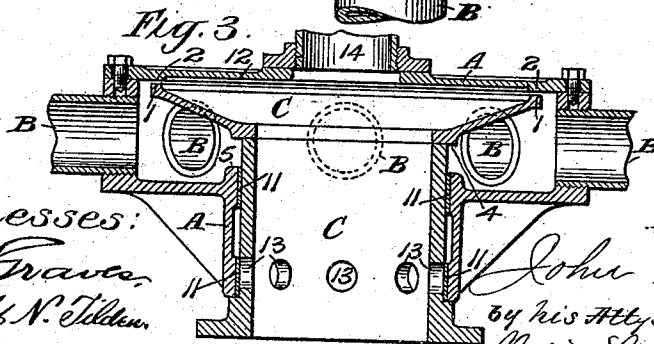
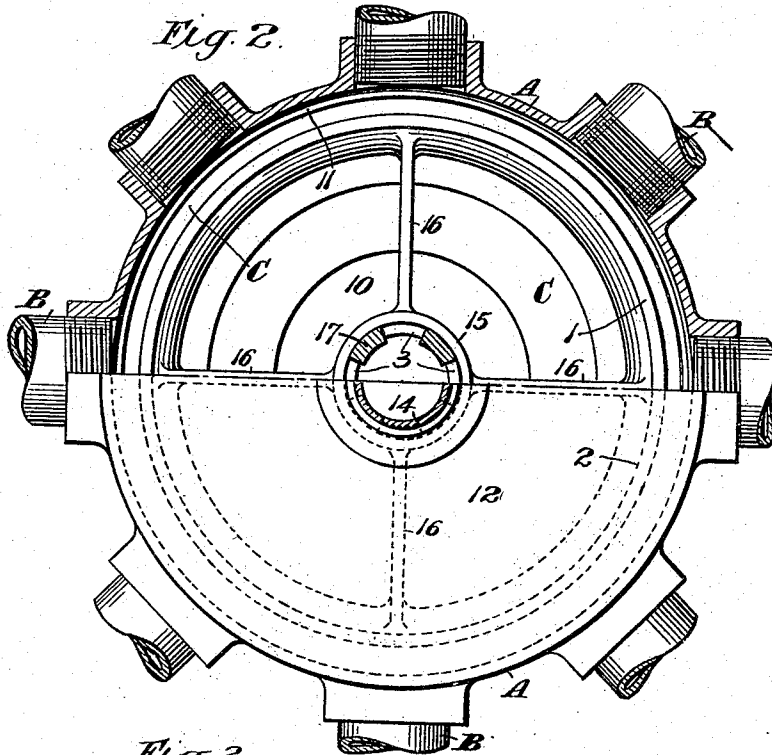
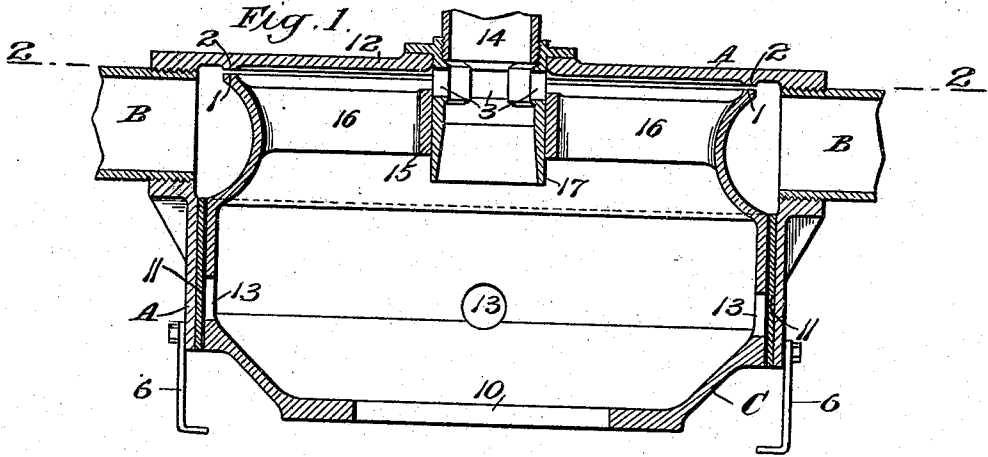


J. F. GRACE.
DISTRIBUTER FOR COOLING TOWERS AND THE LIKE.
APPLICATION FILED JULY 11, 1908.

937,236.

Patented Oct. 19, 1909.



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UNITED STATES PATENT OFFICE.

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DISTRIBUTER FOR COOLING-TOWERS AND THE LIKE.

937,236.

Specification of Letters Patent.

Patented Oct. 19, 1909.

Application filed July 11, 1908. Serial No. 443,134.

To all whom it may concern:

Be it known that I, JOHN F. GRACE, a citizen of the United States, residing at New York, county of Kings, and State of New York, have invented certain new and useful Improvements in Distributers for Cooling-Towers and the Like, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates to distributers such as are used for distributing water over the tops of cooling towers in condensing systems, and for distributing liquid over an extended surface in other arts, the especial object of the invention being to provide an improved mounting for the rotating member of the distributer by which an efficient liquid bearing shall be secured without waste of liquid, and further to provide efficient relief devices, brought into operation in case of excess of pressure or choking of the distributer, and to avoid damage in case of sudden large increase of pressure.

As the invention can best be explained in connection with constructions embodying the same, a detailed description of constructions embodying the invention in preferred forms will now be given and the features forming the invention then specifically pointed out in the claims.

In the drawings:—Figure 1 is a vertical central section of the distributer with the distributing tubes and air pipe broken off to reduce the size of the drawings. Fig. 2 is a plan view partly in section on the line 2 of Fig. 1. Fig. 3 is a view similar to Fig. 1, showing a modified form intended especially for small distributers.

Referring now to the drawings, A is the rotating distributer head or spool, carrying the horizontal distributing pipes B, from which the liquid is distributed through slots or perforations in the pipes, as usual in such constructions. This rotating head or spool A is mounted to slide vertically upon an interior sleeve or chamber forming the head journal C, having the water inlet 10 at the bottom, with which the liquid supply pipe is connected. A lining sleeve 11 of suitable metal is preferably used between the journal C and the head A to form a wearing non-corroding surface. The journal C is formed with a bearing surface 1 on its top edge, co-

acting with a similar bearing surface 2 on the cap 12 of head A, the head being raised and the liquid passing from the interior of the journal C to the tubes B between these bearing surfaces 1, 2, when the distributer is in action. The journal C is provided also with relief openings 13 near the lower edge of the head A, through which liquid is wasted when the head is raised too high by excess of pressure or choking of the distributer, thus relieving the pressure and preventing injury to the distributer.

As air is likely to accumulate at the top of the journal C below the head A which might interfere with the operation of the distributer, an air escape at the top of the distributer is preferably provided, this air escape being shown as secured by a central opening in cap 12 with which is connected air escape pipe 14, which extends upward to such a height as to prevent the flow of water through it, the air escaping through the water in the pipe. The pipe may be capped on the top and provided with air escape openings, or the pipe may be open at the top, as found desirable.

In the construction shown in Figs. 1 and 2, which is intended especially for large distributers, a center bearing for the distributer head A is provided, this center bearing being formed by bearing sleeve 15 carried by arms 16 on the journal C, and depending bearing sleeve 17 on the cap. Air escape ports 3 are provided in sleeve 17 close to the cap through which the air from the top of the journal may pass to air escape pipe 14.

The construction shown in Fig. 3 is the same as that shown in Figs. 1 and 2 except that the center bearing is omitted, the structure being entirely satisfactory without the center bearing except in large distributers and a positive stop is provided to avoid all possibility of the head being thrown off the journal by a sudden increase of pressure such as not to be relieved by openings 13. In this construction the journal C is provided with a shoulder or stop 4 which is engaged by the upper end 5 of the sleeve portion of head A inclosing the journal when the head rises too high, thus forming a positive stop for the head. This stop feature may be applied also to the construction shown in Figs. 1 and 2 and may be provided in any suitable manner, as, for instance, by a series of stop

arms 6 carried by the distributor head or spool A and engaging the bottom of the journal C, as shown in Fig. 1.

The operation of the construction will be understood from the drawings and a brief description. The pressure of the liquid to be distributed admitted through the inlet 10 to the interior of the journal C raises the head A to open the passage between the surfaces 1, 2, and the liquid thus passes out to the distributing tubes B, in which the slots or perforations are so arranged as to cause the head to rotate and distribute the liquid over the whole surface covered by the tubes. A liquid bearing is thus provided between the cap and the top of the journal, by which the weight of the distributing head is supported and friction and wear thus greatly reduced while oil lubrication is not required. If the distributor choke or otherwise the pressure becomes sufficient to raise the head A too high, causing liability of injury, the vertical sleeve portion of the head A is raised above the relief openings 13, and the liquid escapes from these openings so as to reduce the pressure. The stop 3 avoids all danger of the head being thrown off by any sudden large increase of pressure, not sufficiently relieved by openings 13.

It is to be understood that the invention is not limited to the particular construction or arrangement of parts illustrated, but that these may be varied widely while retaining the invention defined by the claims.

What I claim is:—

1. The combination with a liquid receiving journal, of a distributing head mounted to rotate and slide on said journal, and bearing surfaces on the head and journal separated by the sliding movement of the head for the passage of liquid between the surfaces whereby a liquid bearing is formed between the head and journal.

2. The combination with a liquid receiving journal, of a distributing head mounted to rotate and slide on said journal, bearing surfaces on the head and journal separated by the sliding movement of the head for the passage of liquid between the surfaces, whereby a liquid bearing is formed between the head and journal, and relief passages from the journal opened by the sliding movement of the head.

3. The combination with a liquid receiving journal, of a distributing head mounted to rotate and slide on said journal, bearing surfaces on the head and journal separated by the sliding movement of the head for the passage of liquid between the surfaces, whereby a liquid bearing is formed between the head and journal, relief passages from the journal opened by the sliding movement of the head, and a stop to prevent excessive sliding movement of the head.

4. The combination with a liquid receiv-

ing journal, of a distributing head mounted to rotate and slide on said journal, bearing surfaces on the head and journal separated by the sliding movement of the head for the passage of liquid between the surfaces, whereby a liquid bearing is formed between the head and journal, and an air escape pipe opening upward from the journal through the head.

5. The combination with a liquid supply journal C, of distributor head A having a sleeve inclosing the said journal and closed at the top by cap 12, distributing tubes B carried by the head, said distributing head being free to be raised by the pressure of the liquid on cap 12 to open an annular liquid passage between the cap and top of the journal for the supply of liquid to the distributing head, substantially as described.

6. The combination with a liquid supply journal C, of distributor head A having a sleeve inclosing the said journal and closed at the top by cap 12, distributing tubes B carried by the head, said distributing head being free to be raised by the pressure of the liquid on cap 12 to open an annular liquid passage between the cap and top of the journal for the supply of liquid to the distributing head, and relief passages 13 in the journal opened by the upward movement of the head, substantially as described.

7. The combination with a liquid supply journal C, of distributor head A having a sleeve inclosing the said journal and closed at the top by cap 12, distributing tubes B carried by the head, said distributing head being free to be raised by the pressure of the liquid on cap 12 to open an annular liquid passage between the cap and top of the journal for the supply of liquid to the distributing head, relief passages 13 in the journal opened by the upward movement of the head, and a stop for the head, substantially as described.

8. The combination with a liquid supply journal C, of distributor head A having a sleeve inclosing the said journal and closed at the top by cap 12, distributing tubes B carried by the head, said distributing head being free to be raised by the pressure of the liquid on cap 12 to open an annular liquid passage between the cap and top of the journal for the supply of liquid to the distributing head, and air escape pipe 14 extending upward from the cap, substantially as described.

9. The combination with a liquid supply journal C, of distributor head A having a sleeve inclosing the said journal and closed at the top by cap 12, distributing tubes B carried by the head, said distributing head being free to be raised by the pressure of the liquid on cap 12 to open an annular liquid passage between the cap and top of the journal for the supply of liquid to the distribut-

ing head, and a central vertical sleeve bearing between the head and journal, substantially as described.

10. A liquid distributor having a dis-
5 tributer head mounted to rotate horizontally and slide vertically, and surfaces on the head and its support between which the liquid passes and separated by the sliding movement of the head under pressure of the
10 liquid, whereby a liquid bearing is formed

for the head and the flow of liquid controlled by the sliding movement of the head.

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

JOHN F. GRACE.

Witnesses:

J. A. GRAVES,
C. J. SAWYER.