FLARE DISPERSING AND IGNITING APPARATUS

Inventor: George L. Kernan, 2567 Fraser Ct., Pinole, Calif.

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Field of Search 89/28; 102/37.4, 102/37.6, 37.8, 70.2 A

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ABSTRACT

An apparatus adapted to be supported on a vehicle for storing an ignitable safety flare, dispensing the flare to deposit the same on the road, and in the process of dispensing the flare causing the same to be ignited. In one embodiment of the invention a plurality of flares are stored in a rotatable turret or magazine. The latter is rotatable to position sequential flares at a discharge station with a metal conductor pin extending through the flare serving as the sole support for the flare. Sending an electrical current through such a pin causes the pin to heat up, ignite the powder in the flare, and simultaneously due to the melting of the pin, results in the dropping of the ignited flare from the storage magazine.

7 Claims, 4 Drawing Figures
FLARE DISPERSING AND IGNITING APPARATUS

This application is a division of Ser. No. 866,534, filed Oct. 15, 1969, now U.S. Pat. No. 3,628,416.

BACKGROUND OF THE INVENTION

Most highway safety experts urge that the drivers of all vehicles keep a supply of safety flares in their vehicles so that in the event of a stalled vehicle or other emergency, one or more flares may be ignited and placed on the roadway to give warning to oncoming motorists. Heretofore, it has been the customary practice for the driver to stop his vehicle, take a flare from the trunk or other part of the vehicle where the flare is stored, strike the flare igniter, and then place the ignited flare in the appropriate position on the road. This type of procedure is not only time consuming, but normally requires the person placing the flare to leave his vehicle and expose himself to the danger of being struck by some moving vehicle. Even in those cases where a person attempts to ignite the flare while remaining in the vehicle, there exists the possibility of damage being caused to the interior of the vehicle and if the flare is dropped to the road surface, it might well roll from the location on which it was initially dropped.

SUMMARY OF THE INVENTION

In broad terms, the apparatus of the present invention is adapted to be attached to a vehicle, and is arranged to drop one or more flares in an ignited condition onto a desired location on a roadway, without requiring the driver to leave his vehicle. Means are provided on the flares to prevent their rolling on the ground. Additionally, and as an important feature of the invention, no flare can be discharged until and unless ignition has taken place, and conversely, there is no danger that an ignited flare will remain in the apparatus without being discharged.

THE DRAWINGS

FIG. 1 is a side elevational view of the apparatus of the present invention shown in the process of dispensing an ignited flare.

FIG. 2 is an exploded perspective view of the apparatus.

FIG. 3 is diagrammatic wiring diagram illustrating the electrical power supply for energizing a solenoid and for igniting the flare.

FIG. 4 is an exploded perspective view of a portion of the apparatus.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The apparatus of the present invention, generally indicated by the numeral 12, is adapted to receive, store, ignite and dispense a safety flare 14. The flare 14 is modified from a conventional flare by adding a flare cap 16 to the lower end of the flare body 18. As shown in FIG. 1, the lower end of the conventional flare body is provided with an igniter portion 20. The cap 16 telescopically engages such lower end and is provided with a pin 22 extending transversely through the cap immediately adjacent the igniter 20 and projecting outwardly from diametrically opposed portions of the cap. The pin is formed of metal and serves as an electrical conductor for reasons presently to be explained, while the cap may be formed of plastic or other non-conducting material. Extending from the upper open end of the cap are a pair of tabs or wings 24 which normally assume the spread position shown in the drawings, but which may be urged into an axial position when the flare is placed in the dispensing apparatus. The purpose of the tabs 24, which are aligned with the outwardly extending pin portions, is to prevent rolling of the flare when the latter is dropped onto a road or other surface. Also, the lower end of the cap is provided with a downwardly projecting lug 25 to be later discussed.

The apparatus 12 generally includes a rotary turret magazine 26 for receiving a plurality of flares 14, a bottom plate 28 through which the flares may be sequentially dispensed, a flare supporting and igniting mechanism 30, a solenoid 32 for effecting an advance of the flares to the discharge position, and a cover 34 overlying the magazine and the flares dispensed therein.

The magazine 26 is of generally cylindrical configuration and is mounted on base plate 28 for rotation about a vertical axis. More particularly, the magazine is provided with an axial bore in which a stud 36 extends. The stud is fixed to the plate 28 and attached to the stud is one end of a spring 38, the other end of the spring being seated in a slot 42 formed in the bottom of the magazine. With the spring end 40 seated in the slot, the magazine may be rotated about the stud 36 against the spring pressure, and the latter will urge the magazine to be contra rotated so that the flares may be sequentially dispensed.

The upper end of stud 36 extends through an aperture 44 in the cover, and a nut 46 is used to secure the various components together. Provided in magazine 26 is circumferentially spaced relation a plurality of vertically disposed bores 48 into which the flares 14 may be loaded. Each bore is provided with diametrically opposed slots 50 for receiving the projecting ends of pin 22 and preventing rotation of the flares in their respective bores. With the flares loaded in the magazine, the lugs 25 will be supported on the upper surface 52 of plate 28.

Plate 28 is provided with a flare discharge opening 54 generally conforming to the size and shape of the bores and slots in the magazine and successively registrable with the latter upon magazine rotation. Also provided in plate 28 is an arcuate slot 56 over which the axes of bores 48 pass during magazine rotation. With the magazine loaded with flares and manually rotated against spring pressure, the lug 25 of the leading flare cap will be disposed in slot 56 and under the influence of spring 38 will engage the end 58 of the slot and thereby prevent further rotation. The magazine is provided with a blank area 60 which will overlie the discharge opening 54 at this time.

The dispensing of the flares may now be considered in connection with the function of solenoid 32 which is attached to the lower surface of plate 28 by bolts 62 or the like. The solenoid is provided with an axial plunger 64 normally maintained in a downward extended position by a spring 66. Energization of the solenoid causes a retraction of the plunger and a resulting upward movement of a rod 68, the latter having an angular extension 70 attached to the plunger. Rod 68 is slidably mounted in a bracket 72 carried on the solenoid housing and is aligned with the base plate slot against the end 58 thereof. Consequently, upward movement of the rod will engage the flare lug 25 and raise the flare, freeing the magazine for rotation until the next succeeding flare lug engages the slot and is stopped at the
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3. The flare, although free to drop through the aperture 54, is halted from complete release as the pin 22 engages the flare supporting and igniting mechanism 30. As best seen in FIG. 4, this mechanism comprises a two piece annular housing 76 attached to the lower surface of base plate 28 by means of lugs 78 and in alignment with discharge opening 54. Disposed on diametrically opposed portions of the inner wall of the housing 76 are a pair of carbon brushes 80, each of generally V-shaped configuration defining a vertical slot 82 for receiving the pins 22. The brushes are formed with a maximum slot width and depth adjacent their upper ends, into which the pin may readily drop. The slots then have a smaller spacing relative to each other so that the pin will be halted in its downward movement, and accordingly prevent the flare from falling through the housing and onto a road surface or the like.

To prevent such release and an igniting of the flare, suitable electrical conductors 84 are connected to the opposed brushes. When current is thus applied to the brushes, assuming a pin 22 is extending between the brushes, an electrical current is carried in the pin 22, it becomes heated to a temperature sufficient to melt the same, and with the pin melted, the flare is free to drop through the housing 76. Simultaneously, the heating of the pin which is in substantial contact with the flare igniter portion 20 will cause an ignition of the flare. In this manner, because the passing of the current through pin 22 effects both ignition of the flare and the dispensing thereof, one cannot occur without the other.

As will be understood, the present apparatus may be mounted in the trunk or on any other portion of the vehicle, so long as the lower end of housing 76 is open to the ground. In FIG. 3, a simple electrical diagram is illustrated wherein operations for a switch 86 disposed for example in the driver's compartment closes a first circuit 88 leading to solenoid 32 for actuation thereof. The leads 84 to the brushes 80 may by-pass the switch entirely since no current flow is possible until the pin 22 spans the two brushes and completes the circuit.

I claim:

1. A safety flare having a generally cylindrical body portion and an igniter portion adjacent one end thereof, the combination therewith of a cap having a tubular portion and an end wall overlying said one end of said flare, said cap having a pin extending diametrically through said tubular portion adjacent said end wall and said igniter portion, and said pin having terminal ends each disposed radially outwardly of the cap, said pin being formed of an electrically conductive material.

2. A device as set forth in claim 1 in which said cap is provided with at least one tab extending from said tubular portion, said tab being normally disposed in angular relationship to the axis thereof and being resiliently deformable to lie adjacent said body portion.

3. A device as set forth in claim 1 including means defining a lug extending axially from and beyond said end wall, said lug being adapted to engage a slot in a flare dispensing apparatus for guiding the flare to a release position.

4. A device as set forth in claim 1 in which said cap is provided with a pair of tabs positioned on diametrically opposed portions of said cap, each of said tabs being formed of resilient material and normally extending in angular relationship to the axis of said cap and being resiliently deformable to lie in an axis parallel to said cap axis, said tabs extending from said tubular portion and away from said end wall.

5. A flare cap for an ignitable safety flare comprising a tubular cylindrical body portion and one end wall, at least one spring tab extending from said body portion and beyond the other end of said cap to a terminal end, said tab and body portion being formed from one piece of resilient material, said tab normally extending in acute angular relationship to the axis of said body portion and being elastically deformable to lie in an axis parallel to said body portion axis, said tab having a thickness substantially corresponding to the thickness of said body portion and extending therefrom in substantial coplanar relationship therewith, and an ignitor means separate and spaced from said tab.

6. A flare cap as set forth in claim 5 in which a pair of said tabs are provided on diametrically opposite portions of said body portion.

7. A flare cap for an ignitable safety flare comprising a cylindrical body portion and one end wall, at least one tab extending from said body portion and beyond the other end of said cap, said tab being formed of resilient material and normally extending in angular relationship to the axis of said body portion and being deformable to lie in an axis parallel to said body portion axis, said tab having a thickness substantially corresponding to the thickness of said body portion and extending therefrom in substantial coplanar relationship therewith, said end wall having a lug extending axially from and beyond said end wall, and said lug being adapted to engage a slot in a flare dispensing apparatus for guiding the flare to a release position.

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