P. KESTNER.

MACHINE FOR ATOMIZING LIQUIDS.

APPLICATION FILED OCT. 10, 1906.

923,856. Patented June 8, 1909.

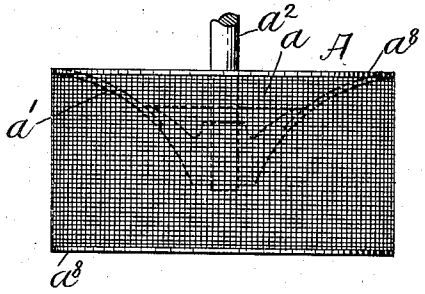


Fig. 1.

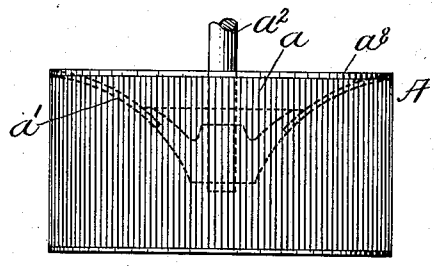


Fig. 2.

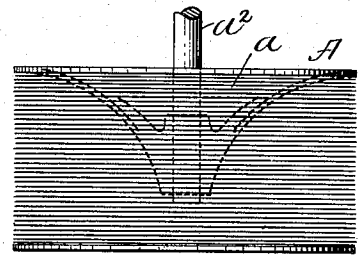


Fig. 3.

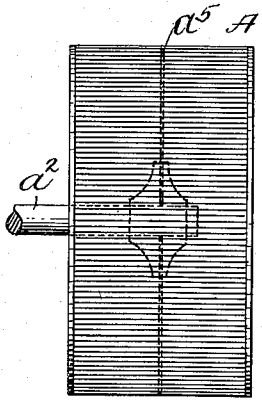


Fig. 4.

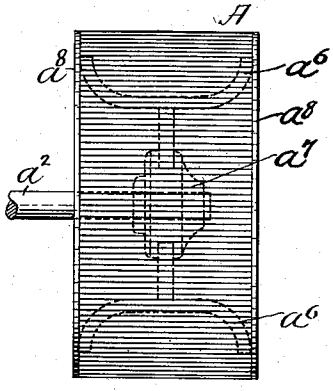


Fig. 5.

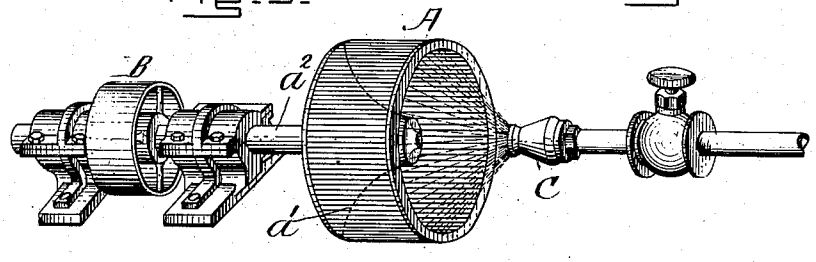


Fig. 6.



Fig. 7.

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MACHINE FOR ATOMIZING LIQUIDS.

No. 923,856. Specification of Letters Patent. Patented June 8, 1909.

Application filed October 10, 1906. Serial No. 338,224.

To all whom it may concern:

Be it known that I, PAUL KESTNER, a citizen of the French Republic, residing at Lille, in the Nord Province of France, have invented an Improved Machine for Atomizing Liquids, of which the following is a specification.

This invention has reference to an improved machine for atomizing liquids to be used for example in the oxidation of water by atmospheric air or the purification of gas or in any case where a liquid has to be brought into immediate contact with the gas.

The object of my invention is to provide a machine capable of atomizing a large amount of liquid in a given time and at the same time expel from the machine the gas or air it is desired to intimately mix with the atomized liquid.

It is well known that water or other liquids when injected into a rapidly rotating centrifugal fan is broken up into a fine spray by being thrown off from the blades of the fan by centrifugal force and I have myself employed such fans—in particular those having a central intake and circumferential discharge—for the purpose. Centrifugal fans, however, are machines especially adapted for the propulsion of air or gas, and for such purpose they show a fair volumetric and mechanical efficiency, but I have found such fans can only deal with a comparatively small quantity of liquid so that the efficiency of such fans when the atomization of liquid is the main object to be attained is very low and in consequence the cost of atomizing a given quantity of liquid is considerably higher than it is when my improved machine hereinafter described is used. In, for example, the oxidation of water by atmospheric air, it is only necessary that a comparatively small quantity of atmospheric air be passed through the fan for the oxidation of a given quantity of water; it is at the same time necessary that the water be broken up into infinitesimally fine particles so that the oxidation may be effected almost instantly.

I have found by experiment that the object of my invention may be attained by the employment of a rotary drum the periphery of which is made up of a great number of fine edges as may be obtained by making the drum of wire. When this kind of drum is rapidly rotated (as it can be owing to the fact that the drum in rotation meets with but little atmospheric resistance) a liquid delivered inside the drum and sprinkled upon the edges or wires forming the periphery thereof will be atomized by its centrifugal discharge from the edges or wires. The greater the speed of rotation and the finer these edges the greater will be the subdivision of the liquid. Now as the liquid thus atomized is discharged from the machine it forms vanes of atomized matter which practically constitute real blades for propelling the gas or air which it is desired to intimately mix with the atomized liquid. In fact machines thus made when rotated at very high speed show a relatively high volumetric capacity for propelling gas or air.

My invention can best be seen and understood by reference to the drawings, in which—

Figures 1 to 5, inclusive, show in front elevation different types of the atomizer embodying my invention, the specific differences in the construction of which will be hereinafter pointed out. Fig. 6 shows in plan a mode of rotating the atomizing machine and supplying liquid thereto. Fig. 7 shows in cross section one of the wires of the atomizing machine sharpened, by which there may be produced a more efficient atomizing effect.

As may be seen by reference to Fig. 1, the atomizer consists of a drum A the side or body of which comprises a web of wires and preferably fine wires a by which there is presented for producing the atomizing effect a great number of fine bars or edges. The wire drum or atomizer A is mounted upon a supporting disk or carrier a^1 which preferably closes one end of the drum, the other end being open for the admission of the liquid to be atomized and the gas or air which it is desired to mix with the atomized liquid. To the disk or carrier a^1 there connects a shaft a^2 by which the drum or atomizer may be rotated.

In Fig. 1 the wire forming the side or periphery of the drum is made woven or with strands interlaced with one another. In Fig. 2 the wires a forming the side or periphery of the drum extend parallelly to the axis thereof. The wires may also run as shown in Fig. 3 in which the wires a run concentrically around the axis of the drum. In Figs. 4 and 5 the drum is shown having a double intake, or in other words, the drum is made open at both ends. In Fig. 4 the drum is mounted upon a central disk a^5 to

which is secured the rotating shaft a^2. In Fig. 5 the drum is secured to arms a^6 connecting with a central arbor a^7 to which the shaft a^2 is secured. It is also to be noted that the outer edges of the drum may be reinforced by a ring a^8 or an equivalent, and the drum may be braced in any suitable manner for strengthening the same. In Fig. 6 I have shown a drum mounted and ready for operation, its driving shaft connecting with a pulley B. Just adjacent to the open end of the drum is a nozzle C by which water or other liquid to be atomized is delivered into the interior of the drum and sprayed upon the atomizing edges or wires thereof.

I prefer that the atomizing edges or wires forming the body or periphery of the drum may be made as sharp as possible, a cross section of the wire, enlarged, so sharpened, is shown in Fig. 7. I have found that the closer the atomizing wires are placed together and the sharper their outer edges, the better is the atomizing effect, the liquid not only being broken up by the wires but expelled in an exceedingly fine mist from the outer sharp edges thereof.

While, as before stated, only a comparatively small quantity of air or gas need be supplied for the purpose of effecting oxidation or purification, as aforesaid, it is nevertheless essential that there be free and unrestricted access of air or gas to the interior of the drum as otherwise unnecessary work in drawing such air or gas through a restricted passage would have to be done by the machine.

The operation of the machine has been sufficiently described. In practice I have found that a large quantity of liquid or water can be atomized with an expenditure of comparatively a small amount of power as practically the whole of the power is utilized in atomizing the liquid and only a small proportion in propelling the air or gas, for the propulsion of the air or gas instead of being accomplished by means of blades meeting with atmospheric resistance which impedes the free rotation of the atomizer or drum, is effected by means of the atomized matter itself which practically forms vanes or blades for propelling the air or gas to be intimately mixed with the atomized matter.

I claim:

1. A machine for atomizing liquids, said machine comprising a drum mounted to have a free and unrestricted rotation, the body or periphery of which drum is composed of a web of wires closely associated with one another and arranged whereby they may meet with but little resistance upon the rapid rotation of said drum and from which wires the liquid to be atomized introduced inside said drum and sprayed onto said web may be centrifugally expelled as said drum is rapidly rotated, means for introducing liquid into said drum and spraying the same onto said web, and means whereby said drum may be rapidly rotated.

2. A machine for atomizing liquid and for intimately mixing the same with a gas and propelling the mixture so obtained, said machine comprising an open drum for receiving a free entry of the gas with which the mixture is to be made, the body or periphery of which drum consists of a web the separate strands of which are adapted and arranged whereby said web may meet with but little resistance upon rapidly rotating said drum and the strands of which web also are adapted and arranged to present a multiplicity of edges from which the liquid to be atomized introduced inside said drum and sprayed onto said web may be centrifugally expelled upon the rapid rotation of said drum, means for introducing liquid into said drum, and means whereby said drum may be rapidly rotated.

3. A machine for atomizing a liquid and for intimately mixing the same with a gas and propelling the mixture so obtained, said machine having an open drum for receiving a free entry of the gas with which the mixture is to be made, the body or periphery of which drum is composed of a web the separate strands of which are closely associated and arranged whereby they may meet with but little resistance upon rapidly rotating said drum and from which strands the liquid to be atomized introduced inside said drum may be centrifugally expelled into the gas introduced into and passing through said drum.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

PAUL KESTNER.

Witnesses:
CHARRIER LEWIS,
LÉON PECKEL.