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RAINMAKER
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ABSTRACT OF THE DISCLOSURE

Apparatus including a large venturi passage carried by an airborne device for impelling moisture laden atmosphere at high velocity therethrough to produce a large volume seeding area for inducing atmospheric precipitation. Supporting mechanisms for the artificial cooling of the impelled atmosphere and for the injection therein of catalytic condensation inducing particles is provided.

This invention comprises a device and process for the production of rain.

In the present invention a large venturi passage carried by an airborne device such as a dirigible, conventional airplane, or lighter than air balloon has moisture-laden atmosphere impelled at high velocity through its length. Condensation is precipitated in the passing air by temporary reduction in pressure and temperature occurring at and after the constriction of the passage. Further, proximate to the constriction of the venturi, artificial cooling means of relatively high intensity injected into the large volumes of passing atmosphere creates a substantial temperature reduction below ambient. Additionally, a plurality of catalytic condensation inducing particles, such as Dry Ice, silver iodide crystals, electrically charged sand particles and the like, are injected into the passing atmosphere. The atmosphere, excited as described, and discharged from the venturi, accumulates or aggregates in a large volume seeding area which is capable of inducing precipitation in surrounding untreated atmosphere more efficiently and effectively than heretofore known.

An object of this invention is to emulate nature in producing rainfall by reducing atmospheric pressure and temperature below ambient and thus to detract from the affinity of said atmosphere for its contained moisture.

A further object is to utilize a device and process which induces precipitation in clouds of low moisture content which heretofore have been unaffected by rain-making machines.

An advantage of this invention is that the condensation inducing phenomena of a venturi acting on large volumes of passing air can be used in combination or independently with either artificial atmospheric cooling below ambient, the introduction of catalytic rain-inducing particles, or both.

An additional advantage is that the volume of air treated to induce rain creates a large seeding area which correspondingly magnifies the probabilities of inducing precipitation.

Other objects, features and advantages of the present invention will become more apparent after referring to the following specification and attached drawings in which:

FIG. 1 is a schematic diagram of the principal embodiment of the invention.

FIG. 2 is a schematic cross section of a dirigible aircraft having the invention installed within; and

FIG. 3 is a schematic cross section of a conventional airplane with the invention installed within.

With reference to FIG. 1, large venturi passage A is

formed by air retaining wall **15** defining opening **17** at one extremity, medially located constriction **18** and exhaust **20** at the other extremity. Venturi passage A is shown concentric and circular in converging area **22** and diverging area **23**. Fluid coolant **25** is entered proximate to constriction **18**. Coolant **25** is stored in a liquefied state in container **27** and expanded through valve **28** in the interior of venturi A. Between constriction **18** and exhaust **20**, catalyst injector **30**, capable of placing a plurality of condensation-inducing catalytic particles **32** in passage A, is located. The catalytic particles used may include Dry Ice, electrically charged sand particles, silver iodide crystals and the like.

In operation, venturi passage A is rapidly moved through moisture-laden atmosphere in the direction of movement arrow **37**. The atmosphere is confined by opening **17** and moves in the interior of the venturi in the direction of flow arrows **40**, **41** and **42**. The atmosphere is accelerated relative to the passage by converging area **22** and reaches a maximum velocity in the confines of constriction **18** as indicated by elongate flow arrow **41**. The atmosphere than traverses the remainder of venturi-shaped passage A, decelerating in diverging area **23**. The rapid flow of the atmosphere in the area of constriction **18**, temporarily reduces the atmospheric pressure in accordance with Bernoulli's principle. This pressure reduction and its corresponding reduction in temperature reduces the affinity of the atmosphere for its contained moisture and droplets of water or ice form.

In addition to the aforementioned pressure and temperature reduction, coolant **25** further causes precipitation in the confined atmosphere. Coolant **25** originally in a liquefied form in container **27** is introduced proximate to constriction **18** by valve **28**. After passing valve **28**, coolant **25** rapidly expands, drops in temperature and intermixes with the passing atmosphere in diverging area **23**. This intermixture lowers the temperature of the exhausted atmosphere, further decreasing the affinity of the atmosphere for its contained moisture.

Condensation-inducing catalytic particles **32** further detract from the affinity of the atmosphere for its contained moisture when added in diverging area **23**. Catalytic particles **32** are placed in the passing atmosphere by catalyst injector **30** and commence their action upon the atmosphere still in venturi passage A. This greatly multiplies the catalytic effect of the particles and induces precipitation in larger amounts.

As can readily be observed from the foregoing description, the atmosphere need only be treated to the extent necessary to induce rain. If the balance of moisture suspended with the air is so delicate that the mere flow of atmosphere through venturi passage A is all that is required to induce precipitation, no liquid gases or silver iodide crystals need be added. In the alternative, when mere passage of the atmosphere through the restriction fails to generate the desired precipitation, then coolant, catalytic particles or both may be added to excite the passing atmosphere.

It is essential to the practice of this invention that at least 1,000 cubic feet of moisture-laden air at ambient temperature be treated. In actual application, the cross-sectional area of opening **17** taken about a plane normal to the axis of venturi passage A is approximately 20 square feet. Constriction **18** has approximately 1/10 the the area of opening **17**. The cross-sectional area of exhaust **20** is approximately one half that of opening **17**. It is contemplated that the overall length of the venturi passage A will be four times the diameter of opening **11**, or about 20 feet.

Although variations may be made in the above described dimensions without departing from the spirit and