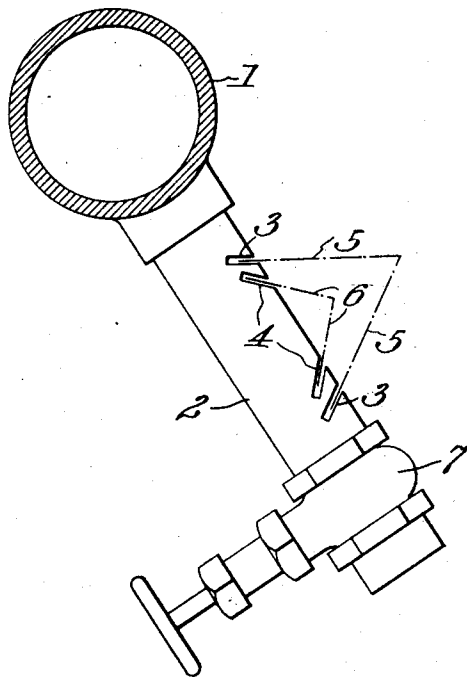


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WATER COOLING APPARATUS
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WATER COOLING APPARATUS

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This invention relates to water cooling apparatus of the cooling pond type and more particularly to a jet for producing a spray for the atomization of the water.

5 In a number of industries in which water is used as a cooling medium, the water is prepared for reuse by dissipating the absorbed heat in cooling ponds in which the water is cooled by spraying it into the air. The present practice is to produce a spray by passing 10 the water through fine jets or by centrifugal devices. These methods are unsatisfactory in that the water, when handled in commercially practical quantities is not sufficiently atomized or if it is sufficiently atomized, a 15 very large area is required to catch the drifted spray. This invention eliminates these objections by producing an extremely fine spray which may be caught in a comparatively small 20 area. In addition, the direction of the spray produced by this invention may be controlled so that a further economy in the area required for the cooling pond is effected.

25 An object of this invention is to provide a spraying device which produces an extremely fine atomization of the water regardless of the capacity of the device.

30 Another object of this invention is to provide a spraying device in which one pair of impacting jets is disposed within another pair of impacting jets.

35 A further object of this invention is to provide a spraying device, the jets of which comprise pairs of angularly and transversely disposed slots cut in a pipe, each pair of slots forming equal but opposite angles with the axis of the pipe but the angles formed by each pair of slots being different from those formed by each other pair of similarly cut slots.

40 A further object is to provide a trap for the collection and disposal of accumulated dirt and scale.

45 These and other objects will be apparent from the following specification when taken with the accompanying drawing which shows a set of jets or slots forming a single unit.

50 The reference numeral 1 indicates the supply header which carries the water to be cooled. Attached to the header 1 is a short section of round pipe 2 in which are cut the

pairs of angularly and transversely disposed slots 3 and 4, the pair 4 lying entirely within the pair 3. The angles of the slots are such that each pair diverges inwardly. The pairs of slots 3 and 4 comprise the orifices through 55 which the water issues to form fan shaped plates of water 5 and 6, the pairs of plates of water impacting against each other to form a finely divided spray. Each pair of slots forms an equal and opposite angle with the 60 axis of the pipe 2, the outer pair 3 forming the greater angle, so that the spray formed by the inner plates of water 6 will be forced through the outer plates of water 5 to carry out further the atomization of the water. In the embodiment disclosed, the most satisfactory results are obtained when the slots 3 and 4 are 65 from one sixteenth to one eighth of an inch wide and are formed by sawing or milling the pipe, along the respective planes of the several slots, to include about 90° of the pipe circumference. It is preferred that the angle 70 between the planes of the outer slots and the axis of the pipe 2 be 60° and the angle between the planes of the inner slots and the axis be 45°. The above dimensions are suitable when the supply header 1 is three inches in diameter and the pipe 2 is one inch in diameter.

75 The pipe 2 is positioned at an angle to the horizontal and at the lower end of the pipe 2 a valve 7 is placed. Accumulations of scale and dirt which would otherwise tend to collect over the slots 3 and 4 then fall to the 80 lower end of the pipe 2 and are held by the valve 7 until such time as it may be removed by opening the valve. 85

The modification disclosed is intended to be representative of any spraying device in which the spray from one set of jets is forced 90 through the mass of water issuing from another set of jets and located on the outside thereof. It is thus within the contemplation of this invention that more than two pairs of slots be used if desired.

I claim:

95 1. A spraying device having in combination, a pipe having an inner passage, and a plurality of associated pairs of inwardly diverging, transverse slots communicating with the passage, providing spraying ori- 100

fices, each pair of slots adapted to provide a pair of impinging jets, said pairs of impinging jets being successively arranged, one within the other.

5 2. A spraying device having in combination, a pipe having an inner passage, and formed therein a set of a plurality of inwardly diverging pairs of transverse slots, each pair being successively arranged, one
10 within the other.

3. A spraying device having in combination, a pipe having an inner passage, a pair of inwardly diverging, transverse slots in said pipe, forming equal and opposite angles with
15 the axis of the pipe, and a second pair of similarly arranged slots in said pipe disposed within the first pair and forming smaller angles with the axis of the pipe than the first pair of slots.

20 4. A spraying device comprising a pipe having an internal passage, a pair of transverse slots in said pipe to project therefrom impinging sheets of water, and outlet means in the wall of said pipe between said slots for
25 projecting water into the zone within said sheets of water.

5. A spraying device as claimed in claim 4, wherein said slots have a circumferential length of not more than about 90°.

30 6. A spraying device as claimed in claim 4, wherein said outlet means consists of a second pair of transverse slots, the planes of which intersect within the zone defined by the intersecting planes of the first pair of slots,
35 and the circumferential length of each of said slots is not substantially greater than about 90°.

In testimony whereof, I affix my signature.

40 ALLAN S. RICHARDSON.

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