Jan. 26, 1954 H. C. O'CONNOR 2,667,000

PORTABLE FOLDING AIRSTRIP MARKER

Filed May 15, 1951

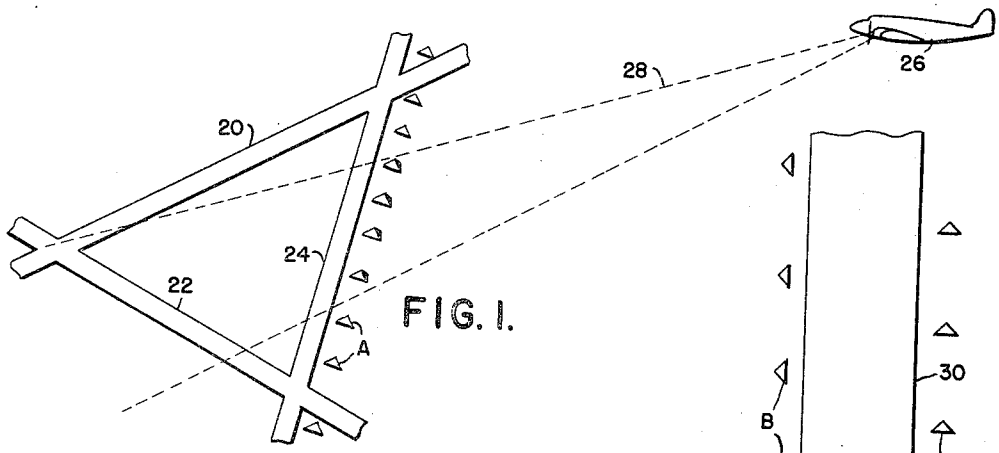


FIG. 1.

FIG. 4.

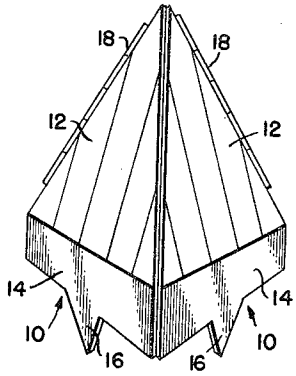


FIG. 2.

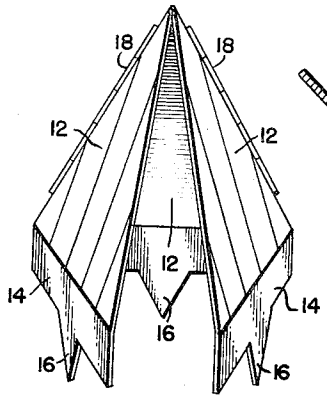


FIG. 3.

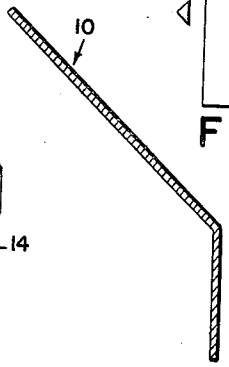


FIG. 7.

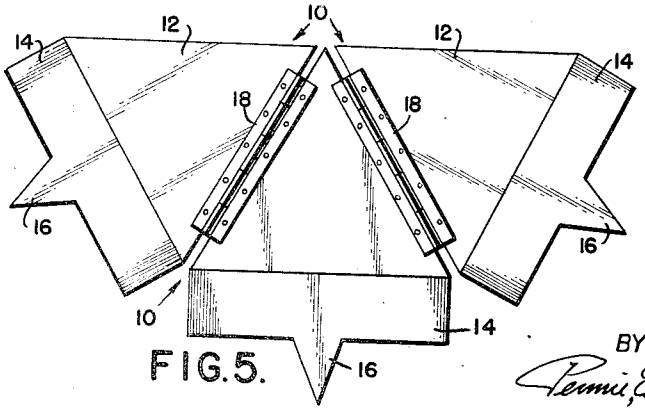


FIG. 5.

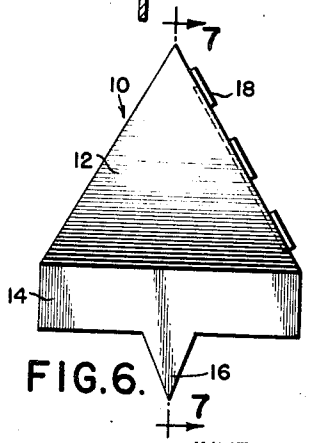


FIG. 6.

INVENTOR
Hazel C. O'Connor

BY
Pennie, Edmonds, Morton, Barrows & Taylor
ATTORNEYS

Patented Jan. 26, 1954

2,667,000

UNITED STATES PATENT OFFICE

2,667,000

PORTABLE FOLDING AIRSTRIP MARKER

Hazel C. O'Connor, Jersey City, N. J., assignor to John L. Mitchell, New York, N. Y.

Application May 15, 1951, Serial No. 228,050

3 Claims. (Cl. 40—125)

1

This invention relates to improvements in luminous marker devices for use in locating and delineating the edges of passageways or runways or for providing warnings of changes in conditions in direction on such passageways or runways.

More particularly the marker device of the present invention is intended for use in connection with airport runways or airstrips on the ground level, for aiding aircraft to make landings and takeoffs at night under conditions where illumination for such airstrips or runways is either lacking, unavailable for use, out of order, or not usable, as in case of blackouts in time of national emergency.

Driveway and highway markers which include luminous markings are well known. However, the improved marker device of the present invention by reason of its angularity and size of its face surfaces and other features make it particularly useful for marking runways.

The primary object of the present invention is to provide a luminous marker device which will clearly and effectively delineate at ground level airport runways and airstrips from the air and from the ground at night. The device is useful on all types of airstrips and runways whether military or civilian.

Another object of the invention is to provide marker devices for clearly and effectively marking the location, direction and length of an airstrip on the ground level or from the air without making such air strip a clearcut target for enemy action.

A further object of the invention is to provide a marker device which is inexpensive to make, can be made by mass production methods and from various types of materials which are not critical from the standpoint of national defense.

Another object of the invention is to provide luminous marker devices which are effective for aircraft landings and takeoffs without the aid of artificial illumination, except for that of the aircraft.

A further object of the invention is to provide a marker device for airstrips which requires little or no mechanical maintenance inspection or upkeep.

Still another object of the invention is to provide an effective airstrip marker made up of a plurality of similar elements which may be readily and quickly assembled without the use of tools, and placed in position and operation by mere hand pressure on the ground.

2

In accordance with the invention, the improved luminous marker device comprises a pyramid constructed of similar flat isosceles triangular-shaped plates hinged together in series, the base of each triangular plate being provided with a depending vertical section having a length equal to that of said base, said triangular plates being hinged together in such a manner that the plates forming the pyramid may be stored in open condition and folded into pyramid form when set up for use, and a luminous coating on said triangular plates for reflecting light. The depending vertical section preferably includes a depending spike for anchoring the device to the ground.

The invention includes other objects, features and advantages described more in detail hereinafter in connection with the accompanying drawings forming a part of this application.

In the drawings:

Fig. 1 is a diagrammatic perspective view illustrating the use of the marker devices of the present invention in connection with one of the airstrips of an airport, showing the manner in which an approaching plane may utilize the marker devices;

Fig. 2 is a perspective view of one form of the marker device of the present invention, the elements of which are folded into pyramid form and ready for use;

Fig. 3 is a view similar to that of Fig. 2 showing the device of Fig. 2 partially folded;

Fig. 4 is a view looking down on a portion of an airstrip and illustrating one method of marking such airstrip with the devices of the present invention;

Fig. 5 is a plan view of the inside of the marker device shown in Figs. 2 and 3 with its elements shown hinged together in series and folded out flat, as for example for storage purposes;

Fig. 6 is a front elevational view of one of the elements of the marking device shown in Figs. 2, 3 and 5; and

Fig. 7 is a sectional view taken on the line 7—7 of Fig. 6.

The marker device of the present invention is a pyramid-shaped structure having 3, 4, 5, 6 or 8 sides sloping to the apex of the pyramid. The sloping triangular-shaped sides of the pyramid are arranged to cause the reflection of light from an approaching aircraft back to the pilot of the craft and thereby guide him in landing.

The marker device as illustrated in Figs. 2, 3, 5, 6 and 7 comprises three sides forming a three-sided pyramidal marker. In this instance, the

marker comprises three similar units 10 of sheet material, each including an isosceles triangular-shaped plate 12, the base of which is provided with a depending rectangular vertical section or flange 14 extending the width of the base of the triangular portion 12, and a centrally located spike 16 forming a continuation of the vertical flange or section 14 and adapted to be inserted in the ground when the marker is set in position.

The units 10 of the marker device, as for example, the three units shown in Figs. 2, 3 and 5 are hinged together in series by hinges 18 attached to the sides of adjacent plates 12 in such a manner that the device may be stored in open condition, as in Fig. 5, or folded into the position shown in Fig. 2 ready for use. The number of hinges as shown in the drawings, for example, is one less than the number of units 10, the meeting edges not provided with a hinge merely being brought together when the elements of the device are folded into position ready for use, as shown in Fig. 2. The hinges 18 are attached to the units 10 by suitable means such as rivets or bolts.

In a particular example, the height of the apex of the marker device was approximately 18 inches from the ground and the plates 12 sloped at an angle of 45° from the ground as indicated in Fig. 7. Each triangular side portion was 18 inches along its base, the section 14 was 3 inches wide and the spike tapered from 2 inches at the top to its point 3 inches below the section 14. The edges to which the hinges 18 are attached measured 25.45 inches.

In Figs. 2 and 3, the lines extending perpendicular to the base of the triangular sides mark the borders of alternating vertical stripes of luminous, contrasting paint or other luminous coating to facilitate the reflection of light in easily discernable colors. The stripes may be 2 inches wide, although those indicated in Figs. 2 and 3 are considerably wider.

When it is desired to use the marker devices of the present invention, they may be picked one at a time off a stack and each folded until the two end plates meet, as in Fig. 2. They are then set in place and the spikes pressed into the ground on or at the side of a runway. The marker devices may be spaced at the same distance now separating electrical marking lights used on runways. Regardless of the angle of approach by a plane at night the multifaces of the marker indicate at once to the pilot of a plane the proper direction of approach which he could then adopt and make a safe landing. Once landed, the plane would leave no tell-tale line of lights but would still have a sufficient line of markers before it to enable it to get off the runway for planes following to make a similar landing.

One method of using the marker devices of the present invention is illustrated in Fig. 1 showing three airstrips 20, 22 and 24 of an airfield being approached by the plane 26, a light beam 28 from which has picked up the air field. The plane 26, for example, may be approaching at from 1000 to 2000 feet elevation at night. A row, A, of the marker devices of the present invention is located along one side of the airstrip 24 and because of their luminescence, angularity and position, they pick up the light beam from the airplane and outline clearly the airstrip for the pilot, also giving him its length, and direction. Because of the multifaces of the marker devices the pilot will know immediately whether he is approaching the airstrip crosswise and must make a turn to come in in line with the airstrip. The pilot will have the proper information when he picks up the illuminated faces of the row A of the marker devices in a straight line to starboard, as in Fig. 1.

Another method of using the marker devices of the present invention is illustrated in Fig. 4 in which a runway 28 is provided with a row B of marker devices on one side and a row C of marker devices on the other side. In this instance, the marker devices in the row C are arranged with their fronts or one side facing in one direction to identify the right or starboard side of the runway, while the devices of row B are faced angularly to identify the left or port side of the runway for a pilot in landing at night.

The improved device of the present invention may be made of relatively light material as, for example, 18 to 24 gauge steel, or other available sheet material so that they are easily transported in large quantities to remote places by airplane. The devices, having a knockdown construction, are light in weight, and low in cost.

I claim:

1. A marker device comprising a pyramid constructed of flat isosceles triangular plates hinged together in series, the base of each triangular plate being provided with a depending rectangular vertical section of equal strength, a spike extending from the lower edge of each rectangular section for anchoring in the ground, said triangular plates being hinged together along contiguous edges in such a manner that the marker device may be stored in open condition and folded into pyramid form when set up for use, and a luminous coating on said triangular plates to reflect light.

2. An airstrip marker comprising a pyramidal structure provided with at least three sloping sides having a slope effective for catching and reflecting the rays of light from the headlight of an approaching aircraft, each side of the pyramidal structure including a side unit of sheet material, the upper sloping part of which is in the shape of an isosceles triangle, the lower portion of said side unit including a rectangular-shaped vertical base connected with and extending across the base of the triangular upper part, a spike extending from the lower edge of each rectangular-shaped vertical base for anchoring in the ground, hinge means joining said side units in series, said hinge means joining at least one side of each triangular part to a side of an adjacent triangular part, and a luminous coating on the pyramidal structure for reflecting light.

3. An airstrip marker as claimed in claim 2, in which each triangular upper part is provided with alternating upwardly-extending stripes of contrasting luminous light reflecting coating material.

HAZEL C. O'CONNOR.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
355,809	Brown	Jan. 11, 1887
397,732	Landis	Feb. 12, 1889
1,624,900	Parkhurst	Apr. 12, 1927
1,848,734	Luce	Mar. 8, 1932
1,882,150	Kent	Oct. 11, 1932
2,264,618	Carver	Dec. 2, 1941
2,330,096	Waters	Sept. 21, 1943
2,410,277	Farris	Oct. 29, 1946
2,542,894	Blanchard	Feb. 20, 1951