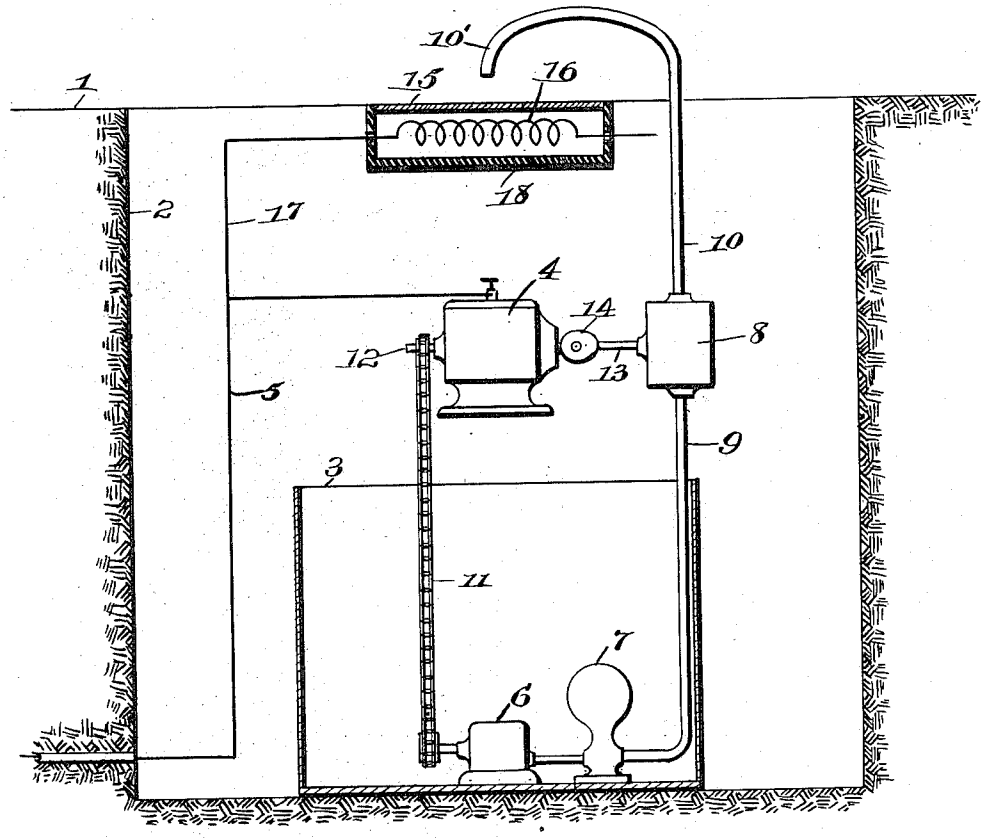
May 29, 1934. W. H. FRANK ET AL 1,960,735

WIND DIRECTION AND VELOCITY INDICATOR FOR AIRPLANE LANDING FIELDS

Filed Jan. 13, 1931



Inventors.
Walter H. Frank
and
Thomas Carroll
By Robert L. Young
Atty

Patented May 29, 1934 1,960,735

UNITED STATES PATENT OFFICE

1,960,735

WIND DIRECTION AND VELOCITY INDICATOR FOR AIRPLANE LANDING FIELDS

Walter H. Frank and Thomas Carroll,
Washington, D. C.

Application January 13, 1931, Serial No. 508,545

6 Claims. (Cl. 177—352)

This invention relates to a wind direction and velocity indicator for airplane landing fields, and has for its object the employment and coordination of mechanisms for producing smoke in discontinuous puffs or small columns of predetermined and constant frequency, to provide a visible indication of the wind direction and velocity at the ground.

In the practical application of this device, it is our preference to locate the same on the ground level and in the actual landing field, as wind direction indicators positioned on elevated structures are frequently subjected to the influence of wind eddies which may not always truly indicate the actual wind direction on the ground level of the landing field.

While our inventive purpose may be carried out in various ways, the accompanying drawing serves to illustrate one of the preferred embodiments of the invention.

The figure is a diagrammatic view in which the various electrical and mechanical elements are illustrated in proper coordination to produce the anticipated result.

Referring to the figure by reference numeral, 1 indicates the ground level of the landing field, and 2 indicates a pit of suitable proportions to accommodate the system.

Within the pit 2 is positioned an oil tank or receptacle 3 to receive any oil such as waste crank-case oil or the like. 4 indicates an electric motor and 5 is the line cable therefor. Within the tank 3 and submerged in the oil therein is a pump 6 piped to a pressure dome 7 by means of which dome the pressure from the pump is maintained constant.

8 indicates a valve which is connected to the pressure dome by a pipe 9, while the discharge pipe 10 from the system projects slightly above the ground level 1 and its discharge end or jet 10′ is curved to discharge downwardly for the purpose which will be presently described.

The oil pump 6 is driven by the motor 4 as by a sprocket and chain drive 11 working off the motor shaft 12, while the valve 8 is opened at a predetermined and constant frequency by means of a plunger 13 actuated by a cam 14 driven by the motor shaft 12.

Disposed flush with the ground level 1, and directly under the discharge end or jet 10′ of the pipe 10, is a plate 15 having immediately thereunder an electric heating coil 16 electrically connected to the line cable 5 as by wires 17. This assembly of plate 15 and heating coil 16 is set in a suitable insulation 18.

Having thus described the several component parts of the system, its operation is as follows:

The intermittent flow of the oil through the discharge end or jet 10′, controlled by the opening and closing of the valve 8 at predetermined and constant frequency results in the oil being discharged directly upon the face of the plate 15 in step with the action of the valve 8. The plate 15 being heated by the heating coil 16 to a temperature sufficient to burn or flash the oil, the visible effect is the formation of a succession of independent puffs or small columns of smoke emanating from the plate 15 at the ground level 1.

These independent puffs or small columns of smoke are created at constant frequency and are clearly visible to a pilot attempting a landing on the field. At low wind velocities, the puffs or small columns of smoke are separated only slightly, the clear spaces between the puffs increasing in length as the velocity of the wind increases. Not only the direction of the wind may be accurately indicated by this system, but after a little observation a pilot is enabled to determine the velocity of the wind at the surface of the landing field very accurately.

The entire system is very simple and inexpensive and extremely efficient, and while we have shown and described only a single example of a mechanism for carrying our inventive purpose into effect, we do not intend to so limit ourselves but consider that we are clearly entitled to all changes and modifications falling within the limit and scope of the appended claims.

While we have referred to the use of oil for the system, we may use any fluid or other material which can be burned or flashed into a visible smoke or vapor without departing from the spirit of our invention.

What we claim as new and desire to secure by Letters Patent of the United States, is:

1. A system for visibly indicating the direction and velocity of wind, including a motor, an oil receptacle, an oil pump within the oil receptacle, driving means between the motor and the pump, a valve, a pipe line connecting the pump and the valve, a pressure dome in said pipe line, a plunger for opening and closing said valve, means actuated by the motor for moving said plunger at constant frequency, said elements being disposed below the surface of the ground, a discharge pipe from said valve extending above the surface of the ground, a plate arranged under the discharge pipe to receive oil discharged from the discharge pipe, and means for heating the said plate.

2. A system for visibly indicating the direction

and velocity of wind, including a motor, an oil receptacle, an oil pump within the oil receptacle, driving means between the motor and the pump, a valve, a pipe line connecting the pump and the valve, means for maintaining a constant pressure in the pipe line, a plunger for opening and closing said valve, means actuated by the motor for moving said plunger at constant frequency, a discharge pipe from said valve, a plate arranged under the discharge pipe to receive oil discharged from the discharge pipe, and means for heating the said plate.

3. A system for visibly indicating the direction and velocity of wind at ground level, including a fluid receptacle below the ground level, means for discharging small quantities of the fluid above the ground level at a constant frequency, and a heated plate exposed to atmospheric currents at the ground level for receiving and visibly flashing the fluid of the discharging means.

4. A system for visibly indicating the direction and velocity of wind at ground level including means for delivering small quantities of oil at ground level at a constant frequency, and a heated element exposed to atmospheric currents at ground level for receiving and visibly flashing the oil so delivered.

5. A system for visibly indicating the direction and velocity of wind, including an electrically heated element exposed to atmospheric currents for receiving and flashing a fluid, and automatic means for delivering small quantities of a fluid to said receiving and flashing means at a constant frequency.

6. A wind direction-and-velocity indicator for airplane landing fields comprising a ground pit, an oil receptacle on the floor of the pit, a heated flasher element at the ground level of the pit, a supply line leading upwardly from the receptacle and extending over the said heated element to discharge downwardly thereon, and means for forcing small quantities of oil through the supply line at a constant frequency.

WALTER H. FRANK.
THOMAS CARROLL.