The present invention relates to highway directional or marking devices. This application is a continuation-in-part of our co-pending U.S. application Ser. No. 537,915, filed Mar. 28, 1966, now abandoned.

In particular, the present invention relates to that type of highway directional device which is to be used under emergency conditions by a motorist to warn other motorists that they must either stop or pass around a vehicle which is in trouble.

Under today's conditions of crowded city roads and crowded highways, together with traffic moving at high speed, it is extremely important to have simple and effective emergency devices by means of which a motorist can give effective warning that his vehicle is stopped for any reason on or next to the road or highway. Many devices for this purpose have been proposed. For example, it has been known to provide auxiliary lights which may be located at a proper point adjacent or behind the automobile, or indeed to modify the flasher system of the vehicle itself to provide an emergency indication. It has further been known to provide flares or other light sources, or flickering lamps, to indicate emergency. All of these devices have presented the common difficulty that they are not sufficiently visible for a sufficient distance, under varying light conditions. In addition, most of these devices are not directional, in that they do not indicate to the oncoming motorist the direction in which he must maneuver his vehicle in order to avoid striking the stopped vehicle. All of these devices have further suffered from the difficulty of reliance upon a source of energy, such as a battery or a fuel, which might be unreliable and fail at the time of emergency. Additionally these devices have in many instances been bulky, costly and difficult to set up and operation. In some instances, as when a volatile fuel has been used as the source of light, the device has presented safety hazards. As a further particular difficulty with flares, which have been commonly used, if they rely upon a volatile fuel as the source of energy, the flame can often be extinguished in a wind.

The invention has particular relation to sign-type highway or road directional devices. Although devices of this general type have been known, they have suffered a number of drawbacks. Thus, prior known sign-type devices have not been quickly and easily set up, have occupied an undesirably large amount of space when not in use, and have not always been marked with sufficient clarity to give the desired information to the passing motorist.

It is accordingly a primary object of the present invention to provide a highway directional device which will avoid the above drawbacks.

In particular, it is an object of the invention to provide an effective highway directional device which is of extremely simple and inexpensive construction and which occupies a relatively insignificant space when it is in a collapsed condition for storage in the car.

Furthermore, it is an object of the invention to provide a highway directional device which will provide clearly visible information even though the device itself is of a relatively small size.

Primarily, the highway directional device of the present invention includes an elongated, one-piece plastic tube having opposed open ends and having in cross section a triangular configuration. It is understood that the above mentioned plastic tube may be extruded or fabricated. This tube of the present invention has a bottom, ground-engaging wall and a pair of opposed side walls inclined upwardly toward each other from opposed side edges of the bottom wall, the side walls intersecting each other along a crest of the tube which extends longitudinally thereof over the bottom wall. At least one of these side walls carries visible information at its exterior surfaces.

In order to render the aforementioned tube secure under windy conditions, a suitable weight, in the form of a rectangular substantially flat sand bag may be secured at the lower end of one of the pair of oppositely inclined side walls, so that in the tube extended position, the sand bag may lie flat on the inside surface of the ground engaging wall. Furthermore, since the sand bag secured to one side wall adjacent to the fold line between that side wall and the ground engaging wall, the said bag may be turned to lie flat on the side wall to which it is secured, thereby permitting the arrow on the other side-wall to be displayed pointing in another direction.

It is sometimes desirable to display the above directional device from an elevated position such as from the side or roof of a car, rather than from ground level, in order to afford better visibility. For this purpose a bar magnet, such as one of synthetic resin may be secured to the ground engaging wall adjacent to the side wall in which the sand bag is secured. This synthetic resin bar magnet may suitably be secured to the ground engaging wall by adhesive. Accordingly, the directional device may be displayed by attaching the bar magnet to the car body.

The invention is illustrated by way of example in the accompanying drawings which form part of the application and in which:

FIG. 1 is a perspective illustration of one possible embodiment of a highway directional device according to the present invention;

FIG. 2 is a top plan view of the directional device of FIG. 1 taken at a scale larger than FIG. 1;

FIG. 3 is an end view of the highway directional device of FIGS. 1 and 2 shown in FIG. 3 in the erected condition;

FIG. 4 shows the directional device of FIGS. 1 and 2 in sectional end view in the collapsed and stored condition;

FIG. 5 shows an end view of the directional devices of FIGS. 1–3, when suspended and attached to a suitable surface such as a car body, by the magnet.

Referring now to the drawings, there is shown in FIGS. 1 and 2 a highway directional device 10 which, in accordance with the invention, is in the form of a one-piece plastic tube 12 having opposed open ends 14 and 16 and having in cross section a triangular configuration, as is apparent particularly from FIG. 1. The tube 12 is extremely inexpensive since it can be formed by extrusion, by molding or in any other suitable inexpensive way. Thus an elongated tubular extrusion having in a cross section the configuration of the tube 12 is cut into sections of suitable length so that each of these sections forms one of the tubes 12.

The tube 12 has a bottom ground-engaging wall 16 and a pair of oppositely inclined side walls 18 and 20 which extend toward each other upwardly from the opposed side edges of the bottom wall 16, these side walls 18 and 20 intersecting each other along a longitudinal crest 22 of the tube 12 situated over the bottom wall 16 thereof. The plastic material from which the tube 12 is
formed is flexible so that the tube can be folded along the side edges of its wall 16, 18 and 20. For this purpose the wall 16 is formed midway between its opposite side edges with a portion 34 of fold line 33 parallel to the opposite side edges of the wall 16, so that the device 10 can be collapsed to the condition shown in FIG. 3. As may be seen from FIG. 3, the walls 20 and 18 have been folded toward each other along the crest 22 while the bottom wall 16 has its portions 16a and 16b which are situated on opposite line 34 situated next to each other with the collapsed wall 16 extending outwardly beyond the walls 18 and 20. In this way the exceedingly simple marking device of the present invention can be collapsed substantially into a thin and substantially flat package so that it occupies an extremely small amount of space. In order to set the device up for operation it is only necessary to situate the portions 16a and 16b of the bottom wall 16 in a common plane, and the device is ready for use.

Since the simple extension section which forms the tube 12 has opposed open ends, the user can manipulate through either one of these ends a suitable weight in the form of any hand rock, wrench, or the like, and such a weight will rest on the bottom wall 16 in the space between the side walls 18 and 20 so as to provide an exceedingly stable condition for the marking device 10 of the invention. However, for optimum operation of the subject directional device a substantially flat sandbag 17 or similar weight, is secured at the lower end of a sidewall 20, so that in the tube erected position, sandbag 17 lies flat on the inside surface of ground engaging wall 16. Sandbag 17 is secured to sidewall 20 at its lower end adjacent to the fold line 34 between sidewall 20 and bottom wall 16 by means of a tab portion 33 extending along and parallel to fold line 34, so that sandbag 17 may be rotated about crease line 35 in tab 33 in a hinge-like motion.

Furthermore, since sandbag 17 is secured to sidewall 20 adjacent to fold line 34, directional device 10 may be erected so that sidewall 20 and sandbag 17 lies flat on the inside surface of wall 16 in the same manner as it lies flat on the inside surface of bottom wall 16.

It is understood that sandbag 10 may be unattached to device 10, and device 10 will be operative satisfactorily although not with all the advantages when in the attached embodiment.

Thus, in order to erect device 10, it is only necessary to grasp device 10 along its crest 22 and allow sandbag 17 to cause bottom wall portions 16a and 16b to unfold to form a flat ground engaging wall 16 with sandbag 17 as shown in FIG. 1.

As shown in FIG. 4, directional device 10 with sandbag 17 attached thereto may be collapsed, by folding bottom wall portions 16a and 16b with sandbag 17 lying adjacent wall 20, and placed in a suitable envelope 36, for storage for example, in the trunk of a car.

Directional device 10 may be erected on a substantially horizontal surface 38 as shown in FIG. 3, i.e. on the ground, or on the roof of a car. Alternately, directionally device 10 may be attached to a substantially vertical surface as shown in FIG. 5, such as the side of the car fender, by means of a bar magnet 39 which is suitably secured e.g. by adhesive to a portion of ground engaging wall 16. Bar magnet 39 may comprise a magnetic synthetic resin, thus rendering magnet strip 39 substantially flexible.

The extruded, molded or otherwise fabricated tube which is divided up into the sections which form the device may consist of any of a number of thermoplastic or modified thermosetting material as long as when the device is set up as shown in FIG. 1 the device will be self-supporting. In addition it is required that the sheet material be flexible and be foldable between the conditions respectively illustrated in FIGS. 1 and 3. Also, it is preferred to be able to locate printed matter on the sheet material so that the bottom wall can be provided at its exterior with suitable advertising matter or the like. Device 10 may have the visible information 30, in the form of an arrow on one sidewall 18, with the other sidewall 12 carrying advertising matter.

The preferred material for the tube is a linear polyethylene which is of high density low pressure polyethylene and which is well known. Of course, other suitable materials can be used, but the above material is preferred because it can be flexed repeatedly and because it has a "memory" which will always return to its original position in the tube 12. In addition, the above material is preferred because it is relatively inexpensive and unbreakable and is virtually unaffected by extreme exterior atmosphere conditions.

Furthermore, it is preferred to provide the tube with the cross section of an equilateral triangle so as to provide the greatest amount of stability with the greatest economy of material. If desired, holes may be formed in the sidewalls 18 and 20 to reduce wind resistance.

In accordance with a further feature of the invention, at least one of the side walls 18 and 20 carries at its exterior surface visible information which will warn passing motorists of the presence of the vehicle which is in trouble. The visible information 30 carried by the wall 18 is in the form of a single arrow as shown in FIGS. 1 and 2. It is to be noted that each of the walls of the tube 12 has in the longitudinal direction of the tube a direction substantially identical to that of the wall of the sign 30 as shown in FIG. 5. Thus, in accordance with one of the features of the invention, this single sign 30 is arranged on the wall 18 with the longitudinal dimension of the sign extending longitudinally of the wall, so that in this way substantially the entire area of the wall can be used for the single sign 30 whose configuration conforms generally to the configuration of the wall. As a result of this feature even though the device is of a small size, it is nevertheless possible to arrange on one side of its side walls a single sign which is of sufficient magnitude to be clearly visible so as to provide unmistakable information to passing motorists.

Although the information carried by the tube 12 can be in the form of a single sign 30 carried by only one of the side walls at its exterior surface, it is preferred to provide additional information 32 at the exterior surface of the other side wall 20, as is indicated in FIG. 2. It will be noted that while the informative quality of the signs 30 and 32 is identical, nevertheless, they have different properties. The sign 30, for example, is designed so as to be clearly visible under daytime illumination conditions, while the sign 32 is designed to be clearly visible under nightime illumination conditions. For example, one of the sign 32 which is to be used under nightime illumination conditions, it is possible to use a pressure-sensitive, light reflective tape or material known as "Scotchlite," produced and sold by the Minnesota Mining Corporation, or "Adcolite," manufactured by the American Decal Corporation, or any other material that is light-reflective. For example, it is possible to use a phosphorescent tape or pigment which can be in addition activated with radium. For daytime illumination conditions, it is possible to use readily available tape or paper which is coated with a fluorescent pigmented material such as "Dayglo," made by many different companies.

In addition to the possibility of using pressure-sensitive adhesive-backed tape, it is also possible to use a tape or material which has a coating which is capable of being heat-sealed to the thermoplastic material of the tube 12. Alternately, the manufacturers of the sign 30 may line any available adhesive backed film with the information to the exterior surface of the side wall. Thus, for example, beside using a backed adhesive film it is also possible to add a heat-sealing film thermoplastic material. The pigment material can be applied directly to the plastic surface of the tube 12 instead of being mounted thereon by means of a tape.

It is to be understood that by daytime illumination conditions and nightime illumination conditions are
meant the prevailing illumination conditions irrespective of the time of day. For example on a foggy, rainy day nighttime illumination conditions may prevail even though the clock does not indicate that it is nighttime.

Although the structure described above represents the preferred form of the present invention, it is possible to provide variation. For example, although a single sign 30 or 32 is preferred since it will occupy substantially the entire area of a side wall and thus be readily visible even though the side wall is relatively small, the information can be different and can be information such as the word “STOP.”

Furthermore, instead of forming the tube 12 as a section of an extrusion, it is also possible to fold the tube 12 from a single sheet of plastic material.

Thus, it will be seen that with the structure of the present invention, when the device is in its collapsed position not in use it occupies an extremely small amount of space even with the weight 17 consisting of a flat bag of sand stored therein because of its thinness. When the device is to be used it is an extremely simple matter to remove the device from its storage envelope 36 and grasp the device at its crest 22 thereby allowing the sand bag weight 17 to open the ground engaging portions 16a and 16b to render the device in its erected condition.

Besides the modifications indicated above, various other modifications are possible. For example, the tube (extruded or fabricated) can be rectangular in cross-section with warming material on the sides, bottom wall with gusset as shown and top wall joining the two sides and also with gusset in the same manner as the bottom wall. The gusset on the top and bottom walls may be of the same or of different size. Optionally, only the bottom wall, in this configuration, may have gussets.

The reflective, phosphorescent or fluorescent material or paint on the side of the device, for increased effectiveness and contrast, can be outlined with blue or black ink or paint.

The plastic panels can optionally be made of blue or black material rather than being transparent or white.

The night-reflective or daylight-illuminated warning material on a panel can be painted, screened, brushed or printed directly on the panel without the use of tape or the like.

Other modifications are possible.

What is claimed is:

1. A highway directional device comprising an elongated, plastic tube having opposed open ends and divided by a full length fold line into a plurality of walls foldable about said fold lines into a flattened condition of the device and into an erected condition thereof, said walls in the erected condition of the device including a bottom ground-engaging wall and a pair of opposite side walls extending upwardly from said bottom wall to intersection to form a crest edge, said bottom wall being formed with a further fold line situated substantially midway between the opposite side edges of said bottom wall to divide it into two bottom wall panels, at least one of said side walls carrying externally visible information, and a substantially flat weight hingedly secured along one of its edges to the inside face of one of said side walls adjacent to the fold line of said one side wall and said ground-engaging wall whereby said device when in the folded condition is automatically rendered into the erect condition by grasping said crest edge thereby allowing said weight to pivot about its hingedly secured edge to fall on said bottom wall to thereby render said bottom wall panels coplanar for engagement with the ground.

2. A highway directional device as defined in claim 1 wherein said weight lies on said one side wall when said directional device is in the erected condition so that said one side wall is ground-engaging.

3. A highway directional device as defined in claim 1 wherein the flat area of said weight engages said bottom wall over an appreciable portion of said bottom wall.

4. A highway directional device as defined in claim 3 including a magnet secured to said bottom wall whereby said device may be secured to a substantially vertical surface.

5. A highway directional device as defined in claim 1 wherein the other of said side walls also carries externally visible information, and the information on one of said side walls having the property of being easily visible under daytime illumination while the information on the other of said side walls has the property of being easily visible during nighttime illumination.

6. A highway directional device as defined in claim 5 wherein said tube has a triangular cross section and has walls each of which is of a rectangular configuration with a dimension longitudinally of the tube substantially greater than its dimension transversely of the tube, and said information on each said side wall taking the form of a single sign having a length substantially greater than its width arranged in the longitudinal direction of said tube so as to occupy substantially the entire exterior surface of the wall which carries said sign.

No references cited

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