

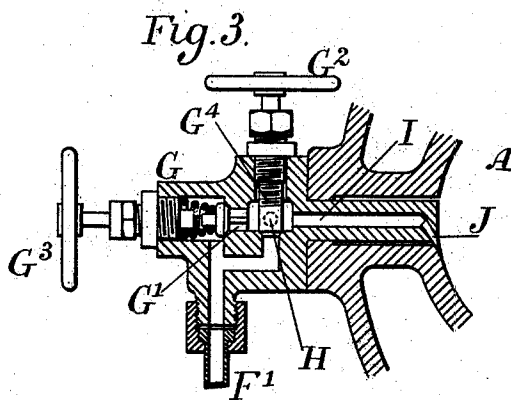
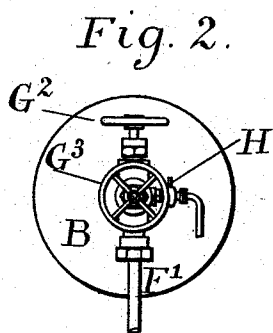
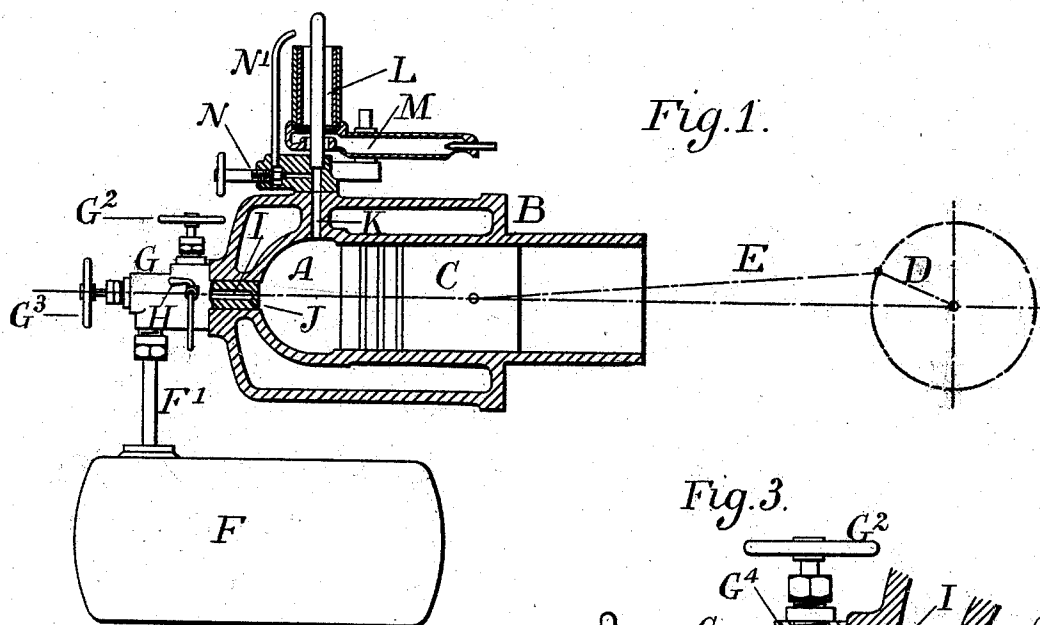
(No Model.)

J. FIELDING.

MEANS FOR STARTING GAS OR OIL MOTOR ENGINES.

No. 505,760.

Patented Sept. 26, 1893.



Witness:  
W. Rea,  
Robert Smith.

Inventor:  
John Fielding  
By *James H. Norris*  
Atty.

# UNITED STATES PATENT OFFICE.

JOHN FIELDING, OF GLOUCESTER, ENGLAND.

## MEANS FOR STARTING GAS OR OIL MOTOR ENGINES.

SPECIFICATION forming part of Letters Patent No. 505,760, dated September 26, 1893.

Application filed December 20, 1892. Serial No. 455,783. (No model.) Patented in England November 11, 1891, No. 19,517; in France June 30, 1892, No. 222,718, and in Germany July 5, 1892, No. 66,960.

*To all whom it may concern:*

Be it known that I, JOHN FIELDING, a citizen of England, residing at Somerset Lawn, in the city and county of Gloucester, England, have invented a new and useful Means for Starting Gas or Oil Motor Engines, (for which I have obtained a patent in Great Britain, dated November 11, 1891, No. 19,517; in France, dated June 30, 1892, No. 222,718, and in Germany, dated July 5, 1892, No. 66,960,) of which the following is a specification.

This invention has for its object to provide new and improved means for starting a gas or oil motor engine; and it consists in the features of construction and the combination or arrangement of devices hereinafter described and claimed, reference being made to the accompanying drawings, in which—

Figure 1 is a longitudinal section and Fig. 2 is an end view of the cylinder of a gas engine with apparatus for starting it according to my invention. Fig. 3 is a longitudinal section drawn to an enlarged scale of the valve box.

A is the space in the cylinder B behind the piston C, which, as indicated by the position of the crank D and connecting rod E, is somewhat advanced in its forward working stroke.

F is a reservoir for the compressed air, communicating by a pipe F' with the valve box G. In this valve box there is a spring check valve G' which can be closed tightly by turning a screw handle G<sup>3</sup> and a stop valve G<sup>4</sup> which can be closed by turning a handle G<sup>2</sup>. Gas is admitted to the valve box by a lateral passage H governed by a stop cock. The passage I from the valve box to the cylinder terminates in an inclined port J.

K is a passage leading from the cylinder to the igniting tube L which may be heated by a Bunsen burner such as M or otherwise. A lateral passage from K governed by a stop valve N leads to an outlet pipe N', which is bent over the chimney of the igniting burner.

Besides the apparatus for starting, the engine is provided with the usual gas and air supply and exhaust valves, and may also have a suitably timed ignition valve. The

starting is effected as follows: The valve N being opened and the valves G' and G<sup>4</sup> being closed, gas is admitted by the passage H into the space A, the entering current being directed by the inclined port J so as to sweep round the end of the cylinder and displace the air, most of which issues at N'. When gas, or gas mixed with a little air begins to issue at N' it becomes ignited by the burner; when it burns steadily, showing that it is mostly gas, the valve N and the gas cock H are closed, and the valve G<sup>4</sup> being opened, compressed air from the reservoir F rushes into the space A forming with the gas already there a combustible mixture under pressure, which becomes ignited by the heated tube L or it might be by an electric spark or otherwise. The piston being propelled by the explosion of the compressed charge with sufficient force to start the motion of the engine, the valve G<sup>4</sup> is closed, and the engine goes on working in the usual way. When it is desired to charge the reservoir F, the gas supply to the engine is cut off and the valve G' is left free to open, so that, by a few compressing strokes of the engine, air is forced into the reservoir F, the valve G' closing against its return. Usually a few strokes of the engine made before it stops after the gas supply is cut off, suffice to charge the reservoir F.

For an engine having several cylinders it is generally unnecessary to apply means, such as I have described, for starting to more than one of the cylinders.

It is obvious that, for an oil motor engine, or engine in which combustible vapor is employed instead of gas, the same means for starting may be adopted.

Having thus described the nature of this invention and the best means I know of carrying the same into practical effect, I claim—

The combination with the cylinder and piston of a motor engine, of a starting mechanism consisting of a valved air escape conduit for the escape of air from the space in the cylinder behind the piston, a valve box connected with the cylinder and having a valved gas inlet, and a valved-compressed air inlet,

a compressed air reservoir connected with the  
valved-compressed air inlet of the valve box,  
and an ignitor for igniting the charge in the  
cylinder to start the engine, substantially as  
5 described.

In testimony whereof I have signed my  
name to this specification, in the presence of

two subscribing witnesses, this 6th day of De-  
cember, A. D. 1892.

JOHN FIELDING.

Witnesses:

HENRY JAMES,  
FRANK FIELDING.