

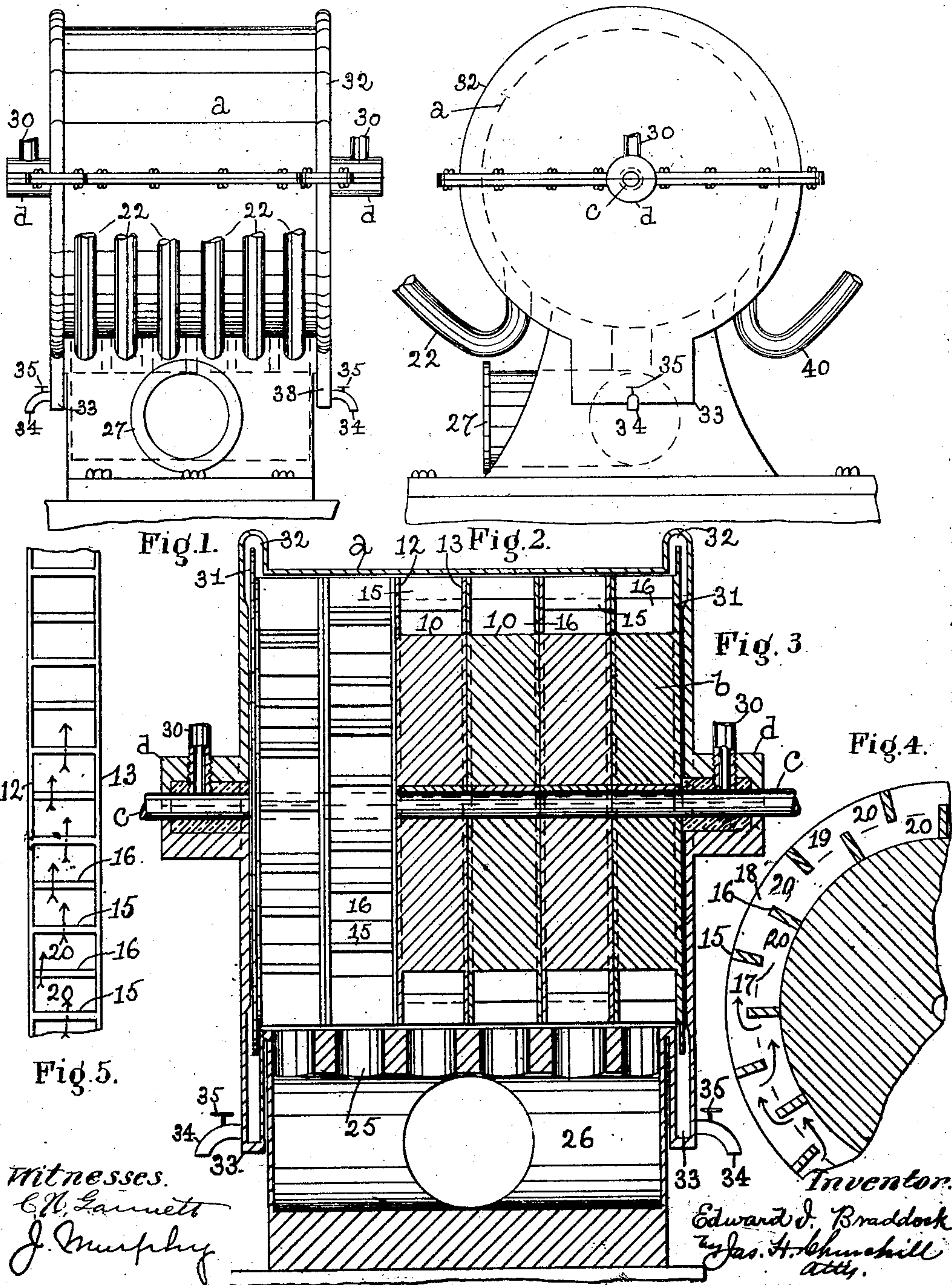
E. I. BRADDOCK.

TURBINE.

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925,556.

Patented June 22, 1909



UNITED STATES PATENT OFFICE.

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MOTIVE POWER COMPANY, OF BOSTON, MASSACHUSETTS, A CORPORATION OF
MAINE.

TURBINE.

No. 925,556.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, EDWARD I. BRADDOCK, a citizen of the United States, residing in Winchester, county of Middlesex, and State of Massachusetts, have invented an Improvement in Turbine Engines or Motors, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention relates to a turbine engine or motor of that class in which a piston wheel is provided with peripheral blades or vanes, and has for its object to provide a turbine engine or motor of the class described, in which the piston wheel is provided with blades or vanes which are arranged with relation to one another to form a continuous passage about the wheel having throats or openings above and below said piston blades or vanes, whereby the expansion as well as the velocity of the steam or other fluid may be utilized, and a highly efficient and economical engine or motor produced. For this purpose, the wheel is provided with an annular body portion having annular side flanges, which form an annular fluid chamber about the circumference of the wheel, and which is separated into pockets by two sets of substantially radial blades or vanes extended transversely of the said annular chamber, one set projecting from the annular body portion toward the rim of said flanges to form one set of throats, and the other set of blades extending from the rim of the flanges toward said annular body portion to form another set of throats, which are on opposite sides of a circular path or line about the wheel as will be described, so that the steam or other fluid passing about the wheel is caused to pass under one set of blades and over the other set, and is directed by the said throats against the preceding blades or vanes, the said steam or other fluid expanding in the pockets between adjacent blades.

Figure 1 is a front elevation of a turbine engine embodying this invention. Fig. 2, a side elevation of the engine shown in Fig. 1. Fig. 3, a vertical section and elevation of the engine shown in Fig. 1. Fig. 4, a detail in section to be referred to, and Fig. 5, a detail in developed view to be referred to.

Referring to the drawings *a* represents an annular casing, within which are located a plurality of piston wheels *b* fast on a shaft *c*

supported in bearings *d*. Each piston wheel *b* is provided with an annular body portion 10 having circumferential flanges 12, 13, which form an annular fluid chamber about the wheel, said chamber being separated by two sets of radially extended blades or vanes 15, 16, into two sets of throats 17, 18, located on opposite sides of a circular path or line 19 about the wheel, and connecting the pockets 20 between adjacent blades to form a continuous but irregular passage about the wheel, so that steam or other fluid admitted into the casing *a* through an inlet pipe 22 strikes against one blade or vane as 15, expands inwardly toward the center of the wheel and passes through the throat 17 into the next preceding pocket 20 and strikes against the blade or vane 16. The steam then expands outwardly toward the casing *a* and passes through the throat 18 into the next preceding pocket, where it strikes against the next blade or vane, and so on until it reaches the exhaust port 25, which is shown as located at the bottom of the casing *a* and communicates with the chamber 26 provided with the outlet pipe 27. The course of the steam or other fluid is indicated by the arrows in Figs. 4 and 5, and it will be observed that the expansion of the steam is utilized as well as the impact of the same for producing rotation of the engine or motor. It will also be observed, that the steam or other fluid passes under one set of blades or vanes as 15, and over the other set as 16, and that the two sets of throats 17, 18, connect the pockets 20 between the blades to form a continuous but irregular passage, portions of which lie on one side and other portions on the other side of the path or line 19 about the wheel.

Provision is made for preventing the oil or other lubricant fed to the bearings *d* through the pipes 30 from mixing with the exhaust fluid, which may be accomplished as herein shown by mounting on the shaft *c* disks 31, which are represented in the present instance as part of the endmost piston wheels and are extended into annular chambers 32 in the casing *a*, which latter communicate with oil wells 33 provided with outlet pipes 34 having valves 35 and designed in practice to be connected with a pump (not shown) by which the oil is supplied to the pipes 30. The oil supplied to the bearings *d* flows along the shaft *c* until it meets the disk 31, on which it is moved by centrifugal force until it is

thrown into the chamber 32, from which it descends into the oil well 33.

The engine may be provided with a second steam inlet pipe 40 on the opposite side to the pipe 22, so that the rotation of the engine may be reversed, and in practice said steam inlet pipes will be provided with suitable valves (not shown) by means of which one pipe may be closed when the other is open.

10 Claims.

1. In a turbine engine or motor, in combination, an inclosing casing, a rotatable wheel within said casing comprising a body portion having side flanges which cooperate with the casing to form an annular fluid chamber, a fluid inlet for said casing, a fluid outlet for said casing, and a plurality of blades or vanes attached to the wheel within said annular chamber and extended transversely of the same in staggered relation and substantially radial with relation to the said wheel to form two sets of blades which interrupt the continuity of the annular chamber and form throats on opposite sides of a circular path or line about the wheel, with the throats formed by each set of blades in line with the blades

of the other set to prevent a direct passage of the steam or other fluid about the wheel and cause the said steam or other fluid to pass under one set of blades and impact against the other set and to pass over the other set and impact against the first-mentioned set, substantially as described.

2. In a turbine engine or motor, a piston wheel having an annular body portion provided with side flanges, and two sets of substantially radial blades or vanes extended transversely of said wheel between said flanges and in staggered relation to each other, the blades of each set projecting beyond the blades of the other set to form two sets of throats, the throats formed by one set of blades being in line with the blades of the other set, substantially as described.

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

EDWARD I. BRADDOCK.

Witnesses:

JAS. H. CHURCHILL,
J. MURPHY.