AL 1,799,684

AIR COMPRESSOR

Filed March 27, 1929



Inventors.
Walter P. Gilbert
Harry Gilbert
by Hazard and Miller
Attorneys.

Patented Apr. 7, 1931

1,799,684

UNITED STATES PATENT OFFICE

HARRY GILBERT AND WALTER P. GILBERT, OF LOS ANGELES, CALIFORNIA

AIR COMPRESSOR

Application filed March 27, 1929. Serial No. 350,406.

This invention relates to compressors and more especially to a device for compressing air.

An object of the invention is the provision of an air compressor especially adapted for use in laboratories to furnish a steady supply of air or other gas under pressure.

Another object is the provision of an air compressor composed of a minimum number of parts, and of very inexpensive construction, and yet which is capable of operating efficiently to provide a continuous supply of air under pressure.

A more detailed object is the provision of an air compressor adapted to deliver air under pressure, into a receptacle, by means of a fluid activated aspirator, both the fluid and the air discharged from the aspirator, being delivered into a receptacle, and the receptacle being provided with means for separating the air from the liquid, and permitting the liquid to flow from the receptacle without permitting escape of the compressed air.

The invention possesses other objects and advantageous features, some of which, with those enumerated, will be set forth in the following description of the invention's particular embodiment which is illustrated in the drawings accompanying and forming a part of the specification.

Referring to the drawings:

The figure is a vertical sectional view taken medially through the receptacle of a compressor, embodying the principles of my invention, and showing the inner contruction of the compressor partially in vertical section and partially in side elevation.

Specifically describing the preferred embodiment of the invention, the air compressor comprises a receptacle 6 of any suitable shape, but preferably being composed of a bottom 7, cylindrical side wall 8, and a top 9 removably attached to the side wall 8, as by a plurality of bolts 11 extending through the top 9 adjacent the periphery thereof, and a flange 12 with which the receptacle 6 is provided adjacent its upper edge.

An aspirator 16 is made fast to the top 9, with the delivery tube 17 of the aspirator, extending therethrough. For this purpose, the exterior of the delivery tube 17, is provided with threads 18; and a nut 19 is engaged thereon to press the flange 21 with which the delivery tube 17 is provided, against the outer surface of the top 9 so as to form an air-tight joint. The bore 22 of the delivery tube 17, is tapering, and communicates at its smaller end, with a combining chamber 23 into which lead both an air inlet 24, and a fluid inlet nozzle 26. The liquid inlet 26 is also tapering, with its smaller end communicating with the combining chamber 23. A conduit 27 of any suitable nature, leads from the larger end of the fluid inlet 26, to any suitable supply of liquid under pressure. Inasmuch as the liquid nozzle 26 and the discharge tube 17 are in axial alignment, and the air inlet 24 leads into the combining chamber 23 from one side thereof, when liquid is projected through the combining chamber 23 into the discharge tube 17, a partial vacuum will be created within the combining chamber, with the result that air will be drawn thereinto through the air inlet 24, and this air will be carried through the discharge tube 17, with the liquid.

A separator tube 31 leads spirally downwards from the discharge tube 17, and has a plurality of apertures 32 in that surface thereof, defining the bore of the spiral described by the separator tube 31. The lower end 33 of the tube 31, may be either open or closed to the interior of the receptacle 6.

Means are provided for permitting liquid to flow from the interior of the receptacle, without the escape of the air or other gas entrapped therein. A drain tube 36 extends through the bottom 7 of the receptacle 6, and upwards inside the receptacle. The inner end 37 of the tube 36, is closed; and a plurality of apertures 38 are formed in the tube 36, slightly above the bottom 7 of the receptacle 6. Preferably these apertures 38 are disposed in diametrically opposed relationship, so that each aperture 38 has another aperture directly opposite it upon the opposite side of the tube. Complete drainage of the receptacle 6, is assured if the lowermost apertures 39 are disposed within the plane of the bottom 7. A tubular valve 40 is slidable upon the tube 36

within the receptacle 6, and has a float 41 of any suitable material such as cork, rigid with the valve 40 adjacent the upper end thereof. This float 41 is adapted to raise the tubular valve 40 when the liquid 42 within the receptacle 6, rises above a predetermined level. A hole 43 in the tubular valve 40, is so disposed that it is higher than the uppermost apertures 38 when the valve is in closed position; and a restricted portion 44 is positioned in the tube 36, so that the hole 43 is in register therewith throughout all or the major portion of the movement of the valve.

An air outlet leads preferably from the top 9 of the receptacle 6, and may be in the form of any suitable conduit 46 extending through the top 9 and leading to the apparatus for which a supply of air or other gas under pressure, is desired.

The operation of the compressor of our invention, is substantially as follows:

The device is operated preferably by water, in which event the conduit 27 is connected to a water faucet, or other source of water under pressure. As explained above, when water is forced through the nozzle 26, and discharge tube 17, it carries with it a quantity of air as above described. From the discharge tube 17, this mixture of water and air flows through the spiral separator tube 31; and inasmuch as the water is heavier than the air carried therewith, the water will be forced by centrifugal action, against the outer wall of the tube 31, permitting the air to escape through the apertures 32, which are in the inner wall of the tube. Thus it may be seen that more efficient separation of the air from the water, is effected, than if merely a straight tube were provided, or if the mixture of air and water were to be permitted to drop from the discharge tube 17 into the receptacle 6.

Thus it may be seen that pressure will be generated within the receptacle 6, and that the water 42 will collect at the bottom, while the air will be entrapped within the space 47 above the water. As the water 42 rises within the receptacle, the float 41 will be raised, carrying with it the tubular valve 40 until certain of the apertures 38 are uncovered, permitting water 42 to flow through the apertures 38 thus uncovered, and through the tube 36, to any convenient point for disposal. As the water 42 drains from the receptacle, the float 41 will again be lowered, carrying with it the valve 40, so that the apertures 38 will again be closed, to prevent further escape of liquid until the float and the valve are again raised. Air under pressure, may now be withdrawn from the receptacle 6, through the conduit 46.

The restriction 44 in the tube 36, and the hole 43 in the valve 40, permit the relatively slow flow of water into the interior of the valve to fill the space between the valve and the tube. Thus a water seal is established, preventing the escape of air which would otherwise enter the tubular valve 40, at the top, and pass downwards therein around the outside of the tube 36, to escape through the apertures 38.

It may thus be seen that we have provided an efficiently operating and very inexpensive air compressor, especially adapted for use in conjunction with laboratory apparatus, such as a blow torch, requiring a steady flow of air under pressure.

It is to be understood that the details of the invention as herein disclosed, are subject to alteration within the spirit or scope of the appended claims.

We claim:

1. In an air compressor, a receptacle, an aspirator associated therewith to discharge thereinto, said aspirator comprising a discharge tube leading into said receptacle, and a liquid nozzle and a gas inlet communicating with said discharge tube, and a liquid outlet comprising a tube extending through the bottom of said receptacle and upwards therefrom, said tube having a plurality of apertures therein, a tubular valve slidable on said tube, and a float rigid with and adapted to raise said valve to uncover said apertures when the liquid in said receptacle rises above a predetermined level, said tube having a restriction therein in register with an aperture in said valve when the valve is in closed position.

2. In an air compressor, a receptacle, an aperture comprising a discharge tube leading into said receptacle, and a liquid nozzle and a gas inlet communicating with said discharge tube, and a separator tube leading spirally downwards from said discharge tube and having a plurality of ports in the surface thereof defining the bore of the spiral, said ports opening directly into the interior of said receptacle.

3. In an air compressor, a receptacle, an aspirator associated therewith to discharge thereinto, said aspirator comprising a discharge tube leading into said receptacle, and a liquid nozzle and a gas inlet communicating with said discharge tube, and a liquid outlet comprising a tube extending through the bottom of said receptacle and upwards therefrom, said tube having a plurality of apertures therein, a valve associated with said tube to permit escape of liquid through said apertures, and a separator tube leading spirally downwards from said discharge tube and having a plurality of ports in the surface thereof defining the bore of the spiral, said ports opening directly into the interior of said receptacle.

4. In an air compressor, a receptacle, an aspirator associated therewith to discharge thereinto, said aspirator comprising a discharge tube leading into said receptacle, and a liquid nozzle and a gas inlet communicat-

ing with said discharge tube, and a liquid outlet comprising a tube extending through the bottom of said receptacle and upwards therefrom, said tube having a plurality of apertures therein, a valve slidable on said tube, a float rigid with and adapted to raise said valve to uncover said apertures when the liquid in said receptacle rises above a predetermined level, and a separator tube leading spirally downwards from said discharge tube and having a plurality of ports in the surface thereof defining the bore of the spiral, said ports opening directly into the interior of said receptacle.

5. In a device of the class described, a receptacle, means for introducing a gas and a liquid thereinto, and a liquid outlet comprising a tube extending through the bottom of said receptacle and upwards therefrom, said tube having an aperture therein spaced from said bottom, a tubular valve slidable on said tube, and means for raising said valve to uncover said aperture, said tube having a restriction therein above said aperture and in register with an aperture in said valve.

6. In a device of the class described, a receptacle, means for introducing a gas and a liquid thereinto, and a liquid outlet comprising a tube extending through the bottom of said receptacle and upwards therefrom, said tube having an aperture therein spaced from said bottom, a tubular valve slidable on said tube, and means for raising said valve to uncover said aperture, said valve having an aperture therein at a greater elevation than that in said tube whereby liquid is permitted to flow between said tube and valve to establish a seal therebetween.

In testimony whereof we have signed our names to this specification.

HARRY GILBERT.
WALTER P. GILBERT.