No. 608,401. Patented Aug. 2, 1898.

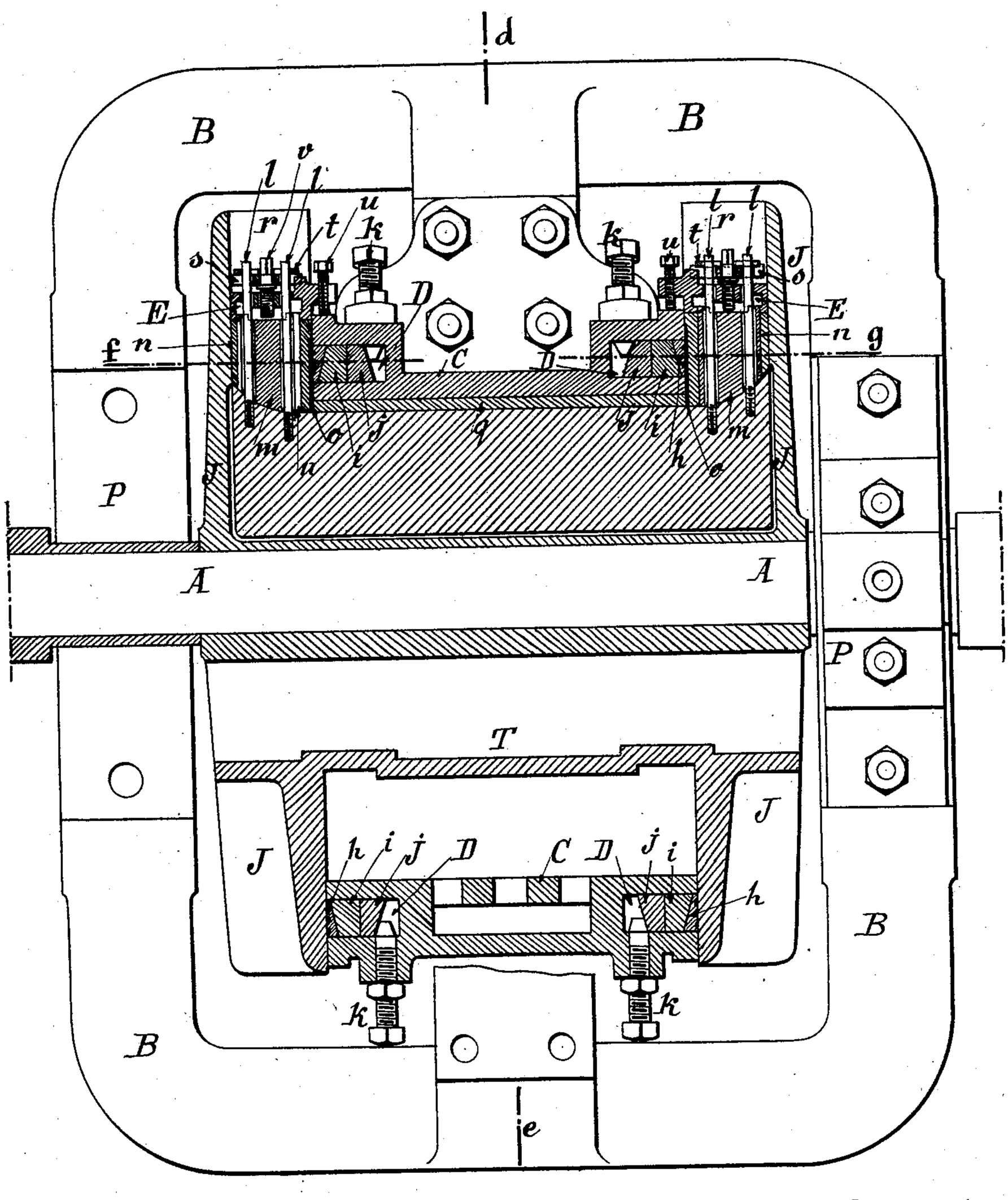
J. T. F. CONTI.

ROTARY ENGINE.

(Application filed Dec. 16, 1897.)

(No Model.) 4 Sheets—Sheet 1.

Fig. 1.



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(No Model.) 4 Sheets—Sheet 2.

Fig .2.

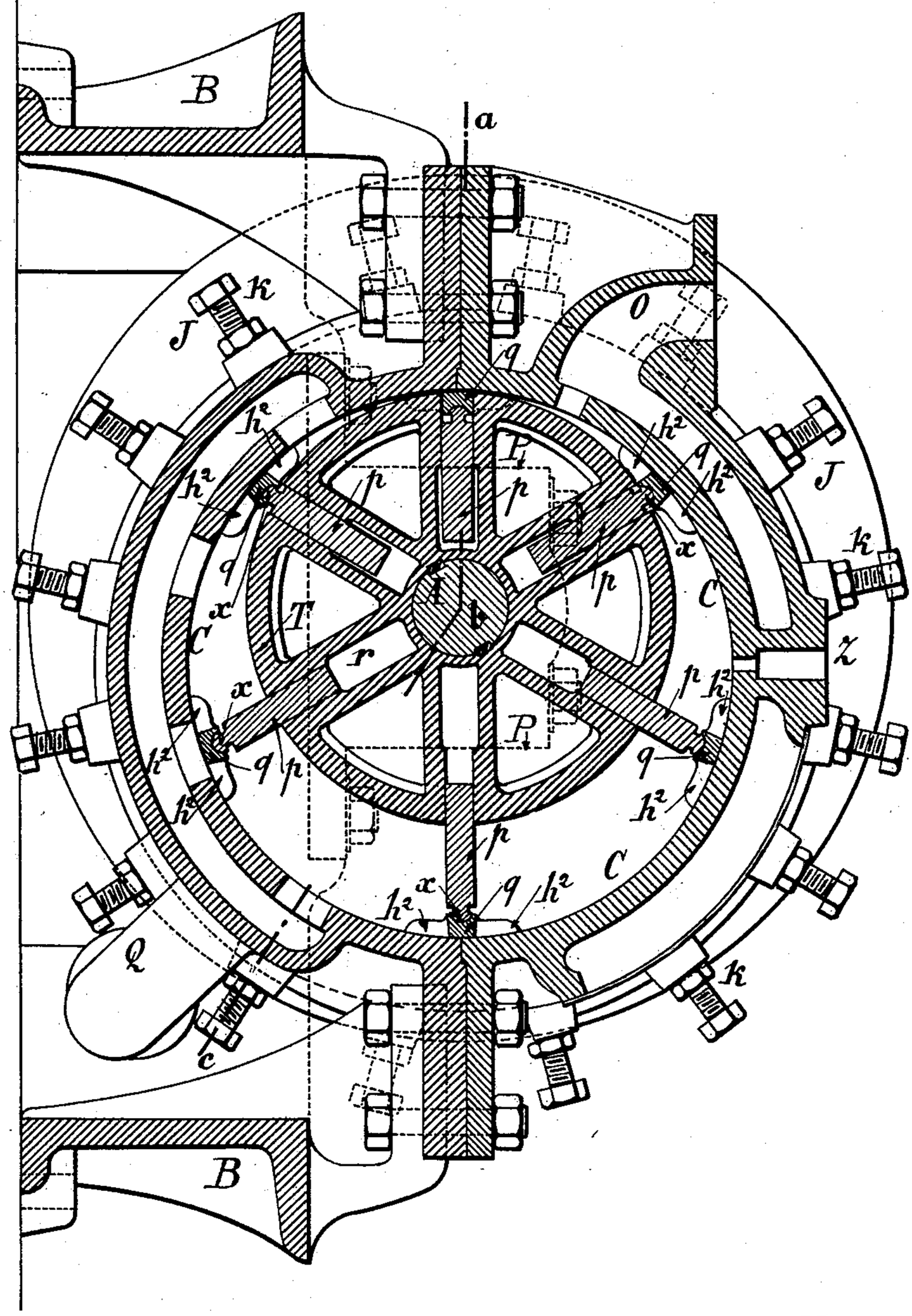

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Fig. 3.

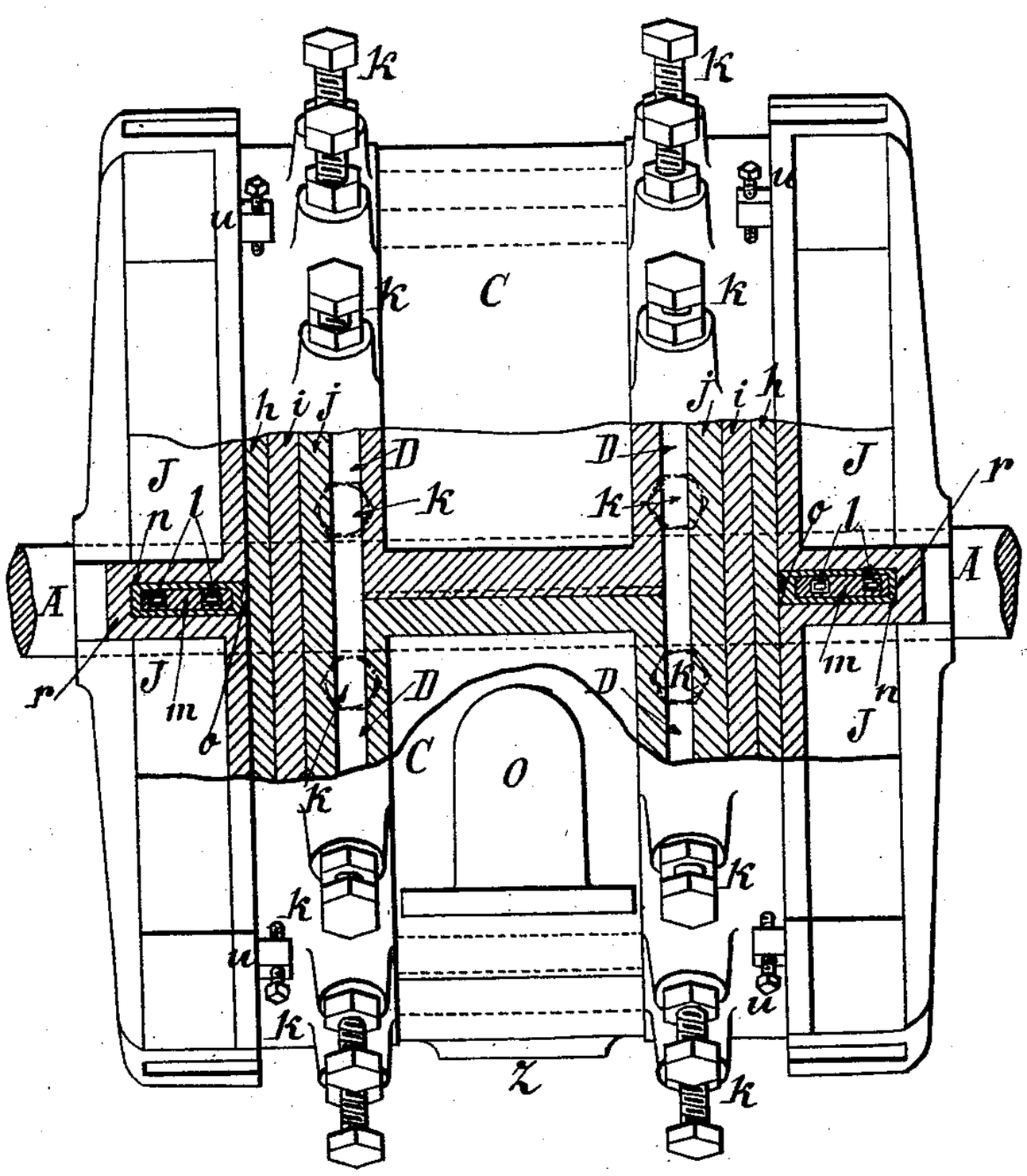
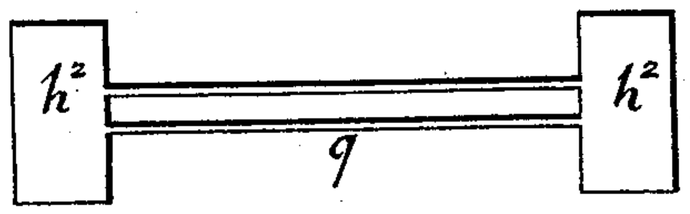


Fig. 4.



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(No Model.) 4 Sheets—Sheet 4.

Fig. 7.

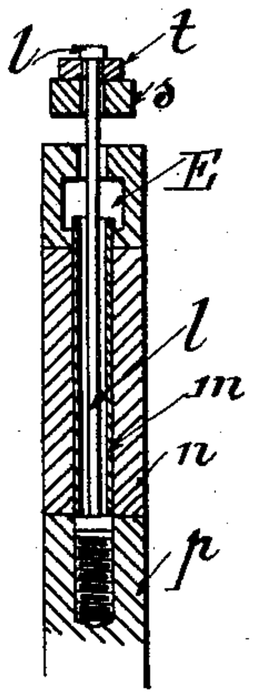

Fig. 5.

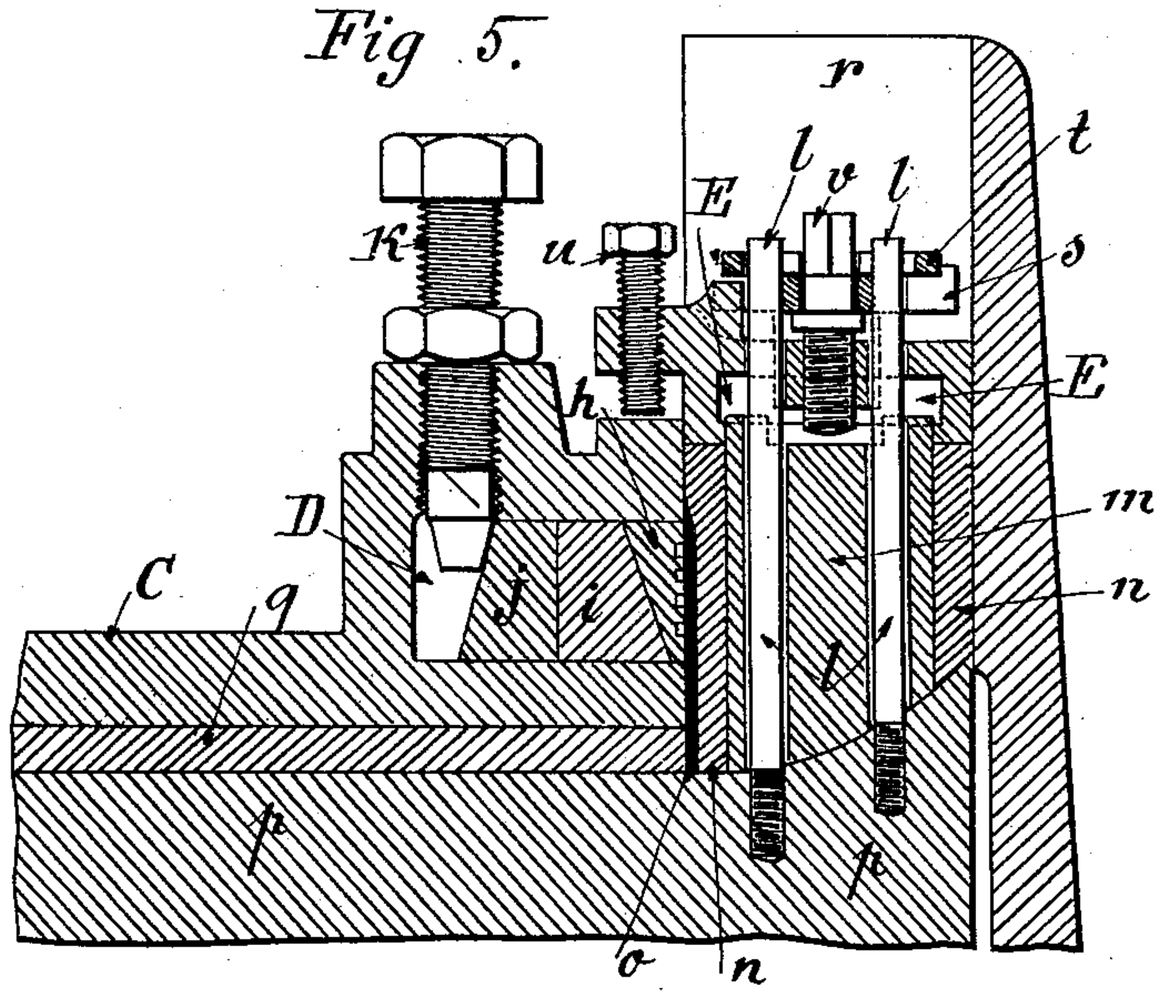

Fig. 6.

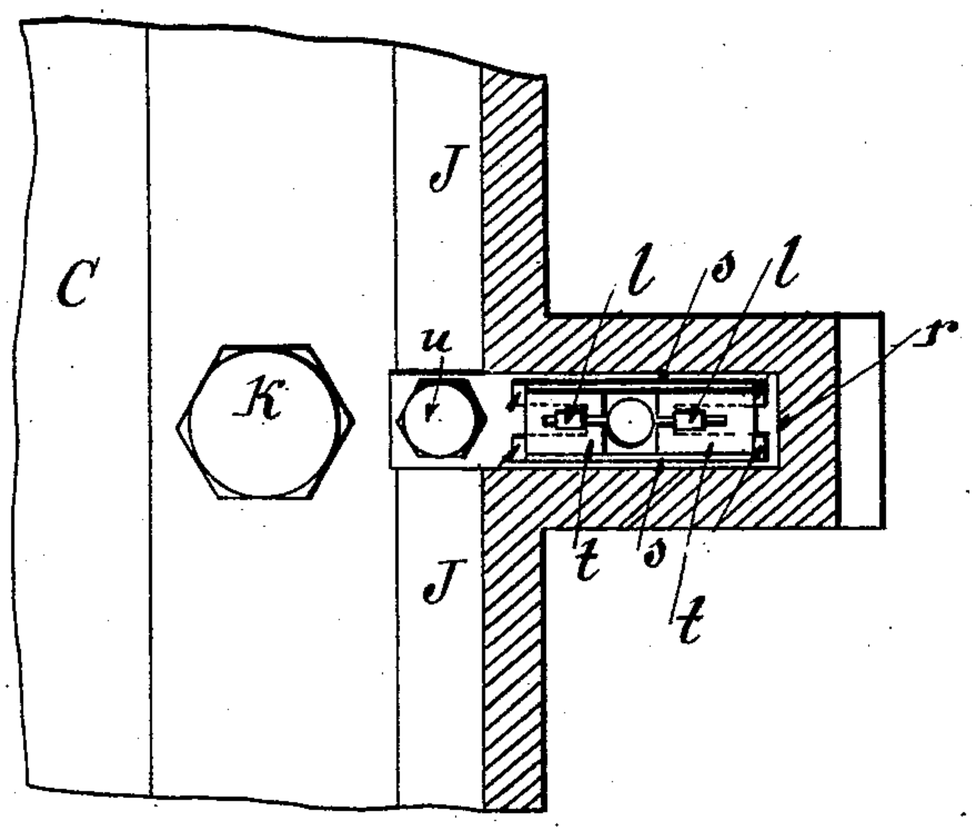

Fig. 8.

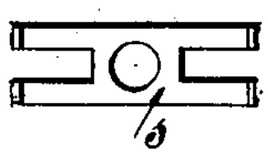

Fig. 9.

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UNITED STATES PATENT OFFICE.

JAMES TIBURCE FELIX CONTI, OF PARIS, FRANCE.

ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 608,401, dated August 2, 1898.

Application filed December 16, 1897. Serial No. 662,155. (No model.) Patented in France May 19, 1897, No. 267,081.

To all whom it may concern:

Be it known that I, JAMES TIBURCE FELIX CONTI, a citizen of the Republic of France, residing at Paris, France, have invented certain new and useful Improvements in Rotary Engines, (for which a patent has been granted in France, No. 267,081, dated May 19, 1897,) of which the following is a specification.

This invention relates to the class of rotary engines wherein the shaft is mounted eccentrically in the cylinder and carries radially-sliding blades or pistons and also wherein the cylinder-heads are fixed to the motor-shaft and connected through the fixed cylinder by a slotted drum in which the radial pistons play.

The object of the invention is to provide a means for packing the pistons which keeps them up to the interior periphery of the cylinder without the aid of springs or the like and means also for packing the joints between the ends of the fixed cylinder and the rotating cylinder-heads.

The accompanying drawings illustrate an embodiment of the engine.

Figure 1 is a section on the broken line *a b c* in Fig. 2. Fig. 2 is a section at right angles to the line *a b c* and in the plane of the line *d e* in Fig. 1. Fig. 3 is a plan, partly broken away, along the line *f g* in Fig. 1. Fig. 4 is a detail view of the foot of one of the sliding pistons. Figs. 5, 6, and 7 are detail sectional views of the side or lateral edge of one of the pistons in the cylinder-head, and Figs. 8 and 9 are detail views of features of the packing devices.

A is the motor-shaft, set eccentrically in a cylinder or engine-body C. This cylinder is fixed to a frame B, on which are the shaft-bearings P. The heads J of the cylinder are fixed on and rotate with the shaft A. These heads are by preference circular and concentric with the shaft, and they are connected together by a drum T, within the cylinder C. This drum T is slotted or grooved longitudinally, the slots being sunk in the drum radially with the shaft A, and in each slot (six, as here shown) is mounted a sliding piston or piston-blade *p*, the sides or lateral edges of these pistons also occupying radial grooves *r*, Figs. 5 and 6, in the heads J. Each piston *p* has at its outer end, next the inner surface of the cylinder C, a foot *q*, (seen detached in Fig. 4,) which is jointed to the end of the piston, as seen in Fig. 2, so that the convex face of the foot may always adapt itself to the concave face of the cylinder. The foot *q* has widened ends h^2, as clearly shown in Fig. 4. The tightness of the lateral edges of the piston, as well as of its lower part, is obtained by the application of the piston itself against the sides of the groove *r* in the walls or heads J, as well as in the drum T—that is to say, each piston always remains applied by the steam against a slide which moves with it, and is consequently supported on three sides. In order to isolate from one another the steam-chambers comprised between the sliding pistons, it is therefore only necessary to keep the pistons pressed outwardly against the cylinder C. To this end the radial grooves *r* in the cylinder-heads J extend out and are open to the atmosphere, and at the outer corner of the piston, occupying a groove *r*, is fixed a rectangular stuffing-box which is exterior to the inner periphery of the engine-cylinder. These stuffing-boxes play in the grooves as the heads rotate eccentrically to the cylinder and serve to keep the pistons out against the cylinder.

Referring particularly to Figs. 5, 6, and 7, in order to make a tight joint between the head or wall J and the end of the cylinder C the latter has a channel D, in which are three contiguous rings—namely, a ring *h*, of copper or suitable antifriction metal, the vertical face of which is grooved; a ring *i*, of india-rubber or like elastic material, and a metal ring *j*, which is acted upon by pressure-screws *k*. This packing device is designed to make a tight joint against the head J and also against the packings with which that part of the piston *p* in the groove *r* is provided. Any means equivalent to the screws *k* may be employed for pressing up the packing-rings *h*, *i*, and *j*.

The packing of the piston, which serves as a stuffing-box, is constructed as follows: The blade *p* has set in it two screws *l*, the outer thinned portion of each of which forms a flat rod. This rod passes freely through a brass plate *m*, surrounded by a flat case *n*, of india-rubber, asbestos, or the like, which is provided with a recess to receive a thin copper

plate *o*, situated contiguous to the end of the cylinder C and the packing-ring *h*, Fig. 5. The packing material *n* is compressed to a greater or less degree by means of the box E, through which pass the flat rods *l*. The notched piece *s* (seen detached in Fig. 8) is placed on the two rods *l*, and above this are placed split keys *t*, (seen in Fig. 9,) which take under shoulders on the flat rods *l*. A screw *v*, which is provided with a shoulder below the notched piece *s*, permits of driving the box E down with more or less pressure on the packing, such pressure being resisted by the shoulders on the rods *l*. A safety-screw *u* serves to keep the piston a little distance from the cylinder when the engine is at rest.

The operation of the engine is as follows: The inlet-port O and the exhaust-port Q being opened, the steam enters, and after having expanded by reason of the increase of volume comprised between two consecutive pistons passes out at the exhaust-port Q. To facilitate starting, steam is admitted at an advanced inlet-port Z, (seen in Fig. 2,) where the effective area of the piston is greater than at the inlet O.

This engine can be run at a very moderate speed, and consequently is well adapted for use in driving vehicles, as the wheels thereof may be mounted directly on the motor-shaft A, thus dispensing with all intermediate gearing.

Having thus described my invention, I claim—

1. A rotary engine having a fixed cylinder, a motor-shaft eccentric to the cylinder, two cylinder-heads fixed on the shaft and provided with radial grooves, open at their outer ends to the atmosphere, a slotted drum on the motor-shaft and connecting said cylinder-heads, radial pistons in the slots in said drum with their lateral edges engaging the radial grooves in the heads, and stuffing-boxes on the outer corners of each piston and fitting in the radial grooves in the cylinder-heads, substantially as set forth.

2. A rotary engine having a fixed cylinder, a motor-shaft eccentric to the cylinder, two cylinder-heads fixed on the shaft and provided with radial grooves, open at their outer ends to the atmosphere, a slotted drum on the motor-shaft and connecting said cylinder-heads, radial pistons in the slots in said drum with their lateral edges engaging the radial grooves in the heads, and stuffing-boxes on the pistons and fitting in the grooves in the cylinder-heads, said stuffing-boxes having each a yielding packing material and means for expanding said material laterally, substantially as set forth.

3. In a rotary engine, the combination with the fixed cylinder, the rotative motor-shaft, the radially-slotted heads fixed on the shaft, the slotted drum fixed on the shaft and connecting said heads, and the pistons occupying the slots in said drum and the grooves in the heads, of the stuffing-boxes carried by the several pistons, each of said boxes comprising a plate *m*, the screw-rods *l* fixed in the piston and extending out through said plate, the case *n*, of yielding packing material embracing the plate *m* and fitting into the radial groove in the cylinder-head, a box E fitting on said case *n* and embracing the screw-rods *l*, and means for pressing said box upon the packing in order to expand it in the slot, substantially as set forth.

4. The combination with the fixed engine-cylinder, having annular channels D in its ends, the motor-shaft, and the cylinder-heads J fixed thereon, of the devices for packing the joints between the respective ends of the cylinder and the said heads, said devices comprising each a metal ring *h*, in the channel D and bearing on the cylinder-head, a ring *i*, of yielding material behind the ring *h*, a beveled or coned metal ring *j*, behind the cushion-ring *i*, and a screw *k*, driven through the outer wall of the channel D, radially to the ring *j*, said screw having a conical tip bearing on the beveled face of the ring *j*, substantially as set forth.

5. The combination with the fixed engine-cylinder having circumferential channels D at its respective ends, the motor-shaft, the grooved cylinder-heads J, fixed on the shaft, the slotted drum connecting said cylinder-heads, the radial pistons, the packing-rings *h i* and *j*, in each channel D, and means for forcing said rings up to the cylinder-head, of the stuffing-boxes carried by the pistons and occupying the radial grooves in said cylinder-heads, said stuffing-boxes each having a casing *n* of soft packing material and a plate *o*, of metal set in that face of the said casing which is adjacent to the ring *h*, substantially as set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

JAMES TIBURCE FELIX CONTI.

Witnesses:
EDWARD P. MACLEAN,
AUGUSTE MATHIEY.