Oct. 8, 1935. R. F. STRATTON 2,017,031

VACUUM DEVICE

Filed Sept. 17, 1934

FIG. 1.

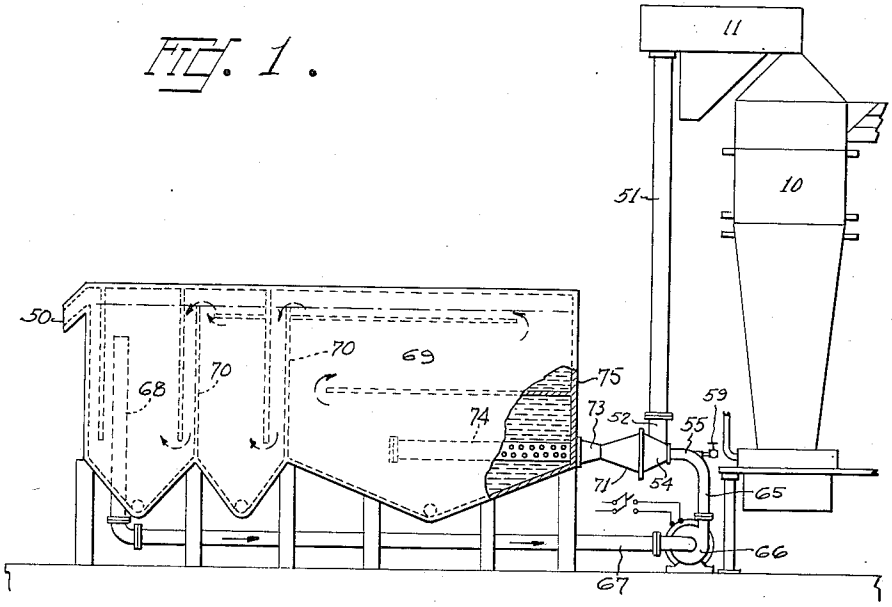


FIG. 2.

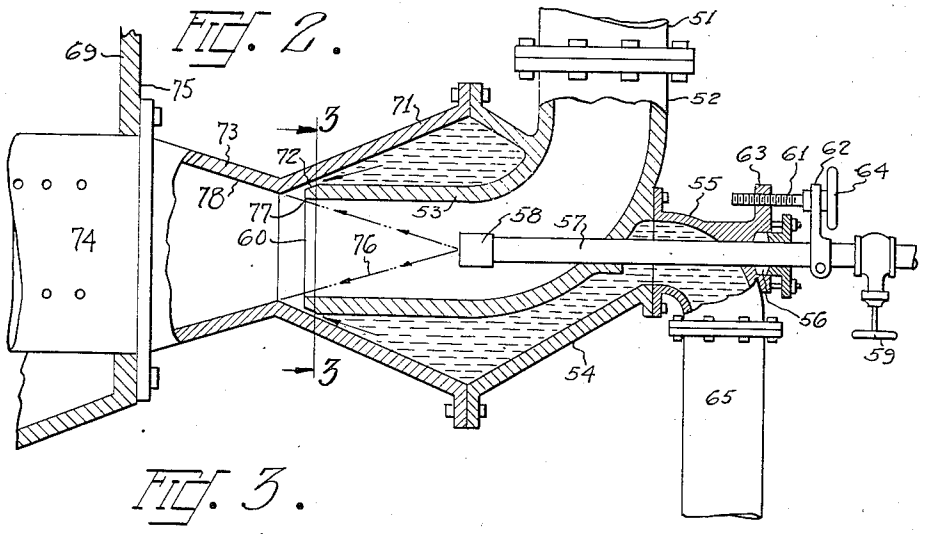
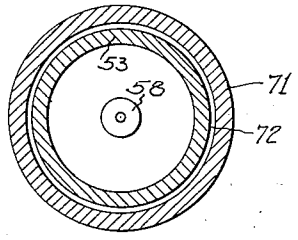


FIG. 3.



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VACUUM DEVICE

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Application September 17, 1934, Serial No. 744,373

1 Claim. (Cl. 261—116)

This invention relates generally to the washing and cleansing of air and to the recovery of certain materials floating in the air.

The main object of this invention is to prevent the contamination of the air supply at smelters, incinerators and crematoriums, as well as other places which make the surrounding air unpleasant or unhealthful to breathe or destructive to vegetation, as well as to make it possible to reclaim from gaseous by-products certain valuable materials which are otherwise destructively scattered about the community.

The second object is to render possible the operation of smelters in close proximity to timbered areas without any injury to the timber itself.

These, and other objects, will become more apparent from the specification following as illustrated in the accompanying drawing, in which:

Fig. 1 is an elevation showing the preferred form of the device with a portion of the water tank broken away in section.

Fig. 2 is a vertical section through the injector shown in Fig. 1.

Fig. 3 is a section taken along the line 3—3 in Fig. 2.

Similar numbers of reference refer to similar parts throughout the several views.

Referring in detail to the drawing, the furnace 10 is shown discharging into the collector 11 from which the vacuum pipe 51 extends downwardly to the elbow 52 whose horizontal portion 53 lies along the horizontal axis of the injector through whose conical end 54 the elbow 52 passes.

Communicaing with the conical end 54 is the elbow 55 through whose stuffing box 56 extends the tubular nozzle 57 whose tip 58 extends into the horizontal portion 53 of the elbow 52. The nozzle 57 is slidable with relation to the elbow 52 through whose wall it passes. The nozzle 57 is controlled by means of a cut-off valve 59.

The position of the tip 58 with relation to the end 60 of the elbow portion 53 is controlled by an adjusting screw 61 which passes through an arm 62 on the nozzle 57 and the lug 63 which projects from the stuffing box 56. A suitable hand wheel 64 is supplied for rotating the screw 61. Obviously, any other form of adjusting means may be employed without departing from the spirit of the invention.

The elbow 55 is connected by means of a low pressure water pipe 65 to the outlet of a pump 66 whose inlet is connected by a pipe 67 to the riser pipe 68 within the water tank 69.

It is preferable to provide the tank 69 with various baffles 70 in order to insure a complete circulation of the gases through the liquid in the tank 69.

Surrounding the elbow end 53 is the conical injector body 71 which is flanged to the member 54 in spaced relation to the outermost corners 72 of the elbow end 53, whereby the clearance between the corner 72 and the interior of the body 71 is substantially the same as the area of the pipe 65. The outlet 73 of the injector is also conical and is connected to the body 71, but is tapered in an opposite direction thereto.

The member 73 connects directly with the perforated discharge pipe 74 of the injector, which pipe extends horizontally through the wall 75 into the tank 69.

It will be noted here that the spray 76 from the nozzle tip 58 forms the apex of the cone of which the member 73 forms the base, and it is important that the adjustment of the tip 58 be such that this condition prevails, and it is equally important that the end 60—or rather the interior corner thereof—shall coincide substantially with the spray cone 76: that is to say, the spray cone 76 which leaves the nozzle tip 58, is in alignment with the corner 77 and the interior face 78 of the member 73.

It is important that the water supplied to the nozzle 57 be under considerable pressure compared with that in the pipe 65, the purpose of which is to reduce the volume of high pressure water required, and at the same time minimize the agitating action set up within the tank 69 by the escape of water and gas from the perforated discharge pipe 74.

I claim:

A vacuum device of the type described consisting of two conical members having their bases joined and having a gas inlet pipe within same coaxial with said conical members, the discharge end of said inlet pipe being near the outer end of one conical member, said gas inlet pipe communicating with the exterior of said body, a high pressure water nozzle projecting coaxially into said gas inlet pipe the tip of which nozzle is adjustably disposed within said gas pipe, the discharge end of said gas inlet pipe being spaced from the interior of its adjacent conical body, means for admitting water to said conical bodies under a relatively low pressure compared with the pressure of the water delivered to said spray nozzle, and a perforated spray pipe through which the discharge from said injector must pass.

RALPH F. STRATTON.