C. Miller,

Rotary Steam Engine.

No. 23,852. Patented May 3, 1859.

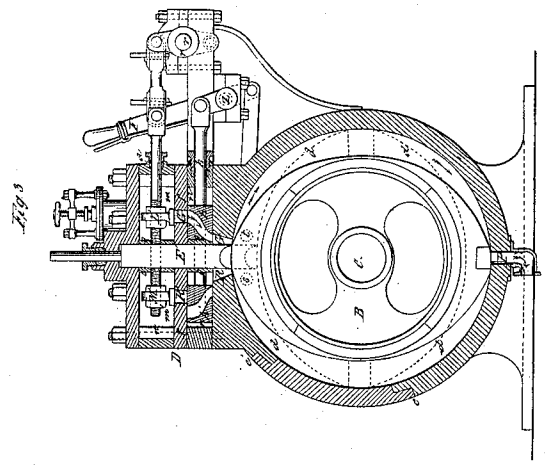


Fig. 3

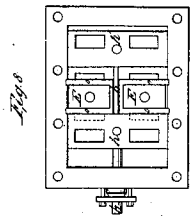


Fig. 6

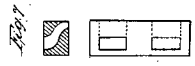


Fig. 7

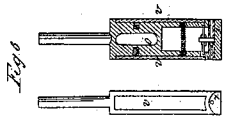


Fig. 8

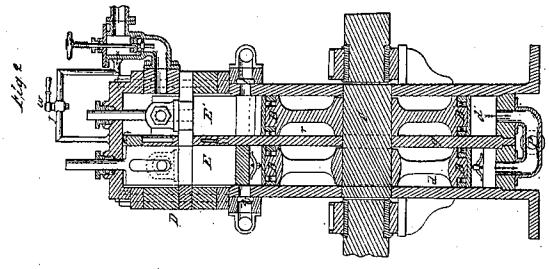


Fig. 2

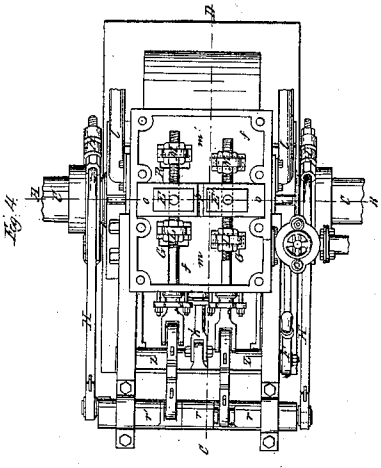


Fig. 4

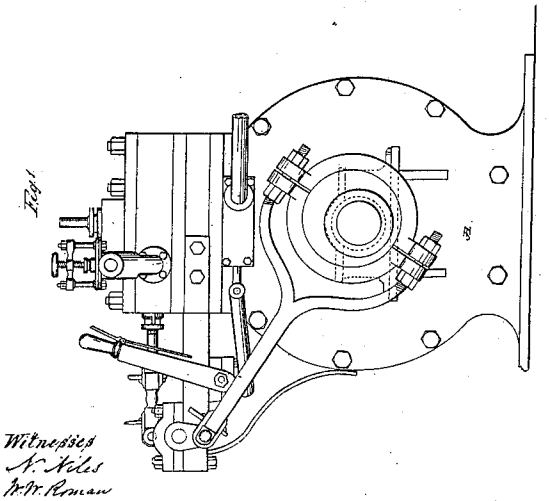


Fig. 1

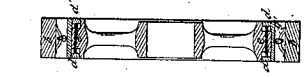
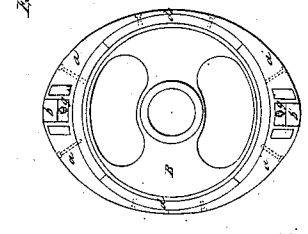


Fig. 9



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CHARLES MILLER, OF BELLEVILLE, ILLINOIS.

ROTARY ENGINE.

Specification of Letters Patent No. 23,852, dated May 3, 1859.

To all whom it may concern:

Be it known that I, CHARLES MILLER, of Belleville, in the county of St. Clair and State of Illinois, have invented a new and useful machine, being and entitled a "Rotary Steam-Engine," and an improvement on all steam-engines heretofore known and used.

The nature and peculiarity of my invention consists principally in the use of revolving pistons, thereby saving the power lost at the dead point, and consequently dispensing with the fly wheel. I hereby declare that the following is a clear and exact specification and description of the construction and operation of the same; reference being had to the annexed drawings making a part of this specification, in which—

Figure 1 is a side view; Fig. 2, a cross section through A B; Fig. 3 a longitudinal section through C, D; Fig. 4, a top view of the engine; Fig. 5, a detailed view of revolving pistons and cams; Fig. 6, a detailed view of movable abutments; Figs. 7 and 8 a detailed view of horizontal slide valves.

The incasement A (Fig. 1) divided by plate *g* consists of two equal chambers *d*, *d'* (Fig. 2) which serve as a cylinder. Pieces *e*, *e'* can easily be taken out for the purpose of making repairs inside. In each of chambers *d*, *d'* is a revolving piston, B, B', which are fastened to shaft C.

The construction of the revolving pistons is as follows: On each of the pistons are two cams *a*, *a'*, fastened by screws. Brass pieces *b*, *b'* which are forced outward by springs cause the tightness inside as do also the cross rings *y*, *y'*, that are fastened on both sides and are also forced outward by springs.

The cams of piston B, (Fig. 3) being in a vertical position, then are the cams of piston B' in a horizontal position (indicated by a red line drawn in Fig. 3). As this is the position of the pistons and cams, when the engine is in action, it avoids the so-called dead center and consequently dispenses with a fly-wheel.

The movable abutments E, E' (Fig. 2) are in a vertical position and serve to prevent the force of steam from taking effect in the opposite direction. The abutments are forced down by a pressure of steam, which is led thither by the throttle valve through pipe J. By means of a cock *w* connected with pipe J, any pressure of steam may be produced. Movable pieces of brass, *x*, *x'*, are fastened at the lower extremity of abutments E, E', (Fig. 6) and as they are formed in conformity with them, they fit closely. They also have brass pieces *v*, *v'* on the sides, which are forced outward by springs, (Fig. 6). The opening *o* in the center of the abutment serves as a passage for the steam slide valve rod.

The steam chest D (Fig. 3) consists of two chambers *m*, *m'*, and *n*, *n'*, placed above one another and separated by plate *f*. The upper chamber is again divided by a box, in which the abutments E, E' are moving, but both parts of chamber *m*, *m'* are connected by a small channel, *p*, for the purpose of forcing steam into both. In plate *f* are four steam channels G, G', and R, R' which are alternately opened and shut by steam slide valves L, L' and M M'. The lower chamber (Fig. 8) is also divided by a box in which the abutments E, E' are moving. In these chambers are two steam slide-valves *h*, *h'*, connected with rod *k*, which by means of lever F serve for running the engine forward or backward, as required.

On both outsides of incasement A are slide-valves *t*, *t'* connected with the lever for the purpose of letting the steam escape, while the course of the engine is changed. The steam slide valves L, L' and M, M' are put in motion by means of the eccentric rods H, H' (Figs. 3 and 4) in connection with rock shafts *r*, *r'*.

Concerning the motion of the engine, as it is effected by steam power, it is necessary to say that I will only explain one course or direction of the engine, as the steam channels R, R' are represented on the drawings as closed by horizontal slide valve *h'*, by means of rock shaft Z in connection with lever F, (Fig. 3). The engine goes through the same motions and to the same effect in the contrary course. When the cam *a* is in a vertical position then the access of steam to the steam channel G' is prevented by steam slide valve L' in chamber *m* in connection with eccentric rod H', but at the same time slide valve L in chamber *m* is opened by eccentric rod H and the piston and cams in a horizontal position is then in full power. If cam *a* moves beyond the steam channel G', then the slide valve L' is again opened by eccentric rod H' for the

access of steam; at the same time piston B with cam *a* opens the exhaust pipe P at the lower center of incasement A and so causes the superfluous steam to escape, consequently there is a perpetual access of steam.

The two slide valves *t*, *t'* fastened outside of incasement A (Fig. 3) allow, if the course of the engine is changed from forward to backward, the steam, that was admitted, while in forward motion, to escape. The openings of slide valves *t*, *t'* run on both sides of abutments E, E' (Fig. 2) into incasement A. If lever F is moved in the opposite direction the engine works in the other course in the same manner.

An engine constructed after this invention has the following advantages viz: 1. It requires far less room, than those now in use. 2. There is no dead center in this engine and the fly wheel is dispensed with. 3. This engine works forward and backward with only two eccentric rods, while the locomotive now in use must have four. 4. This engine can be constructed much cheaper than all others now in use, and also saves a considerable quantity of steam, as the same operates directly on the cams and pistons and by means of the pistons it has lever power from the shaft.

If this engine is constructed as to run one course only, then the chamber in the steam chest *m'* and the slide valves M M' (Fig. 4); the whole (Fig. 8); the slide valves *t*, *t'*, the rock shaft Z and lever F are dispensed with.

The engine is put in motion by eccentric rods H, H', connected with the slide valves L, L' in chamber *m*, (Fig. 4) by rock shafts *r*, *r'*.

I claim as my invention and desire to secure by Letters Patent the combination of the following parts of said rotary steam engine; viz:

1. The incasement A, for that is composed of two distinct chambers.

2. The pistons B, B', for that they are formed oval, consequently return the abutments E, E' upward, when necessary.

3. The packing of pistons B, B'.

4. The movable abutments E, E', for that they prevent reaction of steam.

5. The packing of abutments E, E', and the brass piece at the lower extremity of the same, which, being movable, conforms with the movement of pistons B, B'.

6. The steam pipe J, as by it being connected with abutments E, E', any pressure of steam may be produced from the throttle valve by means of a cock.

7. The movement of steam slide valves L, L', and M, M', for that each opens the steam channel twice while making one revolution.

8. The movement of slide valves L, L', as they work together by means of eccentric rods H, H' and also the movement of slide valves M, M' as they also work together by means of eccentric rods H, H'.

9. The movement of the horizontal slide valves *h*, *h'*, whereby the steam channels G, G' and R, R' may be opened and closed by means of lever F.

10. The slide valves *t*, *t'*, as they let the steam escape, which is admitted, when the course of the engine is changed.

11. The connection of slide valves *t*, *t'* with rock shaft Z, so as they may be opened and closed by means of lever F.

12. The engine constructed for only one operating direction, for that by means of eccentric rods H, H' it has a constant supply of steam without the steam slide valves M, M' and which may be called a single acting rotary steam engine.

I claim a patent for all the parts above specified, in combination being and constituting a rotary steam engine, as asked for in my petition herewith presented.

CHARLES MILLER.

Witnesses:

NATHL. NILES,

W. W. ROMAN.