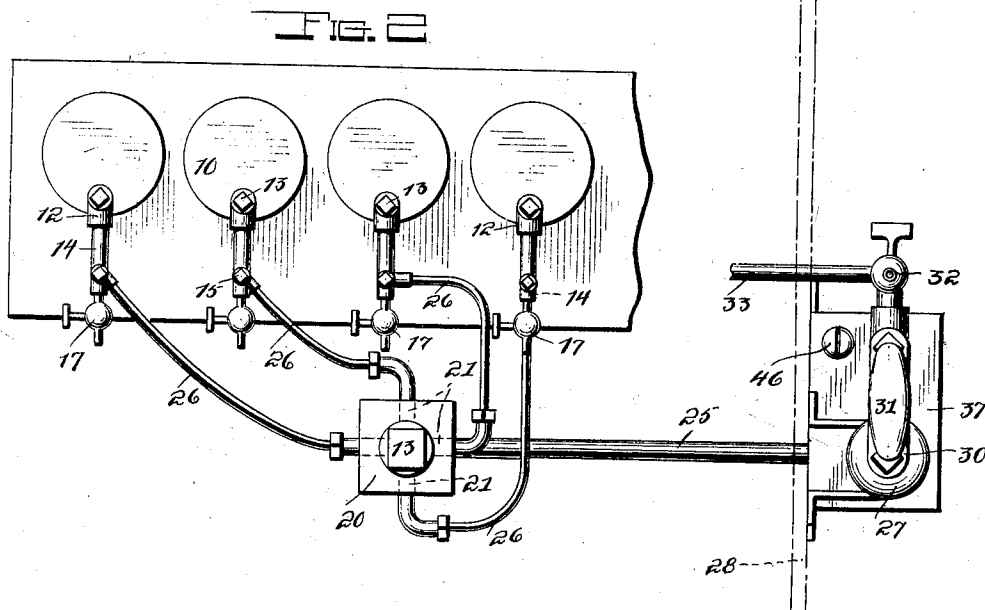
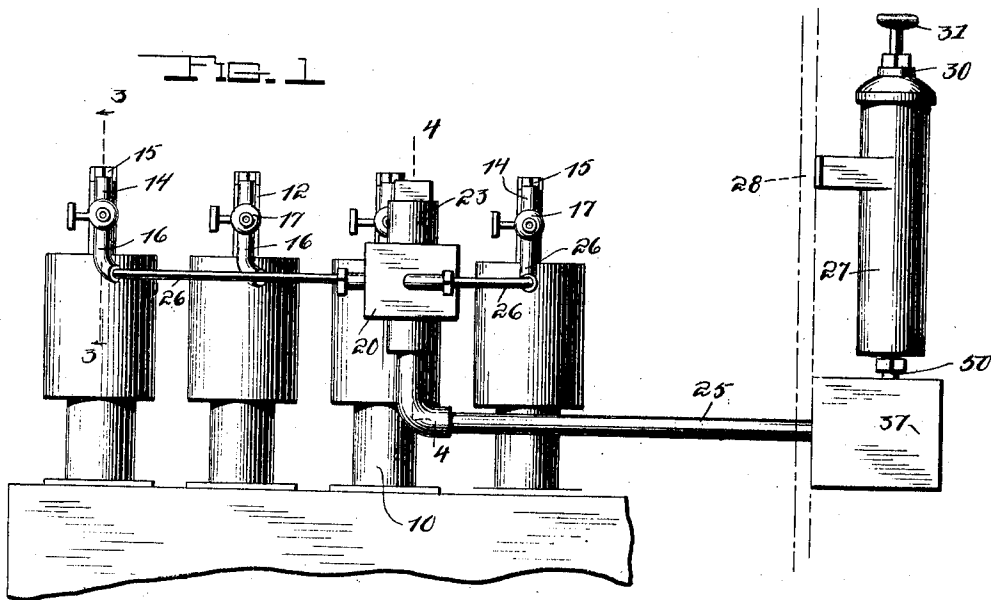


B. F. CLOUD.
GAS ENGINE STARTER.
APPLICATION FILED APR. 18, 1912.

1,058,554.

Patented Apr. 8, 1913.

3 SHEETS-SHEET 1.



Witnesses
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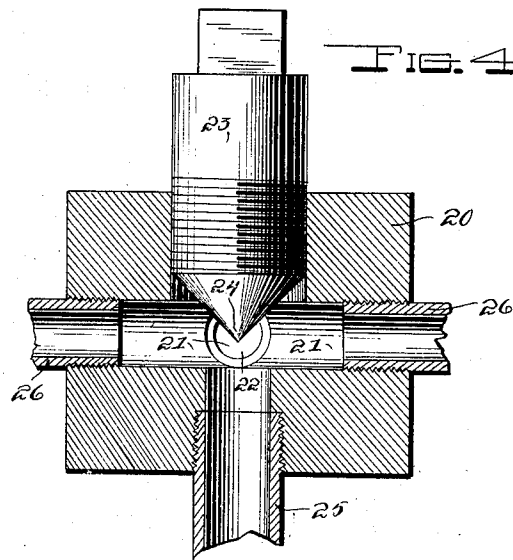
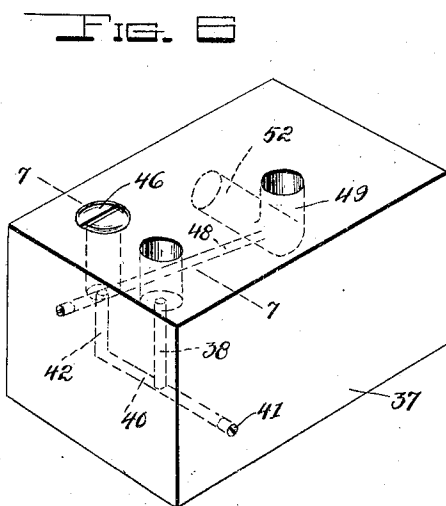
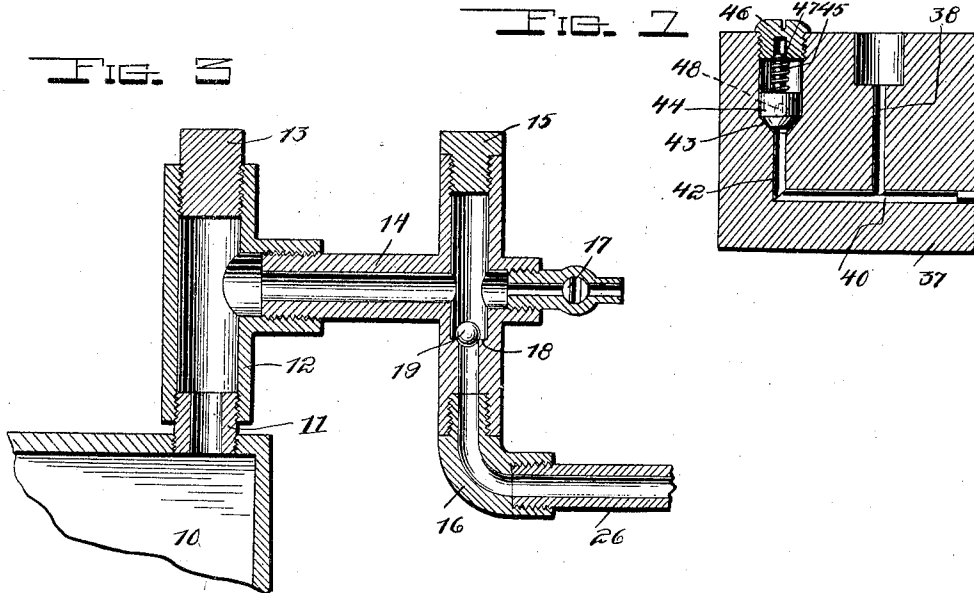
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3 SHEETS—SHEET 2.



Witnesses

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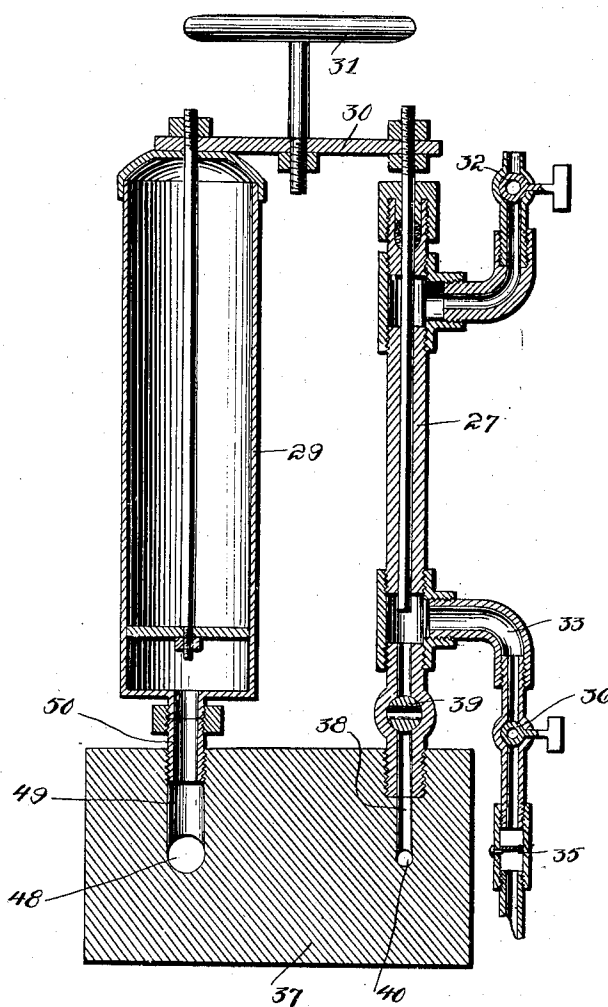
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3 SHEETS—SHEET 3.

FIG. 3



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UNITED STATES PATENT OFFICE.

BENJAMIN F. CLOUD, OF CUPERTINO, CALIFORNIA.

GAS-ENGINE STARTER.

1,058,554.

Specification of Letters Patent.

Patented Apr. 8, 1913.

Application filed April 18, 1912. Serial No. 691,550.

To all whom it may concern:

Be it known that I, BENJAMIN F. CLOUD, a citizen of the United States, residing at Cupertino, in the county of Santa Clara, State of California, have invented certain new and useful Improvements in Gas-Engine Starters; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to means for starting explosive engines without cranking and has for an object to provide a simultaneously actuated gasoline pump and air pump adapted to supply an explosive mixture under compression to the engine cylinders.

A second object of the invention is to provide a novel distributor for delivering the explosive mixture to the engine cylinders.

With the above objects in view the invention consists of certain novel details of construction and combination of parts hereinafter fully described and claimed, it being understood that various modifications may be made in the minor details of construction within the scope of the appended claims.

In the accompanying drawings forming part of this specification:—Figure 1 is a side elevation of a portion of a four cylinder gas engine equipped with my invention. Fig. 2 is a plan view of the parts shown in Fig. 1. Fig. 3 is a cross sectional view taken on the line 3—3 Fig. 1. Fig. 4 is a cross sectional view taken on the line 4—4 Fig. 1. Fig. 5 is an enlarged vertical sectional view through the gasoline and air pumps. Fig. 6 is a detail perspective view of the mixing device with the passages thereof shown in dotted lines. Fig. 7 is a cross sectional view on the line 7—7 Fig. 6.

Referring now to the drawings in which like characters of reference designate similar parts, 10 designates an ordinary four cylinder automobile engine. Threaded into the head of each cylinder is a pipe 11 which carries a T coupling 12, which is closed at the upper end by a threaded plug 13 and threaded into the lateral branch of this coupling is a four-way coupling 14. The upper end of the latter is closed by a threaded plug 15, the lower end is equipped with an elbow coupling 16, and the free branch is closed by a pet cock 17.

A valve seat 18 is formed at the meeting of the bores of the four-way coupling

branches and a ball valve 19 is disposed in the seat. The ball valve when seated cuts off communication between the cylinder and mixture intake elbow 16, and when lifted by pressure of the starting mixture establishes communication between the cylinder and intake elbow.

Each cylinder is equipped with the mechanism above described. For supplying the several mechanisms with the starting mixture under pressure a distributor in the nature of a block 20 is employed, this block having four interior channels 21 corresponding to the four cylinders of the engine. The channels open through the outer faces of the block and are arranged at right-angles to each other, and further all meet at the center of the block in a common opening 22. A set screw 23 is threaded into the block and is equipped with a pointed tip 24 which projects into the opening 22. An intake pipe 25 opens through the bottom of the block and discharges its contents against the pointed tip of the screw, the tip thus forming a conical baffle which deflects the mixture in all directions uniformly into the four channels. Conductor pipes 26 are connected terminally and respectively to the intake elbows 16 of the engine cylinders and communicate with channels 21.

A gasoline pump 27 is arranged preferably on the automobile dash 28, and in close proximity to this pump is arranged an air pump 29, the piston rods of both pumps being connected by a yoke 30 which is centrally equipped with a handle 31 which forms means for simultaneously actuating both pistons. The gasoline pump piston is in the nature of a rod, this rod pumping the gasoline by displacement. The gasoline pump is provided with a cock 32 near the top. A gasoline feed pipe 33 which leads from any suitable gasoline supply is connected with the gasoline pump near the bottom of the pump, this feed pipe having a check valve 35 to prevent retrograde movement of the gasoline and further having a manually operatable valve 36 to regulate the flow of gasoline to the pump.

Both pumps discharge into a common mixing device in the nature of a block 37 arranged below the pumps on the dash. Formed in the block is a vertical passage 38 which communicates with the discharge nipple 39 of the gasoline pump. This passage communicates at the lower end with a

horizontal passage 40 which opens out through the block at one end and is there closed by a plug 41, and which communicates at the opposite end with a vertical passage 42 having an enlargement formed with a valve seat 43 upon which is seated a plug valve 44 having a stem 45 which works in a recess formed in the shank of an adjusting screw 46 disposed in the top of the block.

10 A helical spring 47 is seated on the valve stem and normally holds the valve closed. When closed the valve obstructs one end of a horizontally disposed passage 48 which extends longitudinally of the block and communicates with a vertically disposed passage 49 into which the discharge nipple 50 of the air pump is inserted. An outlet passage 52 communicates with the passages 48 and 49 at their meeting and is connected

20 to the intake pipe 25 of the distributor.

By referring now to Fig. 6 it will be seen that upon depression of the pump pistons the gasoline from the gasoline pump will be discharged against the valve 42 thereby lifting the latter to permit escape of the gasoline through the passage 48 where it encounters the air discharged from the air pump and is thoroughly mixed therewith, the resultant mixture escaping through the passage 52 and pipe 25 into the distributor and from thence escaping into the cylinders ready to take a charge. The mixture may be fired by advancing the spark in the ordinary manner.

35 What is claimed, is:—

1. In a gas engine starter, a gasoline pump, an air pump, means for simultane-

ously actuating both pumps, a common mixer for the discharged contents of both pumps including a block, a passage therein communicating with said air pump, a circuitous passage communicating with said gasoline pump and the first named passage; a valve in the last named passage operated by the flow of fluid through the passage to establish communication of both of said passages, and an outlet passage communicating with the first named passages at their meeting, and forming a mixing chamber for the discharged contents of both pumps.

2. In a gas engine starter, a gasoline pump, an air pump, a common mixer for the discharged contents of both pumps, means for simultaneously actuating both pumps, a distributor for the mixture including a block having crossed communicating passages, a set screw carried by said block having a pointed end projecting into the intersecting portions of said passages, an intake pipe carried by said block and connected to said common mixer, and discharging its contents against said pointed end, said contents being deflected uniformly into all of said passages by said pointed end, and means connecting said passages to the engine cylinders.

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

BENJAMIN F. CLOUD.

Witnesses:

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I. HAGLER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."