W. H. MUZZY.

MOTOR VEHICLE.

APPLICATION FILED MAR. 21, 1908.

1,145,208.

Patented July 6, 1915.

3 SHEETS—SHEET 1.

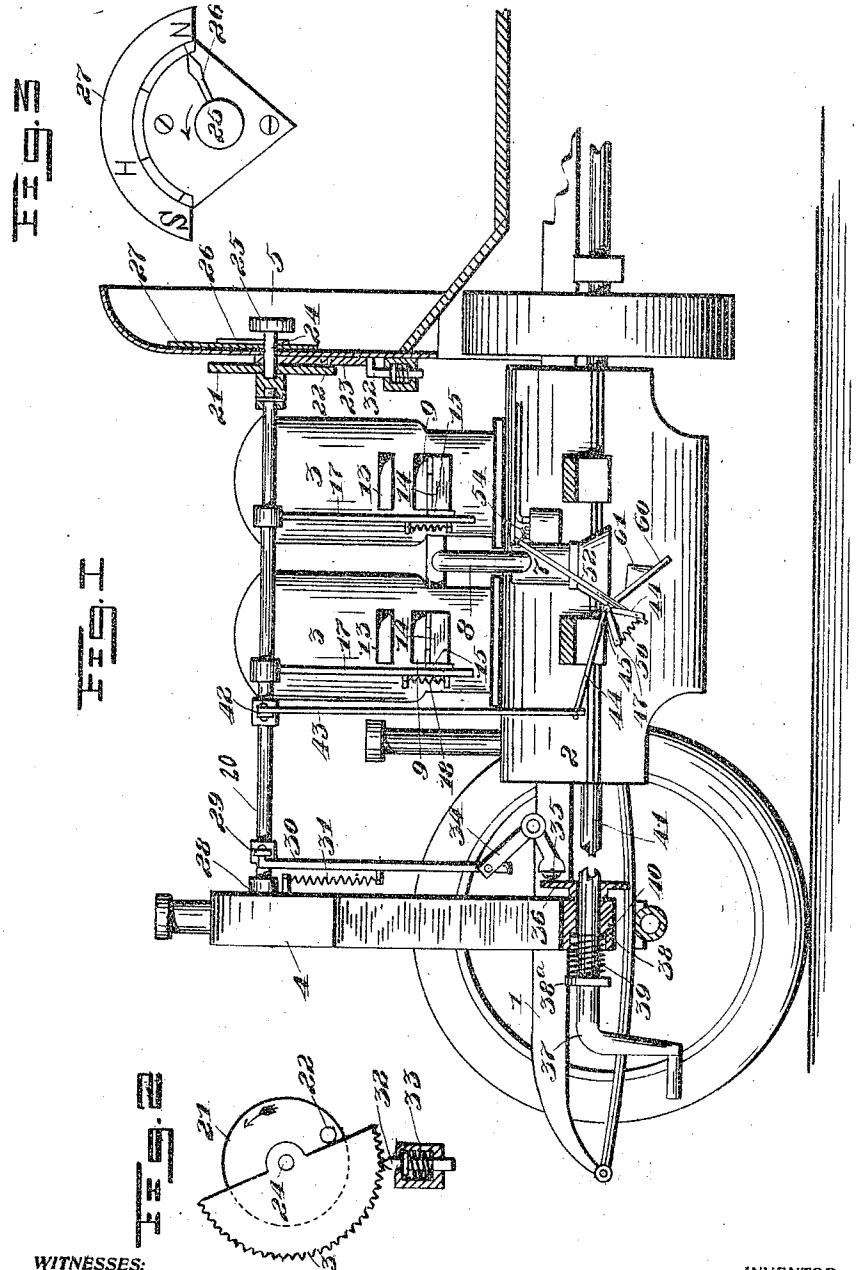


FIG. 1.

FIG. 2.

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3 SHEETS—SHEET 2.

Fig. 4.

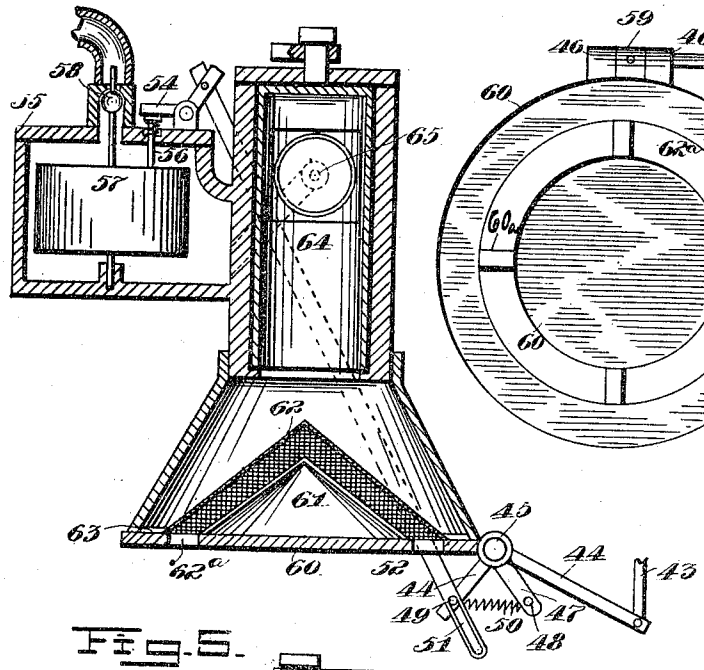


Fig. 6.

Fig. 5.

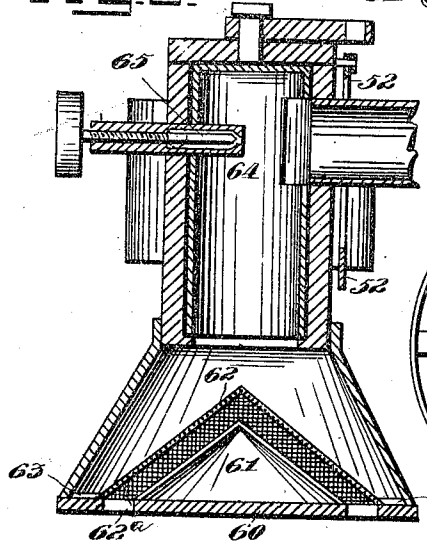
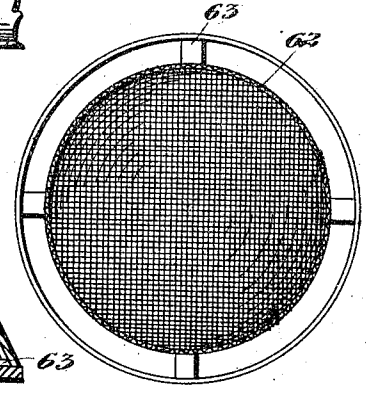


Fig. 7.



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MOTOR VEHICLE.

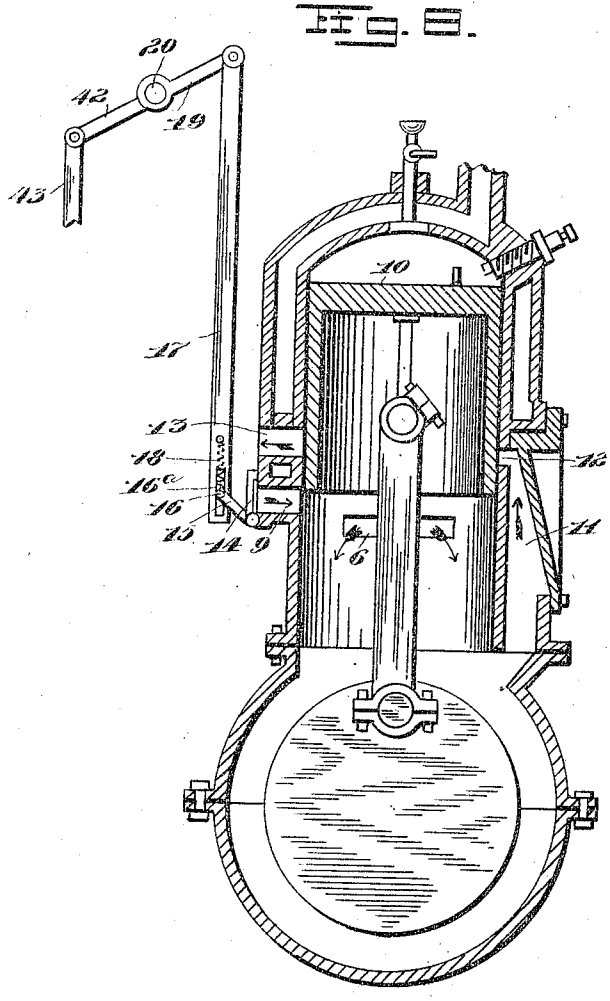
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3 SHEETS—SHEET 3.

FIG. 3.



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MOTOR-VEHICLE.

1,145,208. Specification of Letters Patent. Patented July 6, 1915.

Application filed March 21, 1908. Serial No. 422,431.

To all whom it may concern:

Be it known that I, WILLLIAM H. MUZZY, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Motor-Vehicles, of which I declare the following to be a full, clear, and exact description.

This invention relates to improvements in motor vehicles and has more particular relation to improvements in engines and the controlling devices therefor.

The object of this invention is to provide improved controlling devices for all gas engines but particularly for the control of gas engines of the type known as "two-cycle."

Another object of this invention is to provide devices for automatically changing the adjustments of the engine and the carbureter by the act of starting the engine.

Another object of the invention is to provide fuel controlling devices which are controlled automatically by the act of starting the engine and which may also be controlled after the engine is running and from the seat of the driver.

The invention consists of certain novel combinations, structures and arrangements of parts all of which will be hereinafter more particularly set forth and claimed.

In the accompanying drawings forming part of this specification: Figure 1 represents a side elevation, partly in section, of the devices embodying my invention applied to an engine of the two-cycle type; Fig. 2 represents a detail front elevation of the connection between the hand knob and the control shaft; Fig. 3 represents a detail front elevation of the hand knob and its index plate; Fig. 4 represents a detail vertical section through the carbureter and connection; Fig. 5 represents a detail vertical section through the carbureter taken on a line at right angles to that shown in Fig. 4; Fig. 6 represents a bottom plan view of the adjustable drip cone and its connections; Fig. 7 represents a bottom plan view of the gauze drip cone; and Fig. 8 represents a central vertical section through my improved engine.

Described in general terms the present invention is designed to supply the three-port type of two-cycle engine with the proper mixture for starting purposes and also enable the operator to maintain a uniform mixture, or a proper running mixture under all conditions of speed and throttle.

One of the principal defects of engines of the type mentioned is inability to secure the proper mixture for starting and for slow speed when the throttle is nearly closed. In starting the engine the desired rich mixture is secured by flooding the carbureter and retaining all of the excess gasolene on a gauze through which all of the incoming air must pass and thus become thoroughly saturated.

With crank case compression in the three port type of engine, the compression falls very low on slow speeds and the suction through the carbureter is correspondingly light with the result that the engine does not get the proper charge to subsequently compress in the cylinder and as these charges in many cases are so poorly mixed as to be dependent upon good compression in order to ignite, the engine will miss. With the improved air port opening directly into the cylinder the proper amount of air may be admitted at all times to give the desired compression in the crank case for forcing the charge into the combustion chamber of the cylinder.

A further defect in machines of the type mentioned is the great amount of gasolene wasted by the action of the engine. The suction through the carbureter is almost instantaneous and the gasolene which is set in motion by this suction continues to flow after the suction is cut off and thus falls through the bottom of the carbureter and is wasted. With my improved gauze cone all of this surplus gasolene is caught and used on the next suction of the engine.

Described in detail and referring to the drawings 1 represents the frame of the automobile, 2 the crank case of the engine, 3 the cylinders, 4 the radiator and 5 the dash-board of the car. By reference to Figs. 1 and 8 it will be seen that the cylinder is provided with a gas inlet port 6 which connects with the carbureter 7 by a pipe 8, this pipe being of T-shape to provide a gas supply to the ports 6 of both cylinders. Each of the cylinders is also provided with an air inlet port 9 so located in relation to the lower edge of the piston 10 and the port 6 that this latter port is first uncovered on the upward stroke of the piston and then said air

port. In other words, the rich charge of gasolene is first drawn in through the port 6 and then the necessary quantity of air supplied through the port 9 to entirely fill the crank case so that upon the descent of the piston the proper compression will be secured to force the mixture up through the passage 11 and finally through the port 12 into the upper part of the piston. The cylinder is also provided with an exhaust port 13 from which the spent gases discharge when the piston reaches the lower end of its stroke. For clearer illustration I have shown no piping leading from the exhaust ports 13 but it will be understood that any suitable piping may be employed to direct the exhaust to the muffler.

Each of the ports 9 is provided with a valve 14 hinged at its lower edge and provided with an arm 15 having a pin 16. Each of these pins project through an elongated slot 16ª formed in the lower end of one of a pair of links 17; the pin in each instance being connected to its link by a coil spring 18. Each link is pivotally connected at its upper end to one of a pair of arms 19 which are mounted rigidly upon the control shaft 20 which is rocked as hereinafter described. In operation, when the shaft is rocked, the link 17 is drawn upward and through the spring 18 also draws the arm 15 upward and closes the valve 14 over the port 9 so that the suction from the crank case acts only through the port 6 which results in a very rich mixture in the crank case. When the engine is running under full throttle however the valve 14 is down and the port 9 fully open.

By adjusting the shaft 20 more or less the valve 14 may be opened more or less according to the speed of the engine and thus supply a greater or less amount of air. This opening of the valve is effected by the upper wall of the slot 16ª, in each instance, contacting with its pin 16 and forcing it downward. When the engine is running fast in going down hill or free when the clutch is thrown out the valve 14 can be opened and the crank case thus take sufficient air to get the proper compression in the crank case to force the charge into the cylinder and overcome the cylinder pressure of the exhausting gases.

In order that the shaft 20 may be rocked to any degree desired the forward end of the same is provided with a disk 21 having a pin 22 which projects in front of the vertical edge of a segment 23, best shown in Fig. 2. This segment is fast to a short shaft 24 which passes through the dashboard 5 and is provided with a hand knob 25 by which it may be turned. The shaft 24 also carries an index pointer 26 which travels over an index plate 27 secured to the front of the dash. By this construction when the knob 25 is turned to the left as shown by arrow in Fig. 3, the disk 21 is moved with it but when the pointer 26 is in its home position shown in Fig. 3, the disk 21 may be moved independently of the knob, which action takes place when the engine is being first started.

The forward end of the shaft 20 is journaled in a bearing 28 on the radiator 4 and is provided with an arm 29 from the outer end of which is pendent a link 30. This link is connected to the radiator by a coil spring 31 so as to normally force the arm 29 upward and rock the shaft 20 until the pin 22 contacts with the segment 23. This segment is toothed about its periphery and is engaged by a spring pressed plunger 32 mounted on the dash. The spring 33 of this plunger is of sufficient strength to hold the segment in adjusted position against the tension of the spring 31 which normally tends to return the segment to its normal position.

The lower end of the link 30 is pivotally connected to a bell-crank lever 34 which is pivoted on the frame 1. An anti-friction ball 35 is mounted in the lower end of the bell crank lever and engages a disk 36 mounted on the inner end of the starting crank 37. This crank is journaled in a subframe 38 and is provided with a flange 38ª against which one end of a coil spring 39 abuts, the opposite end of the spring being seated in a recess 40 formed in the subframe. This spring normally holds the inner clutch end of the starting crank out of engagement with the clutch end of the crank shaft 41 of the engine.

It will be seen from the above that when the starting crank is forced inward to clutch it to the crank shaft, the bell-crank 34 will be rocked and the shaft 20 correspondingly moved. This movement will close the air valves 14 and cause the pistons to draw the entire supply for the crank cases through the ports 6 which connect with the carbureter. When the starting crank is released the parts resume their normal positions with the air valves fully open.

The automatic rocking of the shaft 20 also adjusts the carbureter 7 for starting in the following manner: Fast upon shaft 20 is an arm 42 to which a pendent link 43 is pivoted. The lower end of this link is pivoted to one end of a bell-crank lever 44 which is pivotally mounted upon a shaft 45. This shaft is journaled in lugs 46 formed on the carbureter 7 and carries an arm 47 having a pin 48 in alinement with a pin 49 mounted on the bell-crank 44. The two pins are connected by a coil spring 50 and the pin 49 projects into an elongated slot 51 formed in the lower end of a link 52 the upper end of which is connected to a bell-crank lever 54 mounted on the top of the float chamber 55 of the carbureter. One arm of the bell-crank 54 contacts with a spring pressed

plunger 56 mounted in the top of the float chamber. When the bell-crank is operated the plunger forces the float 57 downward to unseat the valve 58 and thus cause the carbureter to flood in a manner well known in the art and needing no further description here.

The shaft 45 is fast to a lug 59 formed on the bottom plate 60 of the drip cone 61 which is thus pivoted under the flaring lower end of the carbureter. Upon the plate 60 is mounted the solid drip cone 61 the lower edge of which terminates at an angular slot 62^a formed in the plate 60 and having bridges 60^a to support it. The upper surface of the cone 61 is preferably provided with a felt covering or other absorbent material.

The gauze drip-cone 61 is supported in the lower flaring end of the carbureter by four radial arms 63 which connect it to the lower edge of the carbureter. The location of this latter cone is such that its lower edge bounds one edge of the slot 62^a while the lower edge of the cone 61 bounds its other edge. By this arrangement any gasolene falling on the gauze 62 or running down the same will be brought directly into the path of the inrushing air. Any gasolene that may fall through the gauze 62 will be caught by the cone 61 and running down the same will be also brought into the path of the air suction and will be instantly taken up and carried into the crank case. When the cones are up in position as shown in Figs. 4 and 5 all of the air drawn through the carbureter must pass through the slot 62^a but when the plate 60 is partly lowered air will also be admitted around the edges of the plate and the same amount of gasolene will not be taken up from the drip cones as all the air will not be drawn over the solid felt covered cone. The arrangement of the cones prevents the wasting of any gasolene because of the peculiar action of the engine, which, as before stated, is of the three-port type. The customary throttle valve 64 and gasolene needle valve 65 are provided but need no further description here.

When the link 43 is first depressed it will cause the bell-crank 44 to extend the spring 50 which will draw on the arm 47 and thus rock the shaft 45 to partly close the cones. This adjustment can be continued until the bottom plate is fully closed before the pin 49 will contact with the upper end of the slot 51 to elevate the link 52 and flood the carbureter. By this means all of the desired adjustments of the cones can be secured without flooding the carbureter and this flooding need only take place in starting when the link 52 is given its maximum movement by the forcing inward of the starting crank.

It follows from the above that when the engine is to be started the carbureter is flooded and all the gasolene caught and directed in fine particles in the path of the inrushing air. As the slot for the inward passage of the air is limited in area the gasolene is caught and carried inward with considerable force and finely divided so that a mixture is drawn into the crank case which is rich enough to form an explosive mixture in the cylinder even though the speed of the piston is not sufficient to draw in a perfect charge. Further the adjustment of the starting crank closes the valves 14 and thus causes the piston to draw the entire charge through the carbureter. When the starting crank is released the parts automatically return to their normal positions with the air valves open and the solid cone 61 moved down out of the path of the inrushing air as shown in Fig. 1. The gauze cone however remains in position at all times and thus catches all surplus gasolene that may fall from the needle valve. As the air passes through this gauze it takes up this gasolene upon the next stroke of the engine.

When the engine is running at speed after starting it is of course necessary that the air valves should be open as otherwise the engine would be taking too rich a mixture. The proper provision has thus been made for a very rich mixture for starting which in effect is the same as introducing gasolene directly into the cylinders. This rich mixture is provided without thought from the operator as the action is altogether automatic and he cannot start or attempt to start the engine without first unconsciously making the proper adjustments. Further after the engine is running at speed he has it in his power to make any desired adjustments of air and gasolene from the seat by means of the knob 25. Again at high speeds with a partly closed throttle there is always the proper compression in the crank case to prevent back firing as the air valves supply the necessary amount of air to prevent any vacuum in the crank case at the end of the up stroke of the piston.

It will of course be understood that I do not limit myself to the control of the several devices by means of the crank shaft as the invention with equal facility may be used with the adjusting knob 25 alone as all of the desired adjustments may be secured by turning this knob either to the right or the left.

I further do not care to limit myself to any particular form of starting crank as it will be readily seen that the invention may be employed in connection with any approved form of crank now on the market.

It will of course be understood that any varying adjustments of the knob 25 may be made and the richness of the mixture fed to the crank cases thus changed at will. When the engine is slowed down the rich-

ness of the mixture must be increased to prevent the engine missing explosions. The movements of the valve plate 60 secure this result and the relative movements of the valve 60 and the air valves may be so fixed as to close the air valves if desired when the valve 60 is open. As shown the air valves are opened as the valve 60 is opened. The result of this is that as the motor is slowed down the air valves are closed and the increased suction feeds a richer mixture which is necessary in motors of the two-cycle type.

What I claim as new and desire to secure by Letters Patent is:

1. In a motor vehicle the combination with an explosive engine, of a cranking means for the same and a device automatically operated in connection with the cranking means for introducing liquid gasolene into the intake pipe.

2. In a motor vehicle the combination with an explosive engine, of a cranking means for the same, a carbureter, and connections for changing the richness of the mixture in the carbureter from the cranking means.

3. In a motor vehicle the combination with an explosive engine of a starting device for turning over the engine, a carbureter having an air valve for admitting air to the spray nozzle and connections for closing the air valve automatically by the starting device to cause a greater suction of gasolene from the spray nozzle.

4. In a motor vehicle the combination with an explosive engine, of means for turning over the same, a carbureter, means on the carbureter for increasing the richness of the mixture and connections between this latter means and the turning over means.

5. In a motor vehicle the combination with an explosive engine, of a cranking means for the same, a priming device for the engine, devices connecting the priming device to the starting means and means for adjusting the priming device independently of the starting means.

6. In a motor vehicle the combination with an explosive engine having an air port of a carbureter connected to the engine independently of the air port, a valve for the air port, a starting means for mechanically turning over the engine and devices connecting the latter and the air valve.

7. In a motor vehicle the combination with an explosive engine of a carbureter for the same, a valve and float for the carbureter, a starting means for turning over the engine, and devices for causing a flow of gasolene by the starting means operating the float.

8. In a motor vehicle the combination with an explosive engine of a starting means for turning over the same, a carbureter, a priming means for causing an excess of gasolene in the carbureter, and a drip catching device on the carbureter operated by the starting means.

9. In a motor the combination with an explosive engine, of a starting means for turning over the same, a carbureter, devices for increasing the richness of the mixture in the carbureter controlled by the starting means, and independent mechanism for similarly controlling the carbureter from the vehicle seat independently of the movement of the starting means.

10. In a motor vehicle the combination with an explosive engine, of a starting means for turning over the same, a carbureter, devices for increasing the richness of the mixture in the carbureter operated by the starting means which automatically return to normal position after the engine is started, and mechanism for moving and holding said devices after the engine is running.

11. In a motor vehicle the combination with an explosive engine, of a starting device for turning over the same, a carbureter, and means connecting the starting device to the carbureter for increasing or decreasing the amount of air supplied to the carbureter according to the movements of the starting device.

12. In a motor vehicle the combination with an explosive engine, of a starting crank for the same, a carbureter means for increasing the richness of the mixture in the carbureter operated by the starting crank according to the movements of the latter, and devices operated from the dash board of the machine for similarly adjusting said means and holding it in its adjusted positions.

13. In a motor vehicle the combination with an explosive engine, of a starting crank for the same, a carbureter for the engine and means for increasing the richness of the mixture in the carbureter by the inward movement of the crank to couple it to the crank shaft.

14. In a motor vehicle the combination with an explosive engine, of a starting crank for the same, a carbureter having a movable priming device and a movable drip device for supplying an excess of gasolene, arranged to operate successively, means of setting or operating said devices from the starting crank and independent means for operating said devices from the dash board.

15. In a motor vehicle the combination with an explosive engine, of a carbureter, a starting means for turning over the engine, and devices controlled by the starting means for securing a richer mixture of fuel from the carbureter for starting.

16. In a motor vehicle the combination with an explosive engine of a starting means for turning over the engine, means for priming the engine, and devices connecting the starting means and priming means for automatic correlated operation.

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

WILLIAM H. MUZZY.

Witnesses:
SOL BLICKMAN,
JOHN J. HOOVER.