No. 894,978. PATENTED AUG. 4, 1908.

J. C. PEACHE.

INTERNAL COMBUSTION ENGINE.

APPLICATION FILED JAN. 2, 1908.

Fig. 1.

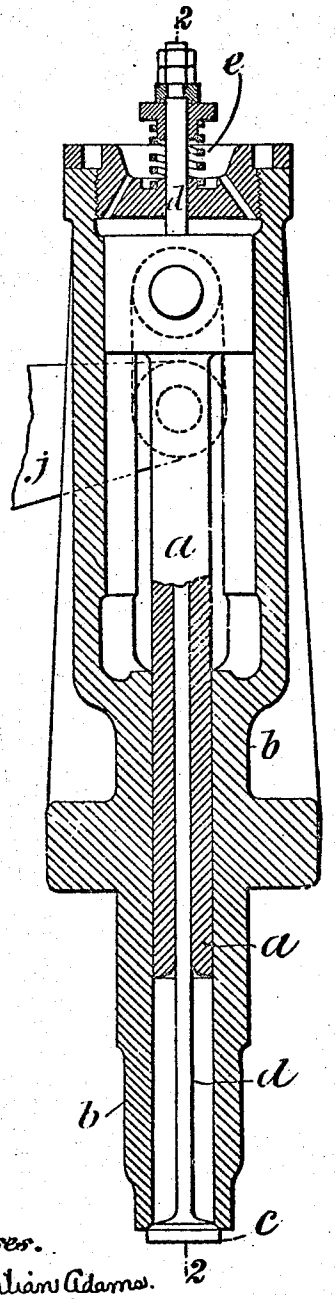
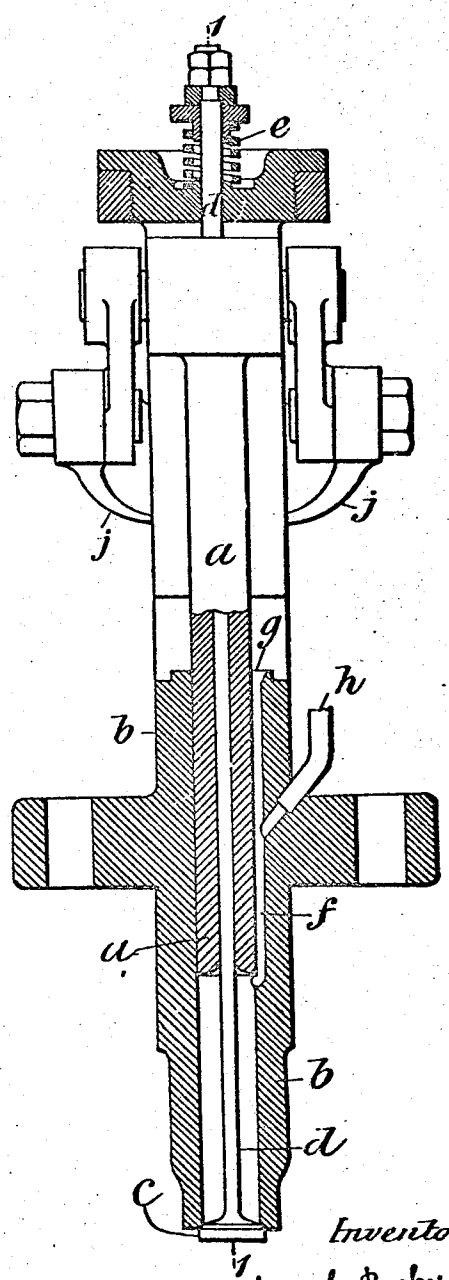


Fig. 2.



Witnesses.

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UNITED STATES PATENT OFFICE.

JAMES COURTHOPE PEACHE, OF RUGBY, ENGLAND, ASSIGNOR TO WILLANS & ROBINSON, LIMITED, OF RUGBY, ENGLAND.

INTERNAL-COMBUSTION ENGINE.

No. 894,978. Specification of Letters Patent. Patented Aug. 4, 1908.

Application filed January 2, 1908. Serial No. 409,009.

To all whom it may concern:

Be it known that I, JAMES COURTHOPE PEACHE, engineer, a subject of the King of Great Britain, residing at Victoria Works, Rugby, in the county of Warwick, England, have invented new and useful Improvements in Internal-Combustion Engines, of which the following is a specification.

In engines working under the Diesel system it is customary to introduce the fuel by means of air under compression supplied from storage cylinders.

In practice it is found that as the amount of fuel is cut down to suit a decrease of load, the consumption of compressed air increases and the combustion of the fuel becomes imperfect owing to the cooling effect of the air introducing the fuel.

This invention has for its object to dispense with the compressed air reservoirs now required for injecting the fuel, to use a minimum of compressed air whether injecting much or little fuel, and to supply this compressed air in a highly heated state so that there shall be no cooling effect but on the other hand a considerable heating and vaporizing effect on the incoming fuel. Further by a simple external adjustment, to make it possible to regulate the pressure of the injection air and the degree of atomizing to which the fuel is to be subject. For these purposes an apparatus such as is shown in the drawings is employed.

Figure 1 is a longitudinal section on the line 1—1 Fig. 2, and Fig. 2 is a longitudinal section on the line 2—2 Fig. 1.

In this apparatus a plunger *a* and a charging cylinder *b* closed at its lower end by a mushroom valve *c* are provided. The cylinder *b* is adapted to be fixed at the end of the cylinder head of an internal combustion engine. The stem *d* of the valve is carried through the center of the plunger *a* and is anchored by a spring connection *e*, which holds the valve to its seat with any desired degree of pressure. The plunger *a* is made an airtight working fit both in the charging cylinder *b* and round the stem *d* of the valve. It is also made of such a shape as to fit closely to the valve head at the end of its stroke.

A hole or passage *f* for the introduction of fuel and air is provided in the charging cylinder, and the stroke of the plunger is adjusted so that at the end it uncovers this hole. Air is admitted at *g* to the passage *f* and fuel at *h*. The vacuum caused by the movement of the plunger *a* in one direction sucks a supply of fuel and air into the charging cylinder *b;* a non return valve may be fitted to reduce leakage. The plunger is then driven back, compressing the air (and thereby raising its temperature) until the pressure thus generated is sufficient to open the valve and allow the fuel to be driven out. The plunger *a* is caused to reciprocate by the lever *j* operated by the engine in any ordinary manner.

The apparatus described above is fixed in the cylinder head of an internal combustion engine, and the cycle is timed so as first to draw in fuel and air, and compress the air, and then eject the air and fuel into the working cylinder as the main piston begins to make its working stroke.

The spring *e* which holds the valve in place can be tightened up to any desired extent. If this device is applied to a Diesel engine which works under a compression of say 500 lbs. per square inch, the spring would be set so that the valve shall not lift until say a pressure of 700 lbs. per square inch is produced in the charging cylinder. The fuel then is highly heated by this compression and finally atomized by being driven through the valve. The extent of the heating and the fineness of the atomizing can be readily regulated while the engine is at work by adjusting the tension of the spring holding the valve to its seat.

What I claim is:—

1. The combination of a cylinder, a valve seat at the end of the cylinder of the same diameter as it, a valve resting on the seat and closing the end of the cylinder, a spring tending to close the valve, a plunger working in the cylinder, means for reciprocating the plunger up to and away from the valve, and means for supplying fuel and air to the cylinder.

2. The combination of a cylinder, a plunger working in the cylinder, a valve closing the end of the cylinder, a stem carrying the valve and passing through the plunger, a spring acting on the stem and tending to close the valve, and means for supplying fuel and air to the cylinder.

3. The combination of a cylinder, a plunger working in the cylinder, a valve closing the end of the cylinder, a spring tending to close the valve, a longitudinal passage in the

cylinder, and air and fuel ducts opening into the passage.

4. The combination of a cylinder, a plunger working in the cylinder, a valve closing the end of the cylinder, a stem carrying the valve and passing through the plunger, a spring acting on the stem and tending to close the valve, a longitudinal passage in the cylinder, and air and fuel ducts opening into the passage.

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