F. H. C. COPPUS.

STEAM TURBINE.

APPLICATION FILED NOV. 11, 1912.

1,172,436. Patented Feb. 22, 1916.

Fig. 1.

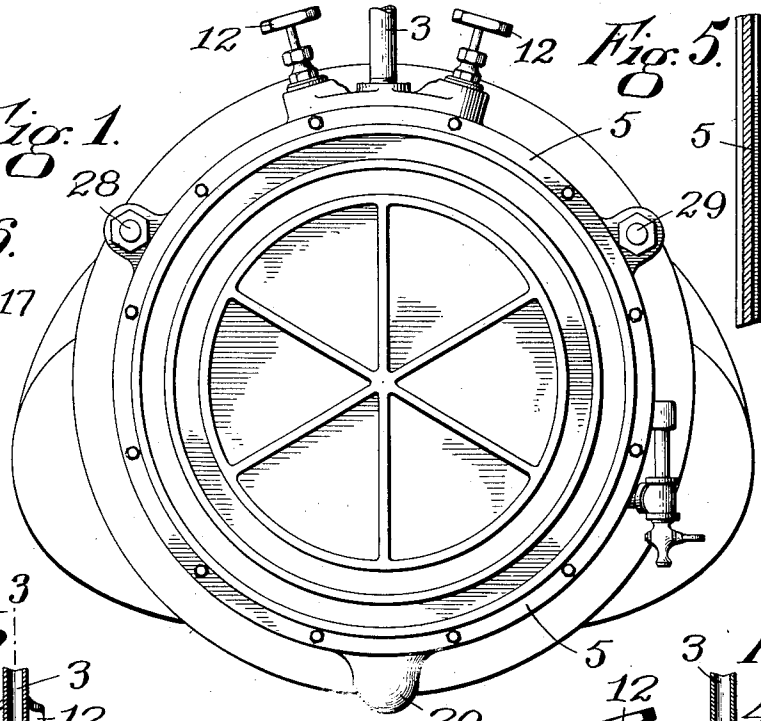


Fig. 5.

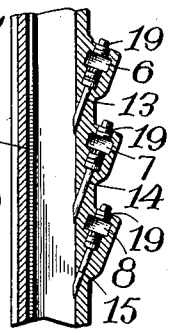


Fig. 6.

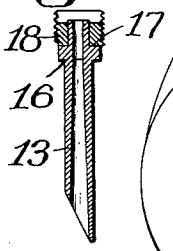


Fig. 2.

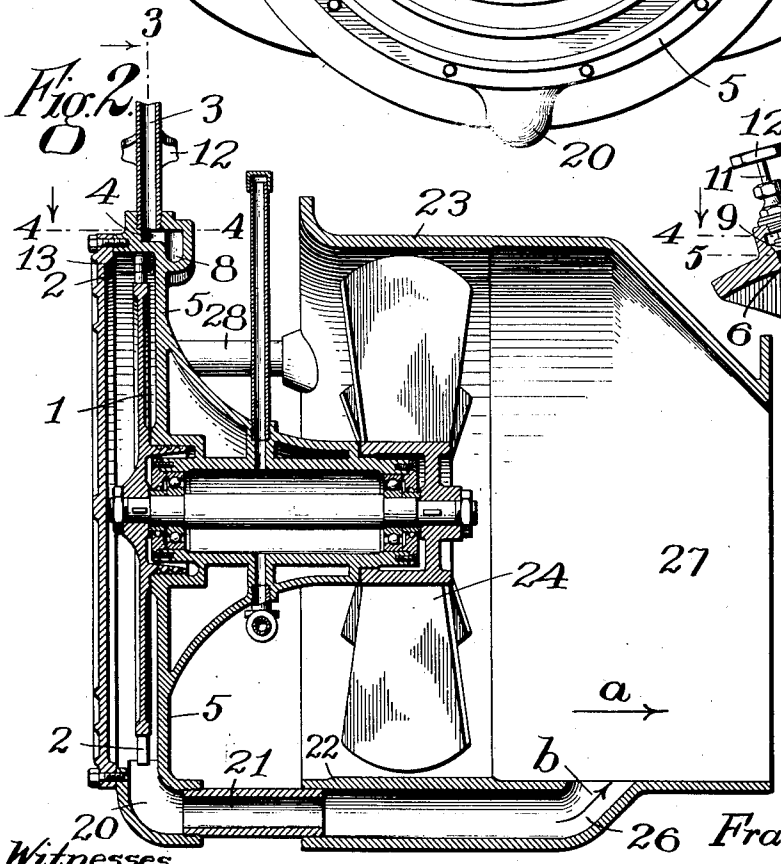


Fig. 3.

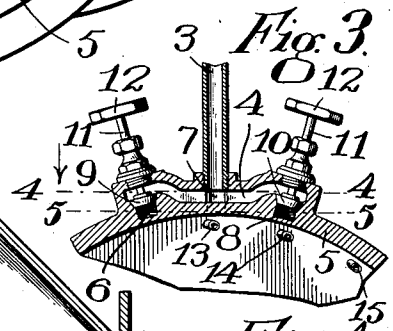
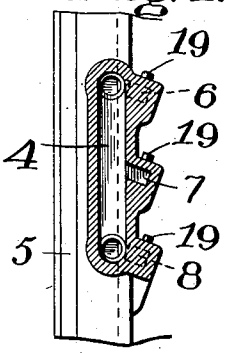


Fig. 4.



Witnesses

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STEAM-TURBINE.

1,172,436. Specification of Letters Patent. Patented Feb. 22, 1916.

Application filed November 11, 1912. Serial No. 730,561.

To all whom it may concern:

Be it known that I, FRANS H. C. COPPUS, a citizen of the United States, residing at Worcester, in the county of Worcester and Commonwealth of Massachusetts, have invented a new and useful Improvement in Steam-Turbines, of which the following is a specification, accompanied by drawings forming a part of the same.

One object of my invention is to provide means for controlling the admission of steam to the buckets of the turbine wheel without interfering with the cleaning or removal of the steam nozzles through which steam is conducted to the buckets. The mechanism by which this object, among others, is accomplished is shown in the accompanying drawings, in which—

Figure 1 is a front view of my improved turbine. Fig. 2 is a central sectional view of the same. Fig. 3 is a vertical sectional view of the steam chamber on the plane of the broken line 3, Fig. 2. Fig. 4 is a horizontal sectional view of the steam chamber on the plane of the broken line 4—4, Fig. 3, and Fig. 5 is a horizontal sectional view showing the steam nozzles, the section being shown on the plane of the broken line 5—5, Fig. 3.

Similar reference characters refer to similar parts in the different figures.

Referring to the drawings, 1 denotes a revolving turbine wheel carrying upon its periphery buckets 2, said wheel and buckets being of any known and suitable form of construction. Rotary motion is imparted to the wheel 1 by means of steam under pressure, which is admitted from a source of steam supply through a pipe 3 into a steam chamber 4 conveniently formed in a casing 5 by which the turbine wheel is inclosed. The steam chamber 4 communicates at its rear side with steam pockets 6, 7 and 8, the communication between the steam chamber 4 and the pocket 7 being permanently open, while those between the steam chamber 4 and the pockets 6 and 8 are closed by valves 9 and 10 carried upon valve stems 11 which are provided with hand wheels 12 to enable the valves to be opened and closed by the operator.

Leading from the steam pockets 6, 7 and 8 and opening into the chamber inclosed by the casing 5 are nozzles 13, 14 and 15, arranged to deliver jets of steam under pressure against the buckets 2 and at an oblique angle to the plane of rotation of the wheel. Holes to receive the nozzles are bored through the casing 5 intercepting the steam pockets 6, 7 and 8, into which the nozzles are inserted, the nozzles being held from longitudinal movement inwardly by means of shoulders 16 contacting with similar shoulders formed in the casing. Against a shoulder 17 on each nozzle is screwed a ring 18 which holds the nozzle from outward longitudinal movement. The holes between the outside of the casing and the several steam pockets 6, 7 and 8, through which the nozzles are admitted, are closed by screw threaded plugs 19. The steam nozzles are capable of being withdrawn by removing the plugs 19 and rings 18. By closing the valves 9 and 10 the nozzles 13 and 15 may be removed without interrupting the operation of the machine.

From the lower edge of the casing 5 an elbow 20 is formed into which is inserted a screw threaded pipe 21. The opposite end of the pipe 21 is inserted, and capable of sliding in, a cylindrical passage 22 formed in a casing 23 which constitutes a cover or hood for a revolving fan blower 24. The passage 22 communicates through a discharge opening 26 with the interior of the hood 23 contiguous to the fan blower 24. The discharge opening 26 of the passage 22 is directed into a chamber 27 at an oblique angle to the axis of the fan blower, so that the movement of air through the chamber 27 by the fan blower 24 in the direction of the arrow *a* will induce a current through the passage 22 in the direction of the arrow *b*, thereby diminishing the steam pressure in the casing 5 and causing the exhaust steam of the apparatus to become thoroughly intermingled with the air forced by the blower 24 through the chamber 27. The short pipe 21 screwed into the casing 5 is capable of a sliding movement within the passage 22 to provide for its contraction and expansion. The casing 5 and hood 23 are supported in proper relation to each other not only by the pipe 21 but by the bolts 28 and 29.

I claim,

1. In a machine of the class described, a turbine wheel, a casing inclosing said wheel,

a steam chamber, a series of steam pockets communicating with said steam chamber, and a series of steam nozzles directed against said wheel and removable through said steam pockets.

2. In a machine of the class described, a casing, a steam chamber, a steam pocket having a valve controlled communication with said steam chamber but in a different plane, and a steam nozzle communicating with said pocket and removable therethrough.

3. In a machine of the class described, a casing, a steam chamber, a series of steam pockets communicating with said steam chamber but in a different plane, a series of steam nozzles removably held in said casing, said nozzles having shoulders, and means contacting with said shoulders for holding the nozzles from longitudinal movement.

Dated this eighth day of November, 1912.

FRANS H. C. COPPUS.

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