June 18, 1940. F. L. VAN DAMME 2,205,074

IGNITION DISTRIBUTOR

Filed Oct. 6, 1938

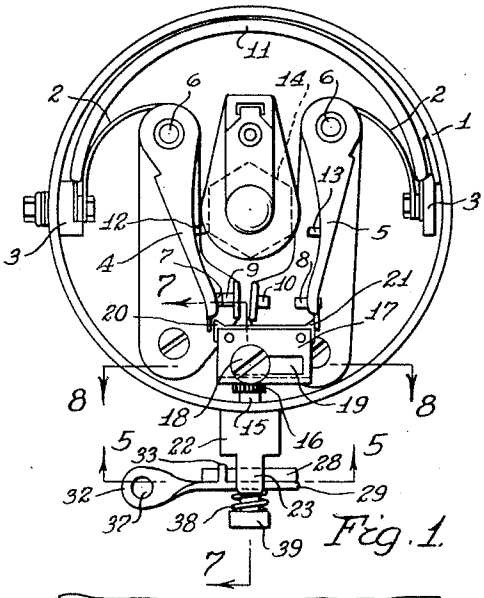

Fig. 1.

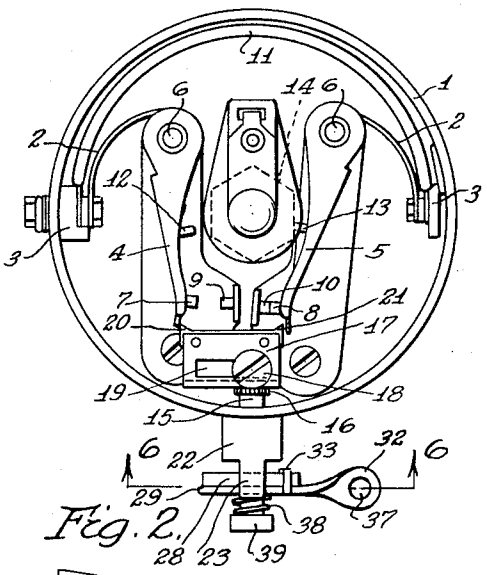

Fig. 2.

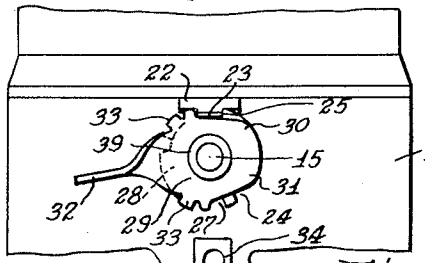

Fig. 3.

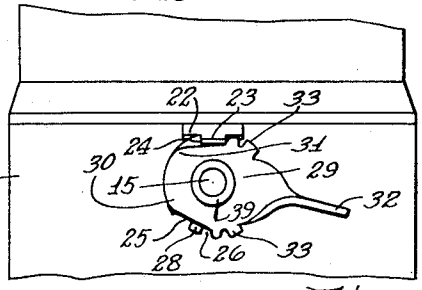

Fig. 4.

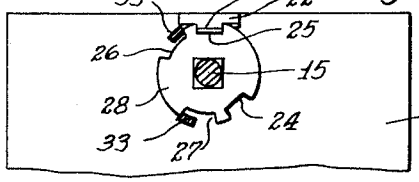

Fig. 5.

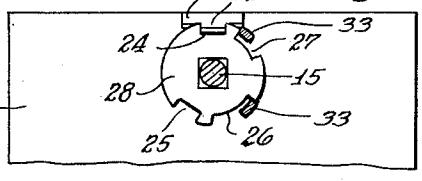

Fig. 6.

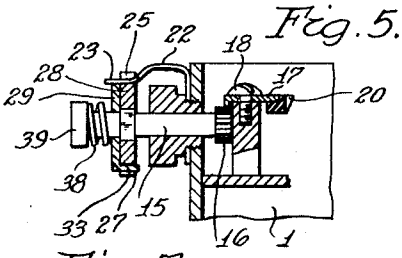

Fig. 7.

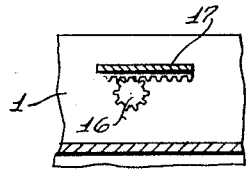

Fig. 8.

INVENTOR.
FRANK L. VAN DAMME
BY
ATTORNEY.

Patented June 18, 1940

2,205,074

UNITED STATES PATENT OFFICE

2,205,074

IGNITION DISTRIBUTOR

Frank L. Van Damme, Grosse Pointe, Mich.

Application October 6, 1938, Serial No. 233,618

12 Claims. (Cl. 200—27)

This invention relates to distributors for internal combustion engines which rely for ignition upon transmission of current through a conventional make and break device to a spark plug, and has for its object to provide a dual system of contactors selectively and alternately operable to insure the transmission of current.

In the make and break devices conventionally used the rapidity of making and breaking is relied upon to lessen arcing, but it does not entirely preclude arcing with the result that the contact points become burnt and dirty thereby gradually reducing the electrical path therethrough and weakening the spark emitted by the spark plugs. The result is difficulty or impossibility of starting the engine, the difficulty being apparently more pronounced in cold weather due to more imperfect vaporization of the fuel and due to slower rotation of the engine by the starter. The object of this invention is to provide an auxiliary set of contact points which are installed in the distributor head and timed in exact accord with the existing points in combination with means operable from without the head for moving either the auxiliary contacts or the existing contacts into operative position. Either but not both sets of contacts will be operative at any one time.

Another object is to provide a selector means rotatable to either of two extreme positions to permit unobstructed operation of the selected set of contacts together with means in conjunction therewith to positively lock the selector means in the chosen position so that it cannot be dislodged by engine vibration or accidental impact.

A further object is to provide an operating handle for the selector device equipped with a cam to unlock the contact actuator, said handle being also the means for rotating said actuator to either extreme position and to permit the actuator to again lock itself in its new position.

A further object is to provide means operative externally of the distributor head for moving one or more sets of contact points into inoperative position as a guard against theft. More particularly, it is an object to provide alternate sets of contacts having a selector operative to extreme positions to render either of said sets operative, the selector having also an intermediate position in which neither set is operative.

Other objects and advantages will become more fully apparent as reference is had to the accompanying drawing wherein my invention is illustrated, and in which:

Fig. 1 is a top plan view of a distributor with the head removed to illustrate my invention, and with one set of contacts in operative position;

Fig. 2 is a view similar to Fig. 2 with the other set of contacts in operative position;

Fig. 3 is an elevation of the selector device in one extreme position;

Fig. 4 is a view similar to Fig. 3 with the selector device in the other extreme position;

Figs. 5 and 6 are sections taken along the lines 5—5 and 6—6 respectively of Figs. 1 and 2, and

Figs. 7 and 8 are sections taken along the lines 7—7 and 8—8 respectively of Fig. 1.

More particularly, 1 indicates a distributor housing in which electric lead lines 2 in the form of metallic springs are each anchored at one end to terminals 3. The other end of each spring 2 is anchored to one of the contact arms 4 or 5 each of which is pivotally mounted on a post 6, also anchored in the housing 1. Each arm 4 and 5 has a contact point 7 and 8, respectively, adapted to contact an electrical terminal point 9 and 10, respectively, anchored in the housing 1. The terminals 9 and 10 are grounded to the housing 1 or connected into the return circuit of a generator or other source of electric current supply. The other terminal 3 is connected to the source of current supply by an electrical conductor 11 leading to the first described terminal 3. Each arm 4 and 5 has a projection 12 and 13, respectively, of non-conductive material for actuating contact with the distributor rotor 14, having the shape of a square, hexagon or the like, depending upon the number of cylinders in the engine.

As the rotor 14 revolves about its center, being driven by the crankshaft or an auxiliary shaft of the motor, each corner thereof swings the arm 4 (Fig. 1) on its post 6 thus moving the point 7 out of contact with the terminal 9. As the rotor continues to revolve the projection 12 rides inwardly on the succeeding side of the rotor, being maintained in following contact therewith by the spring 2. The operation just described is the conventional operation of a conventional distributor. The arm 5 is in totally inoperative position as indicated in Fig. 1.

Extending through the housing 1, at a suitable point, is a shaft 15 which terminates at one end in a pinion 16 concentric therewith and which engages the teeth of a rack member 17 guided for back and forth movement by a screw 18 anchored in the housing 1 and extending upwardly through a slot 19 in the member 17. The member 17 resides between the ends of the arms 4

and 5 outwardly of the posts 6 and has shoulders 20 and 21 for engagement with the arms 4 and 5 respectively. The distance between the shoulders 20 and 21 is substantially greater than the distance between the arms 4 and 5 were the arms both in contact with the rotor 14 and, hence, interposition of the shoulders between the arms forces one or the other of the arms out of possible contact with the rotor. When the rack member 17 is moved to either extreme position, the shoulder moves entirely out of contact with the operative arm, an actual clearance being provided in order to assure that there will be no interference thereof by the member 17.

Outwardly of the housing 1 I provide a fixed spring member 22 immediately above the shaft 15 which terminates in a reduced end 23 constituting a latch member. Fixedly mounted on the shaft 15 near the outer end thereof is a wheel 28 having four notches 24, 25, 26 and 27 in the periphery thereof, the notches 24 and 25 having an arcuate length slightly greater than the width of the end 23 of the spring member 22. Freely mounted on the outer end of the shaft 15 is a cam member 29 having a lobe with two shoulders 30 and 31 and an extension or handle 32. Two lateral projections 33 project from the member 29 for residence in the slots 26 and 27 of the wheel 28, the slots 26 and 27 having substantially greater arcuate length than the width of either projection 33.

In operation, the parts being assumed to be in the positions illustrated in Figs. 1, 3 and 5, rotation of the handle 32 in a clockwise direction rotates the shoulder 30 underneath the spring end 23 which is in engagement with the slot 25 of the member, lifting the end 23 out of the slot. Continued rotation of the handle 32 causes the projections 33 to engage the ends of their slots 26 and 27 thereby rotating the wheel 28 with the handle, the end 23 dropping into the slot 24 when presented thereto, thus again locking the wheel 15. Rotation of the shaft is equivalent to rotation of the pinion 16 by which the rack member 17 is traversed from the position illustrated in Fig. 1 to the position illustrated in Fig. 2, by which the arm 4 is rendered inoperative and the arm 5 is moved into operating position. The showing in Fig. 2 is thus the same as in Fig. 1, except that the arm 5 is in operative position instead of the arm 4.

If the handle 32 is not rotated from one extreme position to the other, but is stopped intermediate the two positions, neither set of contacts will be in properly operative position and the distributor will not function to operate the ignition system of the engine. If the device is thus set, it will be impossible for anyone unacquainted with the presence of this device on the car and with its functioning to start the engine. In order that the device may be actually locked in this "neutral" position, a bracket 34 having a hole 35 therethrough may be secured to the housing 1 and a hole 37 pierced through the handle 32 so that a small padlock can be employed to relatively secure the bracket and handle together.

In order that the extensions 33 will not lose their operative position with respect to the slots 26 and 27, I provide a spring 38 concentric with the shaft 15 which acts against the handle member 29 and which reacts against an enlarged end 36 of the shaft 15.

What is claimed is:

1. An ignition distributor comprising a housing, two sets of breaker points in said housing, means selectively operative from without said housing for rendering either of said sets operative and the other inoperative, positive latch means restraining the first mentioned means against accidental displacement from a selected position, and a movable actuator having means for releasing said latch during initial movement thereof and for actuating said first named means by continued movement after release of said latch.

2. An ignition distributor comprising two sets of breaker points, selective means movable to either of two positions for rendering either of said sets operative and the other inoperative and movable to a third position to render both of said sets inoperative, positive latch means retaining said selective means in a selected position, and a movable actuating element connected to said selective means and having means thereon for releasing said latch.

3. An ignition distributor comprising a housing having two sets of make and break devices housed therein, selective means manually operable externally of said housing and movable to either of two extreme positions for rendering either of said sets operative and the other inoperative, positive means latching said selective means in either of said extreme positions, said selective means being also manually movable to a third position to render both of said sets inoperative, an actuator for moving said selective means, and means on said actuator for the reception of a lock to hold said actuator with the selective means in a neutral position.

4. An ignition distributor comprising a housing having two sets of make and break devices housed therein, selective means manually operable externally of said housing and movable to either of two extreme positions for rendering either of said sets operative and the other inoperative, means latching said selective means in either of said extreme positions, said selective means being also manually movable to a third position to render both of said sets inoperative, and a bracket secured to said housing and with which said selective means is adapted to be locked in said third position.

5. An ignition distributor comprising a housing having a rotor rotated therein and two breaker arms pivotally mounted therein, the outer ends of said arms being substantially spaced from each other, a shuttle device of greater length than the free distance between the ends of said arms interposed therebetween thus preventing at least one of said arms from operating contact with said rotor, said shuttle when moved to either of two extreme positions forcing one of said arms out of operative contact with said rotor and being entirely out of contact with the other of said arms, and manually operable means for moving said shuttle.

6. An ignition distributor comprising a housing having a rotor rotated therein and two breaker arms pivotally mounted therein, the outer ends of said arms being substantially spaced from each other, a rack member of greater length than the free distance between the outer ends of said arms interposed therebetween, a post anchored in said housing extending through a slot in said rack member as a guide for shuttling movements thereof, said rack member having a rack extending in the direction of said slot, and a shaft extending through said housing having a pinion on the end thereof engaging said rack,

said shaft being rotatable from without said housing for rotating said pinion.

7. An ignition distributor comprising a housing having a rotor rotated therein and two breaker arms pivotally mounted therein, the outer ends of said arms being substantially spaced from each other, a rack member of greater length than the free distance between the outer ends of said arms interposed therebetween, a post anchored in said housing extending through a slot in said rack member as a guide for shuttling movements thereof, said rack member having a rack extending in the direction of said slot, a shaft extending through said housing having a pinion on the end thereof engaging said rack, and means comprising a wheel mounted on said shaft outwardly of said housing and a handle for rotating said wheel and said shaft whereby said rack member is shuttled to either of a plurality of selected positions.

8. The combination as set forth in claim 7 together with latch means for securing said rack member against accidental dislocation.

9. The combination as set forth in claim 7 together with latch means secured to the exterior of said housing and operative against said wheel to prevent accidental dislodgment of said rack.

10. An ignition distributor comprising two sets of breaker points, selective means for simultaneously rendering either of said sets operative and the other inoperative, positive latch means securing said selective means against accidental dislocation from either of its extreme positions, and manual means for actuating said selective means to a new position comprising a cam for unlatching said latch means.

11. A distributor comprising dual sets of breaker points, a shaft having means on one end thereof for rendering either of said sets operative and the other inoperative, a latch member near the other end of said shaft, manual means for rotating said shaft to actuate the first named means, and a second latch member engageable with the first named latch member when said first named means is moved to ehtier of two extreme positions whereby said first named means is held against accidental dislodgment, said manual means comprising a handle and a cam for releasing said latch members prior to rotation of said shaft to a new position by said handle.

12. An ignition distributor comprising two breaker arms, a rack member positioned between the ends of said breaker arms holding at least one thereof in inoperative position, a shaft having a pinion thereon engaging the rack of said rack member, and means for shuttling said rack member to either of a plurality of positions comprising a wheel non-rotatably secured to said shaft and having notches in the periphery thereof, and a handle loosely mounted on said shaft adjacent said wheel, said handle having a relatively narrow lateral extension extending into one of said notches whereby rotation of said handle rotates said wheel after traversing a free distance of said extension in its slot, a latch member successively engaging the other of said slots whereby said wheel is latched against accidental angular displacement, said handle having a cam operative during the free travel of said extension in its slot to disengage said latch member from engagement with one of the other of said slots.

FRANK L. VAN DAMME.