

(No Model.)

2 Sheets—Sheet 1.

L. M. HAKANSSON.  
ROTARY IMPACT ENGINE.

No. 585,029.

Patented June 22, 1897.

Fig. 2.

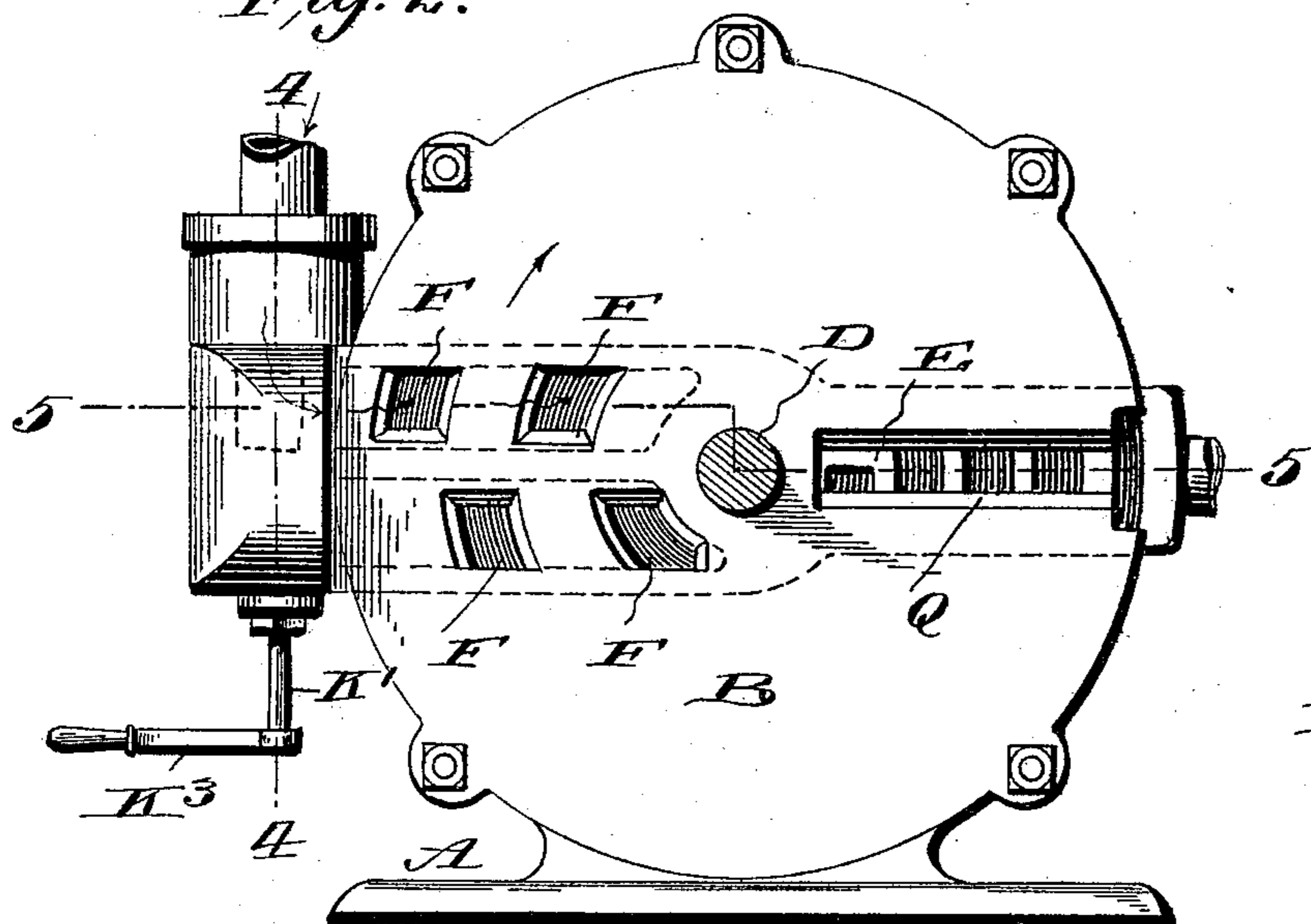


Fig. 7.

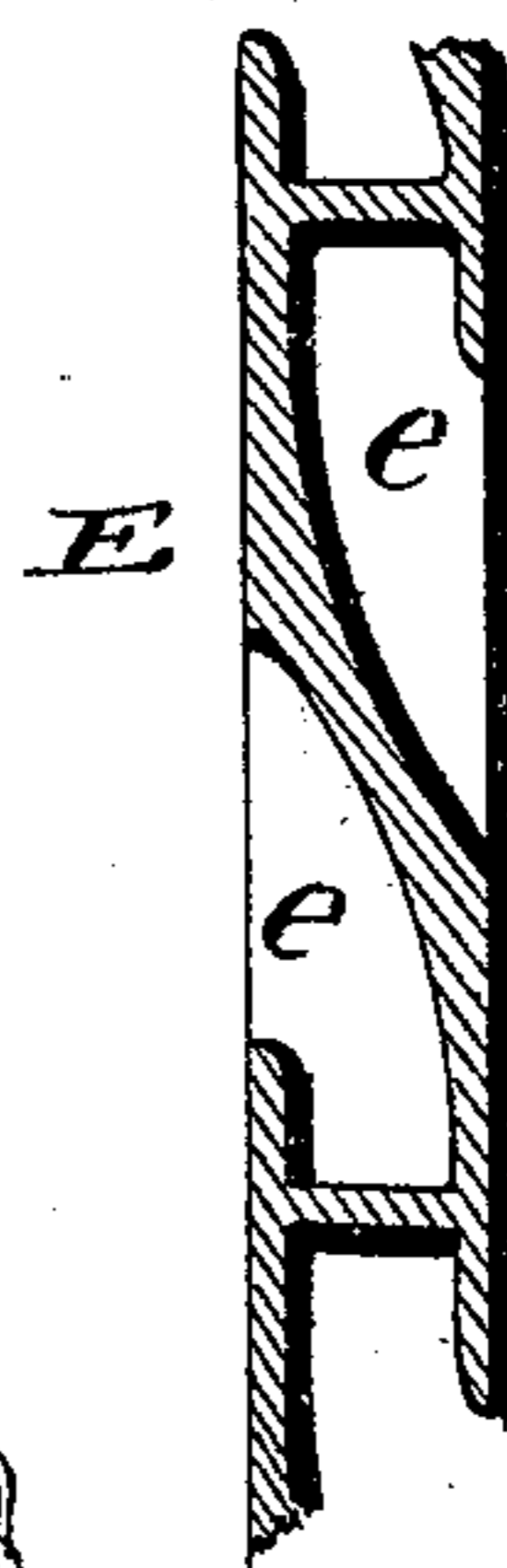


Fig. 1.

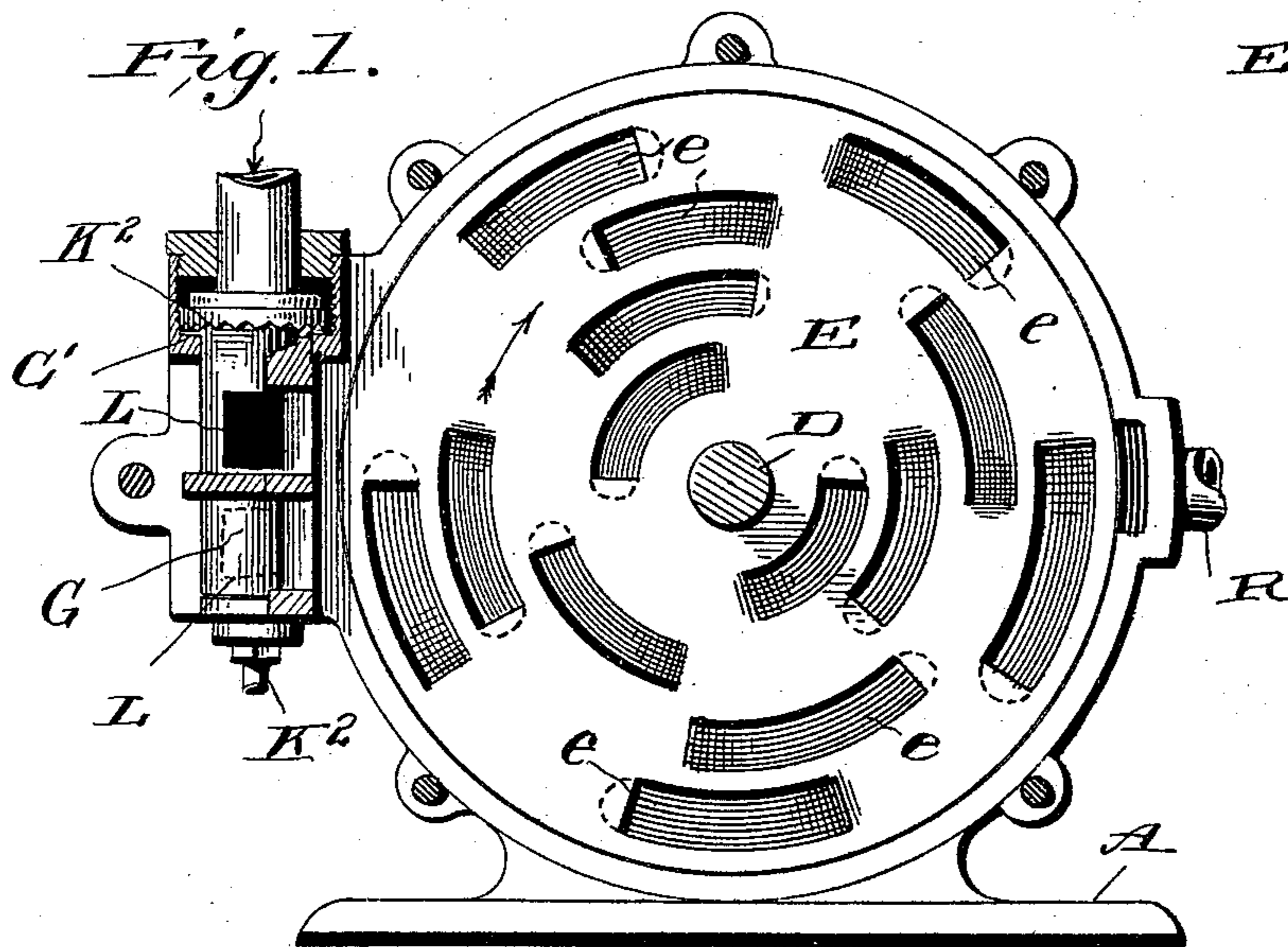
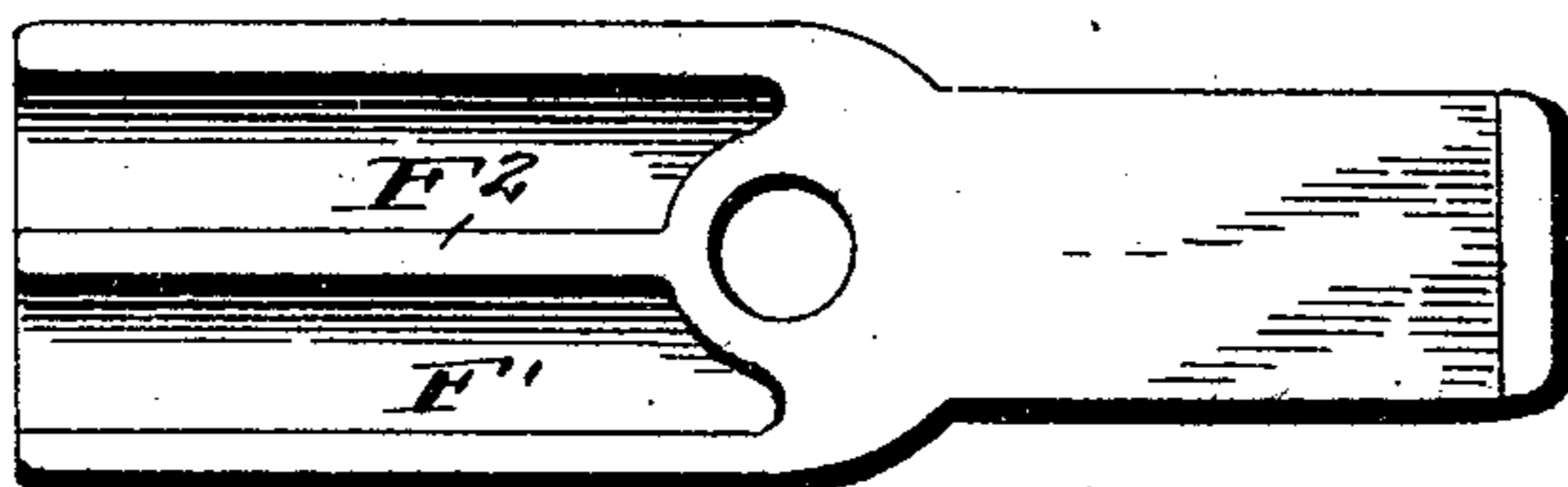


Fig. 3.



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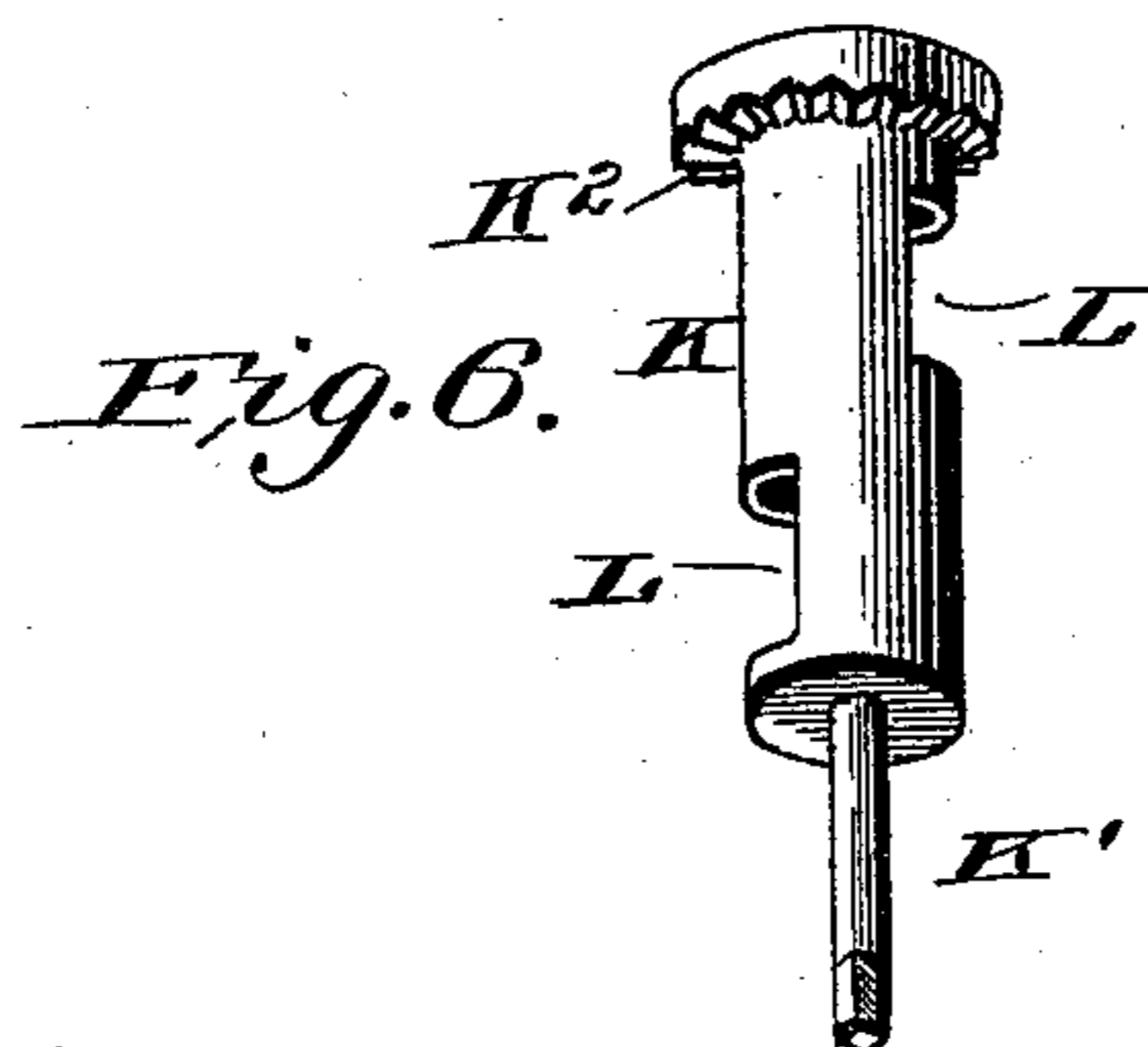
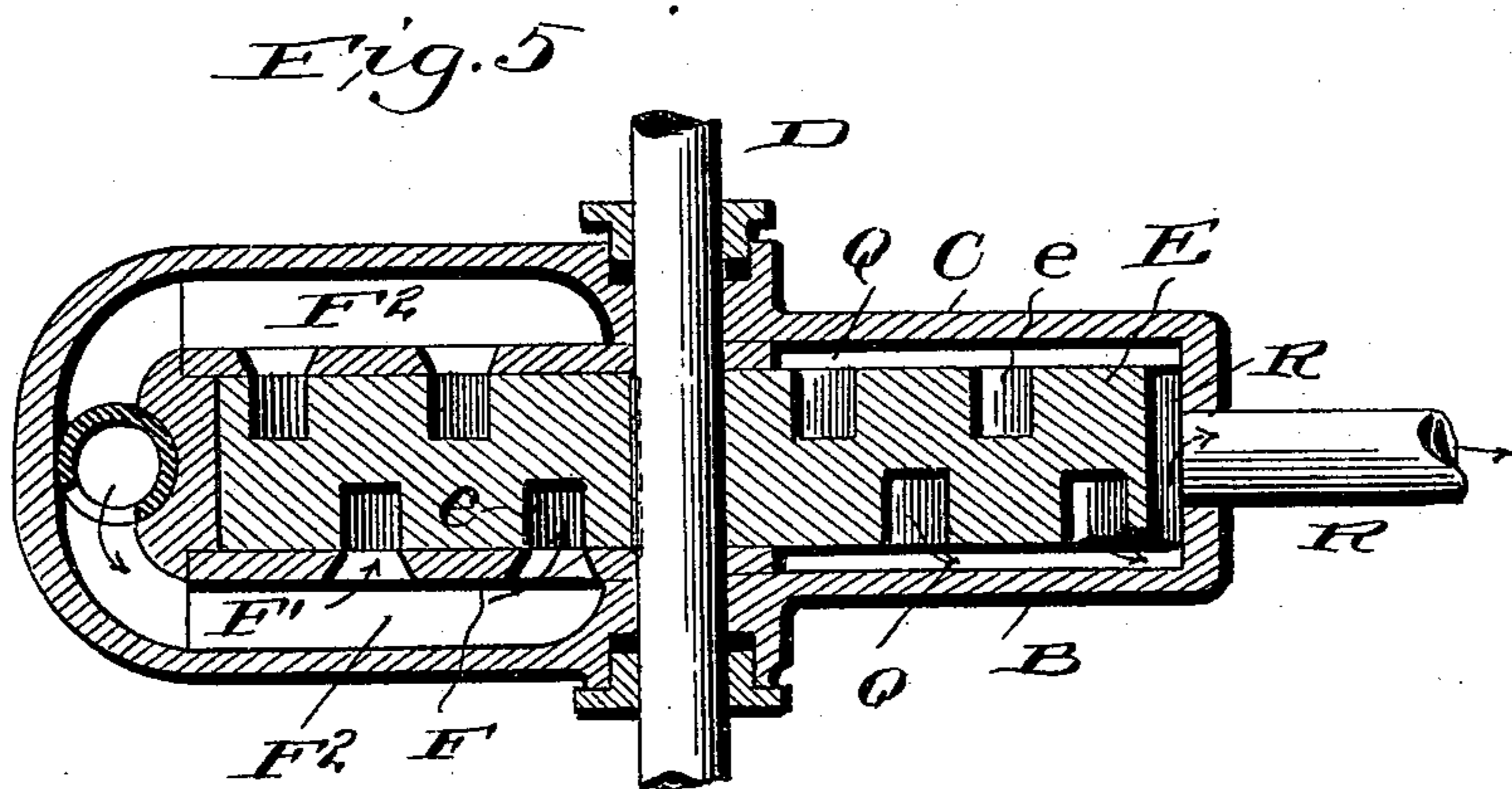
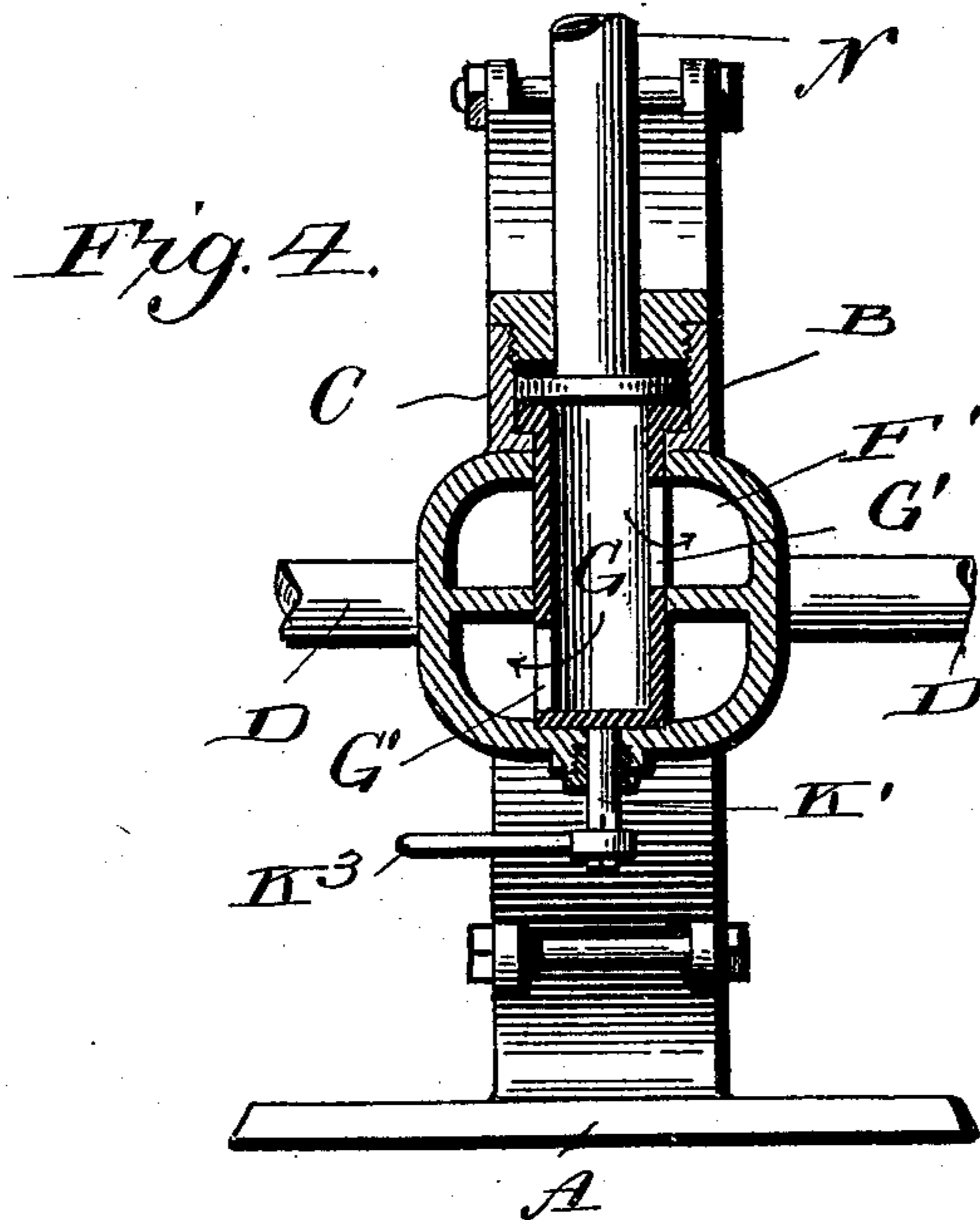
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# UNITED STATES PATENT OFFICE.

LOUIS M. HAKANSSON, OF MASON CITY, IOWA.

## ROTARY IMPACT-ENGINE.

SPECIFICATION forming part of Letters Patent No. 585,029, dated June 22, 1897.

Application filed March 18, 1897. Serial No. 628,182. (No model.)

*To all whom it may concern:*

Be it known that I, LOUIS M. HAKANSSON, a citizen of the United States, residing at Mason City, in the county of Cerro Gordo and State of Iowa, have invented certain new and useful Improvements in Rotary Impact-Engines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to certain new and useful improvements in steam-engines, and especially to a rotary impact-engine in which is a rotary disk, having a series of steam-pockets or steam-chambers disposed on opposite sides of the disk and into which steam is allowed to enter in order to rotate the disk in the direction desired.

A further part of the invention resides in the peculiar construction of a rotary impact-engine, in which provision is made for running the disk which contains the steam pockets or chambers either in a forward or a reverse direction, by having the said pockets or steam-chambers arranged in concentric circles and extending in opposite directions, whereby steam may be admitted from either side in the pockets which are arranged to drive the disk in the direction desired.

A further part of the invention resides in the peculiar construction of the valve-regulating mechanism, whereby steam is admitted simultaneously on opposite sides of the disk.

To these ends and to such others as the invention may pertain the same consists, further, in the novel construction, combination, and adaptation of parts, as will be hereinafter more fully described, and then specifically defined in the appended claims.

The invention is clearly illustrated in the accompanying drawings, which, with the letters of reference marked thereon, form a part of this specification, and in which similar letters of reference indicate like parts throughout the several views, in which—

Figure 1 is a side elevation of my improved rotary impact-engine, having one of the sides of the casing about the rotary disk removed,

showing the arrangement of the steam chamber or pockets with parts in section. Fig. 2 is a side elevation of one side of the casing which incloses the disk and shows steam-ports and exhaust-duct. Fig. 3 is a detail view, in side elevation, of a plate containing steam-ducts. Fig. 4 is a vertical central sectional view through the valve-regulating mechanism on line 4 4 of Fig. 2. Fig. 5 is a horizontal section on line 5 5 of Fig. 2. Fig. 6 is a detail view of the valve-cylinder removed. Fig. 7 is a vertical section through a part of the rotary disk, showing the steam-pockets.

Reference now being had to the details of the drawings by letter, A designates the base portion upon which the cylinder-casing is secured. Mounted in the side plates B and C of the casing is the shaft D, to which is keyed or otherwise secured a disk E, which has formed on opposite sides in concentric series steam pockets or chambers *e*, each alternate series of pockets opening in opposite direction from the intermediate series, whereby it will be possible to reverse the movement of the disk when desired. In the drawings are shown four concentric series of these pockets, but more may be employed, if desired. Each of these pockets has a tapering or inclined entrance leading into the same, and it will be noted that the pockets on the opposite side of the disk in the same series open in opposite directions, whereby, as will hereinafter appear, two currents of steam may be by one movement of the valve allowed to strike against pockets on each side of the disk, which will cause the disk to move in the same direction and also cause the disk to make a reverse motion when the valve is turned, so as to allow steam to pass through registering ducts and to enter steam-chambers which open in an opposite direction. In each wall of the casing in which the disk is journaled are the steam-ports F, the upper of which leads into a duct F', which duct leads to the cylindrical valve-chamber G, and the lower of the said ports leads into a duct communicating with the said valve-chamber, the two ducts being separated by a partition F<sup>2</sup>, as will be seen. These ducts and ports are thus arranged for the purpose of allowing steam to enter either, which will cause the disk to revolve in a forward or reverse direc-

tion. Both side plates inclosing the disk are similarly arranged with ducts and ports, which communicate with the valve-chamber, one on each side, in the manner described.

5 The valve-chamber is cylindrical in shape, having the two ports on diametrically opposite sides which open therein. The valve by which steam is allowed to enter one port on each side in order to drive the engine in one  
10 direction consists of a hollow cylinder K, which has at its lower end an extended portion K', which passes through an aperture in the bottom portion of the said valve-chamber, and on diametrically opposite sides of the  
15 said valve-cylinder are the ports L L, one arranged near the lower end of the valve-cylinder and the other above, and at the upper end of the said cylinder is a collar K<sup>2</sup>, which has a series of teeth on its under edge, and  
20 these teeth are adapted to engage with the teeth G', formed about a shoulder on the interior of the valve-chamber, and are provided to hold the valve from rotation. Mounted on the lower end of the said extension is a  
25 handle K<sup>3</sup>, whereby the valve may be operated. Suitable packing is interposed between the bearing members at the lower end of the valve-chamber, and a spring may be utilized to hold the valve-cylinder firmly seated, if  
30 desired.

It will be noted that when the steam is allowed to enter through the pipe N into the hollow cylinder, if the cylinder-valve is turned so that the lower port in the cylinder is caused  
35 to register with the port leading into steam-duct beneath the partition dividing the two ducts on one side, the upper port in the said cylinder will register with the upper port leading to the duct above the partition on the op-  
40 posite side of the disk, which will cause the engine to rotate in the direction indicated by the arrows or in a forward direction, while if the said cylinder is turned a one-half revolution steam will be allowed to enter through  
45 the ducts above and below the partitioned ducts, respectively, in a reverse manner, which

will cause the disk to rotate in the opposite direction, as will be readily understood. Each of the said plates on opposite sides of the disk is recessed out at Q, which allows an exit  
50 for the exhaust-steam which is allowed to enter into the said recessed portion which leads to an exhaust-pipe R, diametrically opposite from the steam-port through which steam is allowed to enter the cylinder. 55

If preferred, the engine may be covered with sheet-iron over the nuts holding the plates together and the bottom of the casing may be cast together with one of the cylinder-plates. 60

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

1. In a rotary, impact-engine, the combination with the disk as described, of the plates  
65 having ports therein, combined with a hollow cylinder-valve, which has ports on opposite sides, but in different planes, which are adapted to register with ducts on opposite sides of the disk, whereby as the said valve is turned  
70 so that the ports will register in the said ducts, the disk may be made to revolve in opposite directions, an exhaust-pipe communicating with the pockets, substantially as described.

2. In a rotary engine, the combination with  
75 the casing carrying the disk having steam pockets and ducts leading thereto, of the hollow cylindrical vertically-movable and rotary valve, with ports on opposite sides and in different planes, the said cylindrical valve hav-  
80 ing a rim at its upper end toothed on its under edge, and designed to engage with the serrated shoulder on the inner wall of the partitioned valve-chamber, substantially as shown and described. 85

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

LOUIS M. HAKANSSON.

Witnesses:

THOMAS G. THOMPSON,  
ANDREW PETERSON.