Nov. 15, 1938. K. L. CARTER 2,136,673

ANTITHEFT DEVICE

Filed Feb. 15, 1937

Fig. 1.

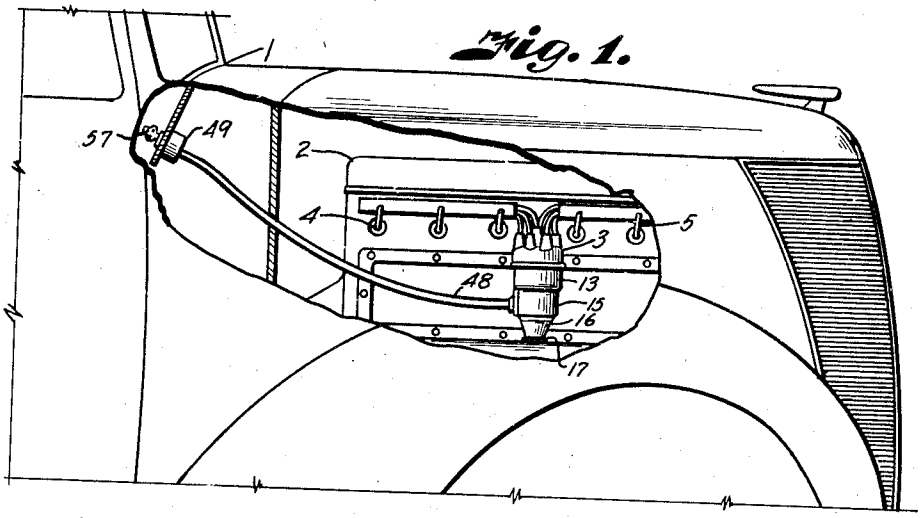


Fig. 2.

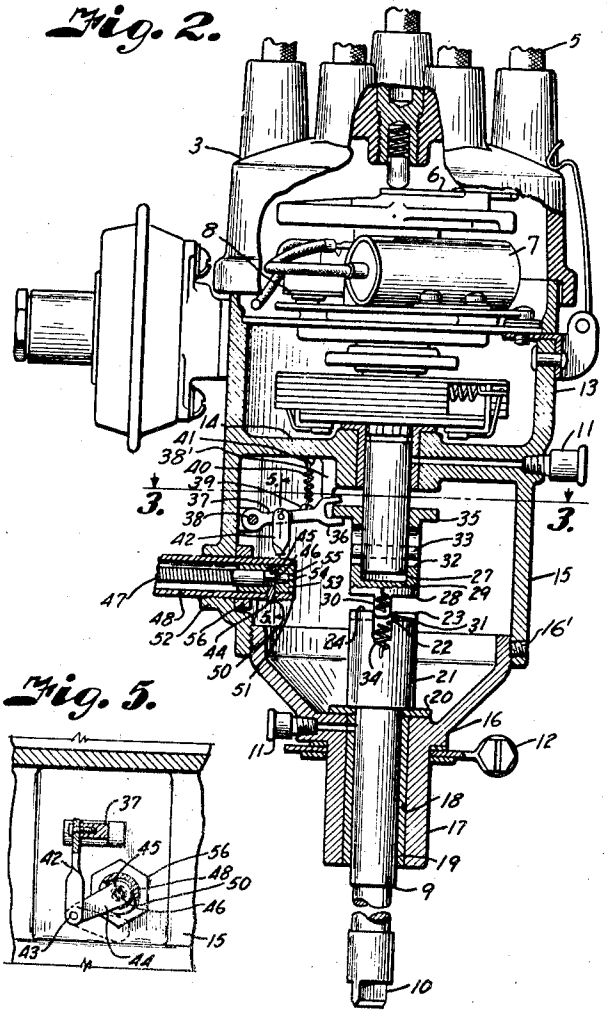


Fig. 3.

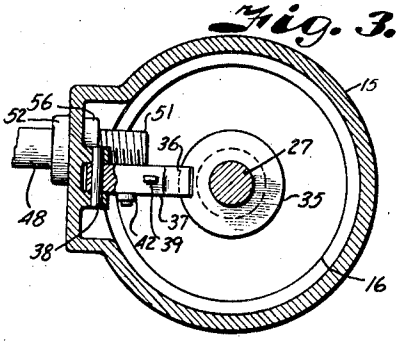


Fig. 4.

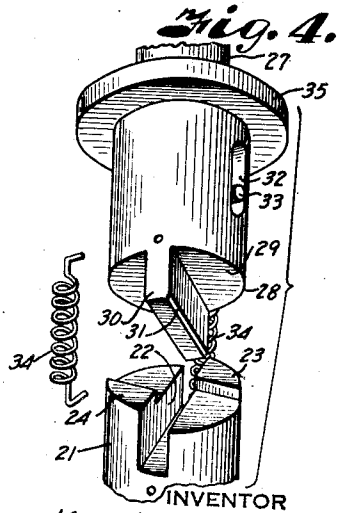


Fig. 5.

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ANTITHEFT DEVICE

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12 Claims. (Cl. 200—44)

This invention relates to anti-theft devices and more particularly to a device of that character formed as a part of a timing device for the spark plugs of internal combustion engines.

Devices have heretofore been devised for the purpose of preventing theft of motor cars and the like, certain of which devices employ locks for ignition switches, transmissions, and the like. Such devices, it has been found, are not completely satisfactory for the reason that "jumpers" may be applied to ignition locks for completing ignition circuits to permit operation of the motor, and transmission locks while very expensive, may be broken to permit actuation of the transmission mechanism of motor vehicles and the like.

It is the principal object of the present invention to provide an anti-theft device for application to a motor timing device with which it is impossible to satisfactorily actuate a motor to which the device is attached regardless of the condition of repair of the locking device proper.

Other important objects of the present invention are to provide for separating the timing device drive mechanism and provide a lag between the separable parts thereof to break continuity of contact in the timing mechanism for disrupting normal operation of the motor; to provide means tending to return the separable parts of the drive mechanism to operative condition; to provide means tending to normally separate the separable parts of the drive shaft; and to provide for automatically actuating the separating mechanism when the locking device is broken.

In accomplishing these and other objects of the present invention, I have provided improved details of structure, the preferred form of which is illustrated in the accompanying drawing, wherein:

Fig. 1 is an elevational view of the front portion of a motor vehicle, part of the hood being broken away to illustrate application of a timing device, such as a distributor, provided with my improved anti-theft device to the motor head of the vehicle.

Fig. 2 is an elevational cross-sectional view of the distributor provided with an anti-theft device embodying the features of the present invention, the casing of the distributor being broken away to illustrate the various parts of the device.

Fig. 3 is a horizontal cross-section on the line 3—3, Fig. 1.

Fig. 4 is a fragmentary perspective view of the timing mechanism drive shaft, the shaft being shown in disassembled spaced relation.

Fig. 5 is a vertical cross-section on the line 5—5, Fig. 2, illustrating the lever mechanism for selectively separating and joining the separable parts of the drive shaft.

Referring more in detail to the drawing:

1 designates a conventional motor vehicle having an internal combustion motor 2 provided with a timing device, such as the distributor 3, for supplying the spark plugs 4 of the motor with electricity through the wires 5 to ignite charges of fuel in the motor cylinders in the usual manner by means of a rotor 6 provided with a brush synchronously engageable with contact points for the wires 5 leading to the spark plugs 4. The rotor 6 is provided with electrical energy by the condenser 7 fed from a source of supply not shown. The rotor 6 cooperates with a governor 8 motivated by the rotatable drive shaft 9 through its connection 10 with a cam shaft drive not shown. Suitable lubricating connections 11 are also provided together with a conventional locking device 12.

The distributor is provided with a housing 13 of suitable material having a partition 14 forming, with the housing 13, a compartment for the distributor mechanism.

Extending below the housing 13 and preferably formed integrally therewith is a substantially cylindrical skirt portion 15 provided at its lower end with internal threads for receiving the externally threaded end of a substantially frustoconically shaped removable drive shaft housing 16 to form, with the skirt 15, a housing for the anti-theft mechanism embodying the features of my invention as now to be described, a set screw 16' also being provided in the skirt 15 for engagement with the housing 16 to maintain fixed relation therebetween.

The drive shaft housing 16 is provided with a downwardly extending neck portion 17 having a central bore 18 and a bearing portion 19 for mounting the shaft 9. A thrust washer 20 is provided for seating on the neck portion interiorly of the housing and surrounding the bore to seat the lower peripheral shoulder of an enlarged preferably cylindrical end member 21 of the shaft. The upper end of the member 21 of the shaft is grooved, as at 22, diametrically thereof, and is provided with lugs 23 and 24 which are disposed preferably on opposite sides and ends of the groove 22.

Provided in concentric alignment with the shaft 9 is the upper spaced drive shaft member 27 which is provided with a sleeve 28 closed at its lower end to provide a bottom 29 and pro-

vided with a downwardly extending diametrically positioned tongue 30 having beveled lower edges 31. The tongue 30 is of a width adapting it for sliding fit in the groove 22 and the bevels 31 are for the purpose of facilitating seating of the tongue in the groove when the sleeve is to be returned to coupled relation with the member 21 after being raised therefrom and positioned diagonally of the groove between the lugs 23 and 24 on the end of the shaft. The lugs are spaced to permit substantial rotative movement of the sleeve 28 but to limit such rotative movement to less than 180°. The cylindrical sides of the sleeve are provided with diametrically opposed aligned slots 32 for receiving the opposite ends of a key 33 extending through the portion 27 of the shaft for slidably keying the shaft to the sleeve. The sleeve and member 21 are provided with a pair of resilient balancing members such as springs 34 suitably engaged therewith at points preferably aligned with the tongue and groove in such a manner that when the sleeve is raised and twisted to separate the shaft portions, the springs tend to both align the tongue with the groove and normally retain the tongue and groove in interengaged relation.

The sleeve is provided with means adapted for engagement in such a manner that the sleeve may be raised and lowered to separate or couple the shaft portions. By way of example, I have illustrated for this purpose an annular collar 35 at the open upper end of the sleeve which is engaged by a yoke 36 on a lever arm 37 having its opposite end suitably pivoted, as at 38, on the inner face of the skirt 15 of the casing. A stop member 38' is provided on the portion 14 with which the yoke is engageable for limiting upward movement thereof to prevent bind between the yoke and collar 35. The arm 37 is provided with an attaching member 39 for connecting one end of a coil spring 40 thereto which has its opposite end fixed to an attaching member 41 suitably mounted on the housing dividing partition 14. The spring 40 is of a design adapting it to predominate over the springs 34 on the shaft and sleeve in order that the sleeve 28 tends to be maintained out of engagement with the shaft 9, for a purpose later described. The arm 38 is also provided with a link 42 operatively connected, as at 43, with an arm 44 having a squared aperture 45 in its end opposite that engaging with the link 42 for engagement over the squared end 46 of a flexible shaft 47 leading through a suitable casing 48 to a lock mechanism 49. The casing 48 is provided with a slot 50 adjacent the lever mechanism for permitting pivotal movement of the arm 44. The end 51 of the casing 48 is suitably mounted in a boss 52 provided in the skirt portion 15 preferably directly below the pivoted arm 37 and is provided with a threaded plug 53 closing the end of the casing. The plug 53 is provided with a bore 54 centrally thereof for receiving the reduced end 55 of the flexible shaft 47. The lock member 56 is also provided for the end 51 of the casing 48 for maintaining the casing in fixed position relative to the skirt portion 15.

The lock mechanism 49 shown is of a type suitable for receiving a key 57 adapted to turn the flexible shaft to actuate the drive member separating mechanism; however, combination or other types of locks may be used.

The operation of a device constructed as described is as follows:

Assuming the motor to be in operative condition, the key 57 is ordinarily in its extreme right hand position. When the key is turned to the left in an anti-clockwise direction, the squared end of the flexible shaft is moved in an anti-clockwise direction to raise the arm 44, link 42 and arm 37 to consequently raise the sleeve through the yoke portion of the arm, thereby disconnecting the tongue of the sleeve from the groove of the drive shaft, which position of the sleeve is maintained until the key is again actuated.

It should be noted that the distance which the sleeve is raised is greater than the depth of the groove but less than the height of the lugs on the shaft. For this reason, when the motor is turned over in the usual manner, the shaft 9 will be rotated and the sleeve will also be rotated normally by its spring connection with the shaft and possibly by engagement of the lugs therewith when the shaft is turned rapidly but in lagging relation to the shaft to break the continuity of contact of the rotor brush with the wires 5 whereby operation of the motor becomes impracticable through improper timing of ignition of charges of fuel in the motor cylinders. It is thus apparent that the motor, due to the variation in timing, will either become completely inoperative or defectively inoperative to discourage attempts at unlawful use of the vehicle.

A reverse movement of the key in the lock mechanism, i. e., in a clockwise direction, turns the flexible shaft, lowers the sleeve through the yoke and lever arm, at which time the springs 34 come into play and cooperate with the yoked arm in returning the tongue of the sleeve to aligned and seating engagement with the groove of the shaft for placing the motor in operable condition by re-synchronizing the timing of fuel ignition.

Should an attempt be made to cut through the casing 48 when the lock mechanism is in locked condition for placing the motor in operable condition, the casing under ordinary circumstances will be broken. Tampering with the casing results in withdrawal of the squared end of the flexible shaft from the squared aperture of the arm 44 in such a manner that operative connection between the shaft and sleeve raising lever is broken and, since the spring 40 predominates over the springs 34, the sleeve and tongue will remain in raised condition to continue to separate the portions of the shaft for creating the lag in the timing mechanism, thereby rendering the motor inoperative and defeating the attempt at theft of the motor vehicle.

The principal advantages in an anti-theft device embodying the features of my invention over others heretofore available are that it makes theft of the motor vehicle to which it is applied impossible regardless of whether "jumpers" are employed or the lock mechanism is broken, and that even though the motor is temporary rendered inoperative when in locked condition, means are provided for automatically correcting the lag in the timing mechanism when the device is unlocked for rendering the vehicle operatable by authorized persons.

What I claim and desire to secure by Letters Patent is:

1. In a device of the character described, a timing mechanism, means for actuating said timing mechanism including a rotatable driving member, means for selectively separating portions of said driving member, and cooperative members on said driving member portions engageable with each other for limiting rotation of said driving mem-

ber portions relative to each other when the portions are in separated condition.

2. In a device of the character described, a timing mechanism, means for actuating said timing mechanism including a separable driving member, cooperative alignable means on the separable portions of said driving member for coupling same, means on one of said portions for limiting relative movement between said portions, means for selectively separating said separable portions within said limits, and resilient means on said separable portions of the driving member tending to align and couple said separable portions.

3. In a device of the character described, a timing mechanism, means for actuating said mechanism including a separable driving member, cooperative means on the separable portions of said driving member for coupling same, means on one of said portions for limiting relative movement between said portions, means for selectively separating said separable portions, means on said separable portions of the driving member tending to couple same, and means normally counteracting said coupling means for separating said separable portions.

4. In a device of the character described, a timing mechanism, a separable drive shaft for actuating the timing mechanism, a portion of said drive shaft being provided with a groove and opposed lugs, the other portion of said drive shaft being provided with a tongue selectively engageable in said groove and with said lugs, means for selectively moving said tongue into engagement with said groove and lugs, and means for actuating said shaft.

5. In a device of the character described, a timing mechanism, a separable drive shaft for actuating the timing mechanism, a portion of said drive shaft being provided with a groove and opposed lugs, the other portion of said drive shaft being provided with a tongue selectively engageable in said groove and with said lugs, means for selectively moving said tongue into engagement with said groove and lugs, means for actuating said shaft, and means tending to position said tongue in said groove.

6. In a device of the character described, a timing mechanism, a separable drive shaft for actuating the timing mechanism, a portion of said drive shaft being provided with a groove and opposed lugs, the other portion of said drive shaft being provided with a tongue selectively engageable in said groove and with said lugs, an arm connected with one of said drive shaft portions for selectively moving said tongue into and out of engagement with said groove and lugs, a lock member engaged with said arm for actuating same, a resilient member connected with said drive shaft portions tending to position said tongue in said groove, and a resilient member on the arm normally counteracting said drive shaft resilient member for retaining said tongue in position to be engaged by said lugs when the lock member is disengaged from said arm.

7. In an anti-theft device of the character described, a distributor having a housing, a separable rotatable drive shaft for actuating the distributor, a portion of said drive shaft being provided with a groove and opposed lugs, the other portion of said drive shaft being provided with a sleeve having a tongue selectively engageable in said groove and with said lugs and having a collar, a flexible actuating shaft mounted in said housing and extending exteriorly thereof, a lever mechanism connected with said flexible shaft and engaging with said collar within said housing for selectively raising and lowering said tongue into rotative engagement with said groove and lugs, a locking member connected with said flexible shaft for actuating same, a resilient member connected with said shaft portions tending to position said tongue in said groove, and a resilient member on the lever mechanism and housing normally counteracting said shaft resilient member for retaining said tongue in position to be engaged by said lugs when said lever mechanism becomes disengaged from said actuating shaft.

8. In an anti-theft device of the character described, a distributor having a housing, a separable rotatable drive shaft for actuating the distributor, a portion of said drive shaft being provided with a groove and opposed lugs, the other portion of said drive shaft being provided with a sleeve having a tongue selectively engageable in said groove and with said lugs and having a collar, a flexible actuating shaft mounted in said housing and extending exteriorly thereof, a lever mechanism connected with said flexible shaft and engaging with said collar within said housing for selectively raising and lowering said tongue into rotative engagement with said groove and lugs, a locking member connected with said flexible shaft for actuating same, a resilient member connected with the shaft portions tending to position said tongue in said groove, a resilient member on the lever mechanism and housing normally counteracting said shaft resilient member for retaining said tongue in position to be engaged by said lugs should said lever mechanism become disengaged from said actuating shaft, a housing for said flexible shaft, said housing maintaining the shaft adjacent the lever mechanism, and interengageable members on said lever mechanism and flexible shaft adapted to become disengaged when said shaft housing is broken for releasing the flexible shaft from the lever mechanism to effect separation of said drive shaft portions.

9. In a device of the character described, a timing mechanism, means for actuating said timing mechanism including a rotatable driving member, means connected with one end of the driving member and adapted to rotate the same, means for selectively separating portions of said driving member, cooperative means on said driving member portions engageable with each other when the driving member is rotated and the portions thereof are separated for limiting relative rotation of said driving member portions, and means tending to return the driving member portions to normal position when the driving member is at rest.

10. In a device of the character described, a timing mechanism, means for actuating said timing mechanism including a rotatable driving member, means connected with one end of the driving member and adapted to rotate the same, means for selectively separating portions of said driving member, cooperative means on said driving member portions engageable with each other when the driving member is rotated and the portions thereof are separated for limiting relative rotation of said driving member portions, means tending to return the driving member portions to normal position when the driving member is at rest, and a lock connected with the separating means for locking the driving member portions in separated condition.

11. In a device of the character described, a timing mechanism, means for actuating said timing mechanism including a rotatable driving member, means connected with one end of the driving member and adapted to rotate the same, means for selectively separating portions of said driving member, cooperative means on said driving member portions engageable with each other when the driving member is rotated and the portions thereof are separated for limiting relative rotation of said driving member portions, means tending to return the driving member portions to normal position when the driving member is at rest, a lock connected with the separating means for locking the driving member portions in separated condition, and means on the lock normally cooperative with said separating means and adapted to effect actuation of the separating means when the lock is broken.

12. In a device of the character described, a timing mechanism, means for actuating said timing mechanism including a shaft, means connected with the shaft for selectively connecting and disconnecting the shaft with and from the timing mechanism, and selectively locking in operative and inoperative position one part of said shaft, means on one of said shaft parts engageable with the other of said shaft parts for limiting relative movement between said parts and the timing mechanism, and resilient means connecting the parts of the shaft for normally maintaining said shaft parts in connected alignment.

KENNETH L. CARTER.