

[54] **FLARE DISPENSER**

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[51] Int. Cl. **G01d 21/00**

[58] Field of Search. 116/28, 63, 124, 132, 114; 102/37.4; 180/82; 340/331, 366; 89/1.5; 67/3; 221/4, 143, 147, 144; 246/215, 211, 473, 477; 124/26; 219/214

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[57] **ABSTRACT**

A flare dispenser for mounting on a vehicle such as an automobile or motorcycle supports a stack of conventional cylindrical flares each with an ignition tip at one end. The dispenser has an electrical igniter and an electrical solenoid for controlling the gravity descent of the flares in the stack, so that the lowermost flare is moved to a lowered position and then moved endwise to contact with the igniter to light the flare, which then falls to the highway. A wind deflection shield mounted on the vehicle in advance of the flare dispenser forms a pocket of relatively calm air into which the lighted flare falls. Remote controls on the vehicle operate the solenoid and the igniter, so that the flares may be ignited and dropped one at a time at desired intervals, while the vehicle is moving.

9 Claims, 8 Drawing Figures

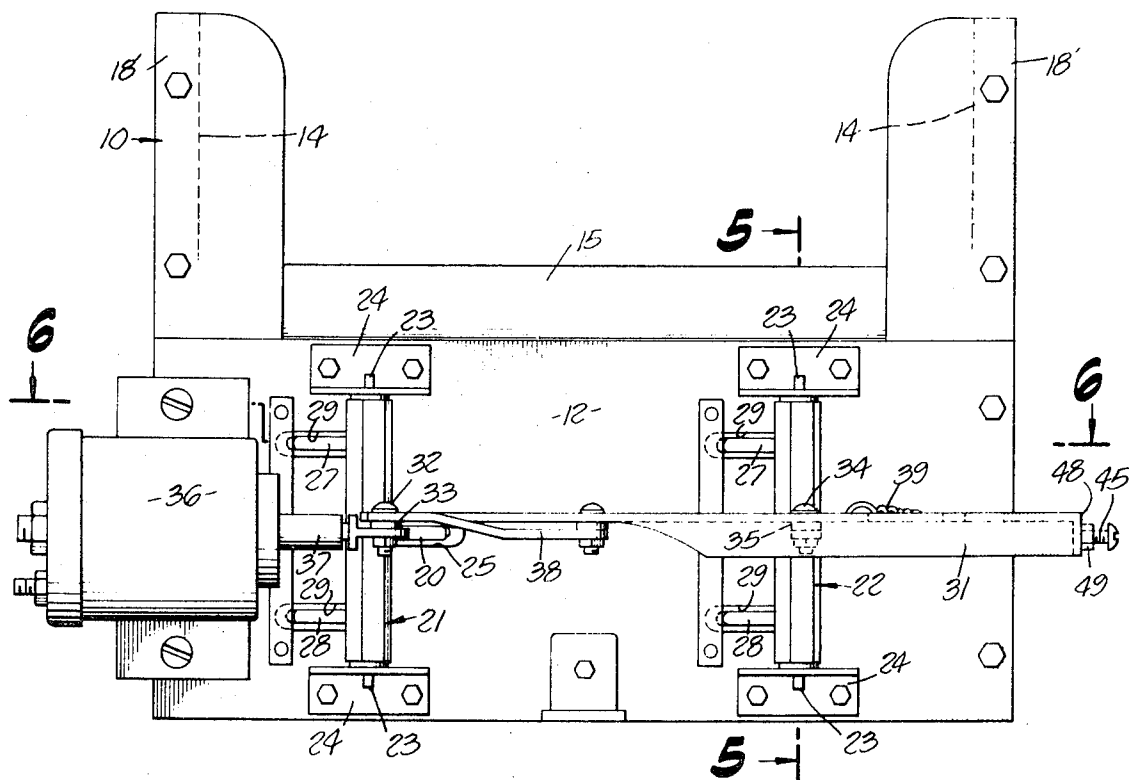


FIG. 1.

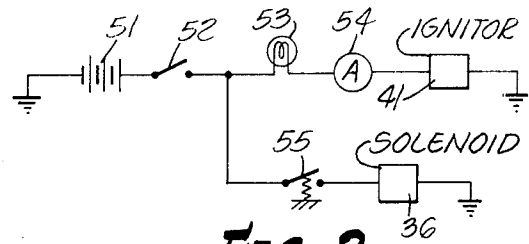
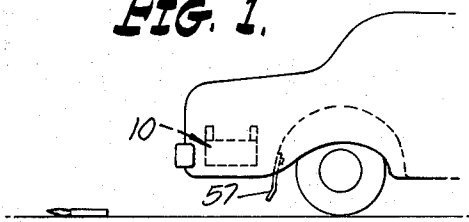


FIG. 2.

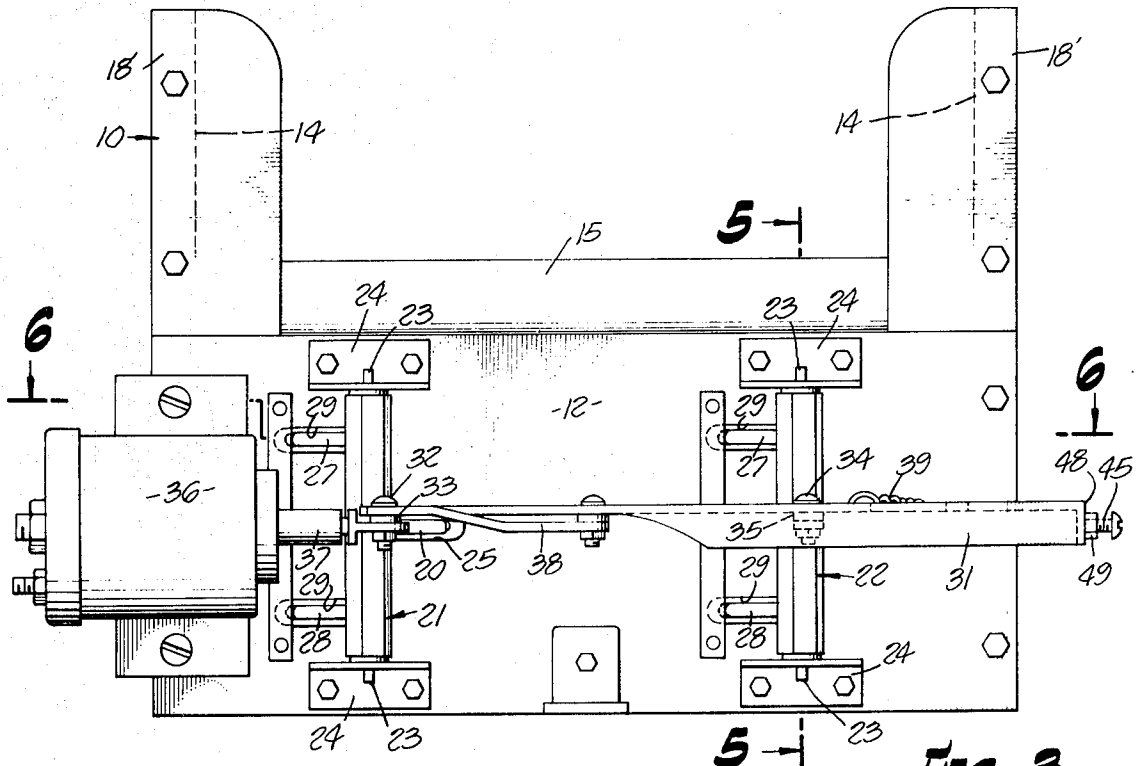


FIG. 3.

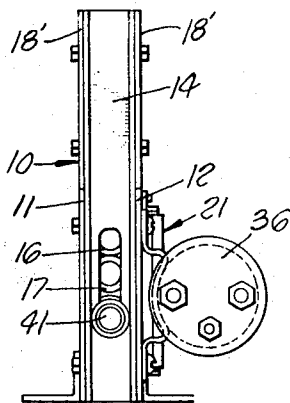


FIG. 4.

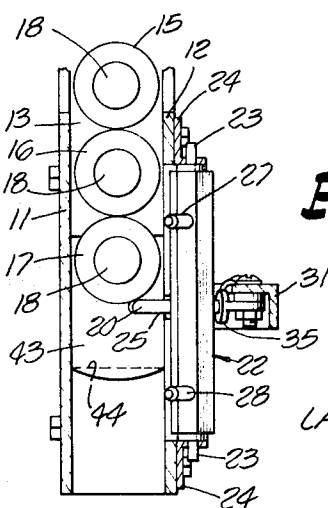


FIG. 5.

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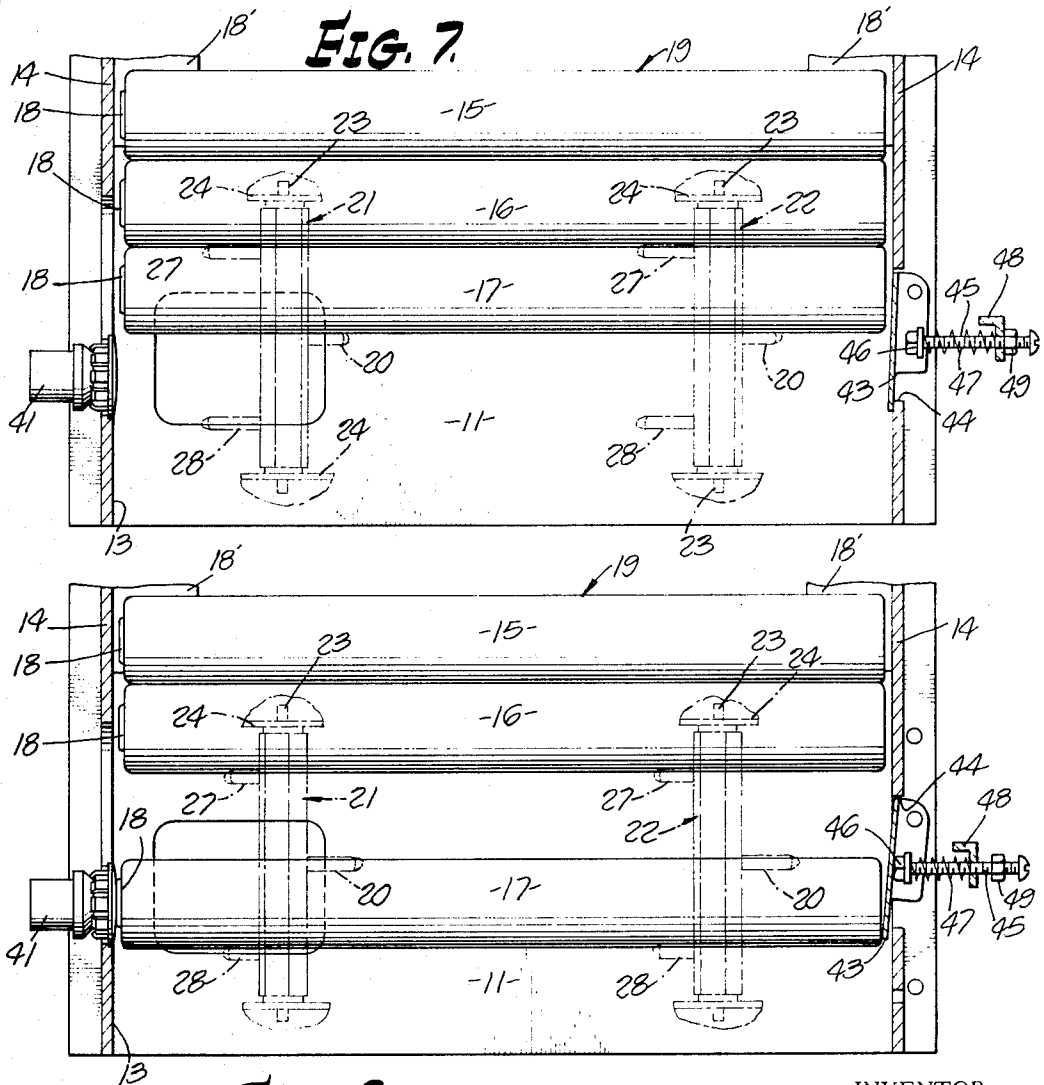
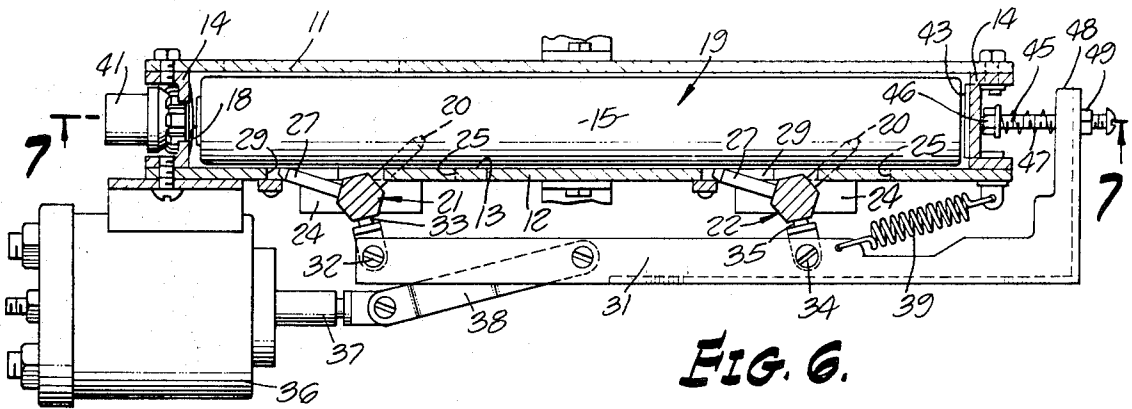


FIG. 8.

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FLARE DISPENSER

This invention relates to apparatus for dispensing lighted flares from a moving vehicle, and an important use of such apparatus is to place lighted flares on a highway to control flow of traffic at the scene of an accident, obstruction, road block, etc. An important feature relating to the use of such a flare dispenser is to avoid the hazardous requirement for a police officer or other person to travel on foot from the scene of an accident against the stream of moving traffic to place lighted flares on the highway.

In accordance with this invention, a plurality of conventional flares are mounted in a dispensing unit attached to an emergency vehicle, such as an automobile or a motorcycle. The operator of the vehicle need only actuate switches on the dashboard of the automobile or in a suitable location on the motorcycle to cause the flares to be ignited and dropped on to the roadway, one at a time, at the desired intervals, and during forward motion of the vehicle while approaching the danger area.

The flare dispenser preferably comprises a pair of laterally spaced guide plates defining a storage space between them. Conventional cylindrical flares each having an ignition tip at one end are stacked in this storage space in a generally horizontal position. Power operated remotely controlled feed means are provided to effect gravity descent of the lowermost flare in the stack to a location below the stack, followed by relative endwise movement of the lowered flare and an electrical igniter device. The ignited flare then descends by gravity into a pocket of relatively calm air created by a wind deflector mounted on the vehicle just in advance of the flare dispenser. The lighted flare then falls directly onto the highway.

Other objects and advantages will appear hereinafter.

In the drawings:

FIG. 1 is a diagram showing the preferred location of the flare dispenser on an automobile.

FIG. 2 is a wiring diagram.

FIG. 3 is a side elevation showing a preferred embodiment of this invention.

FIG. 4 is an end view thereof.

FIG. 5 is a sectional elevation taken substantially on the lines 5—5 as shown on FIG. 3.

FIG. 6 is a sectional plan view taken substantially on the lines 6—6 as shown on FIG. 3.

FIG. 7 is a sectional elevation taken substantially on the lines 7—7 as shown on FIG. 6, and showing three conventional flares in stacked position.

FIG. 8 is a view similar to FIG. 7 showing the position of the flares when one of them has been lowered and pushed endwise against the igniter.

Referring to the drawings, the flare dispenser generally designated 10 includes a pair of laterally spaced guide plates 11 and 12 defining a storage space 13 between them. This space is open at the bottom and the top and its ends are defined by vertical channels 14. Conventional cylindrical flares 15, 16 and 17, each with an ignition tip 18 at one end, are mounted in the space 13. While only three flares are shown in the drawings, any additional number of flares may be accommodated, depending upon the length of the upward extensions 18' of the sideplates 11 and 12. The stack of flares, generally designated 19, is prevented from falling through the storage space 13 by means of the projecting fingers 20 on the duplicate finger supports 21 and 22. The finger supports are mounted to turn about pivot pins 23 extending through the stationary brackets 24 carried on the guide plate 12. Clearance slots 25 are provided in the guide plate 12 through which the fingers 20 project.

When the fingers 20 are in the position shown in the drawings, they underlie the lowermost flare 17 in the stack, thereby supporting the entire stack of flares. When the finger supports 21 and 22 are turned in a clockwise direction, as viewed in FIG. 6, the fingers 20 move into the slots 25 and out of the space 13 between the guide plates 11 and 12. At the same time, however, the parallel fingers 27 and 28 on each of

the finger supports move from an inactive position through the slots 29 and into the storage space 13. The fingers 28 thus intercept the lowermost flare 17 to support it in a lowered position, and the fingers 27 intercept the flare 16 to prevent it and the flares above it from descending. The flare 17 is then spaced vertically below the remainder of the stack, as shown in FIG. 8.

Means are provided for turning the fingers supports 21 and 22 for simultaneous action, and as shown in the drawings this means includes a horizontal bar 31 pivotally connected at 32 to an arm 33 fixed on the finger support 21. Similarly, the bar 31 is pivotally connected at 34 to an arm 35 fixed on the finger support 22. Accordingly, the fingers 20, 27 and 28 all move simultaneously.

An electrical solenoid 36 of conventional design is fixed on the dispenser frame. The moving armature 37 is connected by a link 38 to actuate the horizontal bar 31. When electrical energy is supplied to the solenoid 36, it retracts the armature 37, pulling the horizontal bar 31 to the left, as viewed in FIG. 6, against the action of the return spring 39.

An electrically energized igniter 41 is mounted on one of the spacer channels 14 in line with the position of the lowermost flare 17 in its lowered location. This igniter may conveniently take the form of an electrical resistance wire element of a conventional cigarette lighter used in automobiles. Pusher means are provided for moving the lowermost flare 17 endwise to bring its ignition tip 18 into contact with the igniter 41, and as shown in the drawings this means includes a hinged pusher 43 mounted on the other channel spacer 14 and projecting into an opening 44 therein. A plunger 45 is provided with a head 46 which engages the hinged pusher 43, and a coil compression spring 47 encircles the plunger between the head 46 and the lateral projection 48 on the horizontal bar 31. A threaded nut 49 on the plunger 45 serves as a stop to limit forward movement of the plunger under influence of the spring 47. From this description, it will be understood that when the solenoid 36 is energized to move the horizontal bar 31 to the left, as viewed in FIG. 6, the plunger 45 applies a force through the spring 47 against the hinged pusher 43 to contact the end of the flare 17 remote from the ignition tip 18 and move the flare longitudinally toward the igniter 41. Contact of the ignition tip 18 with the igniter 41 causes the ignition tip 18 to ignite and to light the flare 17.

The fact that the flare 17 in the lower position for ignition is spaced below the remaining flares in the stack is important, since it insures that only the lowermost flare 17 will be ignited and that other flares will not be ignited by the burning end of the flare 17. When the supply of electrical energy to the solenoid 36 is cut off, return spring 39 moves the horizontal bar 31 to the right, as viewed in FIG. 6. This terminates the function of the plunger 45 and hinged pusher 43. This movement of the horizontal bar 31 also turns the finger supports 21 and 22 simultaneously to bring the parts back to the position shown in the drawings, in which the fingers 27 and 28 are retracted out of the storage space 13 and the fingers 20 are extended to support the flares in the position shown in FIG. 7.

The battery 51 (FIG. 2) of the vehicle is connected through a manual switch 52 to operate a signal lamp 53, an ammeter 54, and the igniter 41. The switch 52, signal lamp 53, ammeter 54, and solenoid switch 55 are mounted on the dashboard of an automobile or in a convenient location on a motorcycle or other vehicle. When it is desired to drop a lighted flare from the moving vehicle, the manual switch 52 is first closed, energizing the signal lamp 53 and the igniter 41. The dial of the ammeter 54 is visually checked to be sure that the flow of current is sufficient to heat the igniter 41 to the necessary temperature. The manual switch 55 is then closed for an interval of about 1 second and then released. This causes the solenoid to pull the horizontal bar 31 to the left and then allow the return spring 39 to move it back to the right. This reciprocating stroke of the horizontal bar actuates the feed means comprising the fingers 20, 27 and 28, to lower the flare 17 to the ignition position, and to move it endwise into contact with the

heated igniter 41, and then to release the flare 17 so that it descends by gravity to the highway. The sequence may be repeated by again closing the manual switch 55 and releasing it, so that additional lighted flares are deposited at the desired intervals.

A wind deflector shield 57 is mounted on the automobile in a position just in front of the location of the flare dispenser 10. In a typical example, the shield may be about 8 inches wide and about 10 inches tall, with the lower end having adequate clearance over the highway and the upper end fastened to the vehicle. A preferred location for mounting is within the wheel well just to the rear of the rear tire. As shown in FIG. 1, the dispenser 10 is fixed to the automobile to the rear of the wheel well, so that a flare descending by gravity from the dispenser falls into the space just behind the deflector shield 57. The lighted flare thus falls into a relatively calm air space just behind the wind deflector shield and does not roll about on the highway as much as it otherwise would.

From the foregoing description it will be understood that the device of this invention makes it possible to deposit lighted flares from a moving vehicle and makes unnecessary the present hazardous practice of carrying flares on foot against oncoming traffic, to warn of an accident or an obstruction. The flares may be deposited from the moving vehicle while approaching the danger area. Moreover, the individual flares need not include the conventional striker cap for lighting the flares, and accordingly the cost of the flares is reduced. The device is transferable from one vehicle to another and requires no complicated installation. It may be used on a standard motorcycle. It does not interfere with the existing electrical system on the vehicle.

Having fully described my invention, it is to be understood that I am not to be limited to the details herein set forth but that my invention is of the full scope of the appended claims.

I claim:

1. Apparatus for dispensing lighted flares from a moving vehicle, comprising in combination: a frame having means for storing a stack of horizontal cylindrical flares, means whereby said frame may be secured to a vehicle, feed means mounted on the frame and movable between a first position and a second position, said feed means in first position supporting the entire stack of flares, said feed means in second position supporting the lowermost flare in the stack at a position spaced below the others, an electrical igniter mounted on the frame for igniting one end of the latter said flare, and means for moving said feed means between said first and second positions.

2. The combination set forth in claim 1 in which an electrical solenoid moves the feed means from first to second position, and a return spring moves the feed means from second to first position.

3. The combination set forth in claim 1 together with a wind deflector shield adapted for mounting on the vehicle at a location in advance of the dispensing apparatus so that the lighted flare may drop into a zone of relatively calm air behind said shield.

4. Apparatus for dispensing lighted flares from a moving vehicle, comprising in combination: a frame having laterally spaced guide plates for storing a stack of horizontal cylindrical flares between them, means whereby said frame may be secured to a vehicle, feed means including laterally spaced

finger supports each pivotally mounted on the frame for turning movement about a vertical axis, each finger support having a series of three vertically spaced radially extending fingers, the fingers being movable into the space between the guide plates upon turning movement of the finger supports, means for simultaneously turning said finger supports between a first position and a second position, in the first position the middle finger on each finger support projecting into the space between said guide plates for supporting the entire stack of flares, and the other fingers on each support lying in a retracted position with respect to said space, in said second position said middle fingers lying in a retracted position with respect to said space and the top and bottom fingers projecting into said space, the bottom fingers in each series projecting into said space to support one of said flares in a lower position spaced below the stack, and the top fingers in each series projecting into the space to support the remainder of the stack, and an electric igniter mounted on the frame for igniting one end of the latter said flare.

5. Apparatus for dispensing lighted flares from a moving vehicle, comprising in combination: a frame having laterally spaced guides for storing a stack of horizontal cylindrical flares, means whereby said frame may be secured to a vehicle, feed means mounted on the frame and movable from a first position engaging the lowermost flare in the stack to support the stack of flares to a second position permitting the lowermost flare only to descend by gravity to a position spaced below the stack, an electrical igniter mounted on the frame, pusher means for moving a flare in said spaced lower position endwise against the igniter to ignite the flare, said feed means acting to release the ignited flare for gravity descent out of the frame upon return of said feed means to said first position, and means for moving said feed means between first and second positions.

6. The combination set forth in claim 5 in which common means are provided on the frame to actuate both said feed means and said pusher means.

7. The combination set forth in claim 6 in which said common means includes an electrical solenoid.

8. Apparatus for dispensing lighted flares from a moving vehicle, comprising in combination: a frame having laterally spaced guide plates for storing a plurality of horizontal cylindrical flares between them in stacked relationship, means whereby said frame may be secured to a vehicle, feed means including a pair of finger supports turnably mounted on the frame and each having fingers adapted to project between the plates, said fingers being movable from a first position engageable with the lowermost flare in the stack to support the stack of flares to a second position in which the lowermost flare only is permitted to descend by gravity to a location spaced below the stack, an electrical igniter mounted on the frame for igniting one end of the latter said flare, the finger elements acting to release the ignited flare for gravity descent out of the frame upon return of said finger elements to said first position, an electrical solenoid mounted on the frame, and means whereby said solenoid may actuate said feed means.

9. The combination set forth in claim 8 including pusher means for moving a flare in said lower location endwise against said electrical igniter, and means whereby said electrical solenoid may actuate said pusher means.

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