

No. 674,237.

Patented May 14, 1901.

J. A. GIBSON.
MULTIPLE CYLINDER ENGINE.

(Application filed Dec. 24, 1900.)

(No Model.)

2 Sheets—Sheet 1.

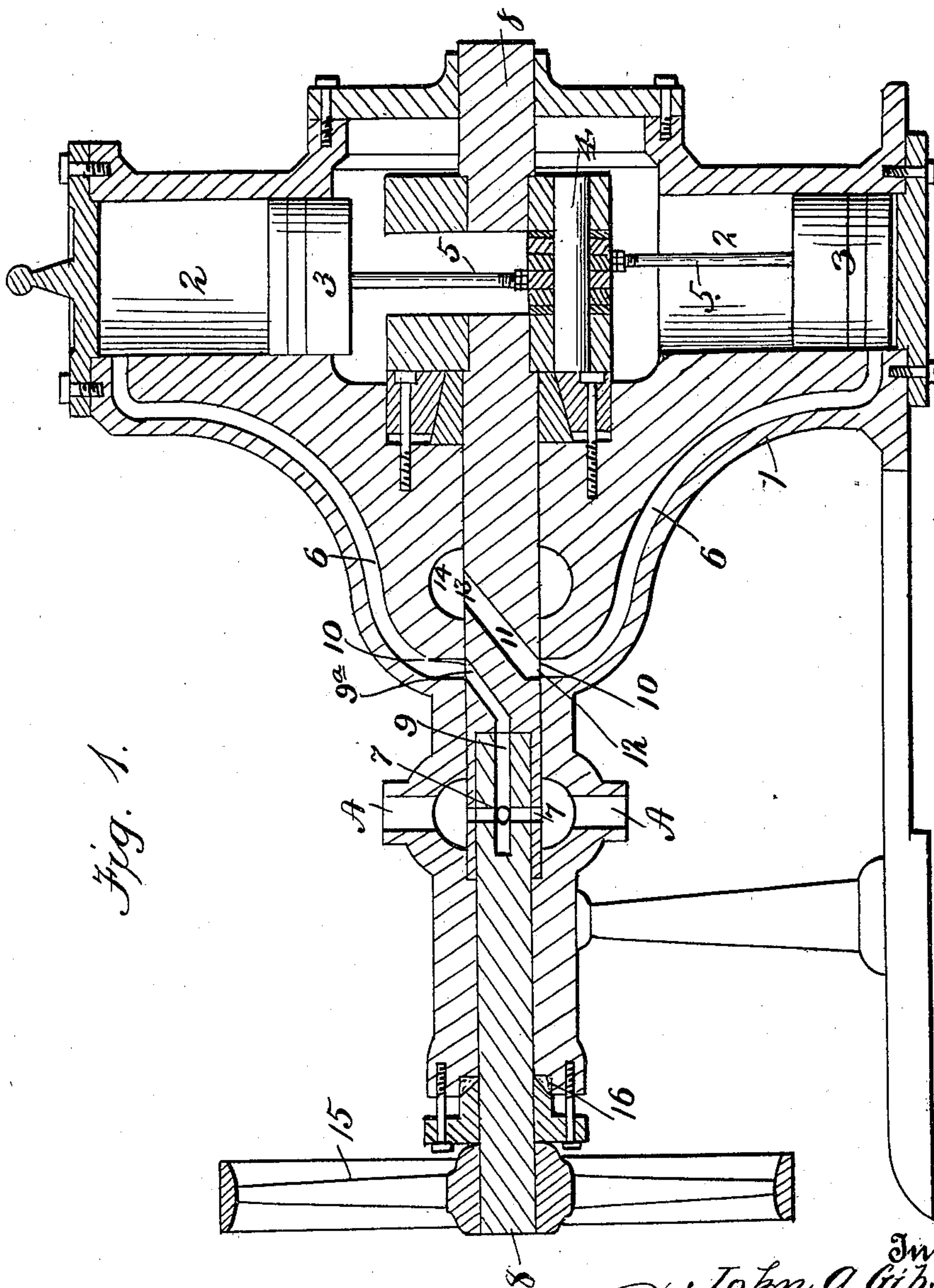


Fig. 1.

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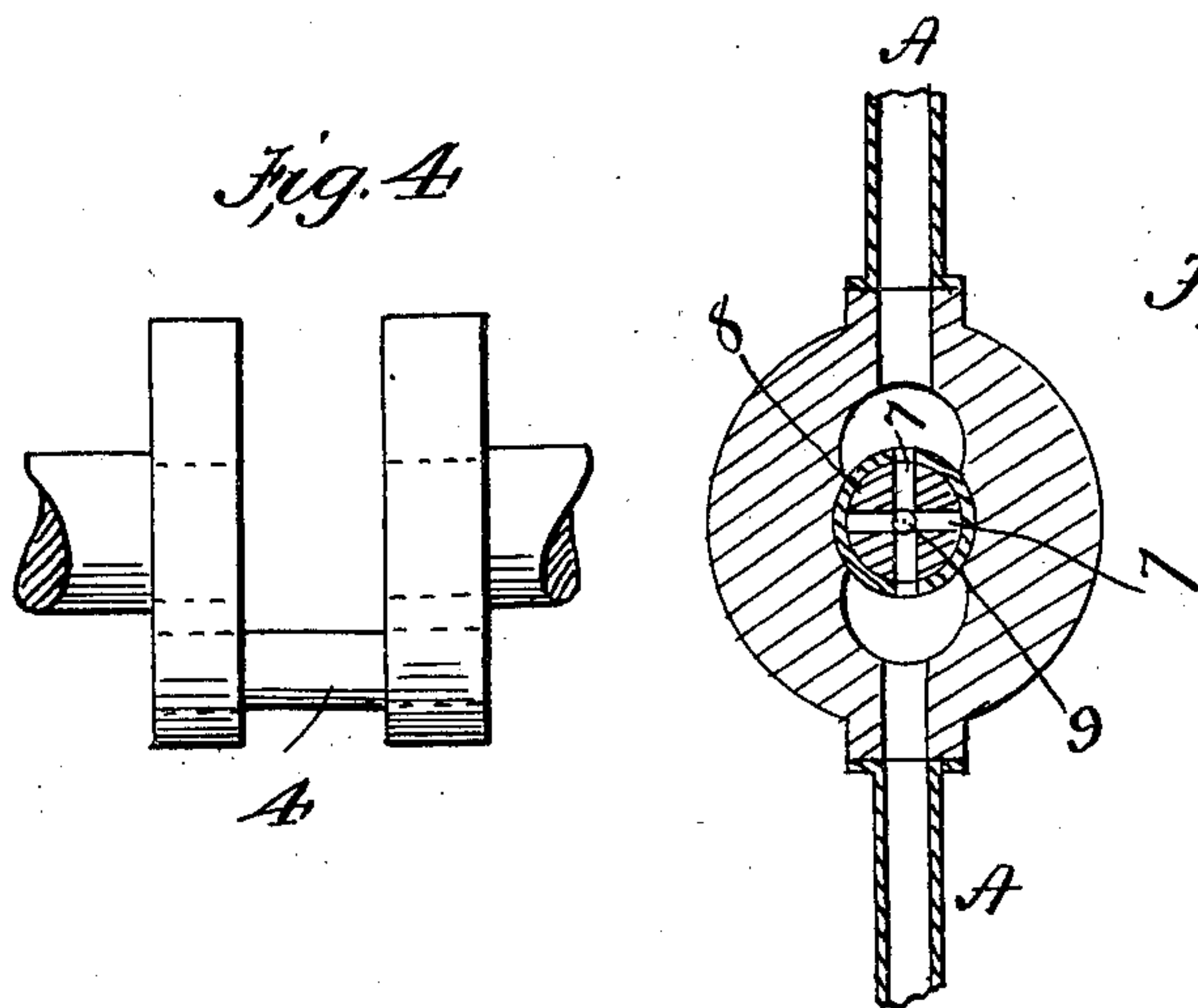
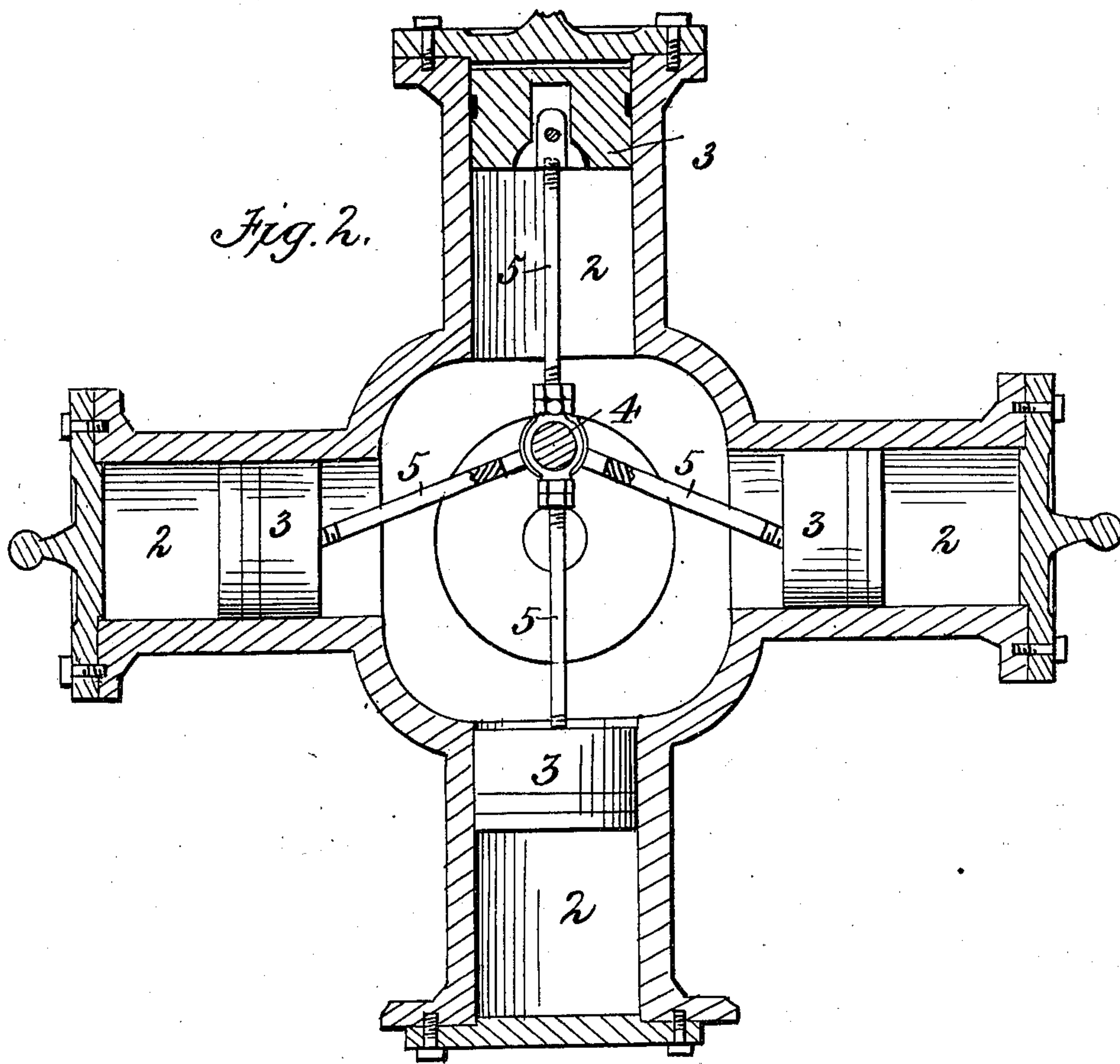
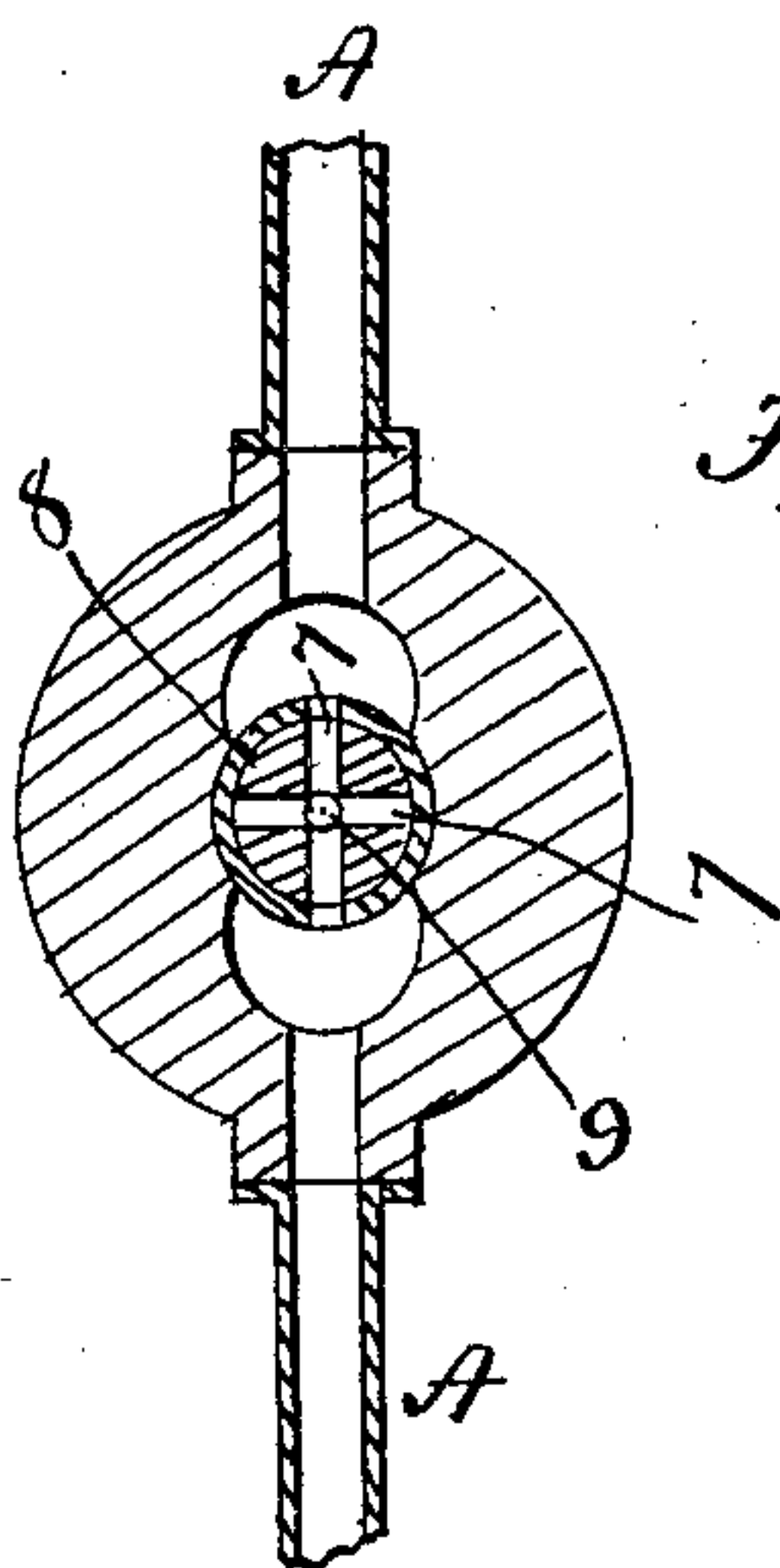


Fig. 3.



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UNITED STATES PATENT OFFICE.

JOHN A. GIBSON, OF TOLEDO, OHIO.

MULTIPLE-CYLINDER ENGINE.

SPECIFICATION forming part of Letters Patent No. 674,237, dated May 14, 1901.

Application filed December 24, 1900. Serial No. 40,954. (No model.)

To all whom it may concern:

Be it known that I, JOHN A. GIBSON, a citizen of the United States, residing at Toledo, in the county of Lucas and State of Ohio, have invented new and useful Improvements in Multiple-Cylinder Engines, of which the following is a specification.

My invention relates to multiple-cylinder steam and air engines; and the object of the same is to produce an engine with cylinders symmetrically arranged which will operate without connecting-rods or slide-valves.

With this object in view I have designed a simple and novel construction by which the efficiency of the engine is greatly increased and dead-centers totally avoided. This construction is fully described in this specification and claimed and illustrated in the accompanying drawings, forming a part thereof, in which—

Figure 1 is a vertical section of my engine taken longitudinally the crank-shaft. Fig. 2 is a vertical section of the same taken transversely the crank-shaft. Fig. 3 is a detail showing the valve-passages. Fig. 4 is a detail of the crank.

Like characters of reference designate like parts in the different views of the drawings.

The numeral 1 designates the frame of my engine, which supports four cylinders 2, symmetrically arranged opposite to each other in pairs. Pistons 3 are mounted in each cylinder and are connected to a crank 4 by pitmen 5, pivotally joined at their ends to the pistons and crank, respectively.

Steam is supplied to the cylinders 2 by means of tortuous passages 6, which communicate with the outer ends of the cylinder. The cut-off mechanism, which regulates the intermittent admission of steam from pipes A into the passages 6, comprises two transverse apertures 7 in the main shaft 8 and a longitudinally-extending elbowed aperture 9, connecting with the apertures 7. The apertures 7 are at right angles to each other and intersect, and the aperture 9 pierces the surface of the shaft at a point 9^a. The outer ends 10 of the passages 6 all lie in the same plane, which plane is coincident with the plane of revolution of the opening 9^a. The consequence of this arrangement is that the mouth 9^a coincides in turn with the openings

10 as the shaft 8 revolves and steam is intermittently supplied to the four cylinders 2.

While steam is being admitted into one cylinder 2 the opposite cylinders must be exhausting, and to provide for this an inclined elbowed passage 11 is made through the shaft 8, one end 12 of which passage also lies in the plane of the openings 10, and therefore registers in turn with the mouths 10 of the passages 6 as the shaft 8 revolves, while the other end 13 makes connections with an exhaust-chamber 14. The shaft 8 is prolonged outward and carries a pulley 15 on its outer end. Metal packing 16 is also supplied.

The operation of my engine is as follows: Steam or air flows from some source, as a boiler or air-tank, (not shown,) through the pipes A and thence into one of the transverse apertures 7—that is, the one that is uncovered, and there must always be one. This steam next passes into the longitudinally-extending aperture 9 and then into one of the passages 6 and through into the cylinder. This admission of steam actuates the piston 2, which travels forward and turns the shaft 8. The rotation of the shaft carries the opening 9 past 10 and into coincidence with the next opening 10, when steam is admitted into the next cylinder and the shaft turned further. This further movement brings the opening 9 in coincidence with the passage 6, which communicates with the cylinder 2 opposite the one first supplied with steam, and the exhaust-passage 11 simultaneously establishes communication between this first cylinder and the exhaust-chamber 14. So the action proceeds, each cylinder exhausting in turn while the one opposite is being supplied with live steam.

It will be evident from the foregoing that my engine is simple in construction and dispenses with all complicated cross-head and valve mechanism.

I do not wish to be limited as to details of construction, as these may be modified in many particulars without departing from the spirit of my invention.

Having thus described my invention, what I claim as new, and wish to secure by Letters Patent, is—

In a multiple-cylinder engine, a cut-off mechanism, comprising the combination of four

cylinders placed opposite to each other and provided with pistons, a crank-shaft, and steam-passages, the outer ends of which are situated in the same plane and ninety degrees
5 from each other, said crank-shaft having transverse intersecting apertures at right angles to each other and located to make connections with steam-pipes which are positioned on opposite sides of the shaft, a longitudinally-extending
10 elbowed aperture which connects with said transverse aperture at their point of intersection and pierces the surface of the shaft at a point situated in the said plane of the outer ends of said steam-passages, and an in-

clined passage one end of which is situated 15 in the said plane of the outer ends of said steam-passages and the other end in the plane of two exhaust-chambers positioned on opposite sides of the said shaft, substantially as described. 20

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JOHN A. GIBSON.

Witnesses:

JOSEPH N. BLUMBERG,
JOSEPH ATKINSON.