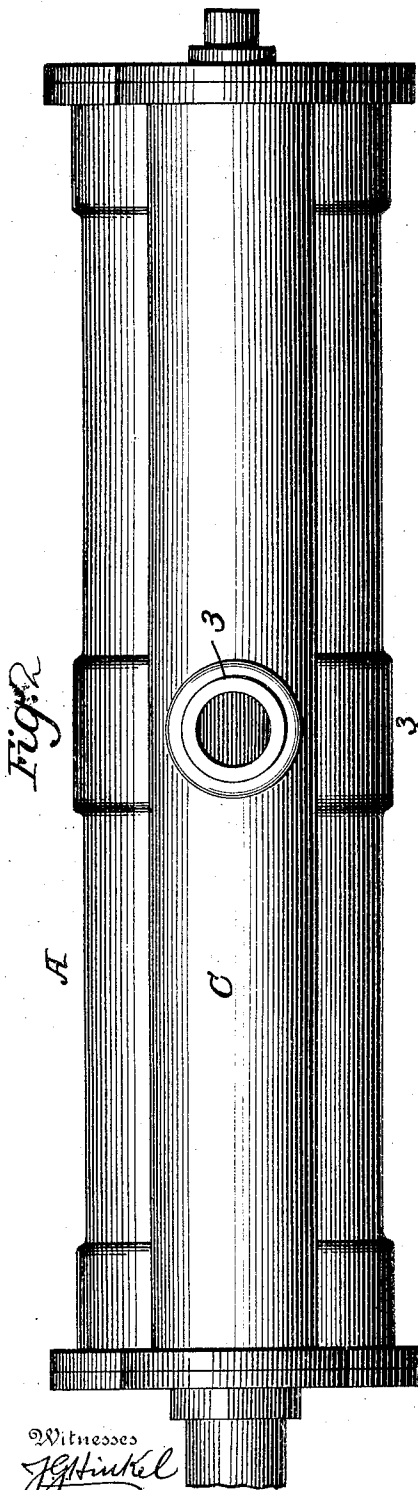


No. 778,928.

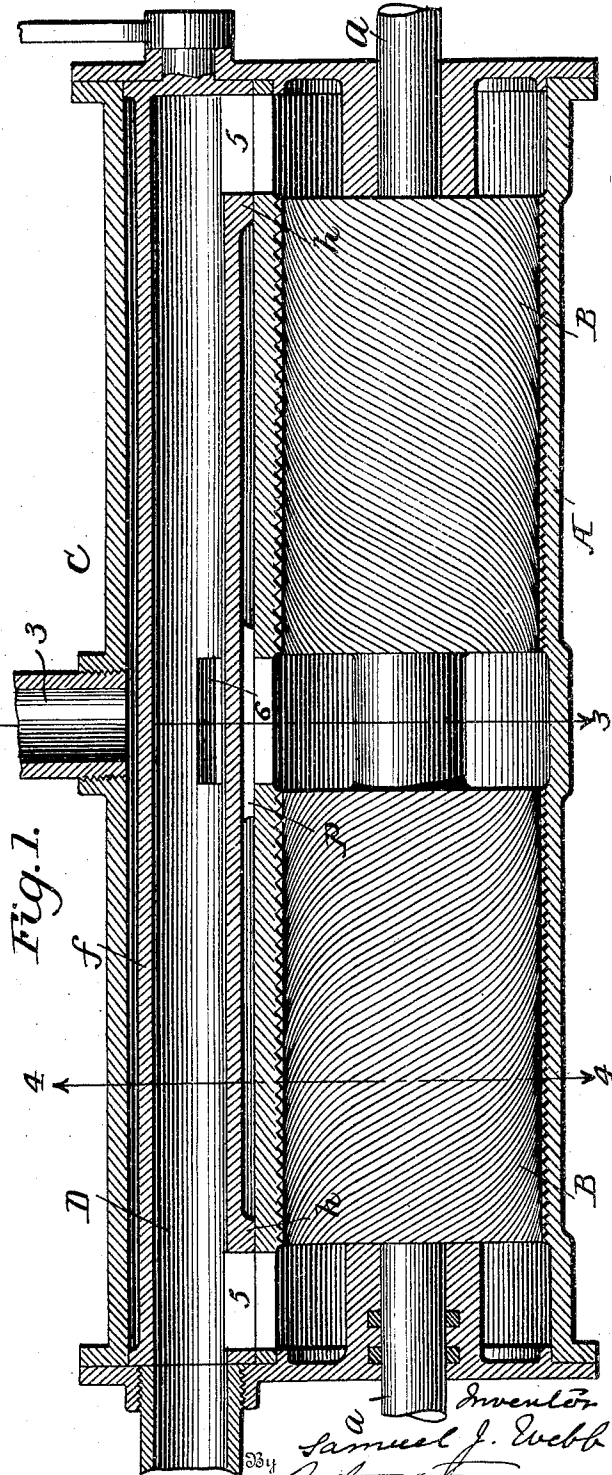
PATENTED JAN. 3, 1905.

S. J. WEBB.
TURBINE ENGINE.
APPLICATION FILED APR. 22, 1901.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

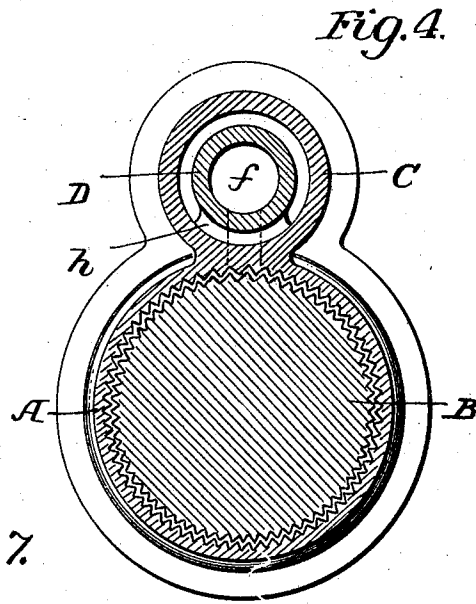
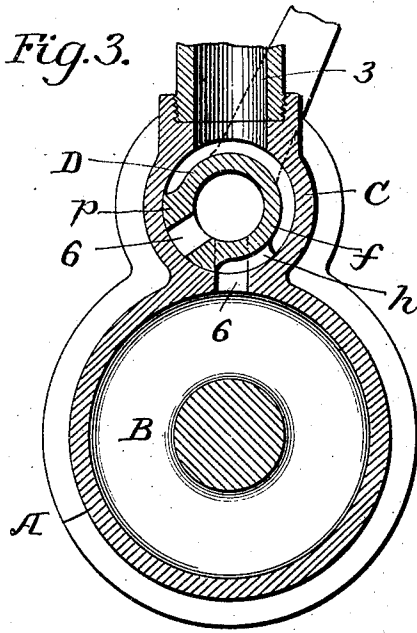
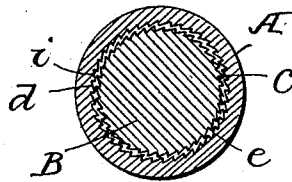
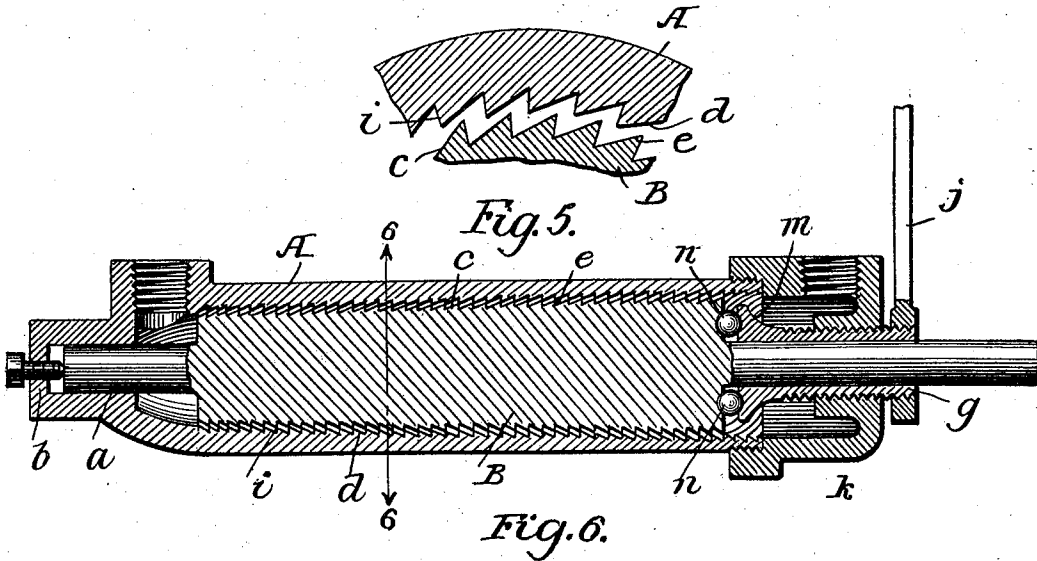


Fig. 7.



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UNITED STATES PATENT OFFICE.

SAMUEL J. WEBB, OF MINDEN, LOUISIANA.

TURBINE-ENGINE.

SPECIFICATION forming part of Letters Patent No. 778,928, dated January 3, 1905.

Application filed April 22, 1901. Serial No. 56,912.

To all whom it may concern:

Be it known that I, SAMUEL J. WEBB, a citizen of the United States, residing at Minden, in the parish of Webster and State of Louisiana, have invented certain new and useful Improvements in Turbine-Engines, of which the following is a specification.

My invention relates to that class of motors termed "turbine-engines" in which a rotary member has movement imparted to it by reaction or expansion of steam passed between the rotary and the stationary members; and it consists in providing the rotary and stationary members with ribs arranged helically and with means for controlling the flow of the steam to and from the parts, as fully set forth hereinafter and as illustrated in the accompanying drawings, in which—

Figure 1 is a longitudinal section showing a double-acting engine embodying my improvement. Fig. 2 is a plan view of Fig. 1; Fig. 3, a section on the line 3 3, Fig. 1; Fig. 4, a section on the line 4 4, Fig. 1; Fig. 5, a longitudinal section of a single-acting engine; Fig. 6, a section on the line 6 6, Fig. 5, and Fig. 7 an enlarged view of the ribs shown in the construction of Figs. 5 and 6.

The engine may be single or double acting and reversible or not, as desired, and in any case is provided with a casing A, a shaft *a* supporting one or more drums B, and with a valve-chest C, containing a control valve or valves D, of any suitable construction. Upon the surface of each of the drums B or of the drum, if a plurality of drums is not used, are formed ribs or shoulders *e*, extending spirally around the drum from end to end and parallel to each other, the said shoulders being either radial, as shown in Figs. 5, 6, and 7, with connecting inclined faces *c*, forming ratchet-shaped ribs, or the said shoulders may be inclined to the same extent as the faces *c*, but in opposite directions, as shown in Figs. 1, 3, and 4, the latter arrangement or construction being preferable when the engine is reversible; but the incline may be upon either side of the ribs. Upon the interior of the casing opposite that portion in which the drum rotates are other spirally-arranged ribs or shoulders *i*, with inclined faces *d*, when

the shoulders are radial, as in Figs. 5, 6, and 7, forming ratchet-shaped ribs or inclined as in the other figures, the arrangement of the shoulders in the casing in each case corresponding with that of the shoulders upon the drum used therewith. The spiral direction of the shoulders (or of the ribs, the faces of which constitute the shoulders) is preferably the same within the casing as upon the drum, so that the ribs of one are parallel to the ribs of the other, and when the ribs are of the shape illustrated in Figs. 5, 6, and 7, the faces of the ribs of the drum will be approximately parallel in cross-section with those of the casing, but they may be reversed so the ribs of the casing and the ribs of the drum will cross each other. With the parts thus constructed, provision is made whereby the steam may be so admitted to a chamber at one end of the casing in case the engine is single acting, or to the center or ends of the casing in case it is double acting, so that in passing between the cylinder or drum and the casing and into the channels of each it will be directed from the channels of one part peripherally against the faces of the ribs of the other part in such manner as to impart rotary motion to the drum, depending for its direction upon the end to which the steam is admitted.

In many instances it is desirable to regulate the distance between the ribs of the drum and those of the casing, and to secure this result a slight taper is imparted to each, as illustrated in Fig. 5, and means are used whereby the drum may be set to any desired position longitudinally. As shown in Fig. 5, the shaft *a* has an end bearing on a set-screw or other adjustable bearing *b*, and a movable sleeve *g* carries at the inner edge a flange *m*, between which and the end of the drum *d* intervene antifriction-rolls *n*. The sleeve *g* may be adjusted in any desired manner, for instance, by providing it with an outer thread adapted to threads in an opening in the detachable head *k* of the casing or cylinder A. In this case the sleeve *g* may be turned by means of an operating-handle *j*.

In the construction shown in Fig. 5 there is a port 3 at each end of the casing, and by connecting the supply-pipe with one port or

the other the drum may be rotated in one direction or the other, although when the ribs have faces of the character illustrated in Figs. 5, 6, and 7 it is preferable that the inlet-port should be at that end, which would cause the streams of steam to be directed as nearly as possible at right angles to the faces or shoulders of the drum.

In the construction shown in Figs. 1 to 3 the inlet-port 3 communicates with the valve-chest C and the end ports 5 5, and the center ports 6 may be either inlet or outlet ports, according to the position of the control-valve.

While the control-valve may be of any suitable construction, I have shown one which is extremely effective and which consists of a sleeve *f*, smaller in diameter than the interior of the valve-chest and supported to rotate centrally therein and hollow and open at one end and with peripheral projections *h p*, in each of which is a port. These projections are arranged so as not to be in line upon the periphery, whereby when the projection P is at one side of the port 6 the steam may pass from within the valve-chest through the port 6 as an inlet-port, and it may then pass through the ports 5 5 as outlet-ports through the ports in the projections *h h*. When the port in the projection *p* is brought opposite the port 6, the steam can pass from the port 6 to the interior of the valve constituting the exhaust, while the steam from the chest C will pass directly to the port 5 5 as inlet-ports.

While I have shown the ribs upon the drums and casings as arranged in regular spirals or helices, this may be varied by imparting a gradually quicker twist toward one end, and, if desired, the channels may be of gradually-increasing depth to afford wider bearing-faces and deeper channels for expansion of the steam.

While I have shown the ports of the valve-casing as arranged upon the same line longitudinally and the projections upon the tubular stem of the valve arranged upon different lines longitudinally, it will be evident that the said projections might be all on the same line, while the ports of the chamber are radially in different positions.

Without limiting myself to the precise construction and arrangement of parts shown, I claim—

1. A turbine-engine having a casing or cylinder and rotary drum therein the proximate faces of the drum and casing provided with

parallel ribs arranged helically, substantially as set forth.

2. The combination in a turbine-engine, of a tapering or conical drum, a cylinder the interior of which is tapering to correspond with the taper of the drum, with inclined helical ribs parallel to each other upon the proximate faces of the drum and casing, substantially as set forth.

3. The combination in a turbine-engine, of a rotary drum the casing containing the same, ribs arranged helically upon the proximate faces of the drum-casing, and means for introducing steam between the drum and casing in either direction, substantially as set forth.

4. The combination of the rotary drum and casing therefor with ribs arranged helically upon the proximate faces of the drum and casing, of a valve device whereby steam may be passed in either direction between the faces, substantially as set forth.

5. The combination with a tapering drum and corresponding casing with ribs arranged helically upon the proximate faces of means for adjusting the drum to different positions longitudinally to vary the distance between the faces of the drum and casing, substantially as set forth.

6. The combination of a plurality of drums, a casing containing the same with parallel ribs arranged helically upon the proximate faces of the drums and casing, and means for introducing steam between the two faces, substantially as set forth.

7. The combination of the casing, and plurality of drums, having helically-arranged ribs upon the proximate faces of ports and a valve device whereby the steam may be admitted either at the center or ends of the casing, substantially as set forth.

8. In an engine, the combination of a casing and a drum therein, the opposing faces of which are provided with spiral parallel ratchet-shaped ribs, each rib on the drum having the side toward the fluid-supply at any one point perpendicular to the axis of the drum, substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

SAMUEL J. WEBB.

Witnesses:

GEORGIA P. KRAMER,
S. A. TERRY.