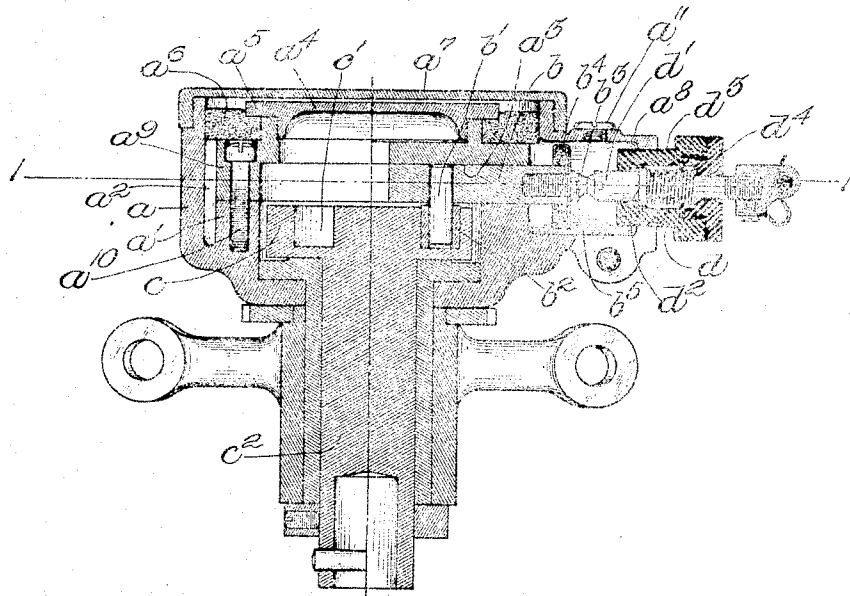
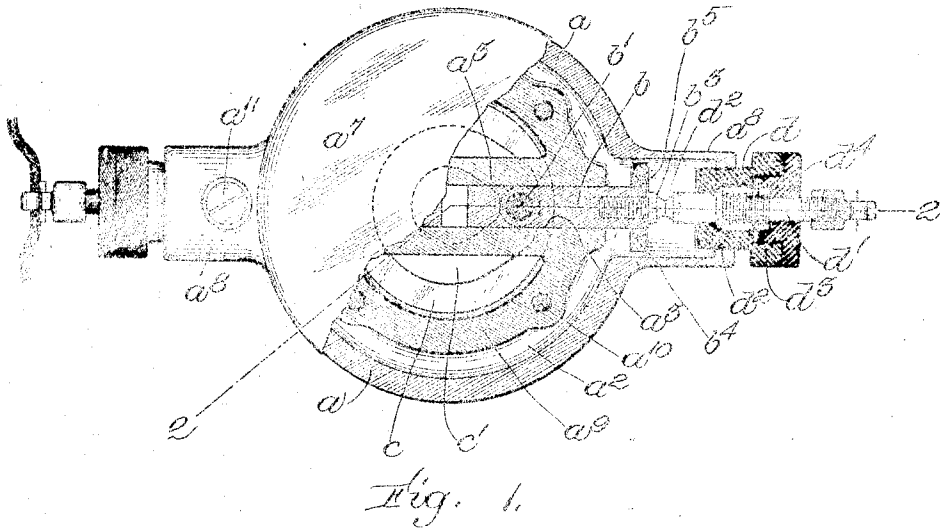


L. B. HOLT & A. B. CLAYTON.
IGNITION TIMER FOR INTERNAL COMBUSTION ENGINES.
APPLICATION FILED JAN. 19, 1910.

984,564.

Patented Feb. 21, 1911.



WITNESSES:

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Fig. 2.

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UNITED STATES PATENT OFFICE.

LAURENCE B. HOLT AND ARTHUR B. CLAYTON, OF LACONIA, NEW HAMPSHIRE.

IGNITION-TIMER FOR INTERNAL-COMBUSTION ENGINES.

984,564.

Specification of Letters Patent.

Patented Feb. 21, 1911.

Application filed January 19, 1910. Serial No. 538,813.

To all whom it may concern:

Be it known that we, LAURENCE B. HOLT and ARTHUR B. CLAYTON, citizens of the United States, and residents of Laconia, in the county of Belknap and State of New Hampshire, have invented new and useful Improvements in Ignition-Timers for Internal-Combustion Engines; of which the following is a specification.

10 This invention relates to an ignition timer for internal combustion engines, and its object is to provide an improved, compact and simple form of timer wherein the movable electrode or contact member will be moved
15 positively in each direction, so that its action will be positive, reliable and not dependent upon the action of a spring as is usual in such devices; and wherein the path of movement between the contact members will be such that they will make and break contact
20 without wiping action, thus greatly reducing the wear upon the contact points, and making it possible to use silver contact points.

Other features will hereinafter be described and particularly pointed out in the claims.

While the invention is applicable to internal combustion engines generally, it is peculiarly adapted to marine gasoline engines, and for the purpose of illustration I will describe a timer adapted for a two cylinder marine engine. It will be understood, however, that the device is not limited to the use in connection with an engine of any
35 particular number of cylinders, nor to use with marine engines, but is capable of application to internal combustion engines generally, and such general use is contemplated in the claims.

40 In the accompanying drawings which illustrate one embodiment of the invention,—Figure 1 is a horizontal sectional view on line 1—1 of Fig. 2 showing the timer partly in plan; and Fig. 2 is a vertical sectional view of the timer on line 2—2 of Fig. 1.

45 The timer illustrated in the drawings comprises a casing composed of an outer wall a of substantially cylindrical form, and an inner wall a' also of substantially cylindrical form, said walls spaced apart leaving the space a^2 therebetween. The inner wall a' , inclosing what may be termed the cam chamber, is provided with radially disposed

guideways a^3 , in which are mounted plungers b extending through and projecting beyond the walls of the cam chamber into the space outside of the cam chamber.

For convenience in manufacturing and assembling the parts, the upper part of the cam chamber comprising the annular wall a^2 , is made in a separate piece fastened to wall a' by screws a^{10} and forming an extension of wall a' . The guideways a^3 extend transversely of, and are integral with, said wall a^2 . Said plungers form reciprocating electrodes or contact members and it will be understood that one such plunger is provided for each cylinder of the engine.

Within the cam chamber is a rotor c in the form of a disk provided on its upper face with a cam path c' . The rotor c is at the top of a shaft c^2 which extends through the casing and may be driven from the engine in the usual manner. Each plunger b is provided at its inner end with a stud b' which projects into the cam path c' . A bushing or sleeve b^2 surrounds and turns upon the stud b' and makes rolling contact with the cam path c' when the rotor is turned to reciprocate the plungers. The outer end of each plunger is provided with a silver contact point b^3 which may be secured to the end of the plunger b by a screw as shown; and surrounding the plungers b outside of the walls of the cam chamber and behind the contact point b^3 , is a collar b^4 , of absorbent material such as felt, held in place by a flanged disk b^5 stamped out of sheet metal and held between the contact point b^3 and the end of the plunger b . The collar b^4 is adapted to arrest any oil or grease which may leak through the plunger guideways a^3 , and prevent it from reaching the contact point b^3 .

95 The cam chamber is wholly closed by a cap a^4 screwed to the upper walls of the cam chamber and having a peripheral flange a^5 which compresses between itself and the edge of the wall a^2 , a ring or washer a^6 of absorbent material, for arresting and holding any oil or grease which might leak through the joint between the cap a^4 and the cam chamber. This washer a^6 extends to the outer wall a of the casing, thus covering the entrance to space a^2 and still further insuring the prevention of admission of oil to the contact points. It will thus be seen that the cam

chamber is wholly closed and that the rotor *c*, plungers *b* and connections therebetween may all run in a lubricant without danger of injurious leakage to the contact points.

5 The outer wall of the casing is also closed by a cap or cover *a'* screwed to the upper end thereof.

The outer wall of the casing *a* is provided at its periphery with the hollow enlargements or hubs *a*⁸. Within an aperture in the end of each hub *a*⁸ is a sleeve *d*, of suitable insulating material such as a hardened and compressed fiber composition, through which projects a contact member *d'*, the inner end of which is provided with a silver contact point *d*², projecting into the path of the contact point *b*³ of the reciprocating contact member. The wire leading to the battery is connected with the outer end of the contact member *d'*. The contact member *d'* is preferably supported so as to yield slightly when contact is made therewith by the movable contact member *b*, thus insuring a firm and perfect engagement between the contact points, and at the same time relieving or reducing the shock of the contacting blow. To this end the contact member *d'* is provided with a shoulder or collar *d*² which abuts against a flange at the inner end of the sleeve *d* and limits the inward movement of the member *d'*, and a cushion spring *d*³ held under compression between the collar *d*² and the end of a nut *d*⁴, which is also made of insulating material, and is screwed within the end of the sleeve *d* as shown. Thus it will be seen that as the shaft *c*² and rotor *c* rotate, the cam path *c'* will reciprocate the radially movable plungers *b*² successively, moving the same positively in both directions and in a path which will cause the contact points *b*³ to engage their respective opposed contact points *d*² without any wiping action whatever, but at the same time making a firm and sure electrical contact, while subjecting the contact points to very little wear.

In order to observe the contact between the two electrodes if desired, a sight aperture may be provided in the walls of the hub *a*⁸, closed by a screw cap *a*¹¹.

We claim:

1. An ignition timer for internal combustion engines, comprising a casing having an inner wall forming a cam chamber, and an outer wall, said walls spaced apart, a rotor within said cam chamber having a cam path, a plunger passing through the walls of said cam chamber, the outer end of which projects into the space between said walls, and the inner end of which is provided with means connecting the plunger with said cam path, and a contact member supported by the outer wall of said casing and projecting inwardly into the path of said plunger.

2. An ignition timer for internal combustion engines, comprising a casing having an inner wall forming a cam chamber, and an outer wall, said walls spaced apart, a rotor within said cam chamber having a cam path, a plunger passing through the walls of said cam chamber, the outer end of which projects into the space between said walls, and the inner end of which is provided with means connecting the plunger with said cam path, and a contact member supported by the outer wall of said casing and projecting inwardly into the path of said plunger.

tion engines, comprising a casing having an inner wall forming a cam chamber, and an outer wall, said walls spaced apart, a rotor within said cam chamber having a cam path, a plunger passing through the walls of said chamber, the outer end of which projects into the space between said walls and is provided with a collar of absorbent material behind the tip of the plunger, and the inner end of which is provided with means connecting the plunger with said cam path, and a contact member supported by the outer wall of said casing and projecting inwardly into the path of said plunger.

3. An ignition timer for internal combustion engines, comprising a casing having an inner wall forming a cam chamber, an outer wall provided with marginal hubs, said walls spaced apart, a rotor within said cam chamber having a cam path, a plunger passing through the walls of said cam chamber, the outer end of which projects into said hub, and the inner end of which is provided with means connecting the plunger with said cam path, and a contact member supported in said hub and projecting inwardly into the path of said plunger.

4. An ignition timer for internal combustion engines, comprising a casing having an inner wall forming a cam chamber, and an outer wall, said walls spaced apart, a rotatable disk in said cam chamber provided with a cam path on its upper face, a plurality of radially disposed guideways in said cam chamber, plungers in said guideways projecting through the walls of said cam chamber into the space between the walls of said chamber and the outer walls of the casing, connections between said cam chamber and said plungers, and a plurality of radially disposed contact members projecting inwardly through the outer wall of said casing into the paths of said plungers.

5. An ignition timer for internal combustion engines, comprising a casing having a cam chamber, a rotary disk within said cam chamber provided with a cam path in its face, a bridge extending over said cam chamber and over the face of said disk and provided with a plunger guideway, a plunger mounted to slide in said guideway, extending over the face of the disk and through the wall of the cam chamber, a stud on said plunger engaging said cam path and adapted to reciprocate said plunger, and a contact member supported by said casing in the path of said plunger.

6. An ignition timer for internal combustion engines, comprising a casing having a cam chamber, a rotary disk within said cam chamber provided with a cam path in its face, a bridge part extending over the top of said cam chamber and over the face of the disk, said bridge part being separably secured to the cam chamber and provided

with a plunger guideway, a plunger mounted to slide in said guideway, extending over the face of the disk and through the wall of the cam chamber, a stud on said plunger engaging said cam path and adapted to reciprocate said plunger, and a contact member supported by said casing in the path of said plunger.

Signed by us at Laconia, New Hampshire this eighth day of January 1919.

LAURENCE B. HOLT.
ARTHUR B. CLAYTON.

Witnesses:

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ARTHUR A. TYLER.