No. 878,176.

PATENTED FEB. 4, 1908.

D. ALMY.

SPARK TIMER.

APPLICATION FILED MAY 16, 1906.

Fig. 2.

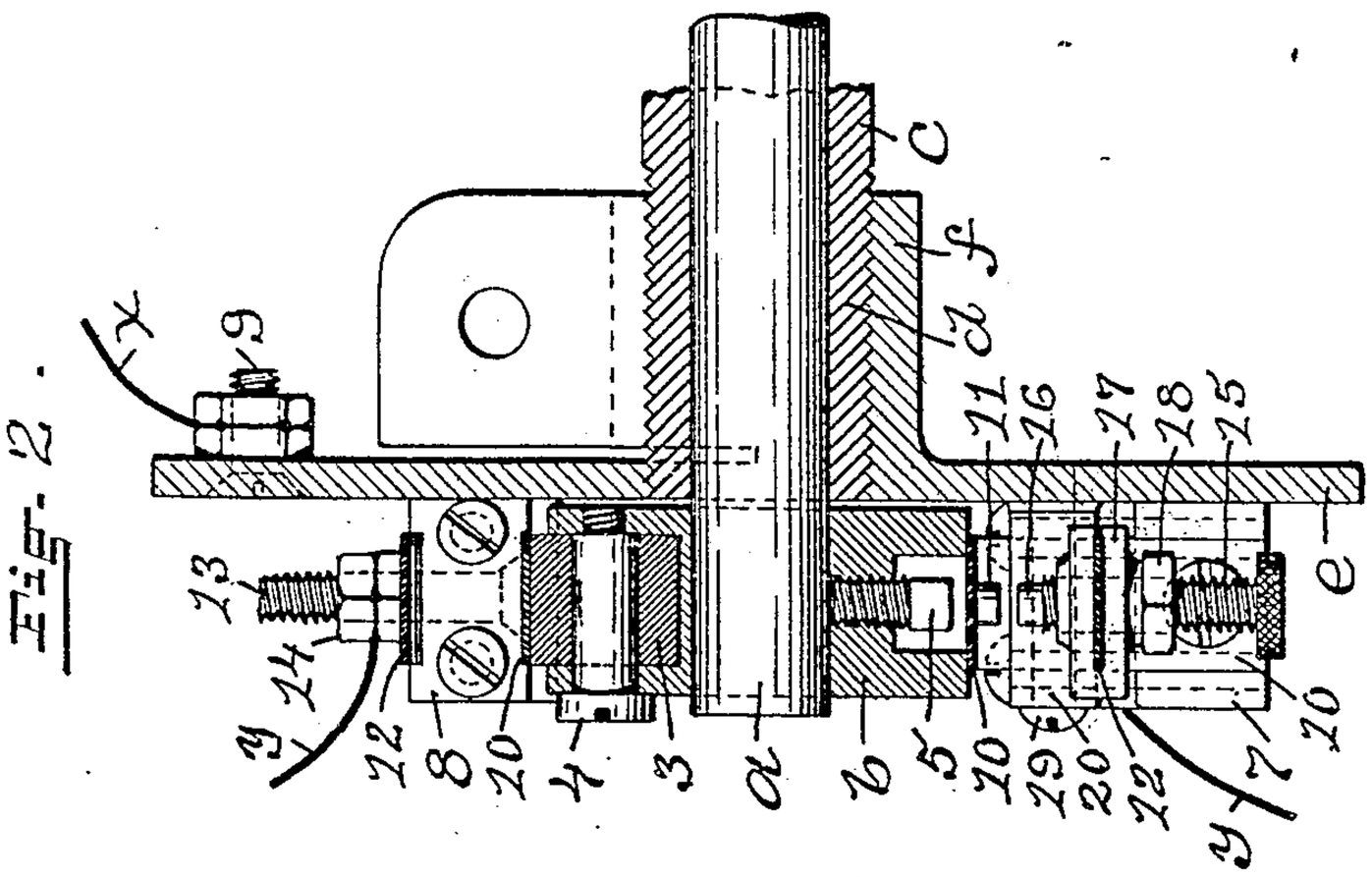
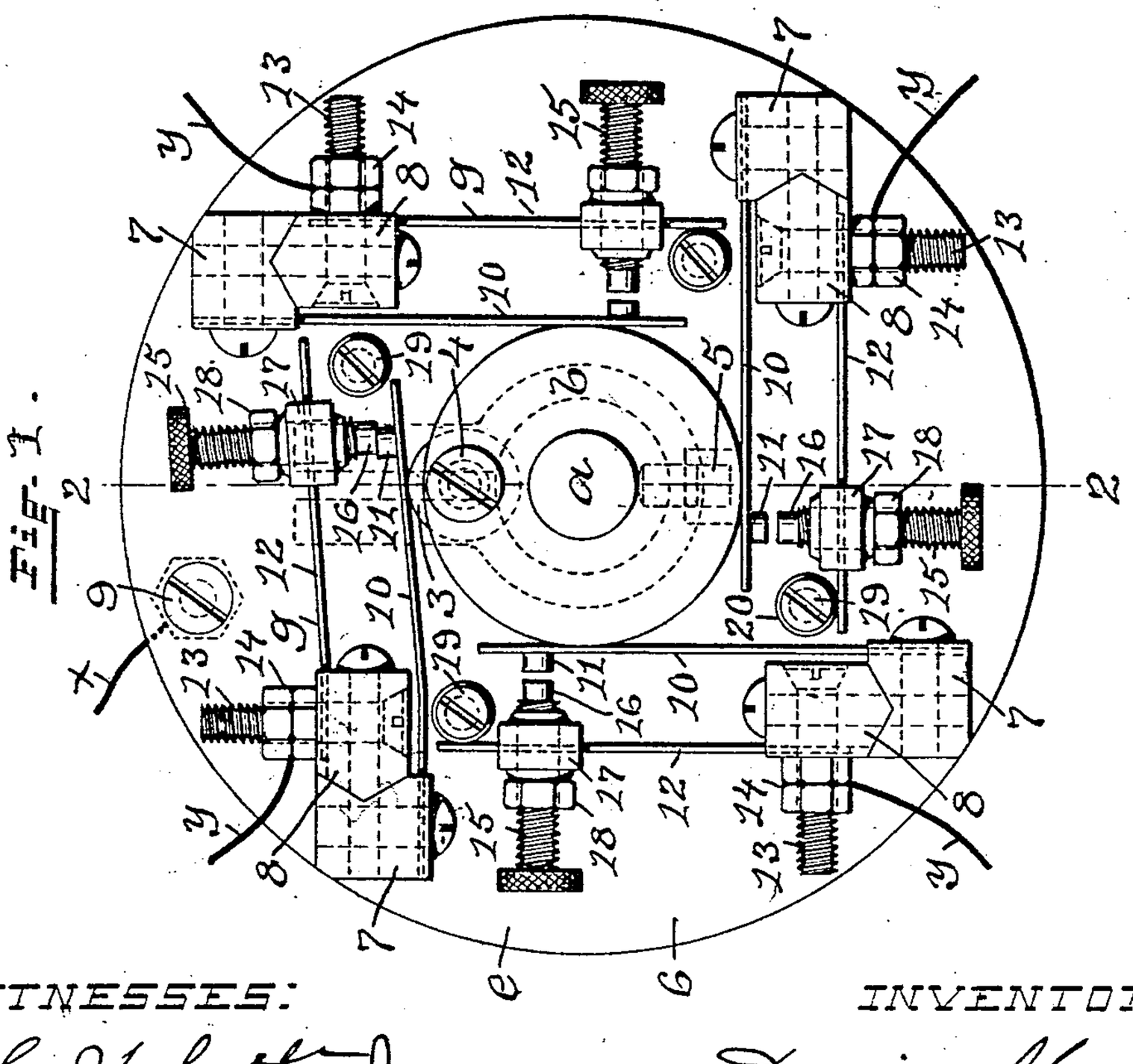


Fig. 1.



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SPARK-TIMER.

No. 878,176. Specification of Letters Patent. Patented Feb. 4, 1908.

Application filed May 16, 1906. Serial No. 317,247.

To all whom it may concern:

Be it known that I, DARWIN ALMY, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented a new and useful Improvement in Spark-Timers, of which the following is a specification.

This invention has reference to an improvement in hydro-carbon engines and more particularly to an improvement in spark timers for hydro-carbon engines.

The object of my invention is to improve the construction of a spark timer for hydro-carbon engines, whereby the use of the engine frame or its equivalent to form a part of the electric circuit is eliminated and a system of direct wiring is used from the source of electrical energy to the timer.

A further object of my invention is to construct a spark timer so that the contact points when brought into contiguity are given a sliding contact on each other, thereby giving a more perfect connection and preventing the accumulation of carbon or other deposits on the contact points.

My invention consists in the peculiar and novel construction of a spark timer for hydro-carbon engines, as will be more fully set forth hereinafter and claimed.

Figure 1 is a face view of my improved spark timer adapted to a four cylinder four cycle hydro-carbon engine, showing three sets of contact springs or switches in their normal or open position and the fourth in the position it would assume when closed by the action of the cam, and Fig. 2 is a sectional view taken on line 2 2 centrally through the timer, showing the construction of the cam and the means for rotatably supporting the timer on the cam shaft bearing.

In the drawings, *a* indicates a cam shaft, *b* a cam, *c* the cam shaft bearing, *d* a screw-threaded trunnion on the cam shaft bearing, *e* the frame of the timer in the form of a disk, *f* an internally screw-threaded hub on the back of the frame, and *g g* a series of switches on the frame surrounding the cam and operated by the cam, as shown in Fig. 1.

The cam shaft *a* is operatively connected to the engine to revolve the shaft in the usual way. The cam *b* is in the form of a collar and has the roll 3 rotatably secured in a recess in the collar by the screw pin 4 in a position for the roll to extend beyond the periphery of the collar a predetermined distance and is adjustably secured to the outer end of the cam shaft *a* by a set bolt 5. The metal frame of the timer *e* has the flat face 6 from which extends a series of lugs 7 7 formed integral with the metal frame, and the hub *f* on the back adapted to be rotatably secured to the trunnion *d* by screwing the hub onto the trunnion, as shown in Fig. 2. The lugs 7 7 are placed at equal distances apart adjacent the periphery of the frame and are each shaped to receive an insulating block which is secured to the lug by screws or other means. A wire binding post 9 is secured to the frame *e*, as shown in Fig. 2, by which a wire *x* is electrically connected with all of the lugs 7 7 through the frame *e*.

Each of the switches *g g* consists of a flat spring 10 having a contact point 11 adjacent its free end and secured at its fixed end to a lug 7 by a screw or other means in a position for the roll 3 on the cam *b* to engage with the spring and force the spring outward, and a flat spring 12 secured at one end to the insulating block 8 by the screw 13 and the nuts 14 forming a binding post for a wire *y* and a screw post 15 on the free end of the spring having a contact point 16. This screw post 15 is adjustably secured to the free end of the spring by forcing a split block 17 over the spring in a position for a screw-threaded hole in the block to coincide with a hole in the spring, screwing the screw post through the hole in the block and spring and locking the screw post in a position for the contact point 11 on the spring 10 to engage with the contact point 16 of the screw post 15 by a lock nut 18, as shown in Fig. 1. A stop 19 covered with an insulating material 20 is secured to the face 6 of the frame in a position for the end of the spring 12 to engage with the stop and hold the contact points in their open or normal position. By this construction all of the springs 10 10 are electrically connected with a wire *x* through the lugs 7 7 and frame *e* and all of the springs 12 12 are electrically connected through the binding posts 9 9 with the wires *y y* which may be united to a single wire and connected to the battery in the usual way. The hub *f* has an upwardly-extending lug in which is a transverse hole for securing a rod from the spark controlling lever to the lug. The hub and lug are split lengthwise to the center of the hub and the halves of the lug may be drawn toward each other by tightening nuts on the connecting rod (not shown) at each side of the lug, or any other means may be used to

compensate for wear between the trunnion *d* and the hub *f* and for holding the hub in frictional contact with the trunnion.

In the operation of my improved timer the cam shaft *a* and cam *b* are revolved usually by connecting the cam shaft through gears to the engine shaft. The roll 3 on the cam *b* engages in succession with the flat springs 10 10, and forcing the free ends of the springs 10 10 outward against the tension of the springs brings the contact point 11 on a spring 10 into contiguity with the contact point 16 on the flat spring 12 and forces the spring 12 against its spring tension outward. As the opposite ends of the flat springs 10 and 12 are fixed and this outward movement of the free ends continues the contact points 11 and 16 slide on each other until the limit of the outward movement of the springs is reached, when they assume the position as shown in the upper switch in Fig. 1. As the springs 10 and 12 assume the normal position by the forward movement of the roll on the cam, the contact points 11 and 16 have a sliding movement on each other in a reverse direction until the free end of the spring 12 comes into engagement with the stop 19 when the contact points are separated and the springs assume their normal open positions. By this double sliding or wiping movement of the contact points on each other the deposit of carbon, oil, or other foreign matter on the points is prevented and a perfect contact of the points obtained. The sparking of the timer is advanced or retarded by slightly rotating the frame *e* on the trunnion *d* through connections from the hub *f* to a spark lever, not shown.

It is evident that the timer could be constructed to have any number of the switches *g g* required, that it could be rotatably supported in any well known way and that the cam shaft *a* could be revolved by any well known mechanism, without materially affecting the spirit of my invention.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. In a spark timer, the combination with a shaft *a*, of a cam *b* in the form of a collar, having the roll 3 rotatably secured in a recess in the collar by a screw pin 4 in a position for the roll to extend beyond the periphery of the collar and adjustably secured to the shaft by a set bolt 5, a screw-threaded trunnion *d* supporting the shaft, a metal frame *e* having the internally screw-thread hub *f*, the flat face 6, a plurality of lugs 7 7 formed integral with the frame on the face 6, an insulating block 8 secured to each lug and interfitting therewith, a binding post 9 secured to the frame *e*, a plurality of switches *g g* each switch consisting of a flat spring 10 having a contact point 11 adjacent its free end and rigidly secured at its opposite end to a lug 7 in a position for the roll 3 on the cam to engage the spring, a flat spring 12 rigidly secured at one end to the adjoining insulating block 8 by a screw 13 and the nuts 14, and a screw post 15 having the contact point 16 adjustably secured to the free end of the spring by a split block 17 and a nut 18 in a position for the contact point 11 to engage with the contact point 16, and a plurality of stops 19 19 consisting of a screw covered with an insulating material 20 and secured to the frame *e* on the face 6 in a position for the free end of the spring 12 to engage with the stop and hold the contact points in their open position, whereby a direct electrical connection is made with the springs 10 and 12 and a reciprocating sliding contact is given to the contact points 11 and 16 on the springs, as described.

2. A spark timer embodying a disk, lugs secured to one of the faces of said disk, blocks of insulating material of less width than said lugs secured to the inner faces of the latter, a flat spring having a contact point secured to each of said lugs, a second flat spring secured to each of said blocks, a split block having an opening receiving said second flat spring, said second spring and split block having registering screw threaded openings therethrough, and a screw post having a contact point on its inner end adjustably secured in said registering openings.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

DARWIN ALMY.

Witnesses:
ADA E. HAGERTY,
J. A. MILLER.