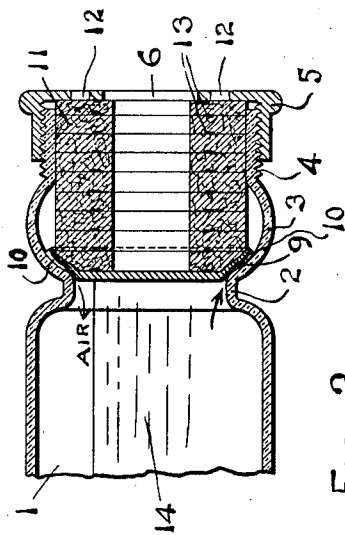


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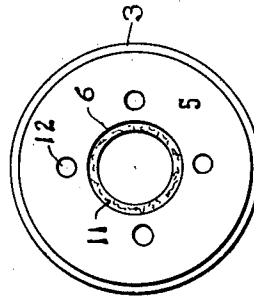
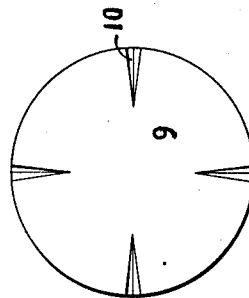


Fig. 3.



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UNITED STATES PATENT OFFICE.

ROBERT S. BLAIR, OF SOUTH ORANGE, NEW JERSEY.

EVAPORATION-CONTROLLING APPARATUS.

1,026,846.

Specification of Letters Patent.

Patented May 21, 1912.

Application filed August 3, 1910. Serial No. 575,368.

To all whom it may concern:

Be it known that I, ROBERT S. BLAIR, a citizen of the United States, residing at South Orange, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Evaporation-Controlling Apparatus, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to evaporation controlling and dampening devices.

One of the objects thereof is to provide simple and practical means for controlling the evaporation of a liquid.

Another object is to provide efficient and uniformly acting means for automatically maintaining cigars and the like in the desired moistened condition.

Other objects are to provide means of the above types of simple construction and readily adjustable action.

Other objects will be in part obvious and in part pointed out hereinafter.

The invention accordingly consists in the features of construction, combinations of elements and arrangement of parts which will be exemplified in the device hereinafter described, and the scope of the application of which will be indicated in the following claims.

In the accompanying drawings wherein is shown one of various possible embodiments of this invention, Figure 1 is a side elevation thereof; Fig. 2 is a sectional detail on a somewhat larger scale; Fig. 3 is an end view; and Fig. 4 is an end view of a valve.

Similar reference characters refer to similar parts throughout the several figures of the drawings.

Referring now to these drawings in detail, there is shown a tubular receptacle 1, preferably formed of glass and having formed therein an annular depression or shoulder 2. Beyond this shoulder the casing is carried to form an extension 3, preferably threaded as at 4. Coacting with this threaded portion 4 is an annular cap 5 provided with a central opening 6 and preferably having formed on its edge a scale 7 to coact with an index 8 upon the casing.

Resting against the shoulder or valve seat 2 is a valve 9 preferably formed of rubber and provided with a plurality of spaced

grooves or recesses 10 on the side toward the shoulder. Within the extension 3 is a member 11 which may be of annular form and is here shown as built up of a series of disks. The term "member" is used in its broader sense, as denoting any body of whatever form and whether unitary or built up. This member 11 is formed of such a material that it will change its form upon passing from a dry to a moistened state. In the present instance, blotting paper or the like is used and this substance, upon becoming moistened or dampened, expands to a considerable degree, and also by its capillary action quickly absorbs and diffuses within itself any liquid brought in contact with any part thereof.

The operation of the above described embodiment of this invention is substantially as follows: Assuming that the receptacle 1 is filled with a liquid 14 either through a suitable opening formed therein or by removing the cap 5, member 11 and valve 9, the parts then being assembled as shown in Fig. 3, and adjusted to the desired extent, the liquid will pass by gravity through the grooves 10 and contact the dry member 11, which will immediately expand, forcing the valve against its seat and flattening the grooves so as to cut off the supply. The opening of the valve permits the water to flow out at one point, and the compensating air to enter at another, as indicated by arrows. The member 11 is then in moistened condition and will quickly evaporate its contained liquid by reason of its surface exposed to the outer air, which may be amplified if desired by means of openings at 12 and elsewhere. Upon the evaporation proceeding to such a point that there is a slight tendency to drying of the member 11, its shrinkage will permit the passage of further liquid from the receptacle either by pulling the valve away from its seat by reason of direct connection between the parts, as a liquid-proof cement, as indicated at 13, or by reason of the resilient action of the rubber valve. In the present embodiment both of these features are employed, in order to render the action more quick and certain. This new supply of liquid is immediately absorbed, and the above cycle of operation is repeated; and it is to be noted that inasmuch as a minute degree of drying will immediately afford a slight new supply of liquid, the member 11 is

maintained at a substantially constant condition of dampness. This condition of dampness, moreover, is readily adjusted to different degrees by turning the cap 5; for it is to be noted that if the cap is withdrawn from the receptacle it will be necessary for the member 11 to become wetter in order to cut off the liquid supply, whereas if the cap is screwed farther down toward the receptacle, the supply is cut off with a slight dampness and corresponding expansion of the evaporation member. The position of the valve 11 with respect to its seat is thus controlled in accordance with the moisture or dampness of the member 11, or hygrometrically controlled; and it is to be noted that the expression "hygrometrically controlled" refers broadly to control in accordance with the moisture or dampness of some member and not necessarily in accordance with the dampness of the atmosphere. By this method of operation the liquid in the receptacle is constantly evaporated, and if the device be used, for example, in moistening cigars, there is provided a surface which is retained always at the same degree of dampness for several months without adjustment of the parts or renewal of the supply of liquid. Moreover, the device is equally adapted for use in evaporating antiseptics or insecticides and the like.

It is to be especially noted in connection with the embodiment herein shown that by reason of the direct action of the liquid itself upon the expanding member, the device is extremely sensitive and quick in operation and the escape of liquid in liquid form, which might occur with injurious results if other factors were involved, such as the dampness of the atmosphere, is absolutely prevented.

As many changes could be made in the above construction any many apparently widely different embodiments of this invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a device of the general nature of that described, in combination, a receptacle adapted to contain a liquid, a member adapted to change its form upon being moistened, means adapted to lead the liquid from said receptacle to said member, and means controlled by the condition of said member and controlling the passage of said liquid from said receptacle to said member and tending to admit liquid to said member as said member dries.

2. In a device of the general nature of

that described, in combination, a receptacle adapted to contain a liquid, a member adapted to change its form upon being moistened, means adapted to lead a liquid from said receptacle to said member, and means controlling the passage of liquid from said receptacle to said member and adapted to maintain said member at a substantially constant degree of dampness.

3. In a device of the general nature of that described, in combination, a receptacle adapted to contain a liquid, a member adapted to change its form upon being moistened, means adapted to lead a liquid directly from said receptacle to said member, and means controlled solely by the condition of said member and controlling the passage of said liquid from said receptacle to said member and tending to admit liquid to said member as said member dries.

4. In a device of the general nature of that described, in combination, a receptacle adapted to contain a liquid, a member adapted to change its form upon being moistened, means adapted to lead a liquid from said receptacle to said member, and a valve controlling the passage through said last means and controlled in accordance with the condition of said member.

5. A unitary device having formed at one portion a receptacle adapted to contain a liquid and having another portion formed to support an absorbent member with a portion of its surface exposed to the outer air and a portion of its surface positioned to receive liquid from said receptacle, an absorbent member supported in said device, and a valve in said device and controlled by the expansion and contraction of said member and controlling the passage of liquid from said receptacle to said member.

6. In a device of the general nature of that described, in combination, a receptacle adapted to contain a liquid, and means comprising an absorbent member positioned to receive liquid directly from said receptacle and controlling the egress of liquid from said receptacle in accordance with the expansion or contraction of said member.

7. A unitary device having formed at one portion a receptacle adapted to contain a liquid and having another portion formed to support an absorbent member with a portion of its surface exposed to the outer air, an absorbent member supported in said device, and a valve in said device and controlled by the expansion and contraction of said member and controlling the egress of liquid from said receptacle.

8. A unitary device comprising a casing having formed at one portion a receptacle adapted to contain a liquid and having a shoulder formed therein, and a supporting portion for an absorbent member upon the side of said shoulder remote from said re-

ceptacle portion, a valve in said casing co-
acting with said shoulder as a valve seat,
and an absorbent member positioned in said
casing and controlling said valve in accord-
ance with its expansion and contraction.

9. In a device of the general nature of
that described, in combination, a valve seat,
a valve having an irregularity formed of
resilient material in its surface coacting
with said valve seat, and a member adapted
to change its form upon being moistened
and positioned to move said valve toward
its seat.

10. In a device of the general nature of
that described, in combination, a receptacle
adapted to contain a liquid, a valve and
valve seat controlling the egress of liquid
from said receptacle, said valve having
formed in its surface coacting with said
seat a plurality of spaced irregularities of re-
silient material, and a member adapted to
change its form upon being moistened and
positioned to move said valve toward its
seat or permit movement of said valve away
from its seat whereby the egress of liquid
from said receptacle and the entry of air
thereto are simultaneously permitted.

11. In a device of the general nature of
that described, in combination, a receptacle
adapted to contain a liquid, a valve posi-
tioned to admit air to said receptacle at
one point and permit the egress of liquid
therefrom at another point, and hy-
grometrically controlled means adapted sub-
stantially simultaneously to cause the open-
ing of said valve at both said points.

12. A unitary device comprising a recep-
tacle adapted to contain a liquid, a member
adapted to expand upon becoming mois-
tened, means comprising a restricted pas-
sage leading from said receptacle to said
member, and means coacting with said parts
to tend to choke said passage as said mem-
ber becomes moistened, said parts being
formed and proportioned to prevent the
escape of liquid in liquid form from said
device in all positions thereof.

13. In a device of the general nature of
that described, in combination, a receptacle
adapted to contain a liquid and having an
annular projecting shoulder therein, a valve
member adapted to coact with said shoul-
der and having a portion toward said shoul-
der of resilient material and provided with
an irregularity, and hygrometrically con-
trolled means adapted to force said valve
toward said shoulder to flatten said irregu-
larity and prevent the passage of liquid
from said receptacle.

14. A unitary device, one portion of
which is formed to provide a receptacle
adapted to contain a liquid, a member
mounted in another portion of said device
and adapted to receive liquid from said re-
ceptacle and evaporate the same, means

comprising a restricted passage connecting
said receptacle and said member adapted
in all positions of the device automatically
to limit the quantity of liquid flowing from
said receptacle to said member to an amount
which is evaporated from said member, and
protective means positioned about said
member to guard it from contact.

15. In a device of the general nature of
that described, in combination, a valve, a
valve seat with which said valve coacts, a
member adapted to expand upon becoming
moistened, a supporting member in which
said expansible member is positioned, and
a member threaded upon said supporting
member and extending over said expansible
member and adapted upon being turned to
force said expansible member toward said
valve.

16. In a device of the general nature of
that described, in combination, a tube hav-
ing a shoulder formed therein and forming
a receptacle for a liquid at one side of said
shoulder, a valve coacting with said shoul-
der as a valve seat, a member adapted to
expand upon being moistened and posi-
tioned in said tube adjacent said valve, and
means extending over said member upon
the side remote from said valve whereby
upon said member expanding said valve is
forced toward its seat.

17. In a device of the general nature of
that described, in combination, a tube hav-
ing a shoulder formed therein and forming
a receptacle for a liquid at one side of said
shoulder, a valve coacting with said shoul-
der as a valve seat, a member adapted to
expand upon being moistened and posi-
tioned in said tube adjacent said valve, and
means threaded upon said tube and extend-
ing over said member upon the side remote
from said valve whereby upon said member
expanding said valve is forced toward its
seat.

18. In a device of the general nature of
that described, in combination, a glass tube
having a shoulder formed therein and form-
ing a receptacle for a liquid at one side of
said shoulder, a resilient valve coacting with
said shoulder as a valve seat, a member
adapted to expand upon being moistened
and positioned in said tube adjacent said
valve, and means removably threaded upon
said tube to permit the removal of said ex-
pansible member and extending in its nor-
mal operative position over said member
upon the side remote from said valve,
whereby upon said member expanding said
valve is forced toward its seat.

19. In a device of the general nature of
that described, in combination, a glass tube
having a shoulder formed therein and form-
ing a receptacle for a liquid at one side of
said shoulder, a resilient valve coacting with
said shoulder as a valve seat, a member

adapted to expand upon being moistened and positioned in said tube adjacent said valve, and means removably threaded upon said tube to permit the removal of said ex-
 5 pansible member and extending in its normal operative position over said member upon the side remote from said valve, whereby upon said member expanding said valve is forced toward its seat, said ex-
 10 sible member being of annular form and said threaded means being provided with an opening to expose said expansible member.

20. In a device of the general nature of that described, in combination, a receptacle adapted to contain a liquid, a member adapted to change its form upon being moistened, means adapted to lead a liquid from said receptacle to said member, and adjustable
 15 means controlling the passage of liquid from said receptacle to said member and adapted to maintain said member at a substantially constant degree of dampness.

21. In a device of the general nature of that described, in combination, a receptacle adapted to contain a liquid, and adjustable means comprising an absorbent member positioned to receive liquid directly from said receptacle and controlling the egress of li-
 20 quid from said receptacle in accordance with the expansion or contraction of said member.

22. In a device of the general nature of that described, in combination, a valve seat, a valve having an irregularity formed of resilient material in its surface coacting with said seat, a member adapted to change its form upon being moistened and positioned to move said valve toward its seat,
 35 and means adapted to adjust said valve with respect to its seat independently of the change of form of said member.

23. In a device of the general nature of that described, in combination, a glass tube having formed therein an annular shoulder and forming a closed receptacle for a liquid at one side of said shoulder and a threaded supporting portion at the opposite side of said shoulder, a resilient valve within said
 45 tube and coacting with said shoulder as a valve seat and having formed in its active surface a plurality of relatively spaced recesses, a member positioned within said supporting portion of said tube of annular

form and adapted to expand upon becoming moistened and abutting substantially against said valve, and an annular cap threaded on said supporting portion of said tube and extending over the edges of said annular absorbent member.

24. In a device of the general nature of that disclosed, in combination, means forming a chamber adapted to receive a liquid, an absorbent member adapted to expand upon becoming moistened and positioned to receive liquid from said chamber and having a surface exposed to the outer air, and means coacting with said absorbent member to restrain the flow of liquid from said chamber to the exposed surface of said member as said member expands upon becoming moistened.

25. In a device of the general nature of that described, in combination, a receptacle adapted to contain a liquid and means comprising an absorbent member positioned to receive liquid in liquid form from said receptacle, and controlling the egress of liquid from said receptacle in accordance with the change of form of said member.

26. In a device of the general nature of that described, in combination, absorbent means provided with a surface adapted to evaporate a liquid, means comprising a receptacle adapted to contain a liquid and adapted to supply the same to said absorbent means in liquid form, and means primarily controlled by the change of form of said absorbent means and adapted automatically to cut down the supply of liquid to said absorbent means as it becomes wet.

27. In apparatus of the class described, in combination, an absorbent member provided with a surface adapted to evaporate liquid, means comprising a receptacle adapted to contain a liquid and adapted to supply the same to said absorbent member in liquid form, and means controlled by the change of form of said absorbent member adapted automatically to increase the supply of liquid to said absorbent member as it tends to dry.

In testimony whereof I affix my signature, in the presence of two witnesses.

ROBERT S. BLAIR.

Witnesses:

P. A. BLAIR,
 A. NUELAND.