

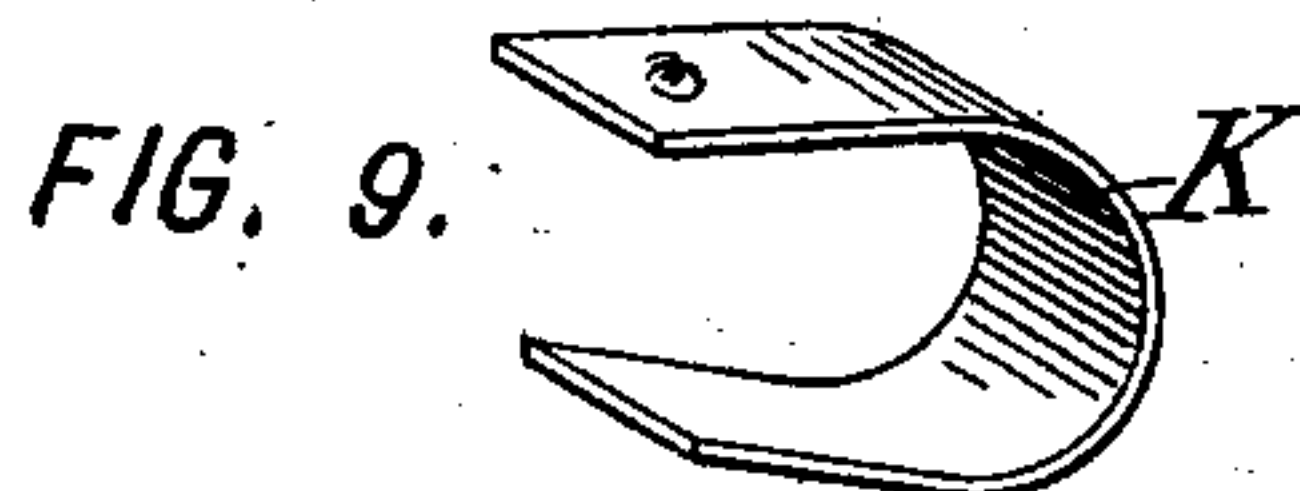
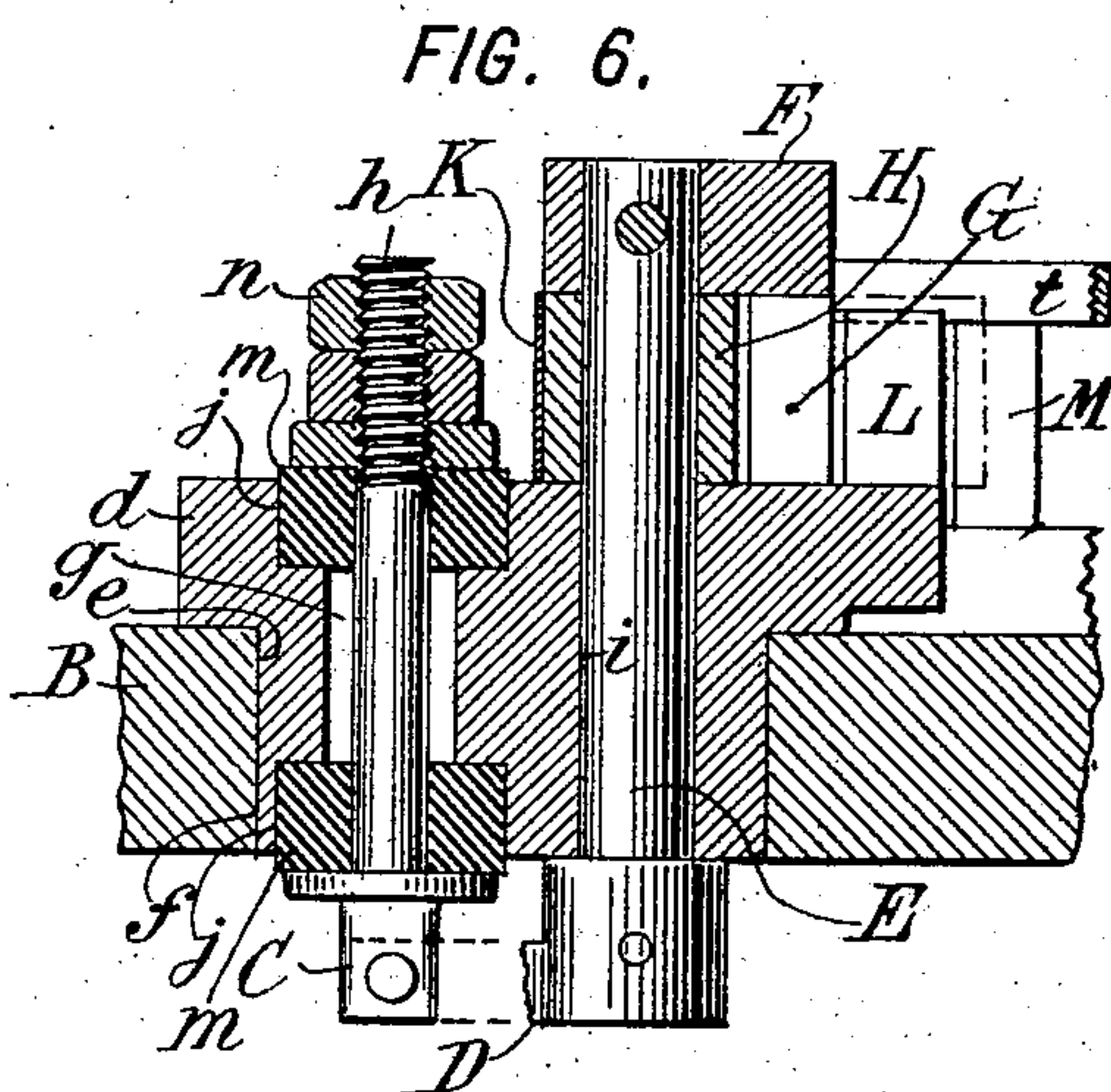
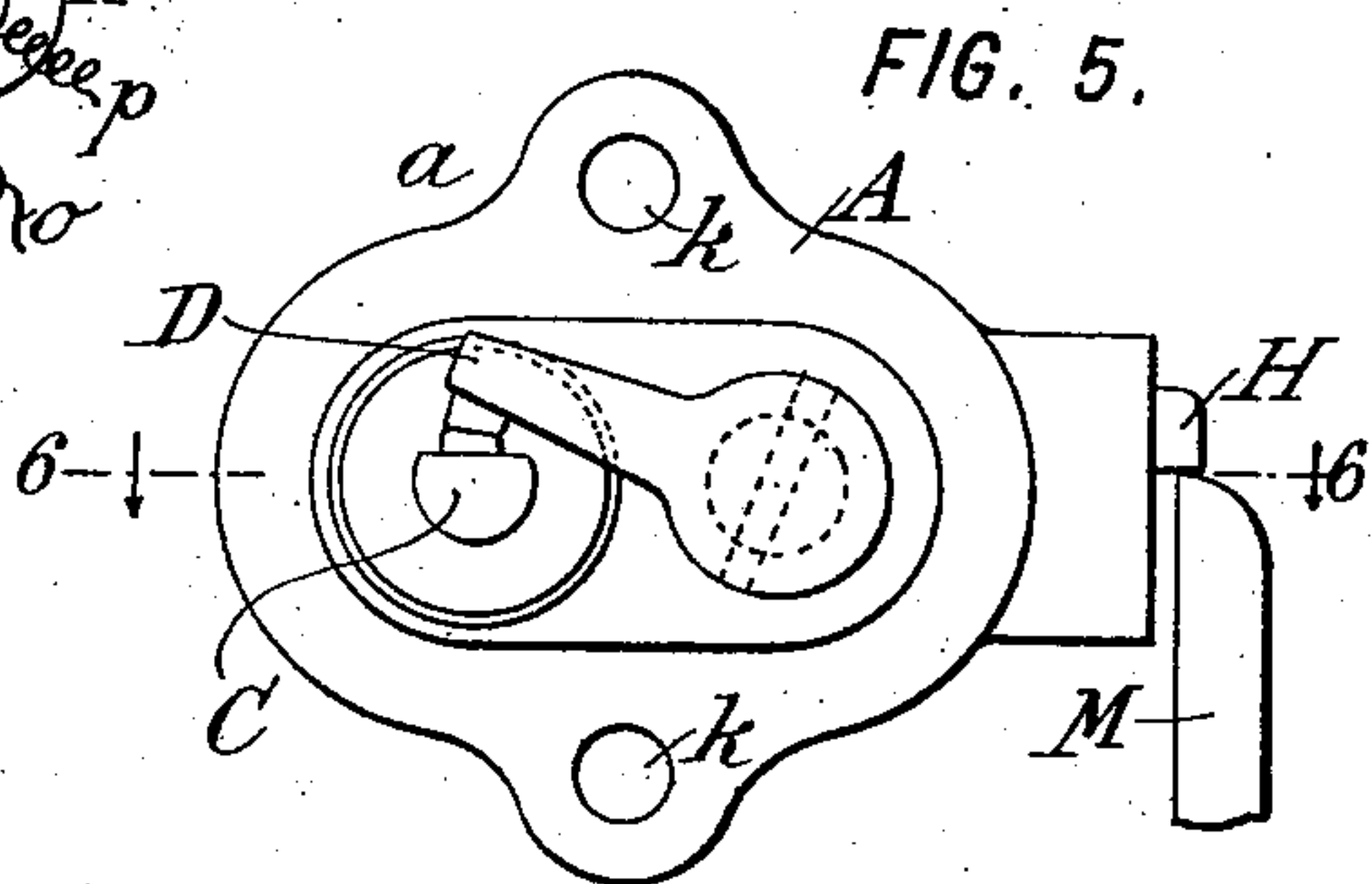
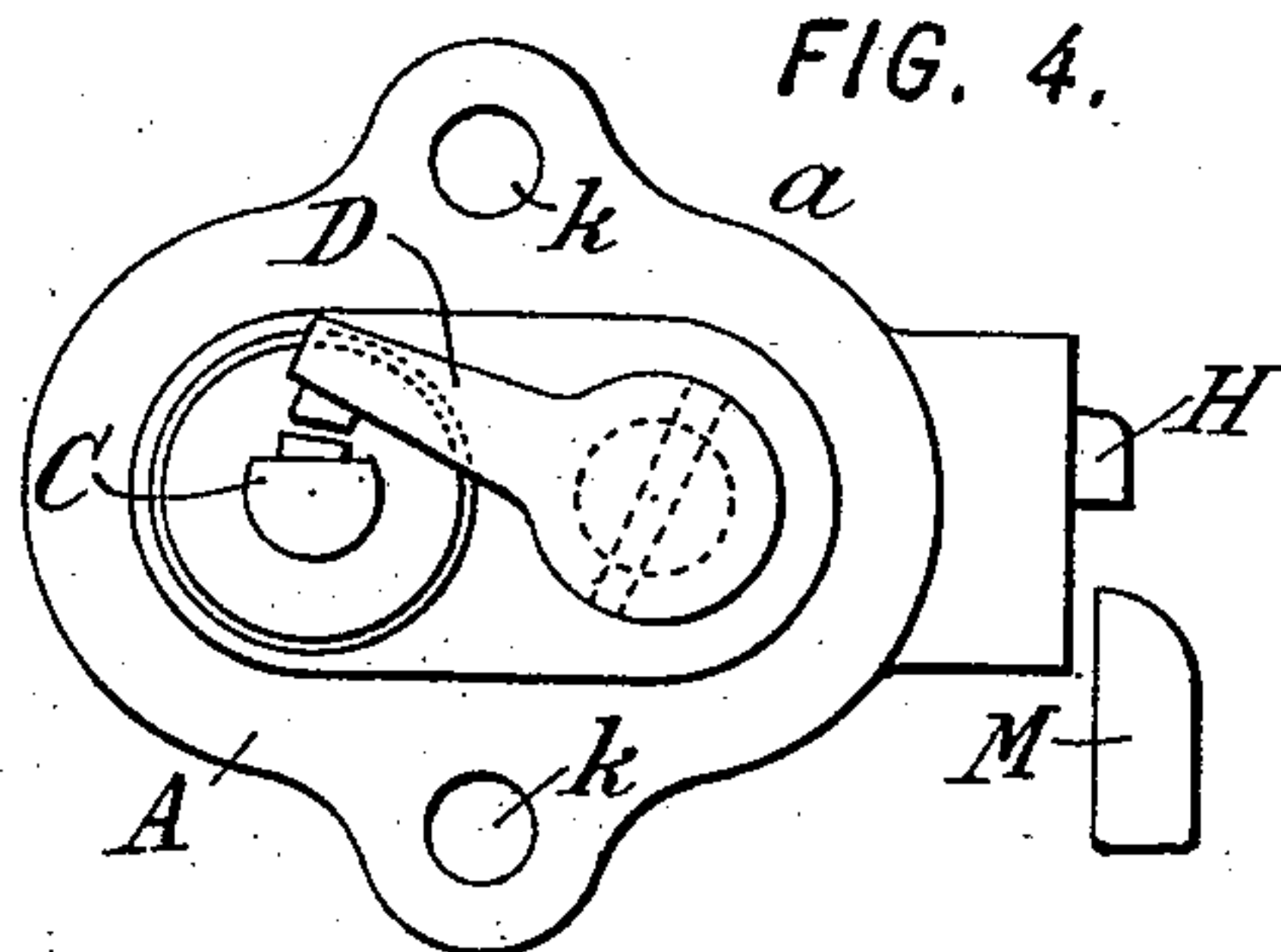
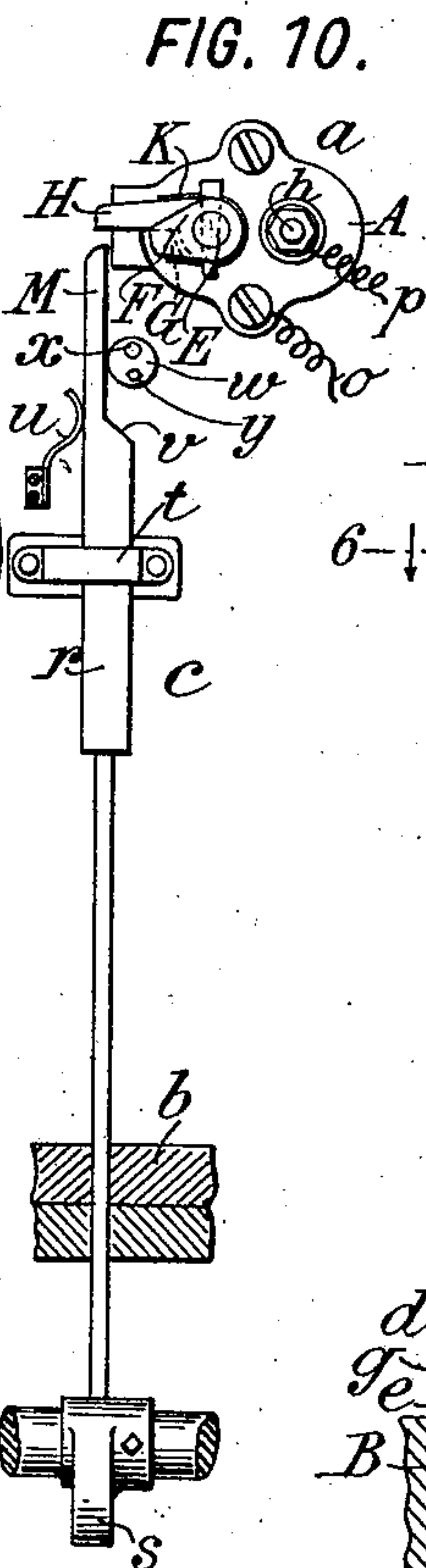
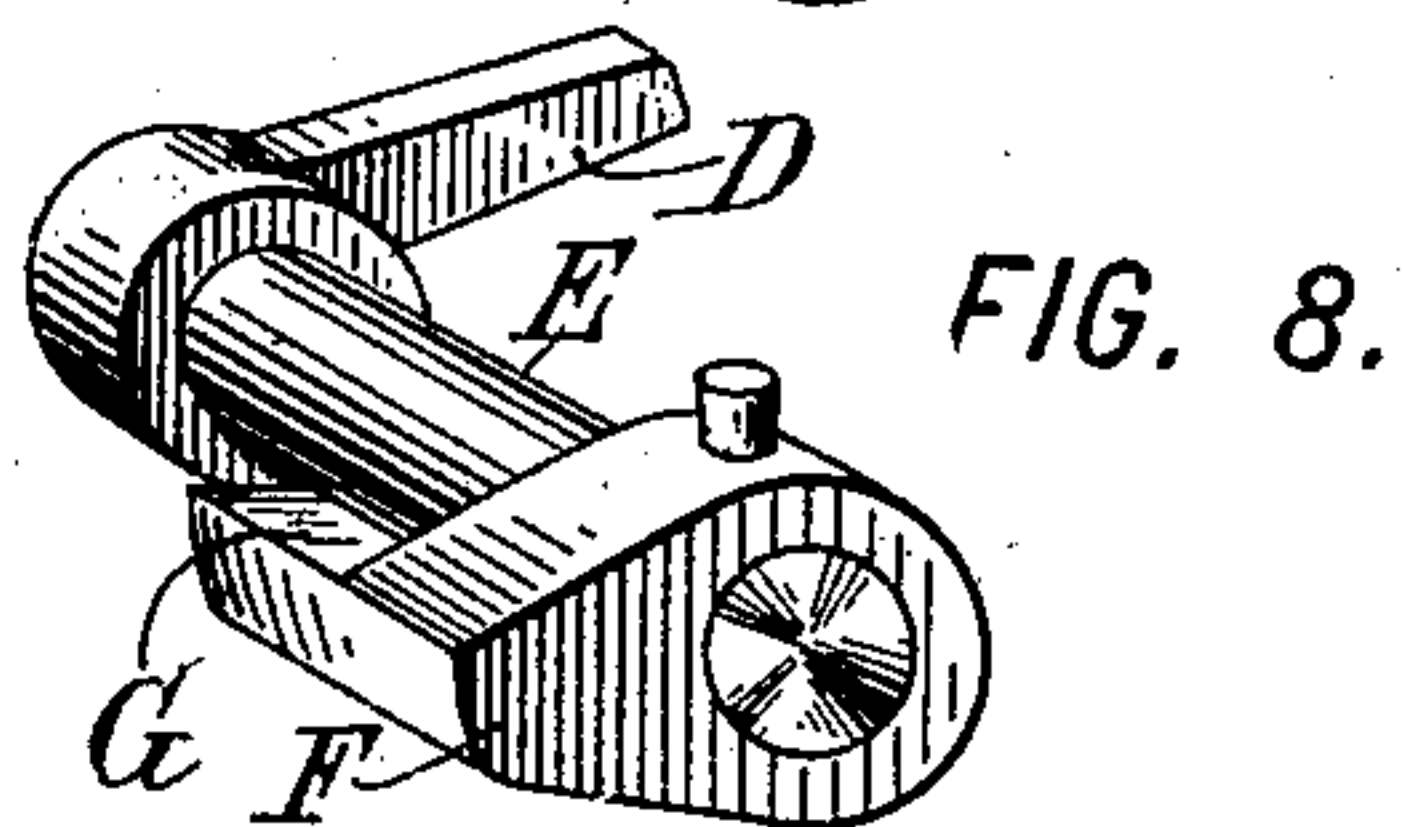
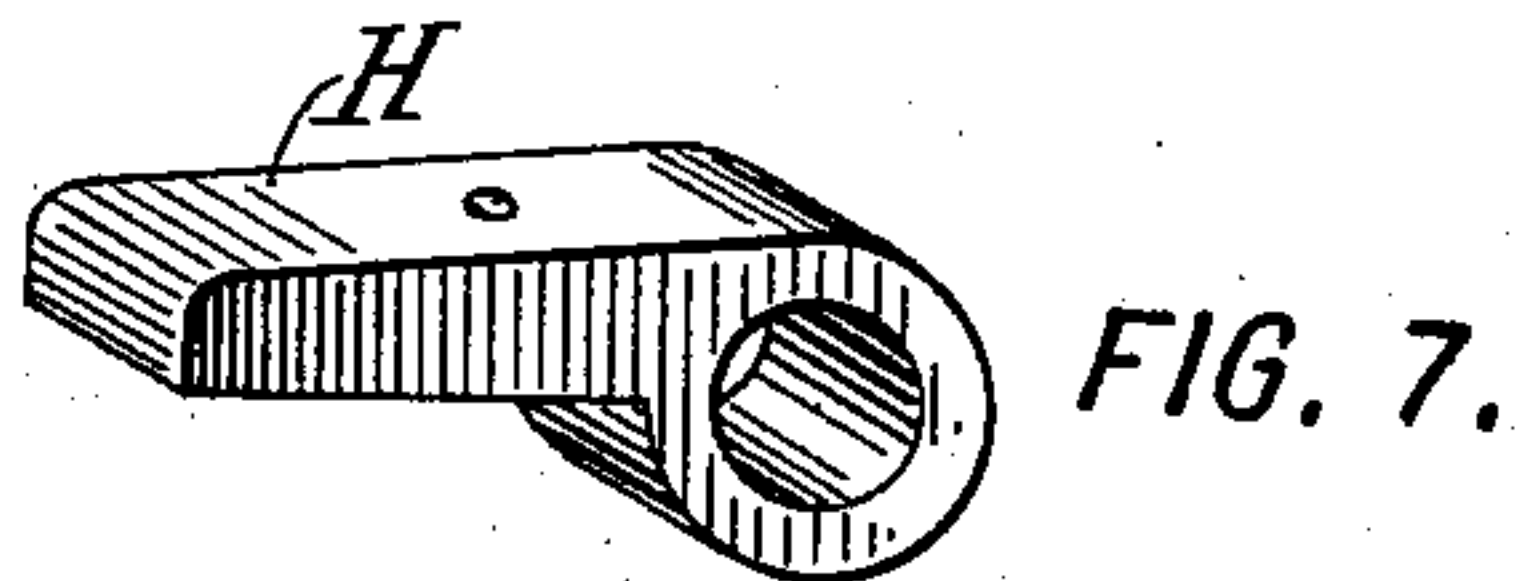
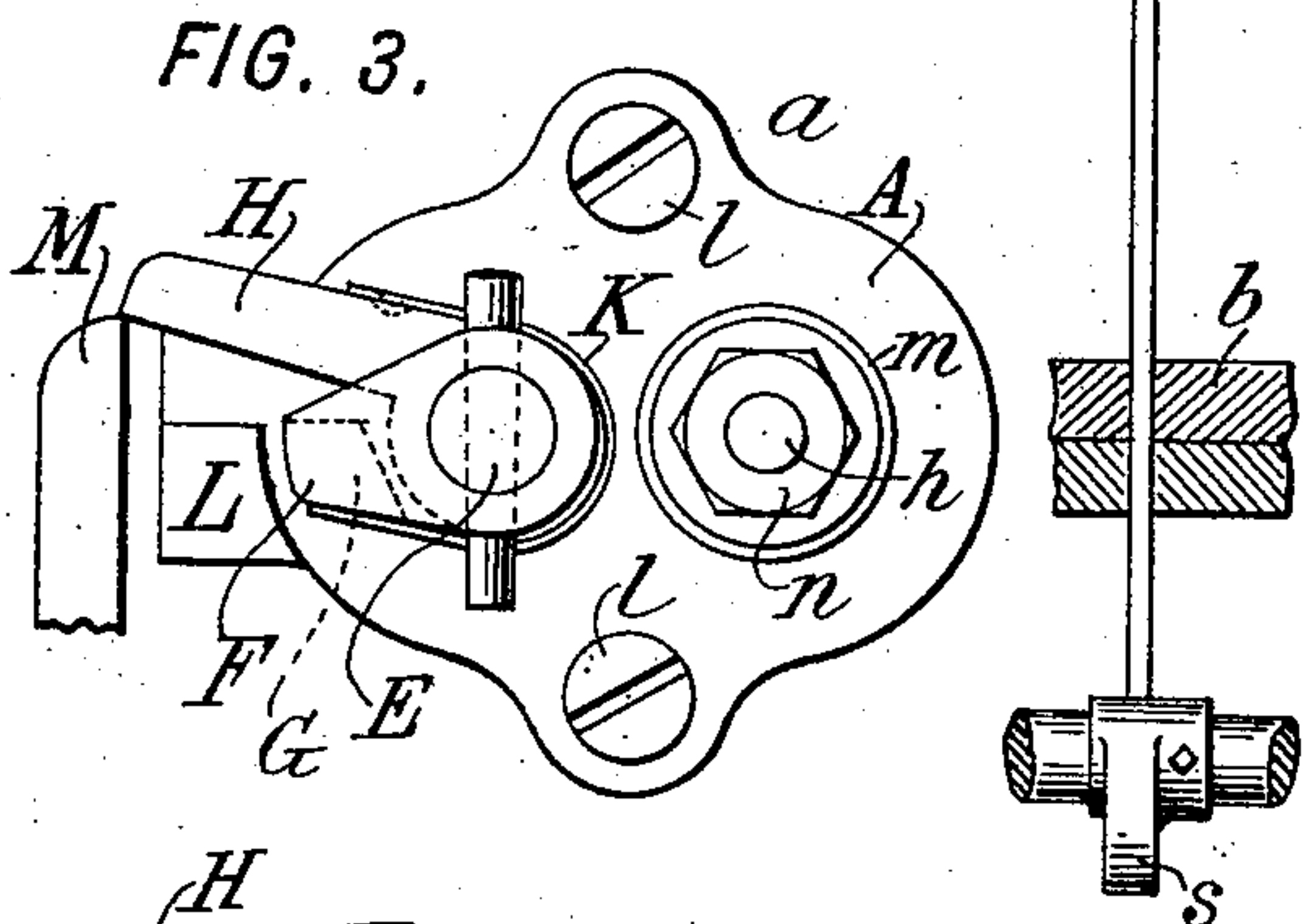
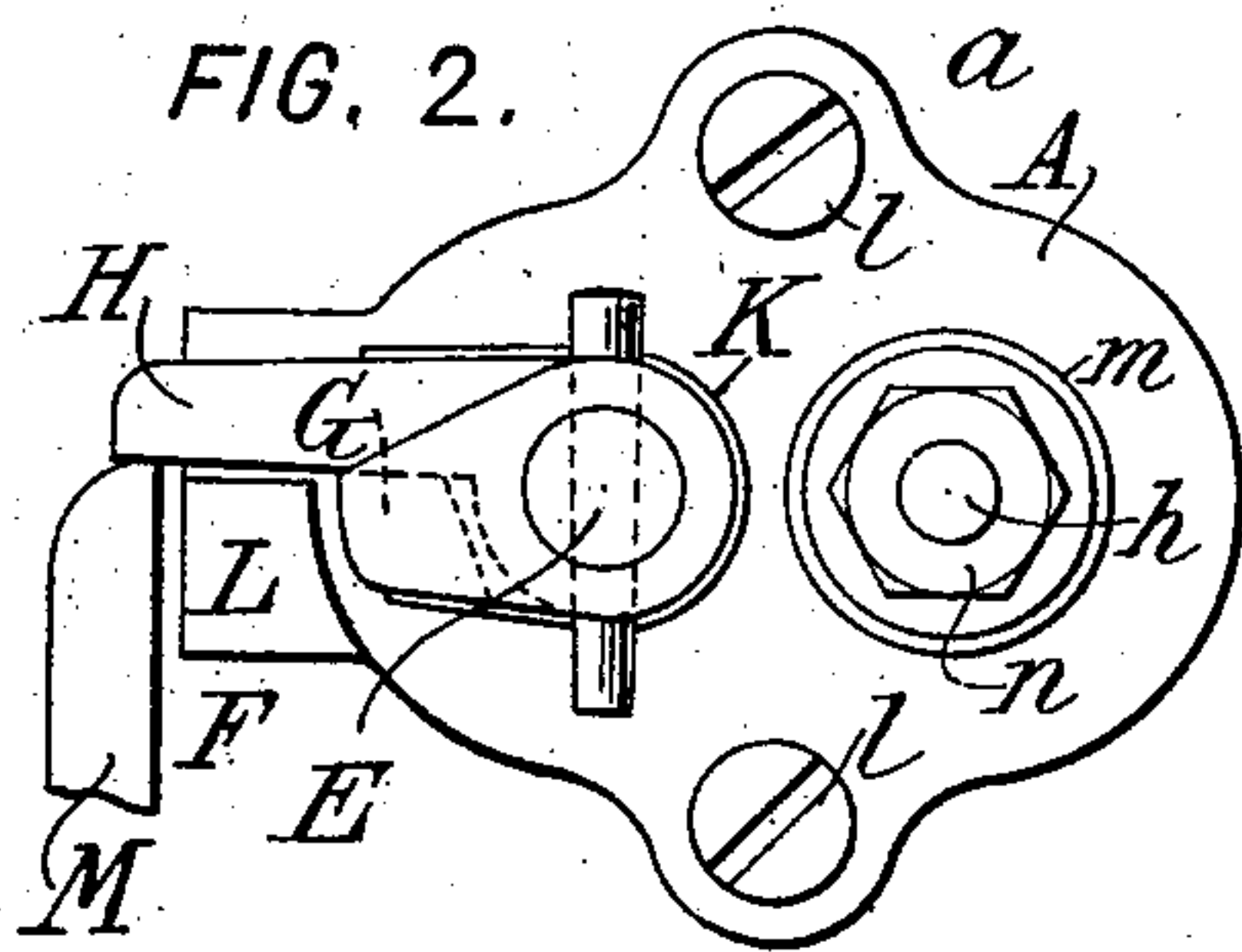
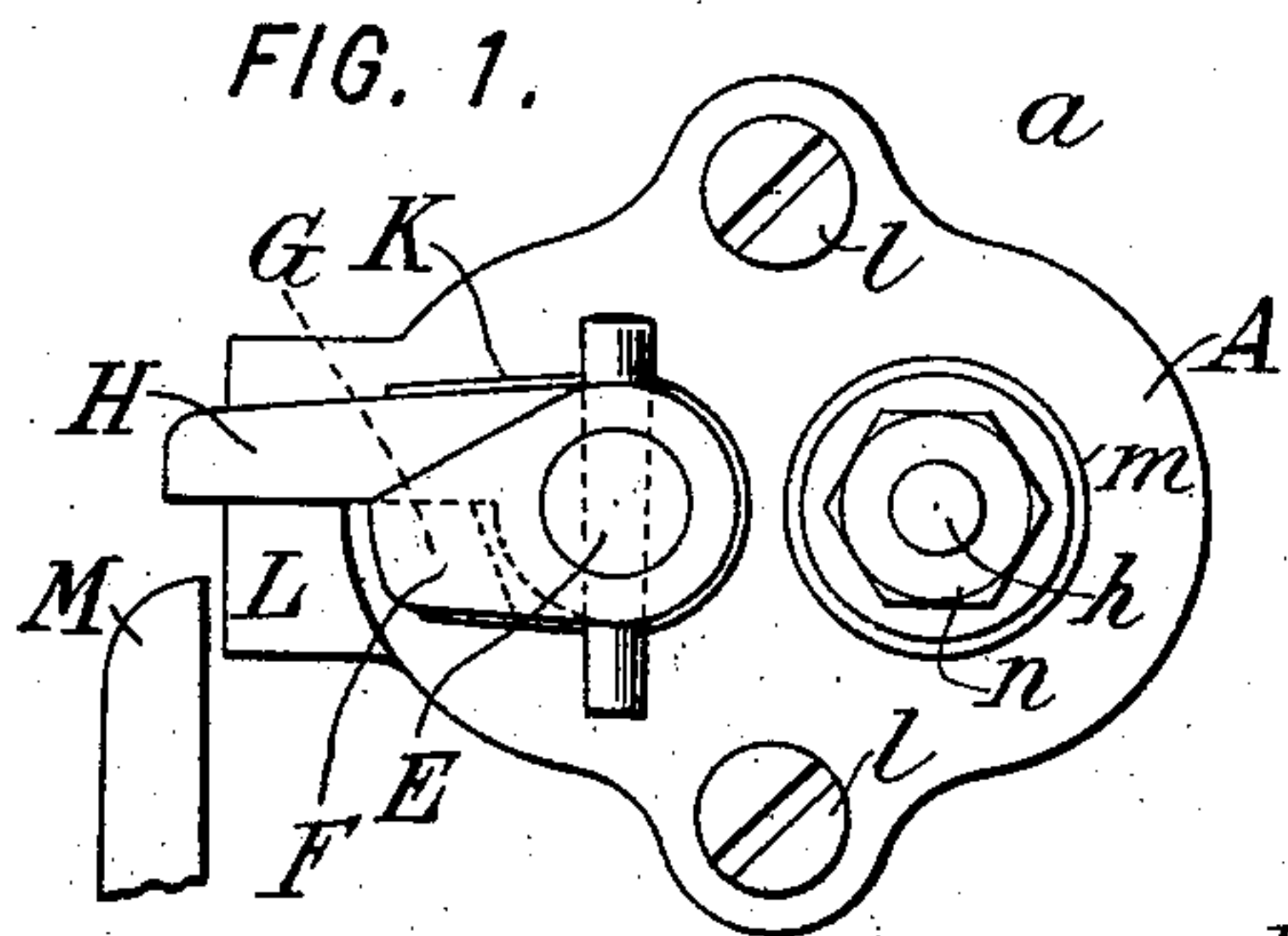
No. 696,147.

Patented Mar. 25, 1902.

C. C. & E. A. RIOTTE.  
IGNITER.

(Application filed Dec. 2, 1899.)

(No Model.)



WITNESSES:

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Arthur C. Fraser & Co.



# UNITED STATES PATENT OFFICE.

CARL C. RIOTTE AND EUGENE A. RIOTTE, OF NEW YORK, N. Y., ASSIGNORS,  
BY MESNE ASSIGNMENTS, TO U. S. LONG DISTANCE AUTOMOBILE COM-  
PANY, OF ELIZABETH, NEW JERSEY, A CORPORATION OF NEW JERSEY.

## IGNITER.

SPECIFICATION forming part of Letters Patent No. 696,147, dated March 25, 1902.

Application filed December 2, 1899. Serial No. 738,959. (No model.)

*To all whom it may concern:*

Be it known that we, CARL C. RIOTTE and EUGENE A. RIOTTE, citizens of the United States, and residents of the city, county, and State of New York, have jointly invented certain new and useful Improvements in Igniters, of which the following is a specification.

This invention relates to igniters for explosion-engines and to similar devices, and aims to provide an improved device especially applicable for use as a circuit-breaker or open-circuit igniter for gas, gasoline, or vapor engines.

In igniters it has been difficult to obtain a quick blow for separating the contacts. Trouble has been found in arresting the motion of the rapidly-moving parts, and the construction has not been as simple, cheap, and durable as is desirable for some uses.

Our invention aims to provide for a quick blow and to avoid danger of injury or wear by reason of the impact or sudden stoppage of the moving part, to simplify the construction of the igniter, to provide an improved attachment comprising in itself a complete igniter adapted to ready application to or removal from an engine, to provide improved operating means for an igniter, and to provide improved details of construction constituting articles of manufacture useful for igniters and other devices in which a quick action is desirable. To this end we provide certain improvements, which will be hereinafter fully set forth.

In the accompanying drawings, which illustrate the preferred form of our improvements as applied to an igniter for an explosion-engine, Figures 1, 2, and 3 are front elevations of the igniter, showing its hammer in its three critical positions. Fig. 4 is a rear elevation showing the position of the contacts or electrical terminals corresponding to the position of the hammer in Fig. 1. Fig. 5 is a similar view showing the positions of the contacts corresponding to the positions of the hammer in Figs. 2 and 3. Fig. 6 is a horizontal section cut on the line 6 6 of Fig. 5 and showing the engine-frame or cylinder-wall in fragmentary section. Figs. 7, 8, and 9 are detail views of the hammer, the movable contact member, and the spring, respectively; and

Fig. 10 is a fragmentary front elevation on a smaller scale, showing the operating means.

Referring to the drawings, *a* indicates the improved igniter attachment as a whole, *b* the wall or frame of an engine, and *c* the operating mechanism for the igniter.

In the form of our improved igniter shown, *A* represents the main frame of the igniter, which is attached to the cylinder *B* and carries all the working parts of the igniter, so that the sparking contacts shall project within a place where ignition is desired, usually inside the cylinder, and the operating mechanism shall be exposed outside where convenient for access and for engagement with the lifter or other means for operating the igniter.

*C* and *D* are the fixed and movable contacts, respectively, the latter being fixed on a shaft *E*, which carries an arm *F* on its outer end, held thereon by a pin, as shown. Projecting laterally from the arm *F* is a shoulder *G*, and journaled on the shaft at a point opposite the shoulder *G* is a weight or hammer *H*. A spring *K* passes around the shaft *E* and bears against the upper side of the hammer *H* and the under side of the shoulder *G* with a pressure of its ends inward against these parts, tending to hold them together.

Projecting outward from the frame *A* is a stop *L*, shown as a lug formed integrally with the frame, at such a point that when the hammer *H* rests on it and the arm *F* is held up by the spring the contacts *C* and *D* will be slightly separated, as shown in full lines in Fig. 4.

*M* represents the lifter, which may be operated by the engine in any well-known manner, its function being to lift the weight *H* slowly to a predetermined point and then to move laterally out of the path of the weight and permit the latter to fall, the lifter returning to a position under the weight and lifting again at each stroke.

The frame *A* is preferably a single metal piece having a wide body or flange *d* for fitting against the wall *B*, a neck or projection *e* for fitting into the hole *f* in the wall *B*, a bore *g* for receiving the pin *h* of the contact *C*, a bore *i* for receiving the shaft *E*, sockets *j* at each end of the bore *g*, and means for fas-



tening the frame to the cylinder, as screw-holes *k*, traversed by screws *l* for engaging the wall of the cylinder and clamping the igniter thereto, with a leak-tight joint. The contact *C* is carried on the pin *h*, which is insulated from the frame *A* by insulating-rings *m*, surrounding the pin and seated in the sockets *j*. The outer end of the pin is screw-threaded, so that the pin may be clamped tightly in position by nuts *n*. Electrical connections may be made with the pin *h* and the frame *A* in any suitable manner, as by the wires *o p*. (Shown in Fig. 10.) The shaft *E* is shown of such length that there is room for the hammer *H* between the inner face of the arm *F* and the outer face of the frame *A*, so that the hammer is retained in position by the arm.

The operating mechanism *c* consists of a sliding bar *r*, carrying on its upper end the lifter *m* and adapted to be operated by any suitable moving part of an engine—as, for example, the cam *s*—which bar may be suitably guided, as by the guideway *t*, and pressed toward the position for engaging the hammer yieldingly, as by the spring *u*, the bar being operated to throw it from the hammer by a cam-face *v*, which comes in contact with an adjustable cam-disk *w*, fulcrumed at *x* and locked in any position of adjustment by a screw-clamp *y*. Adjusting the cam *w* forces the slide *r* away from the axis of the hammer, so that less movement of the slide after its cam-face *v* strikes the cam *w* is necessary to throw the slide out until the lifter disengages the hammer, thus insuring an earlier ignition or a less forceful drop of the hammer, as desired; or, having adjusted the cam *w* to obtain the desired amount of movement of the hammer, the time of ignition may be regulated by the angular position in which the cam *s* is set on its shaft. This is a simple, strong, and easily-adjusted operator for igniters, which can be readily applied to any igniter or used with any engine.

In operation, the parts being in the position shown in Fig. 1, the lifter *M* is brought up under the end of the hammer *H*, carrying it to the position shown in Fig. 2. This movement has carried the movable contact *D* from the position shown in Fig. 4 to that shown in Fig. 5, making connection with the fixed contact *C*. The further movement of the lifter *M* carries the hammer to the position of Fig. 3; but the arm *F* cannot follow it, since the contact *B* cannot be advanced any farther. This movement of the hammer *H* therefore results only in producing a greater pressure of contact *D* on contact *C*, and consequently a more intimate degree of connection. The lifter *M* is then moved laterally, and the weight of *H* and the action of the spring *K*, acting together, cause the hammer to fall with a quick stroke, first to the position of Fig. 2, at which point the separation of the contacts commences, and then to the position of Fig. 1, at which point the contacts are their nor-

mal distance apart. At this point the hammer *H* is held from further movement by the anvil *L*; but the arm *F* is free to continue its movement a little farther until stopped by the gradual action of the spring, carrying with it in this movement the contact *D* a certain distance beyond the normal point of separation and allowing its movement to be stopped slowly and without shock. This greater separation of the contacts contributes to the sudden termination of the spark, and the gradual stoppage of the movement avoids the injuries which are common in igniters of the old type, such as excessive wear and the necessity for frequent readjustment. The anvil *L* will thus take up the shock of the hammer-blow, so that the minimum of shock consistent with a quick separation of the contacts will be sustained by the working parts other than the hammer and anvil, and these can be of such strength and simplicity as to be proof against injury from the successive blows. Adjustment of the cam *w* to regulate the operation of the lifter *M* can be quickly made by releasing the clamp-screw *y* and setting the cam around its axis to the desired point for effecting the throw-off at the time desired, whereupon the cam can be locked by setting the clamp-screw.

It will be seen that the igniter constitutes an improved attachment, comprising the frame, the contacts, and contact-operating devices, ready to be applied to any engine. This attachment can be shipped ready for use, there is no danger of loss or disarrangement of the parts, and it can be applied or removed by simple manipulation of the attaching-screws *l*, which operation makes it possible for one to immediately get access to the contacts for inspection or repair and to assure the correct relation of all the parts before their application to the cylinder-wall. It will also be apparent that the various parts of the igniter and its operating mechanism constitute improved devices which can be readily and advantageously used for igniters and analogous devices whether or not they are combined with each other in the manner shown as constituting the preferred form of this invention.

Our invention can be variously and advantageously availed of, and it will be understood that we do not limit ourselves to the particular details of construction, arrangement, and combination set forth as constituting its preferred form, since it can be availed of in whole or in part, according to such modifications as circumstances or the judgment of those skilled in the art may dictate, without departing from the spirit of the invention.

Having described our invention in its preferred form, what we claim, and desire to secure by Letters Patent, is—

1. In igniters, the improved frame *A* adapted to be attached to the wall of a cylinder, and having a provision for carrying the shaft of a movable contact, and on opposite sides there-



of a stop for receiving the shock incident to the operation of the mechanism, and a provision for carrying the fixed contact.

5 2. In igniters, in combination, the improved frame A adapted to be attached to the wall of a cylinder, a movable contact, a shaft for said movable contact carried by said frame, an anvil for receiving the shock incident to the operation of the mechanism, and a fixed contact, said anvil and fixed contact being carried by said frame on opposite sides of said shaft.

15 3. In igniters, in combination, the improved frame A adapted to be attached to the wall of a cylinder, a movable contact, a shaft for said movable contact carried by said frame, an arm on said shaft, a hammer journaled on said shaft, connected by a spring to said arm and extending beyond said arm, an anvil on said frame beyond said arm for receiving the blow of said hammer, and a fixed contact, said anvil and fixed contact being carried by said frame on opposite sides of said shaft.

4. In an igniter for gas-engines, the combination of the improved frame A adapted to be attached to the wall of a cylinder, a fixed contact, a movable contact, a shaft for said movable contact carried by said frame, a hammer for operating said movable contact, an anvil which receives the blow of said hammer, said fixed contact and anvil being carried by said frame on opposite sides of said shaft, a lifter M, means for operating the same to lift said hammer, and means for moving the same out of the path of said hammer whereby the blow of said hammer is received upon said anvil without shock to the movable parts of the engine.

In witness whereof we have hereunto signed our names in the presence of two subscribing witnesses.

CARL C. RIOTTE.

EUGENE A. RIOTTE.

Witnesses:

GEORGE H. FRASER,

THOMAS F. WALLACE.