Nov. 7, 1933. C. T. WATTS 1,934,576

PORTABLE FLOODLIGHT UNIT FOR AIRPORTS

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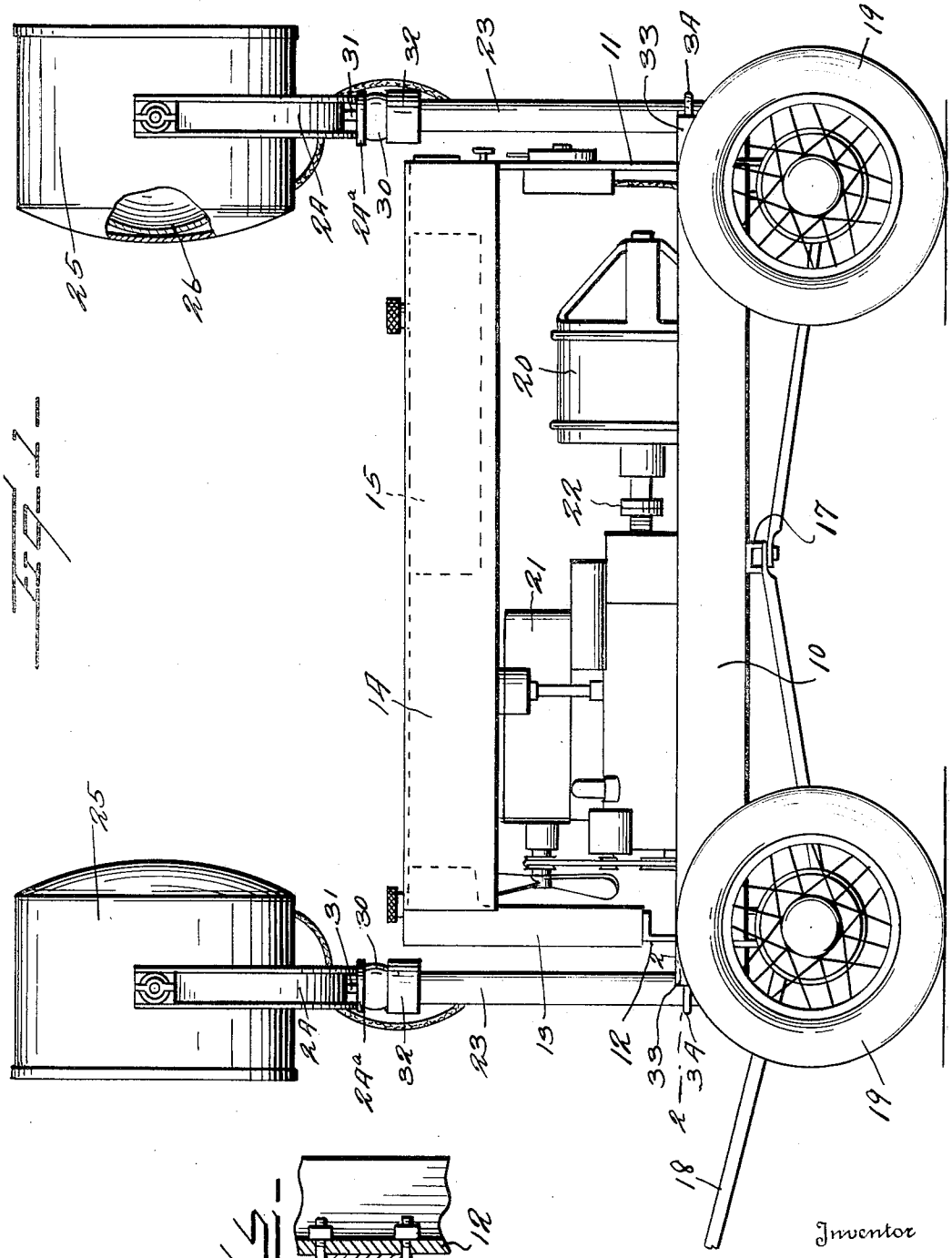


Fig. 1.

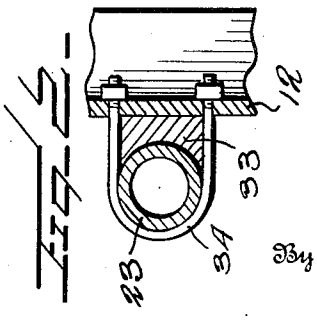


Fig. 2.

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Fig. 3

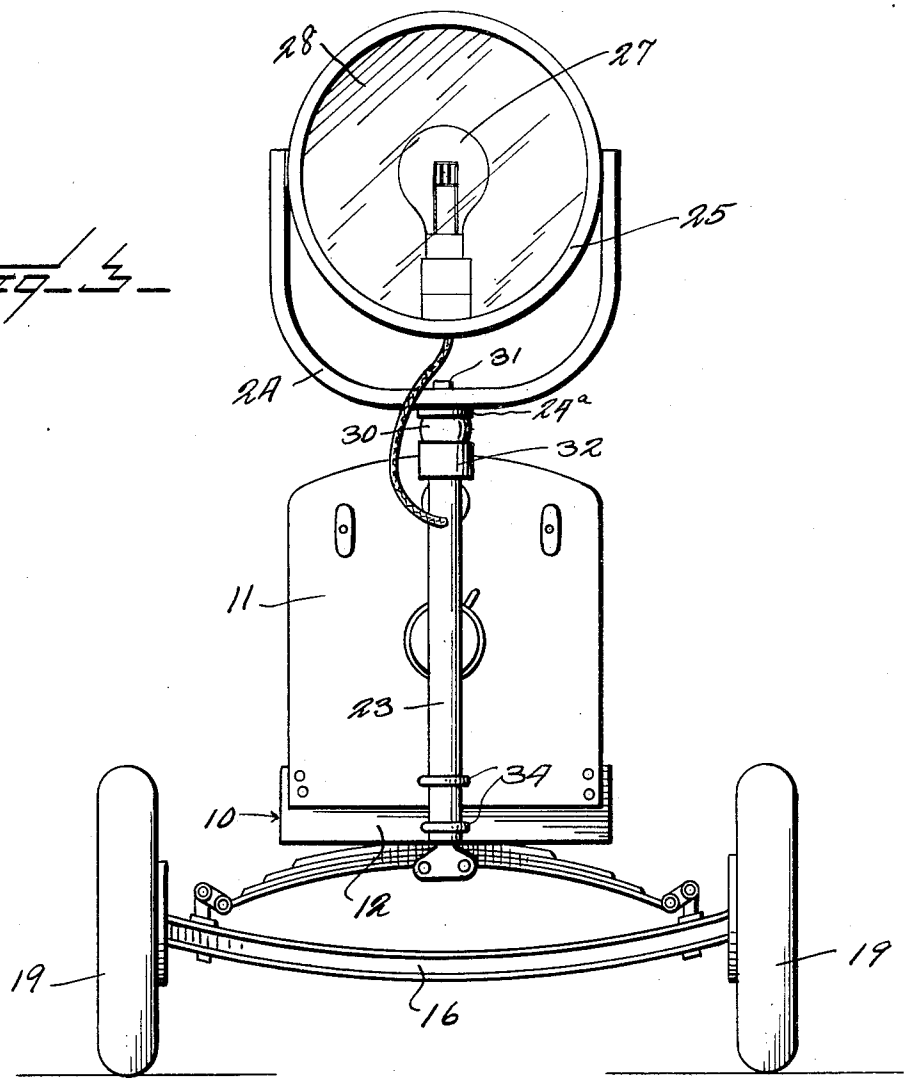
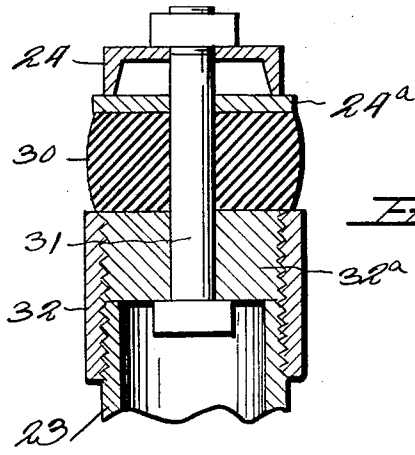


Fig. 4



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UNITED STATES PATENT OFFICE

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PORTABLE FLOODLIGHT UNIT FOR AIRPORTS

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2 Claims. (Cl. 240—1.2)

This invention relates to lighting apparatus and particularly to apparatus for use in airports for the purpose of floodlighting a particular portion of the field. There are three methods of airport lighting now in general use. First by means of arc floodlights, second by batteries of incandescent lights and third individual run-way lighting which is a new method recently adopted by airports having runways and considerable traffic. This last method provides a pair of lights at each end of each runway controlled by remote control switches placed at the lights. These switches are operated from a central point or light tower. Only one set of lights is used at a time, this being the pair that projects into the wind. The approaching pilot observes the runway that is lighted and the end of the runway that has the lights turned on. This indicates the direction he is to land which is over the lights and, of course, into the wind. Thus as he actually touches the ground, the lights are at his back and he does not face a blinding glare from in front or side as he would in the first and second methods of lighting or rather as he would do in a great many cases where the wind is in such a direction that he could not land over the lights. If often occurs that a field, however, is rendered partially unusuable at times by snow or mud and in that case it is very desirable that some means be provided for indicating the best portion available for landing and also indicating the direction in which the plane should land.

Emergency occasions also occur where a pilot cannot land upon a regular field because the field is closed in as by fog so as to shut out the pilot. The pilot under these circumstances notifies the ground crew by radio that there is an opening in the vicinity (which may, for instance be another airport unlighted perhaps or just an ordinary pasture). Under these circumstances, of course, at the present time no means is provided for lighting this unlighted airport or lighting the pasture. The general object of the present invention, therefore, is to provide a portable lighting mechanism which can be readily transported to any portion of a field and may be used for floodlighting this particular portion of the field, thus indicating the most available place to land and also indicating the direction in which the landing should occur, and a further object is to provide a portable lighting apparatus which may be readily transported by the ground crew to an unlighted airport or to a pasture, the mechanism permitting the ground crew to change ground, select the best possible location for landing and then signal the pilot by the use of one of the lights, for instance, that he could land, the mechanism acting to flood-light the adjacent ground and indicate the direction in which the pilot should land. It often occurs at the present time that a plane destined for an airport is forced to remain aloft for a number of hours because of the fact that fog has shut in the airport and there is no other available place to land so that the plane is obliged to stay aloft until daylight, if possible, or probably crash.

A further objects of the invention is to provide an apparatus for this purpose including a chassis, a generator, a motor for the generator, floodlights operatively connected to the generator with means for controlling the motor, the generator and the flood lights, the chassis being adapted to be towed by a light motor car or even transported by hand to any desired position on a field or pasture.

Other objects will appear in the course of the following description.

My invention is illustrated in the accompanying drawings, wherein:—

Figure 1 is a side elevation of a floodlight apparatus constructed in accordance with my invention;

Figure 2 is a detailed fragmentary section on the line 2—2 of Figure 1;

Figure 3 is an end elevation;

Figure 4 is a fragmentary, vertical section through the upper end of one of the posts supporting a projector.

Referring to these drawings, it will be seen that my lighting unit comprises a main supporting frame designated generally 10, which is made of channel steel having seven inch flanges, the length of the channel being six feet and its width 15 inches.

At one end this frame is riveted, welded or otherwise connected to a vertically disposed instrument panel preferably constructed of sheet aluminum. The opposite ends of the channel steel frame 10 are connected by a transverse web 12. A radiator of any suitable character, as for instance the "International truck radiator" 13 is supported upon the web 12. The instrument board and the radiator are connected to each other by a sheet metal hood 14 upon which the gas tank 15 is supported. The frame composed of the parts 10, 11, 12, 13 and 14 is carried by a two point suspension on axles 16 braced by conventional "wishbones" connected to a cross member 17 provided with their support at the middle of the frame.

A tow bar 18 provides a trailing connection for the unit. The wheels 19 may be of any suitable character but are preferably wire type wheels with pneumatic tires.

Mounted upon the channel 10 is a generator 20. Preferably this is a D. C. generator shunt or compound wound 12 k. w. 115 or 230 v. Also mounted upon the channel member 10 in alinement with the generator is the motor designated generally 21. This may be of any suitable construction but I have used a four cylinder Chrysler gas motor for this purpose having the usual governor, carbureter, starter, generator, distributor, oil filter and gasoline tank. The motor is connected to the generator by means of an L. R. flexible coupling 22.

Mounted at opposite ends of the frame are the tubular steel posts 23, each carrying at its upper end a rotatable U-shaped yoke 24 between the arms of which the projectors 25 are pivotally mounted. Each yoke 24 is pivotally mounted upon the post for swinging movement in a horizontal plane while the projectors 25 are mounted for swinging movement in a vertical plane.

Thus projectors may be directed to any desired points of the field or used for signalling purposes. These projectors are preferably constructed of one-eight inch aluminum with a spun back welded in place and having a chromium plated steel reflector 26 having a five degree parabolic curve. The bulbs 27 are preferably 115 v. 5 k. w. Any suitable conventional socket may be used. The lenses 28 are mounted in steel frames and are preferably sheet Pyrex. The two bulbs 29 are wired in series with the generator so that 115 v. are furnished to each from the 230 v. generator. Yokes 24 are preferably of channel steel cadmium plated. Between the upper ends of the posts and the yokes 24 are placed the four inch vibration absorbing cushions 30 of gum rubber. Through these cushions, the pivot bolts 31 pass. The upper ends of the standards 23 are provided with screw-threaded collars 32, each collar receiving at its upper end the screw-threaded plug 32*a* upon which the cushion 30 rests, the pivot bolt 31 passing through these cushions through a wear plate 24*a* and through the angle iron yoke 24. The purpose of the cushion is to absorb any vibration set up in the generator set as well as vibration due to traveling which might effect the light filament while hot.

The instrument panel carries the light and ignition switches, ammeter, oil pressure gage, and a choke, throttle and starter control, all for controlling the motor, and also carries a volt meter, field rheostat and fused circuits for controlling the lights. Posts 23 may be connected in any suitable manner to the channel frame but preferably the posts at the lower ends are held to the frame and against supports 33 by means of U-bolts 34.

It will be seen that I have provided a structure which is very compact and thoroughly portable and which may be readily transported to any part of a flying field or transported to any field pasture or other possible landing place in the vicinity of a landing field and there used to temporarily light up this landing place and if necessary to signal to a plane that a landing may be made.

With my construction, the motor is connected directly with the generator so that there is no chance of slippage or uncertainty in operation. My motor is connected, as before stated directly to the generator and is only used for operating the generator, thus doing away with the necessity of using more or less complicated mechanism to engage or disengage the generator. On reasonably solid surfaces, my unit can be moved by hand power. My unit can readily be towed with a light tractor to any desired portion of a field where during winter months, softness of the field or snow conditions would prohibit truck travel. It is when fields are in this condition that it is most essential to be able to put a lighting unit in position to give the pilot every possible advantage of winds and indicate the best available spot on the field to land. My structure is mounted on a chassis equipped with springs, pneumatic tires and a towing device which will permit its being towed at a high speed over rough surfaces.

I claim:—

1. A portable floodlight unit for air fields including a supporting frame comprising a single longitudinally channeled base member, a radiator extending upward from, having the same width as, and supported by one end of said base member, a sheet metal instrument panel extending upward from and having the same width as the other end of the base member, a sheet metal hood rigidly connected at one end to the radiator and at the other end to said panel and constituting a brace to the radiator and panel, a gas tank supported thereby and disposed within the hood and immediately beneath the same, an electric generator mounted upon the base member on one end thereof, an internal combustion engine mounted upon the base member at the other end thereof and directly coupled to the generator and operating in connection with the radiator and gas tank, supporting posts mounted upon the base member at opposite ends thereof, projectors one for each post, a U-shaped yoke, one for each projector, each yoke being rotatably mounted upon its corresponding post for movement in a horizontal plane, each projector being swingingly mounted in its yoke for rotation in a vertical plane, lamps in the projectors, connections from said lamps to the generator, and means on the panel for controlling the engine and controlling the lamps, said posts extending upward above the hood whereby the projectors may have an unobstructed field in all directions.

2. In a portable floodlight unit of the character described, a supporting frame, a post extending upward therefrom, a U-shaped yoke angular in cross section, a lamp casing supported by the U-shaped yoke, a cap closing the upper end of the post, a vibration absorbing cushion mounted between said yoke and the cap, and a bolt passing through the cap, through the cushion and through the yoke and rotatably connecting the yoke with the cushion.

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