

(No Model.)

2 Sheets—Sheet 1.

F. M. UNDERWOOD.
SPARKER FOR GAS AND GASOLINE ENGINES.

No. 553,181.

Patented Jan. 14, 1896.

Fig. 2.

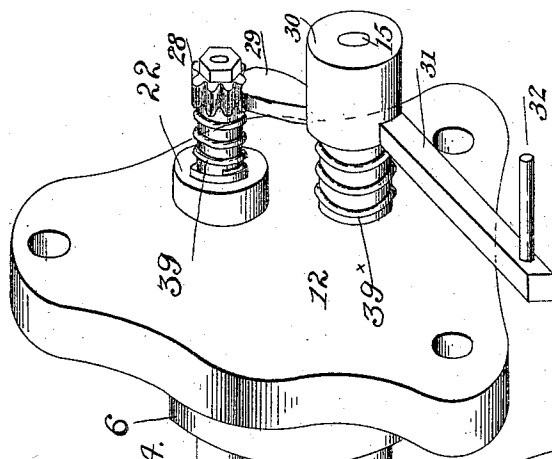
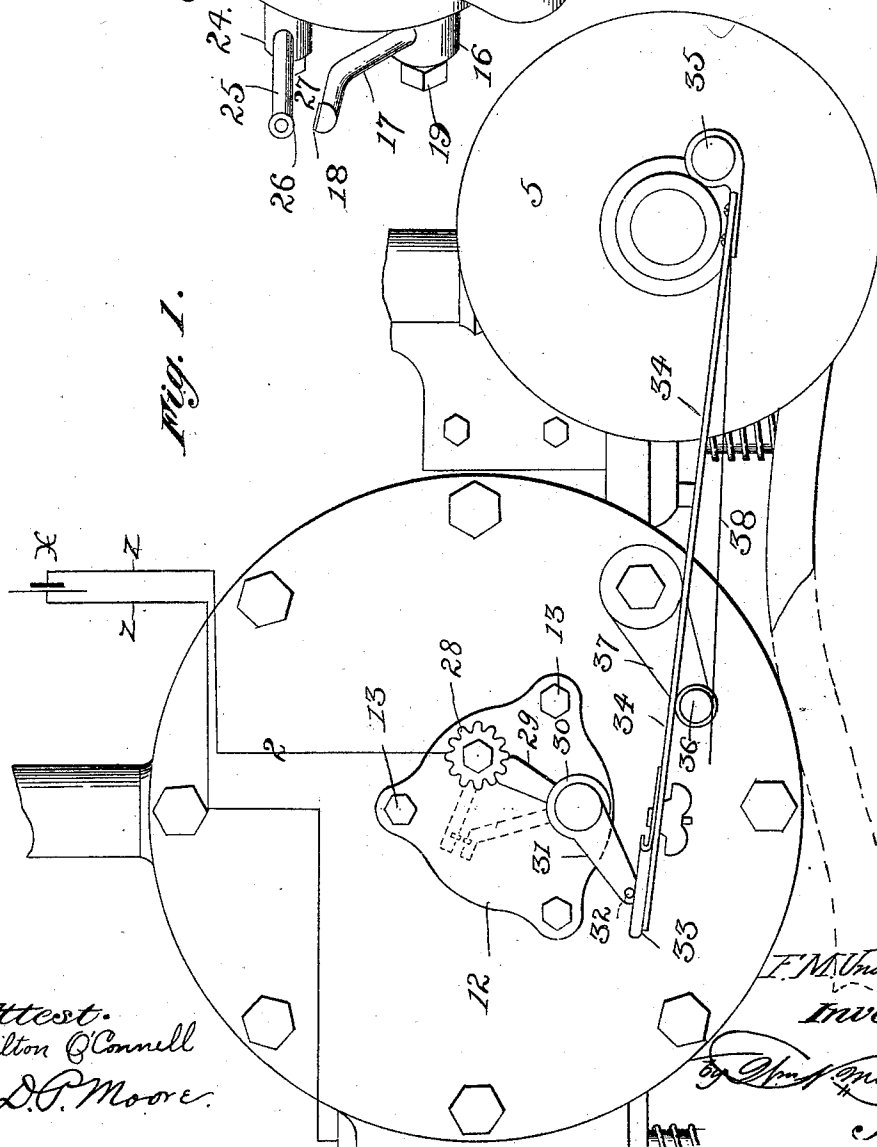


Fig. 1.



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D.P. Moore.

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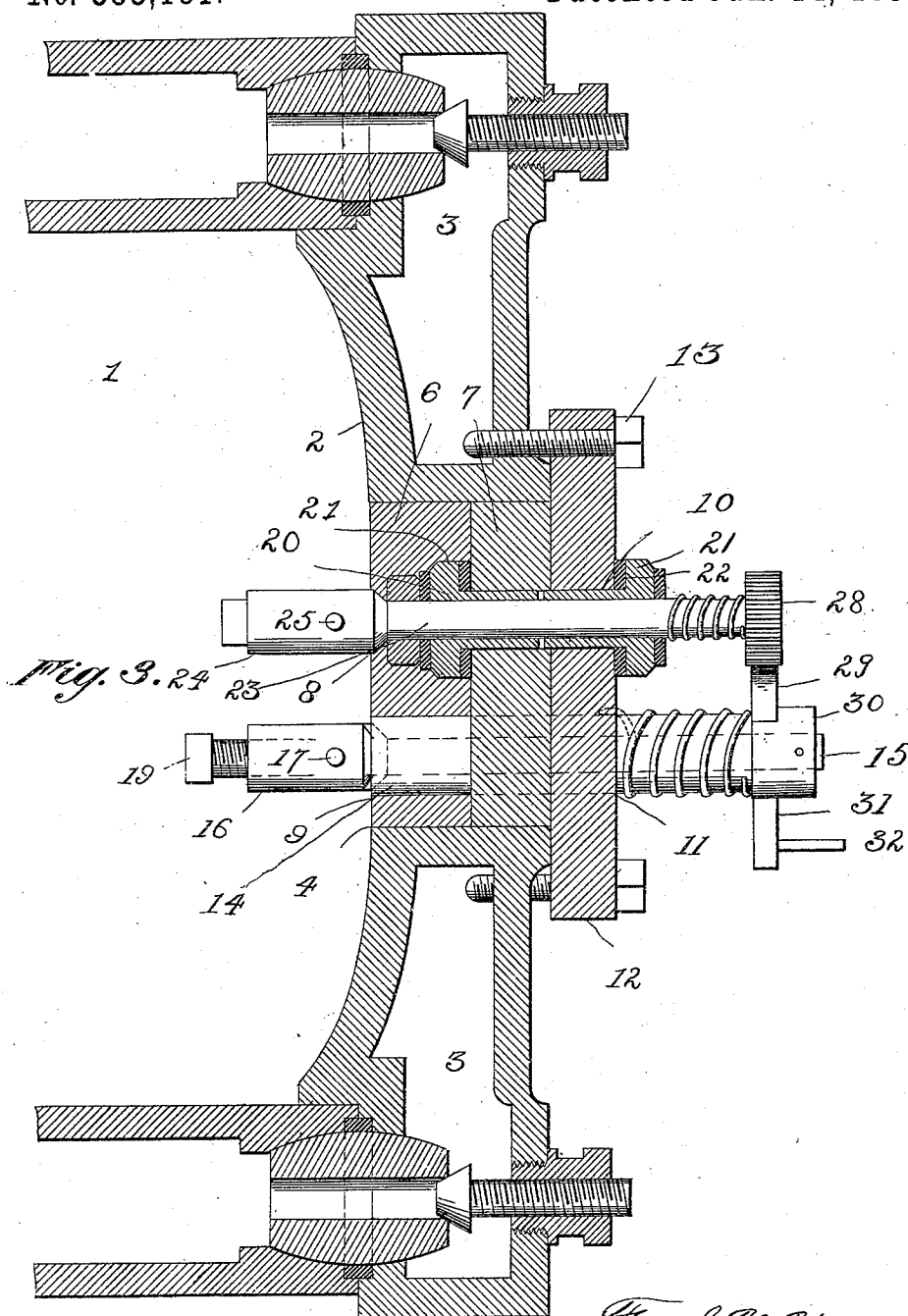
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Frank M. Underwood,

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D. P. Moore.

Inventor:
by *[Signature]* Moore,
Att'y.

UNITED STATES PATENT OFFICE.

FRANK M. UNDERWOOD, OF UPPER SANDUSKY, OHIO.

SPARKER FOR GAS AND GASOLINE ENGINES.

SPECIFICATION forming part of Letters Patent No. 553,181, dated January 14, 1896.

Application filed March 14, 1895. Serial No. 541,701. (No model.)

To all whom it may concern:

Be it known that I, FRANK M. UNDERWOOD, a citizen of the United States, residing at Upper Sandusky, in the county of Wyandot and State of Ohio, have invented certain new and useful Improvements in Sparkers for Gas and Gasoline Engines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in gas and gasoline engines, and has special reference to an electric sparking mechanism for gas and gasoline engines, the object of my invention being the provision of a sparking mechanism which will be positive and reliable in operation, which can be applied to gas and gasoline engines at a moderate cost, and which will be durable, insuring a long life to the sparker, and which will prove a thoroughly practical and desirable improvement in this class of inventions.

To attain the desired objects the invention consists of an electric sparking device embodying novel features of construction and combination of parts, substantially as disclosed herein.

In order that the details of construction of my improvement and its operation may be understood and its numerous advantages be fully appreciated, I have illustrated an electric sparking mechanism constructed according to my invention in the accompanying drawings.

Figure 1 represents an end elevation of a portion of a gas and gasoline engine equipped with my invention to more clearly show its application. Fig. 2 represents an enlarged perspective view of the sparking-plate and mechanism carried thereby detached from the cylinder-head, and Fig. 3 is a vertical sectional view of a portion of the cylinder and cylinder-head with my sparking mechanism applied.

In the drawings the numeral 1 designates the cylinder.

2 designates the cylinder-head communicating with the cylinder and having the controlling-valve 3.

4 designates the central opening in which

is located the sparking mechanism, and 5 designates the driving gear-wheel from which the sparking mechanism is operated.

The peculiar and novel construction of the cylinder and head is fully described and claimed in an application of even date herewith, Serial No. 541,702, and further comment thereof is not deemed necessary in this application.

Fitted in the central opening of the cylinder-head are the disks or plates 6 and 7, having openings 8 and 9 in line with openings 10 and 11 in the plate 12, which is secured to the cylinder-head by means of bolts or screws 13. In one of the series of openings is mounted a sleeve or tube 14, which surrounds a shaft 15 carrying at its inner end the head 16, which supports the arm 17, provided with the platinum contact-point 18 held in place by the clamping-screw 19. In the other series of openings is mounted the sleeve 20, having the heads or flanges 21 and provided with insulating material 22, and in said sleeve bears the shaft 23, carrying at its inner end the head 24, which is provided with the arm 25, carrying the other contact-point 26, and said arm is also retained rigidly in place by means of the clamping-screw 27. From this construction it will be seen that the two shafts are mounted in the cylinder-head, carry the contacts which are properly insulated, and that said shafts may be rotated in their bearings to bring the contact-points together and to separate them, as will presently appear.

To the outer end of the shaft 23 is secured a pinion 28, with which engages the toothed arm 29 carried by the ring 30 secured to the shaft 15, also carrying the arm 31, having the crank-pin 32 adapted to be engaged by the adjustable plate 33 mounted on the pitman 34, having one end connected to the stud 35, secured to the driving gear-wheel 5. The under side of this pitman bears on the roller or guide 36, carried by the arm 37, secured to the cylinder-head, and this pitman is guided in its movements by the spring 38 secured to its under side and engaging the under side of the roller or guide. To return the shafts carrying the contact-points to their normal positions after the spark has been made, I pro-

vide each shaft with the coil-springs 39 and 39^x, which are connected in the well-known manner shown.

The operation of my sparker will be readily understood from the foregoing description, taken in connection with the accompanying drawings, but may be stated briefly as follows: The parts are in their normal position, and the current of electricity is supplied from the battery or source X through the wires Z, the rotation of the gear-wheel moves the pitman, the plate at the free end thereof engages the crank carried by the arm on the shaft carrying the lower contact-point, and the toothed arm thereon engages the pinion on the other shaft, bringing the other contact-point into engagement with the said lower contact-point, causing a spark which ignites the charge and causes the explosion in the cylinder.

It will be seen that the movement of the pitman causes the contact-points to come gradually together and that the springs will instantly separate the points after the contact has been made, thus insuring a perfect spark and preventing the points from lingering, and thereby avoids burning of the platinum and insures a long life to the same. It will also be understood that the distance of movement can be regulated by adjusting the plate carried by the pitman and the arm carrying the roller or guide, which, as is evident, will regulate the throw of the shaft carrying the toothed arm. It will also be observed that a great speed can be accomplished by using my improved sparking device, and also that the entire sparking mechanism can be removed from the cylinder-head without in the least interfering with the other mechanism of the gas or gasoline engine.

I claim—

1. In an electric sparker for gas engines, the combination of the wheel having the stud, the pitman having one end connected to said stud, and having the flanged plate at the other end, the arm having a crank adapted

to be engaged by said plate, the shaft carrying the contact point and connected to said arm, the shaft carrying the other contact point, connections between said shafts to cause them to move simultaneously and springs for returning said shafts to their normal positions.

2. In a gas and gasoline engine the combination with the cylinder head, of the support mounted in one end thereof, the shafts carrying the contact points and mounted in the support, the pinion on one of the shafts, the ring secured to the other shaft and having the toothed arm meshing with the pinion and the crank arm, and mechanism for engaging said crank arm for bringing the contact points together and mechanism for separating the contact points to produce the spark.

3. In an electric sparker, the combination with the cylinder head, of the block mounted therein, the plate connected to the block and secured to the exterior of the cylinder head, the shafts mounted in the block and plate and having contact points at their inner ends, devices for connecting the outer ends of the shafts to cause them to move simultaneously and mechanism for returning the shafts to their initial positions.

4. In an electric sparker, the combination with the cylinder head, the plate secured to the exterior thereof and carrying the block which fits in said head, shafts arranged in said plate and block and having their outer ends geared together to cause said shafts to move simultaneously, and having contact points at their inner ends and mechanism for moving the shafts to bring the contact points together and for separating said points and returning the shafts to their normal positions.

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

FRANK M. UNDERWOOD.

Witnesses:

J. M. STEVENSON,
WARNER CLARK.