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APPARATUS FOR COLLECTING AND DISTRIBUTING ATMOSPHERIC PRECIPITATIONS

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Radio-active dusts which are projected into the upper atmosphere by nuclear tests or by plant using radio-active products, are carried back towards the ground again by atmospheric precipitation. In order to determine whether this radio-activity is greater at the beginning or at the end of a shower of rain, it is necessary to provide an apparatus which can collect fractional samples of these precipitations at different times with a view to their analysis.

The only apparatus which up to the present time enables such precipitations to be collected are essentially intended to determine the quantity of water collected during a given time. They are generally composed of a receiving vessel whose features are determined by the requirements of official meteorological departments. This vessel communicates with a storage tank, and a suitable system transmits the value of the volume of water thus collected to a recording device. The known ratio between the cross-section of the opening of the collecting vessel and that of the storage tank makes it possible to ascertain the height of water which has fallen in a region during a given time.

The adaptation of such apparatus to the measurement of the radio-activity of precipitations which are collected requires the addition of a system which not only permits the taking, for analysis, of sufficient quantities of the precipitations to enable their radio-activity to be detected, but which also permits the taking of the samples to be effected very rapidly in order to avoid the risks of sedimentation in the receiving apparatus of the radio-active dusts which are not transmitted towards the measuring system. It is also important to reduce the number of apparatus or tubes through which the fluid passes between the receiving apparatus and the measuring system in order to diminish the risks of particles whose radio-activity could not be detected becoming deposited on the various components.

The present invention has the object of providing an apparatus for receiving fractional samples of atmospheric precipitations which makes it possible for specific quantities of liquid to be collected directly.

It is concerned with a fractionising receiving apparatus for atmospheric precipitations which comprises a collector, a plurality of receiving bottles, a plurality of channels feeding these bottles, a rockable support for each bottle fast with a feed channel, means for controlling the filling of the bottle and controlling the rocking of the support of the said bottle between a position where the bottle communicates with the collector and the channel is withdrawn and a position where the filled bottle is put "out of circuit" and one end of the channel communicates with the preceding channel and the collector and the other end of the same channel communicates with the adjoining bottle.

This apparatus is extremely simple and accurate in operation. But its main advantage over known fractionising apparatus, also designed to collect equal volumes of liquid, resides in the fact that the receiving bottles are interchangeable. In fact between two visits to the apparatus, which may be daily or weekly, the solids in suspension (particularly the radio-active dusts carried down by rainfall) can be deposited by sedimentation

without falsifying the strict accuracy of the measurements effected later on the contents of the bottles.

In order that the invention may be clearly understood a preferred embodiment will now be described by way of example with reference to the accompanying drawings in which:

FIGURE 1 is a diagrammatic view in elevation and in section of the apparatus of the invention for receiving and fractionising precipitations,

FIGURE 2 is a plan view of the same assembly, and

FIGURE 3 is an elevational view of a bottle provided with its channel and resting on the balance associated therewith.

The drawings show a precipitation collector constituted by a funnel **1** in the form of an inverted cone and provided at its lower portion with a filter **2** and a pouring spout **3**. The funnel **1** rests at its upper portion on a casing **4** provided with a side access door **5**. The base of the casing **4** supports a central shaft **6** which is perpendicular to the base and about which rotate a column **7** and a frame **8** connected with each other. The movable frame **8** supports:

(1) A series of receiving assemblies, each receiving assembly being composed of a supporting rod **9** fixed at its lower portion to the frame **8** and supported at its upper portion by a rod **10** whereby it is secured rigidly to the column **7**, the rod **9** supporting a balance composed of a frame **11** on which is fixed a knife-edge **12** and which carries at its two ends calibrating screws **13** and a beam **14**. This beam **14** constitutes the balance member and carries at one of its ends a receiving bottle **15** and at the other end a balance weight **16**. A tare element **17** is fixed on the beam **14** at the end which carries the bottle and makes it possible to equilibrate the balance correctly whatever bottle is used. The beam **14** also carries a rod **18** which by means of a bearing bracket **19** supports a channel **20**. This channel **20** is provided at one of its ends with a pouring spout **21** and at its other end with a funnel **22** welded on to one of its outer faces.

(2) A tank **23** serving as an overflow means and provided with a feed funnel **24** and a pouring spout **25**. This overflow tank **23** discharges through the spout **25** into a funnel **26** which discharges the water towards the outside of the apparatus through a pipe **27** extending through the base of the casing **4**.

As shown in the drawings, the supporting rods **9** are disposed in a circular manner around the column **7** with the radial rods **10** being all of substantially the same length. The bottles **15** and the channels **20** are also arranged in a circular manner in the casing **4** and the movable frame **8** permits the positioning and removal of the bottles **15** by the door **5** owing to its rotation about the shaft **6**.

The heights of the supporting rods **9** are unequal, and decrease from that of the supporting rod of the receiving assembly fed by the pouring spout **3** to the height of the supporting rods of the last receiving assembly which, when the last bottle is filled, discharges the overflow into the funnel **24**. The balances **11** are therefore slightly staggered in height and the same applies to the channels **20** supported by the brackets **19**. Consequently, each pouring spout **21** is situated above the end of the adjacent channel **20** or the funnel **22** fixed on this side of the said channel, so that the pouring spout **3** remains fixed and feeds each funnel **22** through the agency of the channel or channels **20** which are highest.

First of all it feeds the funnel **22** of the first channel **20** and thence the first bottle **15**, and then having filled the latter bottle and having rocked the balance which carries it, the first channel **20** which by its pouring spout **21** feeds a funnel **22** of the second channel **20**, and so forth.