

No. 723,540.

PATENTED MAR. 24, 1903.

T. C. MENGES.

IGNITER OPERATING MECHANISM FOR EXPLOSIVE ENGINES.

APPLICATION FILED AUG. 29, 1902.

NO MODEL.

Fig. 1.

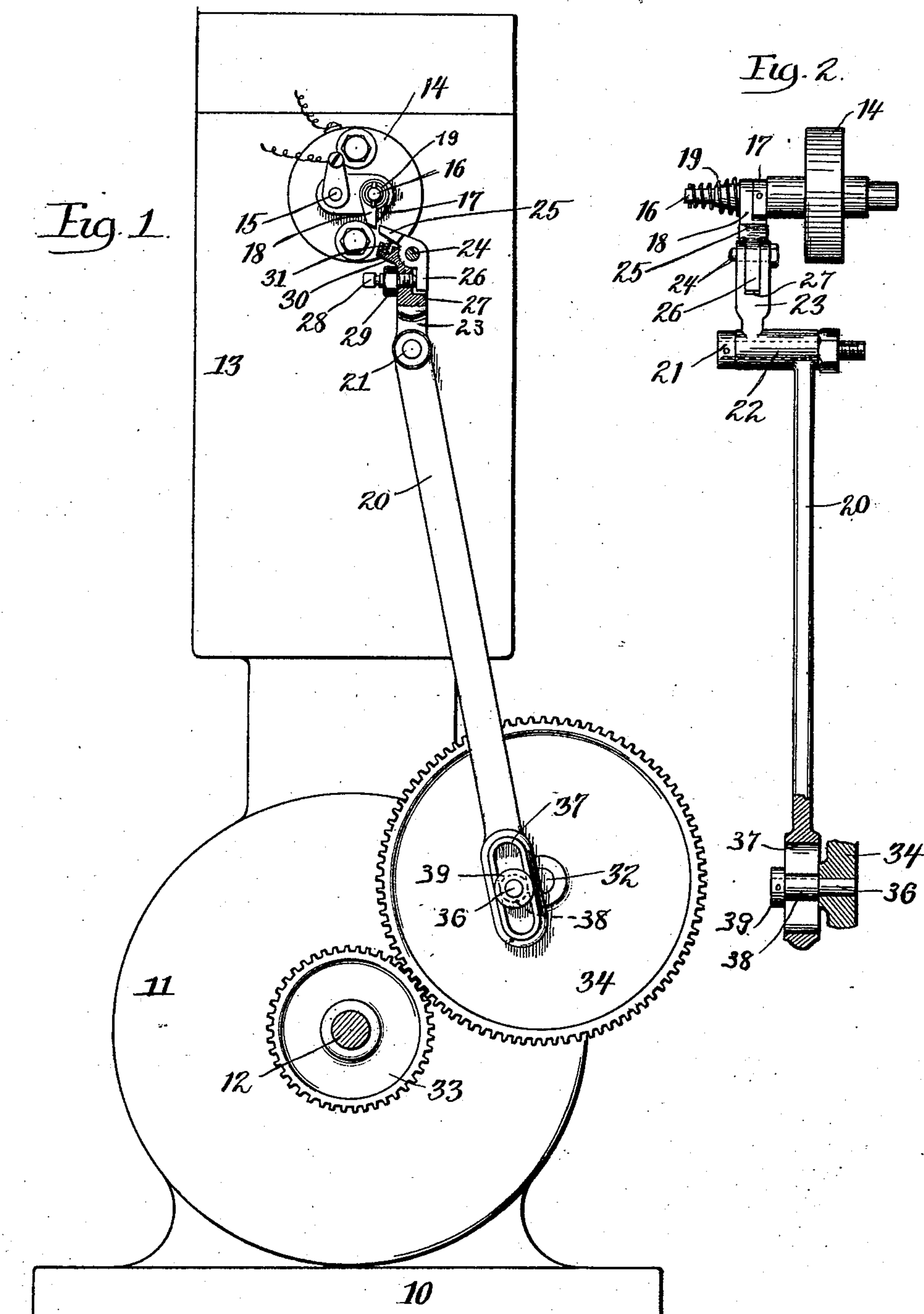
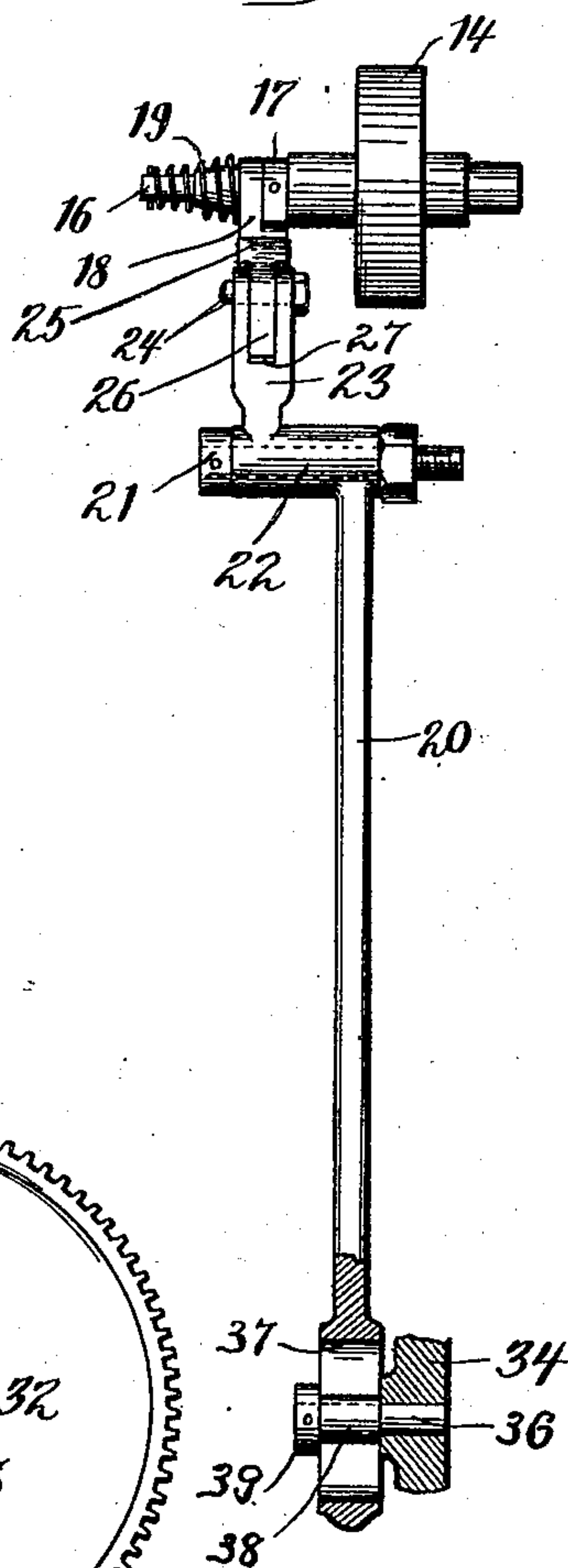


Fig. 2.



Witnesses:
Frederick A. [Signature]
Harry L. Clapp

Inventor
Theodore C. Menges
By *Peirce & Fisher*
his Attorneys.

UNITED STATES PATENT OFFICE.

THEODORE C. MENGES, OF WATERLOO, IOWA, ASSIGNOR TO CASCADEN MANUFACTURING COMPANY, OF WATERLOO, IOWA, A CORPORATION.

IGNITER-OPERATING MECHANISM FOR EXPLOSIVE-ENGINES.

SPECIFICATION forming part of Letters Patent No. 723,540, dated March 24, 1903.

Application filed August 29, 1902. Serial No. 121,475. (No model.)

To all whom it may concern:

Be it known that I, THEODORE C. MENGES, a citizen of the United States, and a resident of Waterloo, county of Blackhawk, and State of Iowa, have invented certain new and useful Improvements in Igniter-Operating Mechanism for Explosive-Engines, of which the following is declared to be a full, clear, and exact description.

10 The invention relates to operating mechanism for the electric igniters of explosive-engines, and seeks to provide a simple and effective construction which will be quiet and reliable in its operation.

15 With these objects in view the invention consists in the features of construction, arrangement, and combinations of parts set forth in the following description, illustrated in the accompanying drawings, and particularly pointed out in the appended claims.

20 In the drawings, Figure 1 is a front elevation of an upright explosive-engine with the improvement applied, certain parts of the latter being shown in section. Fig. 2 is a side elevation of the improved igniter-operator mechanism with parts shown in section.

25 For convenience the improvement is illustrated in connection with an explosive-engine of the four-cycle type; but it will be understood that it could be readily adapted to engines of other types and cycles.

30 The base-plate 10 is surmounted by the crank-casing 11, in which is suitably journaled the crank-shaft 12. The upright cylinder 13 above the crank-casing is provided in its side wall, near its upper end, with the usual igniter-plug 14, which carries, in this instance, the fixed and movable electrodes 15 and 16.

35 The arrangement of igniter-plug and fixed and movable electrodes may be of any convenient or suitable type. In the form shown both electrodes are carried in the same plug, and the oscillating electrode 16 is journaled in the plug 14. Near the outer end of the oscillating electrode 16 is pinned or otherwise fixed a stop arm or finger 17, and adjacent thereto is loosely mounted a projecting trip or finger 18, which is connected to the electrode by a coil-spring 19 and arranged to engage the stop-arm 17.

An igniter-operating lever 20 is pivotally mounted near its inner end to oscillate upon a pivot-pin 21, which is threaded into or otherwise fixed to the wall of the cylinder 13. To provide a long bearing for the igniter-lever 20, it is preferably provided at its pivot-point with a sleeve 22, which surrounds the pivot-pin 21 and to which the opposite ends of the lever are connected in offset relation, as shown in Fig. 2.

The upper or inner end 23 of the igniter-lever is forked, as shown, and within this fork end is pivoted, upon a bolt 24, a pawl 25, which is arranged to engage the projecting end of the trip or finger 18. Pawl 25 is provided with a tailpiece 26, which extends at an angle to the body of the pawl and within a recess 27, formed in the upper end 23 of the actuating-lever. An adjusting stop-screw 28 is threaded through the upper end of the actuating-lever and engages the tailpiece 26 of the pawl 25. A set-nut 29 is provided for the stop-screw 28 in order that it may be securely held in adjustable position. An offset 30 upon the upper end of the actuating-lever is provided with a recess within which is seated a compression-spring 31, which engages with pawl 25 and normally holds it with its tailpiece 26 in engagement with the stop-screw 28.

32 Crank-shaft 12 is connected to a gear-shaft 32 by the two-to-one gears 33 and 34, fixed, respectively, to said shafts. Shaft 32 is provided with a crank or similar actuating pin 36, eccentrically mounted with reference to the axis of shaft 32, and the igniter-lever 20 is provided at its outer end with a longitudinal elongated slot 37, with which pin 36 engages, so that the igniter-lever 20 is oscillated once in every two revolutions of the crank-shaft 12.

38 Preferably to reduce friction and to provide a connection with little lost motion a hardened-steel roller 38 is mounted upon the pin 36 and within the slot 37. This roller is held in place by a collar 39, pinned or otherwise fixed to the end of the pin 36.

The actuating-pin 36 for the slotted lever 20 may be driven in any other suitable manner, in accordance to the particular type of engine to which the improvement may be applied—that is to say, the actuating-pin 36 may be suitably connected to any moving

part of the engine in such a manner as to give an oscillating movement to the igniter-lever 20.

As shown in Fig. 1, the opposite ends of the operating-lever are arranged at an angle to each other or are out of line in order to bring the same in proper relation to the actuating-pin 36 and the trip or finger 18, and preferably the fixed pivot 21 for the lever is arranged nearer the inner end of the lever, as shown. In the operation of parts pawl 25 engages the trip 18 during its forward movement, and the latter, through the medium of its yielding spring connection 19, shifts the movable electrode 16 into engagement with the fixed electrode. As soon as engagement is effected the further movement of trip 18 serves only to compress the coil-spring 19. After the electrodes are brought into engagement pawl 25 snaps off trip-finger 18, and the latter moves quickly back under the influence of spring 19, strikes the stop arm or finger 17, and separates the electrodes with a rapid movement. During the return movement of the operating-lever 20 pawl 25 passes beneath the trip-finger 18, compressing its spring 30, which at the end of the oscillation returns the pawl 25 into position to engage trip 18 at the next oscillation of the igniter-lever.

At the beginning of the stroke of the igniter-lever the parts are in the position shown in Fig. 1, and it will be observed that in that position the actuating-pin 36 is at or near the center of the slot 37. As the actuating-pin 36 moves through the first third of its revolution it moves to and away from the end of the slot 37. Consequently the actuating-lever 20 is quickly shifted and the electrodes quickly brought into engagement; but at or near the end of the first half of the revolution of pin 36, at which point the snap-off of pawl 25 from trip 18 occurs, the pin 36 is at or near the center of slot 37, so that lever 20 moves slowly or is nearly stationary. By this arrangement the electrodes are quickly shifted into engagement, are held in contact for an appreciable length of time to thoroughly establish the electric circuit, and are then suddenly separated.

The operating mechanism has little lost motion and in practice has been found to operate smoothly, quietly, and reliably.

It is obvious that numerous changes could be made in the detail of structure without departure from the essentials of the invention as defined in the claims.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an explosive-engine, the combination with a shifting electrode, of a finger connected thereto, an igniter-operating lever for tripping said finger mounted intermediate its ends upon a fixed pivot, a longitudinal elongated slot in the outer end of said lever and an actuating-pin engaging said slot.

2. In an explosive-engine, the combination with a shifting electrode, of a projecting finger connected thereto, an igniter-operating lever mounted intermediate its ends upon a fixed pivot, a spring-held pawl pivoted to the inner end of said lever for engaging said finger, an elongated longitudinal slot cut in the outer end of said lever and an actuating-pin engaging said slot.

3. In an explosive-engine, the combination with a shifting electrode, of a projecting finger connected thereto, an igniter-operating lever mounted intermediate its ends upon a fixed pivot, a pawl pivoted to the inner end of said lever for tripping said finger, an adjusting-stop for said pawl, a spring holding the latter against said stop, a longitudinal elongated slot in the outer end of said lever, and an actuating-pin eccentrically mounted upon a revolving part of the engine and engaging said slot, the parts being so arranged that said pawl trips off from said finger when said pin is at or near the center of said slot.

4. In an explosive-engine, the combination with an oscillating electrode, of a projecting finger connected to the outer end of said electrode, an igniter-operating lever mounted adjacent its inner end upon a fixed pivot, a pawl pivoted upon the inner end of said lever for tripping said finger, a stop-screw adjustably threaded through the inner end of said lever and engaging said pawl, a cushion-spring interposed between the ends of said lever and said pawl for normally holding the latter against said stop, a longitudinal elongated slot in the outer end of said lever and an actuating-pin eccentrically mounted upon a revoluble part engaging said slot.

5. In an explosive-engine, the combination with an oscillating electrode, of a stop-arm fixed to the outer end of said electrode, a projecting finger loosely mounted on said electrode and normally engaging said stop-arm, a coil-spring connecting said projecting finger and said electrode, an igniter-operating lever mounted intermediate its ends upon a fixed pivot, a pawl upon the inner end of said lever for tripping said finger, a longitudinal elongated slot in the outer end of said lever and an actuated pin engaging said slot.

6. In an explosive-engine, the combination with an oscillated electrode, of a stop-arm fixed to the outer end thereof, a projecting finger loosely mounted on said electrode and engaging said stop-arm, a coil-spring connecting said electrode and said projecting finger, an igniter-operating lever mounted intermediate its ends upon a fixed pivot, a pawl pivoted to the inner end of said lever for tripping said finger, an adjusting-stop engaging said pawl, a spring normally holding said pawl against said stop, a longitudinal elongated slot in the outer end of said lever, and an actuated pin engaging said slot.

7. In an explosive-engine, the combination with an oscillating electrode, of a stop-arm fixed to the outer end thereof, a projecting fin-

ger loosely mounted on said electrode and normally engaging said stop-arm, a coil-spring connecting said finger and said electrode, an igniter-operating lever mounted adjacent its inner end upon a fixed pivot, a pawl pivoted to the inner end of said lever for tripping said finger, a stop adjustably threaded through the inner end of said lever and engaging the tail of said pawl, a cushion-spring interposed between the end of said lever and said pawl and normally holding the latter against said stop, a longitudinal elongated slot in the outer end of said lever, and an actuated pin eccentrically mounted upon a revoluble part of the machine and engaging said slot.

8. In an explosive-engine, the combination with a shifting electrode, of a projecting finger connecting thereto, an igniter-operating lever mounted intermediate its ends upon a fixed pivot, said lever comprising a sleeve journaled on said pivot and oppositely-disposed arms connected to said sleeve in offset relation, a longitudinal elongated slot in the outer end of said lever and an actuated pin engaging said slot.

9. In an explosive-engine, the combination

with a shifting-electrode, of a projecting finger connecting thereto, an igniter-operating lever mounted adjacent its inner end upon a fixed pivot and having its arms on either side of said pivot out of line, a pawl pivoted to the inner end of said lever for tripping said finger, a longitudinal elongated slot in the outer end of said lever, a crank-shaft, a gear-shaft on one side of said crank-shaft, two-to-one gearing connecting said shafts, an actuated pin eccentrically carried by said gear-shaft and engaging said slot.

10. In an explosive-engine, the combination with a shifting electrode, of a projecting finger connecting thereto, an igniter-operating lever mounted intermediate its ends upon a fixed pivot, a pawl upon the inner end of said lever for tripping said finger, a longitudinal elongated slot in the outer end of said lever, an actuating-pin within said slot and an anti-friction-roll journaled on said pivot and positioned within said slot.

THEODORE C. MENGES.

Witnesses:

EMMA RODOMAR,
IRA J. HOOVER.