

No. 670,637.

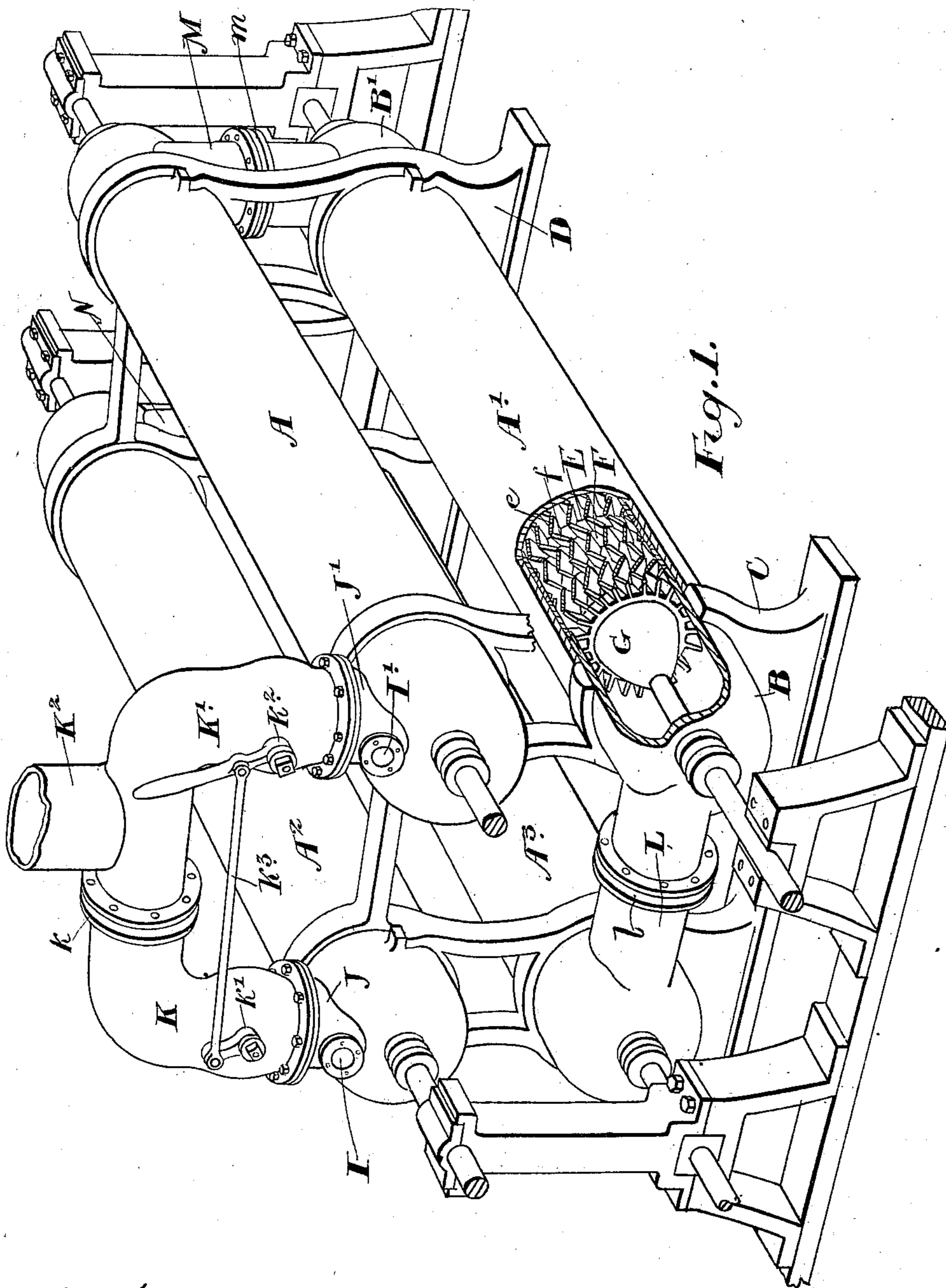
Patented Mar. 26, 1901.

I. M. HOUSE.
COMPOUND ROTARY ENGINE.

(Application filed Sept. 10, 1898.)

(No Model.)

2 Sheets—Sheet 1.



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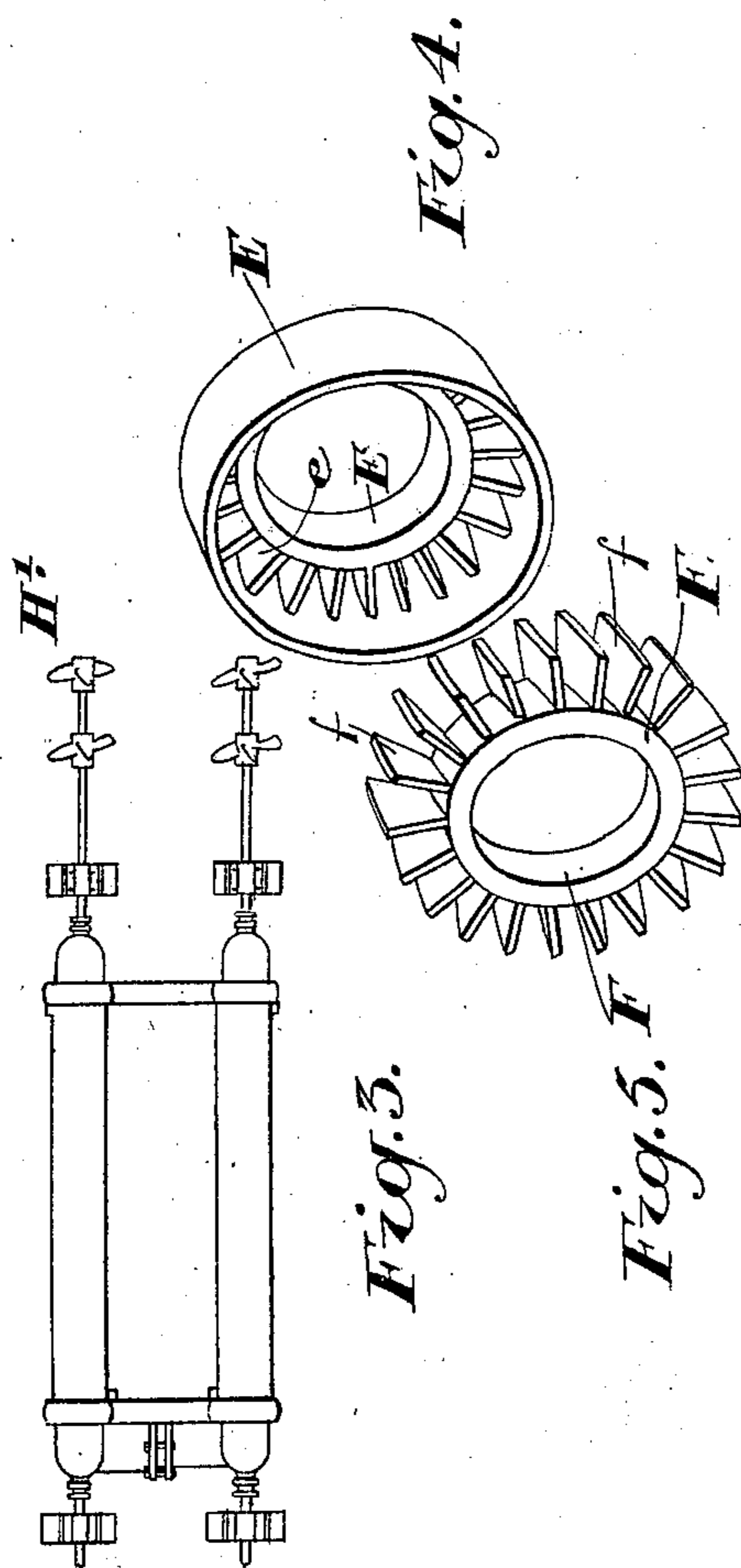
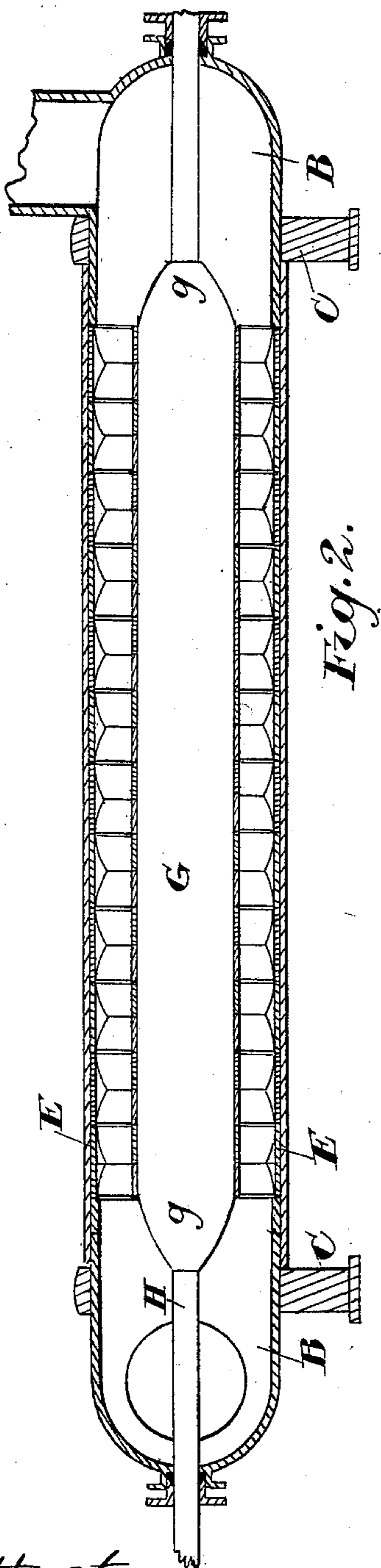
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2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

ISAAC MILTON HOUSE, OF GRAVENHURST, CANADA.

COMPOUND ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 670,637, dated March 26, 1901.

Application filed September 10, 1898. Serial No. 690,689. (No model.)

To all whom it may concern:

Be it known that I, ISAAC MILTON HOUSE, machinist, of the town of Gravenhurst, in the district of Muskoka, in the Province of Ontario, Canada, have invented certain new and useful Improvements in Compound Rotary Engines, of which the following is a specification.

My invention relates to improvements in compound rotary engines; and the object of the invention is to design a form of rotary turbine engine capable of being reversed and which will utilize to the greatest extent possible the maximum and minimum expansive force of the steam and the full and decreased head thereof; and it consists, essentially, of a plurality of parallelly-arranged cylindrical casings connected at their ends, so as to form a continuous passage-way for the steam from inlet to exhaust, the interior of the casings being provided with peculiarly-arranged stationary and rotating wings or vanes and each cylindrical casing having its own separate vane-shaft to which the power of the steam is applied, such shafts being designed to be utilized in the manner hereinafter more particularly explained.

Figure 1 is a perspective view partially broken away to exhibit the construction and arrangement of my improved engine. Fig. 2 is a longitudinal section through one of the parallelly-arranged casings. Fig. 3 is a plan view of my rotary engine on a reduced scale, showing the shaft of each casing arranged with propeller-wheels for marine use. Fig. 4 is an enlarged detail of the ring containing the stationary steam-directing vanes. Fig. 5 is a detail of the ring provided with the peripherally-arranged vanes by which motion is communicated to the shaft.

In the drawings like letters of reference indicate corresponding parts in each figure.

A, A', A², and A³ are the cylindrical casings, which are arranged parallelly, as shown, and provided with suitable dome-shaped heads B, the casings and heads being supported at each end by the standards C and D.

In the drawings I show two sets of two casings arranged parallelly directly above and beside each other. Within each cylindrical casing are a series of rings E, having formed with or otherwise internally attached to the

ring a series of directing-vanes *e*, the planes of which are obliquely arranged to the axis. The inner end of the vanes are attached to or form part of a ring E'. It will be seen that the vanes *e* extend but half the width of the internal periphery of the ring E, the rest of the space being taken up by the vane-ring F, the vanes *f* of which are obliquely and reversely set to the vanes *e* of the ring E. The vane-rings E are securely and frictionally held together and from rotating within the perimeter of the cylinder by the end pressure of the dome-shaped heads B. The vane-rings F are secured to the hollow cylinder G, provided with tapered ends *g*, such cylinder being suitably secured to the main shaft H of the cylinder, which is supported in suitable bearings provided with suitable packing in the dome-shaped heads B.

I and I' are the inlet-ports, which are located in the branches J and J', formed in the heads, and are provided with suitable steam-pipes leading thereto from the boiler.

K and K' are suitable exhaust-pipes connected together, as shown, by a suitable expansive joint *k* and leading to a common pipe K².

k' and *k*² are the valve-cranks, which are connected together by a link *k*³, so that when one exhaust-port valve is opened the other one will be closed.

The lower front dome-shaped heads B are connected together by the branches L, having the expansion-joint connection *l* at the center. The dome-shaped heads B' at the ends of the pipes A and A', are connected by the branches M, having expansion-joints *m*, and the dome-shaped heads on the ends of the cylinders A² and A³ are connected together by the branches N, also provided with suitable expansion-joints connecting the branches.

The operation of my engine is as follows: Provided the steam-inlet port used is I', the arm K² will be swung so as to throw open the exhaust-port branch pipe K and close the branch exhaust-port K'. The full head of steam entering through the port I' would pass into the dome-shaped head and through the several vane-rings F and directing-vanes E, such directing-vanes serving to convey the steam from each preceding revolving vane-ring to the succeeding one in its passage to the

cylinder. As the vane-rings are attached to the shaft through the cylinder G, it will be seen that the shaft H of each cylinder will be caused to rotate. The steam of course
5 passing from one cylinder to the other, starting at the cylinder A and passing through the cylinders A', A³, and A², and exhausting through the pipe K at a minimum pressure, will cause all the shafts to rotate in the same
10 direction.

As the course of the steam is impeded and operates from the maximum to a minimum pressure, where it exhausts, it will of course be understood that the speed of all the shafts
15 will be identical. It is to be especially noted that these shafts are arranged parallelly with connecting end branches, so that there is a continuous passage-way for the steam from the inlet of the first cylinder to the exhaust
20 of the last cylinder, thereby utilizing to the greatest extent possible the maximum and minimum expansive force and head of the steam.

In Fig. 3 I show the shaft H with propelling-wheels H' on the ends, this form being
25 designed especially for marine engines.

In case it is desired to rotate my engine only in one direction I would preferably in

this case make the vanes of the wheel F' curvilinear in form.

What I claim as my invention is—

In combination a plurality of cylinders parallelly arranged suitable heads therefor, shafts extending throughout the cylinders and through the heads, the enlarged drum or
35 cylinder with tapered ends secured to the shaft, a series of rings secured to the internal drum or cylinder and provided with suitable obliquely-arranged vanes, a series of rings provided with directing-vanes reversely set to
40 the rotating vanes and interposed between them throughout the length of the cylinder, such rings abutting each other and being frictionally held in place by the heads, branches connecting the heads of the series
45 of parallelly-arranged cylinders, so as to form a continuous passage-way through them, suitable inlet and exhaust ports arranged so as to reverse the flow of the steam through the cylinders and suitable standards supporting
50 such cylinders as and for the purpose specified.

ISAAC MILTON HOUSE.

Witnesses:

E. P. FETHERSTONHAUGH,
C. W. STUART.