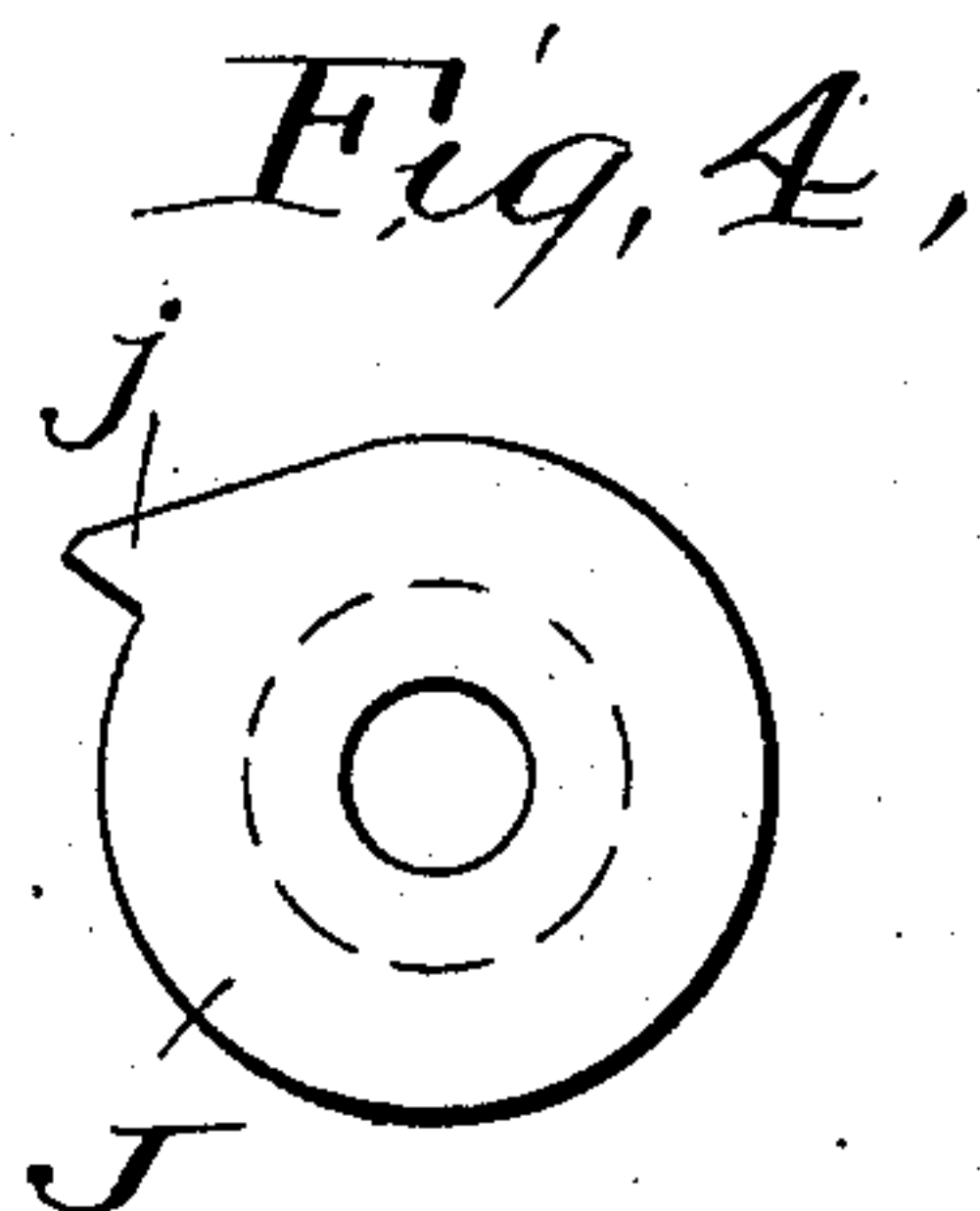
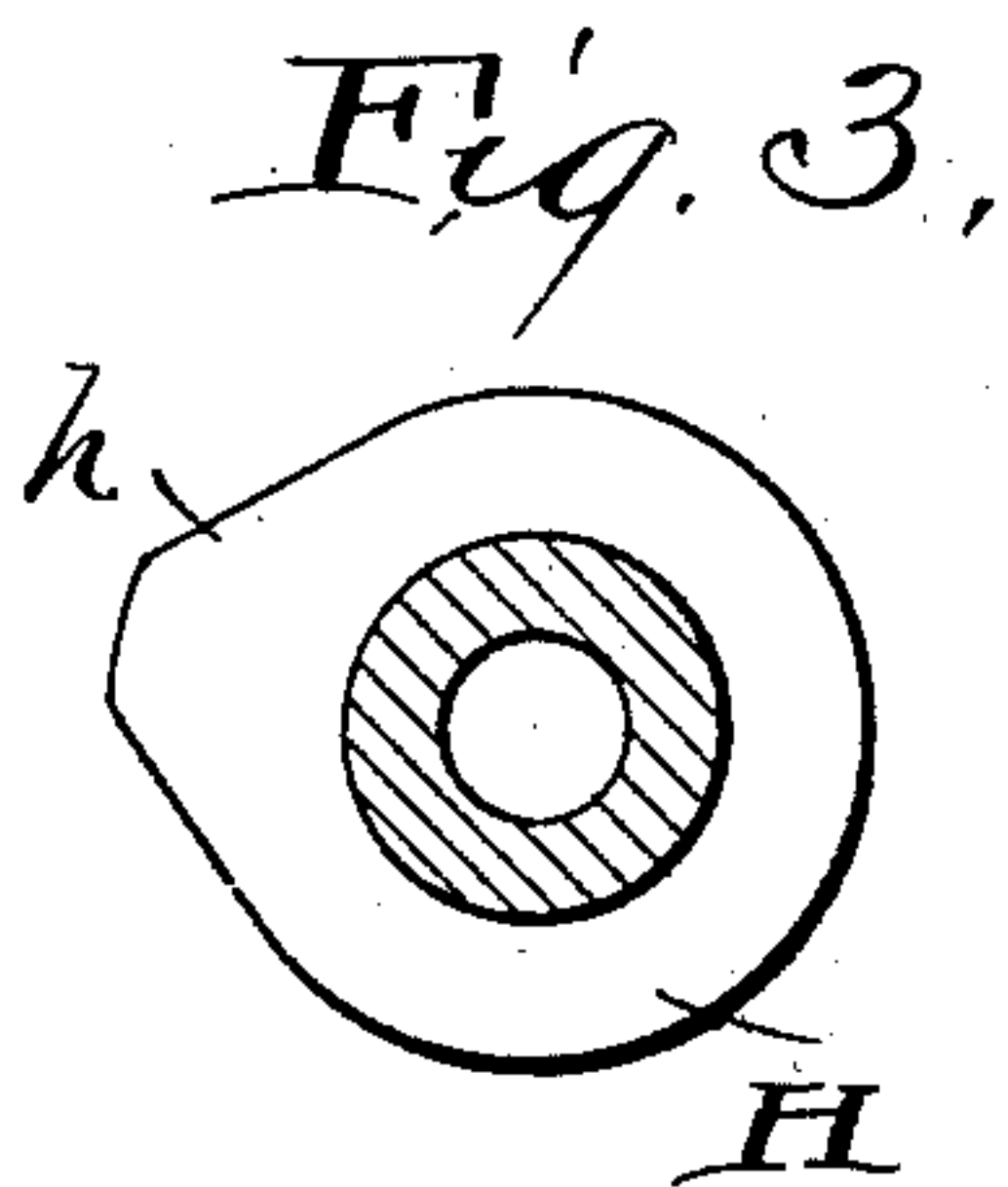
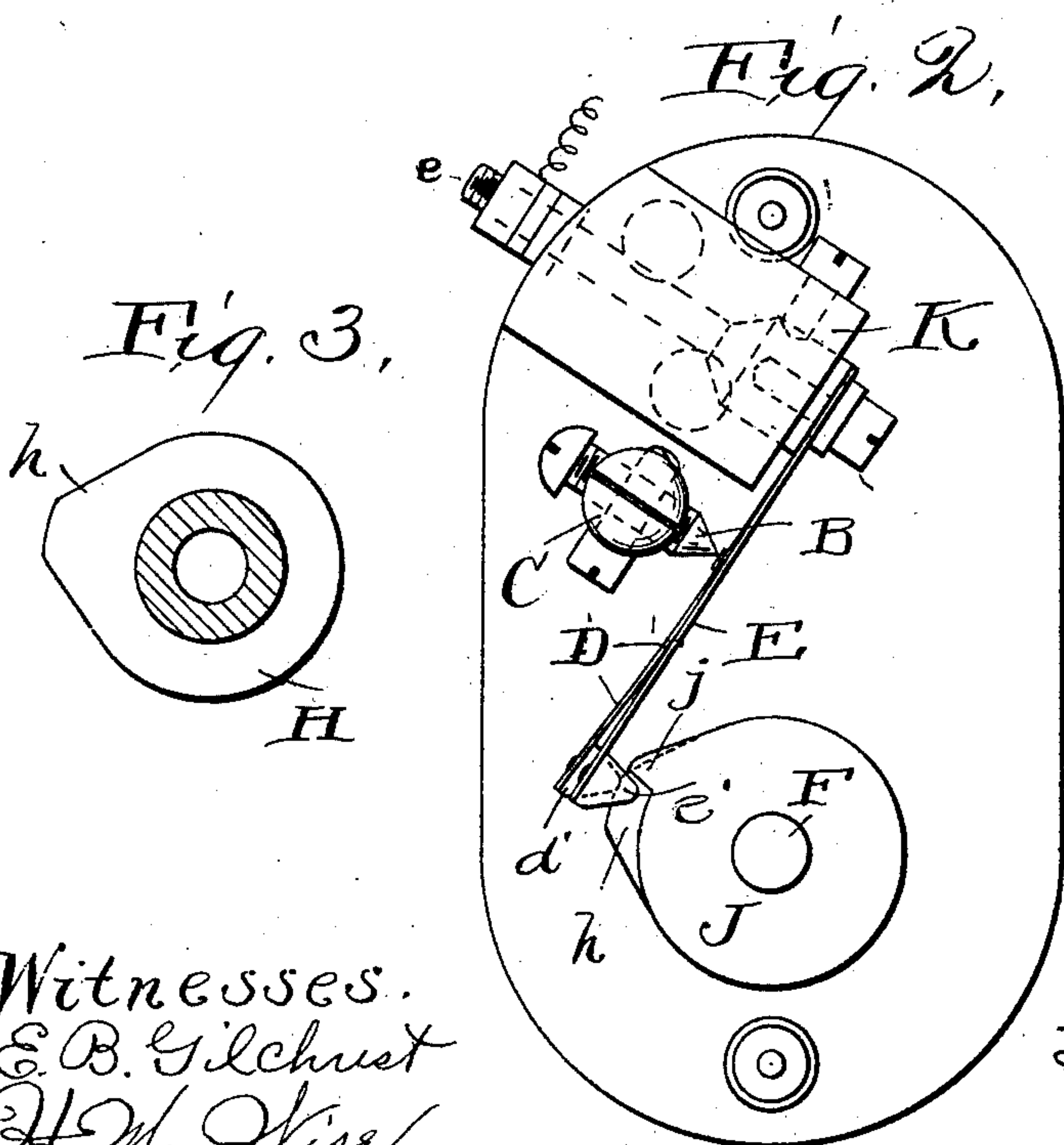
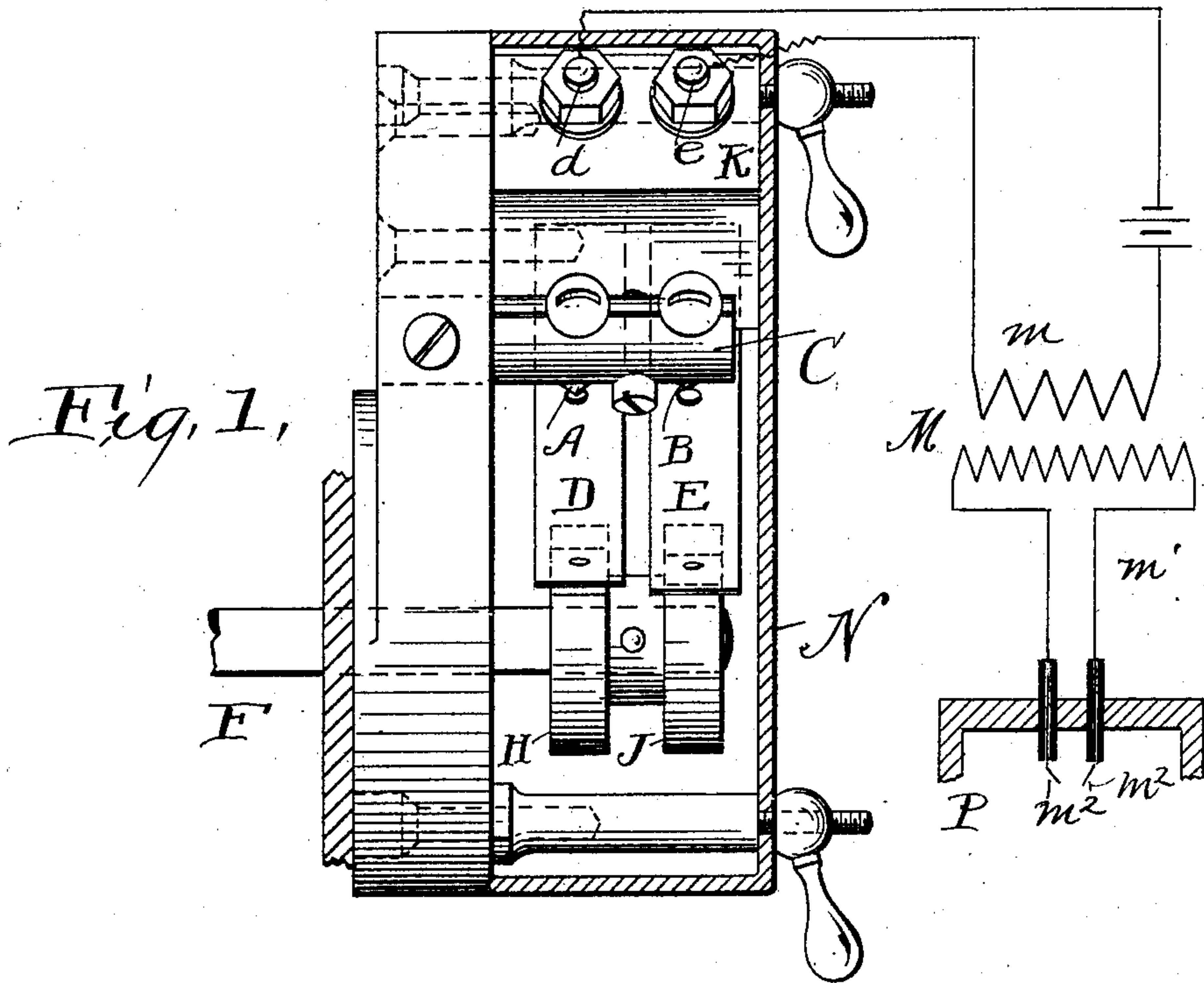


L. P. MOOERS.
GAS ENGINE IGNITER.
APPLICATION FILED OCT. 24, 1901.

NO MODEL.



Witnesses.
E. B. Gilchrist
H. M. Wise

Inventor,
Louis P. Mooers,
By his Attorneys,
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UNITED STATES PATENT OFFICE.

LOUIS P. MOOERS, OF CLEVELAND, OHIO, ASSIGNOR, BY MESNE ASSIGNMENTS, TO PEERLESS MOTOR CAR COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF WEST VIRGINIA.

GAS-ENGINE IGNITER.

SPECIFICATION forming part of Letters Patent No. 721,065, dated February 17, 1903.

Application filed October 24, 1901. Serial No. 79,750. (No model.)

To all whom it may concern:

Be it known that I, LOUIS P. MOOERS, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Gas-Engine Igniters, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

The invention is a spark-producing igniter adapted especially for use with explosion-engines to produce at the proper time a spark, or rather a discharge of sparks, for igniting the explosive mixture in the cylinder. Devices having a similar function and a somewhat similar mode of operation have been heretofore used and are known in the art as "tremblers;" but these prior devices are not sure to ignite the explosive mixture at the proper time, nor is it certain that they may not operate and ignite the mixture at the wrong time. My invention has the characteristic from which this name is derived, as will appear from the following description.

The primary object of my invention is to provide a construction which will certainly produce at the proper time a discharge of igniting-sparks, but which is so contrived that it will not produce such spark or sparks at any other time.

In the drawings, Figure 1 is an edge view of the device with the inclosing casing in section. Fig. 2 is a side view with the casing-cover removed. Figs. 3 and 4 are respectively views of the two cams.

Referring to the parts by letters, A and B represent, respectively, two contact-points, which are secured to the same metallic bar C, through which they are adjustable (being screw-threaded) and by which they are electrically connected.

D and E represent, respectively, two springs, which are secured to a suitable support K and insulated from each other, but are electrically connected with the two binding-posts *d* and *e*, respectively. These springs under normal conditions do not touch the contact-points A and B.

F represents a shaft which is to be constantly rotated through any suitable connec-

tions with the driving-shaft of the engine. Attached to this shaft F are the two cams H and J, which are placed so that the cam projections on their peripheries may engage with the fingers *d'* and *e'*, respectively, attached to the springs D and E. The cam J is a disk having a cam projection *j* substantially in the shape of a ratchet-tooth. The cam projection *h* on the disk H is inclined on both sides preferably. As these two cams rotate in unison, their inclined faces engage with the fingers on the two springs, respectively, and bend the springs so that they respectively engage with the contact-points A and B. At this time the primary circuit *m* of the induction-coil (indicated conventionally at M) is closed. Almost instantly by the further rotation of said cams the tooth *j* passes out of engagement with the finger *e'*, whereupon the spring E flies away from the contact-point B, thereby breaking the primary circuit and causing a spark to pass between the two closely-placed terminals *m*² *m*² of the secondary circuit *m'*, which terminals will project into the explosion-chamber P of the engine. The spring E will for a short space of time vibrate into and out of contact with the point B, during which interval of time the cam projection *h* on the cam H will hold the spring D in contact with the point A, and the result will be a discharge of sparks, one of which will certainly ignite the explosive mixture. When the cam projection *h* passes from beneath the finger *d'* on the spring D, this spring moves out of contact with the point A. The circuit is now broken in two places, and it is not at all probable that through any accident both springs will simultaneously contact with the points A and B, and therefore it is not possible that any spark shall be created except at the desired time—namely, when the two cam projections *j* and *h*, acting on the springs E and D, have closed both breaks in the primary circuit and the spring E has been allowed to fly away from the point B.

The described mechanism is inclosed in a suitable casing N.

The drawings show and the foregoing specification describes what is regarded as the simplest and cheapest practical embodiment of

the invention. It is possible, however, to change the specific construction to a considerable extent without departing from the invention herein broadly claimed. The invention
 5 tion calls for a normally open primary circuit having two breaks. Any suitable mechanism may be employed for closing one of these breaks at the proper time and for holding it closed as long as it is desired to have the vi-
 10 brator operate. The second break, however, must be closed by means which include a vibrator and means for imparting to it the necessary vibration to cause it to rapidly make and break the circuit during a part or all of
 15 the time when the other break in the circuit is closed by the mechanism provided for that purpose.

Having described my invention, I claim—

1. In an igniter for gas-engines, a circuit
 20 having two breaks therein and a generator for furnishing the same with sparking current, combined with a pair of rotatable cams, a contact device operated by one of said cams for automatically closing one of said breaks dur-
 25 ing an interval of time, and a vibrator operated by the other cam for rapidly and repeatedly opening and closing said second break in the circuit during the interval of time the first break is closed, substantially as
 30 and for the purpose specified.

2. In an igniter for gas-engines, a circuit having two breaks therein and a generator for furnishing sparking current thereto, a ro-
 35 tatable shaft, a pair of cams thereon, a pair of contact devices at one of said breaks adapted to be closed by one of said cams for an interval of time, a contact device and vibrat-
 40 ing spring at the other of said breaks adapted to be closed and released by the other of said cams during the interval of time the first break is closed, substantially as and for the purpose specified.

3. In an igniter for gas-engines, the combination of two electrically-connected contact
 45 devices, a movable device held normally out of contact with one of said contact devices, mechanism for automatically and periodically moving the same into contact with the said

contact device, a vibratory spring which is normally out of contact with the other one of
 50 said contact devices, and a movable member which periodically bends said vibratory spring into contact with its corresponding contact device and then suddenly releases it
 55 and thus allows it to make and break several contacts with the corresponding contact device, said first-named movable device remain-
 60 ing in contact with its contact device for some time after said sudden release to allow said several makes and breaks to be effective, substantially as and for the purposes speci-
 65 fied.

4. In an igniter for gas-engines, the combination of an induction-coil having in its sec-
 70 ondary circuit a break whose terminals are placed close together, and having in its primary circuit two breaks, with two electrically-connected contact-points which will be
 75 in the primary circuit when the same is closed, two springs normally out of contact with said points but adapted to be moved into contact therewith and to thereby complete the pri-
 80 mary circuit, and two simultaneously-rotating cams having respectively the cam projection *h* and the cam projection *j* which engage
 85 with said two springs and operate them, substantially as and for the purpose specified.

5. In an igniter for gas-engines as the means for closing and breaking an electric circuit,
 80 the combination of two electrically-connected adjustable contact-points, two springs connected respectively with the terminals of said circuit, which springs are normally out of
 85 contact with said contact-points but are adapted to be moved into contact therewith and to thereby close said circuit, and two simultaneously-rotating cams having respec-
 90 tively the cam projection *h* and the cam-tooth *j* which engage with said springs, substantially as and for the purpose specified.

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

LOUIS P. MOOERS.

Witnesses:

L. H. KITTREDGE,
 CHAS. W. EHRKE.