W. AVENS & F. FRADLEY.

ROTARY ENGINE.

No. 46,436. Patented Feb. 21, 1865.

Fig. 1.

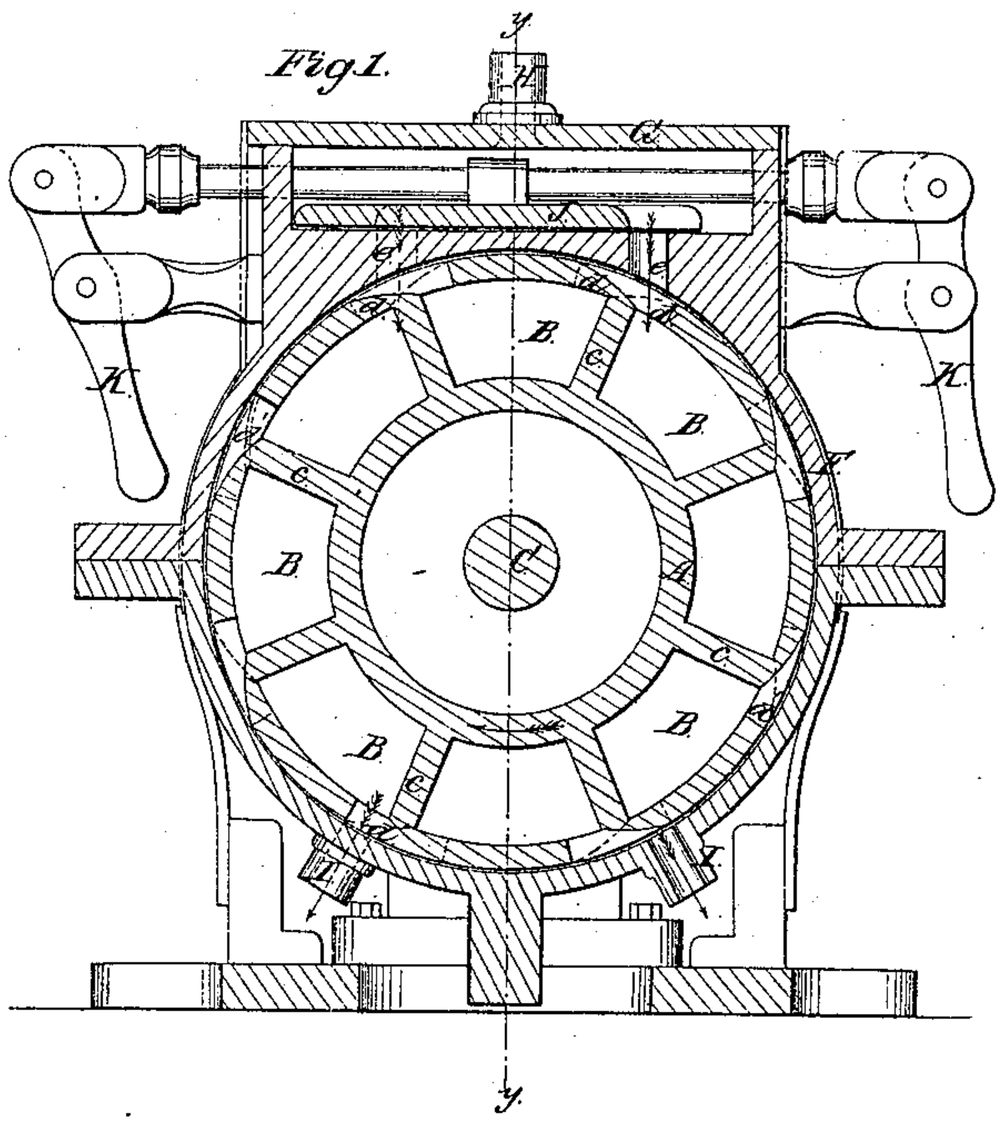


Fig. 2.

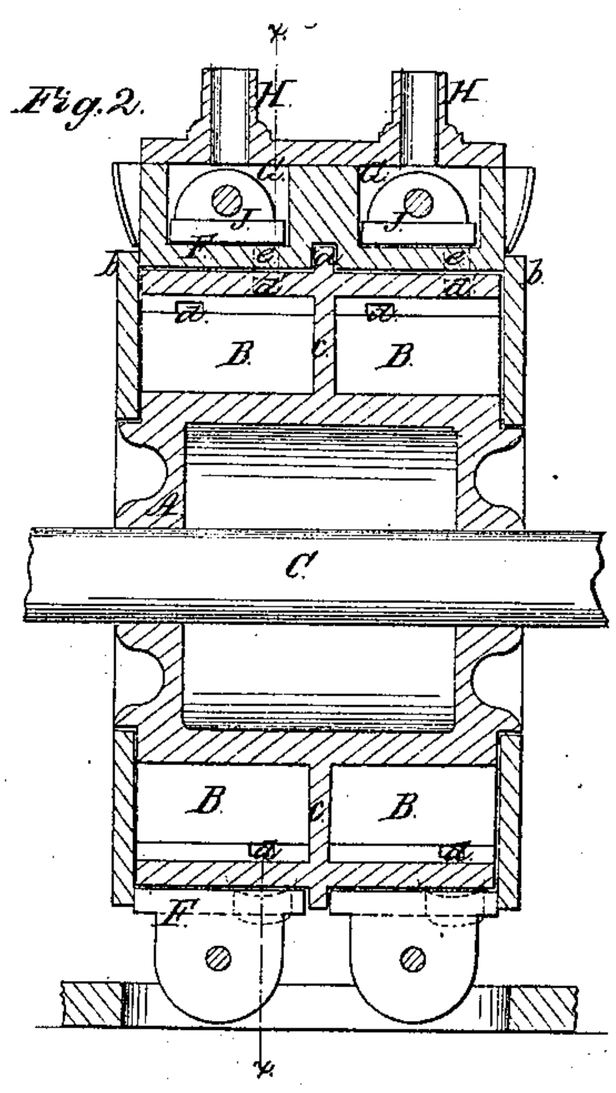
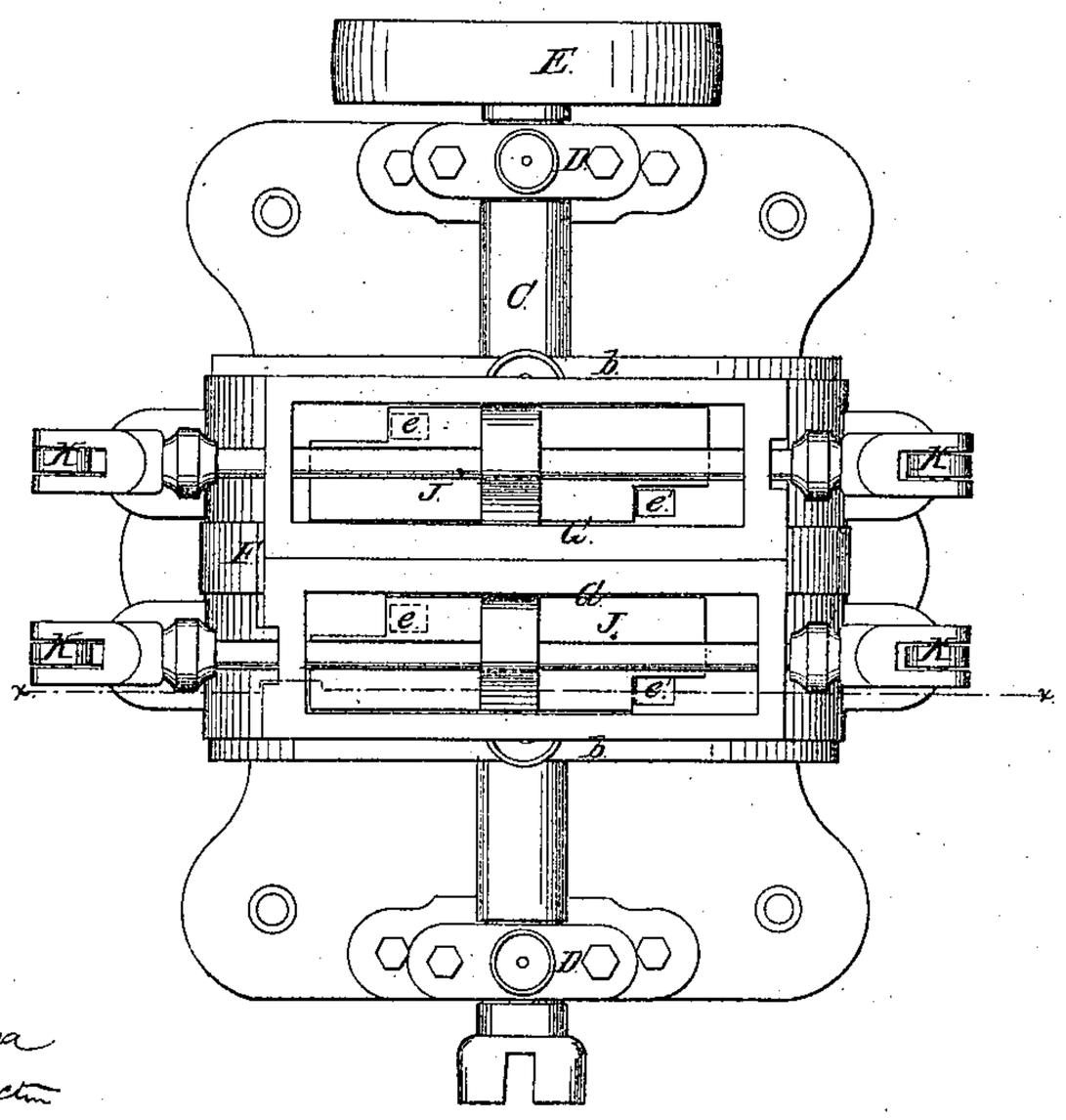


Fig. 3.



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UNITED STATES PATENT OFFICE.

WILLIAM AVENS AND FREDERICK FRADLEY, OF BROOKLYN, NEW YORK

IMPROVEMENT IN ROTARY ENGINES.

Specification forming part of Letters Patent No. **46,436**, dated February 21, 1865.

To all whom it may concern:

Be it known that we, WILLIAM AVENS and FREDERICK FRADLEY, of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Rotary Engine; and we do hereby declare that the following is a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 represents a transverse vertical section of this invention, the line *x x*, Fig. 2, indicating the plane of section. Fig. 2 is a longitudinal vertical section of the same taken in the plane indicated by the line *y y*, Fig. 1. Fig. 3 is a plan or top view of the same, the steam-chest covers having been removed in order to expose the valves.

Similar letters of reference indicate corresponding parts.

This invention consists in a wheel provided with two sets of chambers, to each of which access is had by two channels situated at the opposite ends of the chambers and tapering off in opposite directions, in combination with a cylinder fitting closely to the circumference of the wheel, and with valves which open and close the steam-ports in such a manner that by admitting steam to the chambers of the wheel a rotary motion can be imparted to the same in either direction, and by a simple movement of the valves the motion of the engine can be reversed at any moment.

A represents a wheel, which is provided with two sets of chambers, B, and which is firmly keyed to the central shaft, C. This shaft extends through the sides of the wheel A and it has its bearings in suitable standards D, as clearly shown in Fig. 3 of the drawings. A pulley, E, mounted on one end thereof, serves to transmit its motion to the working-machines, and, if desired, said shaft may be coupled to another shaft and its motion transmitted to any desired spot.

The wheel A is fitted into a cylinder, F, which fits close to the periphery of the wheel, and the two sets of chambers B are separated from each other by a partition, G, as shown in Fig. 3. Flanges *a b*, projecting from the middle and the ends of the wheel A, prevent the escape of steam over the edges of the cylinder. The flange *a* fits into a circular groove in the middle of the cylinder, and the flanges *b* project over the edges of the same. No packing is required to produce a steam-tight joint.

The several chambers in each set are separated from each other by radial portions *c*, (see Fig. 1,) and each chamber is provided with two steam-channels, *d d'*, which are situated at the opposite corners of the same, one set being beveled off in one and the other set in the opposite direction. The channels *d* communicate through ports *e*, and the channels *d'* through ports *e'*, with the steam-chests G, to which steam is admitted through a pipe or pipes, H. I I are the exhaust-ports.

The ports *e e'* are opened or closed by valves J, which are situated in the steam-chests, and which are moved by means of hand-levers K, according to the direction in which the engine is to move.

In the drawings the ports *e'* are shown open, and steam is admitted through the channels *d'* to the chambers B. The motion of the wheel A takes place in the direction of the arrow marked thereon in Fig. 1. If it is desired to reverse the motion of the engine, the valves J are brought in such a position that the ports *e'* are closed and the ports *e* opened. In this case the steam enters through the channels *d* in the chambers B of the wheel A and causes the same to revolve in the direction opposite to the arrow marked thereon in Fig. 1.

The simplicity of this engine is unsurpassed. No packing is required to render the joints tight, no slide-valve or complicated valve-gear is needed, and the motion imparted to the wheel can be transmitted directly to the working-machines.

We claim as new and desire to secure by Letters Patent—

The wheel A, with one or more sets of chambers B, which are provided each with two channels, *d d'*, situated at opposite corners, in combination with ports *e e'*, valves J, and cylinder F, all constructed and operating substantially as and for the purpose set forth.

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