(No Model.) 2 Sheets—Sheet 1.

W. H. BRIGHT.

ROTARY STEAM ENGINE.

No. 368,927. Patented Aug. 30, 1887.

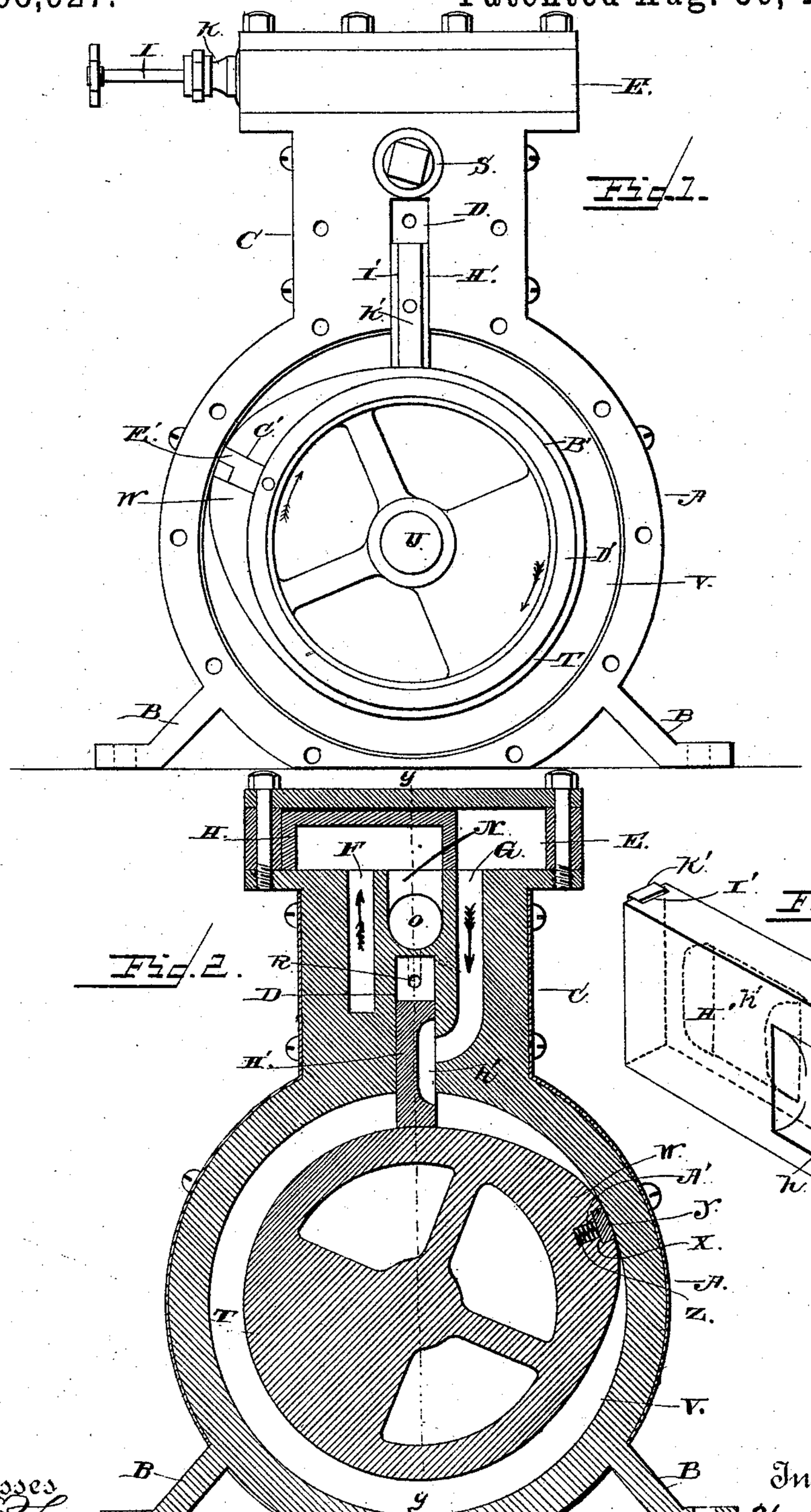

Fig. 1.

Fig. 2.

Fig. 5.

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Fig. 3.

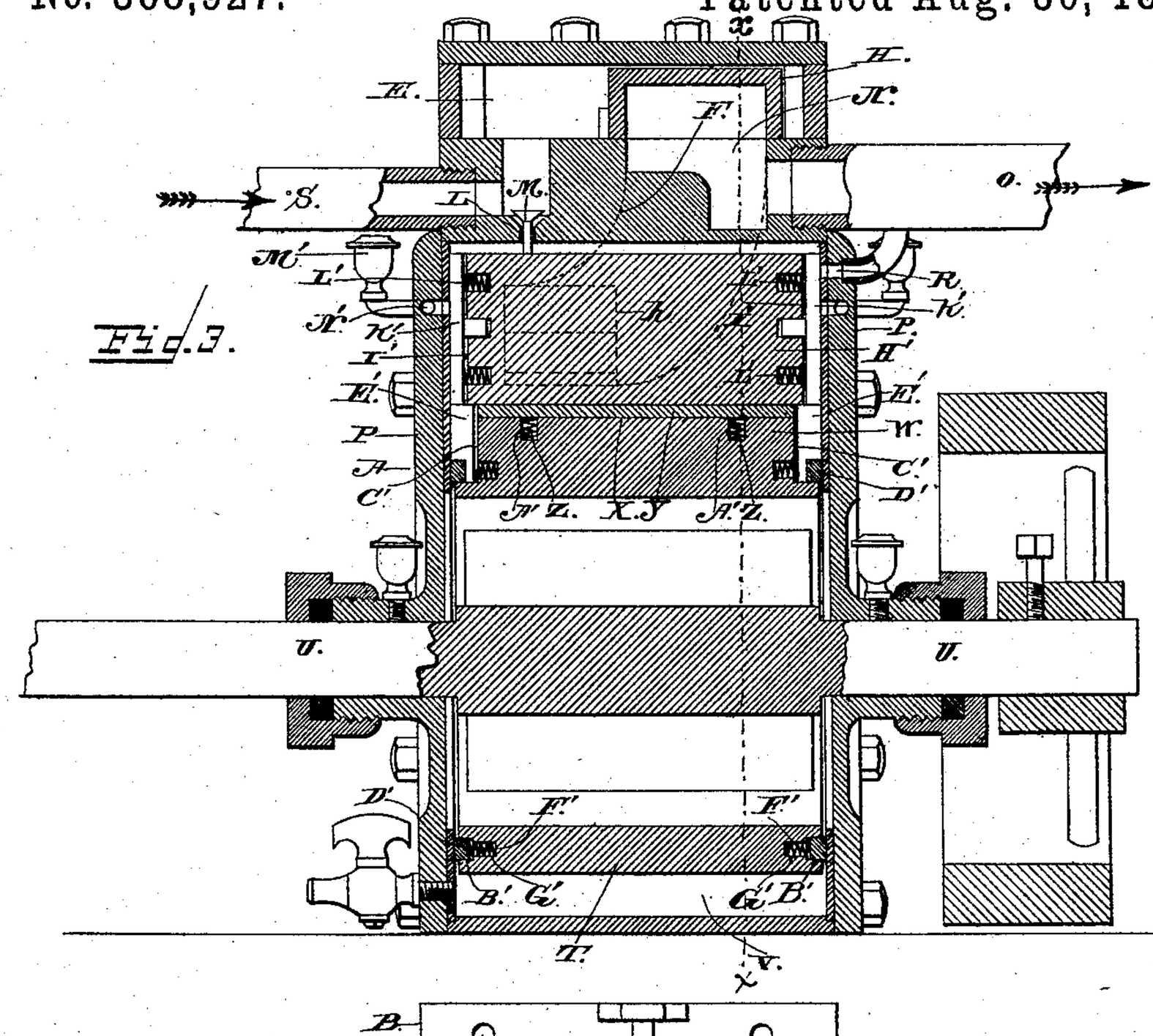
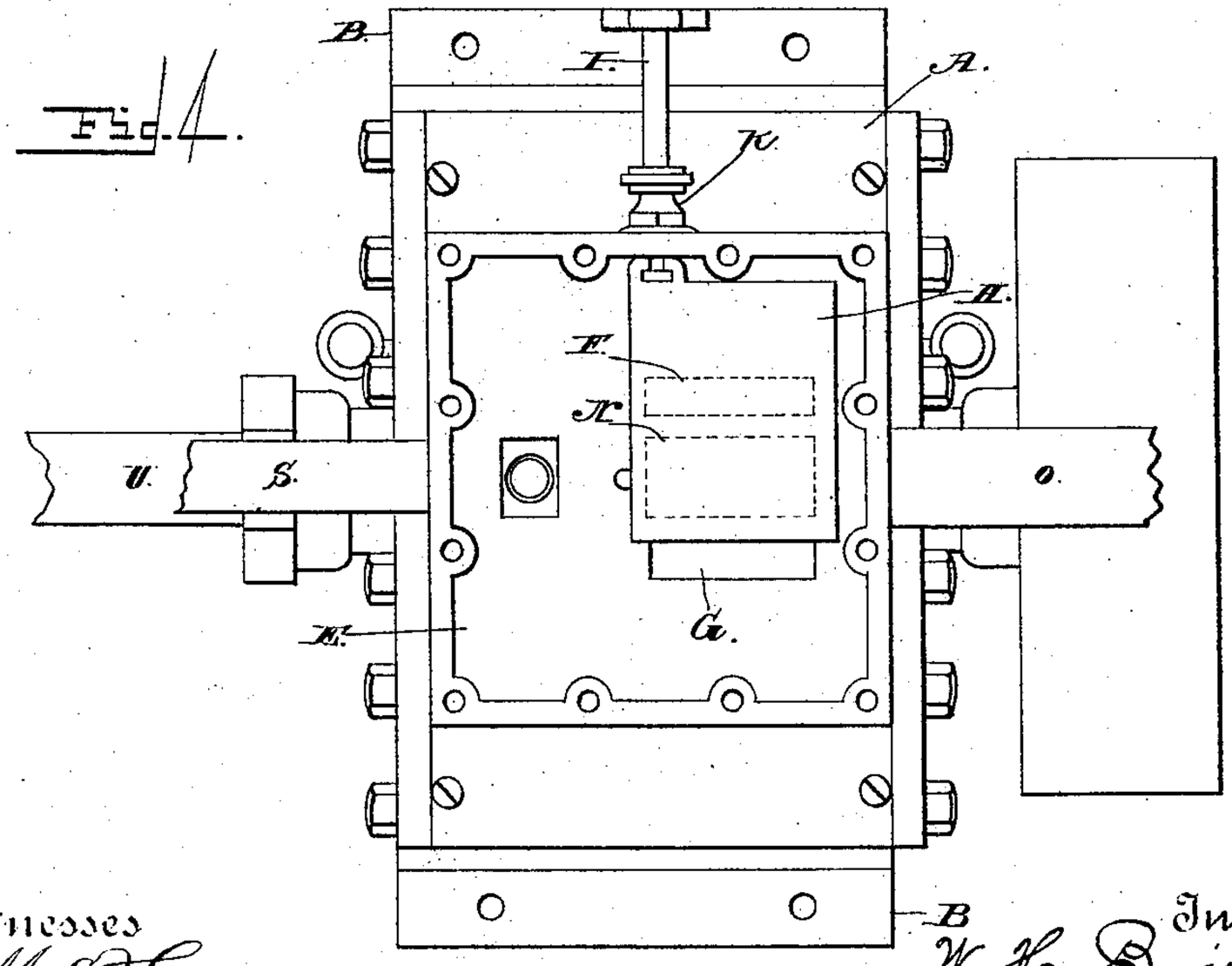


Fig. 4.



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UNITED STATES PATENT OFFICE.

WILLIAM H. BRIGHT, OF McPHERSON, KANSAS, ASSIGNOR TO THE BRIGHT-McNEAL ROTARY ENGINE COMPANY, OF SAME PLACE.

ROTARY STEAM-ENGINE.

SPECIFICATION forming part of Letters Patent No. 368,927, dated August 30, 1887.

Application filed October 26, 1886. Serial No. 217,270. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. BRIGHT, a citizen of the United States, residing at McPherson, in the county of McPherson and State of Kansas, have invented a new and useful Improvement in Rotary Steam-Engines, of which the following is a specification.

My invention relates to an improvement in rotary steam-engines; and it consists in the peculiar construction and combination of devices, that will be more fully set forth hereinafter, and particularly pointed out in the claims.

In the drawings, Figure 1 is an end elevation of a rotary steam-engine embodying my improvements, with one of the cylinder-heads removed. Fig. 2 is a vertical sectional view of the same, taken on the line *x x* of Fig. 3. Fig. 3 is a vertical longitudinal section taken on the line *y y* of Fig. 2. Fig. 4 is a top plan view with the cover of the steam-chest removed. Fig. 5 is a detailed perspective view of the valved abutment.

A represents the cylindrical case, which has on its lower side the supporting-feet B, by means of which the case may be bolted to a suitable base or support. From the upper side of the cylinder extends a vertical neck, C, in the lower side of which is made a vertical transverse opening, D, which extends entirely across the neck and communicates at the lower side with the bore of the cylinder. On the upper side of the neck is a steam-chest, E, which has steam-ports F and G arranged parallel with each other on one side of the steam-chest. The port F communicates with one side of the opening D near one end, and the port G communicates with the opposite side thereof and at the opposite end. Between the ports F and G is an exhaust-port, N, which communicates with an escape-pipe, O.

H represents a slide-valve, which is located in the steam-chest, and is sufficiently large to cover both the ports F and G. A valve-rod, I, is attached to one corner of the valve, and extends out through and beyond a packing-box, K, on one side of the steam-chest. A lever or handle is attached to the outer end of the valve-rod to operate the same. L represents an opening, which extends from the steam-chest to one end of the opening D, and in the said opening L is seated an upwardly-opening puppet-valve, M.

The heads P of the cylinder are bolted to the ends thereof to cover the same, and have upwardly-extending portions which cover the ends of the opening D, and in one of the said heads is made a channel, R, that leads from one end of the opening D, at a suitable height from its lower side, to the exhaust-pipe.

S represents the inlet-pipe to supply steam to the engine.

T represents the rotary piston, which is provided with spindles U, that are journaled in bearings made in the cylinder-heads. The diameter of the rotary piston is less than the interior diameter of the cylindrical case, thereby leaving an annular chamber, V, around the rotary piston, and the latter is provided on one side with a shoulder or offset, W, the sides of which are rounded or inclined, as shown. This shoulder or offset is provided with a transverse groove, X, in which is seated a packing-plate, Y. Coiled extensile springs Z are located in recesses A′, that communicate with the groove X, and the said springs press against the inner side of the plate, so as to force it outwardly against the cylindrical case.

In the ends of the rotary piston are made annular grooves B′. Radial grooves C′ project from the said annular grooves and communicate with the ends of the groove X.

D′ represents annular packing-rings, which fit in the grooves B′ and have radial arms or projections E′, that fit in the grooves C′.

Coiled extensile springs F′ are fitted in recesses G′, that communicate with the grooves B′ and bear against the inner sides of the annular packing-rings, so as to compress the latter against the inner sides of the cylinder-heads.

H′ represents the valved abutment, which is located in the opening D and plays vertically therein. The lower edge of the valve is slightly concaved, and thereby adapted to fit snugly on the rotary piston and bears upon the same. In the vertical ends of the said valve are made vertical grooves I′, in which are fitted packing-plates K′. Springs L′ are secured in recesses that communicate with the grooves I′

and bear against the inner sides of the packing-plates, to force the latter against those portions of the cylinder-heads that cover the ends of the opening D. In opposite sides of the valve, near the ends thereof, are made recesses *h* and *h'*, which register with the inner ends of the ports or chambers F and G, respectively. These recesses extend nearly, but not quite, to the lower edge of the valved abutment, so that when the latter is raised in the opening or valveway D the inner ends of the ports or channels will be closed, and communication between the steam-chest and the annular chamber V will be entirely cut off.

M' represents oil-cups that communicate with oil-chambers N', which are made in the cylinder-heads and communicate with the ends of the opening D, so as to feed oil to the valved abutment, from whence it is diffused over the face of the piston and between the heads of the cylinder and the packing-rings.

The operation of my improved rotary engine is as follows: When the slide-valve is moved so as to cause the port G to be uncovered, the steam is admitted through the said port and the recess *h'* in the valved abutment into the annular chamber V, where it acts between the valved abutment and the offset or shoulder on the rotary piston, so as to revolve the piston in the direction indicated by the arrow in Fig. 1. While the piston is rotating the dead steam on the opposite side of the offset or shoulder thereof is forced through the recess *h* of the valved abutment and the port F and through the recess on the under side of the slide-valve into the exhaust-port, from whence it escapes through the exhaust-pipe. When the piston has nearly completed a revolution, the offset or shoulder thereof reaches the lower edge of the valved abutment, and its inclined or curved side acts as a cam to raise the valved abutment, thus cutting off the steam-ports F and G momentarily and permitting the offset or shoulder to pass under the lower edge thereof. When the valved abutment reaches the upper limit of its movement, it covers the opening R and strikes against the depending stem of the puppet-valve M and opens the same. This admits live steam into the upper portion of the opening or chamber D, and causes it to bear downwardly on the valved abutment with considerable pressure. The inertia of the rotary piston carries its offset or shoulder past the lower edge of the valved abutment, and the pressure of the live steam on the upper side of the same forces it downwardly upon the rotary piston, where it remains by its own gravity during the ensuing revolution thereof. As soon as the valved abutment descends the puppet-valve is closed by its own gravity, and the superincumbent pressure of the live steam in the steam-chest, so as to cut off the supply of steam to the chamber or opening D, and at the same time the opening R is uncovered by the valved abutment, thus permitting the escape of the steam from above the valved abutment. By moving the slide-valve to cause it to cover both the ports F and G the engine is stopped, and the engine may be reversed by causing the slide-valve to cover the port G and open the port F, as will be readily understood. By causing the slide-valve to partly close the inlet-port the speed of the engine may be regulated at will.

Having thus described my invention, I claim—

1. In a rotary engine, the combination of the case having the interior cylindrical opening, the radial chamber or opening D, communicating therewith, and the ports F and G, communicating with opposite sides of the said opening D, the rotating piston having the offset or shoulder on one side, and the movable valved abutment in the chamber or opening D and bearing against the periphery of the piston, substantially as described.

2. In a rotary engine, the combination of the case having the interior cylindrical opening, the radial chamber or opening D, communicating therewith, and the ports F and G, communicating with opposite sides of the said opening D, the rotating piston having the offset or shoulder on one side, and the movable valved abutment in the chamber or opening D, bearing against the periphery of the piston, and having the recesses *h* and *h'* on opposite sides and communicating with the ports F and G, for the purpose set forth, substantially as described.

3. In a rotary engine, the combination of the case having the cylindrical interior chamber, the steam-ports F and G, communicating with the said chamber, the rotating piston in the said chamber having the offset or shoulder on one side to bear against the case, and the movable valved abutment bearing on the piston and located between the ports F and G to close the same when the offset or shoulder is passing the valve, substantially as described.

4. The case, in combination with the rotary piston, the valved abutment H', operated by the piston, the chamber D, in which the valved abutment works, and the valve controlling the supply of live steam to the chamber D to keep the valved abutment pressing against the piston during a portion of the revolution, this latter valve being operated by the valved abutment, as set forth.

5. In a rotary engine, the combination of the case having the annular chamber to receive the piston, and the opening or chamber D, communicating with the said annular chamber, the rotary piston having the offset or shoulder on one side to bear against the side of the annular chamber, the valved abutment located in the opening or chamber D and bearing against the rotary piston, the opening to admit live steam to the chamber D above the valved abutment and having the outwardly-opening valve M, and the escape-opening R, leading from the chamber D, the valved abut-

ment being arranged to close the opening R and open the valve M when the said valved abutment moves outwardly, for the purpose set forth, substantially as described.

6. In a rotary engine, the combination of the case having the annular chamber, the chamber D, communicating therewith, the steam-chest, the ports F and G, leading from the steam-chest to opposite ends of the chamber D, and the exhaust-port between the ports F and G, the slide-valve to open or close the ports, the rotary piston in the annular chamber and having the offset or shoulder on one side, and the valved abutment in the chamber D, bearing on the rotary piston, for the purpose set forth, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

WILLIAM H. BRIGHT.

Witnesses:
W. CLARENCE DUVALL,
JOHN H. SIGGERS.