O. K. NICOLAYSEN.

EXPLOSIVE ENGINE.

APPLICATION FILED OCT. 22, 1914.

1,264,548. Patented Apr. 30, 1918.

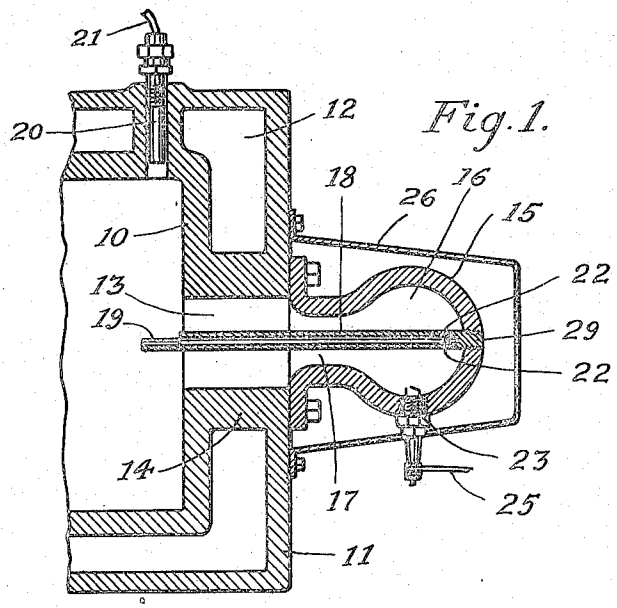


Fig. 1.

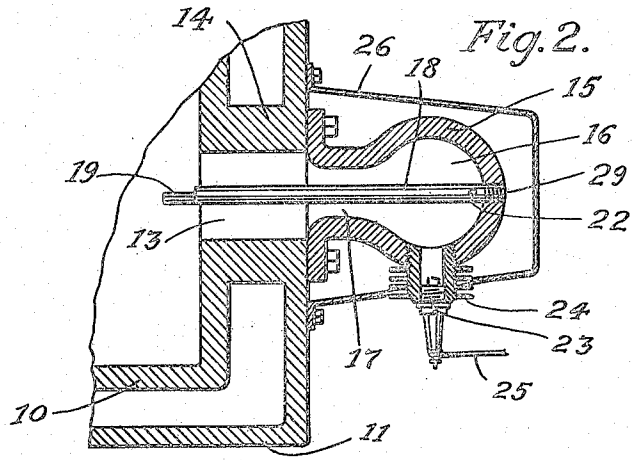
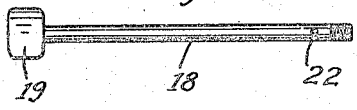


Fig. 2.

Fig. 4.

Fig. 3.



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UNITED STATES PATENT OFFICE.

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EXPLOSIVE-ENGINE.

1,264,548. Specification of Letters Patent. Patented Apr. 30, 1918.

Application filed October 22, 1914. Serial No. 867,944.

To all whom it may concern:

Be it known that I, OLUF KONRAD NICOLAYSEN, a subject of the King of Norway, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Explosive-Engines, of which the following is a specification.

My invention relates to explosive engines and has for its object to provide such an explosive engine wherein kerosene or other heavy oils may be effectively burned of the type in which the oil is injected into the head of the engine cylinder at the time of compression of the air in the cylinder and is gasified and ignited by being thrown upon a hot member within the combustion chamber. As practised in the past, it has been customary to first heat such member by means independent of the explosions therein in order to produce the initial explosions, after which the member is kept hot by the explosions. It is the purpose of my invention to provide means for effecting the initial heating of the member and thereafter through the explosions of the engine itself to provide means of heating the member.

The full objects and advantages of my invention will appear in connection with the detailed description thereof and are particularly pointed out in the claims.

In the drawings, illustrating the application of my invention in one form,—

Figure 1 is a sectional view of a portion of the cylinder head of an explosive engine embodying my improvements. Fig. 2 is a similar view showing modifications of some of the parts. Fig. 3 is a side view of the heating tube and Fig. 4 is an end view of the same.

As shown and illustrated, the engine cylinder 10 is provided with the usual water-jacket 11, forming circulation spaces 12. An aperture 13 extends through the center of the head of the cylinder, about which the cylinder wall 10 and jacket 11 are united, as indicated at 14. Secured to the central outside portion of the head of jacket 11, so as to surround the aperture 13, is a bulb-shaped member 15 having a globular cavity 16 therein communicating through a neck-passageway 17 with the aperture 13. Secured to the central outer portion of the bulb member 15, and extending through cavity 16, passageway 17 and aperture 13 so as to project within the interior of cylinder 10, is a tubular member 18 which, preferably, is provided with a threaded solid end 29 which is secured into the body of member 15. The portion of the tubular member 18 which extends within cylinder 10 is provided with an expanded, slightly curved plate 19 facing an injector tube 20 extending through the cylinder walls and connected by means of a tube 21 with a source of supply of fuel oil such as kerosene. As clearly shown in Figs. 1 and 4, the interior passageway in tubular member 18 extends directly from the inner curved surface of plate 19 to a point adjacent the outer portion of chamber 16, where a series of perforations 22 extend through said tubular member so as to place the channel within the same in communication with the outer portion of chamber 16. When fuel oil is injected, by well-known means which are not here described, through member 20, it is caused to strike upon the plate 19 and a portion of said oil will pass through tubular member 18 and apertures 22 into the chamber 16, excepting when member 18 and plate 19 are so hot as to cause immediate gasifying and combustion of said fuel oil. This will be the case under ordinary operating conditions after the engine has been started and is in active operation. To begin with, however, the parts may be cold, and the oil will then pass up through the tube 18 as above described and the chamber 16 will become filled with an explosive mixture of air and fuel-oil vapor.

To ignite this mixture and bring about the initial heating of plate 19, I provide a spark plug 23 of usual form extending through the wall of member 15, as illustrated in Fig. 1; or extending into the interior cavity of a special cooling or radiating member 24, as illustrated in Fig. 2. The spark plug is connected by wires 25 with a magneto or other sparking device of usual construction. When the engine is turned over, the mixture compressed within cham-

ber 16 will be sufficiently rich so that the spark will cause an explosion. This will generate heat so that at the next operation of the engine more oil will be vaporized and a succeeding explosion will occur of greater intensity. In this manner, through the operation of the spark plug 23 in chamber 16, explosions of successively increasing intensity will occur until plate 19 or chamber 15 has become heated to the necessary degree, when all of the fuel oil or kerosene will be gasified immediately upon coming in contact with plate 19 or chamber 15. At this time the sparking device can be disconnected from the magneto or other sparking devices and the engine will operate in a well-known way by ignition of the fuel oil or kerosene through heat of the plate 19 or chamber 15 absorbed from the successive explosions of the engine.

Even if the specially constructed tubular member 18 for facilitating the passage of oil or oil vapor into chamber 16 were not employed, I would be enabled by means of the sparking device 23, communicating with chamber 16, to effect initial explosions of successively increasing intensity so as to finally heat the bulb member 15 to the desired degree. A casing 26 may be employed surrounding member 15 so as to increase the heating of this member, if desired, and in operation the gasifying and ignition of the fuel oil or kerosene will take place to some extent within chamber 16, even after the sparking member 23 is disconnected from the magneto. The tubular member 18 and plate 19 must be constructed of some material having a very high fusing temperature, so that it will not be caused to melt by the heating to which it is subjected.

The advantages of my invention are apparent. By means of these devices no separate heating means is required. An engine of this type is started as easily as the quick acting types of engines burning a carbureted mixture of gasolene and air.

I claim:

1. An explosive engine for burning kerosene or other explosive fuel comprising a cylinder having a contracted aperture in the end thereof, a member secured to the cylinder and surrounding the aperture so as to form a chamber outside of the cylinder in communication with said aperture, a spark plug extending through the wall of said chamber and having means for generating a spark within the same, a tubular member having a closed end threaded into the wall of said outer member and extending through said chamber and aperture, said tubular member being provided with openings into said chamber adjacent the said closed end and having a curved baffle plate formed integrally therewith at the other end by opening the end of the tube and spreading the same out, said baffle extending into said cylinder, and means for introducing kerosene or other fuel within the cylinder and throwing it against said baffle plate.

2. An explosive engine for burning kerosene or other explosive fuel comprising a cylinder having a contracted aperture in the end thereof, a member secured to the cylinder and surrounding the aperture so as to form a chamber outside of the cylinder in communication with said aperture, a spark plug extending through the wall of said chamber and having means for generating a spark within the same, a tubular member extending through said aperture and into said chamber and communicating at one end with said chamber, its other end being projected into said cylinder, and means for introducing kerosene or other fuel within the cylinder and throwing the same against the projected end of the tubular member.

3. An explosive engine for burning kerosene or other explosive fuel comprising a cylinder having a contracted aperture in the end thereof, a member secured to the cylinder and surrounding the aperture so as to form a chamber outside of the cylinder in communication with said aperture, a spark plug extending through the wall of said chamber and having means for generating a spark within the same, a tubular member extending through said aperture and into said chamber and communicating at one end with said chamber, its other end having connected therewith a baffle plate which extends within said cylinder, and means for introducing kerosene or other fuel into the cylinder and throwing it against said baffle plate.

4. An explosive engine for burning kerosene or other explosive fuel comprising a cylinder having a contracted aperture in the end thereof, a member secured to the cylinder and surrounding the aperture so as to form a chamber outside of the cylinder in communication with said aperture, a spark plug extending through the wall of said chamber and having means for generating a spark within the same, a tubular member having a closed end threaded into the wall of said outer member and extending through said chamber and aperture, said tubular member being provided with openings into said chamber adjacent the said closed end and having a curved baffle plate connected with the other end and extended into said cylinder, and means for introducing kerosene or other fuel within the cylinder and throwing it against said baffle plate.

5. An explosive engine for burning kerosene or other explosive fuel comprising a water-jacketed cylinder having an aperture extending through the jacketed portion of the

end of said cylinder, a cap closing said aperture, a sparking device extending through said cap, a member carried by said cap extending through the aperture and projecting into the body of the cylinder, said member comprising a plate extending substantially in a plane along a diameter of the cylinder, and means for injecting fuel oil into the cylinder at the side thereof in a direction perpendicular to said plate so as to cause said fuel oil to strike the plate.

In testimony whereof I affix my signature in presence of two witnesses.

O. KONRAD NICOLAYSEN.

Witnesses:
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