G. MURRAY, Jr.
Rotary-Engine.

No. 221,599. Patented Nov. 11, 1879.

Fig. 1.

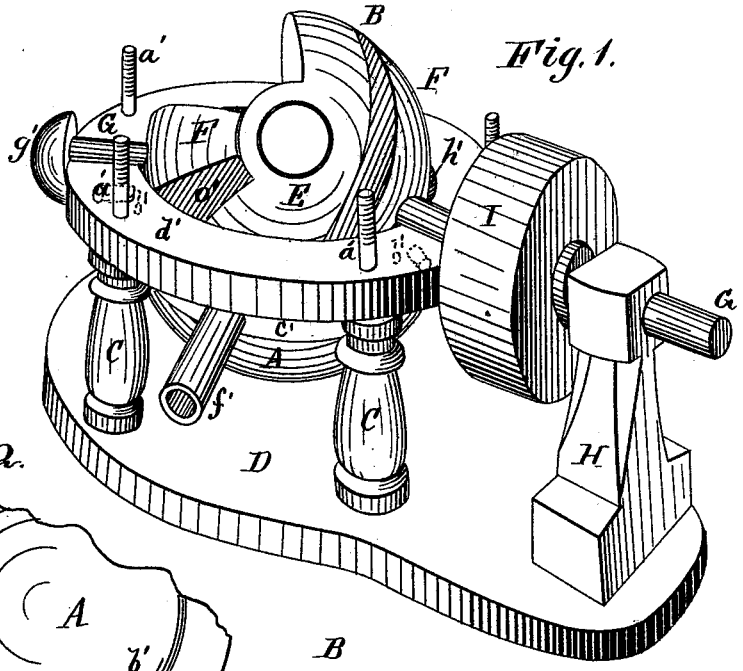


Fig. 2.

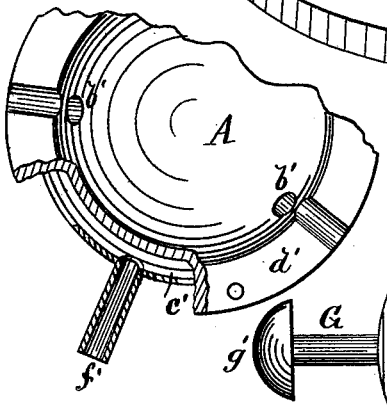


Fig. 3.

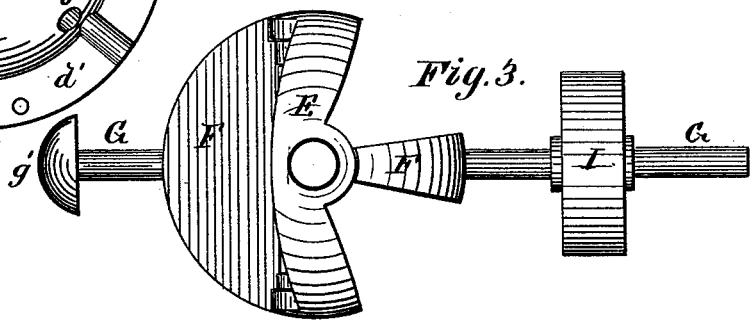
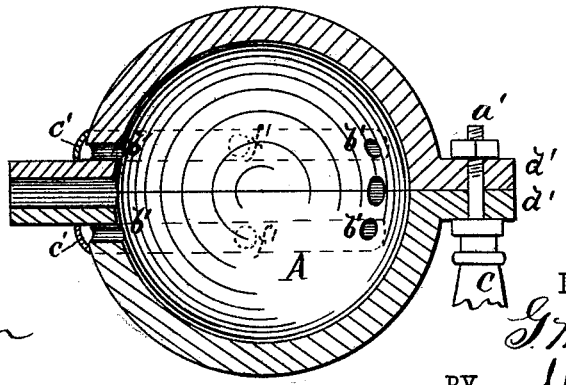


Fig. 4.



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GEORGE MURRAY, JR., OF CAMBRIDGEPORT, MASSACHUSETTS.

IMPROVEMENT IN ROTARY ENGINES.

Specification forming part of Letters Patent No. **221,599**, dated November 11, 1879; application filed June 11, 1879.

To all whom it may concern:

Be it known that I, GEORGE MURRAY, Jr., of Cambridgeport, in the county of Middlesex and State of Massachusetts, have invented a new and Improved Rotary Engine, of which the following is a specification.

Figure 1 is a perspective elevation of the device. Fig. 2 is a plan of the inside of the top or cover. Fig. 3 is a plan of the running part of the device drawn out in a horizontal plane. Fig. 4 is a sectional elevation of the shell or globe of the motor.

Similar letters of reference indicate corresponding parts.

The object of this invention is to provide a novel and simple device that can be used as a steam or hydraulic engine to transmit power, or as a force-pump or blower when power is applied to it.

The invention consists, essentially, of a universal joint with solid sections fitted snugly, but so as to revolve within a globular shell.

In the drawings, A is the cylinder, globe, or shell in which revolves the universal joint B, that serves as a piston when the device is used as an engine or pump, and as a fan or fans when used as a blower. Each half of the globe is flanged, that they may be held together by the bolts *a'*, and each half is furnished with steam or exhaust ports or ingress and egress ports *b'*, that extend from the inside of the shell to the connecting covered chambers *c'*, that are on the outside against the flanges *d'*, while connected with each channel is a pipe, *f'*. The whole device is supported by standards C on the bed-plate D.

To the central portion, E, of the revolving part of the device are hinged at right angles to each other, and on its opposite sides, the two other sections, F, and all these parts are solid from their centers or points of junction to their peripheries. From the apex of each section F projects a shaft, G, which is journaled in the flanges of the globe, and on the end of one shaft is a collar, *g'*, fitting close against the flanges, while the other extends farther outward, and is supported by the pillow-block H, and carries on it the pulley I. These shafts are set at an obtuse angle to each other.

When the device is to be used as an engine or pump the periphery or outer edge of each section will be furnished with a packing ring or strip extending entirely around it, in order to make a tight joint against the steam or water with which the engine or pump may be worked.

When used as an engine the steam or water will be introduced through one of the pipes *f'*, and pass into the shell through one of its connecting-ports *b'*, and exhaust through the ports in the opposite half of the shell, and as the moving parts revolve under the pressure they, in turn, close and open one or the other of the ingress and egress ports in the same manner or with the same effect as does the valve of an engine.

When used as a pump and driven by power applied to the pulley the water will be drawn in through either the upper or lower pipe, *f'*, and ejected by the other pipe *f'*, and when run as a blower the air will be drawn in and forced out in like manner. For instance, steam entering the pipe *f'* (shown in Fig. 1) will find the left-hand port indicated by dotted lines closed by one of the sections F, and will consequently enter through the right-hand one into the space *h'*, and at the same time the left-hand exit or exhaust-port in the upper part of the shell will be found open and the right-hand one closed, and as the parts revolve the open ports are closed and the closed ones opened and steam taken into the space O, and so the motion continues.

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

A rotary engine consisting of the globular shell A, provided with ports *b'*, covered channels *c'*, flanges *d'*, and pipes *f'*, the universal joint B, whose sections are solid, standards C, bed-plate D, shaft G, pillow-block H, and pulley I, constructed and arranged substantially as herein shown, and for the purposes described.

GEORGE MURRAY, JR.

Witnesses:
JOHN MILES MURRAY,
EDGAR SMITH.