CHARLES W. PATTEN.

Improvement in Rotary Steam-Engine.

No. 128,062. Patented June 18, 1872.

Fig. 1.

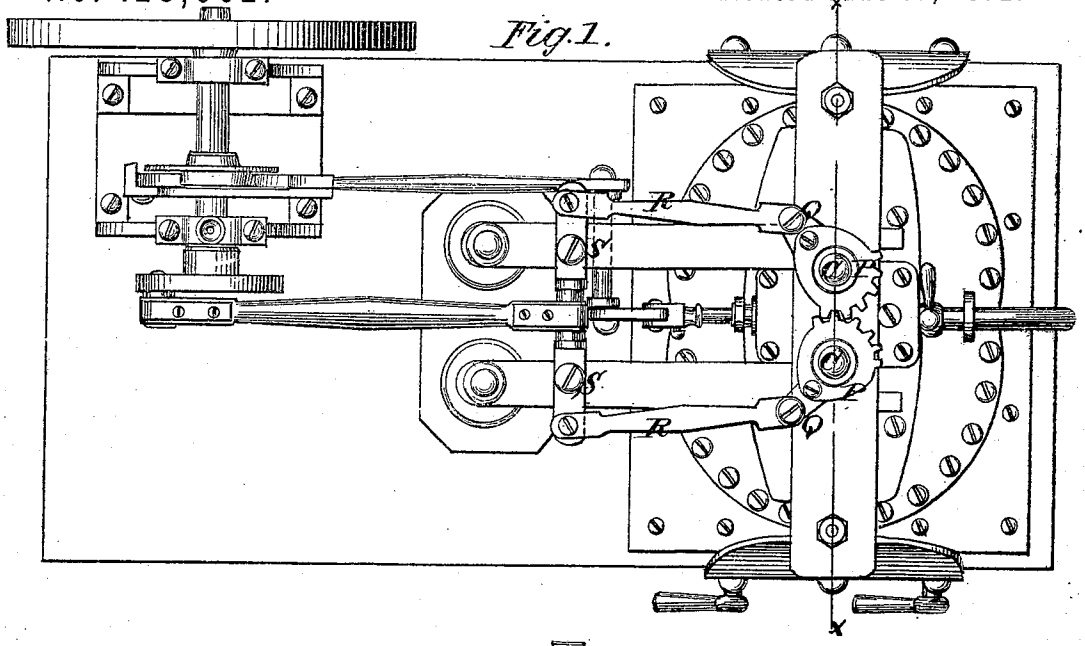


Fig. 2.

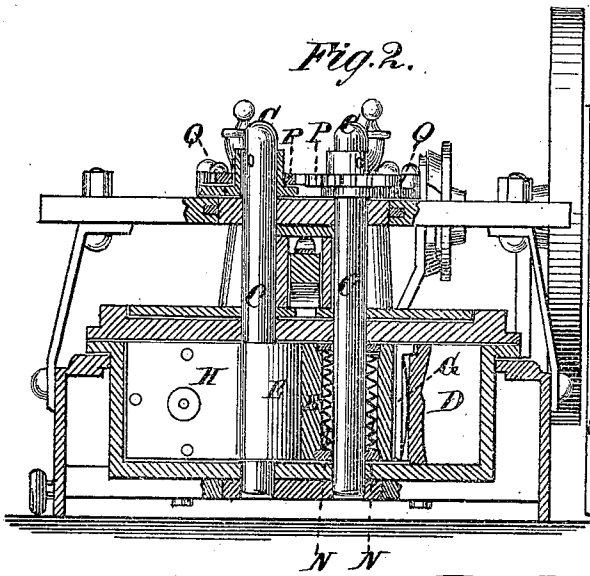


Fig. 3.

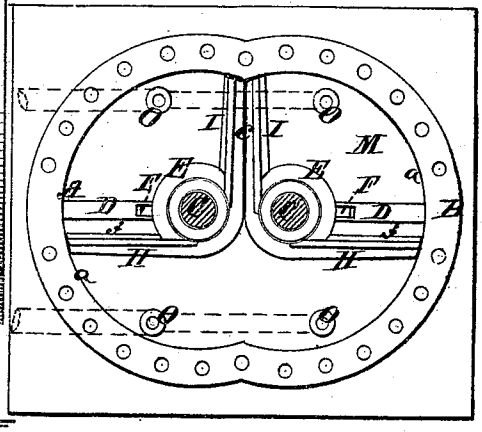


Fig. 4.

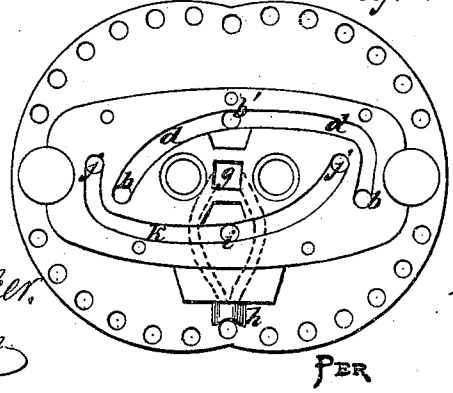
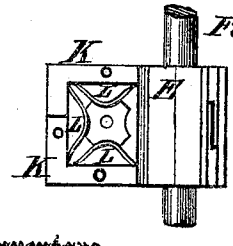


Fig. 5.



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UNITED STATES PATENT OFFICE.

CHARLES W. PATTEN, OF ELK POINT, DAKOTA TERRITORY.

IMPROVEMENT IN ROTARY STEAM-ENGINES.

Specification forming part of Letters Patent No. 128,062, dated June 18, 1872.

Specification describing a new and Improved Steam-Engine, invented by CHARLES W. PATTEN, of Elk Point, in the county of Union and Territory of Dakota.

In my improved steam-engine, which is of the character of rotary engines, mainly, the cylinder is of the form of two cylinders, with about one-quarter of each cut off longitudinally and joined together, inclosing one space, which is divided in its longest diameter by a fixed partition, with a space at the center, where the hubs of two axles are arranged side by side, fitting together steam-tight; also, fitting the partition steam-tight, so that, by these hubs and the said partition, the cylinder is divided into two compartments. These hubs are placed in the axes of the two parts of the case, and they have each two wings applied at right angles to each other, one being in each compartment. The hubs, with said wings, oscillate a quarter of a revolution, or thereabout, the said wings moving from the partitions to the central point between them, where they meet. The steam is applied between the two wings of one compartment, and between the partitions and the wings of the other compartment simultaneously, so that, practically, it is applied in three separate chambers, corresponding to ordinary cylinders, of which the whole or two, or only one, may be used at a time, which is desirable where the work varies considerably. This plan affords all the advantages of ordinary rotary engines without the objectionable sliding steam abutments or abutment-valves; besides, it affords means for working the steam expansively much better than it can be done with ordinary rotary engines.

Figure 1 is a plan view of my improved engine. Fig. 2 is a cross-section on the line *x x* of Fig. 1. Fig. 3 is a side elevation of the cylinder with the cover removed and the axles sectioned. Fig. 4 is an elevation of one of the side-plates, with the parts uncovered; and Fig. 5 is a section of one of the wings, showing the manner of packing it.

Similar letters of reference indicate corresponding parts.

A and B represent the two parts of the cylinder, each representing about three-quarters (more or less) of an ordinary cylinder divided lengthwise, which, being united at the sides cut off, inclose a space, described by two circular walls, *a a*, adapted for the wings working on the two axles C to work against steam-tight, the said axles being at the centers thereof. These axles are therefore in the line of the major axis of the case, and form part of a partition, D, in the same line, dividing it into two compartments. The hubs E of these axles touch each other, so as to prevent the passage of steam between them, and they are fitted steam-tight against the ends of the partition D by packing-strips F, arranged in notches or slots in said partition, and pressed against the hubs by springs G. These hubs carry wings H I, one in each compartment, connected with the hubs tangentially and at right angles to each other, as shown in Fig. 3. The said wings are packed at the edges against the walls of the cylinder by the packing-pieces K, being pressed out by the springs L, which are arranged in a space between the two parts or plates comprising the wings, one of said plates being detachable. The axles are packed at the sides of the cases by the rings M, let into annular cavities in the ends of the hubs, with springs N in holes through said hubs pressing said rings outward against the case. The wings being in the positions represented in Fig. 3, steam will be admitted through ports *b'* and *b*, all connected, by groove *d*, to the space *e* between the wings I of one chamber, and to the spaces *f* between the partitions D and the wings H of the other chamber, by which said wings I will be forced around to the partitions, and wings H will be forced together; then, the valve being shifted, the steam will be exhausted back through said ports and groove *d* to the exhaust-port *g* and pipe *h;* and at the same time steam will be admitted through ports *i j* and groove *k*, to reverse the wings or return them to the partitions represented in the drawing. Any kind of valve may be used. O represents passages from the bottom of the cylinder, for the escape of the water of condensation. The axles or shafts C are geared together by the segmental wheels P upon the outside of the case, and these wheels have an arm, Q, connected by a rod, R, with the cross-head. The connection of the cross-head with the crank-shaft and the valve motion will be similar to such devices in other engines, and need not be described.

This plan enables me to utilize the expansion of steam, and obviates one of the chief objections to rotary engines by having fixed abutments for steam instead of sliding abutments or abutment-valves; also, by the independent chambers I get a wide range of expansion with a short stroke. Moreover, if these chambers are connected independently with the valves, as they may be, the engine can be provided with valves so as to cut off the steam from all but two chambers; or one only can be cut off, thus adapting the capacity of the engine to the work to be done, and still have it run at the maximum speed.

Those acquainted with the manufacture of lumber by steam power understand the advantages resulting, or which will result, from having an engine so constructed that its power can be reduced or increased to the extent of one half or more without reducing or increasing the piston speed below or above the maximum speed for which the engine is constructed. Also, this construction adapts these engines to running flouring-mills where an engine is required, for instance, to drive four runs of stones part of the time, and two runs or one part of the time; these changes frequently having to be made several times a day. If two runs only of stone are to be driven, the steam can be shut off from two chambers of the cylinders, and the engine will have a steady maximum speed with only half the power, and with half the steam; so, with regard to sawing of lumber, the sawyer can so control the engine as to have a uniform speed as the work varies, and the change can be made as quickly as a lever can be moved. Any suitable arrangement of valves for cutting off the compartments may be had. Another advantage is, this machine constitutes two distinct engines in one cylinder when provided with two valves, as it may be, which enables me to use steam exhausted from one engine in the other at a lower pressure, as now practised under various methods with two separate engines.

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

1. A cylinder, constructed in the form of the two parts A B, with a partition, D, and two axles with wings H I, combined substantially in the manner specified.

2. The arrangement of ports, substantially as represented in Fig. 4, with a cylinder and wings or pistons, arranged as represented in the foregoing claim.

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