

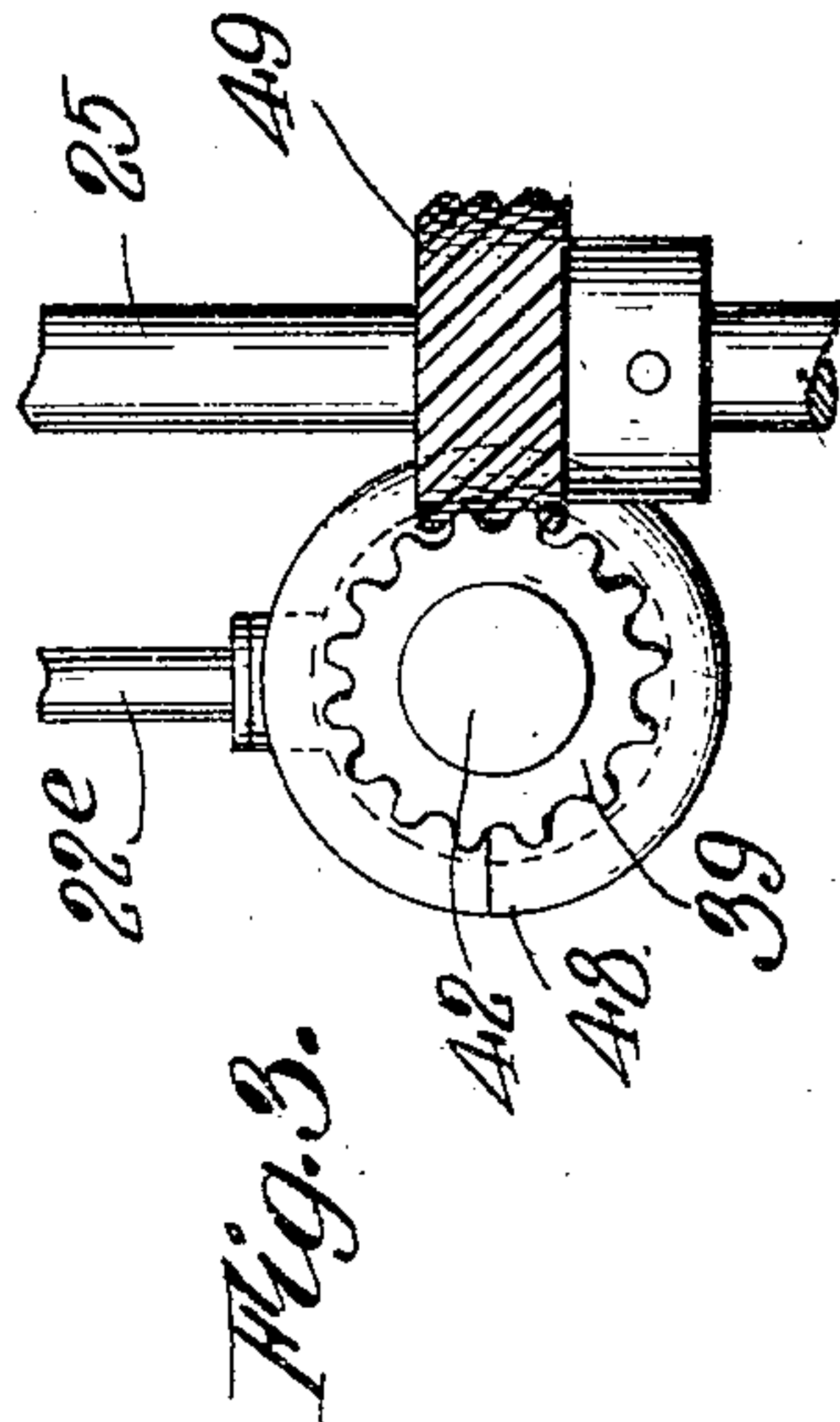
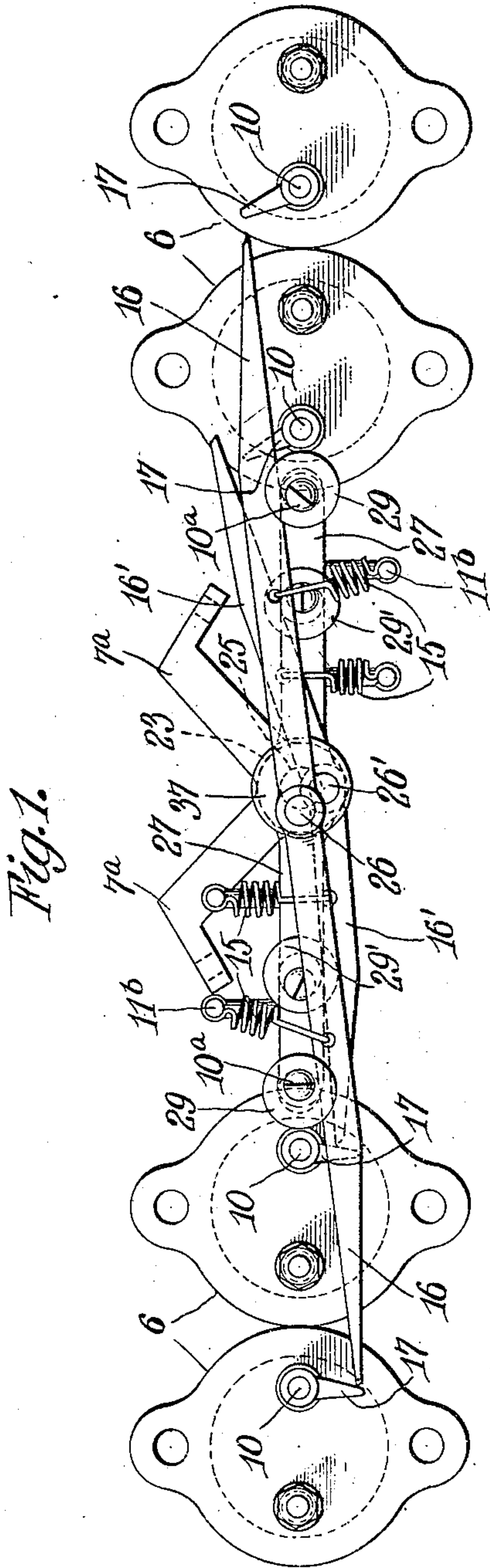
No. 880,650.

PATENTED MAR. 3, 1908.

P. GAETH.
SPARKING IGNITER.

APPLICATION FILED APR. 9, 1907.

2 SHEETS—SHEET 1.



Paul Gaeth.
Inventor

Witnesses

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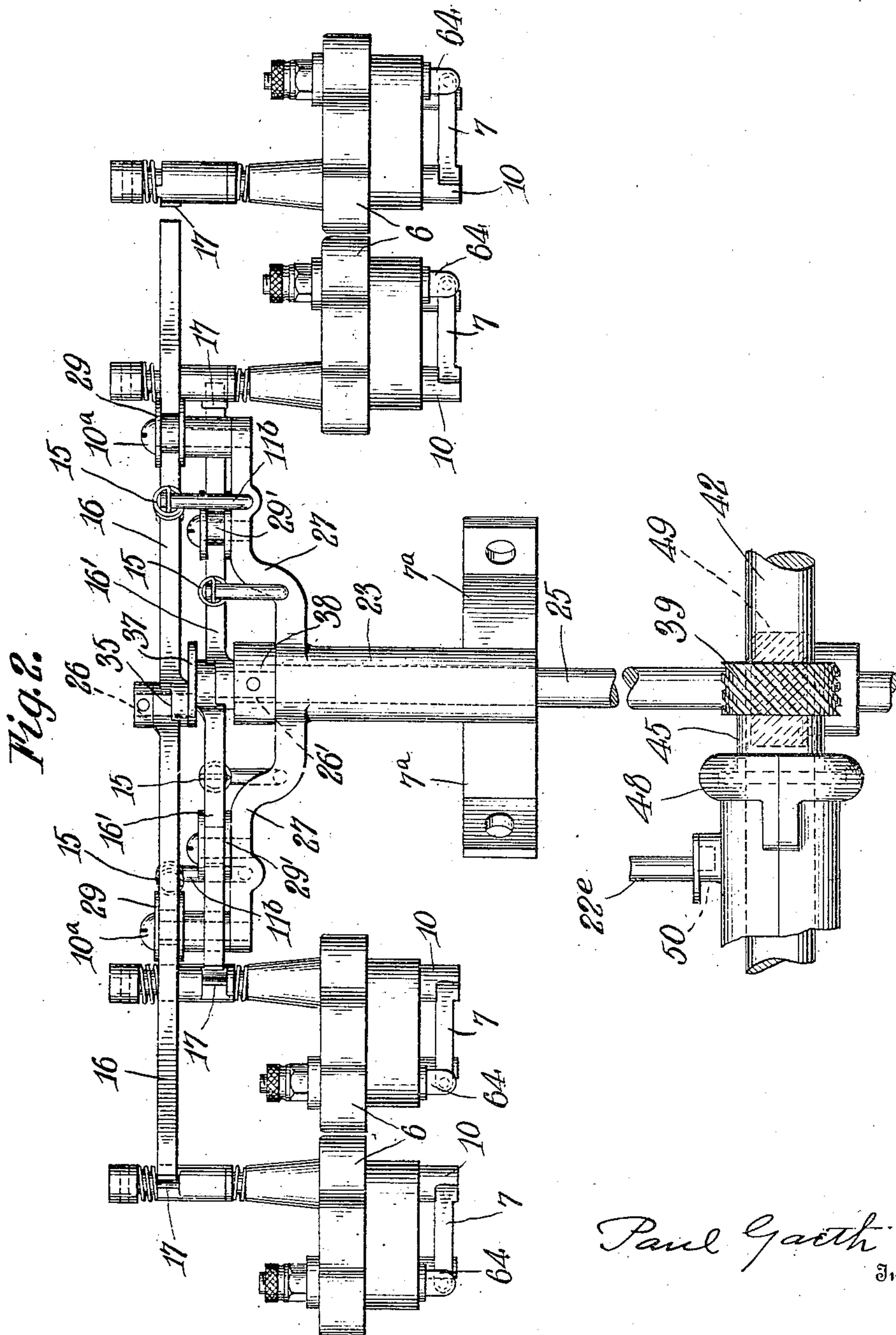
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UNITED STATES PATENT OFFICE.

PAUL GAETH, OF CLEVELAND, OHIO.

SPARKING IGNITER.

No. 880,650.

Specification of Letters Patent.

Patented March 3, 1908.

Application filed April 9, 1907. Serial No. 367,179.

To all whom it may concern:

Be it known that I, PAUL GAETH, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Sparking Igniters, of which the following is a specification.

This invention relates particularly to sparking igniters of the make and break type for internal combustion engines, and has for its object to provide improved means for operating, in proper sequence, the sparkers of multiple cylinder engines, said operation being effected by connections or means actuated by a single operating shaft. Improved means are also provided for adjusting the operating shaft so as to advance or retard the ignition, the adjustment being the same for all the cylinders, thereby maintaining the proper timing of the respective cylinders in all positions.

The invention is illustrated in the accompanying drawings, in which

Figure 1 is a plan view of four sparkers and the operating mechanism. Fig. 2 is a side elevation thereof. Fig. 3 is an end view of the adjusting device.

Referring specifically to the drawings, 6 indicates a make and break sparker, which may be of the type having a fixed electrode 64 and a rocking electrode 7, carried at the inner end of the trigger stem 10 which extends through the plug and carries at its outer end a spring-actuated trigger 17.

As shown in the drawings, there are four of these sparkers, the arrangement being suitable for a four cylinder engine, one of the sparkers being applied to each cylinder.

23 indicates a bearing bracket sleeve having feet 7^a whereby it may be bolted to the cylinder, and having arms 27 to support other parts to be hereinafter described.

25 indicates an operating shaft extending through the sleeve and supported therein by a collar 38 at the top, which collar carries double crank pins 26 and 26' which are connected by a table 37. The crank pins are set respectively on a quarter, and act to operate the two pairs of push rods by which the triggers of the respective sparkers are actuated.

The upper crank pin 26 carries the oppositely extending long push rods 16, these rods being halved and lapped, as indicated at 35, so as to extend in alinement with each other. They work respectively over spools 29 supported by bolts 10^a on the arms 27,

and they are held to the spools by means of springs 15 connected to fingers 11^b. These push rods are adapted to actuate the sparkers of the two end cylinders.

The inner or lower pair of short push rods 16' are connected in a manner similar to that above described to the lower crank pin 26', and work over spools 29' against which they are held by the springs 15, and actuate the two intermediate sparkers.

The triggers of the respective sparkers, on opposite sides of the shaft 25 (which is located between the two intermediate cylinders) project in opposite directions on opposite sides of a line drawn through the axes of the four sparkers, and the push rods on the respective sides of the shaft 25 are positioned on opposite sides of the spools 29 and 29', giving thereby a directly opposite motion or reciprocation of the push rods. The upper and lower pairs being set on quarters, the rotation of the shaft 25 causes the push rods to actuate the triggers of the four cylinders in succession. Obviously by setting the crank pins at halves two sparkers may be simultaneously actuated; but the successive operation suits the preferred construction and operation of four cylinder engines, particularly those used in automobile work.

The shaft 25 may be set forward or back to advance or retard the spark. It carries a spiral gear 49 in mesh with a spiral gear 39 which is formed with a sleeve and a collar 45 and is slidable on the main cam shaft 42 of the engine. The collar 45 is engaged by a split sleeve 48 which is movable along the cam shaft by means of a crank pin 50 projecting from a shaft 22^e which may be extended to a position convenient for operation. By turning the shaft 22^e the split sleeve 48 may be moved one way or the other along the cam shaft 42, carrying with it the spiral gear 39 and thereby turning the shaft 25 to vary the set of said shaft with respect to the stroke of the engine and to advance or retard the operation of the sparkers accordingly, at all four cylinders.

When the shaft 25 is turned the push rods advance in succession against the respective triggers and turn the same until, in consequence of the lateral movement or vibration over the spools 29 and 29' the outer ends of the push rods are caused to slip off the triggers. The advance movement brings the electrodes of the sparkers together, and when the push rods slip off the triggers, the elec-

trodes are snapped apart by the trigger spring, in a manner well-known in such sparkers, thereby drawing a spark at the time of the separation.

5 Obviously the invention is not limited to the exact construction shown, but the same inventive idea may be utilized in various modifications.

I claim:

10 1. The combination with quadruple sparkers arranged in a row and having movable electrodes, of an operating shaft at the middle of the row having a pair of cranks set at a quarter to each other, and a pair of oppositely extending push rods connected to each
15 crank and extending toward the sparkers and arranged to operate said electrodes, one pair

being long to operate the sparkers at opposite ends of the row and the other being short to operate the intermediate sparkers.

20 2. The combination with a plurality of sparkers having rocking electrodes, of a shaft having a crank, and push rods connected to the crank and extending at various angles toward the sparkers and arranged to operate
25 said electrodes, guide rollers over which the push rods work, and means to hold the rods thereto.

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

PAUL GAETH.

Witnesses:

JOHN A. BOMMARDT,
SHIRLEY J. BOMMARDT.