

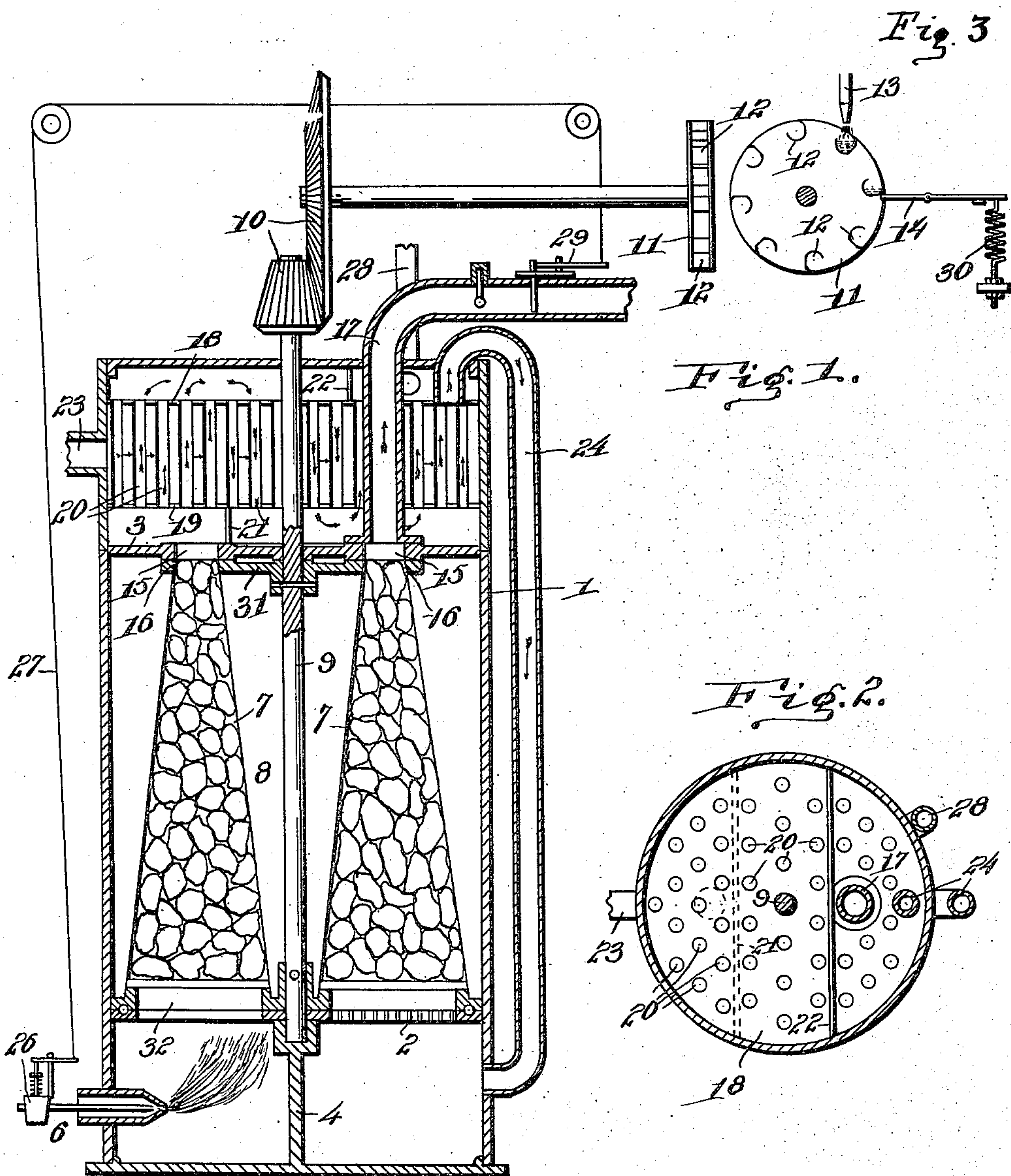
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E. W. COOKE.

AIR DRIER FOR DESICCATING APPARATUS.

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Witnesses

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UNITED STATES PATENT OFFICE.

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AIR-DRIER FOR DESICCATING APPARATUS.

No. 870,546.

Specification of Letters Patent.

Patented Nov. 12, 1907.

Application filed February 11, 1904. Serial No. 193,205.

To all whom it may concern:

Be it known that I, ERNEST WILLIAM COOKE, a citizen of the United States of America, residing at New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Air-Driers, of which the following is a specification.

My invention relates to air drying apparatus and consists in certain improvements in the construction and arrangement in the parts, whereby certain advantageous results are obtained, all of which are clearly set forth in the following detailed description, reference being had to the accompanying drawings, in which—

Figure 1 is a vertical section of an air drier embodying my invention; and Fig. 2 is a sectional plan view of the same, taken on the line $x-x$ of Fig. 1. Fig. 3 is a partial end view of Fig 1.

In said views 1 represents a cylindrical shell or casing, divided by two transverse partitions 2 and 3 into three superimposed compartments. The lowest of these compartments is again divided into two sections by a vertical partition 4, one of which contains a source of heat, such as the oil-burner 6. The other of said sections of the lowermost compartment serves merely as an air passage, as will appear hereinafter.

The central compartment of the casing 1 contains two or more receptacles 7, filled with a moisture absorbing substance, such as calcium chlorid and carried by a frame composed of two plates 31 and 32 fast on a shaft 9 which is journaled axially of the casing 1. Said shaft is connected, as by bevel gearing 10 with an intermittent source of power, which I have illustrated by way of example as a water-wheel 11, provided with buckets 12, one of which at a time receives water from a pipe 13. When the weight of the water in the said bucket reaches a predetermined amount, the wheel starts to rotate, turning the frame 8 until it is stopped by contact with a pivoted stop 14, which is normally maintained in operation by an adjustable spring 30, or by any other suitable means. The buckets are so constructed that all, or part of the water escapes therefrom by the time the stop is reached, so that the wheel is held stationary thereby until the next bucket receives the requisite amount of water to start the wheel again. It is obvious that by controlling the rate of flow of water from pipe 13 and by adjusting the strength of the spring 30, the length of the intervals of time between successive turns of the wheel can be regulated as desired.

I may construct the receptacles 7 in the form of cones, as shown, although they may be cylindrical or of any other form desired and the partition 3 has flanged apertures 15, which register with the corresponding flanged apertures 16 in the frame-plate 31, which last mentioned apertures surround the upper

ends of the cone-shaped receptacles 7. The plate 31 is solid, with the exception of said apertures, so that while the frame is rotating the apertures 15 are practically cut off. One of said apertures 15 opens directly into the uppermost compartment of the casing 1, while the other leads into the air egress pipe 17. The said uppermost compartment contains two tube-plates 18 and 19, in which are secured the open ends of a series of short tubes 20. That part of the compartment below the lower of said tube-plates 19 in which the aperture 15 opens, is cut off from the rest of the compartment by a partition 21, and that part of said compartment above the tube-plate 18 contains a partition 22, which diverts the products of combustion downwardly through the tubes 20 at that end of the compartment.

The air enters, through the pipe 23, the space between the tube-plates 18 and 19 and passes around and between the tubes 20, then through the pipe 24 down to the other section of the lowermost compartment than that containing the burner. The partition 2 above this section is apertured as shown and the air passes from said section up through one of the receptacles 7, in which it is dried and then passes out through the pipe 17. The other receptacle 7, assuming that there are only two, as shown in the drawing, is being dried at this time by the heat from the burner 6, the products of combustion from which pass up through the tubes 20 which are on the left side of the partition 21. They return down through the central set of tubes and finally up through the right hand set and pass off into the stack 28. When the water-wheel starts it turns the shaft 9 which substitutes the receptacle through which the air has been passing for that one which has been over the burner and vice versa. It will thus be seen that the process of drying the current of air can be carried on continually and automatically.

To regulate the temperature of the air issuing from the drier, I connect the valve 26 of the burner 6 by a cord 27 to a thermostat 29 arranged in the pipe 17. Thus the amount of fuel supplied to said burner can be automatically controlled so as to maintain the temperature of the dried air practically constant.

It is not essential that the air-inlet should be at the top of the casing or that the air should pass upwardly through the chlorid, as by obvious changes in the piping, the direction of the air through the apparatus may be reversed from that described.

Other modifications in detail may be made without departing from my invention, as expressed in the following claims:

1. An air drier comprising a plurality of movable receptacles adapted to contain moisture-absorbing substance, relatively stationary means to convey a current of air through one of said receptacles and means to periodically move said receptacles so as to place another of them in position to receive said current of air.

2. An air-drying apparatus comprising a plurality of receptacles adapted to contain a moisture-absorbing substance, a source of heat, an air inlet and an air outlet, and means to move said receptacles at predetermined regular intervals of time from a position adjacent to said source of heat to a position between said inlet and said outlet and vice versa whereby the operation can be carried on continuously.
3. An air-drying apparatus comprising a plurality of receptacles adapted to contain a moisture-absorbing substance, a source of heat, an air inlet and an air outlet, means to move said receptacles at predetermined regular intervals of time from a position adjacent to said source of heat to a position between said inlet and said outlet, a thermostat in said outlet pipe and connections therefrom to said source of heat, whereby the amount of heat is automatically regulated and the operation can be carried on continuously.
4. An air-drying apparatus comprising a casing, a revoluble frame within said casing, a plurality of receptacles adapted to contain a moisture-absorbing substance carried by said frame, a source of heat within said casing, air inlet and air outlet pipes, means to intermittently revolve said frame to bring one of said receptacles adjacent to said source of heat and another of said receptacles in connection with said pipes, whereby the operation can be carried on continuously.
5. An air-drying apparatus comprising a casing, a rotatable shaft vertically mounted within said casing, a frame attached to said shaft and carrying a plurality of receptacles adapted to contain a moisture-absorbing substance, a furnace within said casing below said frame, an air-inlet below said frame and an air-outlet above the same, and automatic means to rotate said shaft at predetermined regular intervals of time to place each of said receptacles successively over said furnace and then be-

tween said air-inlet and air-outlet, whereby the operation can be carried on continuously.

6. An air-drying apparatus comprising a casing divided horizontally by apertured partitions into three superimposed sections, the lowermost section being divided into two compartments, a frame, carrying a plurality of receptacles adapted to contain a moisture-absorbing substance, revolubly mounted in the central section, a furnace located in one of the said compartments in the lowermost section, tubes arranged in the uppermost section to receive the products of combustion of said furnace, means to force air into said uppermost section and around said tubes, a pipe to convey the air thus heated from said uppermost section to the other compartment of said lowermost section, an air-outlet pipe communicating with said central section and means to intermittently revolve said frame to place each of said receptacles successively over said source of heat with its upper end in communication with said tubes and over said last-mentioned compartment of the lowermost section with its upper end in communication with said outlet pipe.

7. An air drier comprising a casing, a shaft vertically journaled in the center of said casing, a pair of receptacles adapted to contain moisture absorbing substance carried by said shaft at diametrically opposite points, means to supply a current of air at one end of said casing and to cause it to pass through one of said receptacles, a source of heat at the other end of said casing and means to periodically rotate said shaft through 180° so as to change the relative positions of said receptacles.

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

ERNEST WILLIAM COOKE.

Witnesses:

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