(No Model.)

C. M. BAUM.

APPARATUS FOR PURIFYING STEAM AND REMOVING EXTRANEOUS MATTER.

No. 515,105. Patented Feb. 20, 1894.

FIG: 1

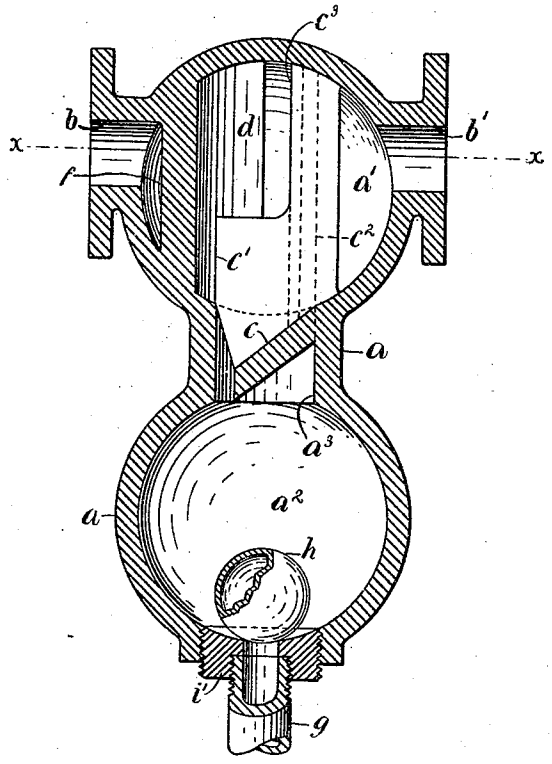


FIG: 2

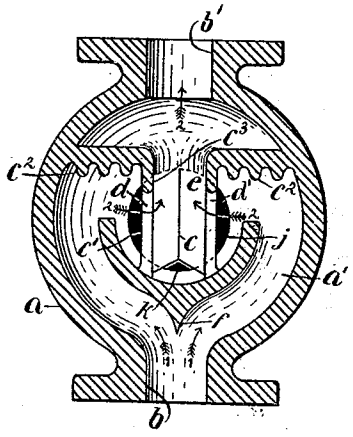
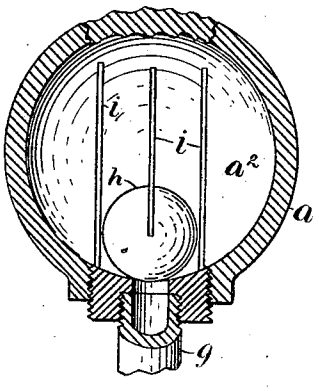


FIG: 3



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CLARENCE M. BAUM, OF PHILADELPHIA, PENNSYLVANIA.

APPARATUS FOR PURIFYING STEAM AND REMOVING EXTRANEOUS MATTER.

SPECIFICATION forming part of Letters Patent No. 515,105, dated February 20, 1894.

Application filed March 7, 1893. Serial No. 464,942. (No model.)

To all whom it may concern:

Be it known that I, CLARENCE M. BAUM, a citizen of the United States, residing at the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Apparatus for Purifying Steam and Removing Extraneous Matter Therefrom, of which the following is a specification.

The principal objects of my invention are first, to provide a durable, reliable, efficient and comparatively inexpensive apparatus for purifying steam by removing entrained water therefrom and for separating extraneous matter as oil, grit, grease, &c., from live and exhaust steam; second, to construct and arrange the parts of the apparatus in such manner that the top of the same extends but slightly above the steam pipes to which it is connected, so that the apparatus may be conveniently applied to a steam pipe suspended from a ceiling; third, to cause the steam and entrained water and extraneous matter to impinge perpendicularly against the baffle-plate or plates, whereby the water and the extraneous matter thereof are removed, and to cause the steam after thus depositing its entrained water and extraneous matter to pass upward through a port or ports located near the top of the apparatus and thence to the outlet-pipe or conduit, whereby the steam is more thoroughly purified than was heretofore possible; and fourth, to provide automatic means for permitting of the discharge of entrained water and the extraneous matter thereof, from a chamber or receptacle and for preventing the escape of steam from the drip or waste off-take thereof.

My invention consists of a steam purifying apparatus, comprising a casing or casting having communicating steam and fluid chambers, inlet and outlet conduits for the steam-chamber, an inclined trough discharging into the fluid chamber and provided with upwardly projecting side-walls and with transversely ranging baffle-plates extending to the top of the steam-chamber and constituting steam ports above the upwardly projecting side-walls and a passage to the outlet, and a director-plate ranging crosswise of the open end of the trough and adapted to guide the incoming steam to the baffle-plates.

My invention further consists of the improvements in steam purifying apparatus hereinafter described and claimed.

The nature and general features of my invention will be more fully understood from the following description taken in connection with the accompanying drawings forming part hereof; and in which—

Figure 1, is a view illustrating in central longitudinal section a steam purifying apparatus embodying features of my invention. Fig. 2, is a vertical transverse sectional view taken on the line x—x, of Fig. 1; and Fig. 3, is a detached sectional view of the waste reservoir or drip-chamber, showing means for controlling the range of vertical movement of the buoyant device or ball illustrated in Fig. 1.

In the drawings a, is a casing or casting having a spherical steam chamber a', and a spherical fluid chamber a^2, communicating with each other by means of an oblong or other shaped neck a^3.

b and b', are steam inlet and outlet conduits disposed diametrically opposite each other and located comparatively near to the top of the casing or casting a, in order to permit of the latter being connected with a steam pipe suspended from a ceiling.

c, is an inclined trough merging at its higher extremity and beneath the outlet b', into the curved wall of the steam chamber a', and having its lower extremity disposed in position for discharging fluid with its extraneous matter into the chamber a^2. This trough c, is provided with upwardly projecting side-walls c', that extend about midway to the roof of the chamber a', and with transversely ranging partially or wholly fluted or corrugated baffle-plates c^2, extending upward to the roof of the chamber a', and also projecting outwardly toward the central portion thereof, whereby ports d and d', are provided above the upwardly projecting side-walls c', and a passage e, to the outlet b', is provided between the baffle-plates c^2. In the present instance these baffle-plates c^2, are provided with flanges c^3, for a purpose to be presently fully described.

f, is a director-plate supported by the curved walls of the chamber a', and by the side-walls c', of the trough c, and disposed crosswise of

the open end of the trough and transversely of the steam-inlet *b*.

g, is a discharge-pipe communicating with the interior of the chamber a^2, and with a drain or waste-pipe, not shown.

h, is a buoyant device, for example, a hollow ball of aluminum or other preferred material normally seated in the mouth of the waste conduit and is adapted to close the entrance to the pipe *g*, in such manner as to prevent the escape of steam therethrough and also adapted to be automatically lifted or floated from its seat, by the fall of the water with its extraneous matter into the spherical chamber a^2, along or adjacent to the spherical surface or wall thereof, in order to permit of the escape of the same through the waste or drip-pipe *g*, thereof.

i, (in Fig. 3,) are rods attached to a bushing *i'*, and adapted to form a cage for guiding or limiting the range of vertical movement of the ball *h*, and for preventing undue lateral or sidewise movement thereof.

The mode of operation of the hereinbefore described apparatus is, as follows:—The steam entering through the inlet *b*, divides and pursues two courses by reason of the construction, arrangement and location of the director-plate *f*, and in following inward the curved walls of the chamber *a'*, the divided steam impinges perpendicularly against the baffle-plates c^2, as indicated by the arrows 1, with the result that the entrained water with its oil, grease, &c., is deposited against the baffle-plates c^2, in the channels between the fluted, corrugated or ribbed portions thereof, and falls by gravity into the chamber a^2. The purified steam then escapes around the flanges c^3, of the baffle-plates c^2, and through the ports *d* and *d'*, to the passage *e*, whence it passes outward through the outlet conduit *b'*, as indicated by the arrows 2, and any remaining liquid is removed from the steam before it escapes through the outlet *b'*. The water with its extraneous matter baffled off from the steam while it is traversing the passage *e*, falls by gravity or otherwise into the V-shaped trough *c*, and escapes in a downward direction therefrom into the spherical chamber a^2, as at *k*. During this operation the ball *h*, by suction closes the entrance to the drip or waste outlet pipe *g*, and thus prevents the escape of steam. However, the liquid freed from the purified steam falling into the chamber a^2, lifts or floats the ball *h*, from its seat in the waste or drip outlet pipe *g*, in order to permit of the escape of the same therethrough, whereupon the ball *h*, by suction is again returned to its initial position on its seat in the bushing *i'*, forming part of the waste pipe *g*, for preventing the escape of any steam from the spherical chamber a^2, through said waste pipe.

It will be obvious that as to some minor details of construction and arrangement of parts, modifications may be made without departing from the spirit of my invention, and hence I do not wish to limit myself to the precise construction and arrangement shown in the drawings; but

Having thus described the nature and objects of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A steam purifying apparatus comprising a casing or casting having communicating steam and fluid chambers, inlet and outlet conduits for the steam-chamber, an inclined trough discharging into the fluid-chamber and provided with upwardly projecting side-walls and with transversely ranging baffle-plates extending to the top of the steam-chamber and constituting steam ports above the upwardly projecting side-walls and a passage to the outlet conduit, and a director-plate ranging crosswise of the open end of the trough and adapted to guide the incoming steam to the baffle-plates, substantially as and for the purposes set forth.

2. A steam purifying apparatus, comprising a casing having communicating steam and fluid chambers, inlet and outlet conduits for the steam chamber, an inclined trough discharging into the fluid chamber and provided with upwardly projecting side walls and with transversely ranging corrugated ribbed or fluted baffle-plates projecting from the walls of said chamber and forming between adjacent portions thereof passages to the outlet conduit, a director-plate ranging transversely of said passages and the inlet conduit and adapted to permit the entering steam to impinge against said baffle-plates, and the said fluid chamber provided with a discharge-pipe having a rolling body normally seated in the mouth thereof and adapted to automatically open and close said pipe, substantially as and for the purposes set forth.

3. A steam purifying apparatus, comprising a casing having a steam-chamber provided with baffle-plates and a director-plate, and having a fluid-chamber provided with a discharge-pipe, a rolling body normally seated to said pipe, and a series of rods constituting a cage for guiding and limiting the vertical movement of said rolling body, substantially as and for the purposes set forth.

4. A steam purifying apparatus, comprising a casing having spherical steam and fluid chambers communicating with each other by means of a neck, inlet and outlet conduits for the steam-chamber, an inclined trough ranging transversely of the neck and provided with upwardly projecting side-walls and outwardly projecting baffle-plates and a director-plate ranging crosswise of the open end of the trough and adapted to guide the incoming steam to the baffle-plates, substantially as and for the purposes set forth.

5. A steam purifying apparatus comprising a casing or casting having communicating steam and fluid chambers, inlet and outlet conduits for the steam chamber, transversely ranging corrugated, ribbed or fluted baffle-plates projecting from the walls of said cham-

ber and forming between the adjacent portions thereof passages to the outlet conduit and a curved director-plate ranging transversely of said passages and the inlet conduit and adapted to permit entering steam to impinge against said baffle-plates, substantially as and for the purposes set forth.

In testimony whereof I have hereunto set my signature in the presence of two subscribing witnesses.

CLARENCE M. BAUM.

Witnesses:
THOMAS M. SMITH,
RICHARD C. MAXWELL.