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SPARK TIMER FOR GAS ENGINES.

APPLICATION FILED SEPT. 23, 1907.

907,628.

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Fig. 1.

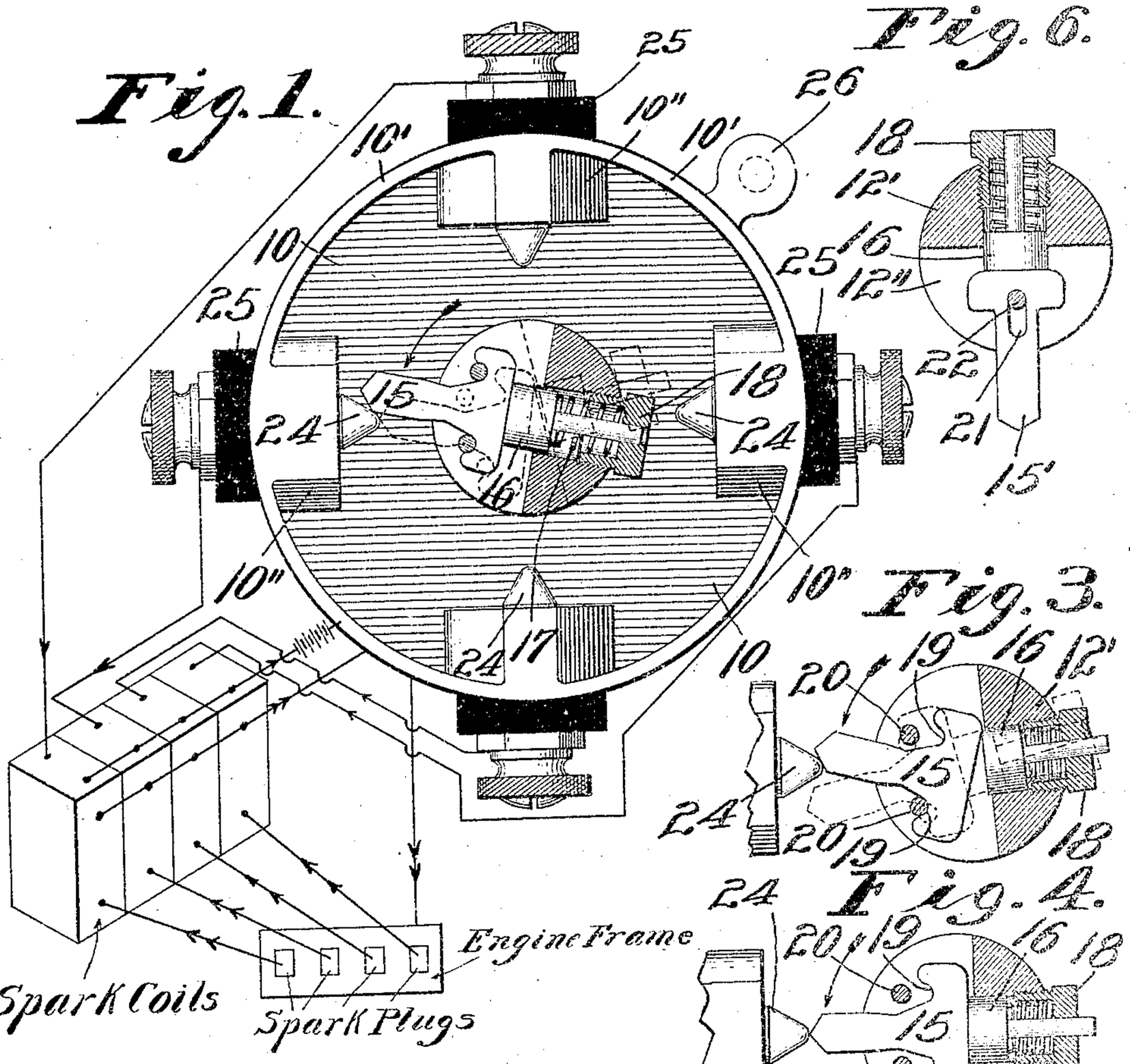


Fig. 6.

Fig. 3.

Fig. 4.

Fig. 5

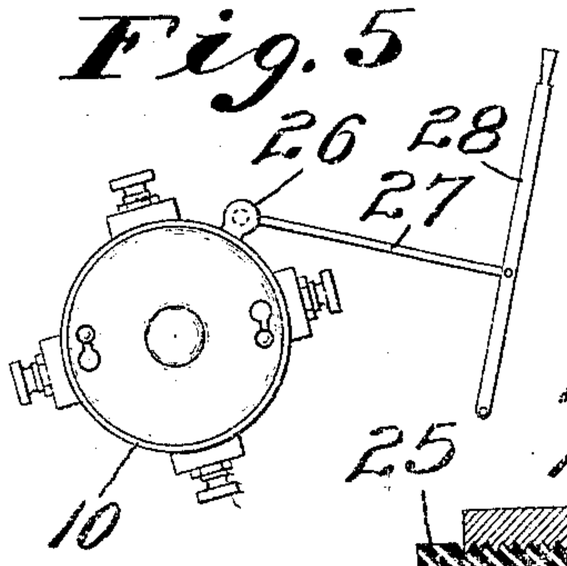
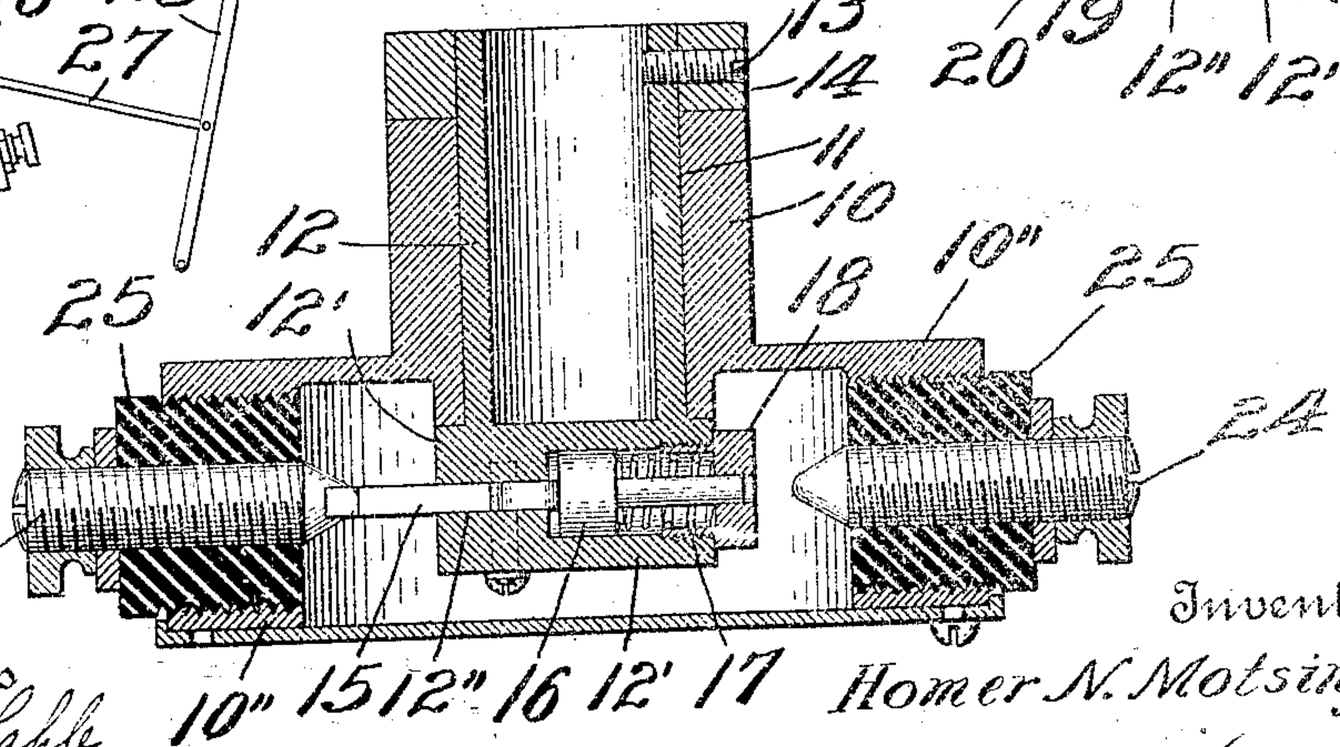


Fig. 2.



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UNITED STATES PATENT OFFICE.

HOMER NAPOLEIN MOTSINGER, OF PENDLETON, INDIANA, ASSIGNOR TO MOTSINGER DEVICE MFG. CO., OF PENDLETON, INDIANA, A CORPORATION OF INDIANA.

SPARK-TIMER FOR GAS-ENGINES.

No. 907,623. Specification of Letters Patent. Patented Dec. 22, 1908.

Application filed September 23, 1907. Serial No. 394,106.

To all whom it may concern:

Be it known that I, HOMER N. MOTSINGER, a citizen of the United States, residing at Pendleton, in the county of Madison and State of Indiana, have invented certain new and useful Improvements in Spark-Timers for Gas-Engines, of which the following is a specification.

The object of my invention is to produce a device for timing and controlling the igniting circuit or circuits for gas engines, and to provide means by which the time of action may be externally and manually retarded or advanced, the construction being such that, when used in connection with a multiplicity of cylinders, the sparking action in the several cylinders will be accurately timed and the accuracy of timing will not be affected by the advancement or retardation of the spark.

A further object of my invention is to so construct the parts that the apparatus may be driven in either direction with equal facility and also such that a reversal of movement of the parts cannot, at any point, result in injury thereto.

The accompanying drawings illustrate my invention:

Figure 1 is a plan of the mechanism embodying my invention together with a diagram of the wiring, the cover being omitted and the rotating head being shown in horizontal section; Fig. 2 an axial section; Fig. 3 a horizontal sectional detail of the rotating head and one of the coöperating stationary terminals showing different positions of the swinging contact arm; Fig. 4 a similar view showing the position assumed by the parts in case of a stoppage and reversal when the movable contact arm is radially opposite a stationary terminal; Fig. 5 an elevation, on a smaller scale, showing means for rotating the casing of the apparatus relative to its rotating head, in order to advance or retard the spark, and Fig. 6 a detail of modification.

In the drawings, 10 indicates a suitable inclosing casing having a central bearing 11, within which is journaled a hollow spindle 12 adapted to receive a suitable driving shaft which may be secured within the spindle by any suitable means, such for instance as the set screw 13 which may also pass through a collar 14 serving to retain the spindle in place within the casing in conjunction with a head 12′ formed at the inner end of said spindle. Formed in head 12′ at right angles to its axis is transverse slot 12″ within which is mounted the swinging contact finger 15, said contact finger normally projecting radially from head 12′ and being yieldingly held in normal position by a spring plunger 16 yieldingly held in place by a spring 17 and block 18.

Finger 15 may be mounted in head 12′ by any suitable means which will not only permit a swinging of the finger in either direction but will also permit a radially inward yielding of the finger, for a purpose which will appear. In Figs. 1 to 4 I show a form in which the finger 15 is T-shaped in general form, having a pair of sockets 19 under the head of the T and adapted to receive a pair of pins 20 arranged upon opposite sides of the stem of the finger, and also arranged eccentric to the axis of head 12′, the arrangement being such that the outer projecting end of finger 15 may be swung in either direction upon one or the other of pins 20, as illustrated in Fig. 3, and may also be free to move bodily inwardly away from both pins 20, as illustrated in Fig. 4.

Instead of the construction shown in Figs. 1 to 4, the form shown in Fig. 6 may be used. In this form the finger 15′ is provided with an axial slot 21 through which a pin 22 passes, said pin being parallel with but eccentric to the axis of head 12′. Finger 15′ is held normally radially projected by the plunger 16, said plunger yielding either to a swinging movement of the finger upon pin 22 as an axis, or to a bodily movement radially inward, which movement is permitted by slot 21.

Casing 10 is provided with a flange 10′ which surrounds head 12′ and at intervals said flange is provided with a boss 10″ in which is mounted a terminal pin 24, the said pin being mounted in a suitable insulating bushing 25, and its inner end being conical and projected into the path of movement of the outer end of finger 15.

Casing 10 is provided with an ear 26 to which may be attached a link 27 or suitable member forming a connection between the casing and an operating lever 28 whereby, when spindle 12 is secured to a shaft rotated in proper time by the engine, casing 10 may

be shifted upon the shaft by the operating member 28 so as to advance or retard the spark, in a well known manner.

Any suitable system of wiring may be used for utilizing this structure in connection with the spark plugs of an internal combustion engine, as illustrated, for instance, diagrammatically in Fig. 1.

In operation the rotation of head 12′ by the engine while casing 10 is held stationary, causes finger 15 to be brought successively into engagement with the ends of terminals 24 and said finger 15 yields upon its pivotal mounting so as to wipe successively across each stationary terminal and, as soon as it reaches the position indicated in dotted lines in Fig. 1, a very slight further advancement of head 12′ results in a sudden snapping of the finger 15 away from the terminal 24 to the position indicated in dotted lines in Fig. 3, thus making a sudden break, which is very desirable for the production of a satisfactory igniting spark in a sparking circuit. Finger 15, projecting radially from head 12′, occupies such a relation to the stationary terminals 24, that head 12′ may be rotated in a reverse direction without injury to any of the parts, and if, by any chance, the engine should stop at a point where the tip of finger 15 rested upon the tip of one of the stationary terminals, and the engine should then be reversed, no injury would result to the parts because the finger 15 may yield inwardly bodily, as clearly shown in Fig. 4.

I claim as my invention:

1. In a timer, the combination of a casing carrying one or more terminals, a rotatable head journaled therein, a coöperating normally radially extending contact arm carried by said head, and supporting means for said contact arm permitting a swinging movement in the plane of rotation and a yield substantially radial to the axis of the head, and yieldingly holding said finger in normal position.

2. In a timer, the combination of a casing carrying one or more terminals, a head journaled in said casing, a normally radially extending contact arm adapted to coöperate with said terminals, a pivotal support for said arm on said head eccentric to the axis of the head, and means permitting the substantially radially bodily shifting of said contact arm relative to its pivot, and yieldingly holding said contact arm in normal position.

3. In a timer, the combination of a casing carrying one or more terminals, a head journaled therein, a contact arm pivotally mounted on said head and adapted to cooperate with the casing terminals, and means permitting said contact arm to shift bodily substantially radially with relation to its pivotal support, and yieldingly holding said contact arm in normal position.

4. In a timer, the combination of a casing carrying one or more terminals, a head journaled in said casing, a T-shaped contact arm carried by said head and arranged to pivotally engage a pair of pins carried by said head and to coöperate at its extended end with the terminals of the casing, and means for yieldingly holding said T-shaped arm in engagement with the said pivot pins whereby said contact arm may pivot upon either of said pins or may yield bodily relative to said pins.

5. In a timer, the combination of a casing carrying one or more terminals, a head journaled in said casing, a T-shaped contact arm carried by said head and arranged to pivotally engage a pair of pins carried by said head and to coöperate at its extended end with the terminals of the casing, and a spring plunger engaging said T-shaped head in opposition to said pivot pins, for the purpose set forth.

In witness whereof, I, have hereunto set my hand and seal at Indianapolis, Indiana, this seventeenth day of September, A. D. one thousand nine hundred and seven.

HOMER NAPOLEIN MOTSINGER. [L. S.]

Witnesses:

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