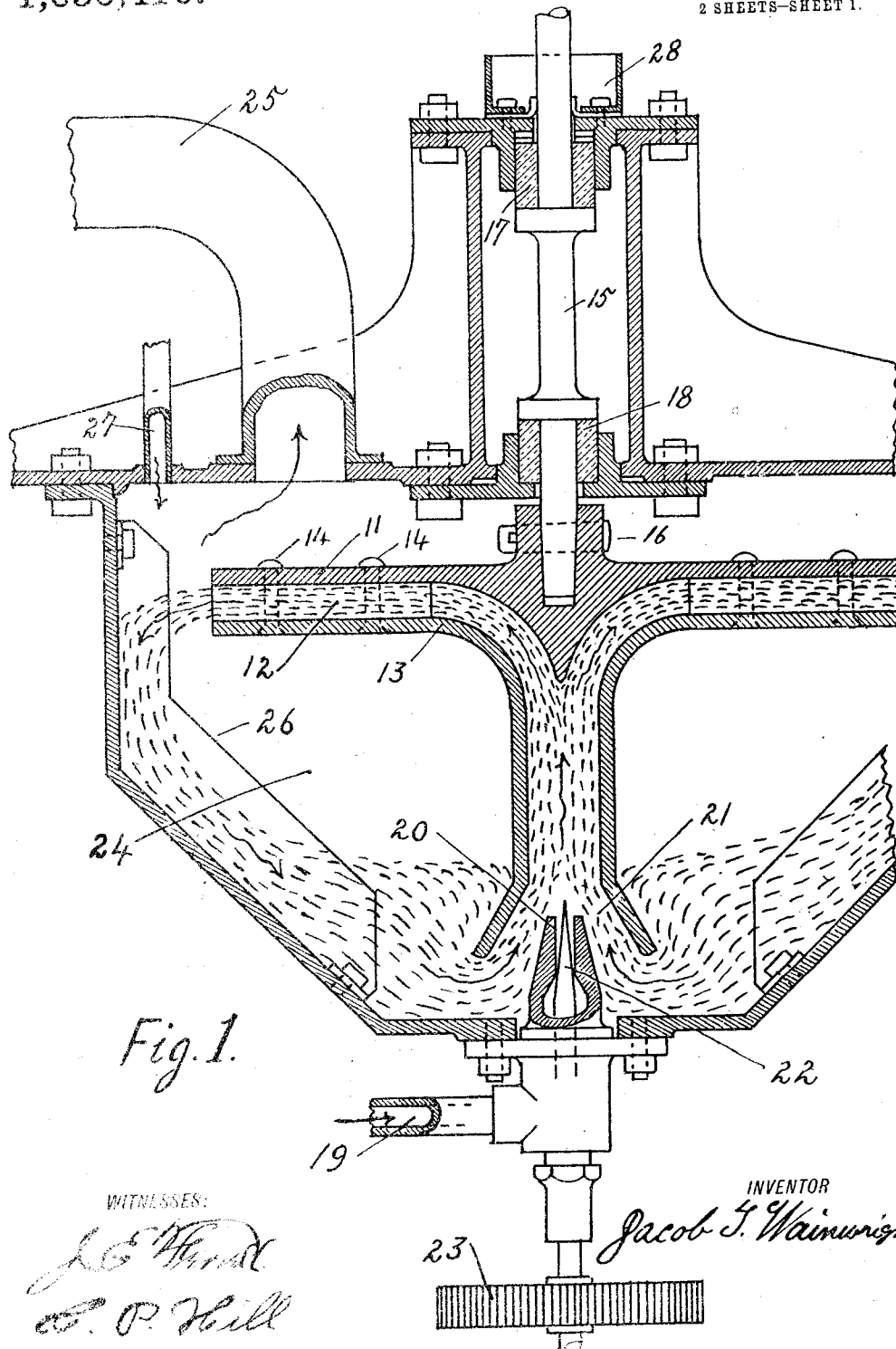


1,050,410.

2 SHEETS—SHEET 1.



WITNESSES:

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W. P. Hill

INVENTOR

Jacob J. Wainwright.

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MOTIVE POWER TURBINE.
APPLICATION FILED NOV. 27, 1911.

1,050,410.

Patented Jan. 14, 1913.
2 SHEETS-SHEET 2.

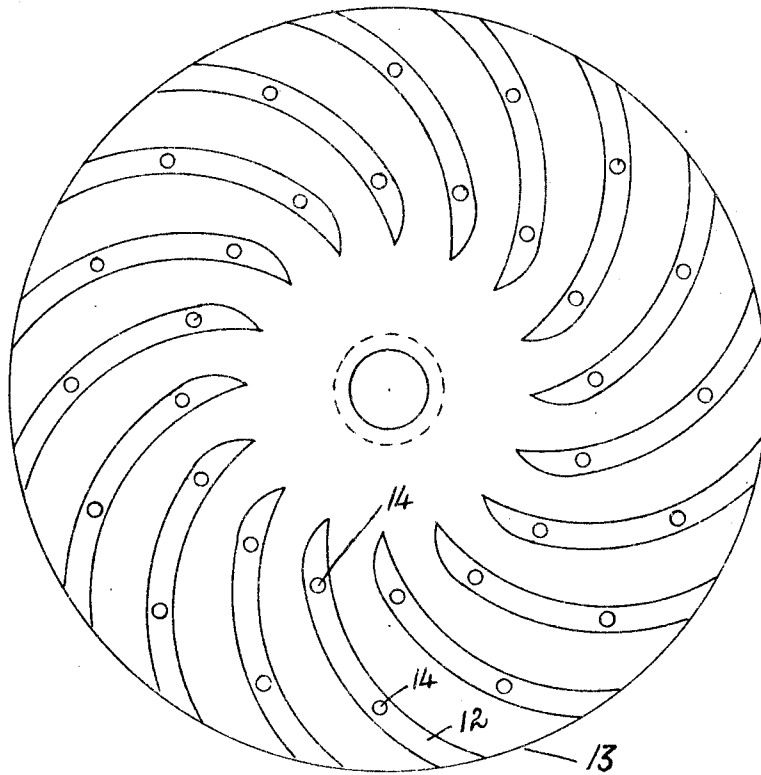


Fig. 2.

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JACOB T. WAINWRIGHT, OF CHICAGO, ILLINOIS.

MOTIVE-POWER TURBINE.

1,050,410.

Specification of Letters Patent.

Patented Jan. 14, 1913.

Application filed November 27, 1911. Serial No. 662,682.

To all whom it may concern:

Be it known that I, JACOB TRIPLER WAINWRIGHT, a citizen of the United States of America, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Motive-Power Turbines, of which the following is a specification.

My invention relates to what are commonly known as elastic fluid turbines, and more particularly to that type of same in which a heavy liquid is introduced into the working fluid current for the purpose of reducing the velocity of said current without incurring a serious loss of energy, and in that way efficiently operate the turbine at comparatively low speed.

The principal objects of my invention are to provide a turbine which can be manufactured more cheaply, has fewer parts, is stronger, more simple, more durable, more economical, and more efficient than is identified with the prior state of the art.

Figure 1 represents a vertical section through the center of the turbine, the apparatus is symmetrical about the central shaft 15, and the left hand side of the diagram also applies for parts which are not shown because of insufficient space on right hand side. Fig. 2 represents a plan of the rotator, with the top plate 11 of same removed, and shows the shape and disposition of the propelling blades 12 which are rigidly clamped between the top plate 11 and the bottom plate 13 by means of bolts or rivets 14.

The top plate of the rotator is a figure of revolution described by revolving the section 11 about the central vertical axis which coincides with the axis of the vertical shaft 15 to which it is rigidly connected and held by the key 16 which may be locked by a suitable device. In this manner, the rotator is attached to the shaft 15 which rotates in suitable bearings 17 and 18.

The bottom plate of the rotator is a figure of revolution described by revolving the section 13 about the central vertical axis, and

at its lower part forms a vertical conduit which contains and conveys in an upward direction the mixture of gas and liquid which in the upper part of this conduit reacts upon the curved conical part of the top plate 11 and is thereby deflected into a horizontal flow which impinges or reacts on the propelling blades 12 and from there is discharged from the rotator.

The high pressure steam or other suitable gas is conveyed through the pipe or conduit 19, and from there through the nozzle 20 from which it flows with great velocity in a jet which impinges against a current of water or other suitable heavy liquid which enters at 21 and progresses upward through the rotator conduit at a velocity which is accelerated by the impinging action of the gaseous jet.

The flow of gas through the nozzle 20 is regulated by the tapered-plug-valve 22 which is actuated by the wheel 23 which may be operated either by hand or by the governor which regulates the rotative speed of the turbine. The flow of the operating liquid through the clearance 21 may be adjusted to suit the particular speed desired, by using a nozzle 20 of proper length to provide suitable amount of clearance or opening at 21. In small turbines, I prefer to use mercury as the operating liquid.

The containing pan or chamber 24 receives the fluid discharged from the rotator, that portion of such fluid which is in the gaseous state passes out through the exhaust pipe 25, and the liquid portion returns to the opening 21 at the bottom of the rotator to maintain a continuous circuit action. Deflecting plates or surfaces 26 which may be bolted to the interior surface of the pan are a convenient means for aiding this return of the liquid.

Liquid is injected through the pipe 27 to replace loss by reason of evaporation or other causes.

When the exhaust pipe 25 leads to a condenser for the purpose of maintaining vacuum or low pressure discharge from the

rotator and thereby contribute to the mechanical efficiency of the apparatus, it is desirable to provide a cup and sleeve for the shaft 15, as shown at 28, for holding
 5 oil and excluding the extraneous air.

Gages for various purposes, valves, and lubricating devices may be the same as known in the art and are omitted in these diagrams in order to avoid prolixity.

10 I claim:

1. The combination, in a motive power turbine, of a nozzle passageway occupying some extent with progressively enlarging cross-section following after its most contracted cross-section, means for continuously conducting gaseous fluid from a high pressure source of supply and passing it through said passageway and impinging it against liquid coming in a separate current from a low pressure source of supply, a rotator provided with propelling surfaces adapted to react from radial movement of fluid thereon, and means for containing fluid movement resulting from said impinging action and delivering same in a radial direction against said propelling surfaces.

2. The combination, in a motive power turbine, of a nozzle passageway occupying some extent with progressively enlarging cross-section following after its most contracted cross-section, means for varying the cross-sectional limitations to the space which said passageway occupies, means for continuously conducting gaseous fluid from
 35 a high pressure source of supply and passing it through said passageway and impinging it against liquid coming in a separate current from a low pressure source of supply, a rotator provided with propelling
 40 surfaces, and means for containing fluid movement resulting from said impinging action and delivering same against said propelling surfaces.

3. The combination, in a motive power turbine, of a nozzle passageway occupying some extent with progressively enlarging cross-section following after its most contracted cross-section, means for varying the cross-sectional limitations to the space
 50 which said passageway occupies, means for continuously conducting gaseous fluid from a high pressure source of supply and passing it through said passageway and impinging it against liquid coming in a separate current from a low pressure source of
 55 supply, a rotator provided with propelling surfaces adapted to react from radial movement of fluid thereon, and means for containing fluid movement resulting from said
 60 impinging action and delivering same in a radial direction against said propelling surfaces.

4. The combination, in a motive power turbine, of a nozzle passageway occupying

some extent with progressively enlarging
 65 cross-section following after its most contracted cross-section, means for continuously conducting gaseous fluid from a high pressure source of supply and passing it through said passageway and impinging it
 70 against liquid coming in a separate current from a low pressure source of supply, a rotator provided with propelling surfaces adapted to react from radial movement of fluid thereon, means for containing fluid
 75 movement resulting from said impinging action and delivering same in a radial direction against said propelling surfaces, and means for returning liquid to a repetition of the same procedure.

5. The combination, in a motive power turbine, of a nozzle passageway occupying some extent with progressively enlarging cross-section following after its most contracted cross-section, means for varying the
 85 cross-sectional limitations to the space which said passageway occupies, means for continuously conducting gaseous fluid from a high pressure source of supply and passing it through said passageway and impinging it against liquid coming in a separate current from a low pressure source of
 90 supply, a rotator provided with propelling surfaces adapted to react from radial movement of fluid thereon, means for containing fluid movement resulting from said impinging action and delivering same in a radial direction against said propelling surfaces, and means for returning fluid to a repetition of the same procedure.

6. The combination, in a motive power turbine, of a nozzle passageway occupying some extent with progressively enlarging cross-section following after its most contracted cross-section, means for continuously conducting gaseous fluid from a high pressure source of supply and passing it through said passageway and impinging it against liquid coming in a separate current from a low pressure source of supply, a
 110 rotator provided with propelling surfaces, means for containing fluid movement resulting from said impinging action and delivering same against said propelling surfaces, and a pan for collecting and returning
 115 discharged liquid provided with deflecting projections whereby rotary progression of liquid flow in the pan is impeded.

7. The combination, in a motive power turbine, of a nozzle passageway occupying
 12 some extent with progressively enlarging cross-section following after its most contracted cross-section, means for continuously conducting gaseous fluid from a high pressure source of supply and passing it
 12 through said passageway and impinging it against liquid coming in a separate current from a low pressure source of supply, a

rotator provided with propelling surfaces adapted to react from radial movement of fluid thereon, means for containing fluid movement resulting from said impinging action and delivering same in a radial direction against said propelling surfaces, and a pan for collecting and returning

discharged liquid provided with deflecting projections whereby rotary progression of liquid flow in the pan is impeded.

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Witnesses:

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