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ATMOSPHERIC CONTAMINANT COLLECTOR

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This invention relates to atmospheric pollution, and, more particularly, to a device adapted to selectively collect certain constituents of the atmosphere.

The study of the factors influencing pollution of the atmosphere is today enjoying the interest of municipalities and civic organizations to a greater extent than at any previous time. Due to the interest of an awakened populace, as evidenced by the various ordinances passed by many municipalities, the development of tools which may be of use in solving the problems associated with atmospheric pollution has received a great impetus.

Two of the primary contaminants of the atmosphere are solid particulate matter, commonly referred to as dust, and gaseous materials. In an area having a plurality of sources of such contaminants, it is extremely desirable to know the course taken by such contaminants, and where they will be deposited. For instance, it might be desirable to be able to ascertain whether the dirt fall in a certain area comes from a foundry nearby, or from a foundry miles away. The same thing is true of noxious gases.

There have been attempts, in the prior art, to provide devices which would collect certain constituents of the atmosphere. By means of complex recording mechanisms, and correlation with weather reports for a similar period, it was possible to obtain an approximate determination as to what contaminants were present in, or precipitated from, the atmosphere at a particular time. However, none of these devices in the prior art has attempted to collect and segregate these constituents, with reference to the velocity and/or the direction of the wind.

It is, therefore, one object of this invention to provide a device capable of collecting constituents from the atmosphere and segregating such constituents, depending upon the velocity and the direction of the wind.

It is another object of this invention to provide such a device capable of collecting and segregating solid constituents of the atmosphere.

It is still another object of this invention to provide a device capable of collecting and segregating gaseous constituents of the atmosphere.

Various additional objects and advantageous features of this invention will become apparent from the following description, when read in conjunction with the accompanying drawings, wherein

Fig. 1 is a perspective view, partly in section, with portions broken away, of a device constituting a portion of this invention;

Fig. 2 is a partial schematic plan view of a modification of this device, showing the various electrical connections;

Fig. 3 is a side-elevation view of a portion of the device shown in Fig. 2;

Fig. 4 is a plan view of a further modification of this device, partially schematic, and showing the various electrical connections;

Fig. 5 is a side-elevation view of a portion of Fig. 4; and

Fig. 6 is a modification of a portion of the device shown in Fig. 5.

Referring to the drawings and, more particularly, to Fig. 1, the embodiment of the invention shown therein comprises a base-plate **10**, on which is fixedly positioned hollow, columnar member **11**. Columnar member **11** is provided at fixed intervals with outwardly extending clamps **12—12**, which are adapted fixedly to secure jars **13—13**. Outwardly extending from the upper edge of

columnar member **11** are substantially flat, trough-like sections **14—14**, each of which is provided with a centrally disposed opening **15** therein, which is so located as to be in registration with a corresponding opening **16** in jar **13**. To insure close cooperation with opening **16** in jar **13**, opening **15** in member **14** is preferably formed by downwardly turning the central portion of member **14** to cooperate with opening **16**.

Plate **10** is provided with a depending cylindrical portion **18**, centrally disposed with respect to columnar member **11**. Within portion **18** may be positioned bearings **19—19**, and shaft **20** rotatably mounted therein. Shaft **20** supports and rotates with platform **22**, which is slightly spaced above plate **10**. Upstanding from platform **22** are a plurality of (preferably, four) pillars **23—23**, only one of which is completely shown in the drawing. Supported on and adapted to rotate with said pillars is shell **24**. Shell **24** preferably has a skirt portion **25** which functions to prevent any solid contaminant matter from the atmosphere from being deposited on trays **14—14** or jars **13—13** other than through means to be hereinafter described. Centrally positioned on platform **22** is jar **27**, which may be provided with a trough-like member **28**, having a centrally disposed opening **29** therein, which is in registration with the opening in the top of jar **27**, similar to the arrangement of jars **13—13** and members **14—14**. However, in this case, trough-like member **29** is supported by jar **27** and is not supported by columnar member **11**. Likewise, it should be apparent that trough-like members **14—14**, instead of being supported by columnar member **11**, could as well be supported by jars **13—13**. Jar **27** is free to rotate with shell **24** and platform **22**, with respect to stationary member **10**, columnar member **11**, and jars **13—13**. On the upper surface of shell **24**, which surface is preferably flat, there is provided an opening **29**, preferably, as shown, with an upstanding rim **30**. Opening **29** is so located that it will be in registration with the openings **15—15** and **16—16** of the trough-like members **14—14** and jars **13—13** when member **24** rotates. Member **24** is provided with a centrally disposed opening **32**, also preferably provided with an upstanding rim **33**, whose purpose will be hereinafter described. It will be apparent that centrally disposed opening **32** is in registration with opening **29** of trough-like member **28** and the opening in jar **27**. Shell **24** may be fixedly secured to pillars **23—23** by means of nuts **34—34**, which threadedly engage the ends thereof. A sliding cover **36**, of such a length that it can cover either opening **29** or opening **32**, is provided, and is adapted to slide on tracks **37—37**. Cover member **36** may be slid backwardly and forwardly on tracks **37—37** by reversible electric motor **40**, through threaded shaft **41**, member **42** which threadedly engages said shaft, and connecting members **43** and **44**.

Upstanding from the upper surface of shell **24** are fins **45—45** which function as weathervanes. Instead of the two fins **45—45**, it should be apparent that a single fin **45**, or more than two fins could be utilized. Moreover, the fins may be larger, with respect to shell **24**, than shown. Shaft **46** is fixedly secured in fins **45—45** and supported by, but free to rotate on shaft **46**, is flap **48**, provided with a shelf **49**, on which is counterweight **50**, and switch **52**. Switch **52** is of a type which will close an electrical circuit when flapper **48** is tilted. Limit switches **55—55**, connected by leads **56—56**, limit the movement of cover **36**, and also alternately reverse the direction of rotation of motor **40**. Insulatedly supported by pillars **23—23** are sliprings **57—57**, which connect to wires **51—52** which lead to motor **40** and switch **52**. Fixedly, but insulatedly, connected to the inner portion of columnar member **11** are brushes **53—53**, which may be provided with leads **54—54** which connect to a source of electrical current **58**.

For the purposes of atmospheric pollution studies, it is desirable to know the quantity of solid impurities which settle from the air while the wind is blowing from various directions. Moreover, it is also desirable to be able to collect such solid material for later analysis. For example, as long as the wind blows from the northeast quarter, it is desirable to have a device which will collect solid impurities which settle from the atmosphere while the wind is blowing from that direction. Moreover, it is