L. J. PETRE.
CARBURETER.
APPLICATION FILED DEC. 28, 1907.

988,502. Patented Apr. 4, 1911.

2 SHEETS—SHEET 1.

Fig. 1.

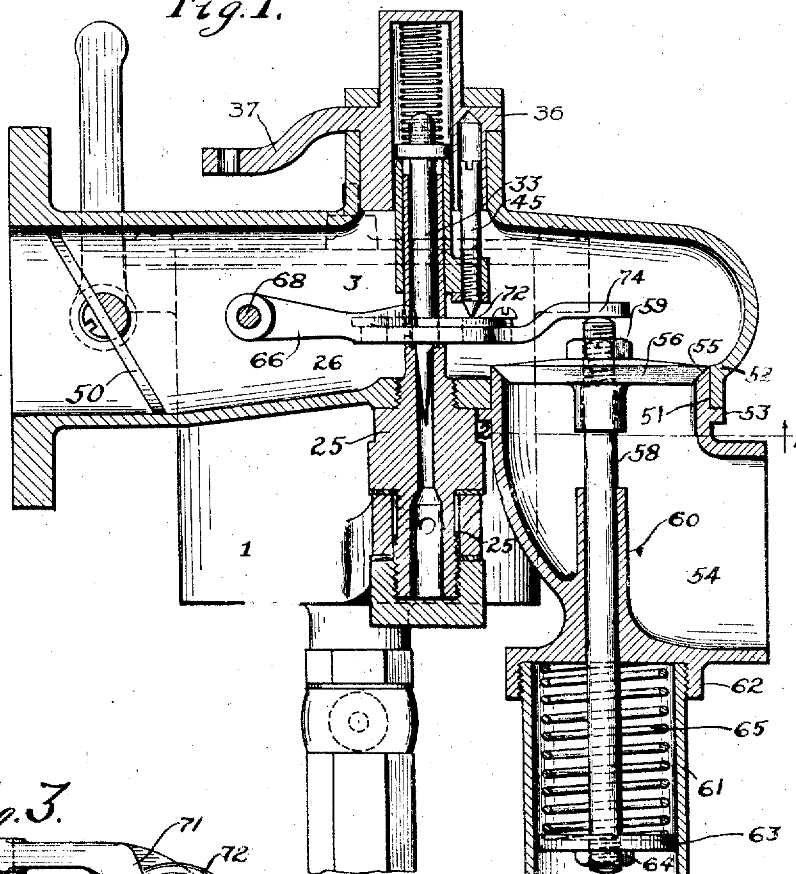
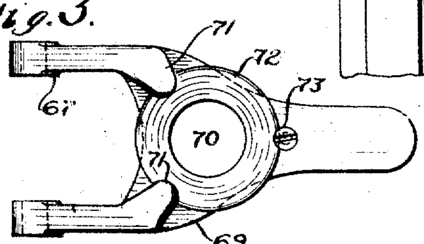


Fig. 3.



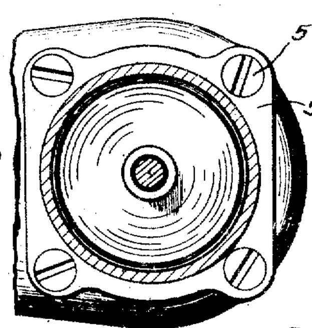


Fig. 2.

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2 SHEETS—SHEET 2.

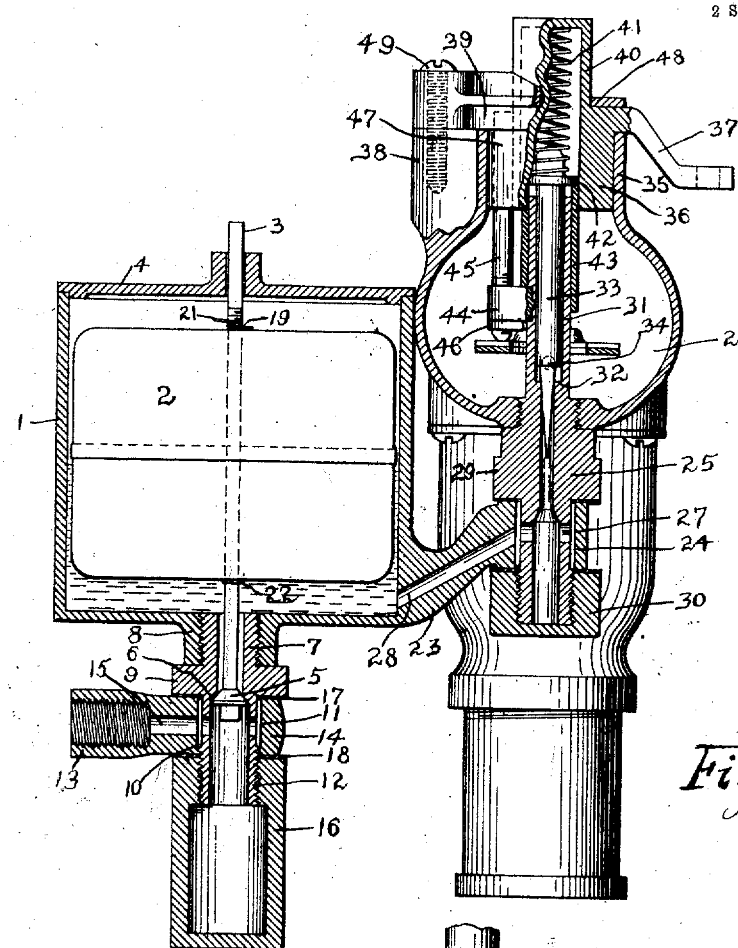

Fig. 4.

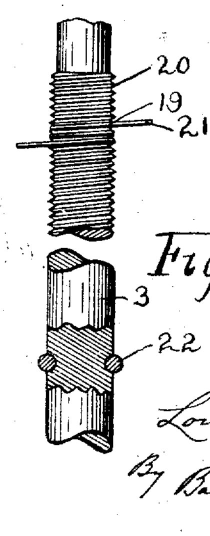

Fig. 5.

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UNITED STATES PATENT OFFICE.

LOUIS J. PETRE, OF EAST CLEVELAND, OHIO.

CARBURETER.

988,502. Specification of Letters Patent. Patented Apr. 4, 1911.

Application filed December 28, 1907. Serial No. 408,371.

To all whom it may concern:

Be it known that I, LOUIS J. PETRE, a citizen of the United States, residing at East Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Carbureters, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

This invention relates to carbureters of the type disclosed in my application No. 376,966 filed June 3rd, 1907, wherein means are provided for maintaining constant the proportion between the air and the gasolene vapor admitted to the mixing chamber notwithstanding wide fluctuations in the openings of said valves, and wherein the opening of the valves is accomplished only when a high suction obtains in the engine or engines with which the mixing chamber is connected.

The objects of the invention are generally to improve and simplify the construction and operation of carbureters of this type.

Generally speaking, the invention may be defined as consisting of the combinations of elements embodied in the claims hereto annexed and illustrated in the drawings, wherein—

Figure 1 represents a longitudinal, sectional view taken through the central portion of a carbureter constructed in accordance with my invention, the throttle valve being shown in elevation. Fig. 2 represents a sectional view on the line 2—2 of Fig. 1, looking in the direction of the arrows. Fig. 3 represents a detail in plan of the lever connecting the air and gasolene valves. Fig. 4 represents a transverse sectional view of the device shown in Fig. 1, and Fig. 5 represents an enlarged detail of the gasolene valve stem showing the manner in which the stem is secured to the float.

Gasolene, which flows as a liquid when only a slight vacuum is created, vaporizes readily and flows as a gas when the suction is increased. Consequently, the hole which was of the right size to admit the proper quantity of gasolene is too large for the vapor of gasolene, and too rich a mixture results.

My invention does away with the necessity of adjustment and the carbureters built on the principles of my invention operate strictly in accordance with the law governing the flow of fluids. By keeping the suction practically constant the gasolene will always flow in the same vaporous condition and the quantity will always be proportional to the size of the opening. Thus it will be seen that if a fixed ratio of size be maintained between the gasolene and the air openings, an unvarying proportion of the two fluids will follow. In my invention I have so arranged the air valve and the fuel valve that any movement of the former causes an exactly proportionate movement of the fuel valve, thereby always giving a perfect mixture no matter what the speed of the engine may be.

The above principles of my invention are embodied in the constructions shown in the accompanying drawings, in which—

1 represents the float chamber, which is provided with a hollow metal float 2 therein mounted on the valve stem 3, the upper end whereof extends through and is guided by the cover 4, and the lower end whereof is provided with the valve 5, shown as an upwardly seating tapered valve coöperating with the correspondingly tapered seat 6. The valve 6 is provided in a tubular connection, the upper end 7 whereof is threaded into a nipple 8, projecting from the bottom of the float chamber. The tubular connection is provided with an internal nut 9 adapted to abut against the lower end of the nipple 8 by means of which the connection may be threaded into said nipple. Below the nut, the connection is provided with a plain or unthreaded portion 10 having oppositely located ports 11 therein and below said plain portion with the threaded end 12.

13 denotes the gasolene supply connection having a sleeve 14 adapted to fit loosely the smooth portion 10 and provided with a passageway 15 adapted to communicate with either of the ports 11. The connection 13 is ordinarily held in place by means of the elongated hollow nut 16, which is threaded on the lower end 12, washers 17 and 18 being provided between the upper and the lower surfaces of the sleeve and the nuts 9 and 16 respectively.

Float 2 is retained in place on the valve stem by means of a spiral wire 19 applied to the stem above the top of the float. The pitch of this spiral is equal to the pitch of the threads 20 on the upper end of the valve stem and said wire is provided with extended ends 21 for a purpose to be described. At a proper distance from the valve opening, stem 3 is provided with a circular groove into which is fitted a wire 22 forming a support for the lower end of the float. In applying the float to the stem, it is only necessary to insert the upper end of the valve stem through the float. The float will rest upon wire 22. Spiral wire 19 is then applied to the top of the valve stem by pressing the arms 21 toward each other. By holding one of said arms and turning the stem 3, the wire may be threaded along the stem in the same manner as a nut until it engages the top of the float. The employment of the recess in the stem and the wire 22 enables me to form an abutment for the lower surface of the float without enlarging the valve stem, and this enables me to employ a relatively small sized bore in the tubular connection and yet maintain a sufficient passageway around the stem for the flow of gasolene into the float chamber.

The float chamber is provided with a lateral arm 23 having a sleeve 24 at the end thereof loosely fitting the tubular connection 25 which is threaded into the bottom of the mixing chamber 26. The connection 25 is provided with a pair of oppositely-arranged ports 27 adapted to register with the passageway 28 in the arm 23, although such registration is not necessary, owing to the fact that the part containing the ports is constricted so that the gas or liquid may flow around it and enter the ports irrespective of their position with respect to the passageway. Sleeve 24 is retained in place between nuts 29 and 30 on the connection 25. The upper portion of 25 is reduced at 31, and such reduced portion extends upwardly through the bore of chamber 26 and is provided with a valve seat 32 for the valve 33 which admits the gasolene vapor into the mixing chamber. Owing to the fact that it is necessary to operate my device under relatively high suction, or minus pressure, in the mixing chamber, the ordinary level of gasolene in the float chamber 1 will be considerably below the outlet port 34 in tube 31, normally preventing gasolene from entering the mixing chamber in a liquid condition. Above valve seat 32, the mixing chamber is provided with a tubular bearing 35 adapted to receive a sleeve 36 having an operating handle 37. Said sleeve is provided at one side thereof with an internally threaded boss 38 the upper edge whereof is flush with the top of the sleeve. The top of sleeve 36 is provided with a flange 39 adapted to rest on top of bearing 35 and boss 38. The central portion of said sleeve is extended upwardly at 40, providing a chamber for the reception of the spring 41, the lower end whereof bears against the flange 42 on the valve 33.

43 denotes a tubular sleeve mounted on the upper end of the tubular connection 25, the upper end of which sleeve projects above the top of 31 and engages flange 42 when valve 33 is seated. Sleeve 43 is provided with a boss 44 which is internally threaded for a pin or screw 45, which is threaded through said boss and provided with a lock-nut 46 applied to its lower end. The upper end of screw 45 projects into a cylindrical recess 47 provided in sleeve 36, and sleeve 36 is retained in place by a clamp 48, which surrounds the extension 40 and is secured to boss 38 by means of a screw 49. By tightening screw 49, the friction of clamp 48 on the adjacent surface of sleeve 36 may be adjusted as desired, so as to permit the rotation of the sleeve and screw 45 and retain the same in any desired position. The recess 47 is shown on the opposite side from handle 37 and serves as an index for the position of pin or screw 45. The construction described provides a rotary lever-engaging member for valve 33, as will appear hereinafter.

The mixing chamber 26 is elongated and is provided at one end thereof with a throttle valve 50. The opposite end is closed, and said chamber is provided beyond the connection of 25 therewith with an enlarged circular aperture 51. The bottom of the chamber surrounding said aperture is provided with a flange 52 against which abuts a flange 53 forming preferably an integral part of the elbow 54 through which air is admitted to the chamber. The upper end of said elbow fits the aperture 51 snugly and is provided with a beveled edge for the air valve 56. Flange 53 is provided with equi-distant apertures for the reception of screws 57, and said flange is preferably square in outline with an aperture at each corner, whereby the elbow connection 54 may be applied to the bottom of the mixing chamber at varying angles to meet the conditions of use, the bottom of the chamber being provided with threaded apertures (not shown) for the reception of said screws. Valve 56 is provided with a valve stem 58 which is threaded therethrough, a lock-nut 59 being provided on the upper end of said stem. This stem projects downwardly through a cylindrical boss 60 formed with said elbow into the cylinder 61 of a liquid dash-pot carried by said elbow. This dash-pot is carried by the under side of the elbow, the cylinder being threaded into an internally-threaded flange 62 formed with said elbow. At its lower end, the stem 58 is provided with the piston 63 of the dash-pot, said piston being retained in place by means of the nut 64. Between said piston and the lower surface of the elbow, there is interposed a spiral spring 65, the operation of which will be described in detail hereinafter.

66 denotes a lever which is horizontally pivoted to the mixing chamber at a point between the throttle valve 50 and the gasolene valve 33. This lever is forked and each

fork is provided with a tubular bearing 67 for the pivot rod 68. These forks project from a generally triangular body 69, said body being provided with a circular aperture 70, for the reception of the tubular connection 31 and the valve therein and being provided with lugs 71 adapted to overhang and assist in retaining a washer 72 on the upper surface of said lever. A screw 73 is threaded into said lever in position to have its head engage another portion of the washer and, with lugs 71, retain the same in place. As will appear more particularly from Fig. 1, the lever is deflected downwardly intermediate of the ends thereof and the free end of said lever is elevated, whereby the center of the pivot of said lever, top of washer 72 and lower surface of the free end 74 are in substantially the same horizontal line. The point of screw 45 is adapted to engage the upper surface of washer 72 when valve 33 is seated. From this arrangement, it follows that the lift of valve 33 will always be proportional to the lift of valve 66 and, by properly proportioning the said valves and their ports, a constant proportion will be maintained between the opening of the gasolene port and the opening of the air port.

In order to avoid gasolene being supplied to the mixing chamber in a liquid condition, I not only maintain constant the suction or minus pressure at which the air valve will open and, through the lever 66, open the gasolene valve, but oppose to such opening movement a relatively high resistance. In practice, I have found that this resistance should be from 10 to 14 ounces. I accomplish this result by means of the spring 65 interposed between piston 63 and the opposite end of the dash-pot, placing the said spring under such compression that the air valve will not open until a suction or minus pressure of ten or fourteen ounces has been produced in the engine cylinder. By employing a long spring, as shown, the resistance opposed to the further opening of the valve will not materially increase. In fact, there will not be a variation of more than two ounces between the suction required to open the valves to a minimum distance and the suction required to open the valves to a maximum distance. An important feature of maintaining so nearly constant the proportion between the movements of the air and gasolene valves is that it enables me to us a straight taper for the gasolene valve and still maintain a constant proportion between the air and gasolene supplied to the mixing chamber.

Should it be desirable to vary the proportions between the gasolene and the air admitted to the mixing chamber, this can be accomplished by rotating the handle 37 in the appropriate direction, thereby shifting the connection between the lever 66 and the gasolene valve to or from the pivot 68. By moving the screw or pin inwardly, the opening of the gasolene valve relative to the opening of the air valve will be diminished, while by moving the screw or pin outwardly or toward the free end of the lever, the opening of the gasolene valve relative to the opening of the air valve will be increased. In any event, after the predetermined proportion between the gasolene and air has been secured by adjusting the handle 37, such proportion will be maintained constant thereafter notwithstanding variations in the extent of opening of said valves.

It will be noted that the bottom wall of the mixing chamber tapers from the gasolene connection toward the throttle valve 50. Should any gasolene escape in liquid condition from such connection, it will run down the wall of the mixing chamber to the lower edge of the throttle valve, where it will be in position to be atomized or vaporized by the air which is drawn in through the air valve.

By the construction herein described, I produce a form of carbureter which is particularly well adapted to carry out the principles of my invention as disclosed in my prior application, and which is compact, simple of construction, easily assembled and disassembled and which is adapted to all ordinary incidents of use. The manner of constructing and locating the dash-pot enables me to ship the carbureter without the necessity of having the glycerin or other liquid inserted into the dash-pot after its arrival at the point of use and without danger of spilling the contents thereof during shipment.

I claim:

1. In a carbureter, the combination of a carbureting chamber, having an opening in the bottom thereof, an elbow projecting downwardly from said opening and provided on its lower surface with a threaded seat, a cylinder threaded onto said seat, a valve on the upper end of said elbow and having a stem projecting into said cylinder, a piston on said stem, a spring interposed between said piston and said seat, a valve controlling the supply of fluid fuel to said chamber, and connections whereby said valves may be operated simultaneously, substantially as specified.

2. In a carbureter, the combination of a carbureting chamber having in the bottom thereof an air port, a valve controlling said air port, means for retarding the closing of the air port valve, a connection for supplying fluid fuel to said chamber, a valve controlling the flow of fluid fuel through said connection, and a lever connecting said valves, said lever being pivoted adjacent to one end thereof and engaging the air valve

at its free end and engaging the fluid fuel valve intermediate of its ends, the valve-engaging portions and the pivot of the lever being in substantially the same straight line, substantially as specified.

3. In a carbureter, the combination of a carbureting chamber having an air port and a fluid fuel port, valves controlling said ports, means for retarding the closing of the air port valve, a lever connecting said valves, said lever being pivoted adjacent to one end thereof and engaging the air valve at its free end and engaging the fluid fuel valve intermediate of its ends, the valve-engaging portions and the pivot of the lever being in substantially the same straight line, substantially as specified.

4. In a carbureter, the combination of a carbureting chamber having an air valve, a valve for fluid fuel, a lever engaging said valves and adapted to be operated by the air valve, and means for varying the point of engagement of one of said valves therewith, substantially as specified.

5. In a carbureter, the combination of a carbureting chamber having an air valve, a valve for fluid fuel, a lever engaging said valves and adapted to be operated by the air valve, and means for varying the point of engagement of the fluid fuel valve therewith, substantially as specified.

6. In a carbureter, the combination of a carbureting chamber, an air valve, a fluid-fuel valve and a lever engaging said valves and adapted to be operated by the movement of the air valve, the portion of the fluid fuel valve engaged by the lever being revoluble to vary the distance thereof from the point at which said lever engages the air valve, substantially as specified.

7. In a carbureter, the combination of a carbureting chamber, an air valve, a fluid fuel valve, a sleeve surrounding the fuel valve revoluble with respect to said fluid fuel valve and operatively connected to the said valve, a lever-engaging member carried by said sleeve, and a lever engaging the air valve and having a surface adapted to engage said member, substantially as specified.

8. In a carbureter, the combination of a carbureting chamber, an air valve, a fluid fuel valve, a revoluble lever-engaging member for the latter valve, and a lever engaging the air valve and having a surface adapted to engage said member, substantially as specified.

9. In a carbureter, the combination of a carbureting chamber having an air port, a fluid fuel port, valves for said ports and means whereby said valves may be simultaneously operated, said means comprising a lever pivoted at one end thereof and having its other end operatively engaged with the air valve and being provided intermediate of its ends with an aperture through which the fluid-fuel valve extends, and a revoluble member connected with the latter valve and adapted to engage the lever at points outside of said aperture, substantially as specified.

10. In a carbureter, the combination of a carbureting chamber having an air port and a fluid fuel port, valves for said ports, a lever pivoted at one end and having its free end in operative engagement with the air valve and provided with an aperture intermediate of its ends through which the fuel valve extends, a washer surrounding said aperture, a sleeve revoluble with respect to the axis of the fluid fuel valve, a pin carried by said sleeve and adapted to engage said washer, and means whereby said sleeve may be rotated, substantially as specified.

11. In a carbureter, the combination of a carbureting chamber having an air port and a fluid fuel port, valves for said ports, a lever pivoted at one end thereof and having its free end in operative engagement with the air valve, said lever being provided with an aperture through the body thereof and a seat surrounding said aperture, said fuel valve extending through the aperture, a sleeve revoluble with respect to the axis of the fluid-fuel valve and operatively connected with said valve to open the same, a pin carried by said sleeve, a member engaging said pin, and a handle for rotating said member, substantially as specified.

12. In a carbureter, the combination of a carbureting chamber having an air port and a fluid fuel port, valves for said ports, a lever pivoted at one end thereof and having its free end in operative engagement with the air valve, said lever being provided with an aperture through the body thereof and a seat surrounding said aperture, said fuel valve extending through the aperture, a sleeve connected to and revoluble with respect to the axis of the fluid fuel valve, a pin carried by said sleeve and engaging the lever, a sleeve having a bore therein for the former sleeve and operatively engaging said pin, a handle for rotating the latter sleeve, and a clamp for the latter sleeve, substantially as specified.

13. In a carbureter, the combination of a carbureting chamber having ports for air and fluid-fuel, valves for said ports, a lever operatively engaged by the air valve, a member revoluble around the fluid fuel valve and operatively connected to said valve to open the same, and said revoluble member operatively engaging the lever, a second member for operating said revoluble member and provided with an operating handle serving as an index, substantially as specified.

14. In a carbureter, the combination of a carbureting chamber having ports for air and fluid fuel, valves for said ports, a lever operatively connected with said valves, the

said lever being pivoted at one end and having its free end in operative engagement with the air valve and being provided with a central aperture for the fluid fuel valve, said lever being provided with a pair of lugs on the top thereof, a washer inserted under said lugs and surrounding the aperture in the lever, a screw securing another portion of said washer to the lever, and a revoluble member connected to the fluid-fuel valve and having a point adapted to bear on said washer, substantially as specified.

15. In a carbureter, the combination of a carbureting chamber having in the bottom thereof a passage for fluid fuel and being provided with an air port, a port in said passage, valves controlling said ports, a connection between said valves whereby they operate simultaneously, and a rotary throttle valve in said chamber, the bottom of the chamber being inclined downwardly from said connection toward said throttle valve and forming an unobstructed sloping passage-way extending to a point directly beneath the lower edge of the throttle valve with the latter in closed position, substantially as specified.

16. In a carbureter, the combination with a carbureting chamber, of an air valve, a fluid fuel valve, and a member mounted adjacent to the said fuel valve and revoluble with respect to the axis of the latter valve, said member being operatively connected to the fuel valve, an adjustable member carried by the last mentioned member, and a lever engaging the air valve and engaging the adjustable member, substantially as specified.

17. In a carbureter, a carbureting chamber, an air valve and a fluid fuel valve therefor, the air valve being opened by direct suction thereon, and lever means for communicating an opening movement from the air valve to the fluid fuel valve, the point of contact of said means with at least one of said valves and the fulcrum of said means being relatively adjustable.

18. In a carbureter, the combination of a carbureting chamber, a multiple of normally closed valves for said chamber, a part of said valves controlling the admission of air and a part the admission of fluid fuel to said chamber, mechanical means for causing said valves to have opening movements in unison, and means for adjusting the point of contact of said means with at least one of said valves, at least one of said valves being opened by direct suction action thereon.

19. In a carbureter, the combination of a carbureting chamber, an air valve and a fluid valve associated therewith, said valves being normally seated and the former opened by direct suction thereon, means for retarding a closing of the air valve, and lever means for communicating opening movements in unison from one to the other of said valves, the point of contact of said means with at least one of said valves and its fulcrum being relatively adjustable.

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

LOUIS J. PETRE.

Witnesses:

J. B. HULL,

BRENNAN B. WEST.