No. 680,422. Patented Aug. 13, 1901.

# J. D. TERMAAT & L. J. MONAHAN.

## SPARKING IGNITER FOR GAS ENGINES.

(Application filed Oct. 22, 1900.)

(No Model.)

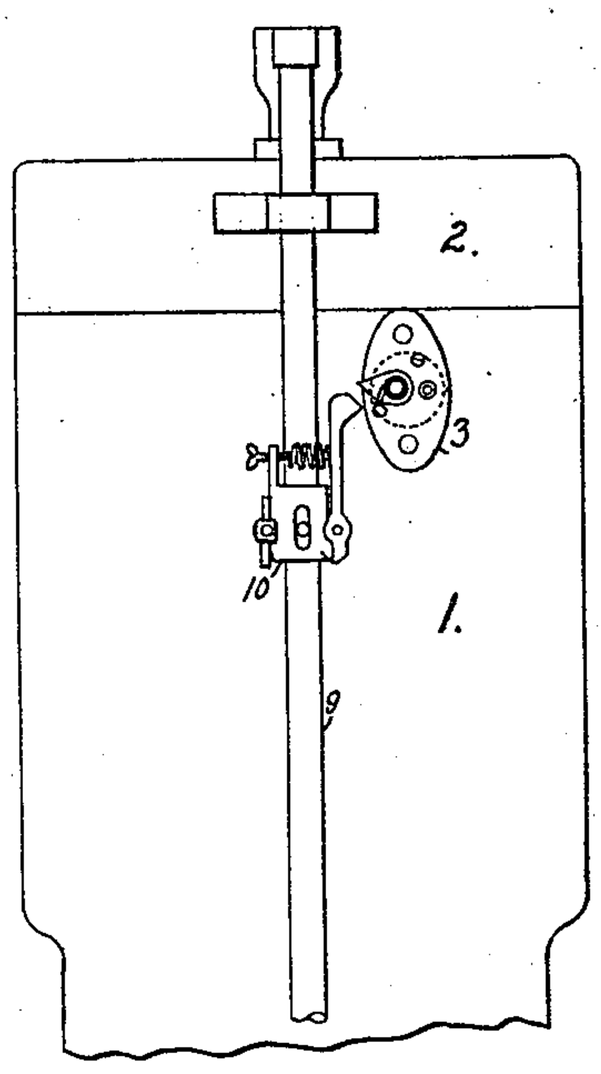


Fig I

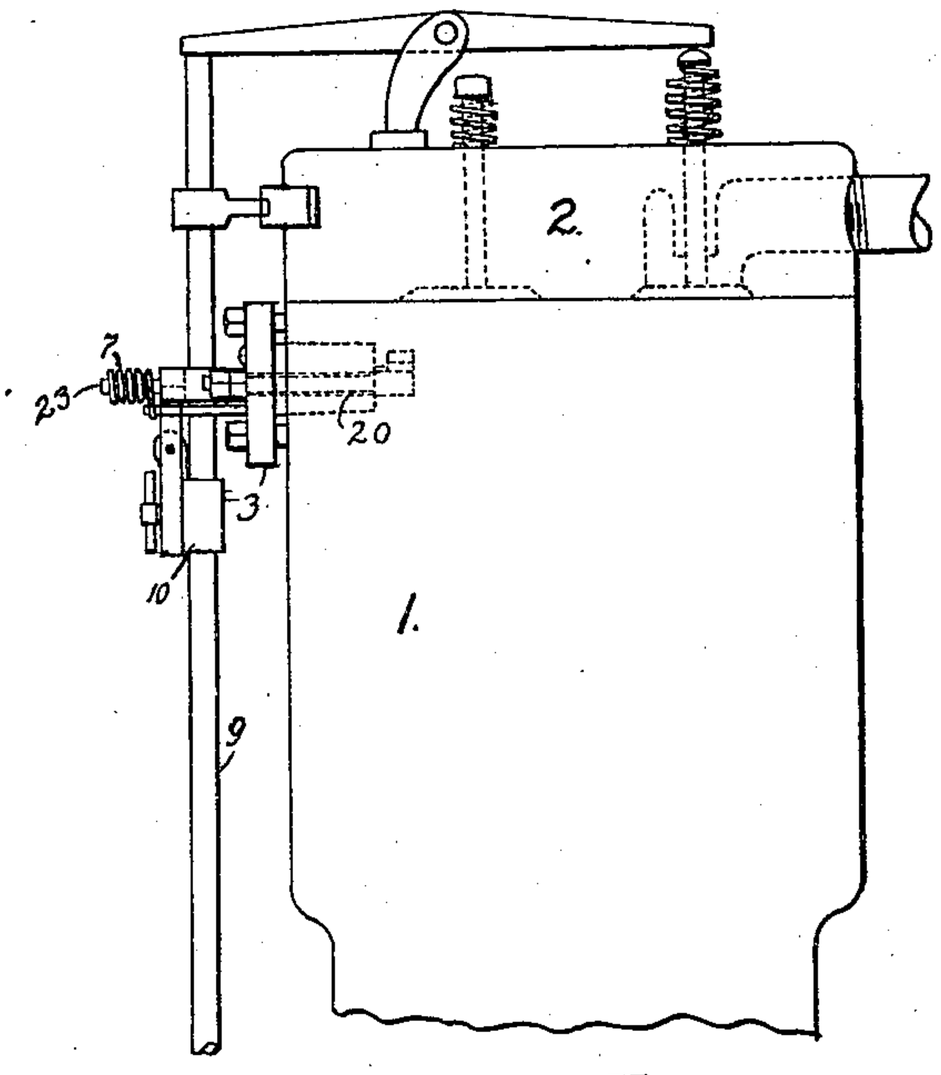


Fig II




Fig III

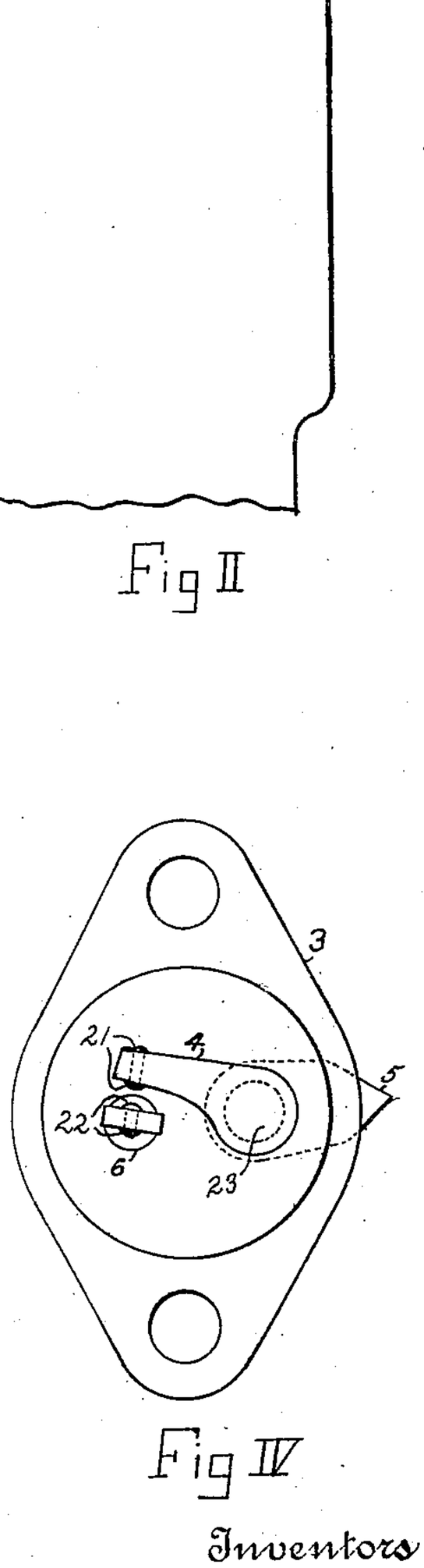


Fig IV




Fig V

Witnesses
Wm J Mannon
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# UNITED STATES PATENT OFFICE.

JOHN D. TERMAAT AND LOUIS J. MONAHAN, OF OSHKOSH, WISCONSIN.

## SPARKING IGNITER FOR GAS-ENGINES.

SPECIFICATION forming part of Letters Patent No. 680,422, dated August 13, 1901.

Application filed October 22, 1900. Serial No. 33,845. (No model.)

*To all whom it may concern:*

Be it known that we, JOHN D. TERMAAT and LOUIS J. MONAHAN, citizens of the United States, residing at Oshkosh, in the county of Winnebago, State of Wisconsin, have invented Improvements in Electric Igniters for Gas-Engines, of which the following is a specification.

Our invention relates to improvements in electric igniters for gas-engines, being adapted in particular to engines of four-cycle type and having a hit-and-miss governor and with the exhaust-valve operated by a cam through a push-rod.

The object of the invention is to produce an igniter which will be simple and positive in its action and will admit of adjustment while in operation.

In the accompanying drawings, Figure 1 is a front view of an engine-cylinder with igniter attached. Fig. 2 is a side view of the cylinder and igniter. Fig. 3 is a detailed view of the igniter, showing more plainly the operation. Fig. 4 is the inner end of the plug containing the electrodes, showing the contact-points. Fig. 5 is a section taken through *a b*, Fig. 3.

Like figures designate like parts in all the views.

In the drawings figure 1 is a cylinder, shown here as vertical.

2 is a cylinder-head containing the suction and exhaust valves. As here shown, the exhaust-valve is opened by means of the push-rod 9 through a lever.

The igniter is composed of a plug 3, turned to a taper to fit a similar hole in the side of the cylinder and ground in place to a tight fit. The plug contains a stationary electrode 6, which is insulated from the plug by insulating material, such as mica, wrapped around it before placing it in the plug. The insulation is shown at 20. The movable electrode 4 is free to oscillate between the contact-points 22 and the stud 8. The lug 5 is pinned rigid on the electrode-stem 23 and is normally held against the stud 8 by a coiled spring 7, one end of the spring being firmly attached to the stem and the other end to the stud 8, thus holding the contact-points apart. The device for bringing the contact-points together consists of a casting 10, of peculiar form, mounted on the exhaust-valve push-rod and clamped in place by the screw 12. The engaging finger 15 is pivoted to the casting 10 and held in its normal position against the stop 16 by a spring 17. The tension of the spring 17 may be adjusted by the thumb-screw 19, which determines the pressure on the contact-points. The casting 10 is slotted on one side 13, and a pin or stud is secured to the rod 9, which is intended to keep the casting from turning on the rod 9 while it is being adjusted and also provides a limit in which to move the casting in order that the spark will not be produced too early or too late while the engine is in motion. The electrodes are provided at their inner ends with a non-corroding metal (such as platinum) 21 and 22, which is driven in the points of the electrodes and riveted to a head.

In operation the push-rod 9 is operated by a cam or eccentric in the ordinary way, preferably the former, which imparts a reciprocating motion to the rod in order to open the exhaust-valve. The rod in moving in the direction to open the exhaust-valve the points 18 and 5 are brought in contact with each other. The spring 17 being stiffer than the spring 7, the lug 5 is moved to bring the contact-points 21 and 22 together, which limits the movement of the lug 5, and as the finger 15 continues to move upward it is forced against the spring 17 until the points 18 and 5 pass, when the action of the spring 7 will bring the lug 5 back to its normal position, causing the points 21 and 22 to separate rapidly, producing a spark. The battery-wires are connected to the insulated electrode and to the plug 3, as at 24. After ignition takes place the rod 9 continues on its travel to open the exhaust-valve, and on the return stroke the finger 15 is again pressed against the spring 17 in passing downward by the lug 5. In case it is desired to change the point at which the spark takes place the thumb-screw 12 is slackened and the casting 10 moved upward or downward for an earlier or later spark, as the case may be, when the screw 12 is again tightened.

This igniter is adapted to engines using a hit-and-miss governor and in particular to the method of governing by holding the exhaust-valve open. In this method it will be seen that when the valve is held open from excess of speed the igniter also ceases working, which results in battery saving, or, in

fact, there is no spark produced unless there is a charge in the cylinder to ignite.

Having fully described our invention, what we claim, and desire to secure by Letters Patent, is—

In a gas-engine igniter the combination with a valve-actuating rod, of a casting or sleeve 10 mounted thereon, a yielding engagement-finger 15 pivotally attached to said casting or sleeve, an adjustable spring 17, means for adjusting the tension of said spring, a pin 14 secured to the rod 9, a slot 13 in casting 10, a thumb-screw 12 for clamping the casting 10 to the rod 9, a stationary electrode, a movable electrode having a lug or tappet 5 secured thereto and forming part thereof, a stop 8, a coiled spring 7 having one end attached to said stop and the other end attached to the movable electrode adapted to normally hold the contact-points 21 and 22 apart for the purpose set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

JOHN D. TERMAAT.
LOUIS J. MONAHAN.

Witnesses:
WM. J. MANSON,
BER. J. DALY.