

No. 762,708.

PATENTED JUNE 14, 1904.

R. B. HAIN.

SAFETY SPARK SHIFTING DEVICE FOR EXPLOSIVE ENGINES.

APPLICATION FILED APR. 28, 1903.

NO MODEL.

Fig. 1.

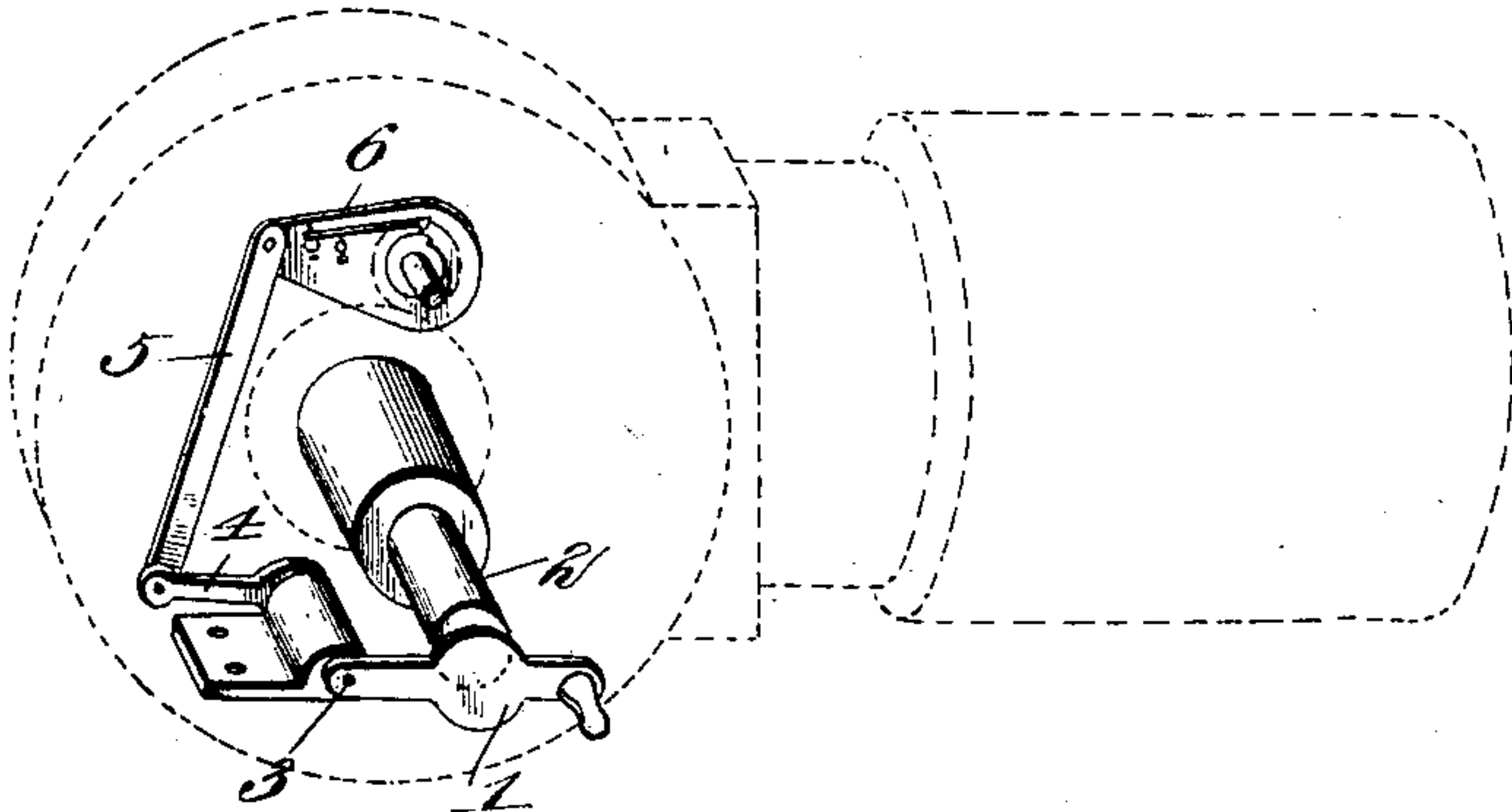
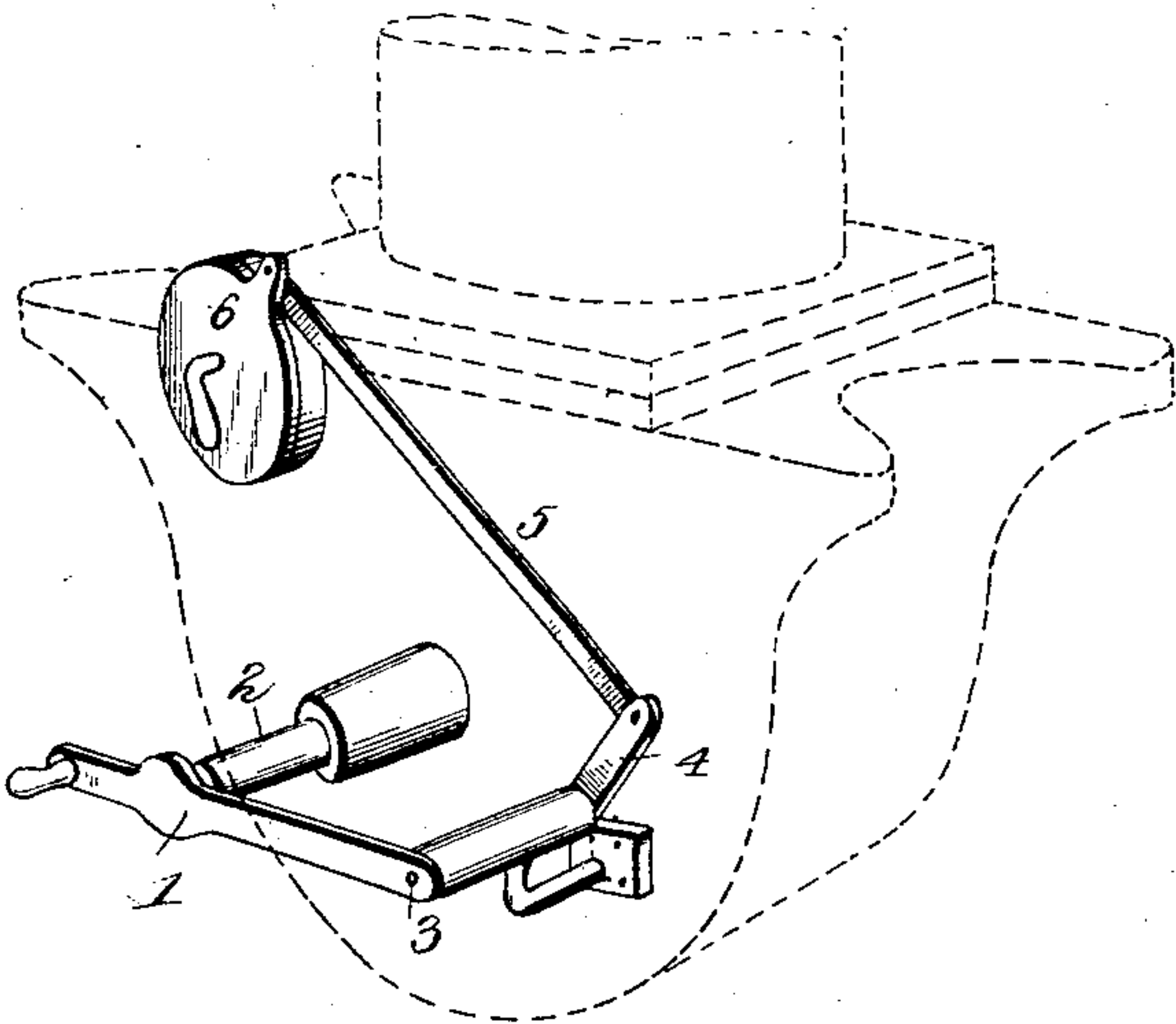


Fig. 2.



WITNESSES

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RALPH BENTON HAIN, OF LOS ANGELES, CALIFORNIA, ASSIGNOR TO AUTO VEHICLE COMPANY, OF LOS ANGELES, CALIFORNIA, A CORPORATION OF CALIFORNIA.

SAFETY SPARK-SHIFTING DEVICE FOR EXPLOSIVE-ENGINES.

SPECIFICATION forming part of Letters Patent No. 762,708, dated June 14, 1904.

Application filed April 28, 1903. Serial No. 154,728. (No model.)

To all whom it may concern:

Be it known that I, RALPH BENTON HAIN, a citizen of the United States, and a resident of Los Angeles, in the county of Los Angeles and State of California, have made certain new and useful Improvements in Safety Spark-Shifting Devices for Explosive-Engines, of which the following is a specification.

As is well known to all acquainted with the operation of gasoline engines or motors, a charge of mingled gasoline-vapor and atmospheric air is drawn into the cylinder and then compressed by the piston, and when the latter is at the top or limit of its stroke the explosive charge is ignited by an electric spark, and the resulting expansion of gases drives the piston back. It is important that such ignition shall not take place an instant in advance of the piston reaching the limit of its stroke, for a premature explosion of the charge in the cylinder would drive the engine, and consequently the vehicle on which it may be used, in the wrong direction and the starting-crank be driven back in the operator's hand, with liability of producing a sprained wrist or even a broken arm or rib. In other words, when an engine is being driven the time of contact of the electrical igniter is so arranged that the spark will take place when or before the crank reaches the center, the sparker being advanced for this purpose after the engine has been started. If the parts be left in such position, then upon attempting to start the engine the explosive charge ignites so soon as to "kick back," and the results above indicated are likely to follow. To prevent this and insure that the spark shall be set back at the time of starting the engine, I provide the guard hereinafter described and claimed, and illustrated in accompanying drawings, in which—

Figure 1 is a partly diagrammatic view in perspective, illustrating my invention and the position of its parts relative to the shaft and circuit-breaker of a gasoline-motor. Fig. 2 is mainly a diagrammatic perspective view illustrating another application of the invention.

Referring to Fig. 1, a bar or guard 1 is provided for the end of the engine-shaft 2, to which a crank or key must be applied for starting the engine, (which is effected by setting the piston and crank on dead-center or, preferably, a little beyond it.) This guard 1 is provided with a pivot 3, which is in the nature of a rocking journal or rock-shaft, and the opposite end of the latter is provided with a radial arm 4, which is connected by a link 5 with the contact make-and-break device 6. The latter is shiftable radially on a shaft arranged counter to and driven from the main shaft 2. The guard 1 is practically a lever having its central portion somewhat broadened. In normal horizontal position its central portion conceals and protects the engine-shaft 2. Hence a crank or key cannot be applied to the latter for starting the engine without first raising the lever 1, which necessarily shifts the arm 6, carrying the contact make-and-break device backward or downward, so that the spark produced in the course of rotation of the said arm will be retarded to the point of safety. In other words, the circuit will not be broken and the charge ignited prematurely, but with certainty after the piston and crank shall have passed the dead-center point. After the engine has been thus safely started the contact make-and-break device will be shifted back to the normal position and the spark thus advanced, as usual for speeding. This shifting or readjustment will restore the guard 1 to its normal position covering the shaft, as indicated in Fig. 1.

In Fig. 2 I illustrate diagrammatically the application of my invention to another form of circuit-breaker. In fact, the invention is broadly applicable, under various modifications of form and arrangement of parts, to nearly all engines on the market, for the reason that in nearly all a circuit-breaker or contact make-and-break device is provided and the same adapted for being shifted or rotated for the purpose of changing the time of producing the spark.

What I claim is—

The combination, with the shaft of an explosive-engine and a shiftable electrical circuit-breaker and a sparking device connected
5 with the latter, of a cover for the end of said shaft, a rocking journal for said cover having a radial arm, and a link pivotally connecting such journal-arm with the circuit-breaker,

whereby upon raising the cover, the circuit-breaker is shifted correspondingly, substantially as shown and described. 10

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Witnesses:

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