April 20, 1943. J. O. KAHL 2,317,066

SPRAYING MACHINE

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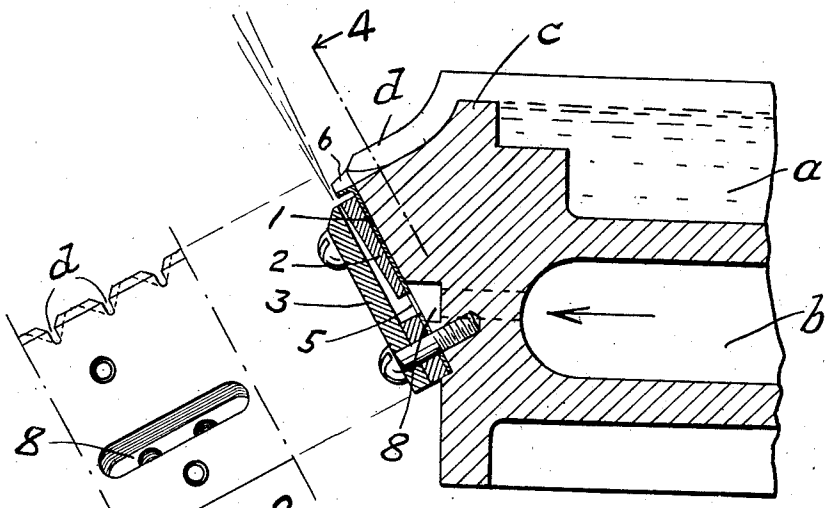


FIG. 2.

FIG. 1.

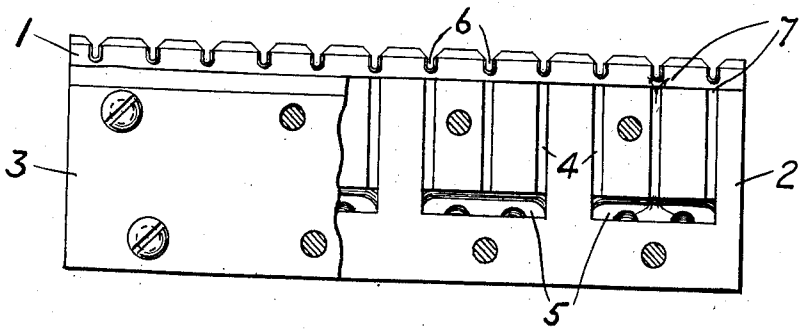


FIG. 3.

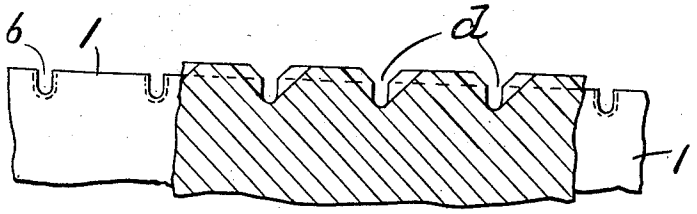


FIG. 4.

WITNESS:

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SPRAYING MACHINE

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2 Claims. (Cl. 299—86)

The principal objects of the present invention are: to provide for producing a thorough and fine atomization at relatively low air pressure; and to cause the air to draw the water or other liquid out of the water passages and to keep the water out of the air passages.

Other objects of the invention will appear from the following description at the end of which the invention will be claimed.

Generally stated, the invention comprises, a series of spaced air jet orifices, and a series of open-ended gutters respectively spaced from and aligned with said orifices and terminating in or near the path of the air jets. The invention also comprises three plates arranged face-to-face and of which the center one is provided with fluid channels opening as spray orifices through one edge of the plate and also provided with through openings communicating with the other end portions of the channels, and of which one side plate is imperforate, and of which the other side plate extends above the first two and is provided with gutters extending into line with and spaced from the outlets of the air channels.

The invention also comprises the improvements to be presently described and finally claimed.

In the following description, reference will be made to the accompanying drawing forming a part hereof and in which:

Fig. 1 is a transverse sectional view of a spraying machine embodying features of the invention.

Fig. 2 is a face view of Fig. 1 looking toward the right and showing the plates removed.

Fig. 3 is a front view of the device with the outer plate removed, and

Fig. 4 is principally a transverse sectional view taken on the line 4—4 of Fig. 1 looking toward the left.

Referring to the drawing, *a* indicates a reservoir for the liquid or fluid to be sprayed which, for convenience, will hereinafter be referred to as water, although, of course, it need not be water in all cases. *b* is an air trunk to which air or other atomizing medium or fluid under suitable pressure is supplied. *c* is a dam at the outlet of the reservoir *a* and it is provided with a series of inclined sluiceways *d*. There is nothing particularly new about the apparatus above described or indicated.

In the embodiment of the invention chosen for illustration in the drawing, there are three plates 1, 2 and 3 arranged face-to-face. The center plate 2 is provided with facial channels 4 opening through one of its edges, the top edge in the drawing, and through openings 5. The plate 3 is imperforate. The plate 1 extends above the other plates 2 and 3 and is provided with open gutters 6 extending into line with and spaced from the outlets of the channels so that their ends terminate in or near the air jet indicated in dotted lines in Fig. 1. These plates are assembled as shown on the face of the structure in which is provided the air trunk and the reservoir. The gutters 6 constitute extensions of the inclined sluiceways *d*. As indicated in the drawing the ends of the gutters are blunt or square in the sense that their side walls terminate in a plane in line with the direction of the spray. This construction is of importance because the air jet is directed generally crosswise of the end of the gutter and strikes upon its side walls near the end of the gutter and thus the air jet tends to suck water out of the gutter. It may be remarked that if the sluiceways *d* terminate in a plane indicated by the line shown just to the right of 6 in Figure 1, or, in other words, if the gutters 6, or their equivalents, were absent the discharge ends of the sluices would all lie in the same plane, which is the plane of Figure 3, and fluid would travel along that plane and reach fluid escaping from an adjacent sluice. Since the jets discharge across the ends of the sluiceways, in the absence of the gutters 6, they tend to cause the liquid to back-up in the sluiceways and overflow the side walls to adjacent sluiceways. Spraying machines are required not only to deliver a certain quantity of fluid in the form of a very fine spray but also to deliver the liquid in uniform quantity throughout the width of the spray. Sometimes the spray is relatively wide and in such cases the gutters, sluiceways or channels that deliver the fluid to the air jets are arranged in groups, and a predetermined quantity of liquid is delivered to each group and each gutter, sluiceway or channel in each group must deliver the predetermined quantity of fluid to its jet. This would not happen if all the sluiceways ended in one plane because in that case the fluid could flow from one sluiceway to another sluiceway.

By the described construction there is provided a series of air jet orifices 7 and they communicate by the channels 4 through openings in the plate 1 with a duct 8 leading from the air trunk *b*. There is also provided a series of open-ended gutters 6 which lead from the sluiceways *d* and are respectively spaced from and aligned with the orifices 7 and they terminate in or near the path of the air jets. Water is supplied over the dam

to the gutters 6 and the jets of air atomize the water into a fine spray while, at the same time, the jets of air draw water from the gutters and the gutters oppose entrance of water into the air channels.

It will be obvious to those skilled in the art that modifications may be made in details of construction and in matters of mere form without departing from the spirit of the invention.

I claim:

1. A spray device comprising, in combination, three plates arranged face-to-face and of which the center one is provided with facial channels opening through its edge and openings through the plate communicating with the other end portions of the channels, and of which one side plate is imperforate, and of which the other side plate extends above the first two plates and is provided inside of its margin with gutters extending into line with and spaced from the outlets of the channels, and means for supplying fluid to the gutters and air to the channels.

2. In a spraying machine and in combination sluiceways constituting a fluid supply and in the bottoms of which fluid travels, gutters with side walls terminating in a plane in line with the direction of the spray and projecting into space from the discharge ends of the sluiceways and serving to separate the fluid of the respective sluiceways and maintain in each its proper proportion thereby maintaining even distribution, and jet devices directed onto the overhanging end portion of the gutters and across the overhanging ends of the gutters and operating to suck fluid therefrom.

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