J. A. STEWART.

ROTARY STEAM ENGINE.

No. 2,302. Patented Oct. 11, 1841.

Fig. 1.

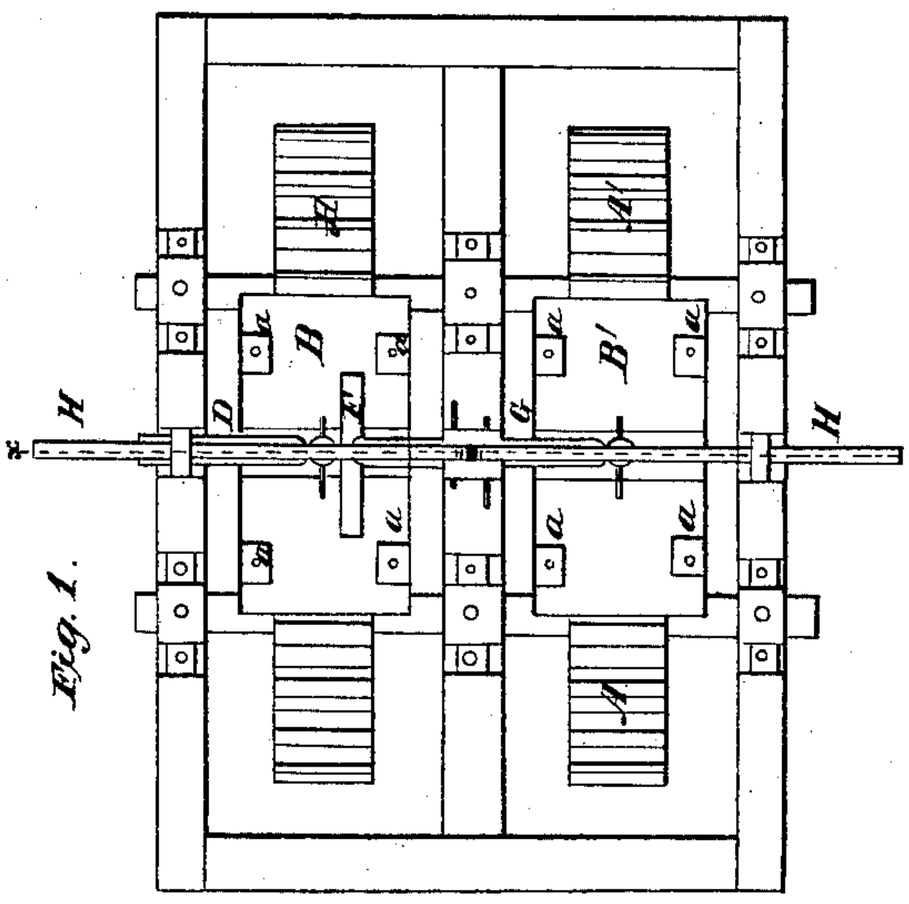


Fig. 2.

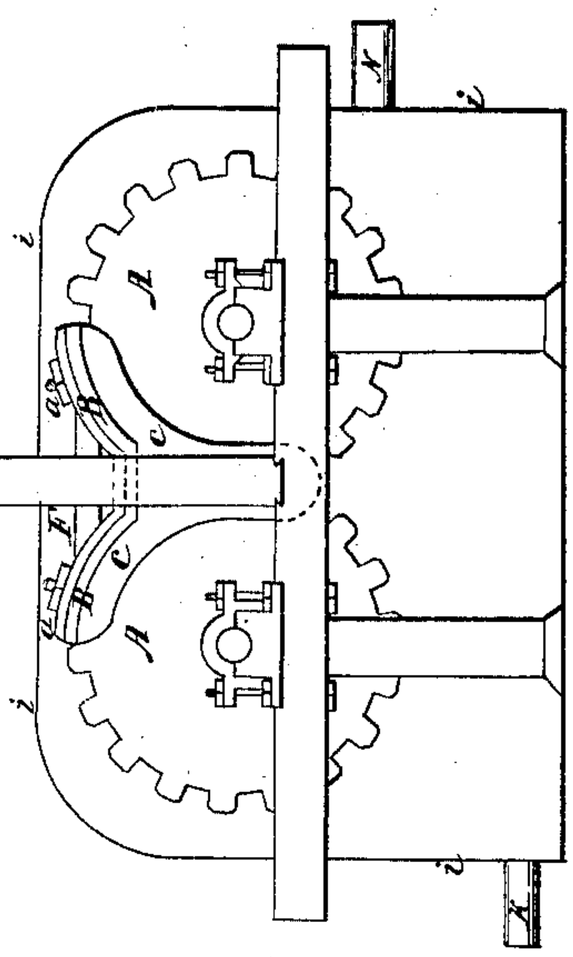


Fig. 3.

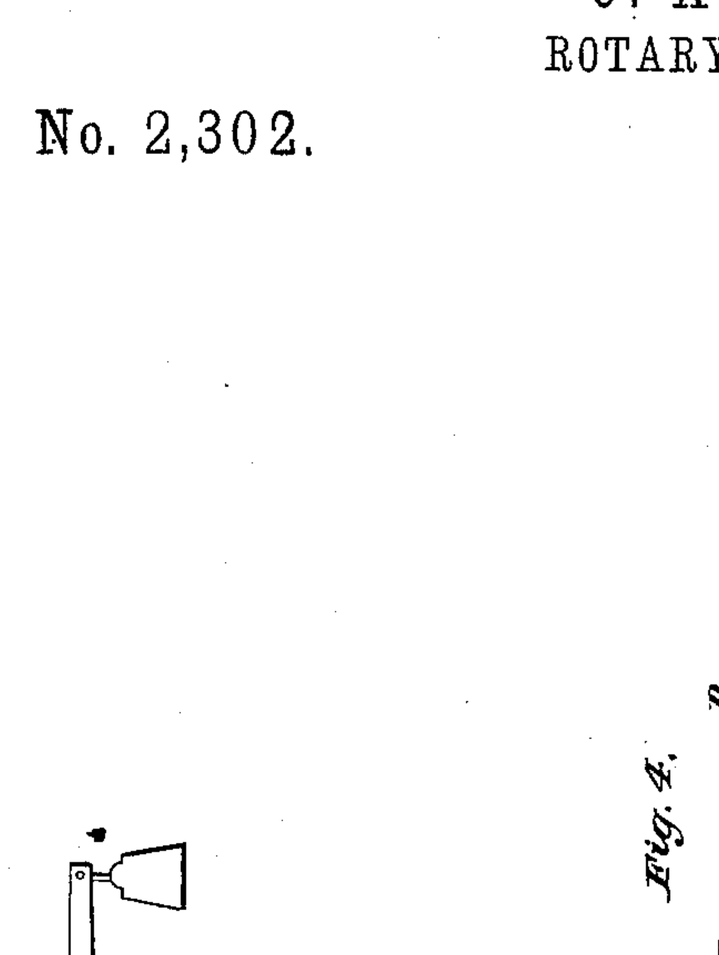


Fig. 4.

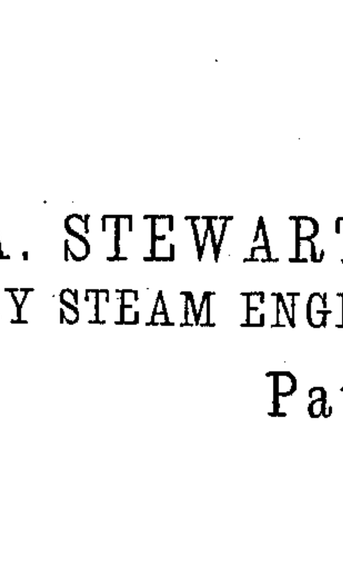


Fig. 5.

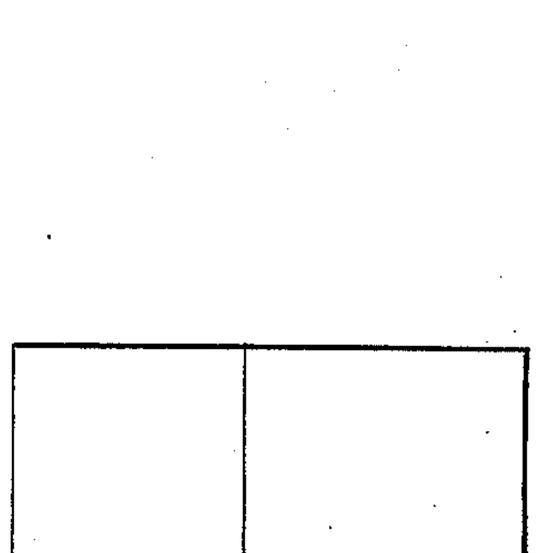
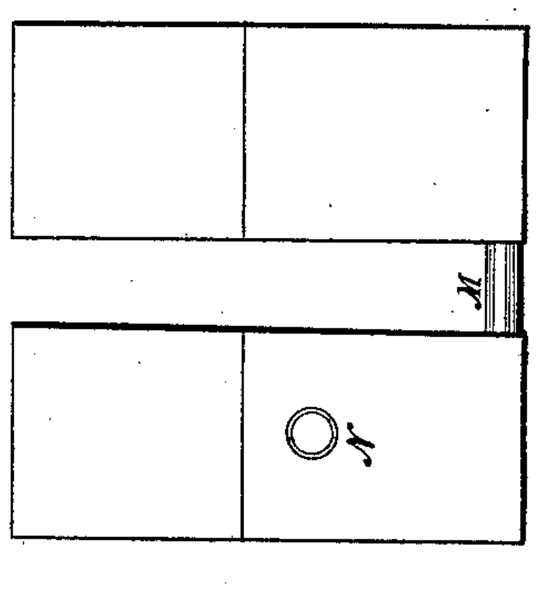


Fig. 6.



UNITED STATES PATENT OFFICE.

J. A. STEWART, OF CROSS PLAINS, TENNESSEE.

ROTARY STEAM-ENGINE.

Specification of Letters Patent No. 2,302, dated October 11, 1841.

To all whom it may concern:

Be it known that I, J. A. STEWART, of Cross Plains, in the county of Robertson and State of Tennessee, have invented certain Improvements in the Manner of Constructing a Rotary Steam-Engine; and I do hereby declare that the following is a full and exact description thereof.

My improved rotary engine, in its general construction, and mode of action, bears a resemblance to that known as Murdock's engine, invented and patented in England upward of forty years since, and which has undergone some modification in the hands of others, but without its being rendered a useful instrument. By my improvements, however, I have, as I verily believe, removed those objections to its use which have heretofore existed.

In the accompanying drawing, Figure 1, is a top view of my engine. Fig. 2, is a side view thereof; and Fig. 3, a vertical section along the line *x*, *x*, Fig. 1. Fig. 4, is a side view of a part of two of the wheels, with the check-piece C, removed.

A, A, A′, A′, Fig. 1, are two pair of cog-wheels, the teeth of which are made perfectly true, so that they will mash into each other steam tight, or nearly so, as may be. Each of these pair of wheels may be considered as a distinct engine, as the steam is to act upon one pair, with its whole elastic force, as it turns the generator, and is to be, in part, conducted thence to act upon the second pair of wheels, upon the same principle as that employed in some cylinder engines in which the high steam after operating in one cylinder escapes into a second cylinder within which it operates in an expanded state.

B, B, are steam caps, there being one cap to each pair of wheels; the under sides of these caps embrace the upper portion of the wheels to a line vertical, or nearly so, to the axis of each wheel, said caps fitting with a close joint to the surfaces of the teeth. To each of the caps are attached side, or cheek pieces C, Figs. 2 and 3, which embrace the sides of the wheels. One of these cheek pieces of each pair of wheels is made adjustable by means of the screws *a*, *a*, Figs. 1, 2 and 3. So that in case of any wearing they may still be made to embrace the faces of the wheels, steam-tight. The space under the cap B, and between the cheek-pieces C, at the junction of each pair of wheels is that into which the steam is to be admitted so as to operate upon the teeth of the wheels. These caps and cheek pieces are substituted for the close cases used by Murdock and others, and obviate all necessity of elastic packing, effecting the end designed by them in a simple and perfect manner.

In the section Fig. 3, D, is the induction tube, leading from the generator, into the space, or chamber, E, Fig. 4, where acting by its elastic force against the teeth of the wheels it causes them to move in reversed directions, as shown by the arrows. When two of the teeth, as *c*, *d*, and *e*, *f*, have passed under the cap, the steam in the spaces *g*, and *h*, between these teeth will cease to operate on the wheels, its action being equal in both directions, and to use this steam beneficially, it is carried to the second pair of wheels A′, A′. The tube F, extends across the cap B, and opens through it into these spaces; and from this tube passes that marked G, through the cap B′, into the steam under that cap, where, operating with a diminished pressure, it will actuate the wheels A′, A′, just as the first pair were actuated, although with less force. The caps B, B, are borne down upon the wheels by weighted levers H, H, which caps, operating like safety valves, would let off steam should the pressure become too great. The caps are thus kept continuously in contact with the teeth of the wheels without requiring any packing.

One of each pair of wheels is allowed end play on its axis, the gudgeons not being checked by shoulders; the wheels are thus enabled to adapt themselves to each other between the cheeks; and one of the wheels, also, is allowed to have some slight play in the direction of its revolving motion; by which devices, all binding or cramping, of the teeth, and of the sides of the wheels, is obviated. The wheels revolve in covered cases I, J, Fig. 5, into which the steam is to escape, and in which a portion of it is to be condensed; into one of these cases cold water is to be pumped, and this is to flow along said case into the second case, from which the water heated by condensing steam is to be supplied to the boiler. This water may cover the bottoms of the cases to the depth of a few inches. The cold water may, for example, be forced in at the tube K, and the water to supply the boiler may be furnished through the tube L. There is a tube

at M, between the two cases, which allows the steam to pass from one box, or case, to the other; a similar tube M′ for the flow of water from one to the other connects the two cases at their opposite ends, close to the bottom, as shown in a view of that end in Fig. 6.

N, is a tube for the escape of waste steam from the cases.

In Fig. 2, *i*, *i*, *i*, is the outline of the cases, seen sidewise; which cases enclose the steam wheels &c.

Having thus fully described the nature of my invention, and shown the manner in which my machine operates, what I claim therein as new, and desire to secure by Letters Patent, is—

1. The manner of constructing combining and arranging the cap and cheek pieces, so as to embrace, under the cap, but a small portion of each wheel, in the manner represented in the drawing, employing the cap and check pieces in lieu of the close case, or cases, hitherto used in such machines, and introducing the steam through the caps between each pair of wheels.

2. I claim the combining with these caps the weighted levers for pressing them down on the teeth of the wheels, thus preserving them in close contact without the necessity of any elastic packing.

3. I claim the manner of preserving binding, or cramping, in said pairs of wheels by the combined operation of the end play of the axles of two of them, and of the play of one of them in the direction of its revolution.

4. I claim the using of the steam on a second pair of wheels by condensing it from the first pair through the cap of the second pair, in the manner set forth.

J. A. STEWART.

Witnesses:
THOS. P. JONES,
S. H. STEWART.