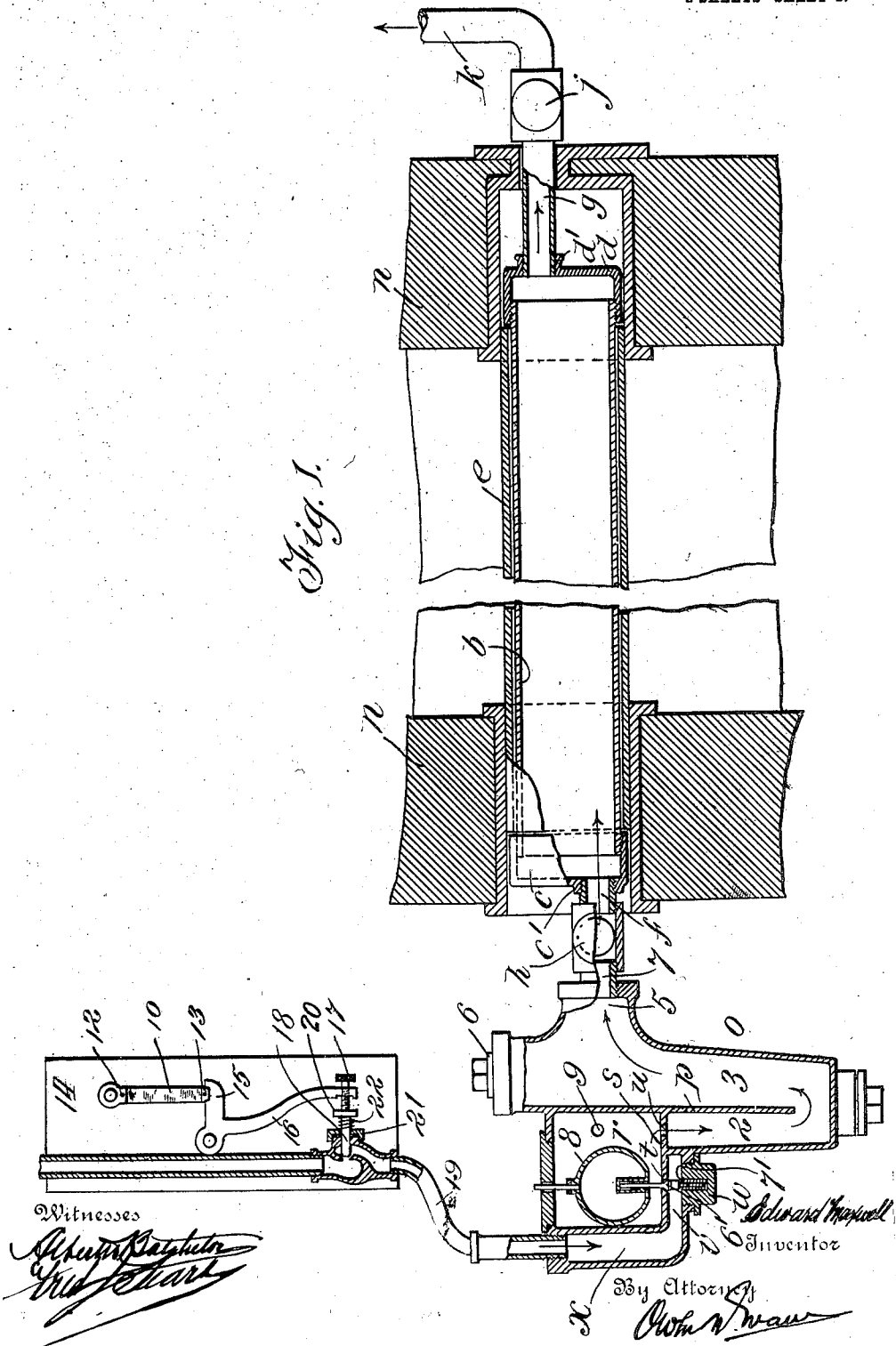


APPLICATION FILED JAN. 3, 1908.

957,430.

Patented May 10, 1910.

2 SHEETS--SHEET 1.



E. MAXWELL.
HUMIDIFIER.
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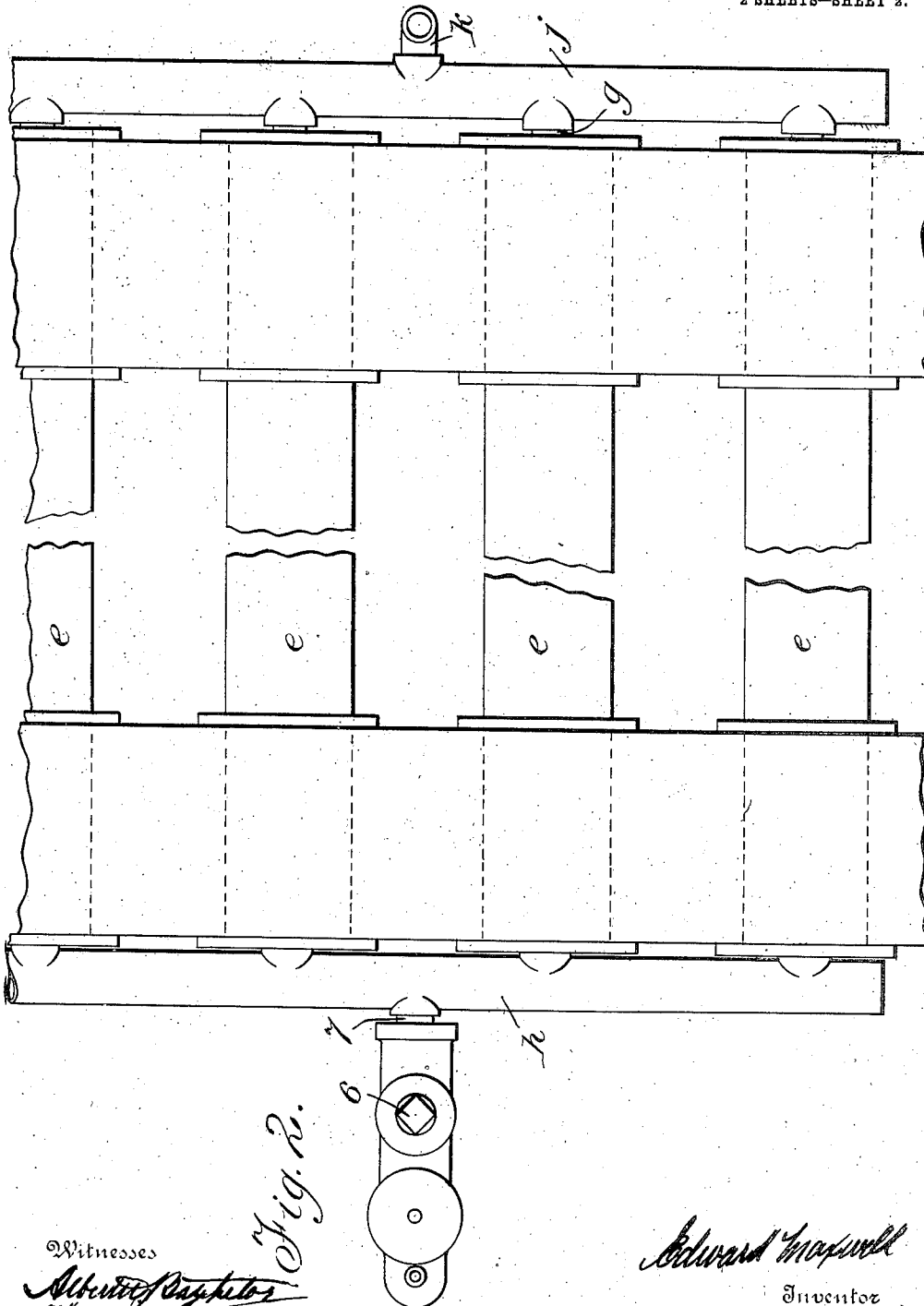


Fig. 2.

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HUMIDIFIER.

957,430.

Specification of Letters Patent.

Patented May 10, 1910.

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To all whom it may concern:

Be it known that I, EDWARD MAXWELL, of the city of Montreal, Province of Quebec, Canada, have invented certain new and useful Improvements in Humidifiers; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention relates particularly to the humidifier disclosed in U. S. Patent No. 859502 granted to Herbert James Page and myself, July 9th, 1907, although the parts thereof may be applied with advantage to other systems without departing from the spirit of my invention.

The invention may be said briefly to consist of a vaporizing device comprising a retort adapted to be located in intimate relation with a heat generator; an automatically operated water supply regulating device and steam trap connected to such retort and adapted to regulate the amount of water admitted to the retort and at the same time prevent the surging thereof and consequent agitation of the valve which would cause the flooding of the retort, such device also serving in its capacity as a trap, to prevent the steam passing to the valve chamber.

A further feature of the invention consists of a valve operating member actuated by the variation in the humidity of the atmosphere in the chamber to be humidified and controlling the supply of water to the said water regulator and retort.

For full comprehension, however of my invention reference must be had to the accompanying drawings forming a part of this specification, in which similar reference characters indicate the same parts, and wherein—

Figure 1 is a view illustrating my improved water regulating and vaporizing parts in vertical section, and the member for controlling the water supply; Fig. 2 is a plan view of a portion of the retort.

The vaporizer consists of a plurality of retorts each consisting of a pipe *b* closed at its opposite ends by a pair of caps *c* and *d*, the cap *c* having a tapped opening *c'* near the bottom of the retort and the cap *d* a similar opening *d'* near the top thereof, the pipe being protected by an inclosing refrac-

tory tube *e* extending from one cap to the other. Pipes *f* and *g* connect the opposite ends of these retorts to headers *h* and *j* the former having the water supply connected thereto and the latter the vapor conducting pipe *k* leading therefrom to any required point of distribution (not shown). This vaporizer is located in the fire pot of a furnace (portions of the walls thereof are indicated at *n*) or otherwise in intimate relation with a heat generator.

The water supply regulator consists of a closed vertical chamber *o* divided into passages 2, 3, by a vertical partition *p* extending from the top of the chamber to within a short distance of the bottom, the passage 2 being laterally extended to form a reservoir *r* the floor whereof consists of a horizontal partition *s* extending completely across the said passage and its extension, and such horizontal partition has a diminutive intake port *t* centrally of the reservoir and a port *u* communicating with the passage 2. The wall of this extension is of sufficient depth to present a valve chamber *v* beneath the reservoir and having its bottom closed by a screw plug *w*, and a by-pass *x* formed in this wall communicates at its lower end with the valve chamber while its upper end receives the water supplied by the member within the chamber to be humidified. The passage 3 has a discharge port 5 on a level with a point about midway of the height of the reservoir, and the upper end of such passage is plugged as at 6, while a pipe 7 connects the port 5 to the header *h*. A valve 6' within the chamber *v* is yieldingly retained seated upon the edge of the diminutive port *t* by a spring 7' and its stem projects through such port and has riding thereon a ball float 8 which is of sufficient weight, when there is no water in the reservoir, to depress the spring and open the said port.

9 is an overflow.

The member actuated by the variations in the humidity of the atmosphere in the chamber to be affected, consists of a bar 10, of "end-grain" wood, (or other expansible material) having an eye 12 secured to its upper end and an end piece 13 of relatively harder material secured to its lower end the

upper end being pivoted to a base 14. A bell-crank lever fulcrumed upon this base has the end 13 of the bar 10 bearing upon one arm 15 thereof and its other arm 16 provided with an adjustable thumb screw 17, while a valve 18 controlling a water pipe 19 has a head 20 between which and a stuffing box 21, a spring 22 bears and tends to hold the valve away from its seat. The thumb screw 17 is adjusted to locate this valve in its proper position with relation to the seat, the scope of variation in the length of the bar 10 being taken into careful consideration.

Operation: The operation of the apparatus is as follows:—The valve 18 being properly set, water is permitted to flow through pipe 19 to the valve chamber *v* of the regulator and slowly ooze through the diminutive port *t* into the reservoir and along the floor of the latter to the port *u* into the trap which it gradually floods until the ball float 8 is lifted and the spring 7 permitted to cause the valve 6' to close the port *t*, and, if in the meantime the member 10 has not expanded and closed the valve 18, a reserve supply of water will be collected in the portion of the pipe between such valve and the reservoir.

If the heat to which the vaporizer is subjected is sufficiently intense the water will be converted into steam as soon as it enters the retorts and such steam will rise to the chamber to be humidified, and will be supplied to a greater or less degree according to the variations of the humidity in the atmosphere.

What I claim is as follows:—

1. In a humidifying system the combination with a retort, of a combined water supply regulator and steam trap consisting of a chamber presenting a pair of passages communicating at one end and having an overflow for establishing the level of water in the chamber; a humidistat; means controlled by such humidistat whereby water is supplied to one end of such chamber the other end whereof is connected to the retort, and means whereby steam is conducted from the retort.

2. In a humidifying system the combination with a retort, of a combined water supply regulator and steam trap consisting of a chamber presenting a pair of passages communicating at one end; a humidistat, means controlled by such humidistat whereby water is supplied to one end of such chamber the other end whereof is connected to the retort, and means whereby steam is conducted from the retort.

3. In a humidifying system the combination with a retort, of a water supply regulator consisting of a water conductor communicating with the retort; a reservoir communicating with the conductor; a valve chamber communicating with the reservoir

and containing a valve controlling the communication between such reservoir and chamber; means controlled by the vaporization in the retort for operating the valve; means whereby water is supplied to the valve chamber; and means whereby steam is conducted away from the device.

4. In a humidifying system the combination with a retort, of a combined water supply regulator and steam trap consisting of a chamber presenting a pair of passages communicating at one end; a reservoir formed by an extension of one of such passages and containing a float; a valve chamber communicating with the reservoir and containing a valve coacting with the float and controlling the communication between such reservoir and conductor; means controlled by the vaporization in the retort for operating the valve; means whereby water is supplied to the valve chamber; and means whereby steam is conducted away from the device.

5. In a humidifying system the combination with a retort, of a water conductor communicating with the retort, a unitary member consisting of a chamber divided by a partition into two passages communicating at one end, automatic means controlling the supply of water to one of such passages the other passage being connected to the retort.

6. In a humidifying system the combination with a retort having a steam outlet, of a unitary member consisting of a chamber having an overflow and divided by a partition into two passages communicating at one end; a water conductor communicating with one of such passages; and means for supplying water to the water conductor, the other passage being connected to the retort.

7. In a humidifying system the combination with a retort, of a water conductor, a unitary member consisting of a chamber having an overflow and divided by a partition into two passages communicating at one end; automatic means controlling the supply of water to one of such passages, the other passage being connected to the retort.

8. In a humidifying system, means for supplying water to the system comprising a wooden member adapted to expand or contract to a greater or less degree longitudinally as the atmospheric humidity varies, a water conducting pipe having a valve controlling the flow of water therethrough, such valve having an operating part disposed in line with and borne upon by the said wooden member, and an operative connection between the said member and the said operating part of the valve.

9. The combination with a water conducting pipe having a valve controlling the flow of water therethrough, of means whereby the atmospheric humidity is caused to operate the valve such means consisting of a

wooden bar capable of expanding and contracting longitudinally as the humidity varies such bar being confined at one end, and means operatively connected to the
5 valve and disposed in line with and constructed and arranged to be borne upon by the free end of the said bar in the expansion thereof.

In testimony whereof, I have signed by name to this specification, in the presence of 10 two subscribing witnesses.

EDWARD MAXWELL.

Witnesses:

WILLIAM L. McFEAT,

FRED. J. SEARS.