

No. 859,502.

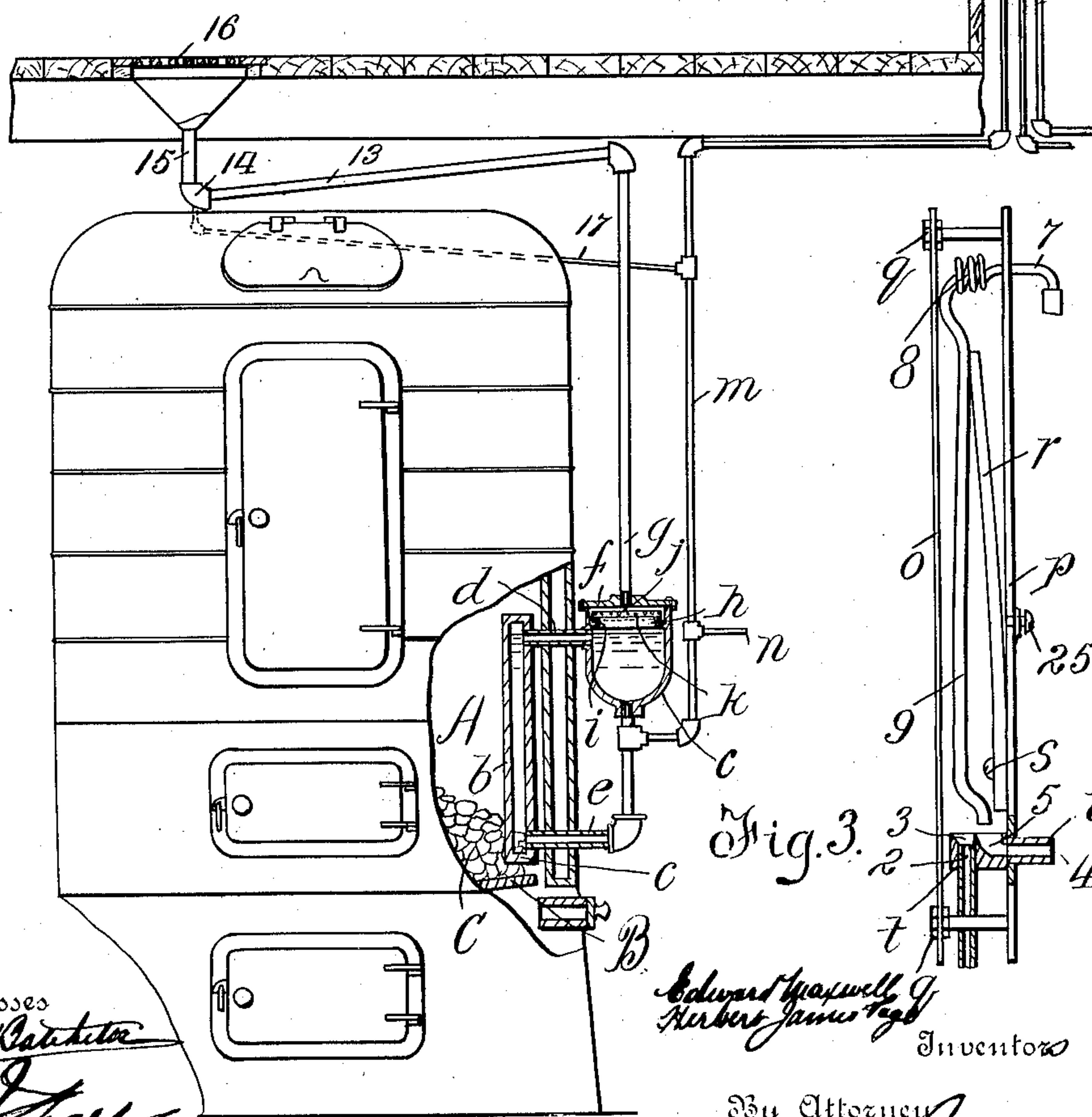
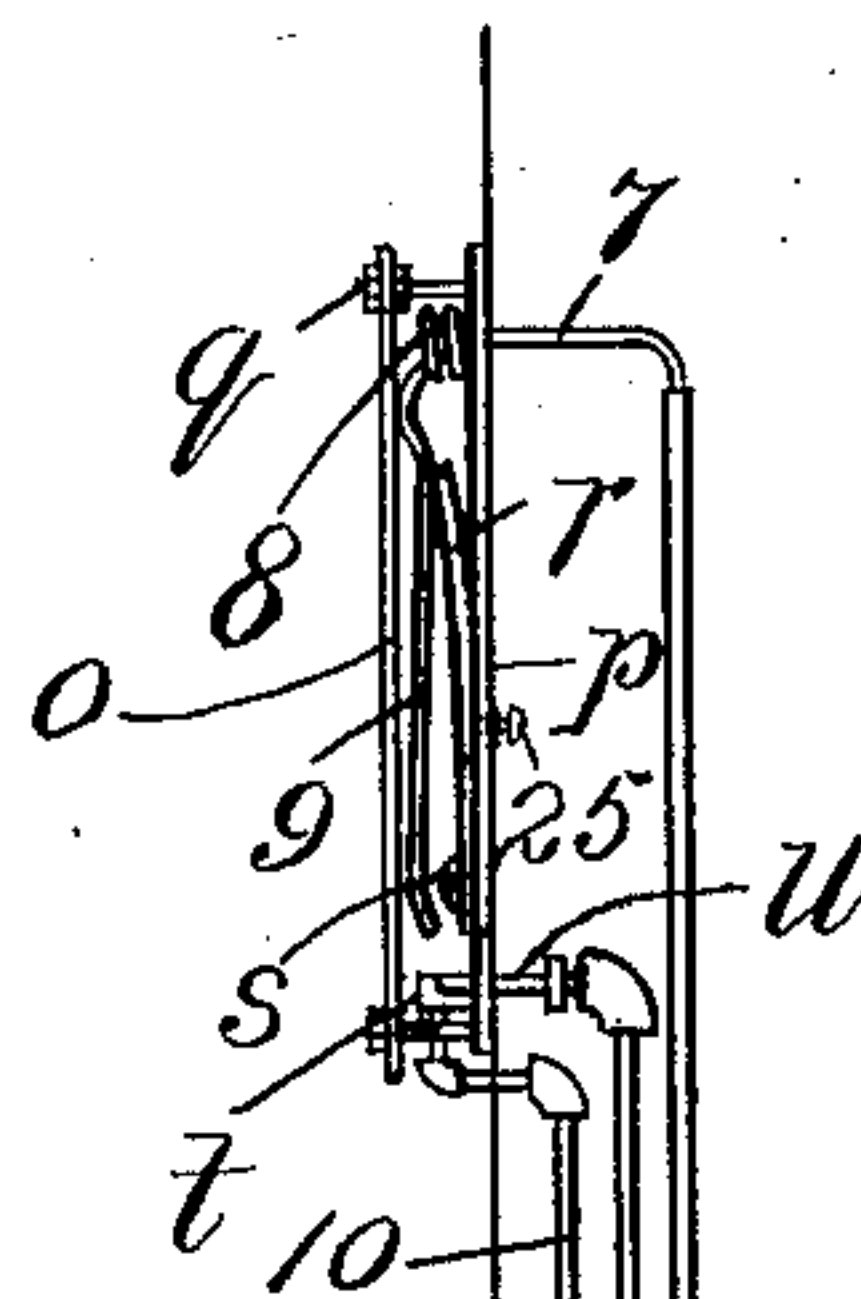
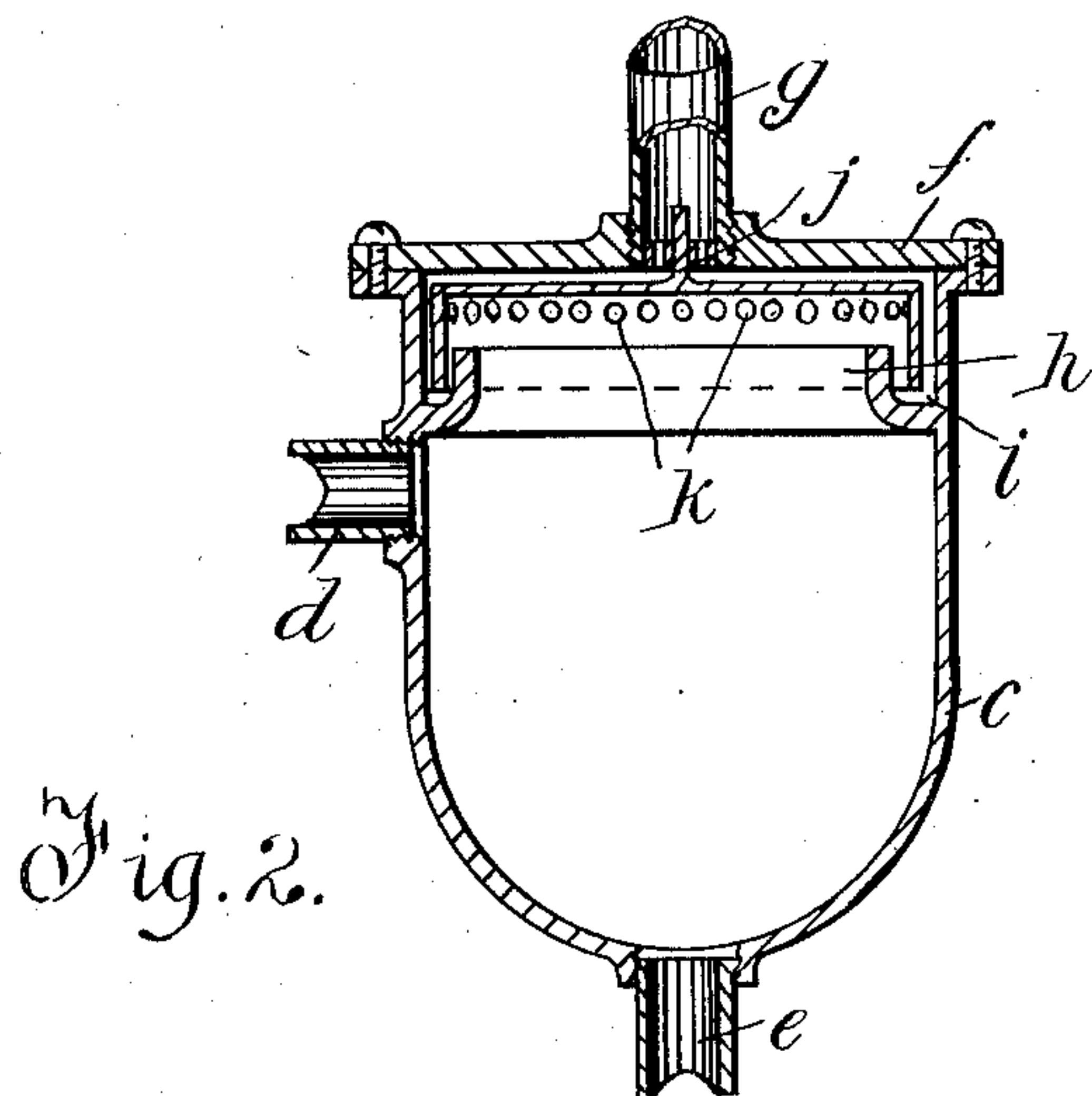
PATENTED JULY 9, 1907.

E. MAXWELL & H. J. PAGE.

## HUMIDIFYING SYSTEM.

APPLICATION FILED MAR. 10, 1906.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

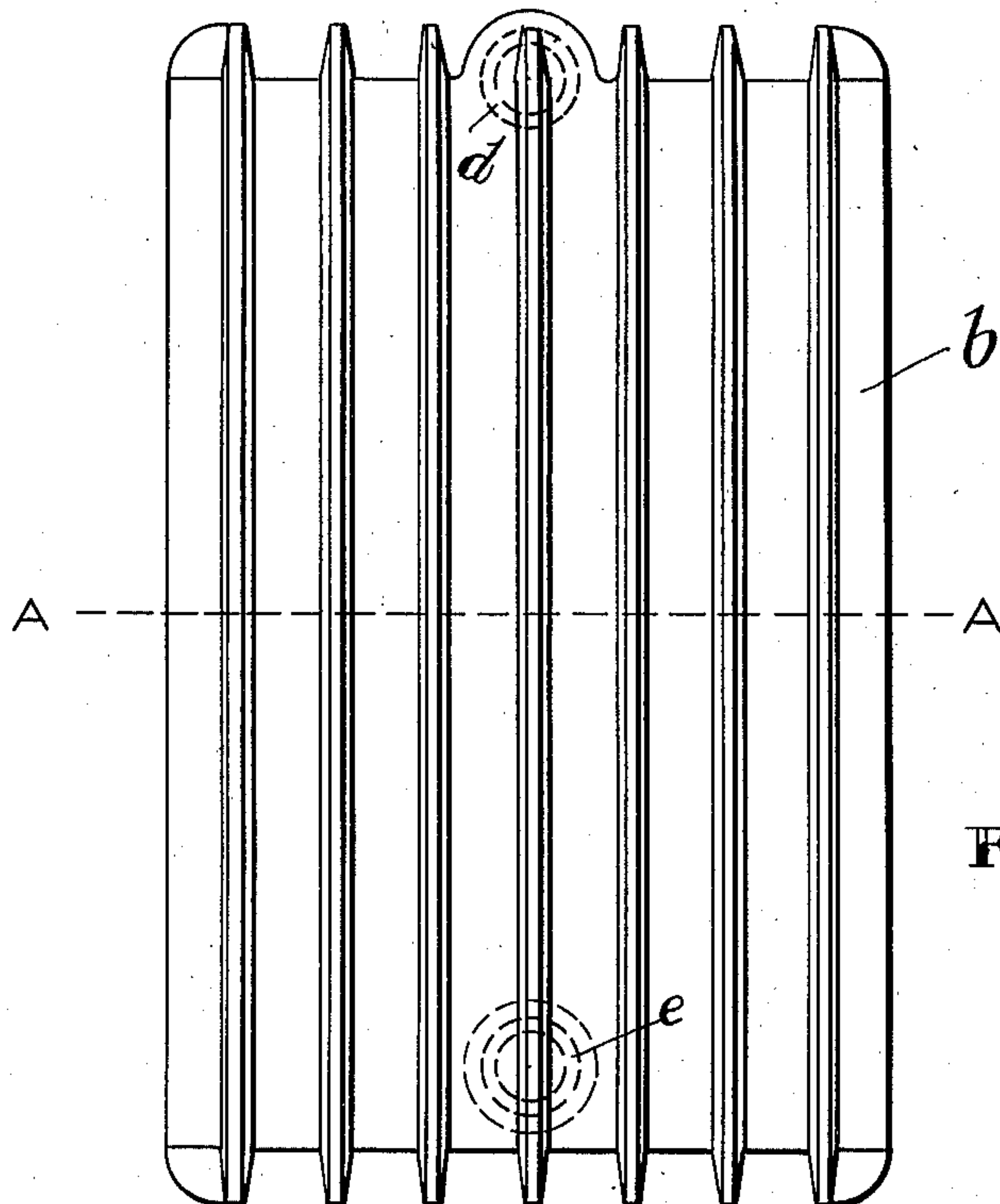


FIG. 4.

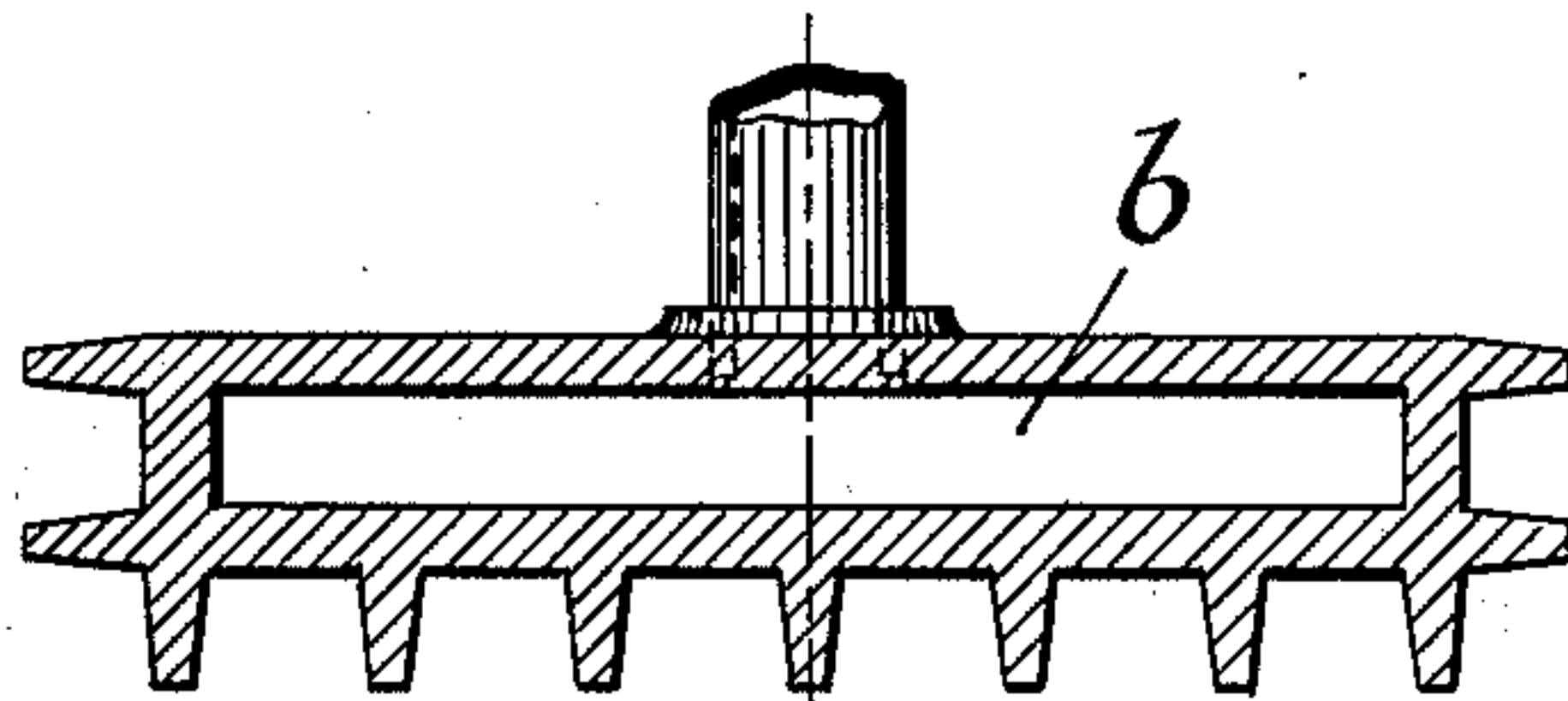


FIG. 5.

SECTION AT A-A

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# UNITED STATES PATENT OFFICE.

EDWARD MAXWELL AND HERBERT JAMES PAGE, OF MONTREAL, QUEBEC, CANADA.

## HUMIDIFYING SYSTEM.

No. 859,502.

Specification of Letters Patent.

Patented July 9, 1907.

Application filed March 10, 1906. Serial No. 305,401.

*To all whom it may concern:*

Be it known that we, EDWARD MAXWELL and HERBERT JAMES PAGE, both of the city of Montreal, Province of Quebec, Canada, have invented certain new and useful Improvements in Humidifying Systems; and we do hereby declare that the following is a full, clear, and exact description of the same.

Our invention relates particularly to humidifiers for use in buildings although it may be applied to other uses without departing from the spirit of our invention, and it has for its object to provide a device of this type which will automatically regulate the humidity of a chamber to a predetermined degree, and further objects of the invention are to render the device noiseless in its operation, and adapt the same to diffuse an anti-septic substance or a perfume through such chamber.

The invention may be said briefly to consist of a vaporizing chamber and a retort included in a closed circuit and presenting a vapor receptacle outside of the heater while the retort is located within the latter, and means is provided to establish a water level within the circuit. A controller for the water supply is located in the chamber to be humidified and is adapted to be affected by the humidity of the atmosphere, and comprises preferably a strip of wood having one side coated with a waterproofing substance and its other side treated with calcium chlorid or other substance adapted to render the same more susceptible to variations in the atmospheric humidity.

For full comprehension, however, of our 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 illustrates our humidifier applied to a furnace, the retort and vaporizing chamber being shown partly in sectional view; Fig. 2 is an enlarged vertical sectional view of the vaporizing chamber; Fig. 3 is an enlarged elevation partly in section of the means for controlling the water supply to the retort; Fig. 4 is a detail enlarged elevation of the retort, and Fig. 5 is a horizontal sectional view thereof.

The steam generating apparatus of our improved humidifying system comprises preferably a retort and a vaporizing chamber included in a closed circuit. The retort consists preferably of a vertically arranged tube *b* having both ends closed and located within the fire chamber of the furnace *A* (or other heat generator) with its end in close proximity to the grate *B* and its lower portion covered by the fire bed *c*.

The vaporizing chamber consists preferably of a vessel located outside of the fire chamber and with its top above the level of the retort. A pair of pipes *d* and *e* extend from the top and bottom, respectively of the retort through openings in the wall of the furnace, and the pipe *d* is connected to the vaporizing vessel at a point a short distance below the top thereof while the

pipe *e* is connected to and communicates with the bottom of such vessel. The top of this vaporizing vessel is closed by a hermetically sealed cover *f* from the center of which a steam pipe *g* leads, and an inverted cup *h* within the upper end of the vessel has its lower end located in an annular trough *i* kept constantly filled by the water of condensation, while a spindle *j* of diminutive cross-section projects from the center of the cup into the lower end of the pipe *g* and localizes such cup. The wall of the latter is formed with perforations *k*.

Water is fed to the retort and vaporizer by a pipe *m* connected to the pipe *e*, and the desired level (slightly above the pipe *d*) is maintained by an overflow pipe *n*.

Our improved device whereby the humidity of a chamber controls the water supply, consists, preferably, of a frame supporting means the shape whereof is changed by changes in the humidity of the chamber, and which is adapted to control means varying, to a minute degree, the water supplied. The frame is disposed vertically and comprises preferably a pair of plates *o* and *p* secured together, a short distance apart, by a series of stud screws *q* and nuts. A strip *r* of wood (preferably hard wood dried to the usual outside atmospheric degree of humidity) has one side coated with a waterproofing mixture. One end of this strip is secured by a screw *s* to the frame plate *p* and the other end thereof is free, such strip being arranged with its waterproofed side towards such frame plate *p*.

A block, *t*, formed with an exteriorly screw-threaded nipple *u* is secured to the frame plate *p* by having such nipple screwed through an opening therein. This block is bored to present a vertical passage 2 with a flared mouth 3, and an angular passage 4 with its upper end terminating in a flared mouth 5, the other end of the latter passage terminating in the interior of the nipple which forms a continuation thereof; while a transverse partition 6 constitutes the adjacent side walls of the flared mouth and its top edge is sharpened to a knife edge.

A pipe 7 of diminutive bore leads from any available water supply to the top of the interior of the supporting frame where it is formed into a coil 8 to increase the resiliency thereof and its end 9 is extended down over the strip *r* of wood upon the free end of which it bears, and is retained in different positions (according to the curvature of the strip) over the flared mouths above mentioned.

A pipe 10 leads from the vertical passage 2 to the upper end of the pipe *m*, and a pipe 12 leads from the nipple *u* to any available waste pipe, or other waste discharge not shown; while the upper end of pipe *g* is connected to the upper end of an inclined pipe 13 the lower end whereof is connected by an elbow 14 to a pipe 15 the upper end whereof terminates in a grating 16 located at any suitable point in the chamber to be humidified. The elbow 14 constitutes a receptacle for



the water of condensation from pipes 15 and 13 and a drip pipe 17 leads therefrom to the pipe *m*.

The degree of humidity in the atmosphere causes the sides of the strip of wood not waterproofed to contract or expand thereby bending the same to either force the end of the water supply pipe 9 into position to drop water into the pipe 10 or allow such pipe 9 to assume its normal position in line with the mouth of pipe 4. The water thus dropped finds its way to the heated retort where it is immediately converted into steam which rises to the grating 16, and as the water continues to be supplied it gradually reduces the temperature of the retort and fills the latter and the chamber *c* to the level of the overflow *n*, the steam meanwhile finding its way through the perforations in the inverted cup *h* (which acts as a muffler) to the pipes *g*, 13 and 15 and the grating 16.

An adjustment screw 25 enables the normal position of the strip to be varied, and a damper controlled draft duct *B'* affords a means for constantly maintaining a good fire beneath the retort.

What we claim is as follows:—

1. A humidifying system comprising a vaporizer, means controlled by the variations in the humidity of the atmosphere for supplying a liquid to the vaporizer, and a vapor conductor leading from the vaporizer to a point adjacent the space to be humidified.

2. A humidifying apparatus comprising a retort, a vaporizing chamber located with its top above the level of the top of the retort, a pipe connecting the top of the retort to the vaporizing chamber at a point a short distance below the top of the latter, a pipe connecting the lower end of the retort to the bottom of the vaporizing chamber, a pipe leading from the top of the vaporizing chamber to the space to be humidified, means whereby the retort is heated, and regulable means supplying water to the retort.

3. A humidifying apparatus comprising a retort, a vaporizing chamber located with its top above the level of the top of the retort, a pipe connecting the top of the retort to the vaporizing chamber at a point a short distance below the top of the latter, a pipe connecting the lower end of the retort to the bottom of the vaporizing chamber, a pipe leading from the top of the vaporizing chamber to the space to be humidified, and means controlled by the variations in the humidity of the atmosphere of such space for supplying water to the retort.

4. A humidifying apparatus comprising a retort, a vaporizing chamber located with its top above the level of

the top of the retort, a pipe connecting the top of the retort to the vaporizing chamber at a point a short distance below the top of the latter, a pipe connecting the lower end of the retort to the bottom of the vaporizing chamber, a pipe leading from the top of the vaporizing chamber to the space to be humidified, an inverted cup in the top of the vaporizing chamber and having its wall perforated, an annular trough upon the interior of the said chamber and loosely containing the rim of such cup, means whereby the retort is heated, and regulable means supplying water to the retort.

5. In a humidifying system, means for supplying water to the system comprising a member adapted to warp to a greater or less degree as the atmospheric humidity varies, a water supplying device and means operated by the said member for controlling the quantity of water supplied.

6. A water supplying device for a humidifying system, comprising a member adapted to have its form changed by variations in the atmospheric humidity, a pair of conductors having flared mouths, a knife edged partition separating and forming a portion of the walls of such flared mouths, a resilient water conducting pipe of diminutive bore having its discharge end located over the said flared mouths and bearing upon the said member for the purpose set forth.

7. A water supplying device for a humidifying system, comprising a support, a strip of wood having one side waterproofed, means securing one end of the strip to the support, a pair of conductors having flared mouths disposed in line with the strip of wood, a knife edged partition separating and forming a portion of the wall of each flared mouth, a resilient water conducting pipe of diminutive bore having its discharge end located over the said flared mouths and bearing upon the free end of the said strip of wood for the purpose set forth.

8. A water supplying device for a humidifying system, comprising a support, a strip of wood having one side waterproofed, means securing one end of the strip to the support, a pair of conductors having flared mouths disposed in line with the strip of wood, a knife edged partition separating and forming a portion of the wall of each flared mouth, a resilient water conducting pipe of diminutive bore having its discharge end located over the said flared mouths and bearing upon the free end of the said strip of wood, and an adjusting screw carried by the support and acting upon the strip of wood, for the purpose set forth.

In testimony whereof, we have signed our names to this specification, in the presence of two subscribing witnesses.

EDWARD MAXWELL.  
HERBERT JAMES PAGE.

Witnesses:

WILLIAM P. McFEAT,  
ARTHUR H. EVANS.