964,431.

J. W. KEATING & A. McDONALD.

ROTARY ENGINE.

APPLICATION FILED JUNE 15, 1909.

Patented July 12, 1910.

2 SHEETS—SHEET 1.

Fig. 2.

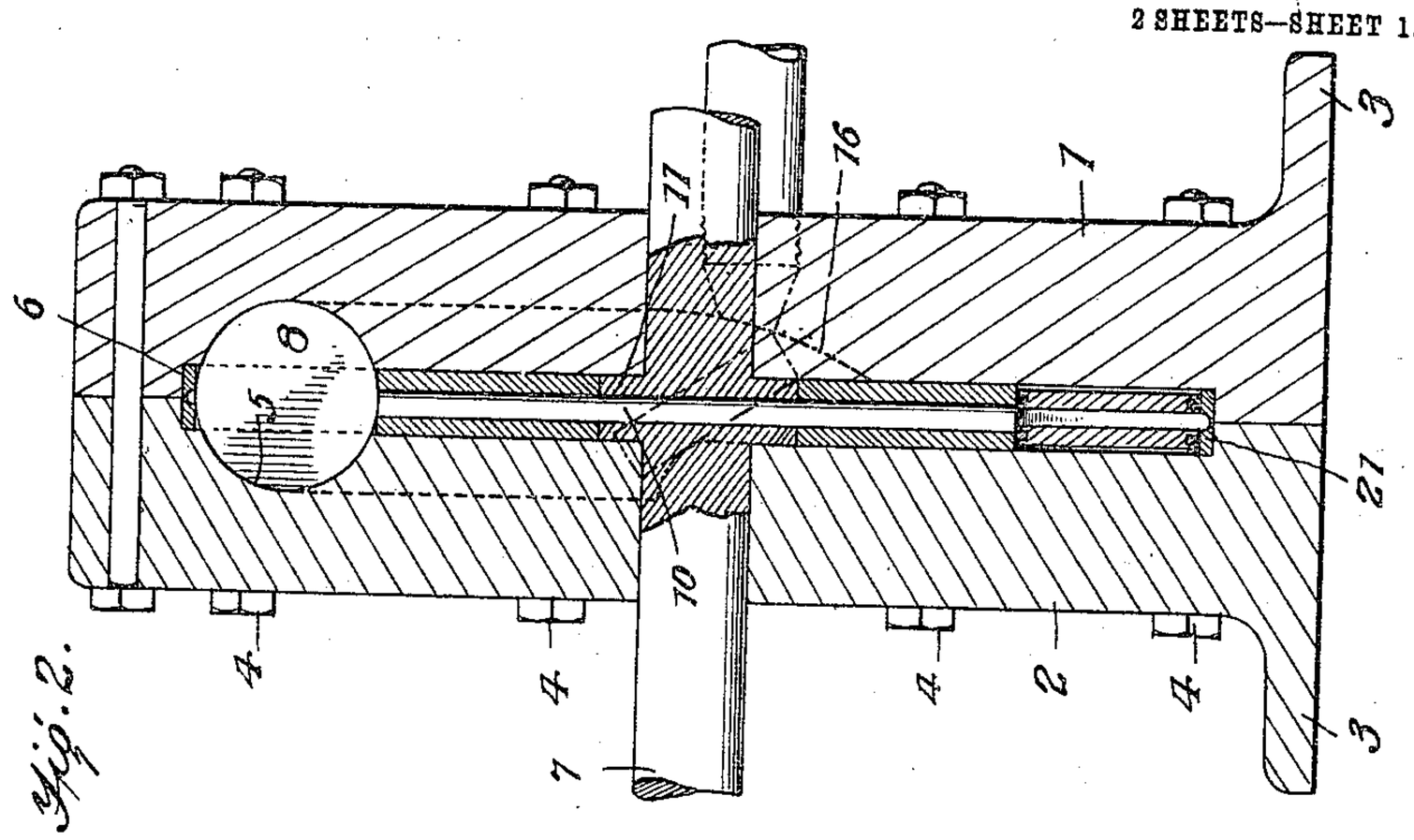

Fig. 1.

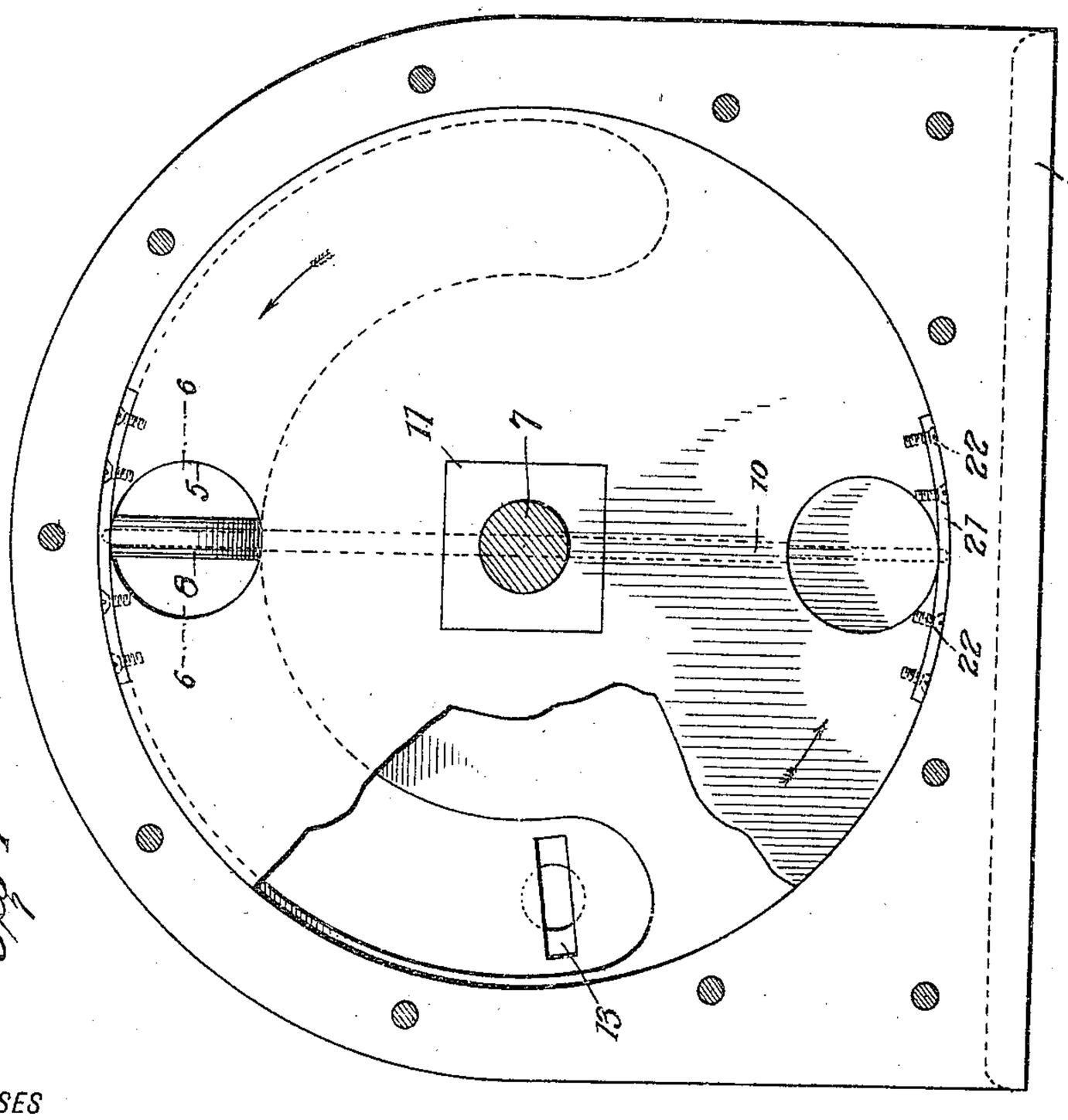

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Fig. 3.

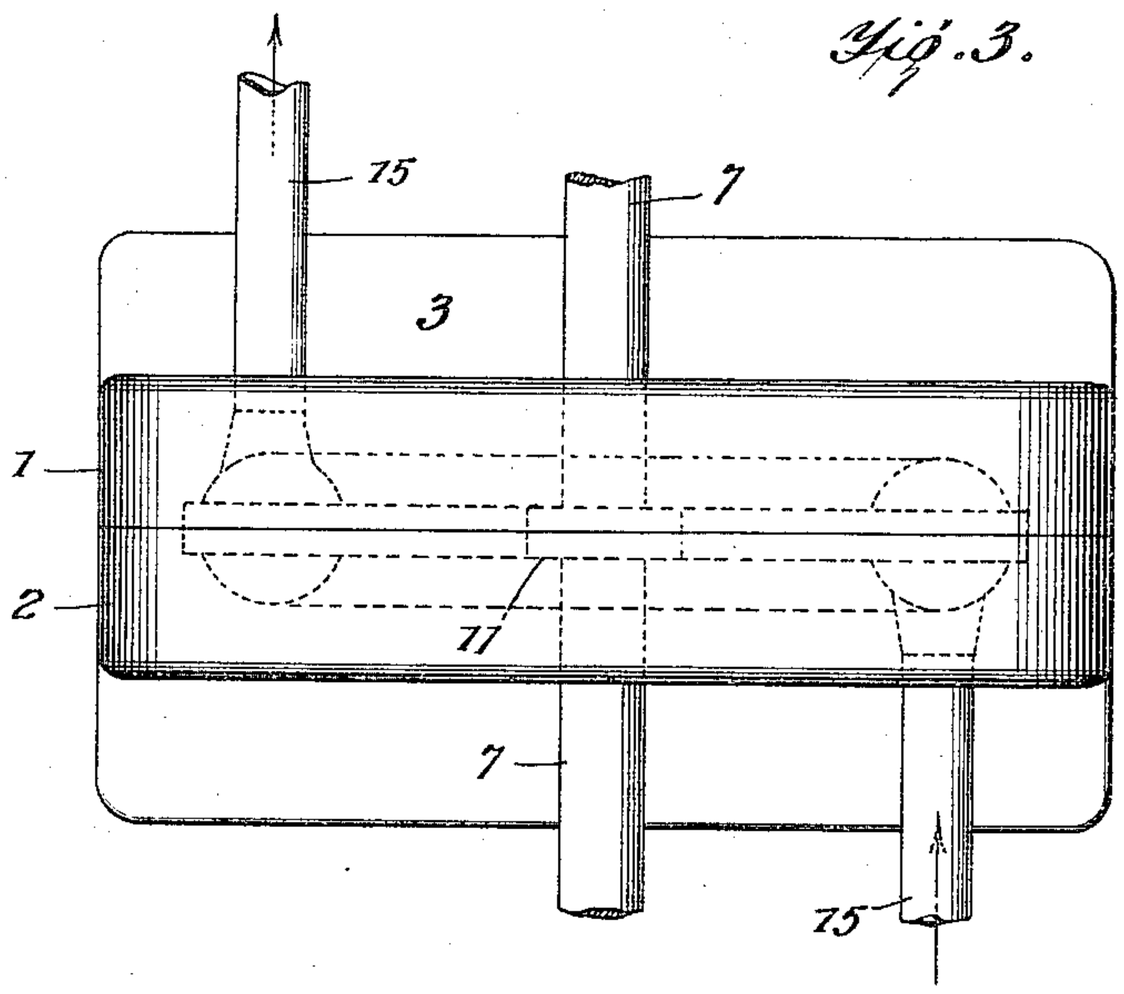


Fig. 4.

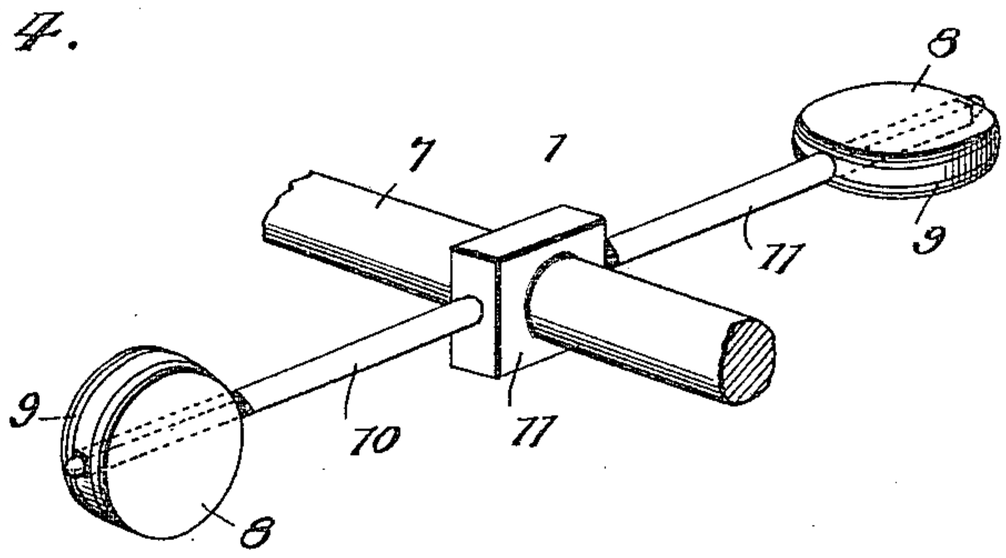
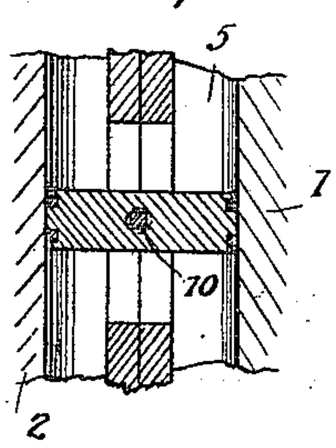
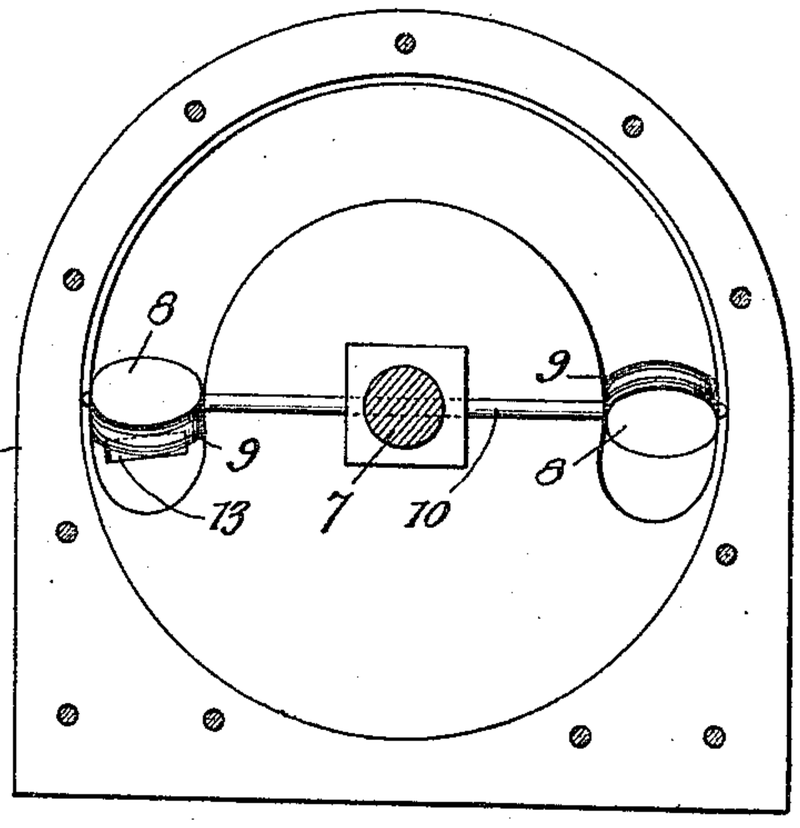


Fig. 5.

Fig. 6.





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UNITED STATES PATENT OFFICE.

JAMES W. KEATING AND ALLAN McDONALD, OF PORTLAND, OREGON.

ROTARY ENGINE.

964,431. Specification of Letters Patent. Patented July 12, 1910.

Application filed June 15, 1909. Serial No. 502,215.

To all whom it may concern:

Be it known that we, JAMES W. KEATING and ALLAN MCDONALD, citizens of the United States, residing at Portland, in the county of Multnomah and State of Oregon, have made certain new and useful Improvements in Rotary Engines, of which the following is a specification.

Our invention is an improvement in engines, and consists in certain novel constructions, and combinations of parts hereinafter described, and claimed.

The object of the invention is to provide a rotary engine, requiring no valves for operating the parts of the engine proper, the rotor comprising oppositely arranged disks rigidly connected, which are moved into operative position by each other.

Referring to the drawings forming a part hereof, Figure 1 is a side view of the improvement, partly in section, Fig. 2 is a vertical section, Fig. 3 is a plan view, Fig. 4 is a perspective view of the rotor, Fig. 5 is a side view of the engine, with one of the casing sections removed, and Fig. 6 is a partial transverse section through a vane.

The embodiment of the invention shown in the drawings, comprises a two part casing, consisting of sections 1 and 2, each of which is laterally flanged at its bottom as at 3 to form a base, and the sections are secured together by bolts 4. Each of the sections is substantially cylindrical, and provided in its inner face with a circular recess, the recesses coöperating to form a substantially cylindrical opening 5 within the casing, the outer edge of the opening being formed into an annular passage 6.

Each of the sections is provided with a central axial opening, the opening of one section registering with the opening of the other, and a shaft 7 is journaled in the openings, the shaft forming a part of the rotor to be presently described.

The rotor comprises the shaft 7, which is provided with a bearing block 11, and a pair of wings or vanes 8 of disk shape, secured to the opposite ends of a rod 10 journaled for rotation in the bearing block.

The vanes as shown in Fig. 4 are at right angles to each other, and are journaled on a diametrical axis, and the openings for receiving the ends of the shaft are square in cross section, as are also the said ends, to rigidly connect the vanes together. The vanes move in the annular passage, and it will be evident that when one is rotated, the other must undergo a like degree of rotation.

The disks are provided near their margins with registering annular openings 20 in which the vanes are received, and the ends of the rod are received in depressions in the inner faces of straps 21, which are secured to the peripheries of the disks, the disks being recessed to receive the straps, and the said straps are secured in place by screws 22.

The disks as shown in Fig. 4, extend to the inner face of the casing sections, and the rod is journaled between them, each being provided with radial grooves, which coöperate to form passages for receiving the arm.

The passage as shown in Figs. 1 and 5 is circular in cross section for some what more than 180° of its extent, being flat throughout the remainder, and the circular portion merging abruptly into the flat portion. At each end of the circular portion of the passage, a port 13, 14, is provided, one port acting as an inlet for the motive fluid and the other as an exhaust, depending upon the direction in which the engine is running, and the ports are connected by pipes 15, with any suitable form of reversing valve.

At the point where the circular portion of the passage merges into the flat portion, the sides of the passage are inclined as shown at 16, enough to rotate the rod, so that the disk passing into the flat portion will be turned into a plane transverse to the shaft, while the disk which is leaving the passage will be turned at right angles to the passage, thus forming a moving abutment against which the motive fluid acts.

It will be evident from the description that the entrance of one vane into the flat portion of the annular passage, swings the other which is leaving the passage, transversely thereof, to form a movable abutment closing the said passage until the exhaust opening is passed, and the motive fluid is permitted to exhaust.

The annular passage at the point where the circular portion merges into the flat portion is shaped to conform with and fit the change in form of the projection of the vane, so that the walls of the passage are at no time out of contact with the entire periphery of the vane.

In the operation of the device, the motive fluid is admitted through one of the ports, in accordance with the direction in which

it is desired to run the engine. The fluid travels in the direction of least resistance, which will be the circular portion of the passage, and as it strikes the vane which is therein, it will be moved ahead by the fluid.

Before the vane passes the exhaust opening the following vane will have passed the inlet port opening, but does not however stand squarely transverse to the passage until it has passed the said port, at which point of time the first vane has passed the exhaust, and the fluid in front of the second vane is exhausting.

The reversing valve may be of any suitable construction, forming however, no part of the invention, and by cutting off the fluid at an earlier point the full advantage of the expansive force of the fluid may be taken advantage of. It will be observed that no valves are made use of in the engine proper nor is any separate mechanism used to operate the vanes, the turning movements thereof being caused by the companion vane.

We claim:

1. In an engine of the class described, a shaft having a transverse bearing, a rod having its longitudinal center journaled in the bearing, and having its ends reduced and polygonal in cross section, a vane at each end of the shaft, each of said vanes being circular and having a diametrical opening fitting the reduced end of the rod, a disk arranged on each side of the rod, each having oppositely disposed circular openings at its periphery for receiving the vane.

2. In an engine of the class described, a shaft having a transverse bearing block, a rod journaled in the bearing block, the longitudinal center of the rod being at the center of the shaft, said rod having its ends reduced and polygonal in cross section, a vane on each end of the rod, each of said vanes having a diametrical opening fitting the end of the rod, said vanes being circular and arranged with their planes at right angles to each other, straps secured on the periphery of the disks at the openings, each having an opening for receiving the end of the rod, and a casing inclosing the disk and having an annular passage for the vanes.

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