United States Patent

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[54] **REVOLVING REFLECTOR**
4 Claims, 5 Drawing Figs.

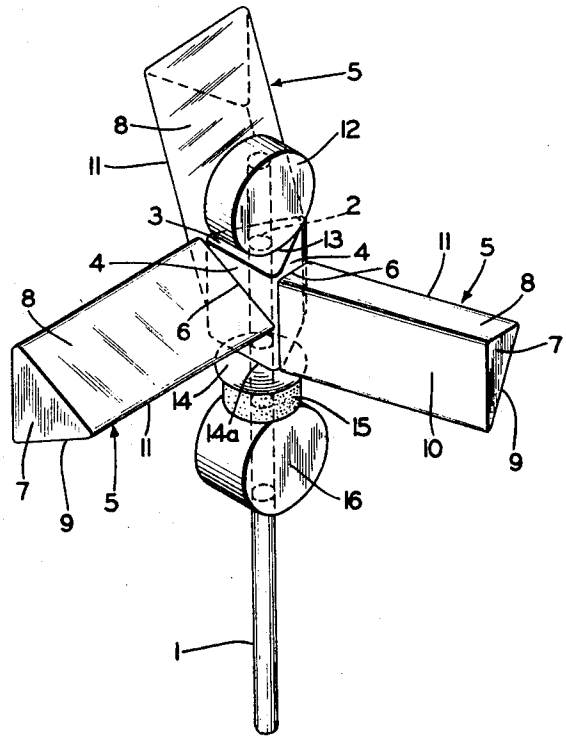
[52] **U.S. Cl.** **350/99**
[51] **Int. Cl.** **G02b 5/12**
[50] **Field of Search** 350/97-
—109, 62; 116/63; 40/37, 37.1; 73/189

[56] **References Cited**
UNITED STATES PATENTS

2,592,238	4/1952	Brammer	350/99
2,781,017	2/1957	Fuller et al.	116/63
2,797,621	7/1957	Gladen	350/99

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ABSTRACT: A revolving reflector having three prismatic-shaped blades attached to a bushing through which a central shaft is inserted. The device, due to the position and shape of the prismatic blades, will rotate regardless of the wind direction or its position on a moving object. The various blade surfaces are coated with different reflecting and nonreflecting materials and provide a flashing effect by reflecting light when revolving. The device can be utilized in various ways, as a safety device, on a child's bicycle, or as an indicating marker for a driveway, etc. The revolving reflector is of simple design and can be produced inexpensively, yet is sturdy and durable.



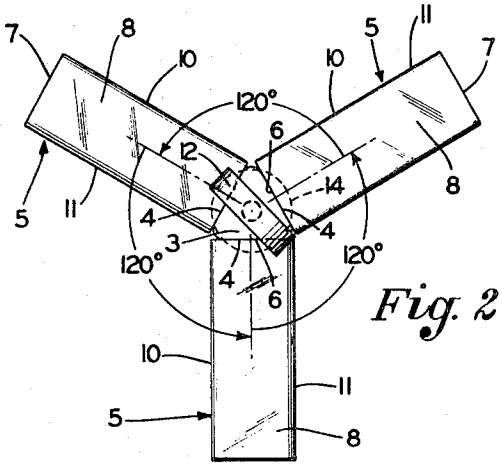


Fig. 2

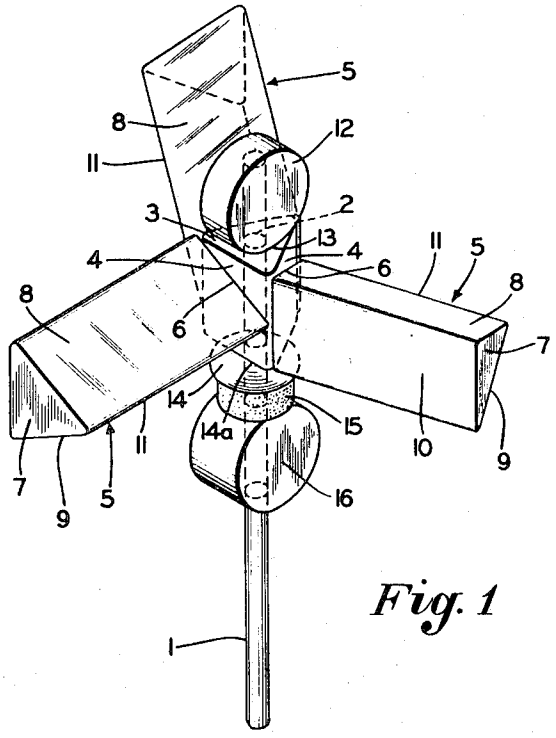


Fig. 1

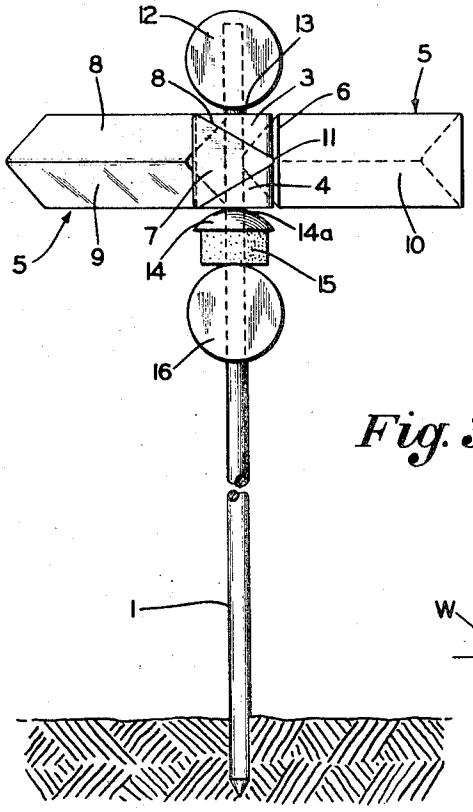


Fig. 3

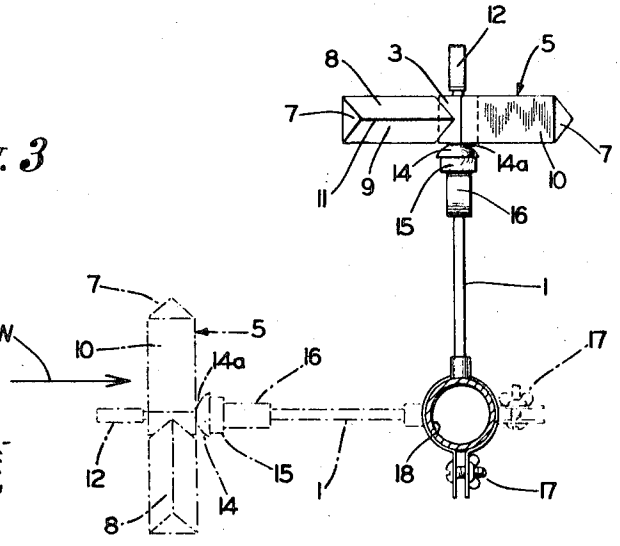


Fig. 4

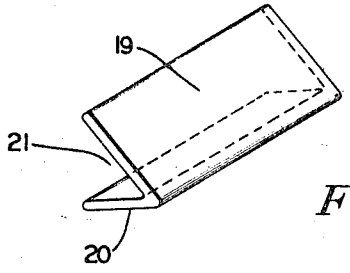


Fig. 5

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REVOLVING REFLECTOR

BACKGROUND OF THE INVENTION

1. Field of the Invention

The invention relates to a revolving reflector adapted to be adjustably mounted on a moving object such as a bicycle or boat, or fixed to a stationary object such as a building or the ground. It also can be held in a person's hand and used as a toy or novelty item.

The device involves a revolving reflector that rotates easily due to wind currents coming from any direction when fixed to a stationary object. Also, the device can be placed in various positions on a moving object and rotates properly regardless of the direction of travel of the moving object and the position of the device or the object.

The reflector blades have a number of surfaces each of which may be coated with a different color or type of reflecting material so that when the blades are rotating the reflected light gives a flashing effect, thereby attracting greater attention than a single reflecting disc.

The revolving reflector is designed primarily as a safety device for a child's bicycle or boat to warn oncoming vehicles or boats of the user's presence. It also can be used effectively to attract attention to a stationary object such as a billboard, store, etc. or placed near the entrance of a person's driveway to indicate the driveway's location.

Finally, the revolving reflector has a construction that is simple and inexpensive to produce, and yet is sturdy enough to withstand wind forces that may be encountered.

2. Description of the Prior Art

A variety of revolving devices and reflectors and many combinations of the two are known. Many of these reflectors are nonrotatable and require the reflected light to be emitted from one particular direction. Nonrotatable reflectors which reflect light from various directions are generally quite complex and require a multitude of reflecting surfaces. As a result, such devices are expensive and cumbersome.

The known reflectors which rotate by motion of the vehicle or the natural air currents generally must be carefully located in relation to the movement of the vehicle or the direction of the wind so as to rotate properly. No adjustments of the revolving reflector to various positions on the vehicle or stationary object are provided.

Many of the known reflectors are designed for a specific use, such as a permanent attachment for a bicycle fender, or mounting on a boat, or insertion in the ground. A change in use may require considerable inconvenience and additional parts.

Present revolving reflectors designed to be used on children's bicycles or as novelty items are generally inexpensive, and as a result the propellers or rotating mechanism used are not sturdy and durable.

These considerations thus have presented a need for a revolving reflector which is adjustable and has the ability to rotate in various positions, and which has a number of surfaces coated with different reflecting material so as to provide a flashing effect when rotating while reflecting light; and also which is adaptable to a variety of applications, inexpensive to manufacture and assemble, and sturdy and durable in use.

SUMMARY OF THE INVENTION

Objectives of the invention include providing a revolving reflector which can be easily and securely fastened to a moving or stationary object and which will rotate with the same velocity regardless of the direction of the wind or the direction of the moving object.

Another object is to provide a revolving reflector which has a number of surfaces, each of which may be coated with a different reflecting material or nonreflecting material so as to provide a flashing effect when rotating while reflecting light so as to attract greater attention.

It is a further object to present a revolving reflector which will reflect light from many different directions when rotating as well as when stationary.

It is also an important object to provide a device which can be adjusted to any position and still perform satisfactorily, thereby providing a device which is adaptable to many uses.

Finally it is an object to provide a revolving reflector which has a simple construction, the components of which may be produced inexpensively from ordinary material and assembled conveniently, yet is sturdy and durable.

These objects and advantages are attained by the revolving prismatic reflector, the general nature of which may be stated as including a stationary center shaft which may be attached to a desired object, a concentric bushing journaled on the stationary shaft, three prismatic-shaped blades attached to the bushing at equally spaced intervals, top cap means mounted on top of the shaft to retain the bushing on the shaft, a lower bearing mounted on the shaft having a curved surface engaged by the concentric bushing, and lower bearing-retaining means on the shaft.

BRIEF DESCRIPTION OF THE DRAWINGS

A preferred embodiment of the invention—illustrative of the best mode in which applicant has contemplated applying the principle—is set forth in the following description and shown in the drawing and is particularly and distinctly pointed out and set forth in the appended claims:

FIG. 1 is a perspective view of the revolving reflector;

FIG. 2 is a top plan view of the reflector shown in FIG. 1;

FIG. 3 is a side elevational view of the revolving reflector embedded in the ground;

FIG. 4 is a side elevational view of the revolving reflector attached to a bicycle with an alternate position depicted in dot-dash lines; and

FIG. 5 is a fragmentary view of an alternate form of a prismatic blade.

Similar numerals refer to similar parts throughout the drawings.

DESCRIPTION OF THE PREFERRED EMBODIMENT

FIG. 1 illustrates the preferred assembly of the new revolving reflector device. A central shaft 1 preferably made of metal is inserted through opening 2 formed in a concentric bushing 3. Bushing 3 may have a prismatic shape, as shown, with three rectangular flat surfaces 4. Three prismatic-shaped blades generally indicated at 5 are mounted on and extend from bushing surfaces 4, one blade for each surface.

Blades 5 have triangular-shaped parallel ends 6 and 7 and similar or equal rectangular sides 8, 9 and 10.

Blades 5 are spaced equally around bushing 3 at 120° intervals (FIG. 2) and are positioned so that their edges 11 formed by sides 8 and 9 (FIG. 3), lie in a plane perpendicular to center shaft 1. This arrangement locates sides 10 parallel to center shaft 1.

Thus, when the reflector is mounted in a vertical or nearly vertical position (FIG. 3), the wind coming from any direction will strike two of the prismatic blades with greater force than the third blade. One of the two blades so struck will have a flat surface 10 facing the direction that the wind is blowing, and the other blade will have an edge 11 facing the direction of wind movement. Flat surface 10 offers greater resistance than edge 11 to the wind force, thereby causing the blades and bushing to rotate.

When the reflector is positioned (dot-dash lines in FIG. 4) to face directly into the wind which is indicated by the arrow W in FIG. 4, the wind W is directed only against slanted sides 8 which rotates the blade and bushing assembly.

This effect results from the symmetrical arrangement of the prismatic-shaped blades 5. The blades 5 with their slanted sides 8 and 9 and edges 11, and their remaining sides 10 located as described, present wind reactive sides 8 or 10 to the wind regardless of the direction of the wind with respect to the reflector.

A cap 12 is secured to the top of center shaft 1 to retain bushing 3 on the shaft. Cap 12 may be a round disc as indicated or any type of ornamental design or figure that may be

desired. Preferably cap **12** should have a rounded surface **13** at its zone of contact with bushing **3** so as to minimize friction between cap **12** and bushing **3** when the bushing is rotating.

A bearing **14** having a curved surface **14***a* is mounted on shaft **1** a short distance below bushing **3** again to minimize friction while the bushing is rotating.

A ring **15** of spongelike material may be placed below bearing **14** on shaft **1** retained by member **16**, which preferably is frictionally slidably mounted on shaft **1**. Component parts **14**, **15** and **16** are thus movable along shaft **1** so that retaining member **16** may be moved upwards compressing ring **15** and forcing bearing **14** tightly against bushing **3**, which thus acts as a braking device, to stop the bushing from turning or to slow its rate of turn. Members **14**, **15** and **16** may have any desired ornamental design or shape.

FIG. **3** illustrates one manner in which the reflector may be used. Shaft **1** is inserted in the ground and placed near a driveway or other home entrance to serve as an ornamental device as well as a marker.

FIG. **4** illustrates another use of the device. Shaft **1** can be attached to an adjustable bracket **17** which is mounted on the handlebars **18** of a child's bicycle. With this arrangement the revolving reflector serves both as a toy and as a safety device. The reflector may be adjusted as shown by the dot-dash lines to add greater enjoyment to the child's play, yet it will revolve with the same velocity as in the vertical position.

Prismatic blades **5** may be constructed of wood, metal, plastic or the like and be either solid or hollow. The blade surfaces may be coated or otherwise provided with reflective materials of any desired type.

FIG. **5** shows an alternate blade construction. Two sides **19** and **20**, corresponding to sides **8** and **9** respectively, are formed as a blade V-shaped in cross section. This blade shape **19—20** functions the same as blades **5**, in that the wind is trapped by V-groove **21** formed by sides **19** and **20** in the same manner as when striking the side **10** of blade **5**.

Accordingly, the new revolving reflector provides a device which may be attached to a moving or stationary object and which will rotate with the same velocity regardless of the wind's direction; provides a device which is both a safety item and a child's toy; provides a device which will produce a flashing effect when reflecting light while rotating; provides a device which will reflect light from many different directions; provides a device which is inexpensive to manufacture yet sturdy and durable; and provides a device eliminating difficulties present with prior devices, and which achieves the objectives stated and solves existing problems in the art.

In the foregoing description certain terms have been used for brevity, clearness and understanding; but no unnecessary limitations are to be implied therefrom beyond the requirements of the prior art, because such terms are used for descriptive purposes and are intended to be broadly construed.

Moreover, the description and illustration of the invention is by way of example, and the scope of the invention is not limited to the exact details shown or described.

Having now described the features, discoveries and principles of the invention, the manner in which the improved revolving reflector is constructed and used; the characteristics of the new construction, and the advantageous, new and useful results obtained; the new and useful structures, devices, elements, arrangements, parts and combinations, are set forth in the appended claims.

I claim:

1. A revolving light reflector having a stationary center shaft, a concentric bushing journaled on the stationary shaft, three similar prismatic-shaped blades mounted on and extending radially from the bushing at equally spaced intervals, the blades having reflecting surfaces, top cap means mounted on the top of the shaft, a lower bearing member having a curved surface mounted below the bushing on the shaft, and lower retaining means mounted on the shaft below the bearing member, said prismatic blade being triangular in cross section and including a plurality of radially extending rectangular sides, in which two of the sides have equal areas, in which said two sides intersect at a front edge, and in which the front edges of the three blades lie in a plane perpendicular to the axis of the center shaft.

2. The revolving light reflector as defined in claim **1** in which the lower retaining means includes a ring of resilient material.

3. The revolving light reflector as defined in claim **1** in which each prismatic blade is triangular in cross section and includes three radially extending rectangular sides, in which two of the sides have equal areas, in which a backside joins the two sides, and in which the backsides of the three blades lie in planes parallel to the axis of the center shaft.

4. The revolving light reflector defined in claim **1** in which each prismatic blade is V-shaped in cross section, in which each blade has two sides of equal area which intersect at a front edge, and in which the two sides form a concave pocket opening rearwardly from said front edge.