United States Patent

Rosenstein

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[54] VEHICLE THEFT ARRESTER

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[51] **Int. Cl.** **B60m 25/00**

[58] **Field of Search** 180/114, 103; 116/32, 33, 34

[56] **References Cited**

UNITED STATES PATENTS

1,483,222	2/1924	Galloway	116/33
1,401,839	12/1921	Ward	116/33
1,326,803	12/1919	Tapley	116/33

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[57] **ABSTRACT**

A sensing device detects initial movement of the vehicle and actuates a trigger mechanism of a device which is aimed to shoot a projectile to deflate and destroy the tire.

10 Claims, 2 Drawing Figures

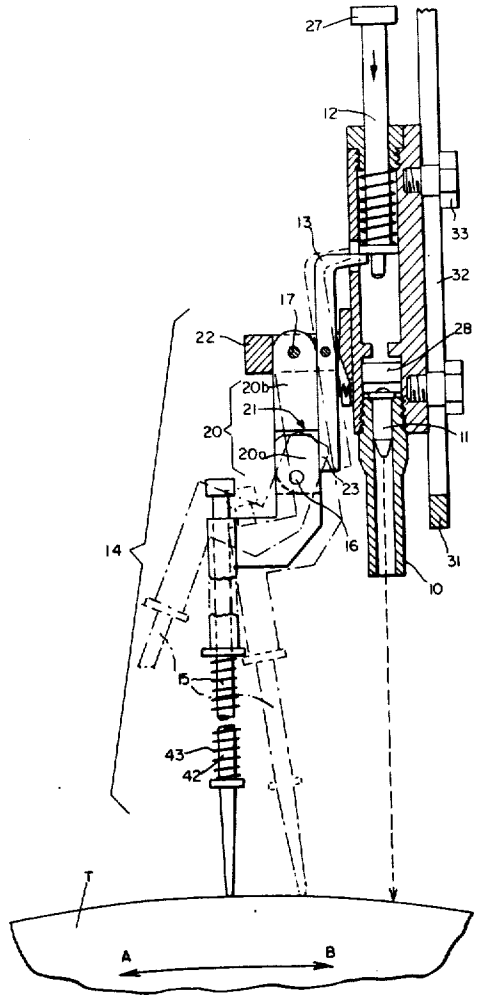


Fig. 1

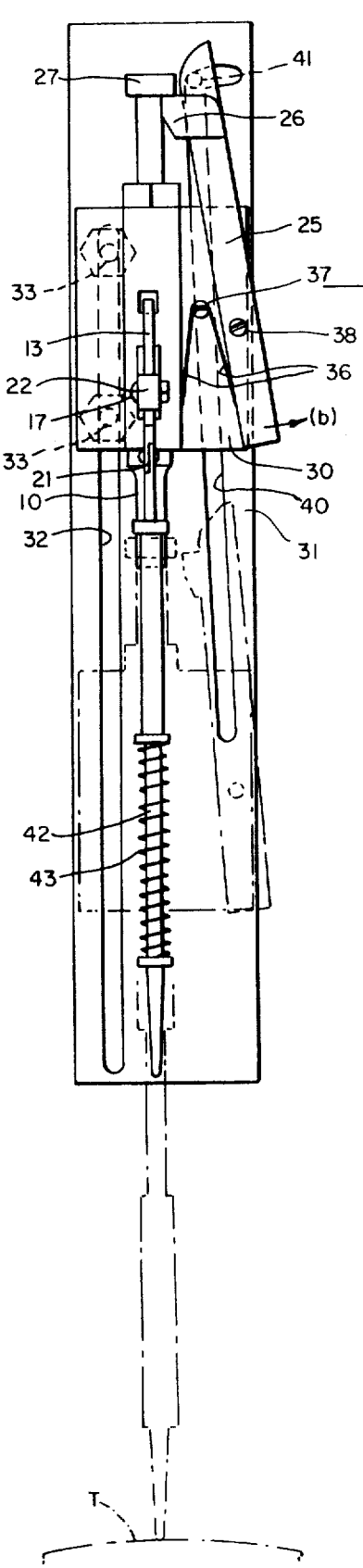
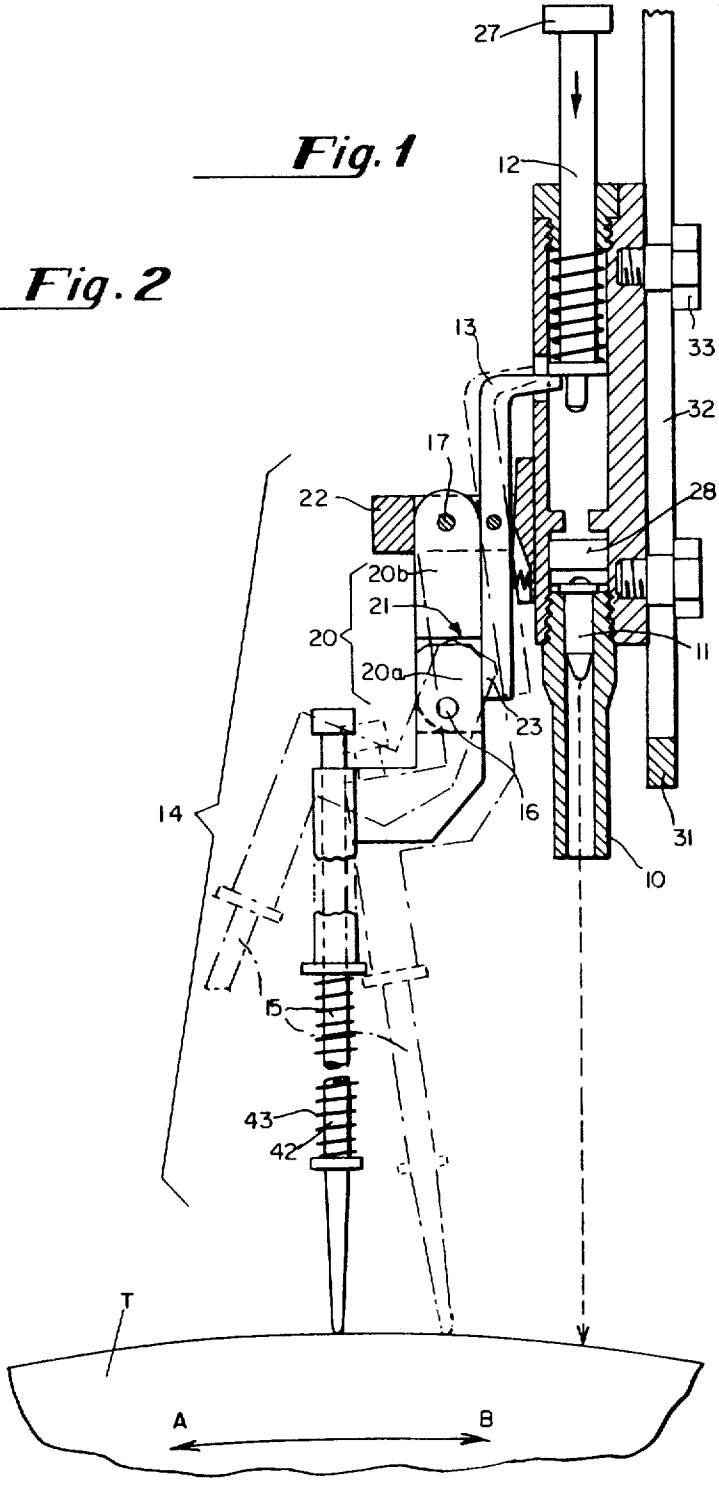


Fig. 2



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VEHICLE THEFT ARRESTER

This invention relates to an apparatus for arresting the theft of a vehicle such as an automobile, truck, airplane or the like. Its purpose is to reduce sharply the annual theft losses, particularly in the field of motor vehicles, and its object is to provide a device that is simple and safe for the vehicle owner but effectively reduces or eliminates theft.

Further, as will be apparent from the description which follows, it is an object of this invention to provide a vehicle which is monitored in such a way that the owner of the vehicle can use it freely and without undue inconvenience, but the prospective thief not only faces an obstacle or a series of obstacles to the attempted theft but is also faced with a number of uncertainties relating to the location of the monitoring device or devices on the vehicle. Further, the thief may face a variety of other uncertainties such as the number of devices in use and their relationship to one another, and he also subjects himself to prompt arrest if he should err in his assumptions.

In accordance with this invention, the prospective thief is confronted not only with the mechanical nature of the devices involved but also with a number of psychological aspects involving uncertainties and dangers. In all of these connections, it is a primary object of this invention to deter prospective car thieves from even attempting the theft at all.

It is another object of this invention to provide a device of the character indicated which can perform efficiently in a simple form or which can be operated in conjunction with numerous automatic controls of a nature and type that naturally flow from the basis of this invention.

DISCUSSION OF THE PRIOR ART

It is known to provide a device including an explosive cartridge, used as an audible alarm only, which is actuated by a mechanical device and senses the movement of a rotating portion of the vehicle. For example, as described in the patent to Tapley U.S. Pat. No. 1,326,803, a sensing mechanism of that type is provided, wherein rotational movement of the steering wheel shaft triggers the firing pin and signals the alarm.

In the patent to Ward U.S. Pat. No. 1,401,839, granted Dec. 27, 1921, centrifugal force caused by rotation of a part on the car causes a plunger to puncture the tire. However, this is not accompanied by the firing of a projectile or bullet or with the attendant loud report that is associated with such firing.

It is also known in the prior art to provide an automatic anti-theft device in which rotational movement of the wheel activates a valve stem engaging mechanism to deflate the tire. However, these references such as the patents to Finn U.S. Pat. No. 1,335,827 and to Rickon U.S. Pat. No. 1,329,210 do not suggest the idea of firing a bullet into the tire to cause its immediate deflation together with an accompanying loud report, nor do they suggest other instant means for deflating the tire such as instant and total destruction of the valve stem, for example.

Accordingly, it is a general object of this invention to provide an effective and efficient means which is sensitive to the initial rotational movement of the wheels of the vehicle to cause a loud report and to fire a bullet or other projectile into at least one tire of the vehicle, causing its immediate deflation and destruction substantially simultaneously with the sounding of a loud report.

Other objects and advantages of this invention, including the simplicity and economy of the same, and the ease with which it may be adapted to a wide variety of applications specifically within and upon a motor vehicle, will become further apparent hereinafter and in the drawings.

DRAWINGS

FIG. 1 is a view in side elevation showing one specific construction embodying features of this invention, with certain parts broken away and shown in section in order more clearly to reveal important details.

FIG. 2 is an end view of the apparatus as shown in FIG. 1.

Referring now to the specific form of the invention shown in the drawings, the letter T designates a tire of an airplane, automobile, truck or the like and the number **10** designates a gun barrel mounted on the vehicle frame and having a bullet **11**. The number **12** designates a cocked, spring-urged hammer which detonates the bullet, and the number **13** designates the trigger which releases the hammer. A pivoted sensing mechanism **14** is arranged to contact the tire T and senses its rotation in either direction as indicated by the arrows A and B. The dot-dash lines show the movement of the detecting finger **15**, together with two pivots **16, 17** which cause the trigger **13** to be moved to its dotted line position in a manner to be described in detail hereinafter, thus releasing the hammer **12** regardless which direction the tire is rotating.

It will be seen that the arm **20** is broken at **21** whereby movement of the finger **15** in the direction (B) as viewed in FIG. **1** causes movement of the arm **20** as a unit about the pivot **17** to trip the trigger **13**. However, when the finger **15** is moved in the direction (A) as viewed in FIG. **1**, the lower portion **20***a* swings about the pivot **16**, the upper portion **20***b* being restained against movement because of the restricting effect of the block **22**. Thus, the shoulder **23** protrudes and contacts the trigger **13**, causing it to move in the same manner as previously described, to release the firing pin **12**, whereupon the energy stored in the firing pin spring drives it forcefully into piston **28** which strikes the bullet causing detonation.

Referring particularly to FIG. **2**, a detent device **25** is provided for deactivating the entire anti-theft device when the motor vehicle is in authorized use. The device **25** has a lug **26** which engages the flange **27** at the top of the firing pin, to prevent its release even in the event the trigger **13** is actuated.

Means are provided for shifting the finger and its associated mechanism either into an operative position to sense the rotation of movement of the tire, or in an inoperative position spaced away from the tire, subject to the will of the owner or authorized operator. For this purpose the entire mechanism is mounted upon a platform **30** which is movable up and down in a supporting angle iron **31** provided with a longitudinal slot **32** through which bolts **33, 33** extend. In this manner, the entire mechanism, mounted upon the platform **30**, can shift up and down along the slot **32**, from the inoperative position shown in solid lines in FIG. **2**, to the operative, motion-sensing position shown in dot-dash lines in FIG. **2**. The safety device **25** is actuated toward its safety position by means of a wire spring **36** which extends around a stationary rod **37**. This urges the lower portion of the safety catch **25**, below the pivot **38**, in a counter-clockwise direction as indicated by the arrow (*b*) in FIG. **2**.

An angularly arranged slot **40** is provided in the supporting plate, through which a pin **41** at the upper portion of detent device **25** extends. Thus, when the plate **30** is lowered with respect to the base plate, the pin **41** is gradually displaced toward the right (in a counter-clockwise direction), thus withdrawing the safety catch **23** from the trigger head **27**. The feeler rod **42**, which is movable up and down but spring-urged by the spring **43**, comes to rest upon the top of the tire as indicated by the lines in FIGS. **1** and **2**, with the device ready to fire. Specifically, in the event of rotation of the tire in either direction, the pin **15** is displaced somewhat, thus moving the trigger mechanism in such a way as to uncock the trigger **13**, releasing the spring-urged percussion pin **12** so that it sharply contacts the bullet **11**, firing it through the muzzle **10** into the tire.

It will be apparent that the firing of the bullet is accompanied by a loud report and that simultaneously the tire is not only deflated but destroyed so that even major efforts and emergency repairs are insufficient to allow the thieves to reinflate the tire.

Once the owner of the vehicle has determined to replace the tire and to set the surveillance mechanism into operation again, he simply unscrews the muzzle **10**, inserts a live bullet and screws the muzzle **10** back into place. As stated, whenever

the vehicle is in authorized use, the entire surveillance mechanism is simply maintained in its upper, inoperative position at any time the owner so desires.

Of course it will be apparent that the embodiment of the invention selected for illustration in the drawings may be modified in many ways. For example, the entire mechanical feeler system may be replaced by an electronic beam which senses the movement of the tire. Such electronic beam can, for example, be conventionally connected to the speedometer to actuate the trigger by means of a solenoid when it is not set on "safe". This actuation may take place at any predetermined speed, such as 5 miles per hour, for example.

It will also be appreciated that the same activating mechanism as shown in the drawings may be connected to an alarm system, in a manner to set off an alarm concurrently with the firing of the bullet.

It will be appreciated that one or more such devices may be used on one wheel or more than one, depending upon the desires of the owner. This enables the owner to camouflage or even periodically change the location of the operative unit or units to the extent that he desires.

One particularly advantageous location for devices of this type is within the trunk of a conventional automobile, so that the surveillance device operates in conjunction with one or both of the rear wheels of the automobile. Mounted at the side of the trunk space, the device is not only protected by the locked door of the trunk, but is easily accessible to the owner and easily adjusted between its operative and its inoperative position.

It will be appreciated from the foregoing description that the apparatus according to this invention effectively prevents vehicle theft by simultaneously emitting a loud report while so drastically puncturing the tire that the release of air from the tire is substantially instantaneous and the tire is destroyed so severely as to be effectively beyond repair.

It will be apparent from the mechanism itself and from the foregoing description that the device according to this invention can perform efficiently in the form in which it was described or that it can be improved and sophisticated by adding numerous automatic controls of a nature and type that naturally flow from the invention. For example, one or more units may be placed under the hood in front of the car directly above one or each of the front tires, as well as inside the rear trunk directly above one or each of the rear tires. In this event, each of the units contains a loaded cassette with a low-caliber cartridge or dart piercing device combined with an alarm system. The loaded unit, which may conveniently be designed as a cassette, is protected by a safety device, when not in use so that the cartridge cannot be fired or triggered by accident when the vehicle is used by a legitimate or authorized operator.

Further, when the "safety" is released and set for protection against vehicle theft, then the one, two, three or four cassettes are re-set into the firing position and the trigger is activated by the slightest rotation of the wheels. This sends one, two three or four bullets or darts into the tire or tires designated for that purpose. If only one of the cassettes is set into its firing position, that fact will be known only to the owner or authorized operator of the vehicle, and this presents an element of uncertainty as to which the thief must guess. As will become apparent, when one or more shells or darts pierce the tire or tires of the vehicle and the alarm system in the vehicle is activated, the theft of the vehicle will be as effectively arrested as if a policeman or sheriff had appeared upon the scene.

It will be apparent that, instead of the physical feeling of the tire as by the extensible finger **15** shown in the drawings, this may be also electronically activated such as by a light beam which is broken as soon as the vehicle starts in motion in either direction, or a speedometer motivated action above a designated speed such as 5 miles per hour, for example, or any other known automatic means which becomes activated as soon as the vehicle starts in motion. Such devices can, of course, be connected in such a manner as to apply and release the safety device as well.

It is an important part of this invention that the device is so positioned as to cause damage to the tire only, avoiding injury even to a prospective thief. It is not the purpose of this invention to fire a projectile in such a manner as to cause physical injury or death.

It will further be appreciated that known combination locks may be used in a conventional manner to engage or disengage the vehicle theft arrester according to this invention.

The use of flashing signals, red light or buzzer to warn the legitimate vehicle user that the automatic theft arrester is in a firing position, is provided optionally in accordance with this invention. Such signalling device should, of course, be of a nature and in a place known only to the owner or authorized operator of the vehicle.

As stated, it is possible to use a form of dart or other piercing device instead of a rifle or pistol cartridge. Where heavy duty tires are used, a heavier caliber shell can be used. Special bullets, particularly shotgun shells or explosive bullets designed to flatten out or otherwise to open a large diameter hole in the tire, can be used.

It is of course comprehended within the scope of this invention to apply the theft arresting device to aircraft, trucks or any other sort of vehicle, and it is contemplated that this invention is particularly effective as a means for apprehending highjackers of aircraft.

It will of course be appreciated that the entire device according to this invention can be completely enclosed in a cassette, and that its size may be reduced to a point where the device can be mounted readily beneath the aircraft landing gear, a vehicle fender or the like so that for all practical purposes it appears to be a portion of the aircraft or fender contour.

Such hole or bore through which the shell or dart was fired should, of course, be as inconspicuous as possible. There may also be a number of "innocent" similar holes exposed from under the fender area for camouflage purposes. It will of course be appreciated that the cassette and warning signals and existing gun safety devices will be used to assure physical protection to the owner and to the thief as well, without loss of effectiveness.

Although certain specific forms of the invention have been selected for illustration in the drawings and have been described in the accompanying specification, it will be appreciated that various other modifications may be made without departing from the scope of the invention. For example, equivalent elements may be substituted for those specifically referred to herein, certain parts may be used independently of other parts, and parts can be reversed, all without departing from the spirit and scope of the invention as defined in the appended claims.

The following is claimed:

1. A vehicle theft arrester for a vehicle having wheels which rotate in a manner to transport the vehicle from place to place, comprising:

a. a projectile mounted in the vehicle and aimed at a wheel of said vehicle,

b. firing means mounted on said vehicle for firing said projectile at said wheel,

c. releasable restraining means normally restraining said firing means, and

d. sensing means arranged to sense movement of said vehicle and connected to release said restraining means in response to such vehicle movement.

2. The arrester defined in claim **1** wherein said firing means includes an explosive device which fires with a loud report.

3. The arrester defined in claim **1** wherein said firing means is a gun and said projectile is a bullet.

4. The arrester defined in claim **1** wherein said sensing means includes a feeler which contacts a rotatable portion of said wheel.

5. The arrester defined in claim **1** wherein means are provided for inactivating said sensing means when the vehicle is in authorized use.

6. The arrester defined in claim 1 wherein said wheels have pneumatic tires and wherein said projectile is a bullet of a size and type to substantially instantaneously deflate and destroy the tire, and wherein said bullet has a powder charge that detonates with a loud report.

7. The arrester defined in claim 1 wherein a plurality of such arresters are mounted on a common vehicle.

8. The arrester defined in claim 7, wherein at least one of said arresters is in an operative condition and another of said arresters is in an inoperative condition.

9. The arrester defined in claim 1 wherein the arrester is mounted in the trunk of an automobile.

10. The arrester defined in claim 1, wherein the arrester is mounted in the motor compartment of the automobile.

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