

(No Model.)

L. BROWN, Sr.

ROTARY ENGINE.

No. 370,373.

Patented Sept. 27, 1887.

FIG. 1.

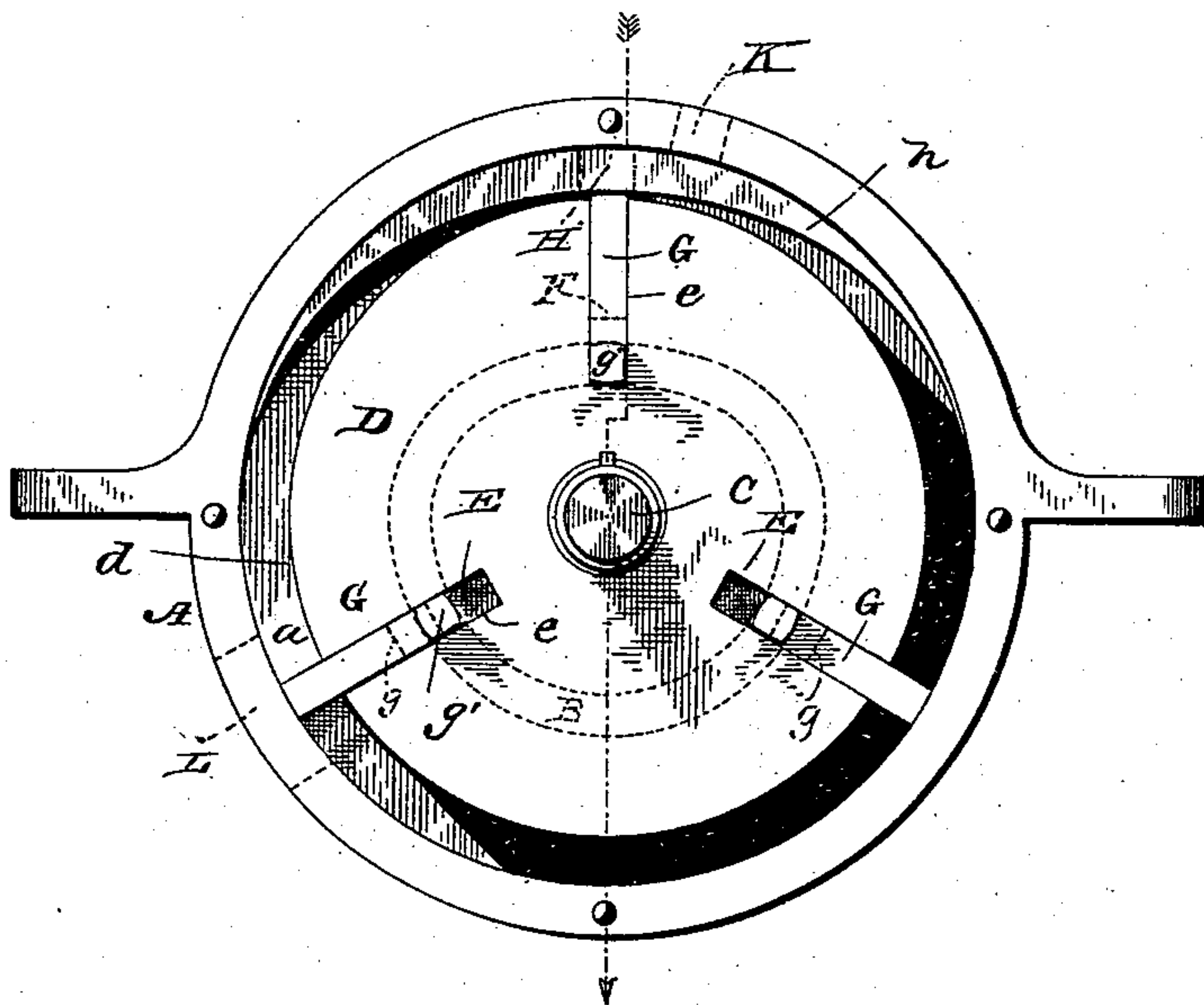


FIG. 2.

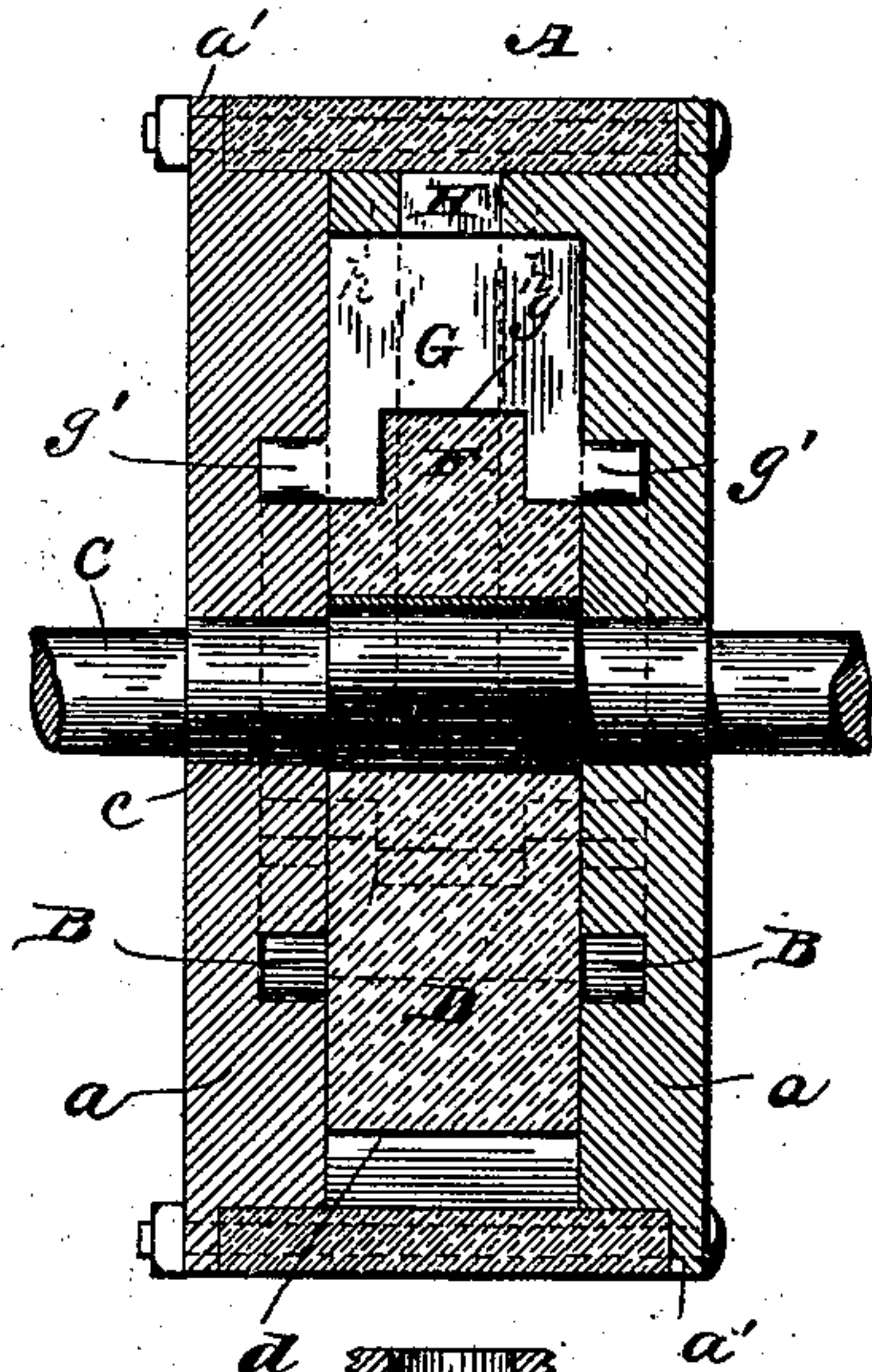


FIG. 3.

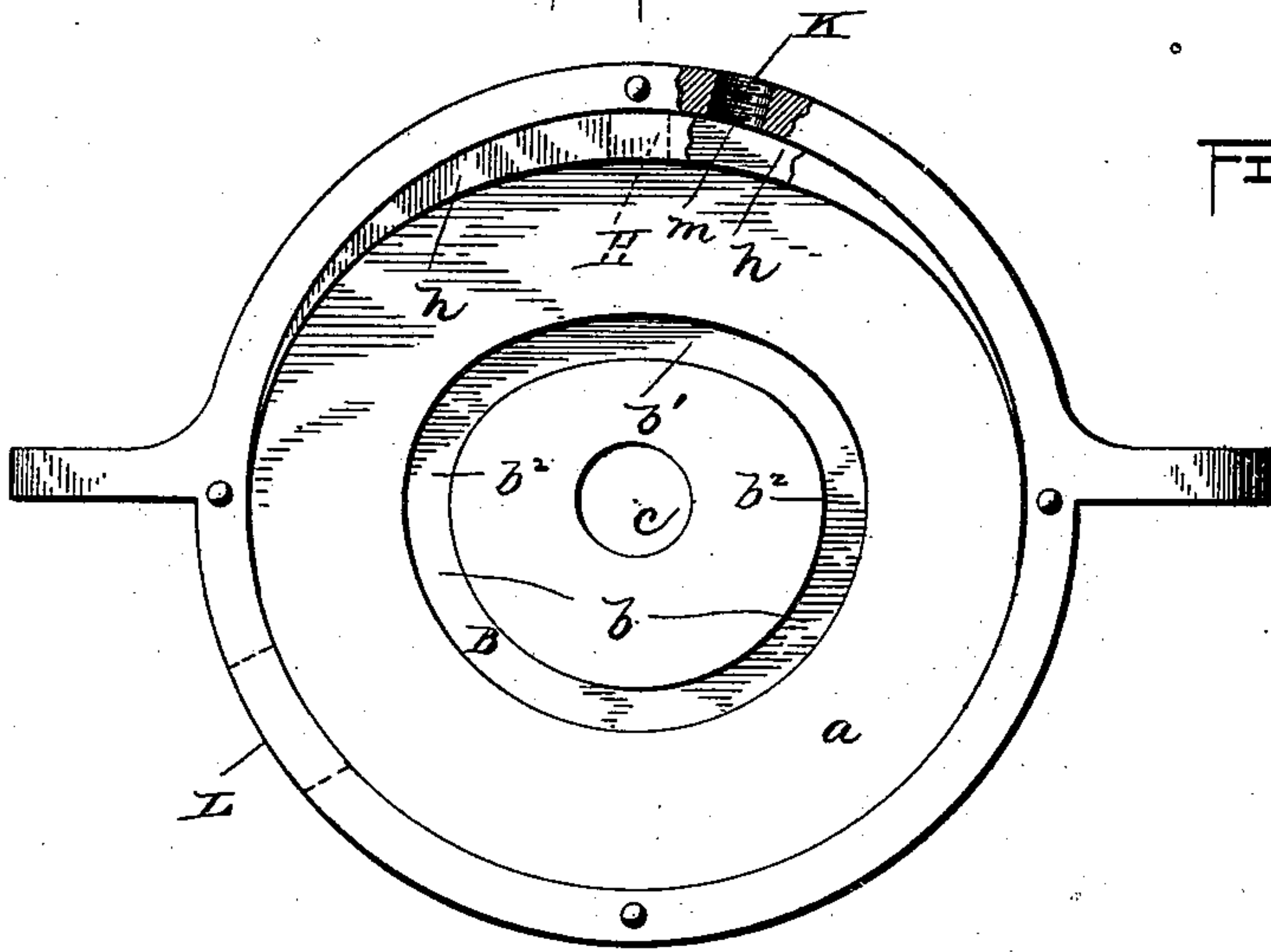
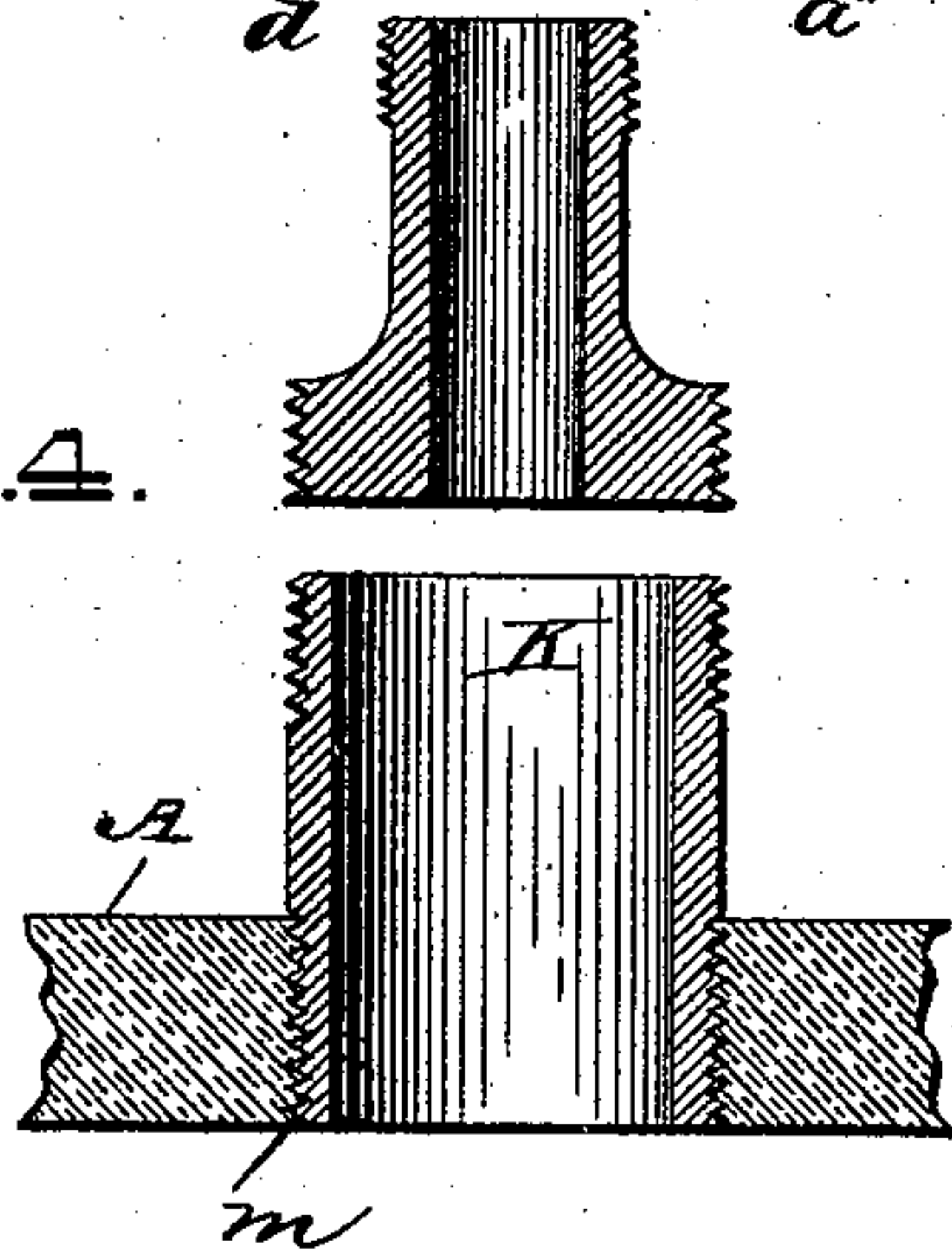


FIG. 4.



Witnesses

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UNITED STATES PATENT OFFICE.

LOAM BROWN, SR., OF COOKSTOWN, GEORGIA.

ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 370,373, dated September 27, 1887.

Application filed May 25, 1887. Serial No. 239,325. (No model.)

To all whom it may concern:

Be it known that I, LOAM BROWN, Sr., of Cookstown, in the county of Wilcox and State of Georgia, have invented certain new and useful Improvements in Rotary Engines; and I do hereby 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.

My invention relates to an improvement in rotary engines.

The object is to provide an engine which may be run by steam, water, or compressed air by simply varying the size of the power-inlet port, and in which the sliding abutments shall be prevented from a wobbling motion in the plane of their bearings and from the consequent frictional contact with the inner walls of the casing.

A further object is to provide an effective engine in which the number of parts shall be reduced to a minimum, and which may be furnished at a low initial cost, thereby adapting it to general use wherever power is required for the various purposes of the farmer, miller, and manufacturer.

With these ends in view my invention consists in certain features of construction and combinations of parts, as will be hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is an end view of the wheel, one end of the casing being removed. Fig. 2 is a central section in the plane of the axis of the shaft. Fig. 3 is an inside view of one end of the casing; and Fig. 4 is an end view of the inlet-port, showing means for regulating the size of the opening.

A represents a cylindrical casing, constructed of any suitable material, and having one or both its ends bolted to the curved portion in any well-known or approved manner. Each end a is provided with a shoulder, a' , preferably formed by rabbeting the inner corner of the end, which is adapted to fit snugly within the end of the curved portion of the casing and form a snug joint therewith. The inner face of each end is further provided with a cam-groove, B , of the form substantially as shown, about two-thirds of the groove being in circular form, as represented at b , while the remaining third, or thereabout, is materially flattened, as shown at b' . The transition from

the circular portion to the flattened portion of the groove is, however, made very gradually, as shown at b^2 , for purposes which will hereinafter appear.

A drive-shaft, C , is journaled in suitable bearings, c , at the middle points of the two ends a , and a wheel, D , is secured at its center, on the shaft C within the casing. The face d of the wheel D is intended to be as wide as the length of the interior of the casing A will admit and at the same time permit a free rotary movement of the wheel. The wheel D also preferably retains its width for a considerable distance back from its face toward the center, in order to form a more effective joint between its end and the casing-wall, and may retain its width throughout or not, as may be found desirable. The face of the wheel is intact, excepting at points as are designated for the insertion of the abutments, and the distance between the face of the wheel and the interior curved wall of the casing forms the live-steam chamber or the water or air pressure chamber, as the case may be. At suitable intervals the periphery of the wheel is provided with radial slots E , in the present instance with three. The slots E preferably extend from the periphery of the wheel about two-thirds of the distance to the center, but may be deeper or shallower, as found expedient. It is desirable that the walls e of the slots E be smooth and solid, even should the wheel itself be formed hollow or skeleton, in order that an essentially steam-tight joint be formed between the wall and the abutment.

From the bottom of the slot E and centrally located therein projects a guide lug or tongue, F , which may be cast integral with the wheel, or may be secured rigidly thereto. The lug or tongue F may project a greater or lesser distance outwardly from the bottom of the slot, as may be found desirable, the object being to provide a central guide for the abutment, as will hereinafter appear.

G represents one of the sliding abutments having a width equal to the width of the steam-chamber, or slightly less, to admit of a free sliding movement, and a thickness equal to that of the slot E , or sufficiently less to admit of a free sliding movement therein. At its end, toward the center, the abutment is forked or provided with a centrally-located

recess, *g*, adapted to receive with an easily-sliding fit the lug or tongue *F*, and is further provided at the same end with oppositely-extending lugs or studs *g'*, which, when the parts
 5 are in working adjustment, fit the cam-grooves *B*, the ends of the studs *g'* being held by the central guide, *F*, a slight distance away from the bottoms of the grooves. Thus as the wheel
 10 revolves within the casing the grooves *B* will serve to slide the abutments outwardly, hold them in that position while receiving the pressure from the power, and then return them to pass the stationary abutment *H* secured to the casing; but the sliding abutments
 15 *G* will be guided in their sliding movement by the central tongue or lug, *F*, and will be prevented from the endwise tilt or wobbling movement so objectionable where the grooves alone are depended upon; and, furthermore, by pre-
 20 venting the ends of the studs *g'* from engaging the bottoms of the grooves *B* and holding the sliding abutment steadily in the center of the steam-chamber the edges of the abutment are prevented from frictional contact with the in-
 25 terior walls of the chamber, and such wear as takes place on the walls of the grooves *B* and on the studs *g'* is regular and does not affect the efficiency of the engine until well worn out.

30 The stationary abutment *H*, above referred to, is secured firmly to the interior-curved wall of the casing, and serves to cut off the back-pressure of the steam or other power as it enters the port *K*. Tapered guides *h* extend from the inner face of the stationary abut-
 35 ment *H*, in opposite directions therefrom, along the ends of the curved wall of the casing a distance corresponding to the flattened portion of the groove *B*, and serve to insure
 40 the return of the sliding abutment to a position flush with the face of the wheel as said abutment passes the stationary abutment *H*.

The steam-inlet port *K* is located in close proximity to the side of the stationary abut-
 45 ment *H*, and the exhaust-port *L* is at such a distance therefrom as to insure the best results, keeping the live pressure on the sliding abutment as long as it can be of service, but not long enough to become a drag. Its loca-
 50 tion is determined by experiment, and should in general be about two-thirds of the circumference distance therefrom, measuring in the direction in which the wheel rotates.

As it is intended to furnish a rotary engine
 55 which may be kept in stock and shipped upon demand to be set up wherever steam, water, or compressed air can be utilized to advantage, it is found desirable to construct the port *H* in such a manner that it may be readily en-
 60 larged or constructed to suit the different powers. For example, when water is employed, the port should be considerably larger than when steam is used. To this end the port is provided with an internal thread, *m*, and a
 65 set of hollow plugs having one end fitted to the port and the other ends and their bores of different sizes to suit the power. This is one of

several arrangements which might be adopted to secure the desired result.

The engine as thus constructed is extremely 70 simple and effective and meets the popular want, because of its moderate cost and general adaptability.

It is evident that the tongues *F* might consist of two or more parts at equal distance 75 from the center, and that other slight changes might be made in the form and arrangements of the several parts without departing from the spirit and scope of my invention; hence I do not wish to limit myself strictly to the con- 80 struction herein set forth; but,

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

1. In a rotary engine, the combination, with 85 the casing provided with inlet and exhaust ports, and with a stationary abutment, and having cam-grooves formed in its ends, of the wheel journaled in the casing and provided with radial slots in its rim, and with lugs or 90 tongues extending outwardly from the bottoms of the slots, and sliding abutments located in the slots and provided with lugs or studs adapted to engage the said grooves, and with recesses adapted to receive the lugs or 95 tongues in the slots, for the purpose substantially as set forth.

2. In a rotary engine, the combination, with a wheel journaled in a suitable casing and provided with radial slots opening on its face, 100 the said slots having centrally-located lugs or tongues projecting outwardly from their bottoms, of sliding abutments located in the slots and having centrally-located recesses adapted to receive with an easy-sliding fit the said lugs 105 or tongues, and, further, having lugs or studs adapted to engage the side walls only of cam-grooves in the ends of the casing, substantially as set forth.

3. In a rotary engine, the combination, with 110 a suitable casing provided with cam-grooves on its interior walls, a wheel journaled in the casing and provided with radial slots opening on its surface, and with centrally-located lugs or tongues extending outwardly from the bot- 115 toms of the slots, of sliding abutments having a free rotary movement within the casing and provided with laterally-extending studs of less length than the depth of the said cam-grooves in the casing, the said abutments being further 120 provided with centrally-located recesses adapted to receive the said tongues in the bottoms of the slots with a close sliding fit, whereby the abutments are held centrally within the casing out of frictional contact with the sides 125 of the casing, substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

LOAM BROWN, SR.

Witnesses:

E. C. SMITH,
 C. C. SMITH.