

R. ODELL.
 STARTING MEANS FOR HYDROCARBON ENGINES.
 APPLICATION FILED SEPT. 16, 1907.

968,593.

Patented Aug. 30, 1910.

2 SHEETS—SHEET 1.

Fig. 1.

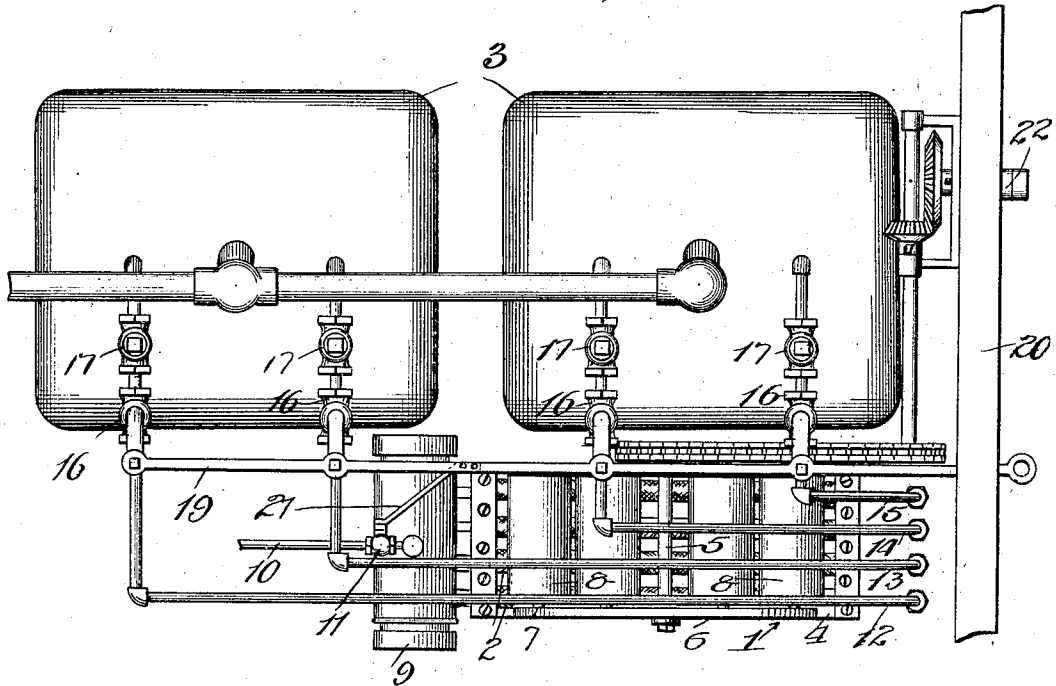
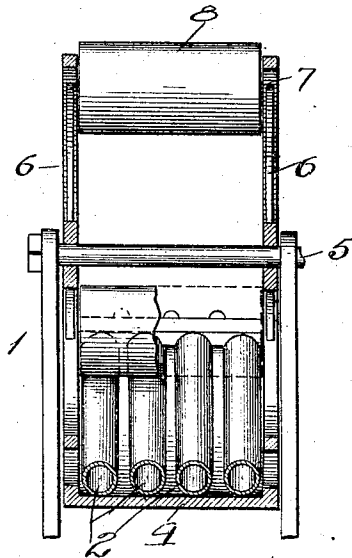


Fig. 2.



Witnesses
 Harry R. White
 Ray White.

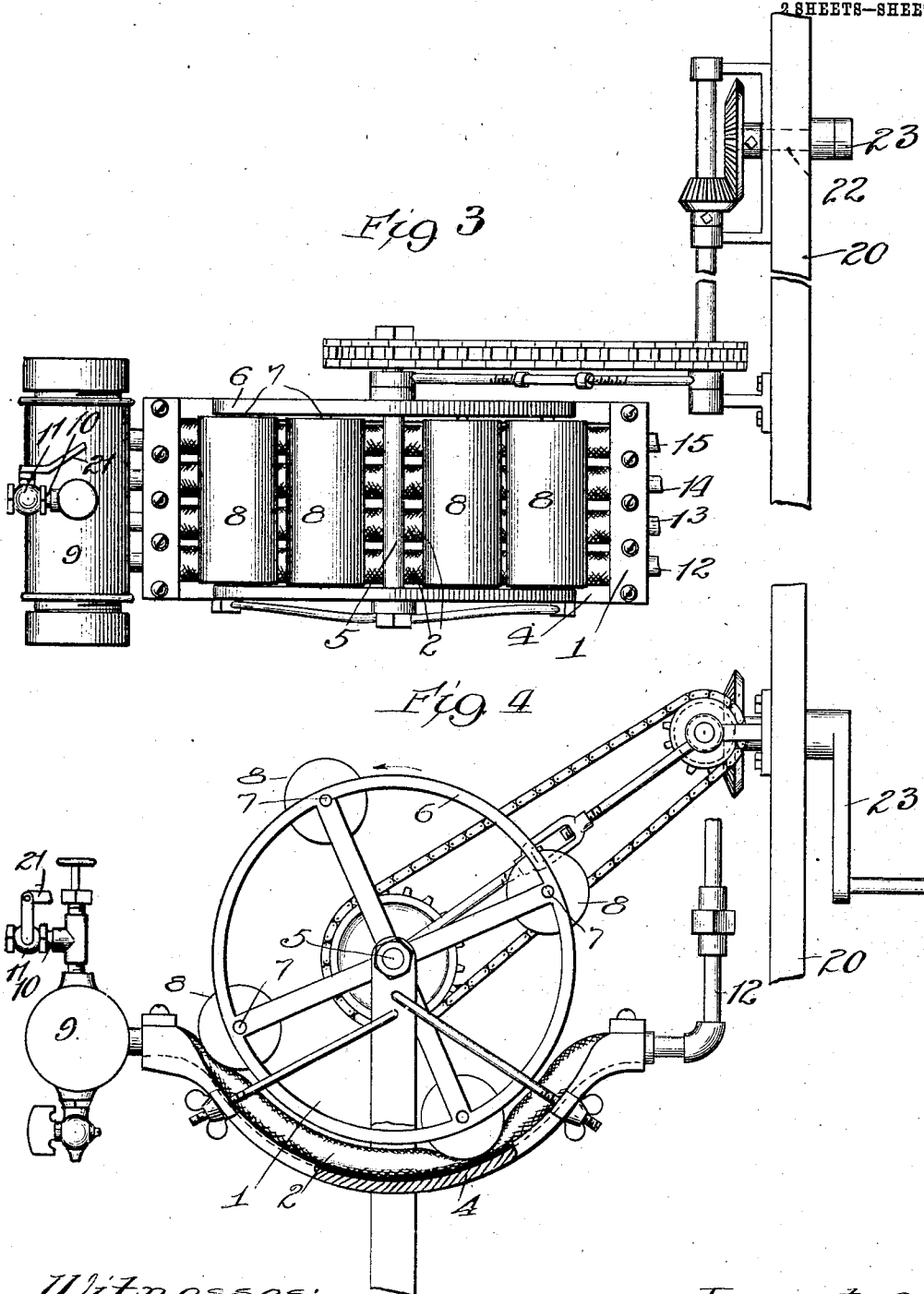
Inventor:
 Rodman Odell
 By Rudolph M. Fox

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UNITED STATES PATENT OFFICE.

RODMAN ODELL, OF CHICAGO, ILLINOIS.

STARTING MEANS FOR HYDROCARBON-ENGINES.

968,593.

Specification of Letters Patent.

Patented Aug. 30, 1910.

Application filed September 16, 1907. Serial No. 393,111.

To all whom it may concern:

Be it known that I, RODMAN ODELL, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Starting Means for Hydrocarbon-Engines; 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 has for its object to provide simple, efficient and easily operable means for starting the multi-cylinder hydrocarbon motors of automobiles without necessitating the driver leaving his seat, and consists in the features of construction and combinations of parts hereinafter fully described and claimed.

In the accompanying drawings illustrating this invention: Figure —1— is a top plan view of a four-cylinder hydro-carbon motor equipped with starting means constructed in accordance with my invention. Fig. —2— is a detail vertical section of a compressor employed. Fig. —3— is a top plan view of the compressor and carbureter and shows the gearing of the compressor to a crank shaft journaled in a bearing in the dash-board, the latter being shown in section. Fig. —4— is a side elevation of the carbureter and compressor, also showing said gearing.

In order to start a hydro-carbon motor it is primarily necessary to introduce into one or more cylinders, a compressed charge of carbureted air, which, upon ignition explodes and thus produces an initial stroke of sufficient force to give the requisite impetus to the balance wheel to repeat the operation which is generally first performed by turning the drive shaft with a crank. The latter operation requires the exercise of considerable strength and necessitates the chauffeur leaving his seat. The strength required is generally greater than is possessed by women, and consequently the latter are frequently unable to start an automobile without the aid of a man.

My invention has for its main object to render the starting of the motor not only very easy, but further, to enable the starting means to be operated from the seat of the automobile and thus avoid the necessity of the driver stepping out frequently into

muddy roads in order to perform the operation.

My invention comprises means whereby a compressed charge of carbureted air is simultaneously introduced into all the cylinders of a multi-cylinder hydro-carbon motor by means of a small easily operated pump having compression chambers corresponding in number with the cylinders and each connected with the compression and explosion chamber of one of said cylinders whereby all cylinders in which the pistons are not in exhaust position receive a compressed charge, the pressure of the latter being in exact proportion to the size of the respective compression chambers due to various positions of the pistons therein. Consequently upon sparking one of said charges, it is ignited and insures the compression and ignition of at least a second charge so introduced and thereby positively insuring the continued operation of the motor as long as desired.

I am aware that the introduction of a charge of carbureted air under compression into the cylinder of a hydrocarbon engine from a pump or compressor other than the motor itself, is not entirely novel, and my invention resides therefore in arrangement involving a single operating device for a multi-cylinder motor whereby a charge of carbureted air is introduced into all compression chambers in which the pistons are in the proper positions to impart the initial strokes necessary to start the motor into continuous operation.

In said drawings the compressor 1, which is in the instance illustrated, is of the collapsed flexible tube type carrying tubes 2 corresponding in number with the cylinders of the motor 3 which in this instance are four in number. The said tubes 2 are disposed parallel with each other in the concave portion of the plate 4 which is disposed concentric with the bearings of the shaft of parallel disks or wheels 6. The latter are connected with each other at regular intervals adjacent their peripheries by the cross rods 7 on which rollers 8 are revolvably disposed, the latter traveling over and completely collapsing the tubes 2, the latter extending through an arc greater than the arc separating adjacent cross rods 7. Each of said tubes is connected at its suction end with the carbureter 9 connected with the

supply of hydro-carbon liquid by means of the pipe 10 controlled by the valve 11, and at its discharge end is connected with the compression and explosion chamber of one of said cylinders by means of the pipes 12, 13, 14 and 15 respectively. Each of said pipes 12 to 15 inclusive, is equipped with a valve or stop-cock 16 and a check valve 17, the latter being disposed between the valve 16 and the point of connection of the pipe with the cylinder, the latter connection being preferably effected by means of a T, one arm of which communicates with the cylinder through the outer end wall thereof and the other arm of which is equipped with a pet-cock, the said T's and pet-cocks being omitted from the illustration as superfluous matter. All of said valves 16 are simultaneously operated by means of a rod 19 passing through the dash-board 20, said rod being also connected by means of a link 21 with the valve 11 to open and close the latter simultaneously with the valves 16.

The carbureter 9 employed is additional to the carbureter feeding the motor while in operation, and is supplied for the reason that the carbureted air introduced into the compression must be saturated in order to supply sufficient vapor to the air or products of combustion contained in the motor cylinders to insure combustion in the latter and to effect this through the carbureter feeding the motor, would necessitate readjustment of the latter to an extent which would seriously interfere with proper operation of the motor. The shaft 5 of the disks or wheels 6 is suitably geared to the crank-shaft 22 journaled in a bearing in the said dash-board, the crank 23 thereof being disposed within easy reach of the chauffeur.

My device may be disposed in any available space adjacent the motor and operates in a very simple manner as follows: The motor being inert, the chauffeur first adjusts his motor controlling lever to very low speed and then turns the crank 23 thereby operating the compressor, the valves 11 and 16 being open. The compressor takes its supply through the carbureter 9, the latter being so constructed as to saturate the air passing therethrough with hydro-carbon vapor. Said saturated air is fed continuously into the compression chamber of all cylinders and enriches the air or products of combustion contained therein to an extent which renders the latter combustible. In a four cylinder motor, one piston and the valve controlled thereby is always in exhaust position, hence, the carbureted air entering said cylinders merely pass through but leaves a charge therein. Another cylinder is in position to ignite the charge upon closing the igniter circuit and the two remaining pistons are approaching the re-

spective positions of those already mentioned. After rotating the crank 23 a few times, the chauffeur adjusts his motor controlling lever to medium speed and then closes the igniter circuit thereby exploding one charge, and the impetus thus given the motor causes at least one other charge to be exploded in proper succession after the first and this insures operation of the motor. The rod 19 is then moved to close the valves 11 and 16 thus preventing flooding of the carbureter 9 and consequent waste of hydro-carbon liquid.

The crank 23 occupies very little space and by reason of the small diameter of the tubes 2 is so easily operated as to bring it within reach of a young girl. Any other convenient form of multicylinder compressor may be employed without departing from my invention.

I desire to direct particular attention to the carbureter 9, which as stated, is so constructed as to completely saturate the air with hydro-carbon vapor. This, I have found by long and careful experiment, to be absolutely essential to successful operation, the carbureters generally employed to feed hydro-carbon motors being totally inadequate to produce a sufficiently enriched carbureted air. The said carbureter forms the subject of a companion application filed simultaneously herewith.

I claim as my invention:

1. The combination of a multi-cylinder hydrocarbon motor, an auxiliary carbureter, a compressor having a plurality of chambers, one for each cylinder, an operating device adapted to cause the simultaneous contraction of the chambers of said compressor, passages connecting each of said chambers with said carbureter and with its respective motor cylinder, and mechanism for imparting motion to said device for forcing carbureted air into all of the motor cylinders simultaneously.

2. The combination of a multi-cylinder hydrocarbon motor, an auxiliary carbureter, a plurality of compressors, one for each cylinder, a rotary operating device comprising a plurality of parts adapted successively to cause the simultaneous contraction of the chambers of said compressors, passages connecting each of said chambers with said carbureter and with the respective motor cylinder, and mechanism for causing the rotation of said operating device.

In testimony whereof I have signed my name in the presence of two subscribing witnesses.

RODMAN ODELL.

Witnesses:

RUDOLPH WM. LOTZ,
E. L. MOORE.