1,164,119

PATENT SPECIFICATION

DRAWINGS ATTACHED

1,164,119

Date of filing Complete Specification: 30 November, 1966.

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COMPLETE SPECIFICATION

Device for Modifying Atmospheric Conditions for example, for the Inhibition or Dispersal of Fog or Mist, or to Induce Rain

ERRATA

Specification 1,164,119

Page 1, line 28, *for* "aid" *read* "air"

Page 1, line 61, *after* "compartment" *insert* "through which air is permitted to pass to an upper compartment"

Page 2, line 119, *for* "beleved" *read* "believed"

Page 3, line 50, *for* "Clims" *read* "Claims"

Page 3, line 75, *after* "container," *insert* "the upper"

Page 3, line 87, *for* "mean" *read* "means"

THE PATENT OFFICE,
19th November 1969

D 12106

of electro-magnetic pulses, thereby to modify the magnetic field produced by the first means and thereby to produce a resultant magnetic field of variable strength, and third means defining a passage for leading aid through the resultant magnetic field in the vicinity of said spaced poles defined by said first means.

The said first means may comprise at least two permanent or electro-magnets of substantially the same strength spaced apart and arranged with like poles facing each other. At least one of the magnets may be movable to vary the strength of the continuously-acting magnetic field. Alternatively, where electro-magnets are used, the field strength may be varied by alteration of the exciting current of one or more of the electro-magnets. The magnets of the first means are conveniently of annular configu-

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cuit mounted within or externally of said container, the upper compartment having a vent therein leading to the surrounding atmosphere.

Means may be provided in said lower compartment for treating the air therein, for example, by introducing a vaporific substance thereto or by applying heat or light or any combination thereof. Alternatively or additionally, the outer surface of the container may be made of an absorbant material and be provided with a source of water or other vaporific liquid, which will be absorbed by the material of the container and evaporated therefrom.

By way of example, one form of the appartus to be used for modifying climatic conditions will now be described with reference to the accompanying drawings, in which:—

SEE ERRATA SLIP ATTACHED

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COMPLETE SPECIFICATION

Device for Modifying Atmospheric Conditions for example, for the Inhibition or Dispersal of Fog or Mist, or to Induce Rain

I, EDMUND UPDALE, 59 Ruskin Park House, Champion Hill, London, S.E.5., British, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention relates to apparatus for modifying atmospheric conditions, for example, for the inhibition or dispersal of fog or mist or to induce rain.

According to the invention, apparatus for modifying atmospheric conditions by subjecting air to a magnetic field of variable strength comprises first means, which at least during operation of the apparatus, defines at least two spaced magnetic poles of like polarity producing a continuously-acting magnetic field in the space between and around them; second means, which, during operation of the apparatus, is capable of producing an electro-magnetic wave or series of electro-magnetic pulses, thereby to modify the magnetic field produced by the first means and thereby to produce a resultant magnetic field of variable strength, and third means defining a passage for leading aid through the resultant magnetic field in the vicinity of said spaced poles defined by said first means.

The said first means may comprise at least two permanent or electro-magnets of substantially the same strength spaced apart and arranged with like poles facing each other. At least one of the magnets may be movable to vary the strength of the continuously-acting magnetic field. Alternatively, where electro-magnets are used, the field strength may be varied by alteration of the exciting current of one or more of the electro-magnets. The magnets of the first means are conveniently of annular configuration, the end faces of the annular magnets forming the aforesaid poles thereof.

The said second means may conveniently comprise an electrical coil arranged within or adjacent the gap between the poles of said first means and electrical means arranged to pass an intermittent current through said coil, the polarity of the latter being such that the end face thereof nearer to said spaced poles of said first means is the same as that of said spaced poles. The electrical means may produce a signal of audio or radio frequency, as required. The electrical means may, for example, be a multi-vibrator circuit.

In a preferred form of apparatus for modifying atmospheric conditions said third means comprises a container having a lower compartment containing a pair of magnets forming said first means and an electrical coil of said second means, the electrical coil being connected to a multi-vibrator circuit mounted within or externally of said container, the upper compartment having a vent therein leading to the surrounding atmosphere.

Means may be provided in said lower compartment for treating the air therein, for example, by introducing a vaporific substance thereto or by applying heat or light or any combination thereof. Alternatively or additionally, the outer surface of the container may be made of an absorbant material and be provided with a source of water or other vaporific liquid, which will be absorbed by the material of the container and evaporated therefrom.

By way of example, one form of the appartus to be used for modifying climatic conditions will now be described with reference to the accompanying drawings, in which:—

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Figure 1 is a perspective view of the apparatus which includes an outer container, the latter being shown partly broken away to expose the parts of the apparatus within the container.

Figure 2 is a circuit diagram of a multi-vibrator unit shown in Figure 1.

Referring firstly to Figure 1, the apparatus comprises a container 1 divided into two compartments by a perforated shelf 2. The bottom 3 of the container has a plurality of air holes 4 therein, of which only a few have been shown, for admitting air into the lower compartment during use, when the container is mounted with the bottom surface 3 clear of a supporting surface. The bottom 3 is covered by a pad 5 of moisture absorbant porous material, such as felt. The top of the container has an aperture 6 or has holes therein through which air and other gases therein can pass from the container to the surrounding atmosphere. The container has a door 7 through which there is access to the interior of the container. The whole container 1, including the door 7, and the shelf 2 are made of a non-magnetic material.

The shelf carries a fixed annular permanent magnet 8 adjacent one side wall of the container and another annular permanent magnet 9 mounted adjacent the opposite side wall for swivelling on a shaft 10 about an upright diametral axis of the magnet 9. The upper end of the shaft 10 extends through the top of the container and carries a knob 20, whereby the magnet 9 can be swivelled through at least 180° between positions in which it is coaxial with the magnet 8. The magnets 8 and 9 are spaced apart by approximately 4" and each have a field strength of 2,000 gauss. In a position centrally between the magnets 8 and 9 and slightly above them, there is an electrical coil 11 wound upon a bobbin 12 supported by the rear wall of the container, or otherwise, the longitudinal axis of the coil 11 being perpendicular to or parallel with the longitudinal axis of the magnet 8. The bobbin support 13 may be adjustable in height. The ends of the coil are connected by wires 14, 15 to a printed circuit forming part of a multi-vibrator unit 16, mounted on the shelf 2.

The circuit diagram of the multi-vibrator unit 16 together with the wires 14, 15 and the coil 11 is shown in Figure 2. The multi-vibrator includes transistors T_1 and T_2, capacitors C1 and C2 and resistors R1, R2, R3 and R4. The power supply is a dry battery 17. The values of the components shown in Figure 2 are given by way of example only.

In operation, the swivellable permanent magnet 9 is turned until like poles of the magnets 8 and 9 are facing each other. If necessary the strength of the magnetic field produced between the magnets 8 and 9 may be adjusted by swivelling the magnet 9 so that its axis is inclined to that of the magnet 8. The height of the coil 11 is adjusted and the battery 17 is connected in the circuit 16, thereby to produce a series of electro-magnetic pulses to modify the magnetic field produced by the permanent magnets 8 and 9. The coil 11 is so arranged that the polarity of the lower end face thereof, i.e. the pole nearer to the magnets 8 and 9, is the same as that of the adjacent or facing poles of the magnets 8 and 9. The frequency of the electro-magnetic pulses depends upon the values of the components of the multi-vibrator unit. The range of frequency which is believed to give best results lies between 5 and 15 c.p.s. The resultant magnetic field is believed to produce a nuclear magnetic resonance effect which will be transmitted from the constituent gases of the air or other gases in the upper compartment to like gases in the surrounding atmosphere.

The apparatus is rendered ineffective by swivelling the magnet 9 until the pole thereof facing the magnet 8 and the adjacent pole of the latter are of unlike polarity.

When the apparatus is placed in a foggy or misty atmosphere and is operating as described hereinbefore fog or mist in the vicinity of the apparatus is dispersed, due to modification of the electrical properties of the water vapour droplets in the atmosphere by the magnetic resonance effect, thereby resulting in the coalescence of the droplets, thus increasing visibility, and eventually leading to precipitation. It is also possible that turbulence produced in the atmosphere by the magnetic resonance effect may assist in the process of dispersion of the fog or mist. Where the atmosphere is clear, i.e. where there is no mist or fog, operation of the apparatus will inhibit the formation of fog or mist in a similar manner.

It is believed that the addition of water or another vaporific liquid to the pad 5 may have an effect on the operation of the apparatus.

The rate of fog or mist dispersion is believed to be improved by the application of white or coloured light or heat to the air in the container 1.

It is also beieved that the rate of fog dispersion may be dependent upon the orientation of the apparatus with respect to the earth's magnetic field. For example the apparatus may be so orientated that the north-south line of the earth's magnetic field passes transversely through the gap between the permanent magnets.

The apparatus illustrated and described herein may be modified in many respects. For example, instead of mounting the magnets 8 and 9 and the coil 11 in the con-

tainer 1, they may be mounted in a moisture absorbant dome, which is also permeable to air. The dome may stand in a trough containing water or another vaporific liquid and these would act as a wick, causing the air passing therethrough to be mixed with vapour from the dome. The latter or the air within the dome may be heated to encourage evaporation from the dome.

Instead of the permanent magnets 8 and 9, electro-magnets may be used. The strength of the magnetic field produced thereby may be varied by altering the value of the exciting currents applied to the electro-magnets.

WHAT I CLAIM IS:—

1. Apparatus, for modifying atmospheric conditions by subjecting air to a magnetic field of variable strength, comprising first means, which, at least during operation of the apparatus, defines at least two spaced magnetic poles of like polarity producing a continuously-acting magnetic field in the space between and around them; second means, which, during operation of the apparatus, is capable of producing an electro-magnetic wave or a series of electro-magnetic pulses, thereby to modify the magnetic field produced by the first means and thereby to produce a resultant magnetic field of variable strength, and third means defining a passage for leading air through the resultant magnetic field in the vicinity of said spaced poles defined by said first means.

2. Apparatus as claimed in Claim 1 in which said first means comprises at least two permanent or electro-magnets of substantially the same strength spaced apart and arranged with like poles facing each other.

3. Apparatus as claimed in Claim 2 in which at least one of the magnets is movable to vary the strength of the continuously-acting magnetic field.

4. Apparatus as claimed in Claim 2 in which said first means comprises at least two electro-magnets of which the field strength is arranged to be varied by alteration of the exciting current of one or more of the electro-magnets.

5. Apparatus as claimed in any one of Clims 2-4 in which the magnets of said first means are of annular configuration, the end faces thereof forming the said poles.

6. Apparatus as claimed in any one of the preceding claims in which said second means comprises an electrical coil arranged within or adjacent the gap between the poles of said first means and electrical means arranged to pass an intermittent current through said coil, the polarity of the latter being such that the end face thereof nearer to said spaced poles of said first means is the same as that of said spaced poles.

7. Apparatus as claimed in Claim 6 in which said electrical means is a multivibrator circuit.

8. Apparatus, as claimed in any one of the preceding claims, in which said third means comprises a container having a lower compartment through which air is permitted to pass to an upper compartment containing a pair of magnets forming said first means and an electrical coil of said second means, the electrical coil being connected to a multivibrator circuit mounted within or externally of said container, compartment having a vent therein leading to the surrounding atmosphere.

9. Apparatus as claimed in Claim 8 including means in said lower compartment for treating air therein before it passes into said upper compartment.

10. Apparatus as claimed in Claim 9 in which said means is capable of introducing a vaporific substance into the air in said lower compartment.

11. Apparatus as claimed in Claim 9 or 10 including mean for applying heat or light to said air in said container.

12. Apparatus, as claimed in any one of the preceding claims 1-7, for modifying atmospheric conditions and comprising a container having an air inlet and an air outlet and containing a pair of magnets forming said first means and an electrical coil of said second means, the container being made of an absorbant material and being provided with a source of water or other vaporific liquid, which will be absorbed by the material of the container and evaporated therefrom.

13. Apparatus, for modifying atmospheric conditions, constructed and arranged substantially as described herein and shown in the accompanying drawings.

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Agents for the Applicant.

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1,164,119
2 SHEETS

COMPLETE SPECIFICATION

This drawing is a reproduction of the Original on a reduced scale.

SHEET 1

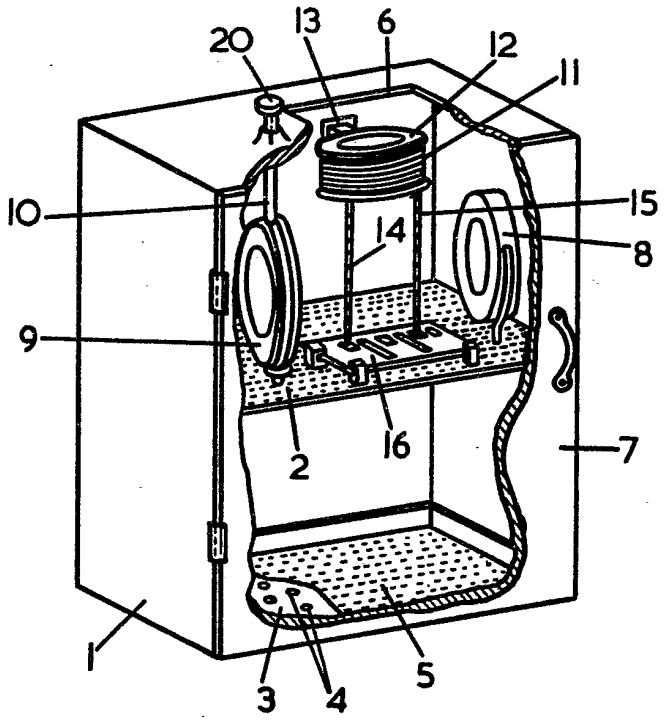

FIG. 1.

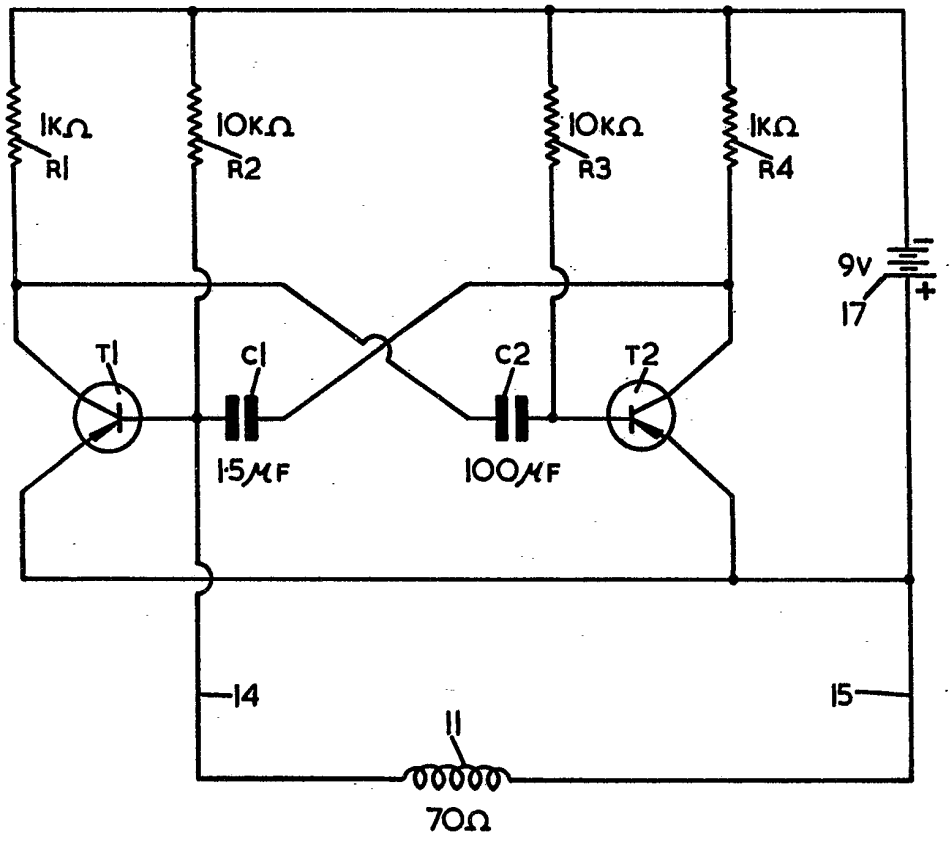
1KΩ
R1
10KΩ
R2
10KΩ
R3
1KΩ
R4
9v
17
T1
C1
C2
T2
1·5μF
100μF
14
15
11
70Ω

FIG. 2.