No. 875,131. PATENTED DEC. 31, 1907.

B. STEVENS.

TURBINE.

APPLICATION FILED SEPT. 7, 1907.

Fig. 1.

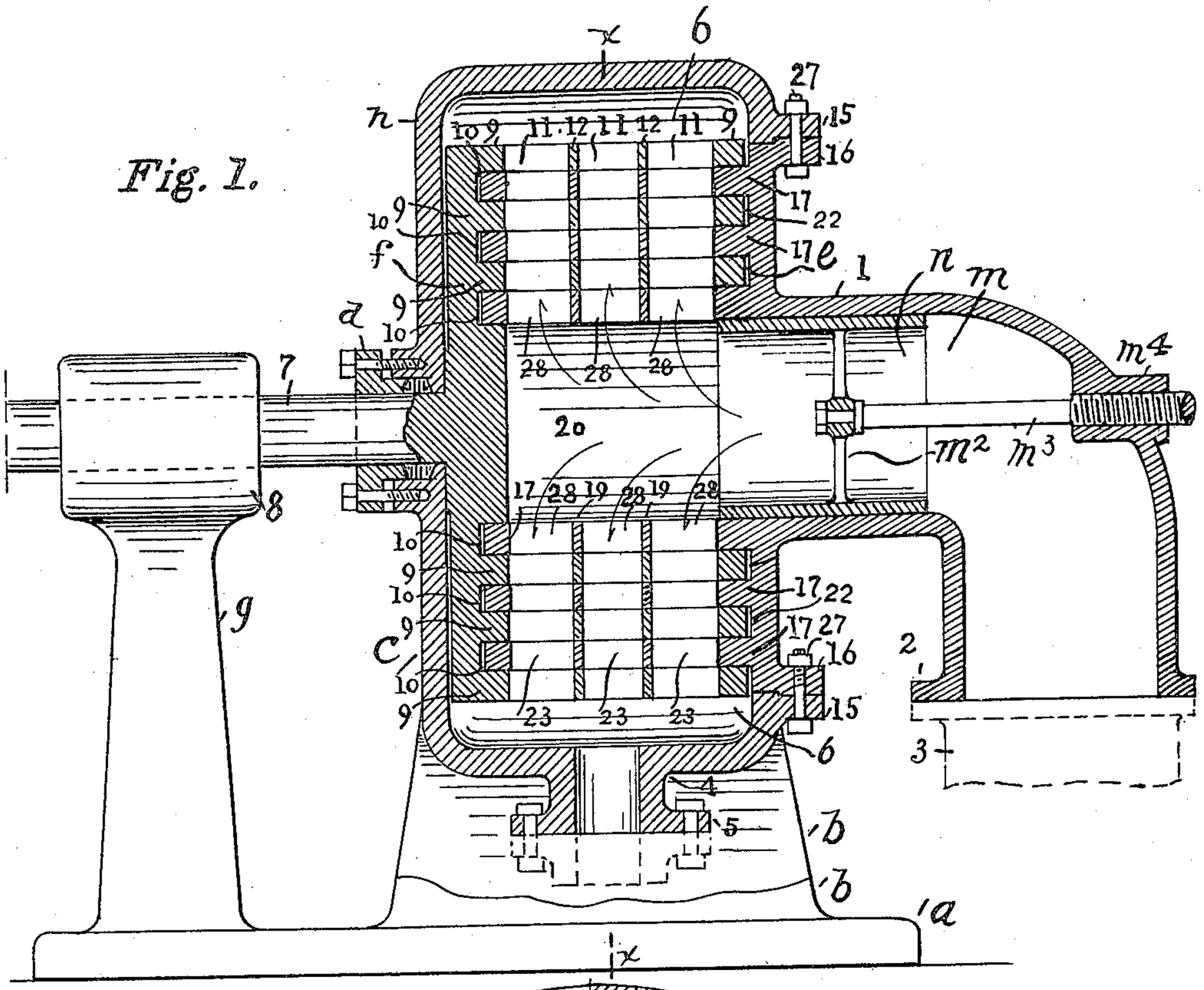
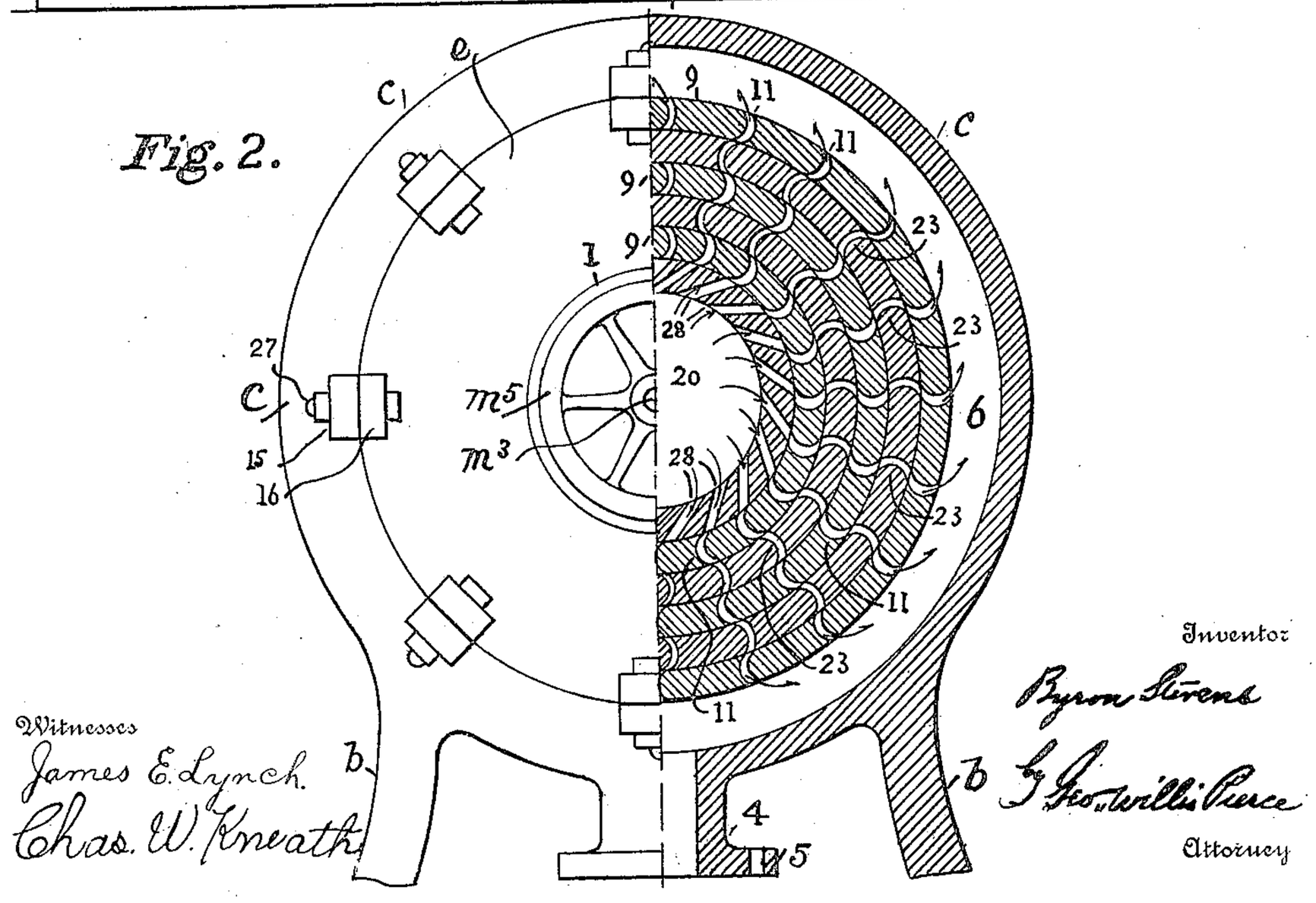



Fig. 2.

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# UNITED STATES PATENT OFFICE.

BYRON STEVENS, OF OAKLAND, CALIFORNIA.

## TURBINE.

No. 875,131. Specification of Letters Patent. Patented Dec. 31, 1907.

Application filed September 7, 1907. Serial No. 391,780.

*To all whom it may concern:*

Be it known that I, BYRON STEVENS, residing at Oakland, in the county of Alameda and State of California, have invented certain Improvements in Turbine-Motors, of which the following is a specification.

The present invention relates to turbine-motors, by means of which the energy of steam or other elastic fluid under pressure is converted into mechanical power.

In carrying out my invention I provide a turbine motor having a pair of wheels, one of which is revoluble while the other is stationary, each having thereon an annular series of blades, one of said series being located inwardly from the other so that the blades of one wheel are concentric with, but oppositely disposed to those of the other, the series of blades being of such a diameter that there is provided centrally of the same a chamber connected to an intake-pipe, through which a stream of fluid may be caused to flow radially against said blades, being directed thereto by a series of openings in the stationary wheel, thereby causing the revoluble wheel to move away from the stationary wheel.

The invention also consists in certain details of construction, all of which I will proceed to describe and point out in the appended claims.

Of the accompanying drawings,—Figure 1 is a side view of the turbine-motor partly in section, and Fig. 2 is a section on line *x*—*x* of Fig. 1.

In the drawings, *a* is a base-plate to which are attached the standards *b b*, which support the cylinder *c*, closed at one end *h* and open at the other end. The closed end is perforated centrally to provide a bearing for a shaft 7 and is made tight by means of the stuffing-box *d*, and the outer portion of the shaft is supported by the standard *g*. The standards *b b*, and *g*, as well as the cylinder, are represented as being integral with one another, but may be separated and bolted together, in a manner well understood.

The open end of the cylinder is closed by the disk *e*, provided with the lugs 16, which register with the lugs 15 on the face of the cylinder, and the lugs are joined by the bolts 27. In practice, the joint between the cylinder and the disk is sealed by a gasket. Extending outward from the center of the disk is a pipe 1 provided with a collar 2 by which the pipe may be extended by a connection 3 to the source of compressed fluid.

The disk *e* is provided on its interior face with a series of concentric tubes 17, separated by the spaces 22. These tubes are represented as having three series of openings 23 through the same; those in the inner tube 17 are straight 28, and at an angle to the radial lines thereof, and give the initial direction to the fluid, while the openings 23 in the other tubes are curved. The openings 23 are shown as divided by partitions 19 into a series of three, but may be divided into any suitable number.

The shaft 7 is joined to a disk *f* on the inside of the chamber 6, and the disk is provided on its interior face with a series of concentric tubes 9 separated by the spaces 10, and these tubes have three series of curved openings 11 through the same, but which are curved oppositely to the curved openings 13 in the tubes of the disk *e*. These openings are divided by partitions 12 into a series of three.

The disk *e* with its concentric tubes constitutes a stationary wheel, while the disk *f* with its concentric tubes forms a movable wheel, and the tubes of each wheel enter the spaces of the other so that the series of openings may be called "blades", as they constitute the parts upon which the compressed fluid impinges—to cause the movable wheel to rotate with the shaft 7, to which may be attached any tool to perform the work, or a wheel from which power may be conveyed.

At the lower side of the exhaust chest 6, is a waste-pipe 4 having a collar 5 to connect with an extension to convey away the exhausted fluid. By locating the exhaust-pipe at the lower end of the chest 6, all condensed fluid will flow away by gravity.

The operation of the turbine-motor will be apparent to one familiar with the art. The compressed fluid enters by the intake 21, being regulated thereto by a governor *m* hereinafter described and comes to the central chest 20 from which it flows by the initial direction passages 28 in the stationary wheel, into the openings 11 and 23 of the movable and stationary wheels to the exhaust chamber 6 and pipe 4, translating in its passage therethrough its energy into motion; and as the movable wheel revolves, the fluid alternately flows against its blades and is cut off and allowed to expand, all in a well understood manner, until its energy is gone.

I claim a particular advantage in the construction of the turbine-motor here described,

in that there is one stationary wheel with initial passages to direct the compressed fluid into the passages of the movable wheel, and a continuation of curved passages in the stationary wheel to further cause an action and reaction of the fluid into the continued passages of the movable wheel; and also in the use of a central chest into which the fluid at its greatest pressure is introduced and caused to pass radially, in all directions simultaneously, and so cause the pressure of the fluid to be felt upon the entire peripheries of the cylinders and blades of the movable wheel.

By means of the central chest a centralized motor construction is secured, and the energy is simultaneously and instantly applied to all the openings of the wheels.

It will be understood that the casing inclosing the concentric cylinders, may be made in many different ways, to support the various parts.

The governor M consists of the tube $n$ provided internally with a spider $m^2$ in which is bolted to turn therein the end of rod $m^3$, provided at its opposite end with a screw-thread which engages with an internally-threaded boss $m^4$ in the pipe 1, and has upon its outer end a wheel $m^5$, by which the rod and cylinder $n$ are moved back and forth. When the governor is in the position shown, the full force of the compressed fluid can pass through the tube $n$ to the blades of the turbine, and by turning the wheel $m^5$ the cylinder $n$ is pushed inward and the fluid is shut off from the blades in any degree desired.

A peculiar advantage is obtained by the use of the tubular valve $n$, as the full force of the fluid is always carried into the chest 20, so that whatever the position of the valve a full head or pressure of the fluid passes to the blades without being diminished, as is the case by the use of a throttle-valve or governor.

I claim as my invention,—

1. In a turbine motor, the combination of a tubular casing, a shaft entering the same on one side, a rotatable disk in the casing on the end of the shaft close to one wall thereof having a series of concentric tubes provided with openings or blades on the inner face of said disk, a second series of concentric tubes with openings or blades connected to the opposite wall of the casing the inner tube of which incloses a chamber extending to the face of said disk on one end and communicating at the opposite end with an intake or supply pipe, with a slide valve in the pipe.

2. In a turbine motor, the combination of a tubular casing, a shaft entering the same on one side, a rotatable disk in the casing on the end of the shaft close to one wall thereof having a series of concentric tubes provided with openings or blades on the inner face of said disk, a second series of concentric tubes with openings or blades connected to the opposite wall of the casing the inner tube of which incloses a chamber extending to the face of said disk on one end and communicating at the opposite end with an intake or supply pipe, a slide valve in said pipe, with a peripheral space of the casing surrounding said tubes provided with an exhaust pipe.

3. In a turbine motor, the combination of a tubular casing, a shaft entering the same on one side, a rotatable disk in the casing on the end of the shaft close to one wall thereof having a series of concentric tubes with openings or blades connected to the opposite wall of the casing interleaving with the tubes of the first series, its inner tube entering said chamber and forming its circular wall, the central face of said disk being an end wall of the chamber, with a supply or intake pipe communicating with the opposite end of the chamber provided with a slide valve.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses, this 26th day of August 1907.

BYRON STEVENS.

Witnesses:

A. C. Beck,

T. R. Grimwood.