

No. 882,401.

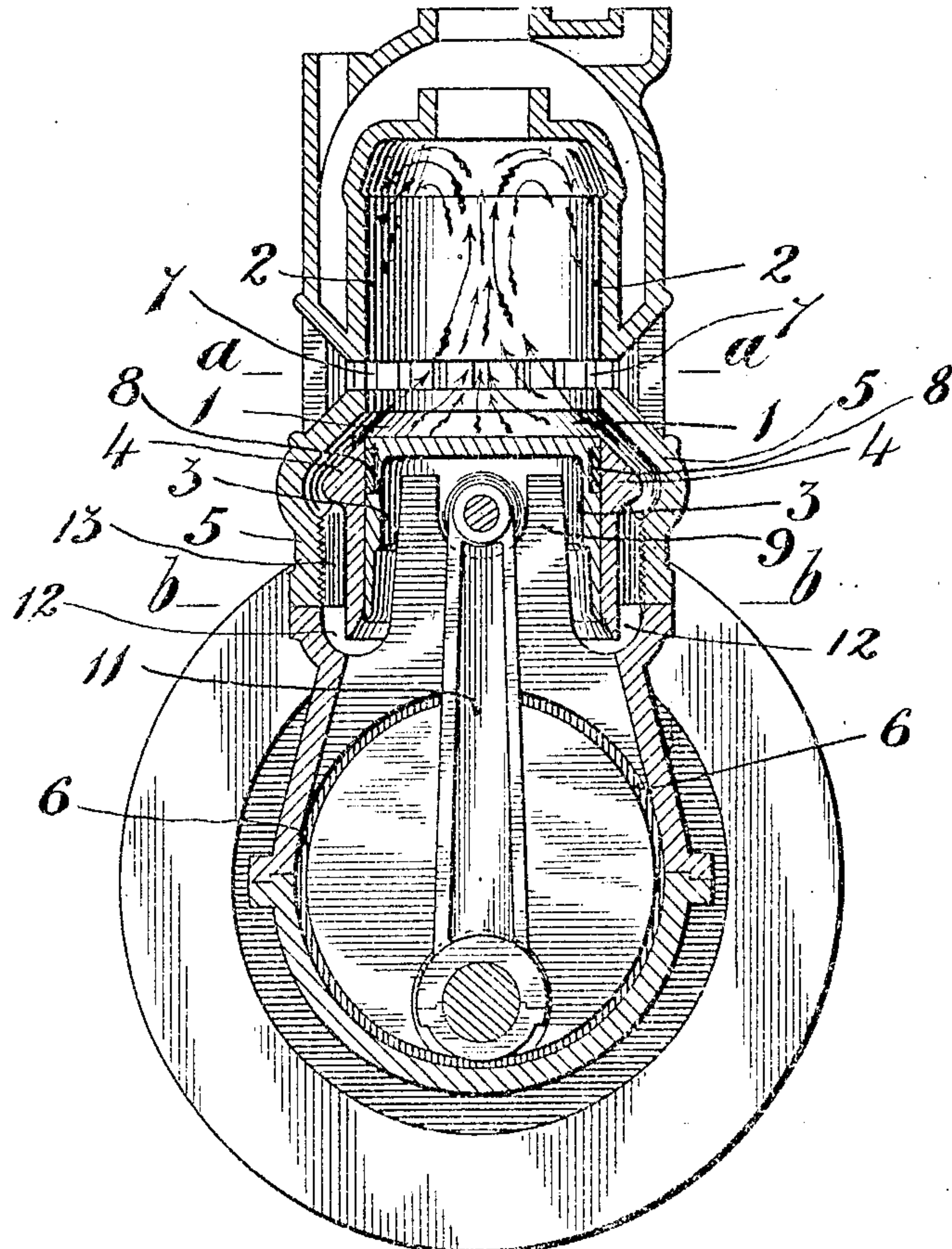
PATENTED MAR. 17, 1908.

A. G. MELHUISH.  
INTERNAL COMBUSTION ENGINE.

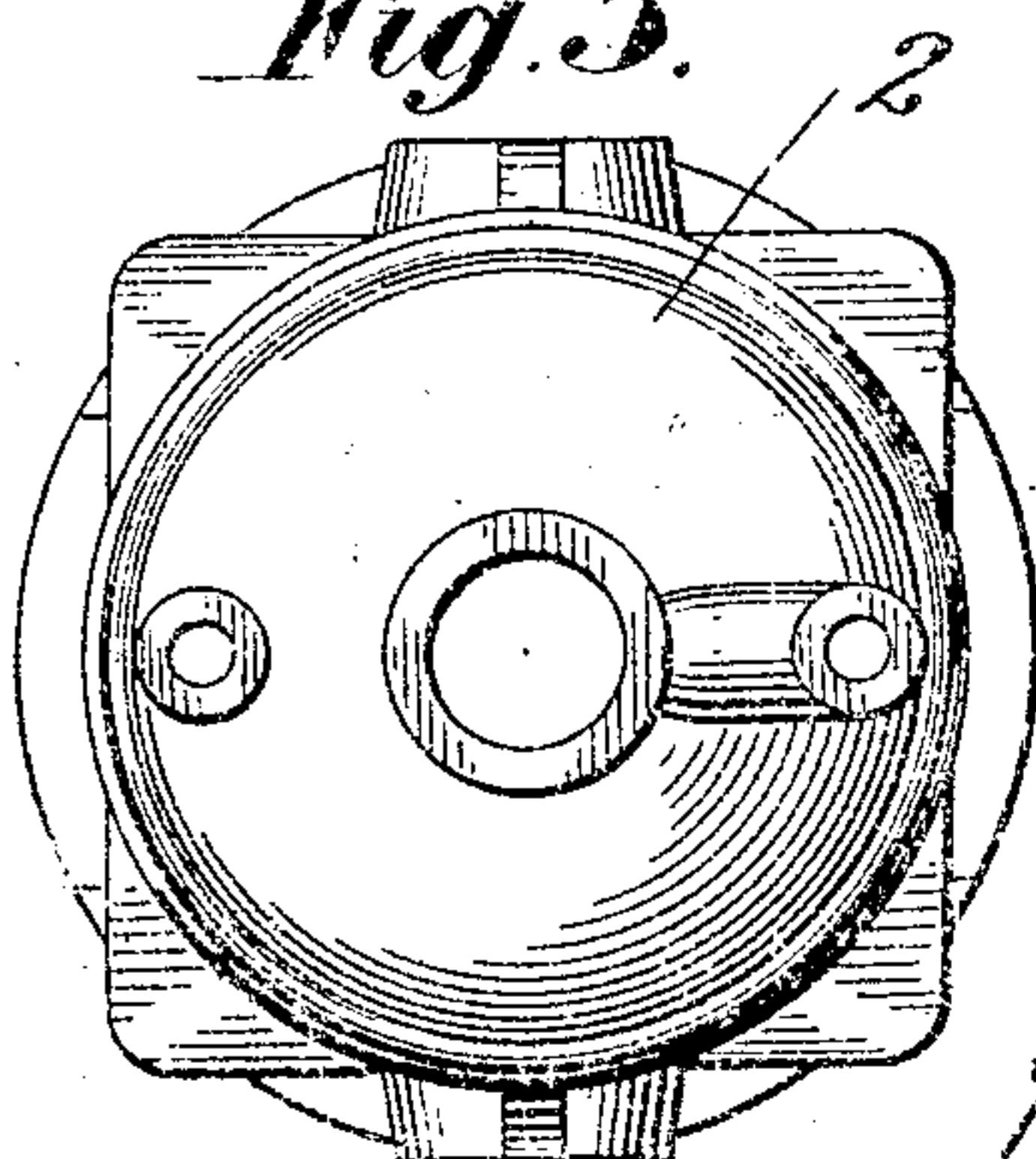
APPLICATION FILED JAN. 9, 1905.

4 SHEETS—SHEET 1.

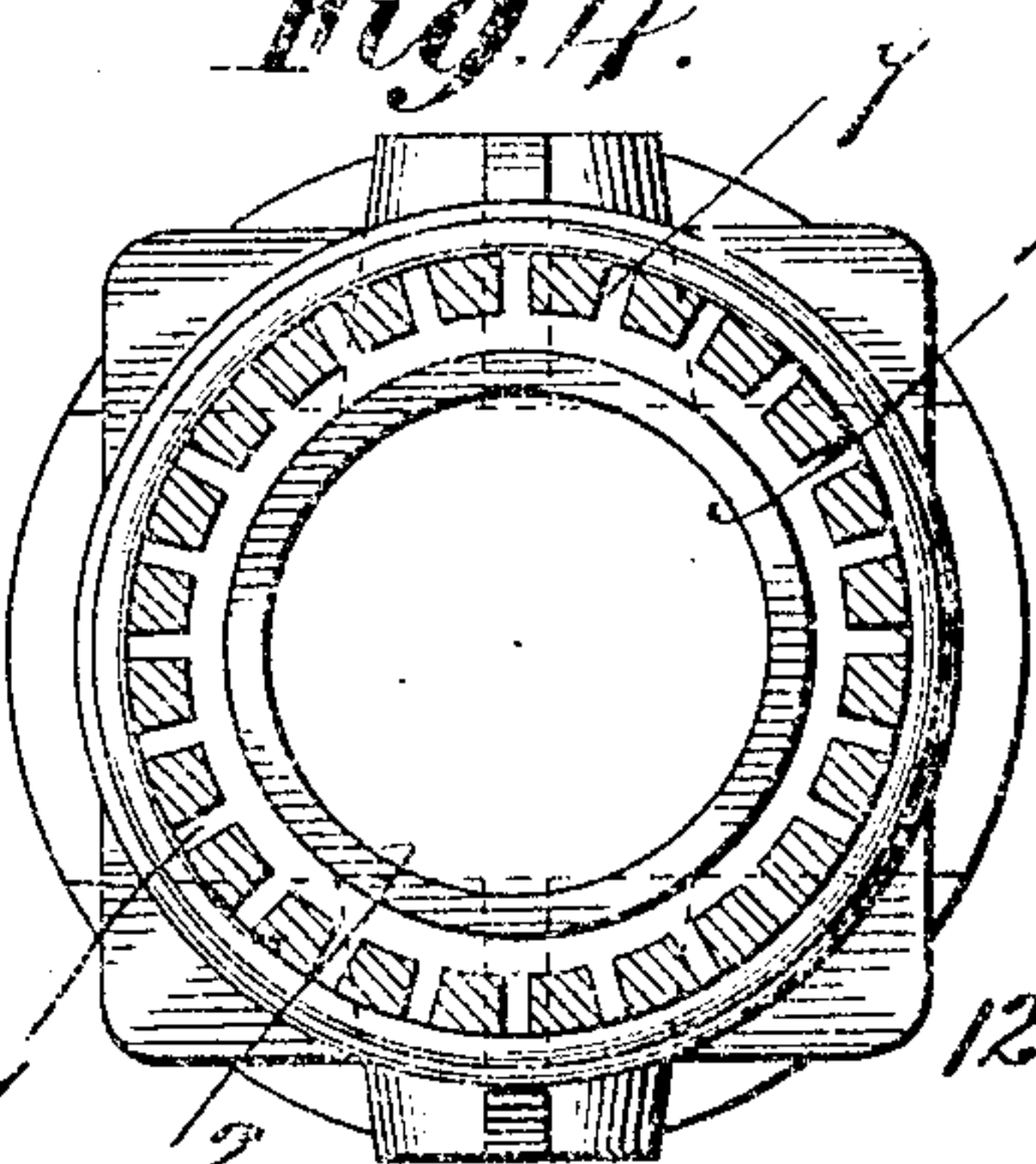
*Fig. 1.*



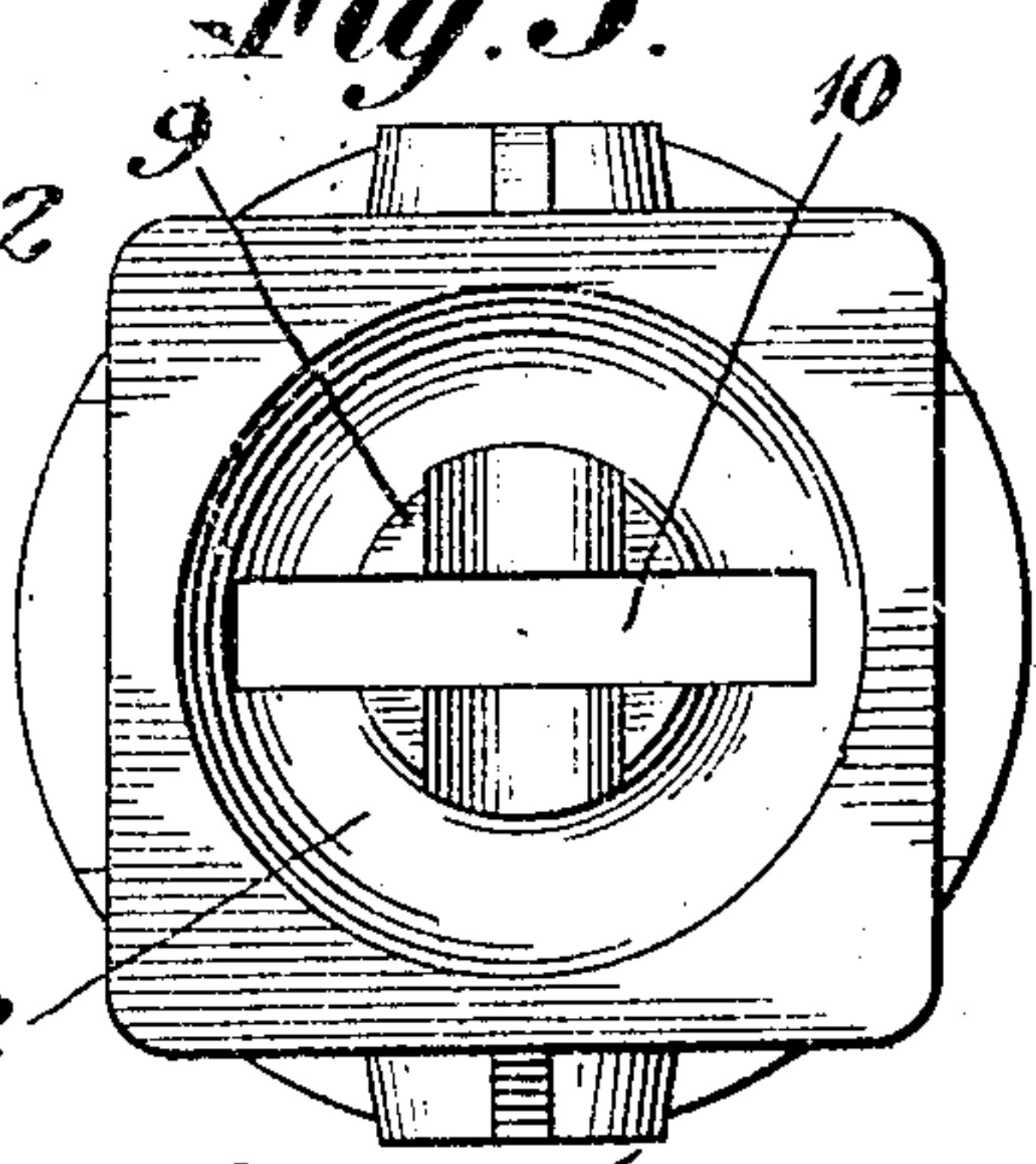
*Fig. 3.*



*Fig. 4.*



*Fig. 5.*



Witnesses:

*James A. Morris, Jr.*  
*C. D. Kesler*

Inventor

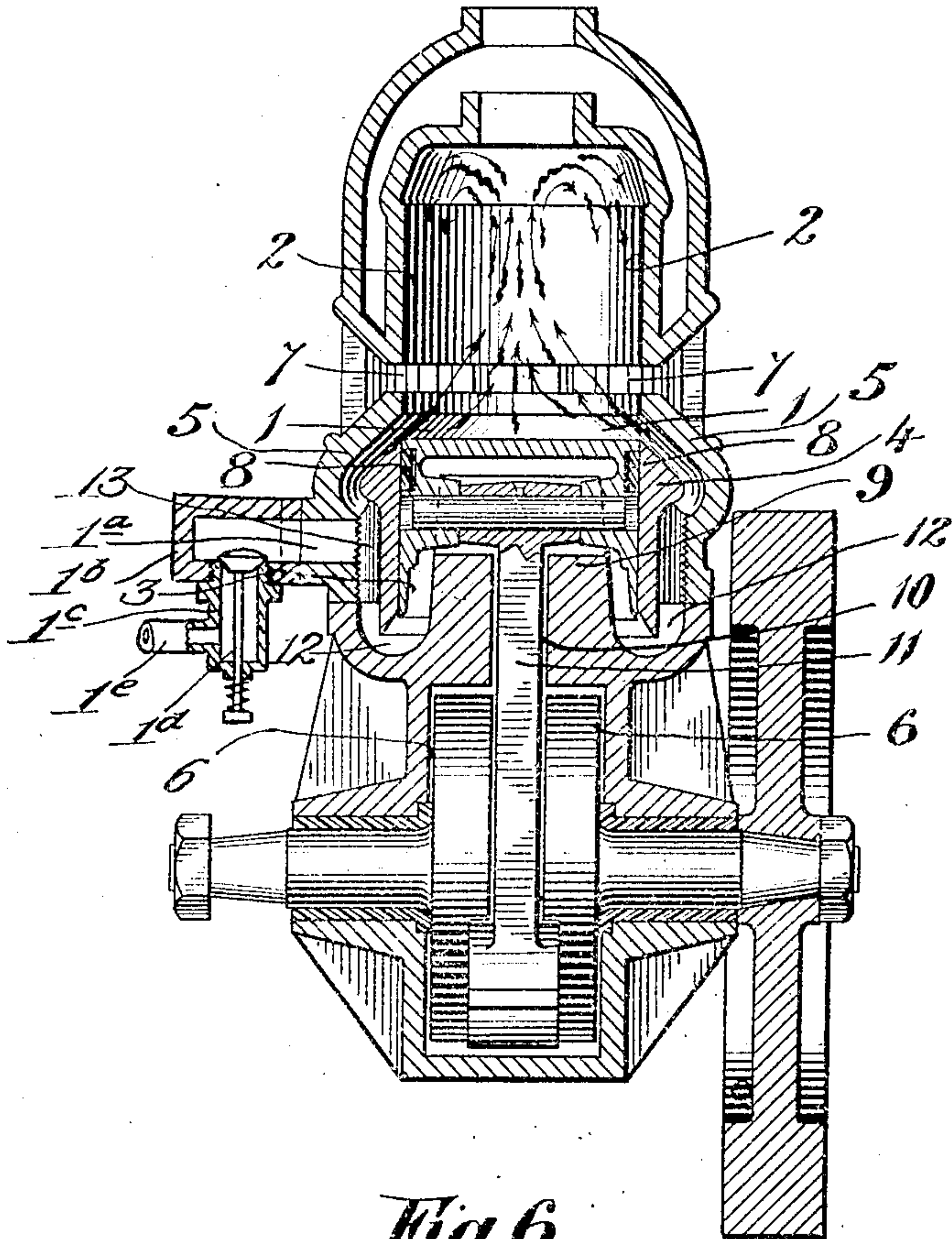
*Alfred G. Melhuish*  
*By James L. Norris*  
*Att'y*

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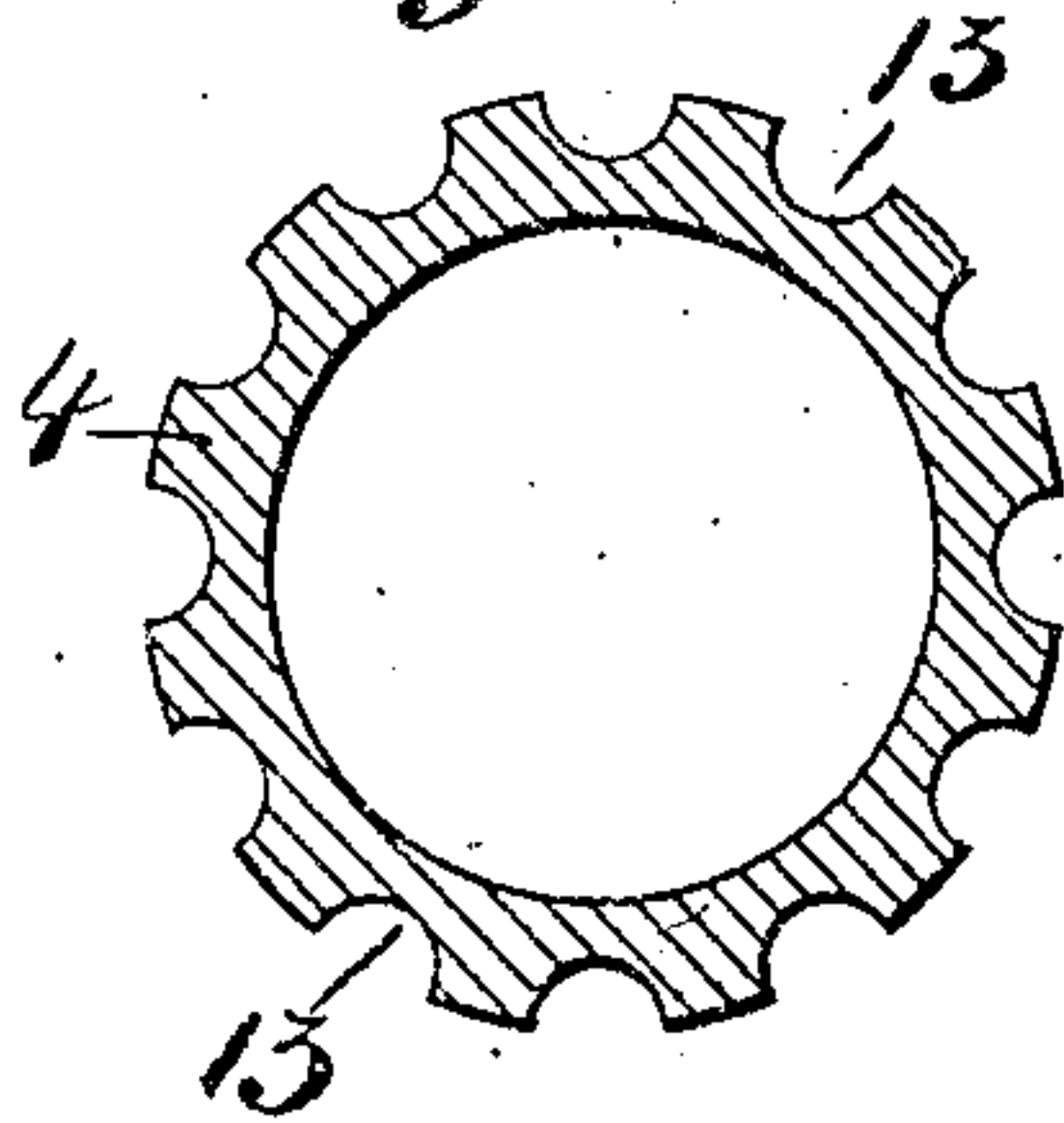
A. G. MELHUISH. PATENTED MAR. 17, 1908.  
INTERNAL COMBUSTION ENGINE.  
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4 SHEETS—SHEET 2.

*Fig. 2.*



*Fig. 6.*



*Witnesses:*

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*Atty*



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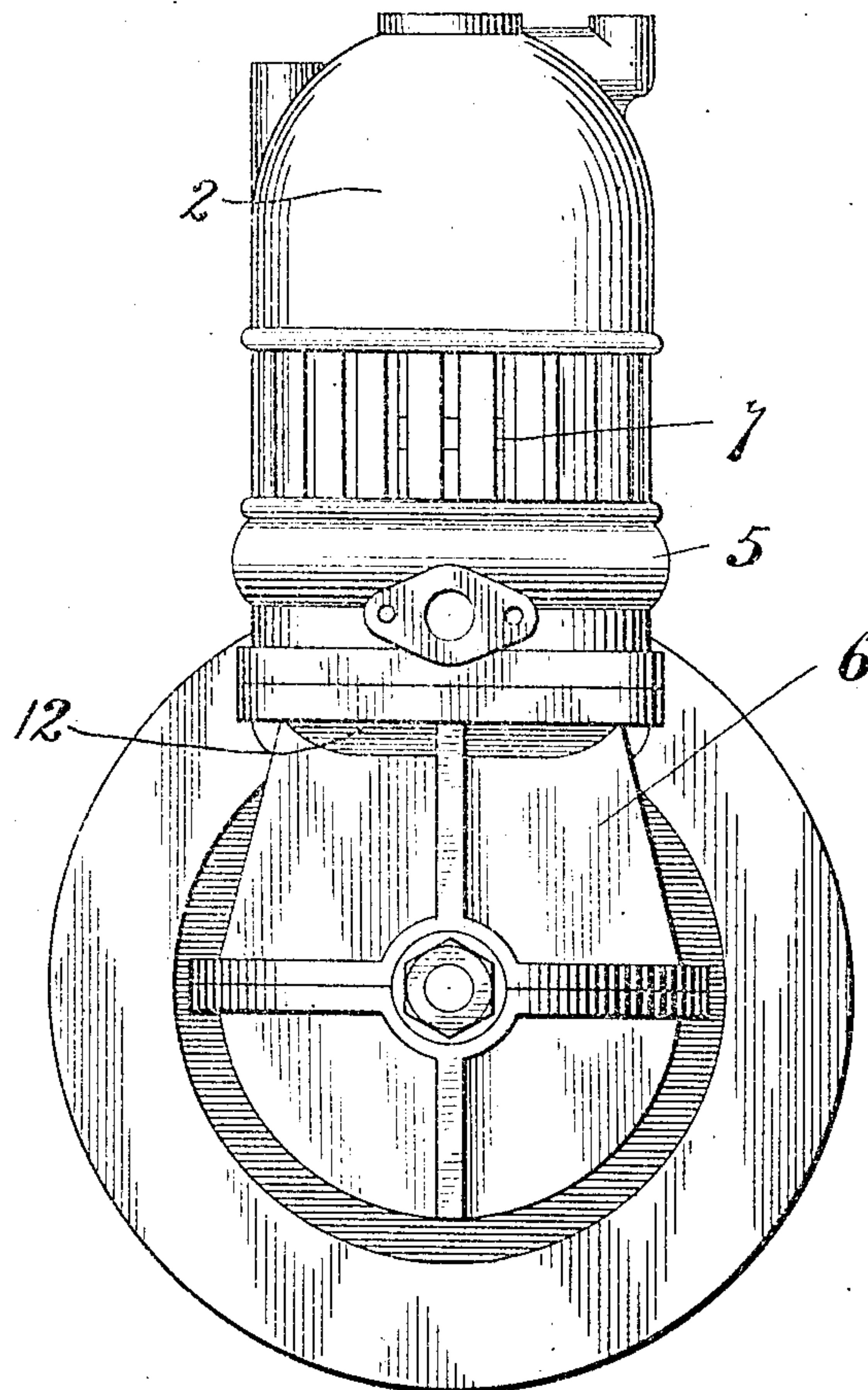
A. G. MELHUISH.  
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PATENTED MAR. 17, 1908.

APPLICATION FILED JAN. 9, 1905.

4 SHEETS—SHEET 3.

*Fig. 7.*



*Witnesses:*

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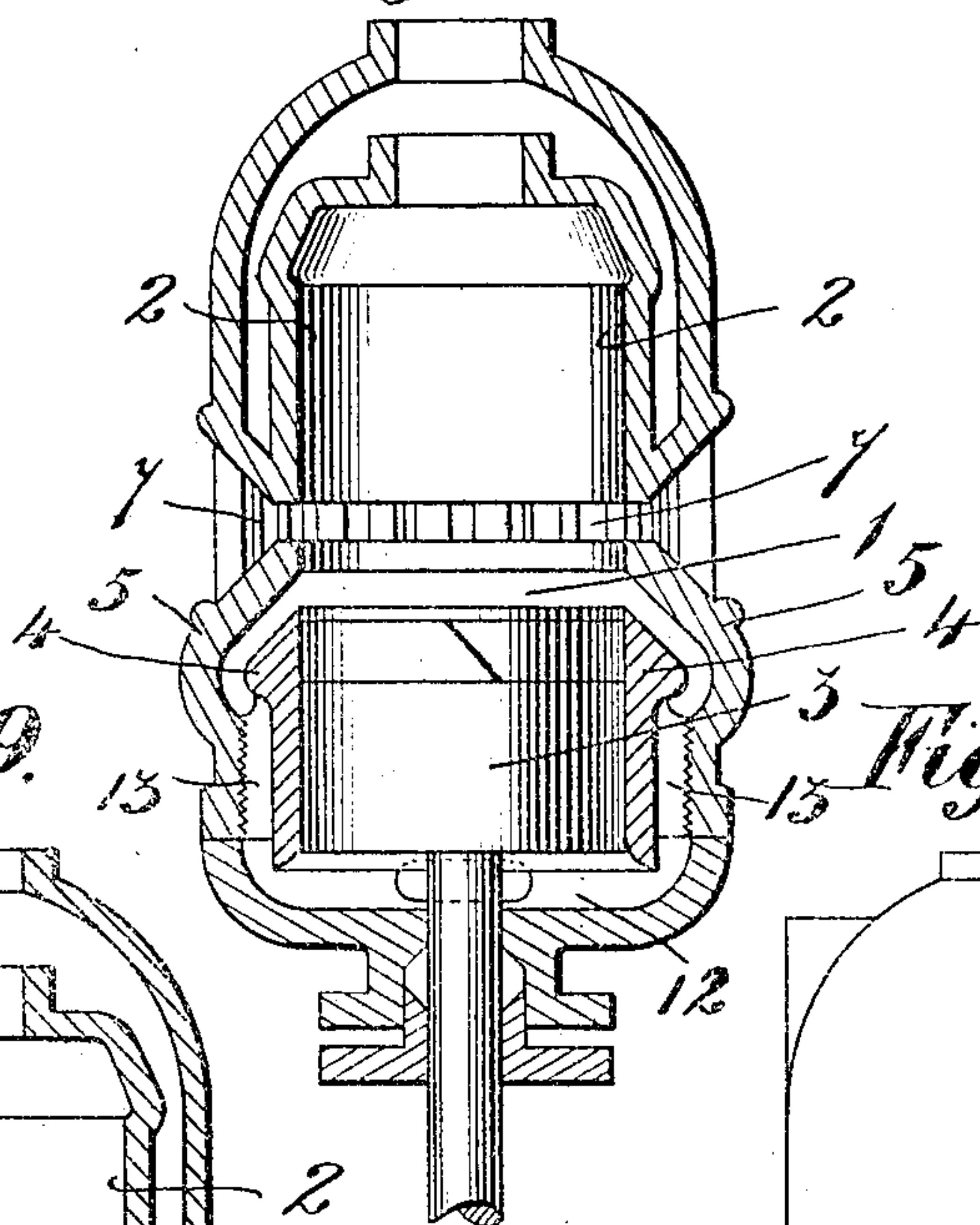
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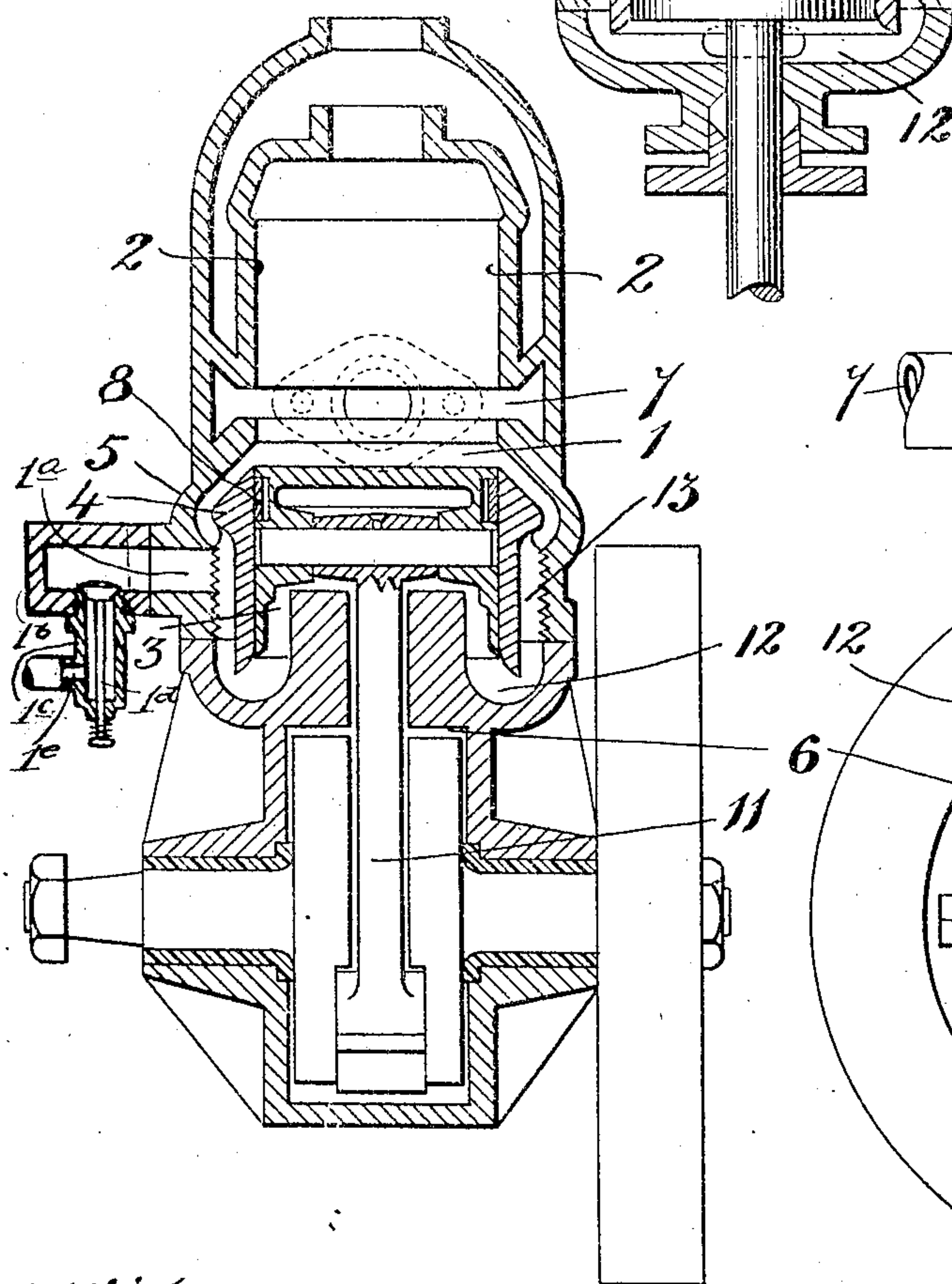
APPLICATION FILED JAN. 9, 1905.

4 SHEETS—SHEET 4.

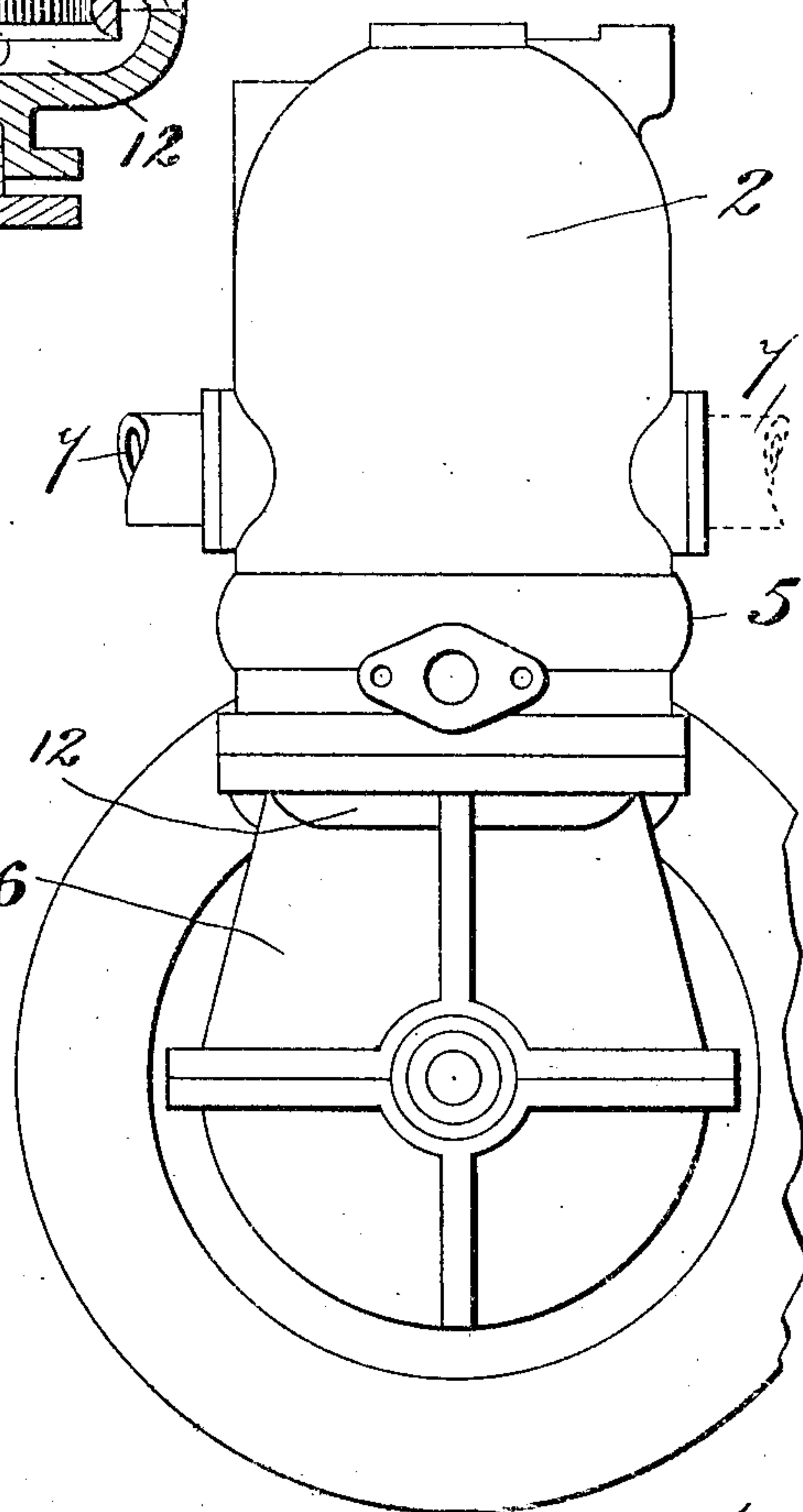
*Fig. 8.*



*Fig. 9.*



*Fig. 10.*



Witnesses:  
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C. D. Kessler

Inventor  
Alfred G. Melhuish  
By James L. Morris, Jr.  
Attor



# UNITED STATES PATENT OFFICE.

ALFRED GEORGE MELHUISH, OF EDMONTON, ENGLAND.

## INTERNAL-COMBUSTION ENGINE.

No. 882,401.

Specification of Letters Patent.

Patented March 17, 1908.

Application filed January 9, 1905. Serial No. 240,311.

*To all whom it may concern:*

Be it known that I, ALFRED GEORGE MELHUISH, subject of the King of Great Britain, residing at Gothic Works, Angel Road, Edmonton, Middlesex, England, have invented certain new and useful Improvements in or Relating to Internal-Combustion Engines, of which the following is a specification.

This invention relates to internal combustion engines, and aims to provide means in a manner as hereinafter set forth, for introducing the charge into the cylinder of that type of engine in which the charge of air or combustible mixture is first drawn into the crank chamber or behind the piston, and has for its object to do away with what has been hitherto a great objection, namely the battle plate for deflecting the incoming charge.

In describing the invention in detail reference is had to the accompanying drawings, which form a part of this specification and in which like reference characters denote corresponding parts throughout the several views, and in the drawings—

Figure 1 is a sectional elevation of an internal combustion engine in accordance with this invention. Fig. 2 is a like view at right angles to that shown in Fig. 1. Fig. 3 is a plan view. Fig. 4 is a section on line *a-a* of Fig. 1. Fig. 5 is a plan of the crank casing on line *b-b* of Fig. 1. Fig. 6 is a sectional detail. Fig. 7 is an elevation of the engine. Fig. 8 is a section of a cylinder of an engine having no crank chamber. Fig. 9 is a cross section of an engine with a modified form of exhaust opening, and, Fig. 10 is an elevation of the same.

Referring to the drawings by reference characters the cylinder comprises an upper or fixed section 2 and a lower or shiftable section 4, and, surrounding the section 4 is a jacket 5, which terminates at its upper end in the lower end of the fixed section 2 of the cylinder and between the jacket 5 and shiftable section 4 of the cylinder a passage 1 is formed, which opens into the cylinder at a point at the extreme out stroke of the piston 3, and which furthermore leads to the crank chamber 6, as shown in Fig. 1, or behind the piston 3, as shown in Fig. 8.

Communicating with the passage 1 is a port 1<sup>a</sup> which opens into the hollow extension 1<sup>b</sup> in the bottom of which is fixed an annular member 1<sup>c</sup>, the upper end of said member constituting a valve seat for the check

valve 1<sup>d</sup>. Communicating with the member 1<sup>c</sup> is an inlet pipe 1<sup>e</sup>.

The upper portion of the jacket 5 is substantially conical in cross section and the upper portion of the shiftable section 4 conforms in contour to the upper portion of the jacket 5, so that the upper portion of the passage 1 will be directed inwardly and communicates with the interior of the cylinder and at an inclination, the angle being such that the incoming charge enters directly into the cylinder in a conical stream, and, meeting in the center of the section 2, arises as a central column and impinges against the cylinder head, then returns in an umbrella-like fashion, as indicated by the arrows and entirely sweeps out the products of combustion remaining in the section 2 that have not previously escaped at the exhaust.

The exhaust is indicated by the reference character 7 and is formed in the section 2 of the cylinder in close proximity to the point of connection between the jacket 5 and the section 2 and opens at a wide outward angle directly to the air, as shown in Fig. 1, or such angle opening may form a chamber leading to the exhaust, as shown in Fig. 9.

The piston rings 8 are wider than the slots 1 and 7 and the crank chamber 6 is formed with a solid piece 9, which stands centrally and occupies such a position that when the piston 3 is at the lowermost point of its stroke the center of the piston 3 is nearly filled up, as is illustrated in Figs. 1 and 2, practically the only space left being that of a slot 10, in the solid piece 9, in which the connecting rod 11 oscillates, and by thus filling up the space the cubical capacity of the crank chamber 6 is considerably decreased, whereby the compression in the same is consequently increased.

The air, or portion of the same to assist in forming the combustible charge is drawn in through the air passages 12, which are cup-shaped in such a manner as to prevent any oil splash and mixing with the combustible charge, and such air passages 12 are adapted to communicate with the passage 1.

The periphery of the shiftable section 4 of the cylinder is provided with ribs 13, which are screw-threaded and engage with screw threads formed on the inner face of the jacket 5. By such an arrangement the section 4 of the cylinder is connected to the jacket 5 and it also permits of the said sec-



tion 4 being shifted or adjusted so as to increase or decrease the width of the slot 1 at the top thereof so that the desired amount of combustible mixture or the desired pressure, therefor when entering the cylinder can be had.

What I claim is—

1. An internal combustion engine having a cylinder formed of a fixed and a shiftable section, a jacket surrounding said shiftable section and terminating at one end in said fixed section, said jacket and said shiftable section forming a passage for the supply of the combustible mixture, and means carried by the shiftable section and engaging the jacket for adjustably connecting the shiftable section to the jacket so that the width of the said passage can be increased or decreased.

2. An internal combustion engine having a cylinder formed of a fixed and a shiftable section, a jacket surrounding said shiftable section and terminating at one end in said fixed section, said jacket and said shiftable section forming a passage for the supply of the combustible mixture, said jacket having its inner face provided with screw threads, and screw-threaded ribs carried by the shiftable section and engaging the screw threads of the jacket for adjustably connecting the shiftable section to the jacket, thereby permitting the increasing and decreasing of the width of said passage.

3. An internal combustion engine comprising a cylinder formed of a fixed and a shiftable section, a jacket surrounding said shiftable section and having its upper portion extending towards and connected to said fixed section, the upper portion of said jacket being substantially conical in cross section, said shiftable section of the cylinder having its upper portion corresponding in

contour to the shape of the upper portion of said jacket, said jacket and said shiftable section forming a supply passage for the combustible charge, and means for adjustably connecting the shiftable section to the jacket for increasing and decreasing the width of the passage.

4. An internal combustion engine comprising a cylinder formed of a fixed and a shiftable section, a jacket surrounding said shiftable section and having its upper portion extending towards and connected to said fixed section, the upper portion of said jacket being substantially conical in cross section, said shiftable section of the cylinder having its upper portion corresponding in contour to the shape of the upper portion of said jacket, said jacket and said shiftable section forming a supply passage for the combustible charge, and means carried by the shiftable section and engaging the jacket for adjustably connecting the shiftable section and jacket together, thereby permitting the increasing and decreasing of the width of said passage.

5. An internal combustion engine having a cylinder formed of a fixed and a shiftable section, a jacket surrounding said shiftable section and terminating at one end in said fixed section, said jacket and said shiftable section forming a passage for the supply of the combustible mixture, and means for adjustably connecting the shiftable section to the jacket thereby permitting the increasing and decreasing of the width of the passage.

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

ALFRED GEORGE MELHUISH.

Witnesses:

PERCY E. MATTOCKS,  
HUGH HUGHES.