

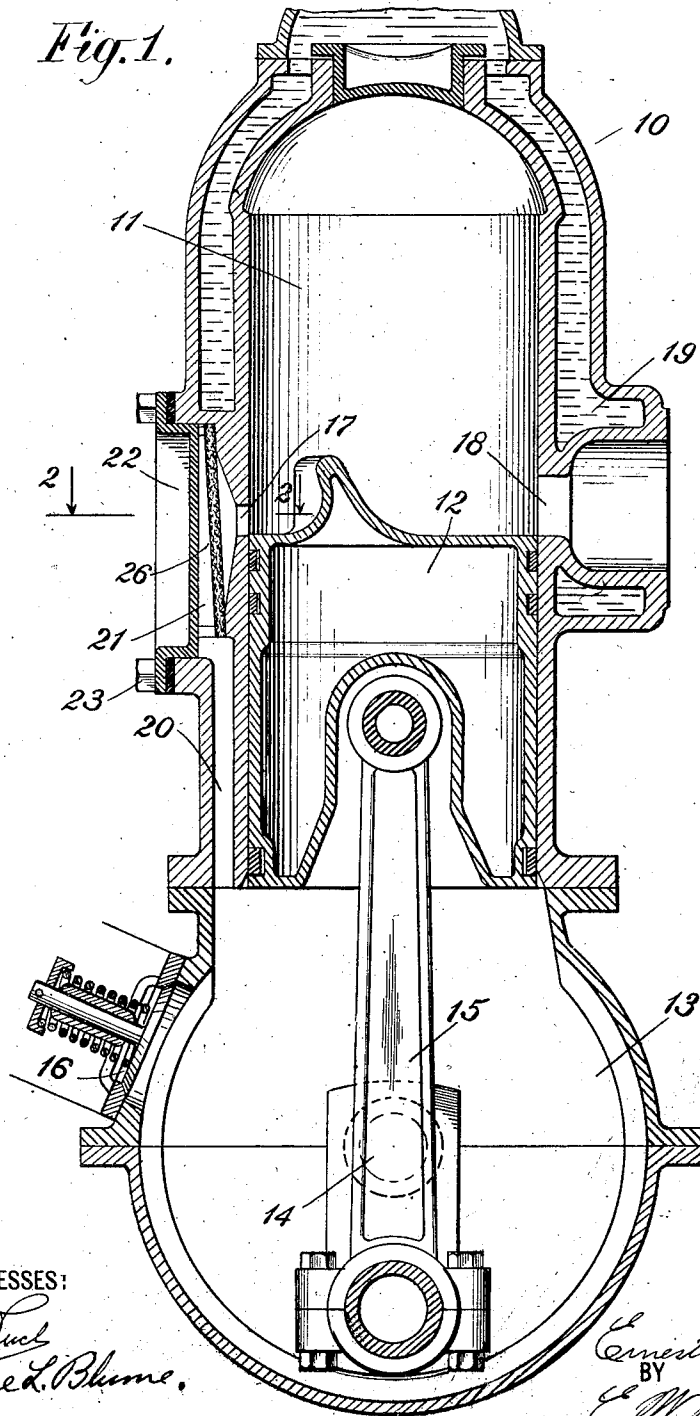
E. T. GILLIARD.  
INTERNAL COMBUSTION ENGINE.  
APPLICATION FILED MAR. 12, 1909.

955,151.

Patented Apr. 19, 1910.

2 SHEETS—SHEET 1.

*Fig. 1.*



WITNESSES:

*Edw. L. Lusk*  
*George L. Blume.*

INVENTOR

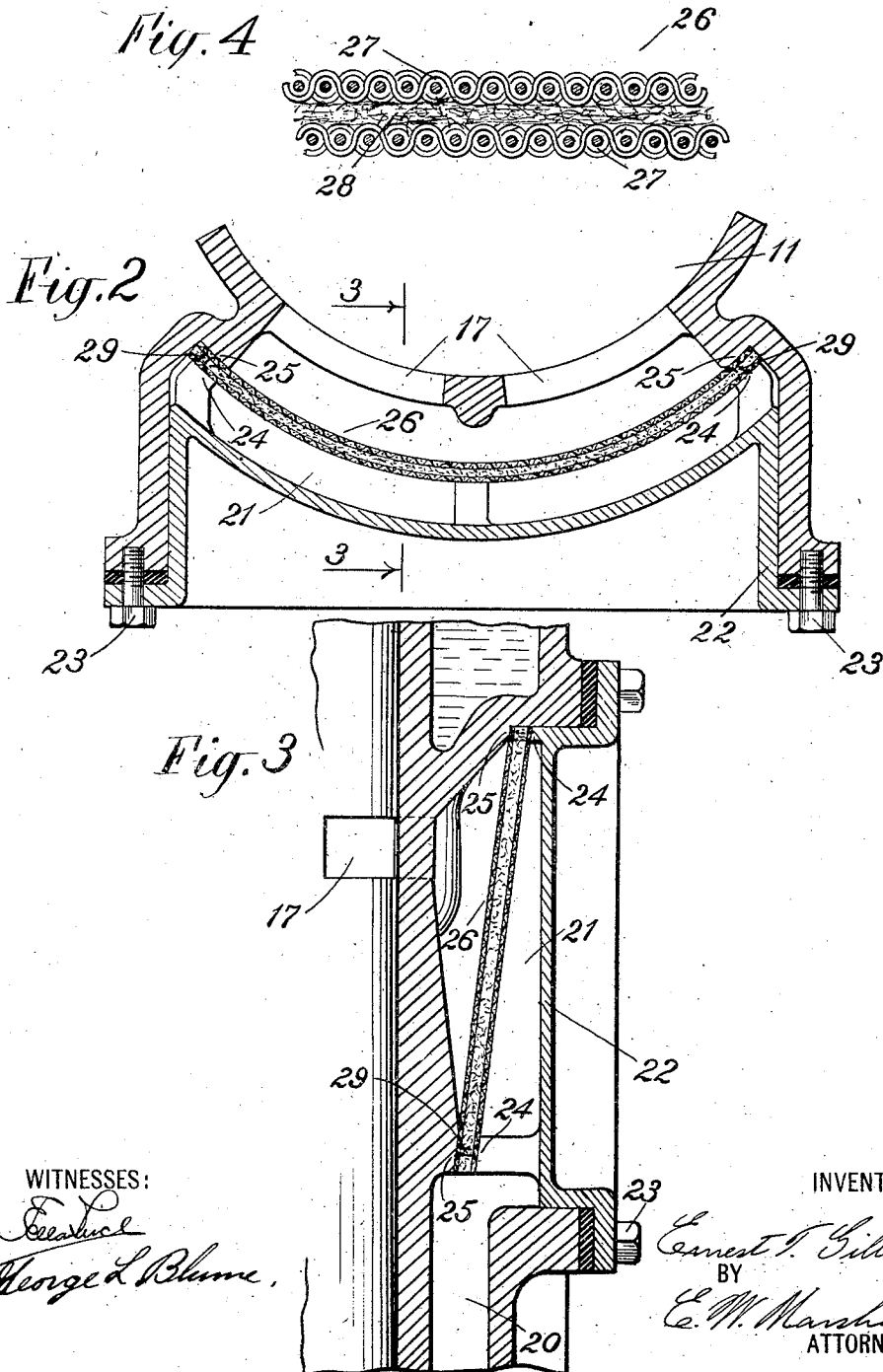
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# UNITED STATES PATENT OFFICE.

ERNEST T. GILLIARD, OF NEW YORK, N. Y., ASSIGNOR TO THOMAS C. O'CONNOR, OF  
NEW YORK, N. Y.

## INTERNAL-COMBUSTION ENGINE.

955,151.

Specification of Letters Patent. **Patented Apr. 19, 1910.**

Application filed March 12, 1909. Serial No. 483,055.

*To all whom it may concern:*

Be it known that I, ERNEST T. GILLIARD, a citizen of the Republic of Switzerland, and a resident of the city of New York, in the county of New York and State of New York, United States of America, have invented certain new and useful Improvements in Internal-Combustion Engines, of which the following is a specification.

My invention relates to internal combustion engines, and especially to those of the two-stroke cycle type. Its object is to improve upon engines of this kind, and to make their operation more certain and reliable.

I will describe my invention in the following specification and point out the novel features thereof in the appended claims.

Referring to the drawings, Figure 1 is a sectional end elevation of a so-called two-cycle engine with my invention applied thereto. Fig. 2 is a sectional plan view, on an enlarged scale, of a part of this engine, the section in this figure being taken on the line 2—2 of Fig. 1. Fig. 3 is a sectional end elevation, on the same scale, of that portion of the engine which is shown in Fig. 2, this section being taken on the line 3—3 of Fig. 2. Fig. 4 is a magnified cross-section of a portion of a screen of special construction which I use in carrying out my invention.

Like characters of reference designate corresponding parts in all of the figures.

10 designates an internal combustion engine which may be of any of the well-known constructions. I have shown it as an ordinary two-port two-cycle engine, the casing of which forms a working cylinder 11, within which is a reciprocating piston 12. 13 is the compression chamber in the base of this casing, and 14 is the crank-shaft within the compression chamber. The crank-shaft is connected with the piston in the usual manner by means of a connecting rod 15.

16 designates a check-valve through which explosive fluid mixture is admitted to the compression chamber during certain parts of the operation of the engine.

17 designates the inlet port or ports of the cylinder 11, and 18 the exhaust port. The exhaust as well as the upper portion of the cylinder 11 may be surrounded by a water-jacket 19, if desired.

A communicating passage 20 is provided between the compression chamber 13 and the

inlet port or ports 17. It is the usual practice to form this passage in the casing as is shown in the drawings. In this case, however, I provide a partially annular auxiliary chamber 21, conforming to the shape of the cylinder 11, opposite the port or ports 17 and at the upper end of the passage 20.

22 is a removable cover-plate which forms the rear wall of the auxiliary chamber. The inner face of this plate is preferably concentric with the wall of the cylinder 11. This plate is affixed to the casing by bolts, 23. The inner portion of the plate is constructed to form shoulders 24 between which and corresponding shoulders 25 of the cylinder casing, is supported a screen 26 which conforms to the cylindrical shape of the auxiliary chamber, and is placed diagonally across this chamber so that it divides it into two compartments.

The screen itself is preferably constructed in some such way as that illustrated in Fig. 4, in which 27 designates two layers of woven wire placed parallel with each other a desired distance apart, and with a filler 28 in the space between them of steel shavings or other desired noninflammable material. The woven layers may be riveted or tied together along their edges as is indicated at 29. It is obvious that this screen will be securely held in desired position by the cover-plate 22, and that when the latter is removed the screen may be readily inspected, and, if desired, may be removed and cleaned.

In order to describe the operation and use of this invention it is not necessary to describe the well-known cycle of operations of the engine, except to point out the fact that the explosive mixture under pressure in the compression chamber 13 is carried up through passage 20, auxiliary chamber 21, and through the screen 26 to the inlet ports 17, and through the latter to the cylinder 11. In passing through the screen the mixture is strained so that no excess of oil or other foreign matter can enter the cylinder. During another part of the operation of the engine, port or ports 17 are opened by the descent of piston 12, after the ignition of mixture in the working cylinder. From various causes, this opening of a path of communication between the cylinder 11 and the compression chamber 13 at this period of the engine's cycle, frequently causes ignition of the explosive mixture in the base,

and this often results in serious trouble. These base explosions are generally caused by sparks from the cylinder flying into the passage 20. The screen 26 which I have provided stops any sparks or hot gases from entering this passage from the working cylinder, and effectively prevents this trouble. It is to be noted that the concentric shape of the auxiliary chamber 21 and of the screen gives sufficient area to amply provide for the passage of gases into the cylinder, so that this arrangement does not interfere with the rapidity of action of the engine nor decrease its efficiency. On the other hand, the reliability and consequent effectiveness of the engine are enhanced. The fact that the chamber and its cover-plate and screen follow the contour of the engine cylinder provides the required room for these parts without detracting from the appearance of the engine.

It is obvious that this invention may be applied to other types of engines than that herein shown, and I do not, of course, wish to limit myself in this respect.

What I claim is:—

1. In an internal combustion engine, a casing forming a cylinder, an inlet-port and a gas passage, said casing also forming an enlarged chamber intermediate said port and passage and concentric with the cylinder; and a screen conforming to the cylindrical shape of the chamber and dividing said chamber into two compartments, one of which is in communication with the port and the other with the gas passage.

2. In an internal combustion engine, a casing forming a cylinder, an inlet port and a gas passage, said casing also forming an enlarged chamber intermediate said port and passage and concentric with the cylinder; a screen conforming to the cylindrical shape of the chamber and dividing said chamber into two compartments, one of which is in communication with the port and the other with the gas passage, and a removable cover-plate forming one side of said chamber and arranged to hold the screen in place.

3. In an internal combustion engine, a casing forming a compression chamber, a working cylinder, and an intermediate auxiliary chamber concentric with the cylinder; a screen conforming to the cylindrical shape of the auxiliary chamber and dividing said chamber into two compartments, and means of communication between the compression chamber and the working cylinder through said auxiliary chamber and screen.

4. In an internal combustion engine, a casing forming a compression chamber, a working cylinder, and an intermediate auxiliary chamber concentric with and partly surrounding said cylinder; a screen con-

forming to the cylindrical shape of the auxiliary chamber dividing said chamber into two compartments, a connection between the compression chamber and one of said compartments, and a connection between the working cylinder and the other of said compartments.

5. In an internal combustion engine, a casing forming a compression chamber, a working cylinder, and an intermediate auxiliary chamber concentric with and partly surrounding said cylinder; a screen conforming to the cylindrical shape of the auxiliary chamber dividing said chamber into two compartments, a removable cover-plate forming one side of said chamber and arranged to hold said screen in place, a connection between the compression chamber and one of said compartments, and a connection between the working cylinder and the other of said compartments.

6. In an internal combustion engine, a casing forming a compression chamber, a working cylinder, and an intermediate auxiliary chamber concentric with and partly surrounding said cylinder; a screen conforming to the cylindrical shape of the auxiliary chamber, said screen being set obliquely across said chamber and arranged to divide said chamber into two compartments, a connection between the compression chamber and one of said compartments, and a connection between the working cylinder and the other of said compartments.

7. In a two-stroke-cycle internal combustion engine, a casing forming a compression chamber, a working cylinder, and an intermediate auxiliary chamber concentric with and partly surrounding said cylinder; a screen conforming to the cylindrical shape of the auxiliary chamber, said screen comprising two layers of woven wire and a filler between said layers, means for fastening said layers together and thereby holding the filler; a removable cover-plate forming one side of the auxiliary chamber, shoulders on said casing and on said cover-plate for holding the screen obliquely across the auxiliary chamber to divide said chamber into two compartments, a connection between the compression chamber and one of said compartments, and a connection between the working cylinder and the other of said compartments, both of said connections having an area less than that of the screen.

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

ERNEST T. GILLIARD.

Witnesses:

FRANCIS B. WOOD,  
ELLA TUCH.