

J. T. RAMSEY.  
 INTERNAL COMBUSTION ENGINE.  
 APPLICATION FILED MAR. 22, 1921.

1,429,164.

Patented Sept. 12, 1922.

FIG. 1.

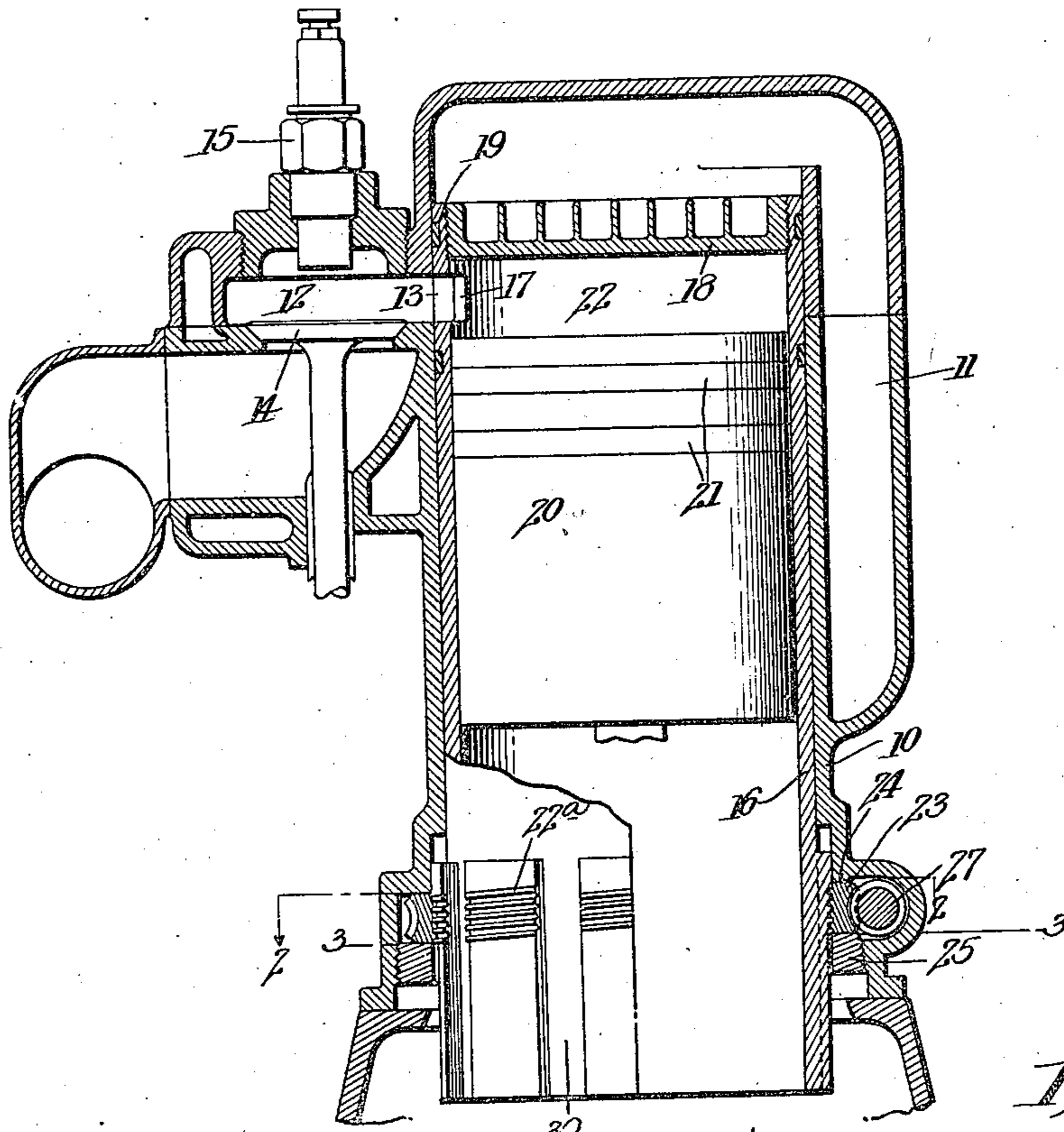


FIG. 2.

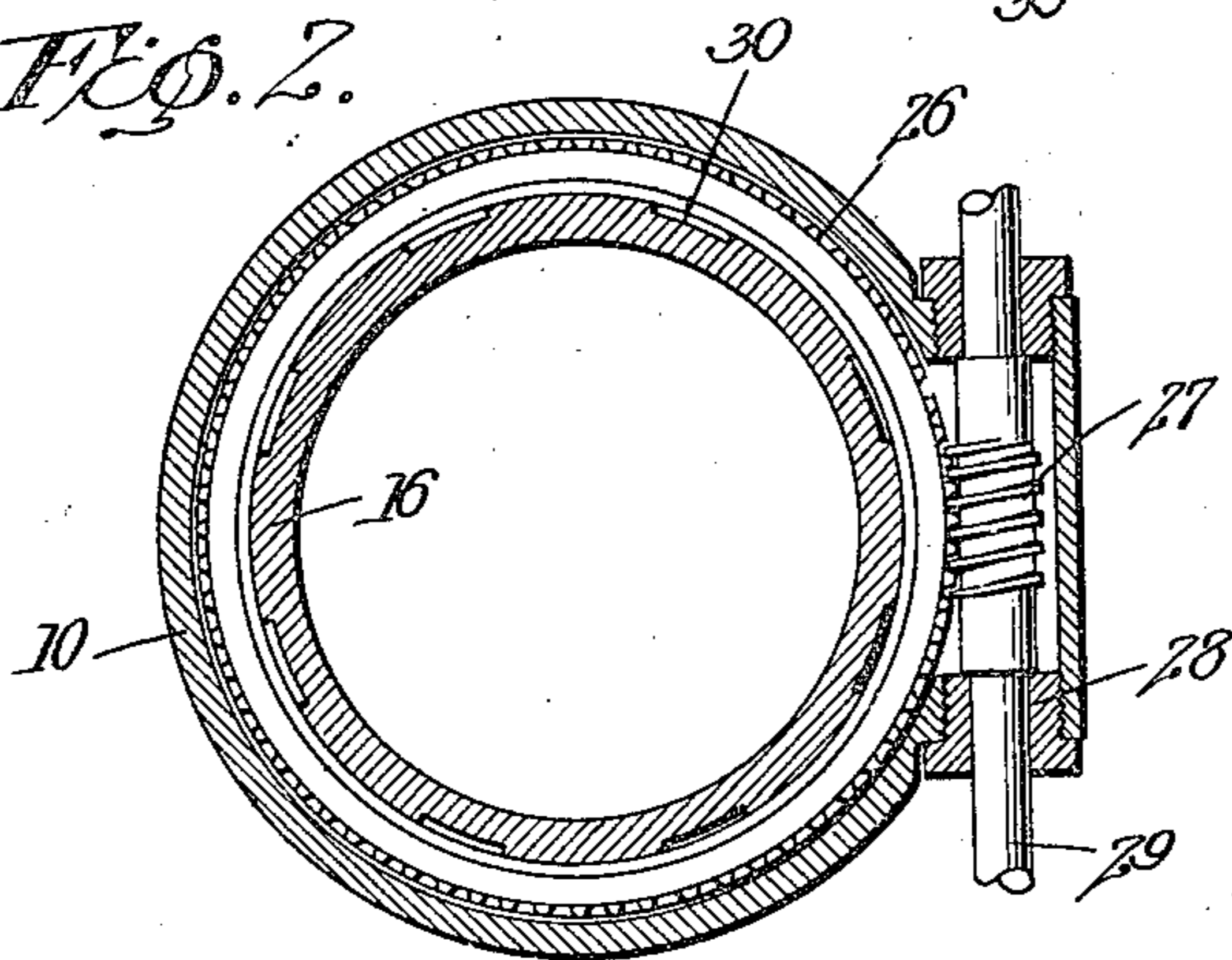
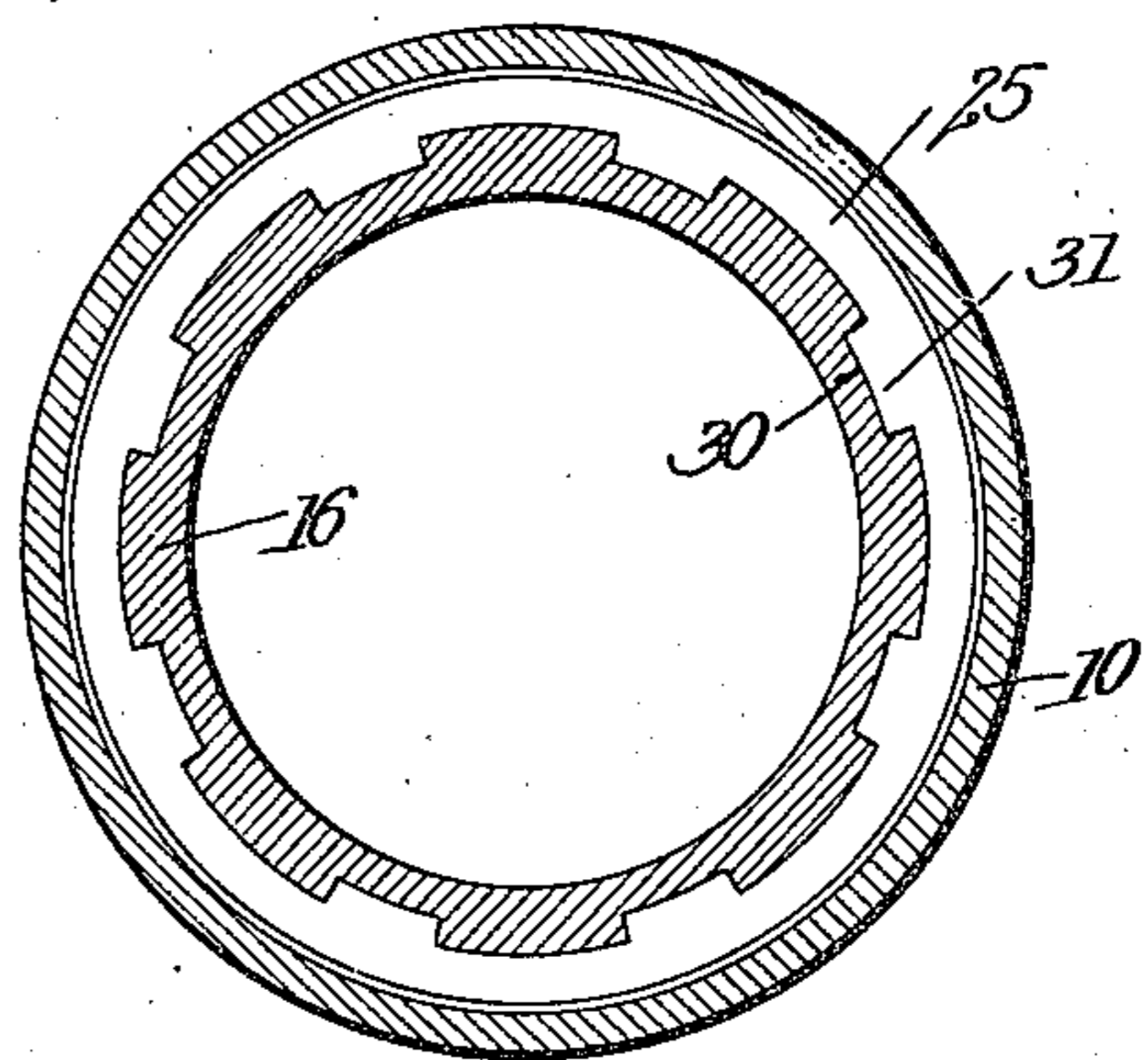


FIG. 3.



*G. H. Baker*

WITNESS:

John T. Ramsey,  
 INVENTOR

BY *Victor J. Evans*  
 ATTORNEY

ATTORNEY

Patented Sept. 12, 1922.

1,429,164

# UNITED STATES PATENT OFFICE.

JOHN T. RAMSEY, OF ROANOKE, VIRGINIA.

## INTERNAL-COMBUSTION ENGINE.

Application filed March 22, 1921. Serial No. 454,477.

*To all whom it may concern:*

Be it known that I, JOHN T. RAMSEY, a citizen of the United States, residing at Roanoke, in the county of Roanoke and State of Virginia, have invented new and useful Improvements in Internal-Combustion Engines, of which the following is a specification.

This invention relates to internal combustion engines and has for an object the provision of means for adjusting the size of the compression chamber, or compression space within the engine cylinder so as to regulate its size in accordance with the amount of fuel fed to the engine and work performed.

In the operation of internal combustion engines, when the load is increased, as in an automobile ascending a grade, in order to supply increased power, the fuel supply is increased. This increased amount of fuel results in increased compression of the gases where the size of the compression space is not increased and when this increased compression reaches a certain point, preignition occurs. When the engine operates under these conditions, loss of power and an objectionable "knocking" of the engine occurs. By the provision of means for regulating the size of the compression chamber, the latter may be adjusted to correspond to the amount of fuel supplied, so that a maximum percentage of power may be obtained from each charge of fuel.

Another object of the invention is the provision of means for accomplishing the above, which is exceedingly simple in construction and operation and which will not interfere with the further control of the engine through the use of the usual spark control, or throttle.

With the above and other objects in view, the invention further includes the following novel features and details of construction, to be hereinafter more fully described, illustrated in the accompanying drawings and pointed out in the appended claims.

In the drawings:—

Figure 1 is a sectional view through an engine cylinder illustrating one form of the invention.

Figure 2 is a transverse section on the line 2—2 of Figure 1.

Figure 3 is a similar view on the line 3—3 of Figure 1.

Referring to the drawings in detail,

wherein like characters of reference denote corresponding parts, the reference character 10 indicates the cylinder of an internal combustion engine which may be of the usual or any preferred construction and which is equipped with a water jacket 11, by means of which the engine is cooled in the usual well known manner.

In the type of engine illustrated, there is provided a valve pocket 12 which is located at one side of the engine cylinder and communicates with the latter through a port or ports 13, only one of said ports being shown, which may be either the intake or exhaust port or both. This port is controlled by a valve 14 operated in any preferred manner and the charge is fired by means of an ignition device 15 which extends within the valve pocket 12.

Located within the cylinder 10 is a sleeve 16, the latter communicating with the valve pocket 12 through a port or ports 17, communication being established through the port or ports 13 as will be readily understood. The sleeve 16 carries a cylinder head 18, over which the water of the cooling system circulates, as will be apparent from Figure 1 of the drawings. The sleeve 16 is movable longitudinally within the cylinder 10 and packing rings or other suitable packing 19 is arranged upon opposite sides of the ports 13 and 17 to prevent leakage.

Operating within the sleeve 16 is a piston 20 which is connected in the usual or any preferred manner with the engine crank shaft (not shown). The piston 20 is also surrounded by packing rings 21. The space between the inner end of the piston and the cylinder head 18 thus forms a compression chamber 22, within which the charge is compressed and the purpose of moving the sleeve 16 longitudinally within the cylinder 10 is to increase or decrease the space between the head 18 and the adjacent end of the piston when the latter reaches the limit of its inward stroke and thus regulate the size of the compression chamber in accordance with the amount of fuel fed to the engine, so that a maximum of power from a given amount of fuel is obtained. For this purpose the lower end of the sleeve is surrounded with a number of high pitch threads 22<sup>a</sup> which are engaged by a threaded ring 23. This ring is swiveled within the cylinder 10 between a shoulder or abutment 24 and a removable ring 25, the latter

having a threaded engagement with the cylinder 10 as shown. The ring 23 is provided upon its outer periphery with teeth 26, which are engaged by a worm 27. This worm is mounted in suitable bearings 28 and its shaft 29 extends beyond the bearings for connection with any suitable operating means.

In order to prevent the sleeve from rotating when the ring 23 is rotated, the said sleeve is provided with a plurality of longitudinally extending grooves 30 which intersect the threads 22 and which receive splines or projections 31 which extend inwardly from the ring 25. The sleeve is thus permitted longitudinal movement but is held against rotation.

When it is desired to increase or decrease the size of the compression chamber 22 the worm 27 is rotated to rotate the ring 23 and as the sleeve is held against rotary movement, it will be moved longitudinally so as to move the head 18 toward or away from the adjacent end of the piston 20 as desired. The size of the port 17 is such that it is always in communication with the port 13; while the engagement of the worm 27 with the gear teeth 26 will prevent any tendency of the sleeve to move under the force of the explosion.

The invention is susceptible of various changes in its form, proportions and minor details of construction and the right is

herein reserved to make such changes as properly fall within the scope of the appended claims.

Having described the invention what is claimed is:—

1. In an internal combustion engine, a sleeve located within the engine cylinder and having a head in one end, a piston operating within the sleeve and means including a ring swiveled within the engine cylinder and engageable with the sleeve for adjusting the said sleeve within the engine cylinder to regulate the distance of the head from the adjacent end of the piston and a combined ring retainer and sleeve guide for holding the sleeve against rotation.

2. In an internal combustion engine, a sleeve located within the engine cylinder and having a head in one end, a piston operating within the sleeve, means including a ring swiveled within the engine cylinder and engageable with the sleeve for adjusting the latter within the engine cylinder to regulate the distance of the head from the adjacent end of the piston, a retaining ring located within the cylinder for holding the swiveled ring in position and keys carried by the retaining ring and slidable in grooves formed longitudinally of the sleeve for preventing rotation of the latter.

In testimony whereof I affix my signature.

JOHN T. RAMSEY.