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DEVICE FOR RECOOLING THE WATER IN COOLING TOWERS.

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1,388,039.

Patented June 28, 1921.

Fig. 1.

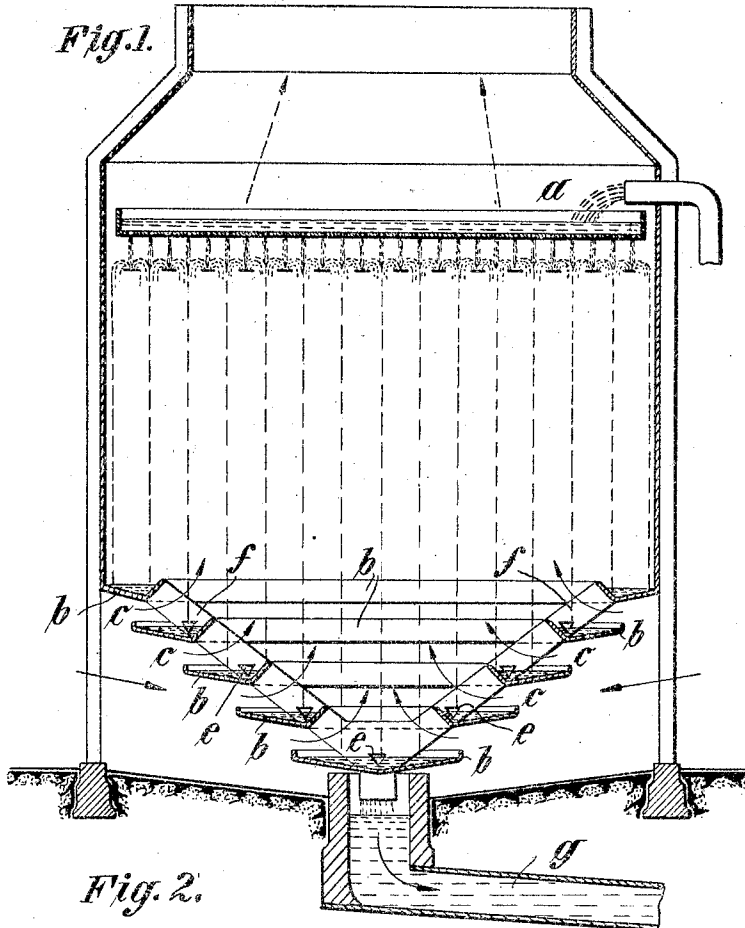
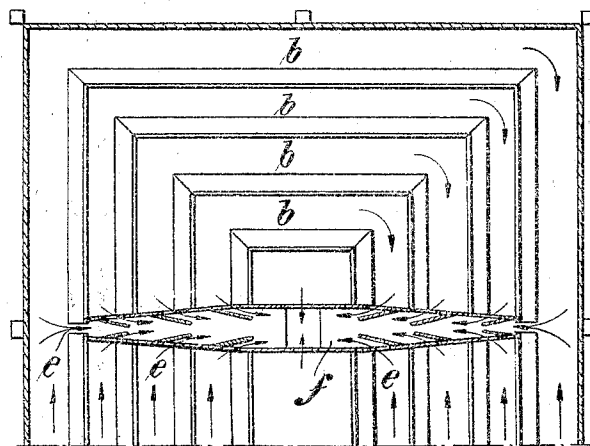


Fig. 2.



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UNITED STATES PATENT OFFICE.

FRITZ UHDE, OF BRESLAU, GERMANY.

DEVICE FOR RECOOLING THE WATER IN COOLING-TOWERS.

1,383,039.

Specification of Letters Patent.

Patented June 28, 1921.

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To all whom it may concern:

Be it known that I, FRITZ UHDE, a citizen of the German Empire, residing at Breslau, in the Kingdom of Prussia, Germany, have
5 invented a new and useful Device for Recooling the Water in Cooling-Towers, of which the following is a specification.

My invention relates to a device for recooling the water in cooling towers and
10 refers more particularly to leading the atmospheric air, serving as a cooling agent. The object of my invention is to provide means for securing a good cooling action in the interior of the cooling tower. And with
15 this end in view my invention consists in certain novel features of construction and combination of parts illustrated in the accompanying drawings, in which—

Figure 1 is a vertical section of the cooling
20 tower,

Fig. 2 a plan of the cooling tower.

The cooled water streaming down in the known manner from the grid-work is received by a number of troughs arranged
25 stepwise one above the other whereby the atmospheric air, serving as a cooling agent, is led directly to every part of the cooler, without meeting resistance and while still in a cooling condition. This arrangement
30 differs from that of known cooling towers, which have the disadvantage that as the depth thereof increases the cooling capacity is considerably decreased, which is explained by the fact that the air entering at the sides
35 cannot straight away penetrate the water streaming down on the periphery of the cooling tower in order to still have a cooling action in the interior of the cooling tower. Devices are known, however, in which
40 an attempt is made to remove this disadvantage and it has generally been suggested to introduce the cooling air by means of ducts or onto the horizontal surfaces projecting into the cooling tower. But, apart from
45 the fact that the entering air has first of all to overcome considerable resistance to arrive at the center of the tower at all, such arrangements must be looked upon as unsatisfactory because the air on its way to
50 the interior of the cooling tower has to pass more or less over water surfaces and becomes so strongly saturated that on reaching the inside of the cooling tower it can cool only a comparatively small quantity of water.

55 The present invention removes the above mentioned disadvantages by a simple and

essentially improved arrangement for the supply of air to the cooling tower. The invention possesses, moreover, the important advantage that the cost of construction of a
60 plant on this new principle is considerably decreased since the usual water catching trays extending over the whole cooling surface, and generally constructed of earthenware, are dispensed with.

The water entering the cooling tower at *a* is distributed over the cooling grids in the usual manner. The further procedure is as follows. The cooled water dropping from the cooling grids is caught by the
70 stepwise disposed trays (*b*) and thence by means of the overflow holes *e* through the common discharge channel or duct *f* to the outlet pipe or reservoir *g* which conveys the water to a pumping shaft, preferably close
75 to the engine house, where the water evaporated in the cooling tower can be replaced. Owing to the step like arrangement of the trays *b* intermediate spaces *c* are formed. The latter form passages for the air and
80 make it possible for the necessary cooling air to reach the cooling tower from below as in a furnace, without meeting with any considerable resistance and in a suitable manner.

Furthermore care is taken that the water collecting in the trays *b* cannot overflow otherwise an effect hindering the supply of air would be produced.

Cooling towers of square, rectangular or
90 polygonal cross section may be constructed with the above described new device.

I claim:

1. A cooling tower having trickling means, the lower opening of which is closed solely
95 by a plurality of superposed spaced open water-catching trays, each of which has a separate water discharge arranged below the upper edges of the tray to prevent overflowing.

2. A cooling tower, the lower opening of which is closed solely by a plurality of open water-catching trays, each of which has a separate water discharge, a common water-catching channel adapted to receive water
100 from all the trays and leading to a reservoir underlying the undermost catching tray.

3. A chimney water cooling tower having its lower end closed solely by a plurality of
110 water-catching trays, these trays extending entirely around the bottom and being ar-

5 ranged one above the other and having their inner edges overlapping the tray next below, each tray being provided with a discharge opening arranged below its upper edge, and
 5 a discharge channel common to all these discharge openings, for the purposes set forth.

4. In a cooling tower of the class described, the combination of a trickling chamber containing suitable trickling means, a
 10 plurality of trays or the like arranged underneath the trickling means in echelon, namely, one above the other each upper one being spaced from but overlapping the next
 15 one below it and adapted to receive the cooled water coming down from the trickling means, an air inlet chamber below the said water-receiving trays, a reservoir below the air inlet chamber, and means adapted to
 20 positively convey and deliver the water from the receiving trays to the said reservoir.

5. In a cooling tower of the class described, the combination of a trickling chamber containing suitable trickling means, an
 25 air inlet chamber underneath the said trickling chamber, a plurality of trays or the like arranged in echelon, namely, one above the other each upper one being spaced from and overlapping the next one below it and
 30 adapted to form a partition between the trickling chamber and the air inlet chamber to allow of the access of the air into the trickling chamber and to receive the trickling water, a reservoir the cross-sectional
 35 area of which is less than that of the ground underneath the air inlet chamber, and means for bringing together and delivering the water from the several receiving trays into the said reservoir.

40 6. A chimney cooling tower having trickling means, the lower opening of the tower being closed solely by a plurality of open water-catching trays spaced apart one above

the other, a reservoir underlying the lowermost tray, and means for preventing the
 45 trays overflowing and also delivering the water from the trays into said reservoir.

7. A chimney cooling tower having trickling means and having its lower opening closed solely by a plurality of open water-
 50 catching trays extending entirely around the bottom and being arranged one above the other and having their inner edges overlapping the tray next below, a reservoir underlying the lowermost tray, and means for
 55 preventing water overflowing the edges of the trays and also conducting the overflow water into said reservoir.

8. A chimney cooling tower having trickling means and having its lower opening
 60 closed solely by a plurality of open water-catching trays extending entirely around the bottom and being arranged one above the other and having their inner edges overlapping the tray next below, a reservoir underlying the lowermost tray, and means for
 65 preventing water overflowing the edges of the trays and also conducting the overflow water into said reservoir, said reservoir having a cross-sectional area less than that of
 70 the ground underneath the group of trays.

9. In a cooling tower of the class described, the combination of a trickling chamber containing suitable trickling means, a
 75 plurality of superposed spaced open water-catching trays or the like underneath the lower opening of the trickling chamber, an air inlet chamber below the said trays, a reservoir below the air inlet chamber, and means adapted to positively convey and
 80 deliver the water from the said trays to the said reservoir.

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Witnesses:

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