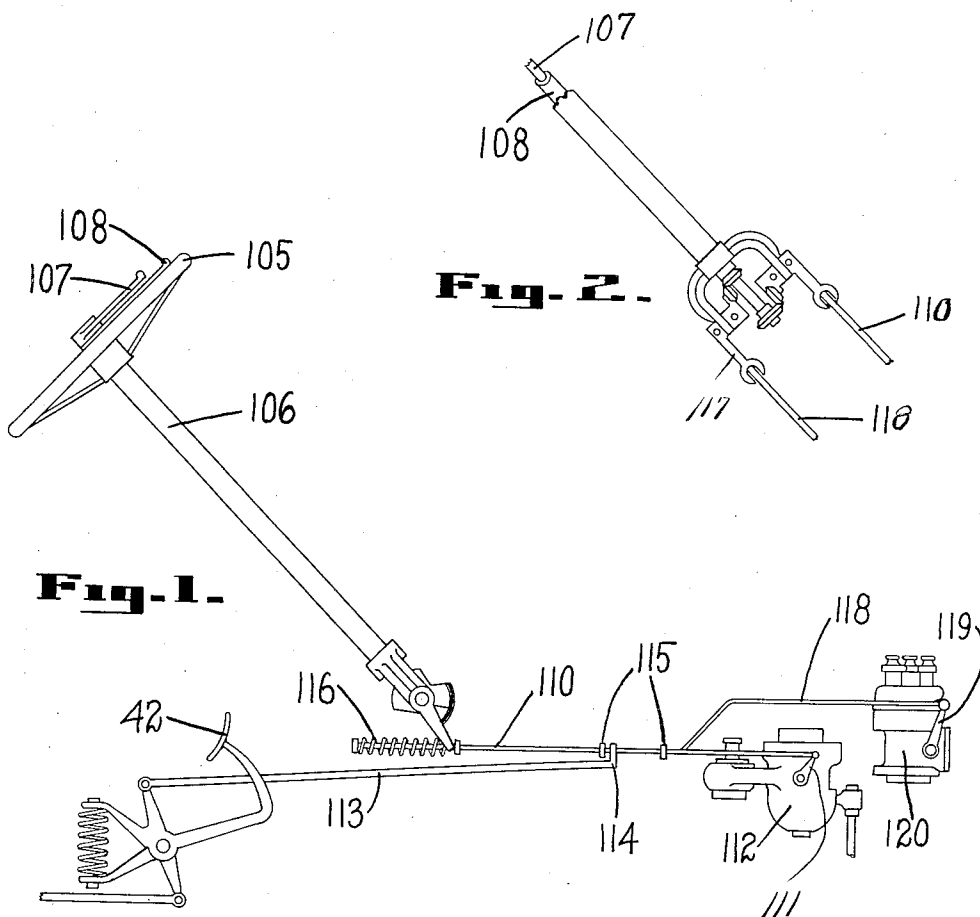


C. F. KETTERING.
ENGINE STARTING DEVICE.
APPLICATION FILED MAY 17, 1917.

1,293,468.

Patented Feb. 4, 1919.



Witnesses
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UNITED STATES PATENT OFFICE.

CHARLES F. KETTERING, OF DAYTON, OHIO, ASSIGNOR TO THE DAYTON ENGINEERING LABORATORIES COMPANY, A CORPORATION OF OHIO.

ENGINE STARTING DEVICE.

1,293,468.

Specification of Letters Patent.

Patented Feb. 4, 1919.

Original application filed April 17, 1911, Serial No. 321,512. Divided and application filed April 19, 1915, Serial No. 22,310. Divided and this application filed May 17, 1917. Serial No. 169,251.

To all whom it may concern:

Be it known that I, CHARLES F. KETTERING, a citizen of the United States of America, residing at Dayton, county of Montgomery, and State of Ohio, have invented certain new and useful Improvements in Engine Starting Devices, of which the following is a full, clear, and exact description.

This invention relates to improvements in starting devices for internal combustion engines, and has particularly for its objects to provide an arrangement, whereby upon the operation of the devices for accomplishing the starting operation, the carbureter lever and the ignition lever will be automatically moved to their proper positions for starting.

This application is a division of my co-pending application, Serial No. 22,310, filed April 19, 1915, which in turn was a division of a previous application which eventuated into Patent 1,171,055, dated February 8, 1916.

In the accompanying drawing, Figures 1 and 2 show the connections, whereby when the foot pedal is operated to start the electric starting motor, the carbureter lever of the gasoline throttle lever, and also the ignition lever, will automatically move to their proper positions for starting.

Since the particular parts of the improvements herein involved relate to the connections between the starting lever and the carbureter and ignition devices, no detail showing is made of the starting devices themselves. It is sufficient to state that the style of starting apparatus to which these inventions are particularly applied, is that shown in my patent above referred to, wherein the foot pedal 42, shown in Fig. 1, is utilized as an operating member for causing the starting operation to take place, that is, to cause the connection between the electric starting motor and the engine, so as to crank the engine.

This starter pedal 42 is also arranged to move the carbureter control lever and the ignition lever into proper positions in case they should have been inadvertently set into improper positions by the operator. This device is shown in Figs. 1 and 2. The steering wheel 105 and steering post 106 carry the usual gasoline throttle lever 107 and spark advance lever 108, 112 representing the carbureter. In the event that the oper-

ator has moved the throttle lever 107 so as to rotate the carbureter lever 111 too far to the left (in Fig. 1), this would possibly give too much gasoline supply to the engine for proper starting conditions. Therefore, a rod 113 is connected to the starter pedal 42 and carries a foot 114 operating between two lugs 115. When the rod 110 is too far to the left, then the pressing of the starter pedal 42 causes the foot 114 to strike the forward lug 115 and thus carry the carbureter lever 111 to the right, against the tension of the spring 116. In this position the adjustments are such that this is the proper and most advantageous position of the carbureter control lever for starting.

Similarly, the spark control lever 108 is connected to an arm 117, which operates a rod 118, similar to the operation of the rod 110. This rod 118 is connected to the timer lever 119 of the ignition or spark control apparatus 120.

These timer devices are well known in the art at the present time, the device herein shown and marked with the reference numeral 120 being a form of timer and distributor which is described in my U. S. Patent 1,040,349, dated October 8, 1912.

This timer lever, however, might be attached to any timing device, it being understood that it is simply a lever which controls the advance and retard of the spark. Thus, for starting, there is a position of the spark control lever which is the preferable one for starting. This is well known in the operation of automobiles as to the starting of the same.

The aforesaid foot 114 of the control rod 113, operates similar lugs upon the rod 118, so that even though the spark lever 108 had been inadvertently advanced too far, the pressing of the starter pedal 42 will operate upon the rod 118 to restore the timer spark lever 119 to the proper position for spark advance for starting.

It is also understood that a variety of starting devices, other than such as is described in my above named Patent, 1,171,055, dated February 8, 1916, may be utilized under the control of an operating lever or member of some sort.

While the form of mechanism herein shown and described constitutes a preferred form of embodiment of the present inven-

tion, it is to be understood that other forms might be adopted, all coming within the scope of the claims which follow.

What I claim is as follows:

5 1. In a starting device for internal-combustion engines, the combination with an operating member for controlling the operation of the starting device; of a fuel supply valve; manual means for controlling the
10 fuel supply valve; means associated with the starter controlling member for controlling the fuel supply valve during the starting operation; and means acting upon the release of the starter controlling member for
15 restoring the fuel supply valve to the position located by the manual controlling means.

2. In a starting device for internal-combustion engines, the combination with an
20 operating member for controlling the operation of the starting device; of an ignition system including a timer having adjustable provisions for advancing and retarding the spark; manual means for controlling the
25 timer; means associated with the starter controlling member for controlling the timer during the starting operation; and means acting upon the release of the starter controlling member for restoring the condition

of the timer to that established by the manual controlling means. 30

3. In a starting device for internal-combustion engines, the combination with a starter operating lever for controlling the operation of the starting device; of a fuel
35 supply valve for the engine provided with a throttle lever; an ignition timer for the engine provided with a lever for controlling the advancing and retarding of the spark; manually operable devices, one for controlling
40 the valve, and the other for controlling the timer, said devices including manually operable levers; links having flexible connections with said levers and pivotal connections with the throttle lever and timer
45 lever, respectively; stop members on said links; and other links connected with the starter operating lever and having sliding connection with the first mentioned links
50 and adapted to engage said stops to effect the movement of said first mentioned links.

In testimony whereof I affix my signature in the presence of two subscribing witnesses.

CHARLES F. KETTERING.

Witnesses:

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