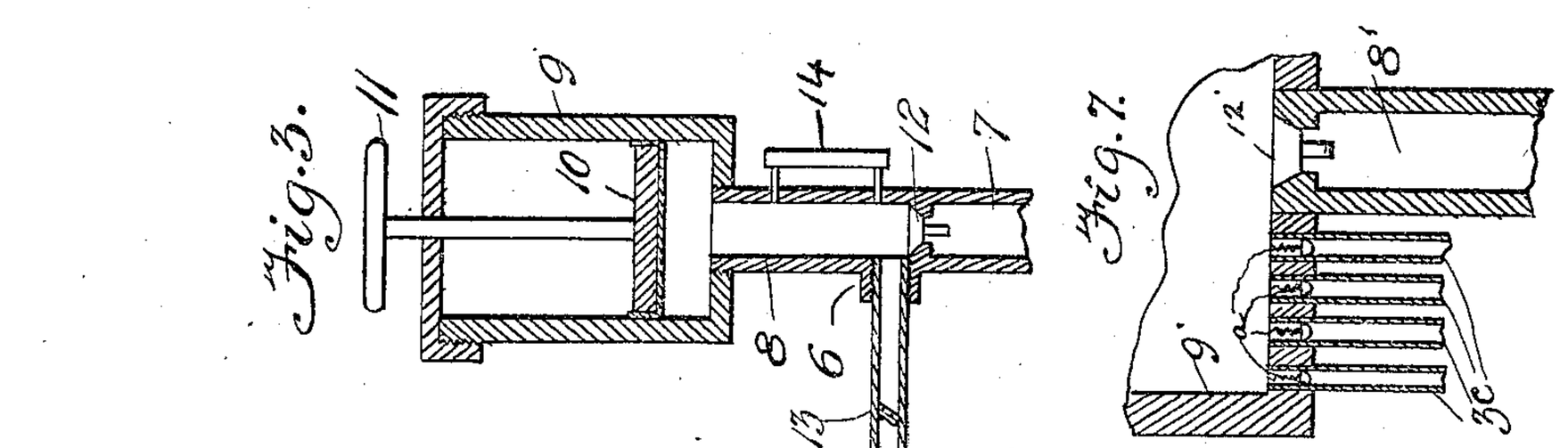
B. RUCKDESCHEL.

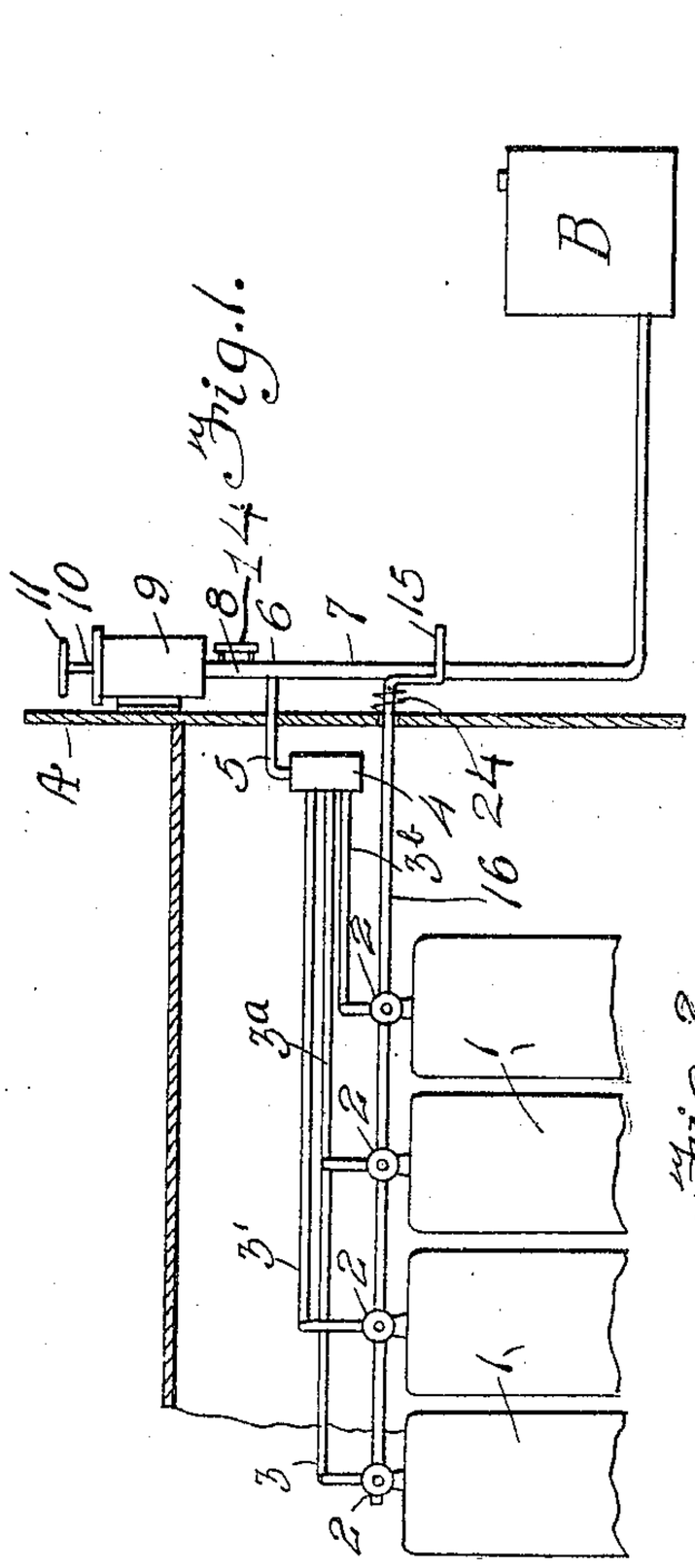
PRIMING DEVICE FOR EXPLOSIVE ENGINES.

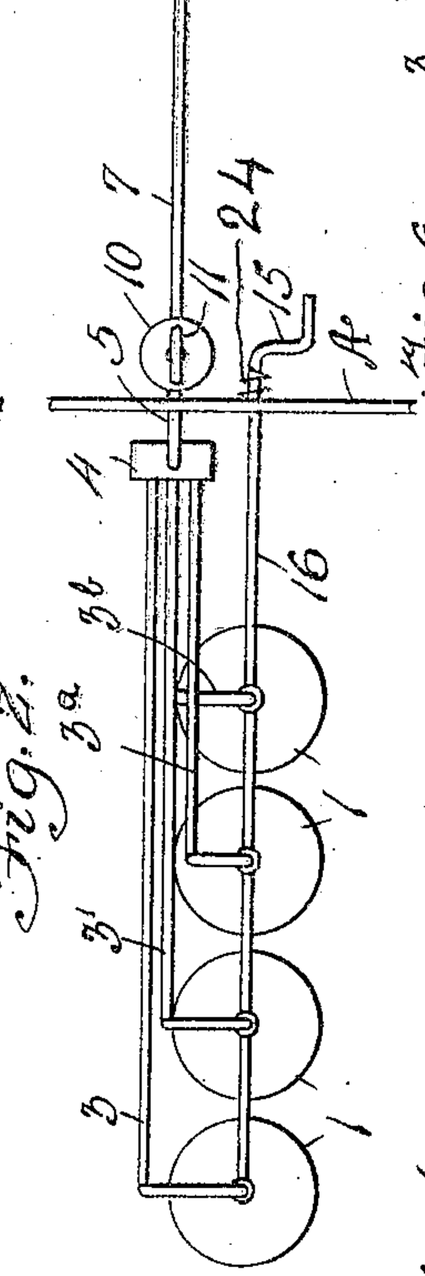
APPLICATION FILED JAN. 21, 1910.

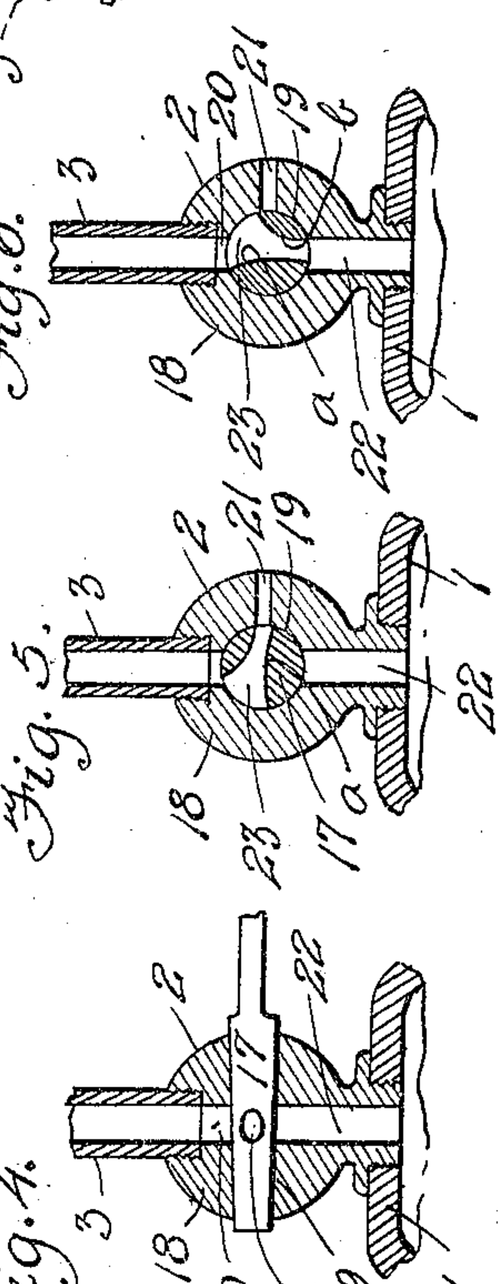
975,639.

Patented Nov. 15, 1910.










WITNESSES

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# UNITED STATES PATENT OFFICE.

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## PRIMING DEVICE FOR EXPLOSIVE-ENGINES.

975,639. Specification of Letters Patent. Patented Nov. 15, 1910.

Application filed January 21, 1910. Serial No. 539,415.

*To all whom it may concern:*

Be it known that I, BERNARD RUCKDESCHEL, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Priming Devices for Explosive-Engines, of which the following is a specification, reference being had therein to the accompanying drawing.

The present invention relates to an improved priming device for explosive engines, and more especially to a device whereby a series of cylinders of an engine may be primed simultaneously, so that all that is necessary, when starting the engine when it is cold, or it is desired to dispense with the cranking operation, is to operate my device to inject the proper amount of hydro-carbon fluid into the cylinders of the engine, and after this operation to operate the spark advance, thereby producing a spark through the medium of the spark-plug in the cylinder, whose piston head is at the highest point of compression, and exploding the charge therein, thus giving a stroke to the piston in said cylinder, and starting the engine without the usual cranking.

By my improved device, a motor car engine may be started from the seat of the vehicle, and by reason of the amount of fluid taken from the tank being so accurately measured, each cylinder head receives exactly the amount necessary and simultaneously with the other cylinders, and thereby is never flooded.

It is a known fact that when an engine is cold, the operator must, in most cases turn on the flow of his explosive fluid, and permit it to run freely into the lower end of the manifold, where by continuous cranking, an explosive charge is drawn into the cylinders of the engine, and the engine is started. However, this is not always successful, and in order to facilitate this, the pet-cock of the cylinders is often opened and the explosive fluid poured or squirted therethrough into the cylinders. When this is done, often too small or too great charge results, and then when the spark is produced, the engine gives only a few kicks or often refuses to move. To insure the simultaneous feeding of all cylinders, and in the proper proportion, the present device has been devised, and by the device herein set forth, I have enabled the operator to accurately charge each cylinder, and thereby in the shortest possible time, start his engine by the simple manipulation of the spark.

To clearly understand my invention, attention is invited to the accompanying drawings, in which:—

Figure 1 is a side elevation of the upper end of a four cylinder explosive engine, the dash board of a motor car, and my priming device attached. Fig. 2 is a top plan view thereof. Fig. 3 is an enlarged section through the pump and its connections. Fig. 4 is a transverse vertical section through one of the pet-cocks in draining position. Fig. 5 is a section taken at right angles thereto. with the pet-cock in draining position, and Fig. 6 is a similar view in priming position. Fig. 7 is a detail of a modification.

Referring to the drawings:—The numeral 1 designates the cylinders of an explosive engine, each one of which is provided with the pet-cock or priming cock 2 in its head or any other convenient place. Each one of the pet-cocks has leading from the upper portion thereof the pipes 3, 3′, $3^a$, and $3^b$, respectively; and all of said pipes lead to and are in communication with the equalizing chamber 4, to which leads the pipe 5. This pipe is in communication with the T-coupling 6, whose lower end is connected to the pipe or conduit 7, which is connected to the hydro-carbon fluid containing tank or reservoir B, from which the engine is also fed in the usual manner. Connected to the upper end of the T-coupling is the short pipe 8, which is connected and in communication with the pump casing 9, having the plunger 10, and operating handle 11, all of which is accessible to the operator or chauffeur and preferably mounted upon the dash-board A, of the motor car. Mounted in the upper end of the pipe 7, is a check-valve 12, which permits fluid to pass therethrough upon the upward stroke of the plunger of the pump, the same closing at the instant of the stopping of the said upward movement, and preventing the fluid now in the T-coupling and short pipe 8, from flowing back into the pipe 7. Upon the downward stroke of the pump, the fluid is forced through the check-valve 13 in the pipe 5, and into the equalizing chamber 4, where as the pressure therein is equal, each pipe 3, 3′, $3^a$, and $3^b$, will receive its proper amount of fluid and con-

duct the same to the upper end of their respective pet-cocks. It will also be noticed that upon the up-stroke of the plunger of the pump when the check valve 12 is opening, the check valve 13 will close, and vice versa. To gage the amount of fluid brought into the pipe 8, upon the up-stroke of the pump, I employ the gage 14, which is of the usual construction and made of glass, so that the fluid in the pipe 8 will be observable therein. This, however, may be dispensed with and the pipe 8 made of glass instead.

In order that the pet-cocks may be in the proper position and be manipulated simultaneously, I employ the handle 15, which is mounted upon the inner or dash-board end of the horizontal rod 16, and this rod carries, or has mounted thereon, for simultaneous operation, the valves 17, of the pet or priming cocks 2, each valve of which is constructed similarly and is clearly shown in Figs. 4, 5, and 6. Each pet or priming cock consists of the casing 18, having the valve receiving bore 19, which is preferably tapered, and the inlet channel 20, draining channel or port 21, and the priming channel or port 22, which is in line with the inlet channel or port 20. When the pet or priming cocks are closed or inoperative they assume the positions as shown in Figs. 4 and 5, wherein the duct or valve port 23, is shown as having the lower straight wall *a*, and the upper curved wall *b*, whereby when the valve is in the position as shown in Figs. 4 and 5, the liquid that may still remain in the pipes 3, 3′, 3ª, and 3ᵇ, may flow through the duct or valve port 23 and through the draining port 21; or when the handle 15 is turned so that to cause the valve to assume the position, as shown in Fig. 6, the downward stroke of the pump will cause the priming fluid to flow through the various pipes into the port 20, through the valve port 23, and the priming port 22 of the pet cock into the cylinder of the engine.

In Figs. 7, 9′ is the pump, 8′ is the pipe having the valve, and 3ᶜ, are the pipes with check valves to the pet cocks.

From the foregoing description, it will be seen that when it is desired to start the engine, the pump's plunger is given an up-stroke, thus drawing the hydrocarbon or explosive fluid from the tank into the pipe 8, above the check valve 12. The operator now turns the handle 15, operating all valves and causing them to assume the position as shown in Fig. 6, at which time the pump's plunger is given a down stroke, closing the check valve 12 and opening the check valve 13, thus forcing the priming charge into the chamber 4, and through all of the pipes 3, 3′, 3ª and 3ᵇ, simultaneously and in equal proportions, into their respective pet or priming cocks and cylinders. When this is completed the spring 24, will rotate the rod 16 and its handle and automatically return the valves to the position shown in Figs. 4 and 5, at which time the operator operates the sparking device, and thus as all of the cylinders have been charged, there is always one ready to be exploded or rather at its highest point of compression, and this is operated and the engine is started and continues to operate bringing its remaining charges through the manifold, whose carbureter has been opened just prior to sparking. Thus it is evident that I produce a priming device for explosive engines, which renders cranking unnecessary and provides a means whereby explosive engines may be quickly and easily started from the steering and controlling part of a motor car, and which is advantageous both in warm and cold weather, as with this device, it is never necessary for the operator to crank the engine and draw the charge through the manifold of the engine, when starting.

What I claim, as new, is:—

1. The combination with an engine, and an explosive fluid reservoir, of a priming device comprising a valve for each cylinder of the engine, a rod for operating all the valves simultaneously, a pump in communication with the reservoir for drawing liquid therefrom, means to prevent the liquid from flowing back into the reservoir, an equalizing chamber adapted to receive the liquid drawn from the reservoir, means to prevent the liquid from flowing to the pump after entering the chamber, and a series of conduits leading from the chamber to the valves of the cylinders, whereby said cylinders are fed simultaneously.

2. The combination with an engine, and an explosive fluid reservoir, of a priming device comprising a priming cock for each cylinder of the engine and having ports leading to the cylinder and for a drain, a valve for each cock having a port adapted to register either with the drain or the other port, a rod for operating all of the valves simultaneously to permit liquid to flow either into the cylinders of the engine or through the drain ports, and a pump interposed between the priming cocks and the reservoir whereby liquid from the reservoir is fed simultaneously to all priming cocks.

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

BERNARD RUCKDESCHEL.

Witnesses:

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G. M. SPRING.