

No. 624,616.

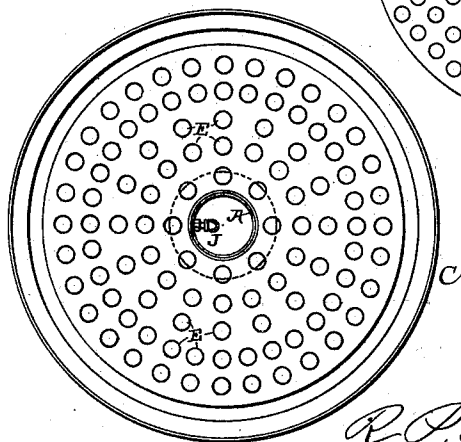
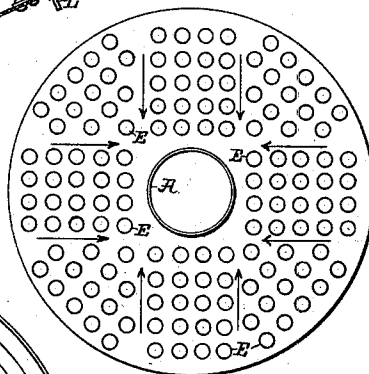
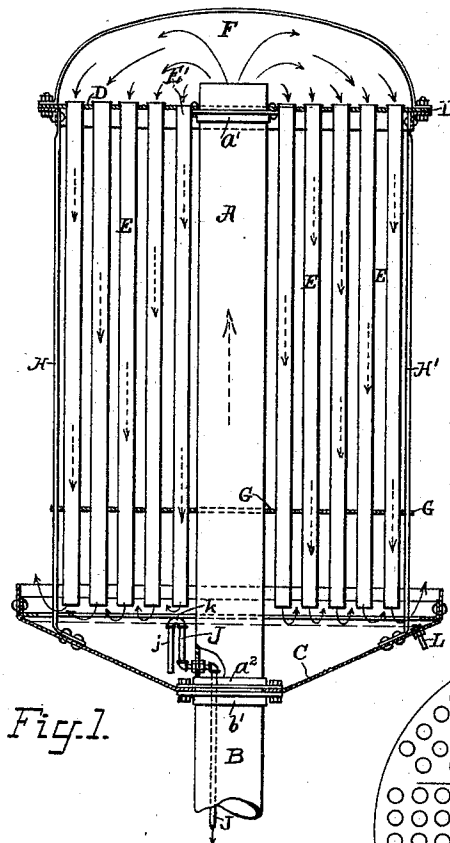
Patented May 9, 1899.

R. P. BOLTON.

CONDENSING ATTACHMENT FOR EXHAUST PIPES.

(Application filed July 5, 1898.)

(No Model.)



Witnesses:

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UNITED STATES PATENT OFFICE.

REGINALD PELHAM BOLTON, OF NEW YORK, N. Y.

CONDENSING ATTACHMENT FOR EXHAUST-PIPES.

SPECIFICATION forming part of Letters Patent No. 624,616, dated May 9, 1899.

Application filed July 5, 1898. Serial No. 685,131. (No model.)

To all whom it may concern:

Be it known that I, REGINALD PELHAM BOLTON, a citizen of the United States, and a resident of New York, (Pelhamville,) in the county of Westchester and State of New York, have invented certain new and useful Improvements in Condensing Attachments for Exhaust-Pipes, of which the following is a specification.

10 The object of my invention is to provide means for a natural condensation of waste or exhaust steam without obstructing the release of said steam, and, further, to provide means for the collection of the water of condensation, the removal from it of contained grease, and the retention of its heat. The apparatus by which I accomplish these ends is shown in the accompanying drawings and is so arranged as to be mounted in a vertical position upon and to form the limit of any waste or exhaust pipe from which steam is emitted.

Figure 1 is a sectional elevation. Fig. 2 is a plan with the cover detached, and Fig. 3 is also a plan in part and somewhat modified.

25 The method I employ is to divert the exhausting steam into an expanding-chamber and thence to deflect its course downward through a large number of tubes exposed to the atmosphere, the condensation resulting from the passage of the steam through these tubes passing downward also and draining naturally to a pan below, while any uncondensed steam blows upon the condensed water contained in the pan, maintaining its temperature and adding to its quantity by further condensation. Any surplus steam is freely enabled to be carried away or float into the atmosphere. The water of condensation is drawn off as fast as formed by an arrangement of pipe to be connected to the feed-pump, hot-well, or boiler, as may be desirable, and a grease-overflow is provided for the removal of floating impurities. The number of the tubes, their diameter, and length form, together, the extent of exposure to which the emerging steam is subjected and may be varied to suit conditions desired. I arrange the tubes relatively to each other with a view to facilitate as much as possible the access of the atmosphere to their surfaces. (See Fig. 3.) The central portion of this apparatus

consists of a piece of tube A, of a diameter not inferior to that of the exhaust-pipe B, provided with flanges a' a^2 at top and bottom, the lower flange being arranged to secure to another flange b' , secured on the exhaust-pipe B, and at same time to support a tray or pan C for the reception of the water of condensation. To the upper flange a' is secured a plate D, extending outward, of sufficient size and suitable form, which plate D is pierced with holes, into which are expanded in well-known manner a number of vertical tubes E E, extending down to a convenient point near or into the pan C below. On top of the tube-plate D is secured a hood F of proportions sufficient to afford considerable expansion of the steam emerging from the waste-pipe and to reduce the speed of its passage therein, and also to direct the steam downward into the tubes.

The number of tubes E E may be increased or diminished from those illustrated, according to requirement or conditions. The object to be attained being the greatest possible approach to a total condensation of all the emerging waste steam, the exposed surface may be proportioned by a calculation based on a knowledge of the atmospheric conditions least favorable to the desired result. Thus, it being well known that with a given temperature of the atmosphere the affinity of air for absorption of heat enables it to absorb heat in proportion to the speed at which it is exposed to heated surfaces, the minimum effect of my apparatus may be decided by a calculation of the absorption of heat from the exposed surfaces in still and warm air, and its maximum effect will be calculable by an extreme condition of cold air moving at maximum wind velocity. The lower ends of tubes E E are, further, in my apparatus secured against wind strains by another tube-plate G, through which the tubes pass and into which some or all of them may be expanded. I provide vertical stay-rods H H between the upper tube-plate D and the pan C for extra security of parts.

In order to drain the upper expanding-chamber entirely from water of condensation getting therein, I provide one tube E' with a screwed end tapped into the tube-plate in

such a manner as to afford a lowest point of exit to the pan below.

My arrangement for dealing with the resultant condensation is contained in the pan
 5 C. I arrange a return-pipe J extending up in the pan C to a desirable point, where it is turned over and carried downward in the form of a siphon j. This is done in order that the entry of the water of condensation shall be
 10 from below the surface, where it is free from grease. In order to prevent this siphon from drawing off periodically all the water down to its mouth, I drill a small hole K in the bend of the pipe, which destroys any siphon action
 15 and maintains a water-level at the point of the bend. I carry the pipe J for the water of condensation down inside the main waste-pipe, thus obtaining a reheating action upon it during its passage to the pump, hot-well,
 20 or boiler-room. I provide an overflow L from the pan at the water-level, by which grease and scum may be drawn off the surface.

I arrange the location of the tubes with a view to affording a free ingress of atmosphere
 25 to the inner rows of tubes, and for this purpose I prefer to locate them in the manner shown in Fig. 2, leaving unoccupied spaces or lanes extending from exterior to interior rows of tubes. In certain cases I arrange these
 30 lanes, as shown in Fig. 3, with a view to the access of the prevailing winds or of the prevailing lightest winds, those of greater force being able to penetrate the ranks of tubes more readily.

35 I claim—

1. Apparatus in the form of a condensing relief-exhaust head consisting of an extension of the waste-pipe, a deflecting-chamber above said extension, the lower portion of which is
 40 extended downward in the form of tubes, exposing an enlarged surface to atmospheric conditions, a pan for receiving condensation below said tubes, means for removing grease

and collecting the water of condensation, and a pipe for returning said water for reuse. 45

2. In a condensing exhaust-relief head consisting of a vertical-pipe extension of the waste-pipe, an expanding and deflecting chamber above said extension, an extension of said chamber downward in the form of tubes opening to atmosphere the arrangement of tubes
 50 leaving lanes or wind-passages between so as to admit of the access of air to the surfaces of the inner row of tubes, the pan below said tubes designed to maintain a water-level
 55 therein, a grease-overflow, and a pipe to return the water from a point below said water-level; substantially as described.

3. The improved condensing attachment for an exhaust-pipe consisting of the combination with said exhaust-pipe, of a series of vertical tubes clustered around the upper
 60 portion of the exhaust-pipe, the hood over the exhaust-pipe for receiving and directing the steam into said tubes, the pan below said
 65 tubes and the discharge-pipe for receiving and discharging the condensation, said pan being open to the atmosphere.

4. The improved condensing attachment for an exhaust-steam pipe consisting of the combination with said exhaust-pipe, of a series of vertical tubes clustered around the
 70 upper portion of the exhaust-pipe, the hood over the exhaust-pipe and tubes for directing the steam into said tubes, the pan below said
 75 tubes, and the discharge-pipe for receiving and discharging the condensation, and the trap for maintaining a level of water in the pan, said pan being open to the atmosphere.

Signed at New York, in the county of New York and State of New York, this 1st day of May, A. D. 1898.

REGINALD PELHAM BOLTON.

Witnesses:

C. SEDGWICK,
 A. P. THAYER.