G. MILSOM.

Ozone-Machine.

No. 163,391. Patented May 18, 1875.

FIG. I

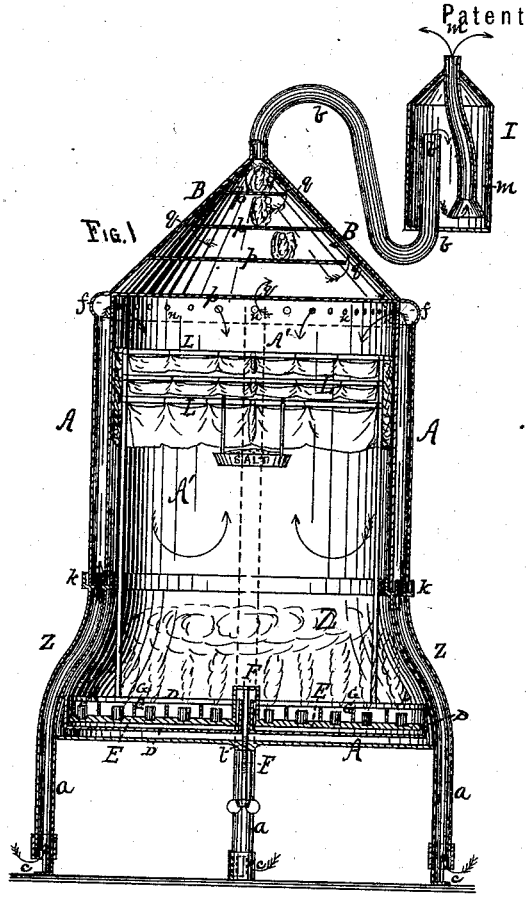
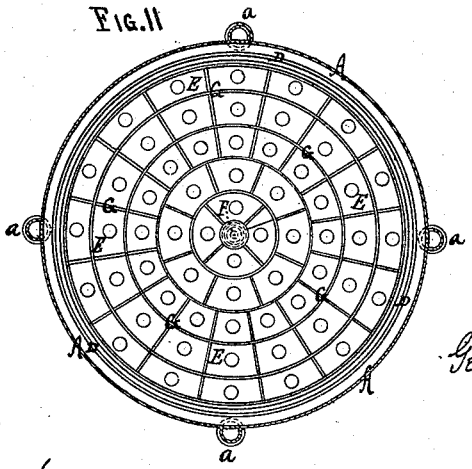


FIG. II



WITNESSES.
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George Milsom,
INVENTOR, BY
J. R. Drake.
atty.

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UNITED STATES PATENT OFFICE.

GEORGE MILSOM, OF BUFFALO, NEW YORK, ASSIGNOR OF TWO-THIRDS HIS RIGHT TO HENRY SPENDELOW AND F. W. BARTLETT, OF SAME PLACE.

IMPROVEMENT IN OZONE-MACHINES.

Specification forming part of Letters Patent No. **163,391**, dated May 18, 1875; application filed February 23, 1875.

To all whom it may concern:

Be it known that I, GEORGE MILSOM, of Buffalo, in the county of Erie and State of New York, have made certain Improvements in Ozone-Machines, of which the following is a specification:

This invention relates to a machine for generating, purifying, and controlling ozone; and consists in its construction and operation as hereinafter specified.

The main features of novelty are generating and purifying ozone without the aid of a stream of water; also, the introduction of air from the lower part of a room or other place through hollow pipes, forming part of the machine, into the top of the combustion-chamber. This introduction of the air at the top is an important aid to the purification also, as it not only supplies the necessary amount of air for the combustion of the phosphorus, but permeates the rising phosphoric vapor, and freeing the ozone therein, which rises through it.

In the drawings, Figure 1 is a sectional elevation, and Fig. 2 is a plan, of the separator, combustion-chamber, &c.

A represents an oblong cylindrical case standing on four (more or less) uprights, *a a a a*, said uprights, pipes, or legs, being hollow, and either constructed independently of, or forming part of, the case or cylinder A, and each opening at the top into a hollow belt or circular chamber, *f*, around the top of the machine, and which is perforated with air-holes *n*, for the air to pass into the cylinder A′. Near the bottom of each foot or leg is an opening, *c*, for the ingress or introduction of said air, which may be either cold or warm. The cylinder A sits in a base, Z, with a rim or gutter, *k*, full of water, so that it makes a water-tight packing, preventing any air getting into the combustion-chamber from the bottom, but only through the top by means of the hollow legs *a a*, and perforated belt *f*. The cylinder A is made removable to renew the phosphorus and the water, and to clean out the machine. The top of the cylinder has a stationary cover or dome, B, in which are arranged alternate shelves or diaphragms *p p p*, with air-passages *q q* between each, as indicated by arrows. These shelves are to retard the escape of the ozone after being generated, and will contain wool or other material. D is a hollow pan sitting inside the cylinder just above or on the bottom, and with a certain quantity of water therein. In this pan sets the phosphorus-holder E, which is raised or lowered by means of a central screw-rod, F, operated from the bottom, and working in a nut, *l*, on the bottom of the cylinder. This raises the phosphorus and holder E above the water-level when desired to let in air and have combustion commence to generate the ozone. At other times the phosphorus and holder are let down by means of said screw-rod, and the whole submerged in the water to prevent ignition. G is a phosphorus separator, circular in form, open at top and bottom, and divided off into compartments, sitting over and dividing a certain number of the phosphorus-sticks, separating each set from the other so as to prevent one set catching fire from the other. This is important to prevent accident.

Having thus described the main portions of my machine, I will now state the operation of producing and purifying the ozone: The phosphorus sticks, which have been kept submerged, are first raised with the holder E, by means of the screw-rod F; air is then admitted by opening or uncovering the air-induction holes *c c*, in the legs *a a*. This is done by raising a slide or other device thereon. The (cold or warm) air in the lower part of the room immediately fills these hollow legs and rushes through and also fills the belt *f*, and exits through the openings or perforations *n n n* therein into the cylinder or ozone-chamber A′.

By this introduction of the air, the heavier particles of the vapor, such as phosphoric-acid gas, and other deleterious matter heavier than the ozone, are kept down or fall into the water in the pan D, while the lighter portion, being the ozone, rises in a vapor, and, finally, up into the dome B. Here it strikes alternately against the plates or diaphragms *p p p*. This prevents the ozone from too quickly rising and leaving the machine, the main object of these

plates being to keep back the ozone, and to hold it as long as possible in the cylinder A′, to throw off the chemicals in it.

To still further aid in purifying the ozone, and to obtain and retain the chemicals therein, I arrange a series of slats or open frames, L L L, one above the other, as shown, which extend entirely across the inside of the cylinder or ozone chamber A′. These open frames are to be covered with loose cotton, wool, or some fabric saturated with such chemicals as will have affinity for the phosphoric acid that separates from the ozone, and which the material will absorb and hold until released therefrom. The ozone, after passing through these, in a greatly purified state goes into the dome B, as before explained. These slats, when so covered, so fill the space that no ozone or gas can get into the dome without being filtered through these chemically-prepared stuffs, and the wool, &c., in the dome filters it still more. To aid in filtering and holding the ozone, a bottle-shaped receptacle, I, closed at the bottom, with an eduction-pipe, *b*, running into it, as shown, is set over the top of the machine, or at the side. This fills with the ozone, which slowly passes off through another tube, *m*, whose mouth is near the bottom of the receptacle, and which finally exits at the neck or apex of the bottle. This is an adjunct of the cylinder A, and is merely to aid in a thorough separation of the ozone, and also preventing its too rapid flow into the air or other receptacle. If desired, another cylinder or chamber may be employed as a reservoir of ozone, connected with the first, to draw supplies from, or a series of bottles, like I, can be attached to the pipe, and after being filled can be removed for use in sick rooms or other places.

By these simple means, water, except a small quantity in the pan D to prevent the phosphorus from igniting, is done away with, and the disadvantages of a tank of water liable to freeze are also avoided, as well as the trouble of keeping up a constant flow of the same.

The introduction of air at the top acts instead of water to aid in freeing the ozone as it rises from the chemicals therein.

By this machine ozone can be generated in a short time, whereas by other devices it usually takes a very long time.

I claim—

1. The combination of the cylinders A and A′, the hollow legs or pipes *a a*, with air-openings *c c*, the air-belt *f*, with air-holes *n n*, the gutters R, and base Z, constructed to operate as and for the purpose herein described.

2. In an ozone-machine, in combination with the water-pan D, the phosphorus-holder E, adjusted up or down by means of the screw-rod F, nut *l*, and sleeve *g*, substantially as and for the purpose specified.

3. In combination with the dome B and cylinder A A′, the receptacle I, constructed with the pipes *b* and *m*, substantially as and for the purpose specified.

4. In combination with the ozone-machine, constructed as described, the cloths or fabrics L suspended in the chamber A′, and saturated with any alkaline solution capable of absorbing and neutralizing the phosphoric acid formed by the combustion of the phosphorus, for the purpose of separating said acid from the ozone, substantially as herein described.

5. In an ozone-machine, the combination of the septums *p p* and the saturated diaphragms B, situated in the upper part of the apparatus, and forming a compartment or chamber communicating with the air-inlet openings *n n*, in order to introduce the air below the said septums *p p* and diaphragms, substantially as and for the purpose set forth.

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

GEO. MILSOM.

Witnesses:
J. R. DRAKE,
T. H. PARSONS.