Oct. 28, 1952 G. A. ALLARD 2,615,249

ATOMIC AIR BURST DIRECTION FINDER

Filed Nov. 8, 1951

Fig. 1.

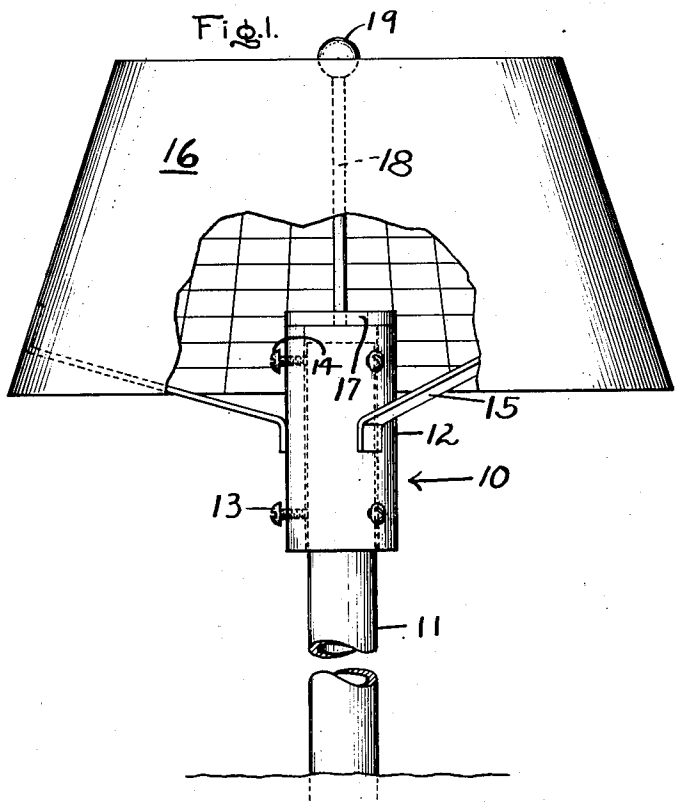


Fig. 2.

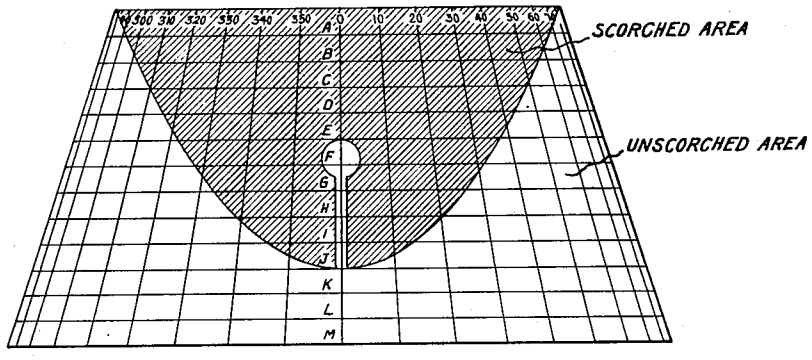
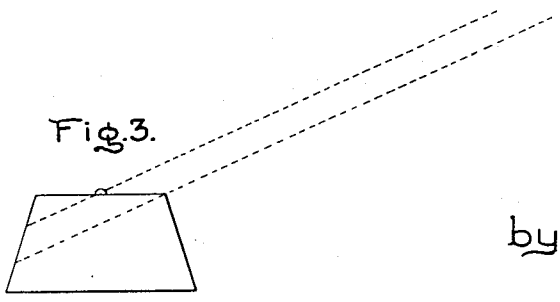


Fig. 3.



Inventor:
Gerard A. Allard

by Roland A. Anderson
His Attorney.

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ATOMIC AIR BURST DIRECTION FINDER

Gerard A. Allard, Schenectady, N. Y., assignor, by mesne assignments, to the United States of America as represented by the United States Atomic Energy Commission

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1 Claim. (Cl. 33—1)

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The present invention relates to a device for quickly and easily locating the point of detonation of an atomic bomb in the air.

The detonation of an atomic bomb is accompanied by the release of energy in the form of heat, radiation and blast. The radiant heat given off in the flash of such a bomb travels with the speed of light but is of extremely brief duration, whereas the blast effect travels much more slowly.

Experience at Hiroshima indicates that the duration of the flash could hardly have exceeded a fraction of a second. Flash burns resulted instantaneously, scorching paint for distances of approximately seven thousand feet from ground zero; yet such was the briefness of the flash that even very slight shielding from leaves, clothing and the like sufficed to afford protection against this aspect of the atomic explosion. The radiant heat came in a direct line, like light, so that the area burned corresponded to an area exposed to a light source at the point of detonation. As the flash ceased very quickly, clearly marked shadows were visible where objects were shielded from the heat. By projecting back the sharply defined outlines of these shadows, Japanese and allied scientists were able to determine both the height and diameter of the fireball.

It is the object of this invention to provide an air blast direction indicator which utilizes the flash effect of an atomic explosion and which may be quickly and easily read by persons lacking in scientific training, such as, for example, volunteer civil defense workers.

The foregoing object is achieved by the provision of an indicator which may advantageously take the form of a truncated conical painted surface mounted on a standard and provided with azimuth and elevation markings. A rod is arranged axially of the conical surface and casts a shadow on the inner surface thereof, the position of which will indicate the direction of the airburst.

The present invention may be more fully understood by reference to the annexed drawings, in which Fig. 1 represents an elevational view of an indicator made according to the invention, portions of the indicator being broken away.

Fig. 2 is a view of the interior of the conical surface of Fig. 1, showing azimuth and elevation markings and illustrating the scorched and unscorched areas which will appear after an atomic explosion.

Fig. 3 is a sketch showing the direction of a flash which will scorch the indicator surface as in Fig. 2.

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With particular reference to Fig. 1, the indicator assembly 10 comprises a standard 11 which may consist of 1¼" pipe set in the ground in an open and preferably elevated position. A cylindrical sleeve 12 of 2" pipe is adjustably secured to the standard by means of two groups of set screws 13, 14 arranged at approximately 120° intervals around the sleeve.

The sleeve carries three steel brackets 15, of which two are shown. Secured to the brackets is the truncated conical indicating surface 16 which may be thin cold rolled steel riveted or spot welded. This surface may be 12 inches in lower and 8 inches in upper diameter and about six inches in height. The inside surface of the indicator is painted and divided by vertical lines at 10° intervals from 0° to 360°, and horizontal circles are drawn at ½ inch intervals from top to bottom of the indicating surface. In the illustrative embodiment of the invention these circles are lettered from A to M to avoid confusion with the numerical azimuth markings.

The upper end of the sleeve 12 is closed by a steel cap 17 which may be welded or threaded in place. The cap supports a vertical brass indicating rod 18 which may terminate in a brass sphere 19 the upper half of which extends above the top of the indicating surface 16. The rod 18 is positioned at the axis of the frusto-conical surface 16.

In operation the indicator is placed in an open, elevated location with the indicating surface approximately five feet above the ground level. The indicator is then oriented in azimuth by loosening the set screws 13 and 14 and rotating the surface until the zero azimuth line is toward north. Alternatively, zero azimuth may be taken from a local landmark or from the azimuth of the sun at a given time of day.

No special orientation in elevation is required.

A number of indicators are set up around a target area and the location of each indicator is noted at a central control station. In the event of an atomic explosion above and to the right of the indicator as sketched in Fig. 3, the unshaded area above the lower dotted line will be scorched except for the portion shaded by the indicating rod and sphere. The pattern so formed is shown in Fig. 2. A civil defense worker, observing the scorch pattern, as shown in Fig. 2, notifies the central control station that the azimuth of the blast was 0° and the elevation was either E or J, depending upon whether the shadow cast by the sphere or the rim of the indicator is used for this purpose. This convention is established in advance by civil defense regula-

tions. Upon receipt of readings from two or more different locations the elevation and azimuth of the air burst can be speedily calculated at the control center. Thus, the intersection of two azimuth readings, preferably not closely in line with each other, will suffice to determine ground zero on a scale map where the locations of the indicators are properly identified. The distance between ground zero and either detector can be measured immediately by scaling on the map, and this information together with the angular elevation, makes it possible to determine by a simple calculation, or from a previously computed table or diagram the height of the explosion above ground zero. With the location of the air blast established, the civil defense authorities can coordinate rescue efforts most effectively.

The present device has the advantage of simple, cheap and rugged construction which will withstand exposure to the weather over extended periods of time. The device furnishes a permanent record of the air burst direction, which record is not lost even if the blast which follows the flash should knock down the indicator.

It is understood that the dimensions and materials mentioned in the illustrative embodiment of the invention have been given by way of example and not as limitation. It is necessary only that the indicating surface be symmetrical about an axis, that an indicating rod be provided at the axis of sufficient size to cast a shadow on the indicating surface, that the indicating surface be marked in azimuth and elevation and that the indicating surface be made or coated with a substance which will scorch upon exposure to heat and leave a visible indication of the scorched area.

I claim:

An atomic explosion direction indicator comprising a vertical standard, a sleeve adjustably supported by said standard a sheet metal, truncated conical indicating surface supported by said sleeve, a heat scorchable painted coating on the interior of said indicating surface, azimuth and elevation markings on said painted coating, an indicating rod supported by said sleeve and arranged axially of said indicating surface, and a sphere mounted on the upper end of said rod, said rod and said sphere being arranged to cast a shadow on said indicating surface, whereby heat from an atomic explosion will scorch a pattern on said surface indicative of the azimuth and elevation of said explosion.

GERARD A. ALLARD.

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