No. 47,636. PATENTED MAY 9, 1865.

S. HARRIS.

ROTARY STEAM ENGINE.

Fig. 1

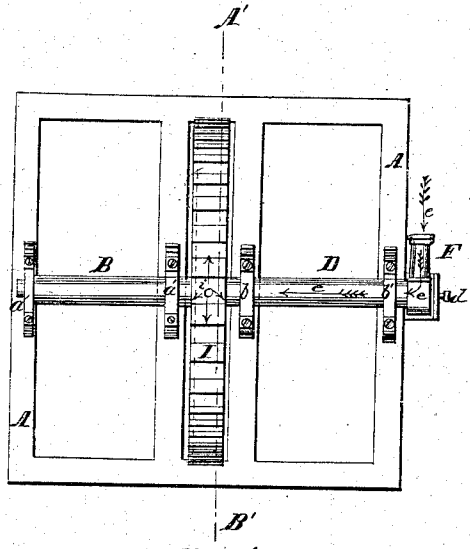


Fig. 2.

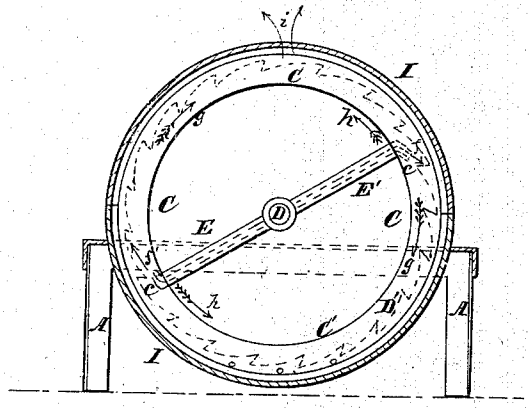


Fig. 4.

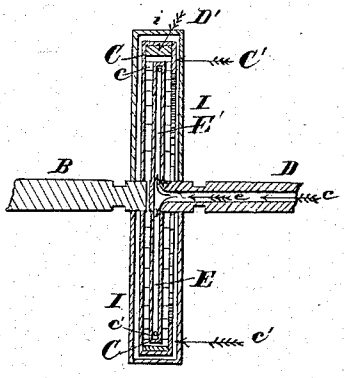
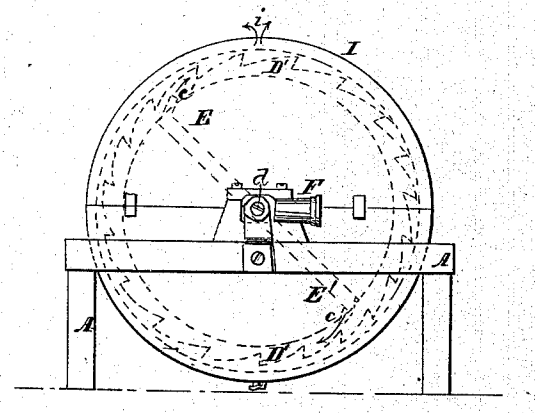


Fig. 3.



WITNESSES.

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SAMUEL HARRIS, OF ROCHESTER, MICHIGAN.

IMPROVEMENT IN ROTARY STEAM-ENGINES.

Specification forming part of Letters Patent No. **47,636**, dated May 9, 1865.

To all whom it may concern:

Be it known that I, SAMUEL HARRIS, of the town of Rochester, county of Oakland, and State of Michigan, have invented a new and Improved Steam-Motor; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

The nature of my invention consists in producing motion by the escape of steam, in one case it being direct and in the other by reaction, both, however, at the same time.

In the drawings, Figure 1 represents a plan of my machine, into which steam is conducted in any suitable way; Fig. 2, a vertical section on line A′ B′; Fig. 3, an end elevation, and Fig. 4 a partial axial section at right angles to line A′ B′.

A represents a table or frame-work of sufficient strength to carry the machinery and remain steady when it is in rapid motion; B, a shaft supported in two bearings, *a a′*, and which carries on its inner end a cup-shaped disk, C. D is another shaft secured in two bearings, *b b′*, carrying two or more arms, E E′, this shaft and its attached arms being hollow for the passage of steam through them. The outer ends of these arms are bent into an elbow shape in opposite directions, and nearly at right angles to the arms; or orifices are made in the ends of the arms for the escape of the steam in like manner as seen at *c c′*.

Shafts B and D are entirely independent of each other. On the outer end of shaft D there is an arm or connecting-pipe, F, into which it fits, both being capable of rotation, there being a steam-tight packing-joint between the two. F has a second bearing in the centering-screw *d*, which serves the purpose also of preserving a tight joint between D and F.

The cup-shaped disk carried by shaft B has, besides its bottom and rim, a front flange, C′, and between it and the bottom there is secured an annular row of tooth-shaped buckets, D′, as seen in red dotted lines in Figs. 2 and 3, and they all revolve together with the shaft B.

The operation of the motor is as follows: Steam being conducted into the hollow arm F, it passes on, as indicated by arrows *e*, Fig. 1, through hollow shaft D, and at its inner end, which is closed, goes to the right and left into and through the arms E E′, passing out of their extremities in opposite directions, and nearly at right angles to the arms themselves, as seen at *f f′*. The steam here impinges against the teeth or buckets D′ on the inner periphery of the cup-shaped disk, the flange C′ assisting in confining its action on the buckets. The force of the escaping steam acting on these gives motion to the disk in the direction of the arrows *g*, (as also to the shaft B carrying it,) and which may serve as a pulley or a spindle on which one can be rigged, and over which a belt may be run to communicate motion to adjoining machinery. The escape of the steam from these arms also gives rise to reaction, and produces motion in the contrary direction to these arms and the shaft D, as indicated by arrows *h*, and motion may be communicated from this shaft in like manner as from B.

The rotating disk C and arms E E′ are confined in an outer casing, I, half of which can be removed when desired, and out of which the expended steam escapes through a hole, *i*, on the top. The flange C′ of the disk C can be perforated for the passage of the condensed steam or water, as also the bottom of the casing I, into which a faucet can be secured for same purpose.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. The combination of the arm F with the shaft D, constructed and operated substantially as described.

2. The arrangement of the arms E E′ on the shaft D with the cupped disk C, its buckets, and flange C′, the whole constructed and operated substantially as described.

SAMUEL HARRIS.

Witnesses:
S. S. FAHNESTOCK,
JOHN S. HOLLINGSHEAD.