

No. 749,739.

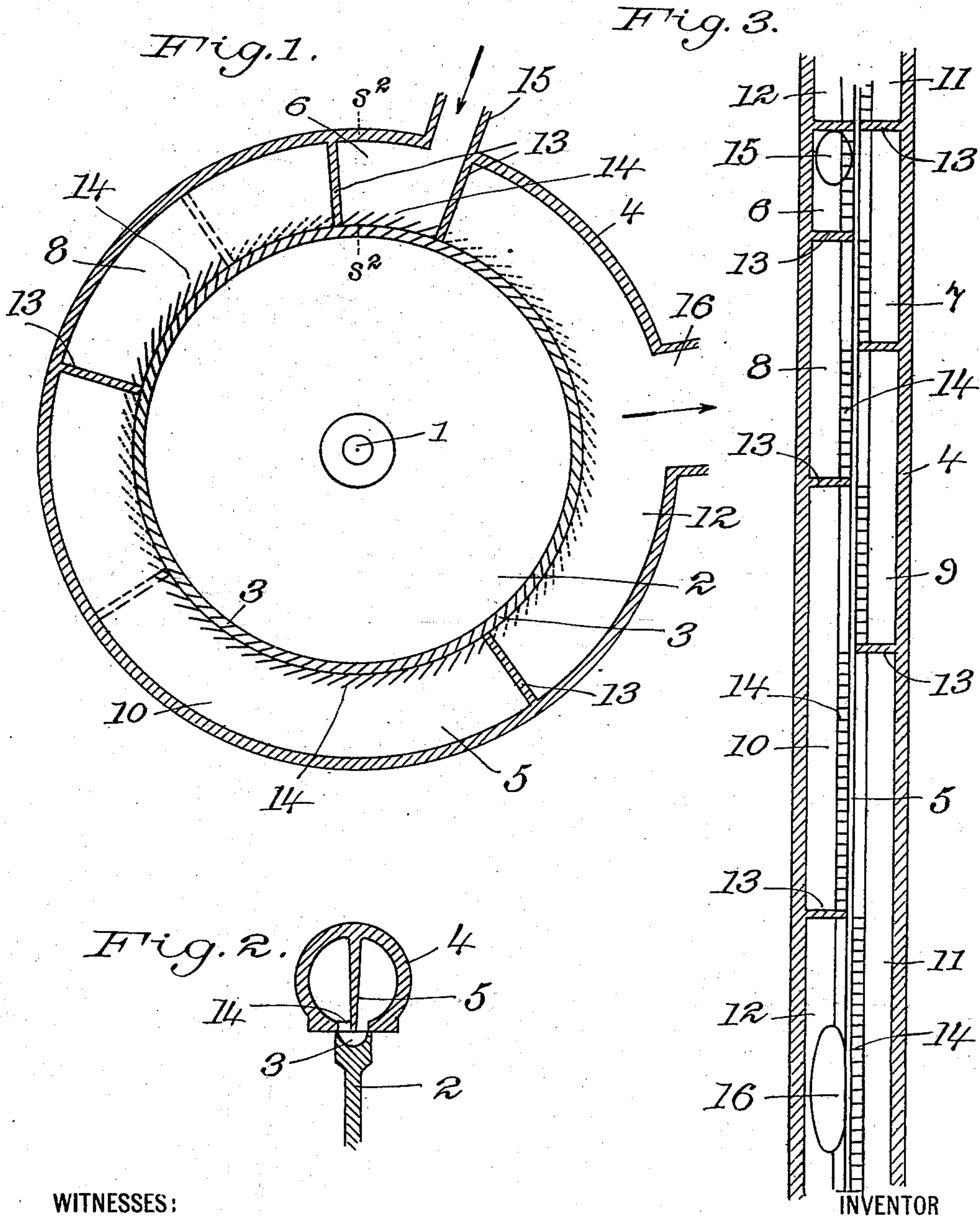
PATENTED JAN. 19, 1904.

S. LOUNT.  
TURBINE ENGINE.

APPLICATION FILED NOV. 14, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



WITNESSES:

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2 SHEETS—SHEET 2.

Fig. 4.

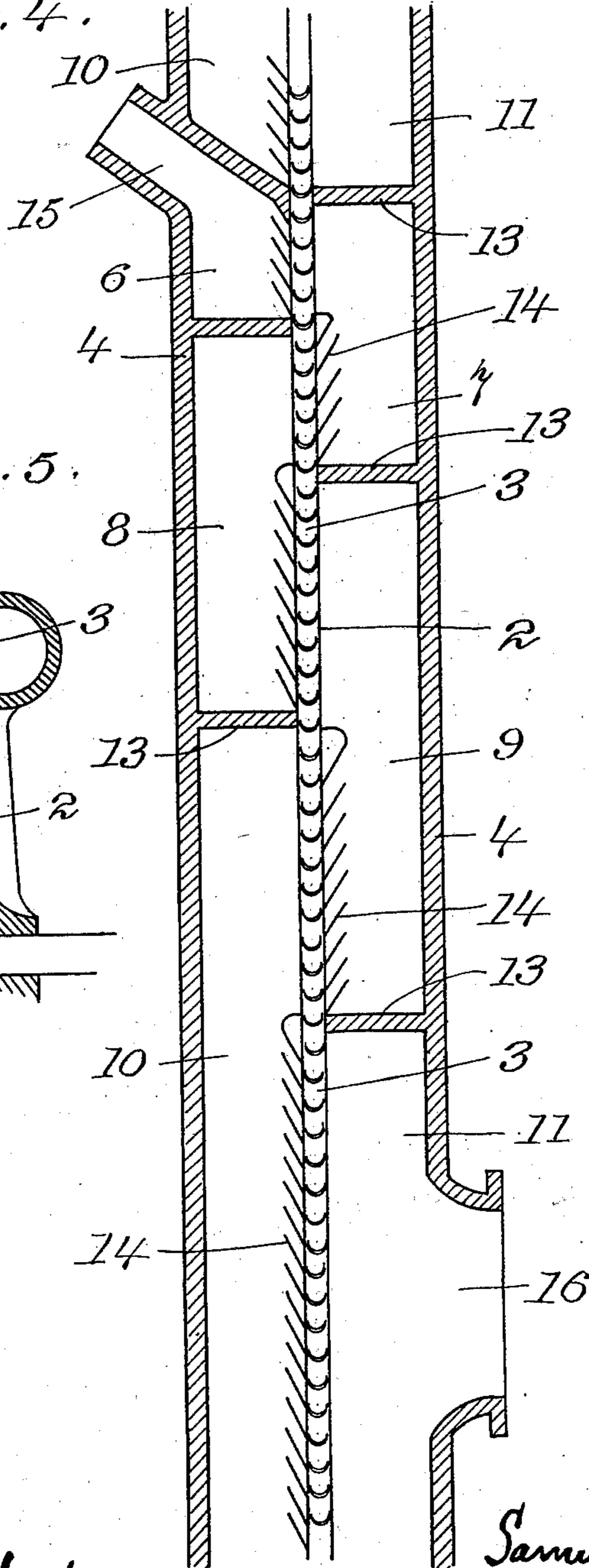
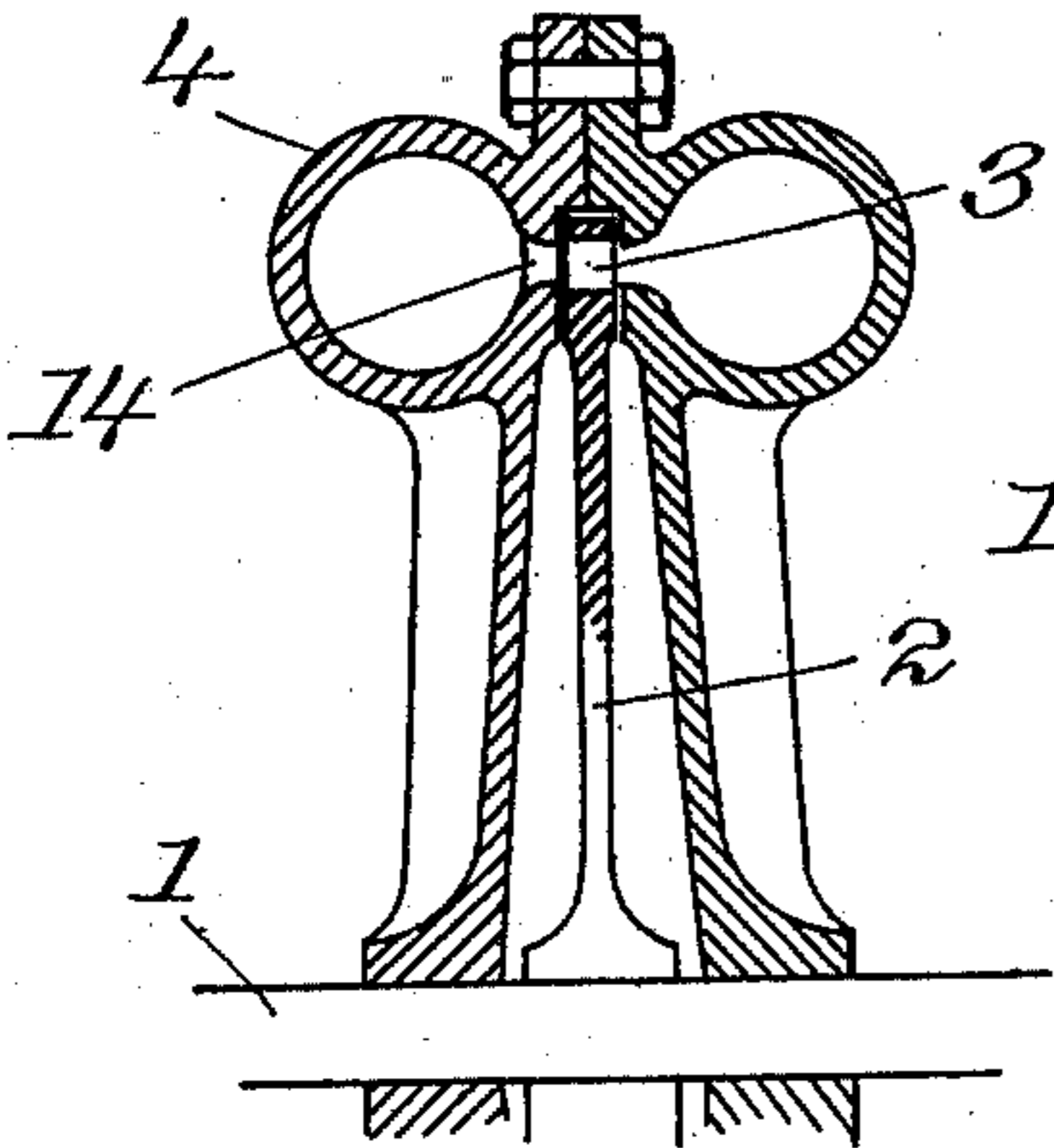


Fig. 5.



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# UNITED STATES PATENT OFFICE.

SAMUEL LOUNT, OF BARRIE, CANADA.

## TURBINE-ENGINE.

SPECIFICATION forming part of Letters Patent No. 749,739, dated January 19, 1904.

Application filed November 14, 1902. Serial No. 131,426. (No model.)

*To all whom it may concern:*

Be it known that I, SAMUEL LOUNT, a subject of the King of Great Britain, and a resident of Barrie, county of Simcoe, Province of Ontario, and Dominion of Canada, have invented certain new and useful Improvements in Turbine Engines or Motors, of which the following is a specification.

My invention relates in general to impact-engines adapted to be propelled by elastic fluids under pressure, and more specifically relates to an improved form of rotary steam-engine in which the rotating wheel, provided with a series of buckets, vanes, or other projections, is driven by the impact of a current of steam discharged in a series of jets against said projections.

The object of my invention is to utilize to the greatest extent possible the energy represented by said current of steam or other fluid by directing and concentrating the fluid-pressure in its discharge and causing it after it has struck the projections and been deflected thereby to return and again strike the buckets or projections at another point of the wheel, and so on until it is finally discharged from the casing of the engine to the condenser or to the atmosphere. The preferred form of apparatus for accomplishing this result and one modification thereof are illustrated in the accompanying two sheets of drawings, in which—

Figure 1 illustrates one form of my invention, the same being shown by a view in diagram looking end on at the engine-shaft. Fig. 2 is a cross-sectional view taken on the line  $S^2 S^2$  of Fig. 1, and Fig. 3 is a peripheral sectional diagram of the casing developed on a straight line. Fig. 4 is a similar view of a modification, and Fig. 5 is a radial section of such modification.

Throughout the drawings like reference-figures indicate like parts.

The engine-shaft 1 carries the rotating wheel 2, mounted thereon in any suitable manner. This wheel is provided with circumferential projections or indentations 3 3, &c., forming buckets or vanes, into or against which the steam or other fluid is discharged.

In the form shown in Figs. 1, 2, and 3 the casing 4 consists of a hollow annular casting, open or slotted throughout its inner circumference and divided internally by a central partition or wall 5, which extends through the slot and terminates flush with the inner face of the casing. On each side of this central wall a number of chambers 6 7 8 9 10 11 12, &c., are formed by cross-partitions 13 13, &c., the arrangement being such that each chamber on one side of the wall overlaps the ends of the two adjoining chambers on the other side of the wall.

The wheel is mounted in the casing with its peripheral indentations or buckets in line with the slot and so relatively arranged as to establish communication between the several chambers, the steam passing from one chamber under the dividing-wall, through the buckets to another chamber, and so on throughout the entire series or from inlet to exhaust. Between the walls of the slot forming the outlet from each chamber a number of vanes 14 14, &c., are arranged to control the direction of the flow of steam and cause the same to discharge in jet form, thereby concentrating the pressure as the steam passes from the chambers into the buckets of the wheel. As shown in Fig. 1, the vanes are set substantially tangential; but their inclination may be varied as desired to discharge the steam at any angle to the periphery of the wheel.

Steam or other fluid under pressure from a suitable source of supply is admitted by a pipe 15 to chamber 6 and directed by the vanes in the slot or outlet discharges into or against the buckets or projections on the wheel or driven member of the engine. The chamber 7 serves to receive the exhaust from chamber 6, the steam passing into the same after striking the buckets and being deflected therefrom. As shown, only the outlet from each chamber is provided with vanes, the inlets being clear and unobstructed to permit the free entrance of the exhaust-steam. From the chamber 7 the steam directed as above described by the vanes in the outlet is again discharged against the buckets and on being deflected thereby exhausts into the chamber 8, and so on through-

out the various chambers until it enters the last one of the series, from which it escapes by way of the exhaust connection 16.

In the modification illustrated in Figs. 5 and 6 the wheel has the buckets so arranged that there is a passage-way from one side of the wheel to the other. The vanes are accordingly set in the outlet of each chamber to discharge the steam across the periphery instead of in line with the same. The steam is admitted through the connection 15 to the chamber 6 and directed by the vanes is discharged against the projections on the wheel. In being deflected therefrom it exhausts into the chamber 7 and is again and in a similar manner discharged against the wheel projections and enters chambers 8, and so on throughout the series until it finally escapes by way of the exhaust 16.

As shown in the drawings, the casing may be formed of a single piece, as in Fig. 1, or in two sections bolted together, as in Fig. 5, or in a number of sections bolted together so long as the wheel is entirely inclosed.

The mode of operation of my invention will be clear from the foregoing description. The steam entering the chamber 6 strikes the engine-wheel and gives an impulse to the same, then being deflected exhausts into chamber 7 and is led onward through the succeeding outlet, so as to again strike the projections on the wheel, and so on until the final exhaust from the last chamber of the series is reached. In this way the velocity of the steam is imparted to the wheel and its stored energy or expansive power is utilized to the highest extent.

The principal advantage of my invention over other forms of impact-engines consists in obtaining an increased efficiency. This follows as a result of controlling the direction of flow of the steam and of concentrating the pressure on the wheel or other rotary element of the engine, which thereby utilizes the expansive power as well as the initial pressure to its full extent.

It is evident, of course, that various changes could be made in the details of construction illustrated in the drawings without departing from the spirit and scope of my invention. Other means might be substituted for the vanes in the outlets and other forms of connecting passage-ways might be employed. The relative proportions of successive chambers might be varied for different rates of expansion and initial pressures of steam, and it will be understood that the drawings are not made upon exact theoretical measurements. The manner of building up the casing of the engine might be different from that shown in the drawings and the number of chambers greater or less than that shown. The form of the projections or buckets upon the moving or driven member of the engine might be different from those shown in the drawings. All such modifications I should, however, consider

within the scope of my invention so long as the principles of concentrating and directing the current of steam or other fluid two or more times against the projections or driven member of an impact-engine be employed.

Having, therefore, described my invention, what I claim as new, and desire to protect by Letters Patent, is—

1. The combination of a casing, a wheel mounted and rotatable within said casing, a series of buckets formed on said wheel, a series of partitions set in the casing dividing the hollow annular space therein on each side of the wheel into separate chambers, each chamber on one side of the wheel overlapping the adjacent ends of two chambers on the other side of the wheel, together with a series of vanes set in the chambers and adapted to control the direction of the steam passing from said chambers to the buckets in the wheel.

2. The combination of a casing, a wheel mounted and rotatable within said casing, a series of buckets formed on said wheel, a series of partitions set in the casing dividing the hollow annular space therein on each side of the wheel into separate chambers, each chamber on one side of the wheel overlapping the adjacent ends of two chambers on the other side of the wheel, an inlet-chamber which is arranged opposite a part of one chamber only and an outlet-chamber of the same description, the intermediate overlapping chambers forming with the buckets on the wheel a connected series of passage-ways from inlet to outlet.

3. The combination of a hollow annular casing open throughout its inner circumference, a concentrically-mounted wheel, a series of peripheral projections formed on said wheel and relatively disposed to cooperate with the opening in the casing, partitions dividing the interior of the casing into a plurality of overlapping chambers alternately arranged upon opposite sides of the opening therein and communicating one with another by way of passages formed between the peripheral projections on the wheel.

4. The combination of an annular casing open throughout its inner circumference, a concentrically-mounted wheel, a series of inclined peripheral projections formed on said wheel and relatively disposed to cooperate with the opening in the casing, a central annular partition dividing the casing interiorly and projecting through the opening therein, cross-partitions forming a plurality of overlapping chambers alternately arranged upon opposite sides of said central annular partition and communicating one with another by way of passages formed between the peripheral projections on the wheel.

5. The combination of an annular casing open throughout its inner circumference, a wheel mounted and rotatable within said casing, a series of inclined peripheral projections

formed on said wheel and relatively disposed to coöperate with the opening in the casing, a central annular partition dividing the casing interiorly and projecting through said opening, cross-partitions forming a plurality of overlapping chambers of increasing size, said chambers being alternately arranged upon opposite sides of the said central annular partition in the casing and communicating one with another by way of passages formed between the peripheral projections on the wheel, the chamber at one end of the series being open to fluid-pressure supply and the chamber at the opposite end to exhaust.

15 6. The combination of an annular casing open throughout its inner circumference, a wheel mounted and rotatable within said cas-

ing, a series of peripheral projections formed on said wheel and relatively disposed to coöperate with the opening in the casing, partitions dividing the interior of the casing into a plurality of overlapping chambers alternately arranged upon opposite sides of the opening therein and communicating one with another by way of passages formed between the peripheral projections on the wheel and directing vanes in the outlet from each chamber.

Signed at Barrie this 11th day of November, 1902.

SAMUEL LOUNT.

Witnesses:

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ALLIE KENNEDY.