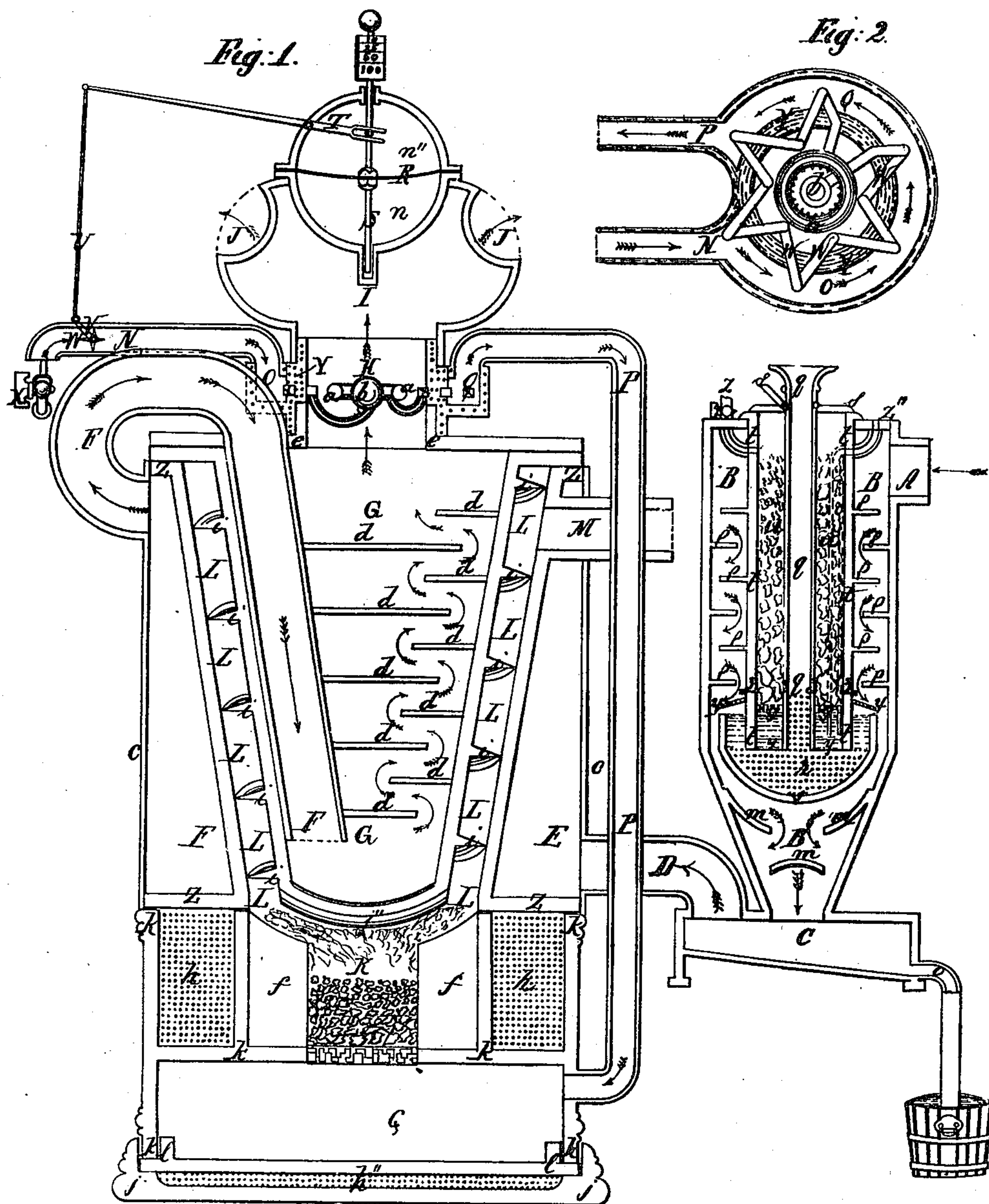


W. Elmer,

Climozonator.

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# United States Patent Office.

WILLIAM ELMER, OF NEW YORK, N. Y.

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## CLIMOZONATOR.

The Schedule referred to in these Letters Patent and making part of the same

Be it known that I, WILLIAM ELMER, of the city, county, and State of New York, have invented a new and useful instrument or apparatus for treating atmospheric air, so as to produce a pure and genial in-door climate, and which instrument I have designated a "Climozonator;" and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings.

The climozonator, as its name indicates, is an instrument intended to produce, in dwellings of all descriptions, an atmosphere or climate containing ozone, and hence a pure climate.

It is also intended to regulate the temperature of the atmosphere within doors at all seasons, so as to produce a genial climate.

To enable others skilled in the art to make and use my invention, I hereby proceed to describe its construction and operation

In my drawings—

Figure 1 represents my climozonator, in sectional view of the entire instrument.

Figure 2 represents a top view of the thermo-electric battery, which comprises a part of the instrument.

### Explanation.

- A, air-inlet to frigidarium and purifier.
- B, air-passage through frigidarium to C.
- C, reservoir for water and refuse from V.
- D, air-conductor between C and E.
- E, air-chamber between C and Z.
- F, air-pipe between E and G.
- G, inverted cone.
- H, air-passage from G to I.
- I, distributing-dome.
- J J, distributing-pipes.
- K, fire-chamber.
- L, spiral flue.
- M, smoke-pipe, (outlet leading to the chimney.)
- N, pipe for supplying a current of air to outer points of metallic bars.
- O, circular casing containing outer points of metallic bars.
- P, pipe connecting O with Q, for conducting air to the furnace.
- Q, ash-pit.
- R, vibrating diaphragm.
- S, rod or stem connecting R with T.
- T, working-beam.
- U, rod connecting V with T.
- V, lever connecting with and working W.
- W, balance-valve or damper.
- X, pipe for gas-jet, or flame.
- Y, non-conductor for battery.
- Z, inverted cone surrounding G.
- a, metallic ring.
- b, metallic sphere.
- c, cylindrical case.

- d, diaphragms in G.
- e, cover for cones and air-chamber.
- f, fire-tile.
- g, perforated tray for ice.
- h h", non-conductor of heat.
- i, spiral diaphragm, forming a flue between Z and G.
- j k l, foundation.
- m, diaphragms in purifier.
- n n", hemispheres.
- o, discharge-pipe for impurities from C.
- p, diaphragms in frigidarium.
- q, funnel for charging V with lime and permanganate.
- r, lime and permanganate.
- s, lids of frigidarium.
- t, inner cylinder of frigidarium.
- u, ice or water.
- v, receiver for lime and permanganate.
- w x, metallic bars.
- y, bottom of cylinder t.
- z', inlet-water pipe for t.
- z, overflow or discharge-pipe for water flowing out of t.

The climozonator is composed substantially of three principal parts, which are, an ozonator, a thermia, and a frigidarium.

The instrument may be made in any form most convenient and desirable; but the one I represent has many important advantages in its construction, which are as follows:

### The Ozonator.

This consists of a thermo-electric battery and electric discharging-apparatus.

The battery may be made in various ways. The one I represent is formed of metallic bars, of different conducting-power, as, for example, bismuth and antimony, or platinum and iron.

These bars are alternately united at their extremities, and are arranged so that each bar has one end directly over the centre orifice H, and the other end extending outward, and into the circular casing O, which surrounds and encloses the outer ends of the metallic bars w x.

The centres of these bars are enveloped in a non-conductor of electricity, y.

The non-conductor is made in a circular form, and insulates the thermo-electric battery from the other parts of the apparatus.

Directly over the centre orifice is placed an insulated metallic sphere, b, which is placed in electric communication with the negative conductor of the thermo-electric battery, and constitutes the negative electrode.

Around sphere b, and on the same line with it, is placed a metallic ring, a, which is also insulated, and provided with short metallic points, all pointing to the sphere b. This ring or annular electrode is placed in



electric communication with the positive conductor of the thermo-electric battery, and constitutes the positive electrode.

Upon the top of non-conductor *y*, and covering the *monator*, is fitted a dome, *I*, provided with proper outlets *J J*, and also a damper-regulator, which is arranged for the purpose of economizing fuel, and to regulate the heat arising from its combustion.

At the top of the distributing-dome there are arranged two hemispheres, one of which is situated below, and the other above the vibrating diaphragm.

The lower hemisphere is perfectly air-tight, being partitioned off from the other by means of a sheet of thin copper, or other suitable metal, which is firmly fastened between the flanges of both hemispheres, leaving a fulness in the centre, (like that of the bottom of an oil-can,) to vibrate a given distance when overbalanced by a slight pressure upon either side.

There is a rod, marked *S*, which passes, in vertical position, through the centre of *n*, connecting *R* with *T*, and sustaining the proper weight (which may be varied at pleasure) to counterbalance or partially counterbalance the expanded air or other gas which is confined in *n*, as will be hereafter described.

The upper hemisphere is not air-tight, as it is employed only for furnishing a flange to compare with that upon *n*, and as a guide for *S*, to compare with that situated at the bottom of *n*, a protection for *R*, and a fulcrum for *T*.

Compressed air, or other suitable gas, being forced in hemisphere *n*, and the rod *S* being properly weighted, the regulator is ready for action.

#### *Operation of the Regulator.*

Heated atmospheric air, in its passage through cone *G* and dome *I*, comes in contact with the outer walls of *n*, which is a rough, dark metallic surface, being a good material for the absorption of heat, which is immediately communicated with the aforesaid air or gas confined therein, thus expanding the same, raising up the copper sheet, carrying with it rod *S*, which operates upon the short end of working-beam *T*, compelling the longer end to move more rapidly, and moving lever *V* still more rapidly in a rotary motion, by means of connecting-rod *U*. Therefore, a slight motion of *R* completely opens or shuts the damper *W*, which is connected with lever *V*.

*G* and *Z* are two inverted cones, which are made of iron.

The inner cone, *G*, is cast whole, with flanges at the top, turning outward, and the bottom rounded and covered with fire-clay tile. To the outer surface of this cone is attached a spiral diaphragm, which forms a spiral flue between the two cones, when the first cone is placed within the second.

The second cone, *Z*, surrounds cone *G*, and is made with flanges, both top and bottom, turning outward, the lower flange resting upon an iron foundation.

Around the outer cone is placed a cylindrical metallic casing, *c*.

Over the two cones and casing *c* is closely fitted a metallic cover, *e*, having in its centre an orifice, *H*.

The interior of cone *G*, and the exterior of cone *Z*, are covered with a fire-proof enamel, or glaze, so as to prevent oxidation of these surfaces, and to render them impervious to the transmission of poisonous gases from the combustion of fuel within the fire-chamber.

Within cone *G* is arranged a number of plates, or diaphragms, *a d d*, the object of which is to divide the air passing through the instrument in thin strata, for the purpose of causing the air to absorb the necessary amount of caloric in cold weather.

*F* is a tube, connected with casing *c*, and passing through cover *e*, down into and near the bottom of *G*, for the purpose of conducting air from air-chamber *E* to *G*, thus obviating the necessity of all joints between the fire-chamber and flue and the pure air.

*L* is a spiral flue, which is situated between *G* and *Z*, and in its passage winding several times around the outer surface of cone *G*, and the inner surface of cone *Z*, forming a continuous spiral flue from the fire-chamber to the smoke-pipe leading to the chimney.

#### *Heating-Surface.*

The arrangement, here indicated, of cones and diaphragms, affords a very extensive heating-surface, within a very small compass, by means of which the air becomes uniformly warmed in large volume, instead of intensely heated in small streams or currents, as in the case with air heated by ordinary heaters.

The climosonator, when complete, rests upon a metallic foundation, which is so arranged as to obviate the great danger of igniting combustible material in contact with its outer surface, when in operation for heating-purposes, *j* being a cast-iron base-plate, (of basin-form,) having a projection upon the inside, a few inches from the bottom, (leaving a space for non-conducting-material, *k*,) for the support of *L*, which is a plate of the same metal, and upon which rests *k*, a metallic casting of cylindrical form, having a recess, for the purpose of holding a non-conductor of heat, the bottom of which extends far enough toward the centre, to support the fire-brick *f* and grate-bars.

*A* is a frigidarium, composed of an upright metallic hollow cylinder, contracted at the bottom in the form of a funnel, and rests upon reservoir *O*, which is a rectangular box, the bottom of which is slightly elevated at one end, to allow of drainage.

*t* is also a metallic hollow cylinder, placed within *A*.

In the centre of *t*, a funnel-tube, *g*, is situated, and extending a little above *t*, and the whole length of *t*, and through the bottom, *y*, opening into receiver *V*, which is charged with quick-lime, and any suitable permanganate, *e. g.*, permanganate of soda or potash.

*u* is ice or water, placed in *t* for the purpose of cooling the air in hot weather.

On the inside of *A*, and the outside of *t*, a number of diaphragms, *p p p*, is arranged, for the purpose of dividing the air into thin strata, and causing it to be thrown against the sides of *t*, whereby the air becomes cold and condensed.

*O* is a purifier, arranged with diaphragms *m m*, below *V*, for the purpose of purifying the air passing through the instrument.

#### *Modus Operandi of the Climosonator in Cold Weather.*

In winter, or cold climates, when artificial warmth is required within-doors, a fire is made in the fire-chamber. The volume of heat there generated is first brought in contact with the rounded bottom of cone *G*, from whence it passes through the spiral flue, heating both the inner and outer cones uniformly.

The heat continuously impinges upon the cones, as it winds around them, causing the cones to absorb nearly all the heat before reaching the flue leading to the chimney.

The air to be warmed enters the instrument at *A*, passing through the purifier *O*, conductor *D*, air-chamber *E*, air-pipe *F*, and in contact with the bottom of *G*, from whence it continues upward, over and under the various diaphragms in *G*, passes through the orifice *H*, in a heated condition, in contact with the inner points of the metallic bars, composing the thermo-electric battery, and in contact with the respective electrodes of the battery, where a portion of the oxygen of the air is, by electrical action, converted into ozone.

The warm air is conveyed from the distributing-dome, *I*, into the various apartments to be warmed.

The strong draught, induced by the furnace, will draw in cold air through pipe *N*, which, being connected with casing *O*, causes the cold air to pass entirely around and in contact with the outer ends of the metallic bars *X W*, cooling them uniformly, while,



at the same time, the heated air being brought in contact with the inner points of the metallic bars, a constant electric current is produced, of sufficient power to generate a continuous supply of ozone.

The sphere *b* and ring *a* become highly charged with electricity, and a continuous, silent electric discharge takes place from the metallic points of ring *b*, by which a portion of the oxygen of the air is brought into a similar electrical state, and is repelled, in the form of ozone, which mingles with the air passing through the instrument, producing an ozonized in-door atmosphere or climate.

*Modus Operandi of the Climozonator in Summer, or in Hot Climates.*

In summer, or in hot climates, when it is desirable to cool the atmosphere, ice or cold water is placed in the vessel *t*.

If ice be employed, it rests upon a perforated tray, to allow of drainage.

The inside of *t* is also perforated with two small orifices, which open into the funnel *g*, so as to allow a certain quantity of water from *t* to drop down into the reservoir below, and in contact with the chemicals in *V*, where the water becomes saturated with the chemicals, forming a solution, and, as the reservoir becomes filled with the solution, it overflows and falls upon the diaphragms *m m*, producing a constant spray, through which the cool air passes, and by which it is freed from carbonic acid, by means of the lime, and various impurities, by means of the permanganate.

The remainder of the water, from the melted ice, flows out at 3, and passes over conductor 4, and is finally discharged through *O*.

If water be used instead of ice, a small but constant stream should be allowed to pass through pipe *z'*, (which extends to near the bottom of *t*), and flow out at *z*.

The constant circulation of water through *t*, produces a good deal of cold, which condenses the air passing through the frigidarium.

The air, as it enters the frigidarium at *A*, is brought in contact with the inner cylinder *t*, by means of the diaphragms *p p p*, and becomes immediately cooled, and, consequently, is thrown down to the bottom of the purifier in a condensed state. The condensed air displaces the lighter air in air-chamber *E* and cone *G*, by means of which a brisk current of cool air continuously passes through the instrument, and is carried into the different apartments to be cooled.

The cool air, coming in contact with the inner ends of the metallic bars, cools them likewise, while the outer ends are heated by the flame at *X*, the heat of which passes entirely around the outer ends of the metallic bars, through the casing *O*, by which means the thermo-electric battery will be in operation, precisely the same as heretofore described.

When the temperature of the atmosphere is such that it requires neither heating nor cooling, it is no less essential to keep up the action of the battery for the production of ozone. For this purpose, all that is necessary is, to keep the flame burning at *X*.

*Philosophy and Advantages of the Climozonator.*

Scientific investigations have established the fact, that the presence of ozone in the atmosphere is essential to the normal existence of animal life, and that in all healthy climates, ozone exists naturally in the atmosphere; but a great variety of causes exists which tend to destroy or consume the ozone of the atmosphere, so that, as a consequence, various diseases, more or less fatal to human life, are thus produced.

Ozone is destroyed by heat above a certain temperature, and rapidly consumed by foul effluvia, effete ani-

mal matter, malaria, and other agents existing in the atmosphere in different localities.

When atmospheric air is heated to about 250° F., the ozone it contains is instantly destroyed; hence, atmospheric air, heated by ordinary "hot-air furnaces," loses the ozone it contained, the very principle on which health so largely depends. Not only is the ozone of the atmosphere thus destroyed, but the heated air becomes charged with poisonous gases from the combustion of fuel.

Carbonic oxide, which is one of the products of combustion, (especially of anthracite coal,) is a most fearful and deadly poison. It escapes through joints, &c., of stoves and "hot-air furnaces," and even through the walls of cast-iron, at a dull red heat and higher temperatures, and mingling with the heated air, produces a poisonous in-door atmosphere, which destroys human life at a fearful rate.

The object of the climozonator is to produce a pure, genial, and invigorating in-door climate, at all seasons of the year. This is accomplished, first, by regulating the temperature of the atmosphere, cooling it when too hot, and warming it when too cool, thus producing continuously an equable climate; second, by ozonizing the atmosphere, which gives it normal, pure, and invigorating properties; and third, by preventing the poisonous gases, liberated by combustion, from mingling with the air passing through the climozonator to the different apartments to be warmed.

The vast importance of ozonizing the atmosphere in our dwellings will be apparent, when we consider the numerous causes existing, in all dwellings, to deprive the air of ozone, and especially when we remember that it is only in the absence of ozone that zymotic diseases can exist.

Ozone is the most active and thorough disinfectant and purifier of the air known.

Where ozone abounds in the atmosphere, health reigns, and where there is no ozone, disease predominates.

*Claims.*

What I claim as my invention, and desire to secure by Letters Patent of the United States, is—

1. The production of an ozonized atmosphere, by means and with the use of a thermo-electric battery, operated by heat and cold, substantially in the manner and by the means set forth.

2. The combination of inverted cones with an outer cylindrical chamber, constructed and arranged for heating atmospheric air, in such a manner that poisonous gases, from the combustion of fuel, cannot enter the heating-chamber and mingle with the air conveyed into the apartments to be warmed, substantially as set forth.

3. The construction of a frigidarium, in combination with the other parts of the apparatus, for cooling the atmosphere, as occasion may require, substantially as above set forth.

4. The combination of heat and cold in contact with a thermo-electric battery, for the purpose of generating ozone, substantially as above set forth.

5. The combination of all the different parts as a whole, in one complete instrument, or apparatus, for purifying, warming, or cooling the atmosphere, as occasion may require, and for producing an ozonized atmosphere, substantially as above set forth.

In testimony whereof, I have hereunto set my hand, this 22d day of May, A. D. 1868.

WILLIAM ELMER.

Witnesses:

ROBERT M. FRYER,

WILLIAM A. ELMER.