PATENT SPECIFICATION

Convention Date (Belgium): Sept. 29, 1928.

319,778

Application Date (in United Kingdom): Sept. 23, 1929. No. 28,831/29.

Complete Accepted: May 22, 1930.

COMPLETE SPECIFICATION.

Improved Means for Collecting Moisture from the Atmosphere.

I, ACHILLE KNAPEN, of 75, rue de Waelhem, Brussels, Belgium, a Belgian Citizen, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

The present invention has for its object an arrangement for collecting moisture from the atmosphere by means of the nocturnal lowering of temperature of the atmospheric air so as to allow its use for facilitating the recovery of atmospheric moisture, particularly in the Knapen process of recovery of atmospheric moisture which consists in causing the atmospheric air to circulate in constructions constituting aerial wells the walls of which are lined with sharp edges favouring the accumulation of the droplets of condensation water and hastening their precipitation and their recovery.

It has been ascertained from the meteorological bulletins from hot and even temperate climates that very sensible differences exist between the temperature of the middle of the day and that of the night. In many countries, the coldest moment of the night precedes sunrise by half an hour. In some cases, and particularly when carrying out the recovery of the atmospheric moisture by the process mentioned above, it is useful to make use of these thermal differences, caused by the lowering of nocturnal temperatures, for the purpose of collecting moisture by drawing the cold air into the recovery device and notably to cause the cold air to enter inside this device in order to lower the temperature of its walls and to maintain them as long as possible at the dew point with respect to the temperature of the external air and to its degree of saturation. According to this invention, we provide an apparatus for this purpose, characterised by a mass in the form of a pyramid or cylinder of circular, pentagonal or any other suitable cross section, of suitable material such as, for example, concrete, moulded clay, earthenware, masonry, etc., bored with a chimney along a portion of its length and in which are provided inclined passages of small diameter, constituted by pipes of earthenware or other material, penetrating at least as far as about half the thickness of the mass. This chimney cooperates with a central tube, preferably of metal, of a diameter equal, for example, to about one-third of the diameter of the central chimney, adapted to bring down the cold air which then flows into the central chimney and enters in the inclined passages communicating with that central chimney.

In carrying out the invention in practice, the mass constituting the apparatus, the object of the invention, is preferably constructed so that its material has a greater density near the external wall than near the internal wall, that is, than near the central chimney, and this external wall is covered over the whole of its surface with pieces of slate, of glass, of metal, or with stone splinters, and like materials, partly embedded in the mortar and forming projections intended to act as condensing objects for the moisture contained in the hot air brought in contact with the cooling mass.

Referring to the appended drawing which shows, as an example, an apparatus of this kind applied to an aerial well of the Knapen system for collecting the atmospheric moisture:—

The Figure is a vertical section through the centre.

In this drawing, 1 represents diagrammatically the external construction or envelope of the aerial well in which is placed the apparatus 2 formed of a mass of suitable material the density of which is greater in the portion 3, adjacent to the external surface, than in the central portion. The central portion is provided with a chimney 4 in which open passages 5, of small diameter, inclined downwards towards the external portion of the mass, and constituted, for example, by earthenware pipes. The central chimney 4 is closed at its lower portion and open at the upper portion and contains a pipe 6 of metal, which may be galvanised, projecting outside the construction or envelope 1, properly so called, of the aerial well. This pipe opens in the chimney 4 near

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the lower portion of the latter and its diameter is preferably approximately one-third of the diameter of the central chimney 4. The external surface of the mass 2 is covered with numerous projections 7 constituted by pieces of slate, of glass, stone splinters and like material, partly embedded in the mortar used in the construction of the mass 2. In these conditions, when a notable thermal difference between the temperature of the day and that of the night takes place, the cold air penetrating by the tube 6 is brought down to the bottom of the chimney 4, rises in the latter and replaces, in the inclined passages 5, the warmer air which they contain, cooling in this way the whole of the mass 2 before escaping outside this mass, in the direction indicated by the arrows.

The mass so cooled is adapted to cause the condensation of the moisture contained in the circulating air.

The moisture condensed, under the form of droplets, drops and collects at the lower portion of the construction in a trough 8 and passes into a reservoir suitably disposed either in the base of the aerial well or in any other suitable place. As shown in the drawing, the central chimney 4 may be provided at its lower portion with a small passage 9 permitting the drainage of the water which may condense inside this chimney.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. Means for collecting moisture from the atmosphere, acting under the action of the nocturnal lowering of the temperature of the atmospheric air, characterised by a mass of material and of any section, provided with a central chimney in which passages open, inclined downwards and outwards, and penetrating at least as far as about half the thickness of the mass, this chimney cooperating with a pipe, metallic or otherwise, opening at the lower portion of the chimney and used for bringing down inside the mass the cooled air taken outside the envelope of the device.

2. Means for collecting moisture from the atmosphere, as claimed in claim 1, further characterised in that the external walls of the mass are lined with projections, for example with pieces of slate, of glass, of metal, stone splinters, and the like partly embedded in the mortar and adapted to condense the moisture of the air flowing in contact with these walls.

3. Means for collecting moisture from the atmosphere, as claimed in claims 1 and 2, further characterised, in that the material of the mass constituting the body of the accumulator has a larger density near the outside than near the central portion provided with the chimney for the circulation of the air.

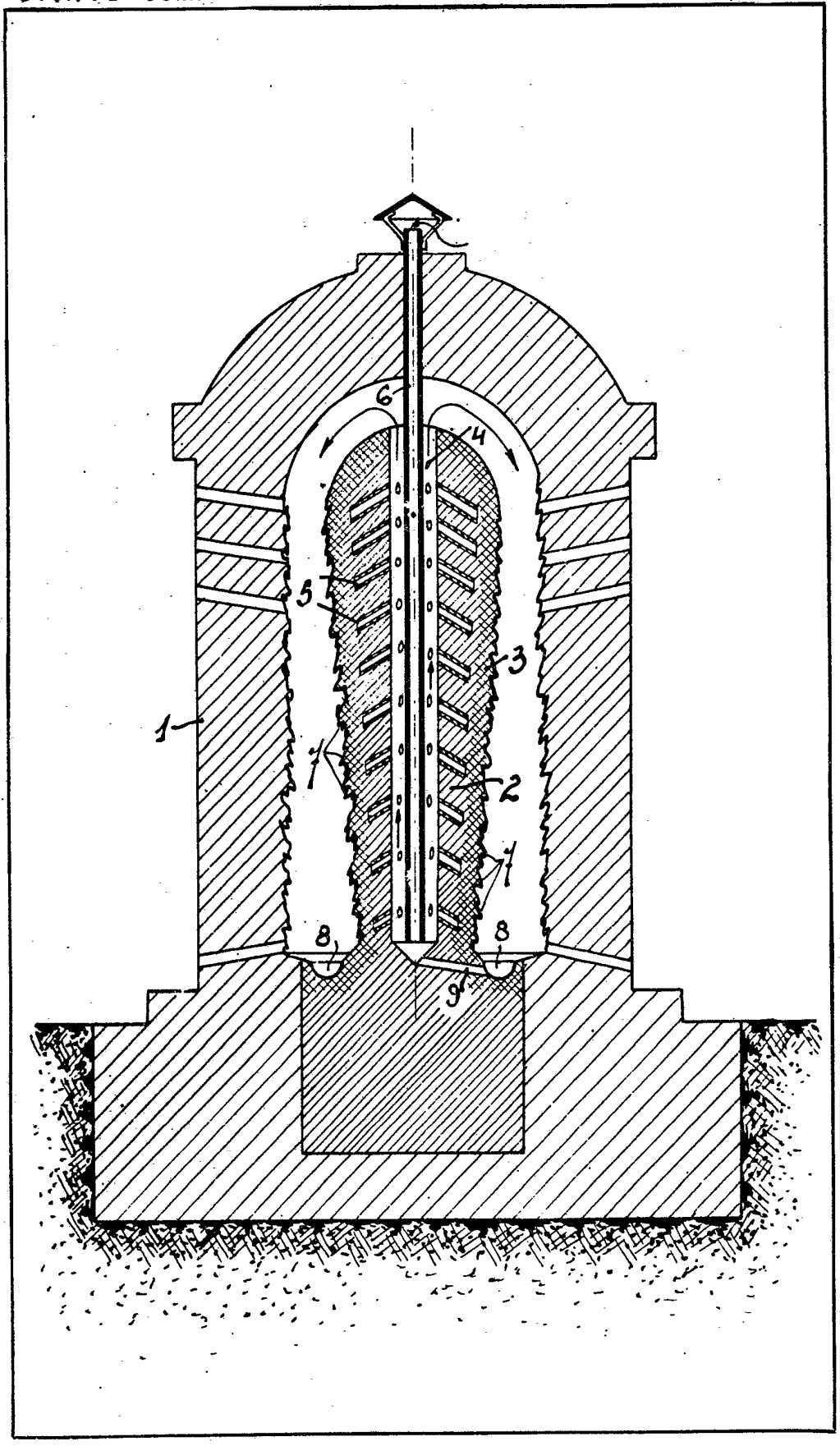
4. Means for collecting moisture from the atmosphere, as claimed in claims 1 to 3, further characterised in that the inclined passages disposed in the mass and opening in the central chimney consist of earthenware tubes.

5. Means for collecting moisture from the atmosphere, utilising the nocturnal lowering of the temperature of the atmospheric air, constructed and working substantially as described and illustrated in the appended drawing.

Dated this 23rd day of September, 1929.

MEWBURN, ELLIS & Co.,
70—72, Chancery Lane, London, W.C. 2,
Chartered Patent Agents.

Redhill: Printed for His Majesty's Stationery Office, by Love & Malcomson, Ltd.—1930.



[This Drawing is a reproduction of the Original on a reduced scale.]

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