

L. S. CHADWICK.  
 VALVE MECHANISM.  
 APPLICATION FILED MAR. 9, 1907.

1,001,352.

Patented Aug. 22, 1911.

4 SHEETS—SHEET 1.

Fig 1

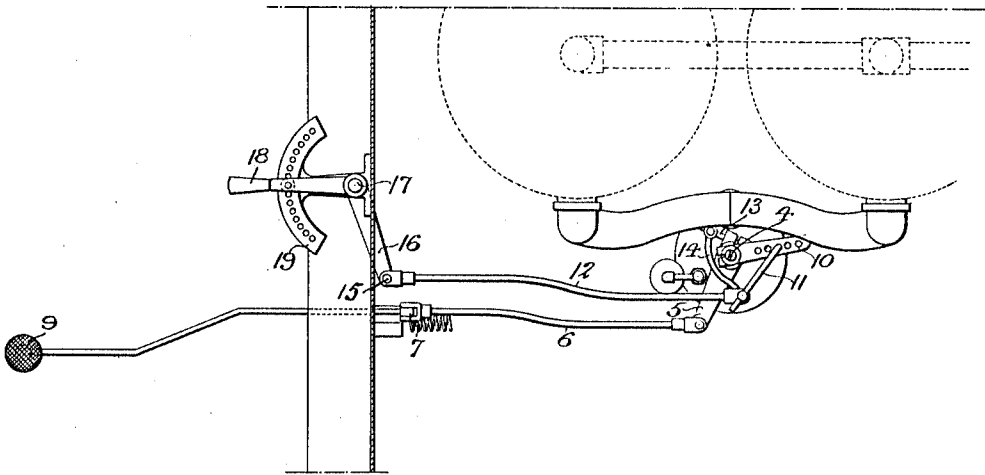
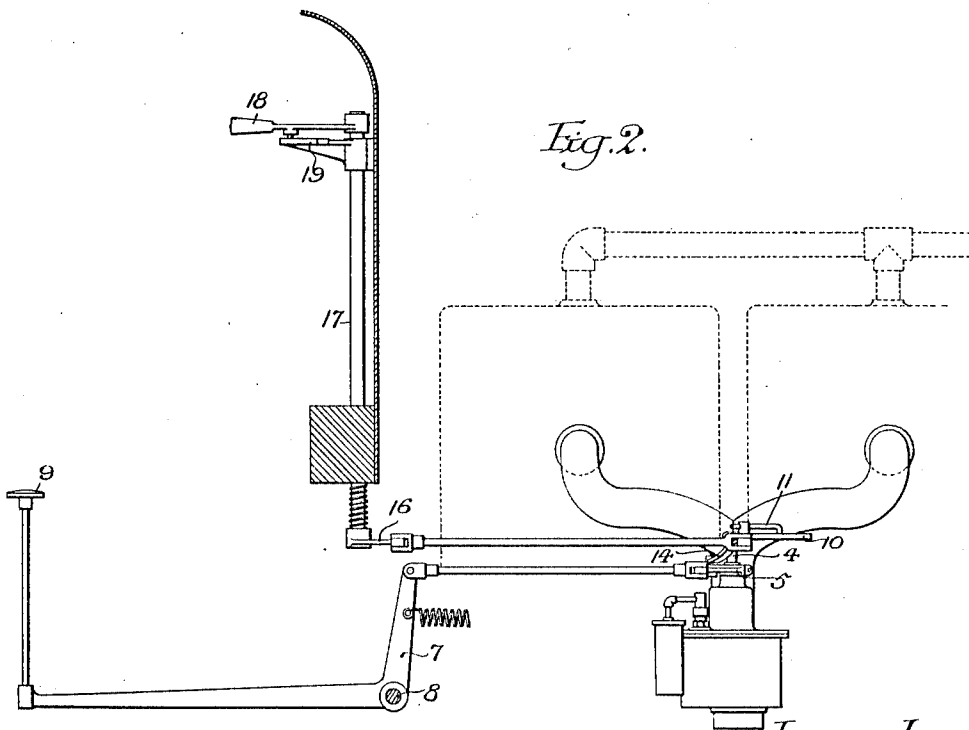


Fig. 2.



Witnesses:  
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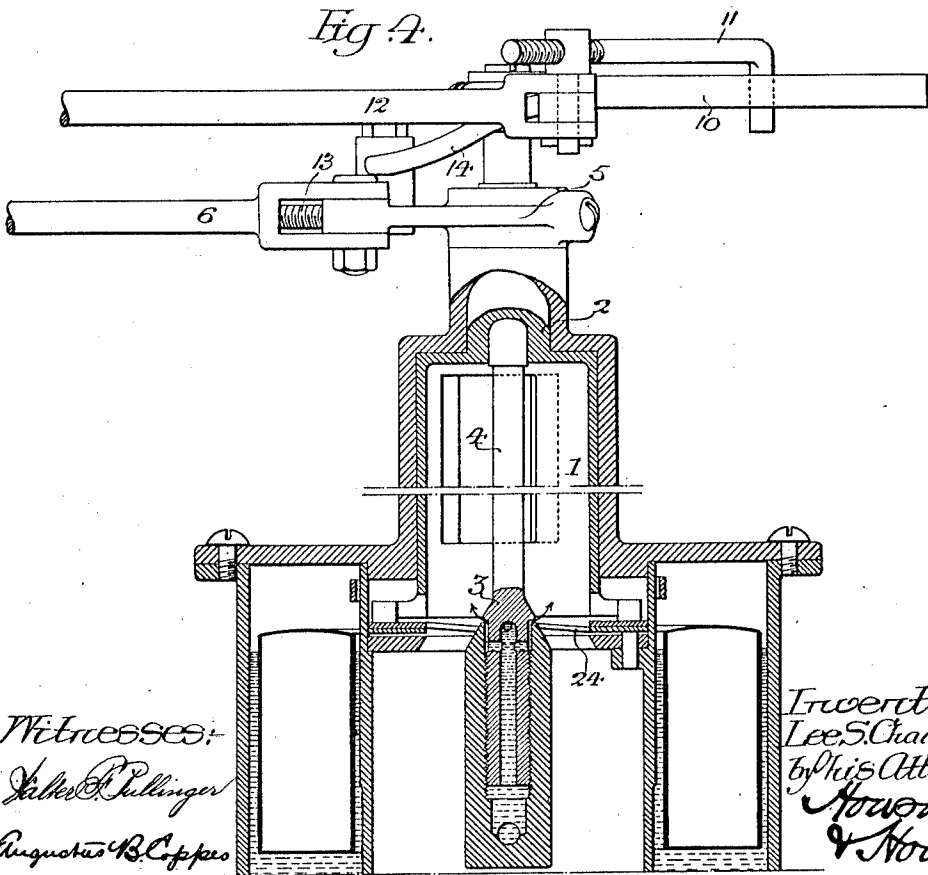
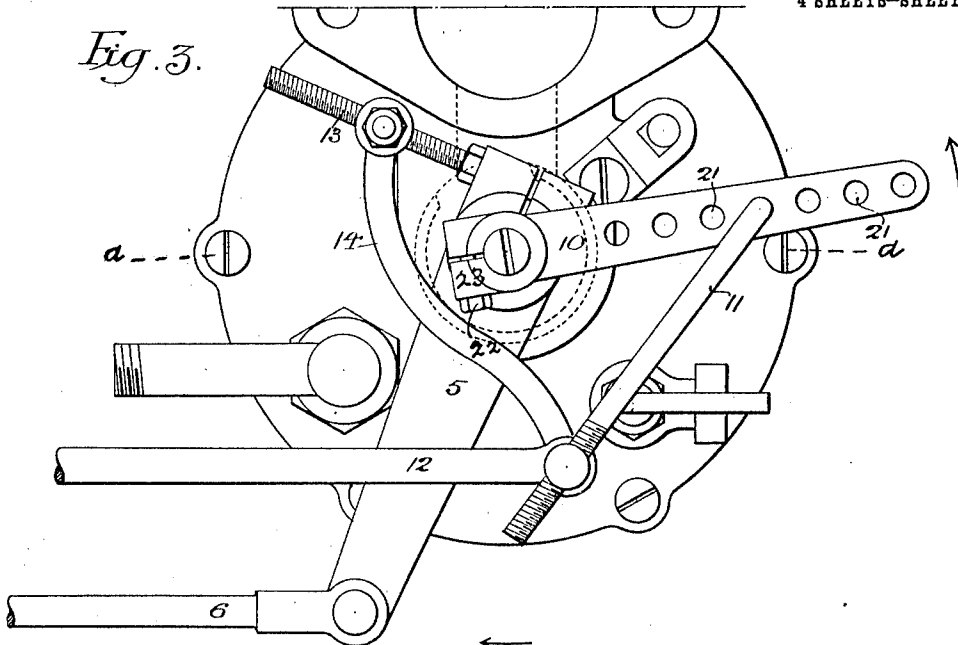
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4 SHEETS-SHEET 2.



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4 SHEETS—SHEET 3.

Fig. 5.

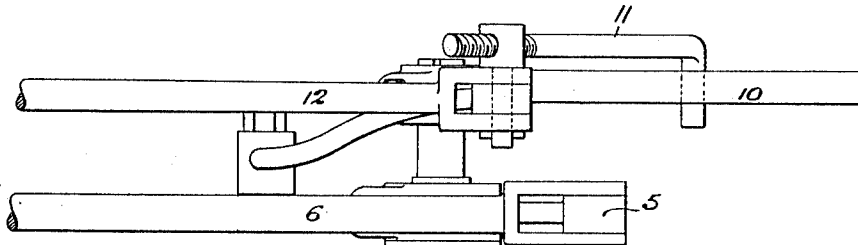
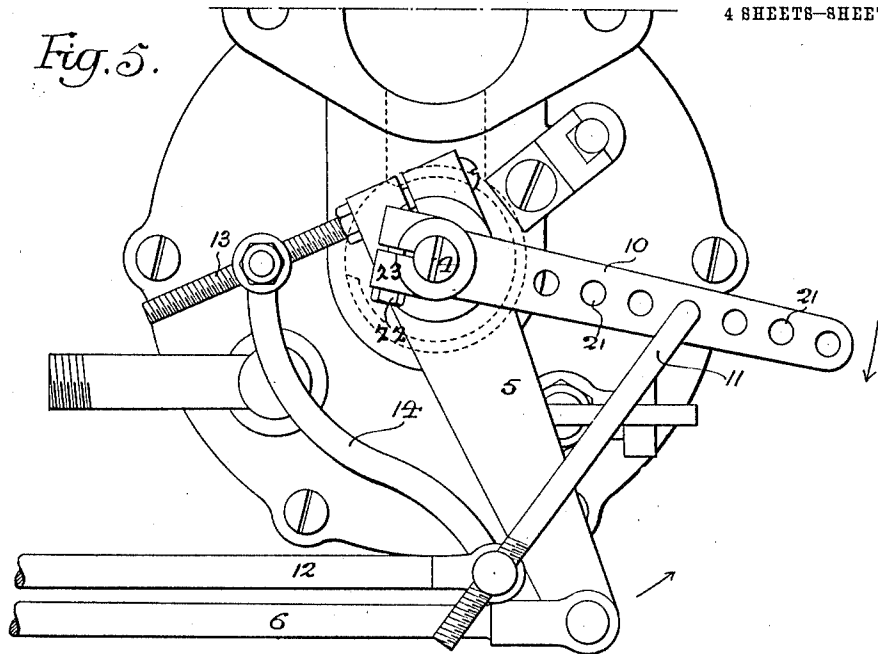
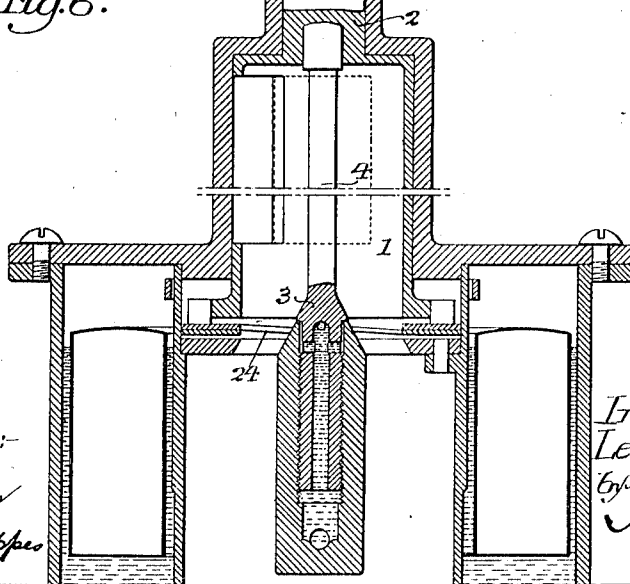


Fig. 6.



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4 SHEETS—SHEET 4.

Fig. 7.

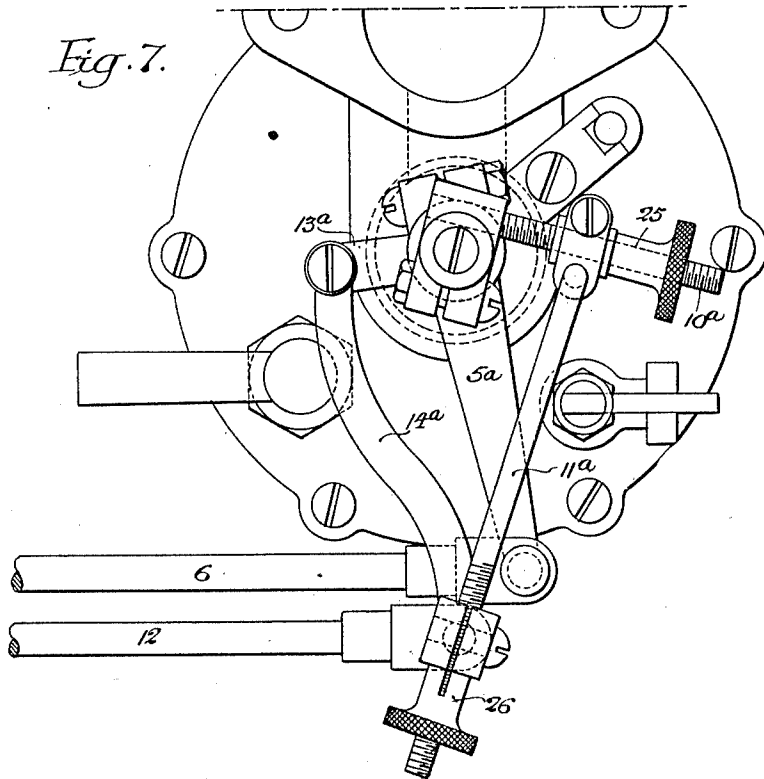
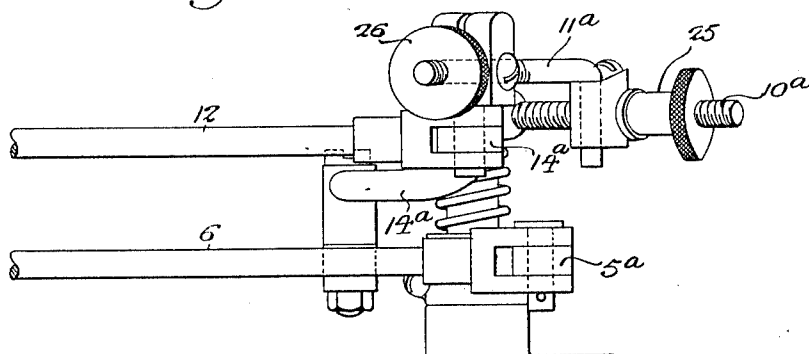


Fig. 8.



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# UNITED STATES PATENT OFFICE.

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## VALVE MECHANISM.

1,001,352.

Specification of Letters Patent. Patented Aug. 22, 1911.

Application filed March 9, 1907. Serial No. 361,430.

To all whom it may concern:

Be it known that I, LEE S. CHADWICK, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Valve Mechanism, of which the following is a specification.

My invention relates to carbureters for internal combustion engines, and the object of my invention is to regulate the amount of gasolene discharged into the mixing chamber when the throttle valve is open; the throttle valve and gasolene valve mechanism being combined in such manner that the discharge of gasolene is in direct proportion to the extent of opening of said throttle valve.

My invention is fully shown in the accompanying drawings, in which:

Figure 1, is a plan view of sufficient of the mechanism of an internal combustion engine, shown in this instance as carried by an automobile, to illustrate my invention; Fig. 2, is a side elevation of the same; Fig. 3, is a plan view showing the adjusting and regulating mechanism forming the subject of my invention, in the position when the gasolene and throttle valves are open; Fig. 4, is a sectional view of the gasolene tank showing the valve controlling the delivery of gasolene and the throttle valve, taken on the line *a-a*, Fig. 3; Fig. 5, is a plan view similar to Fig. 3, showing the position of the parts of the adjusting and regulating mechanism when the valves are closed; Fig. 6, is a sectional view similar to Fig. 4, with the valves closed; Fig. 7, is a plan view similar to Figs. 3 and 5, illustrating a modified form of the controlling devices, and Fig. 8, is a view somewhat similar to the upper part of Figs. 4 and 6, showing in elevation the parts of the adjusting and regulating mechanism illustrated in Fig. 7.

As is well known, it is the common practice to combine the mechanism for operating the valve controlling the discharge of gasolene with the mechanism for operating the throttle valve, so that as said throttle valve is opened the gasolene valve will also open and gasolene will be admitted to the mixing chamber in direct proportion to the opening of said throttle valve, and this arrangement is such that when the throttle valve is closed, the gasolene valve will be partly or fully closed, and when the throttle valve is fully opened the gasolene valve will be in the same position. It often happens,

however, that the character of the gasolene or the type of engine with which such carbureter is to be combined is not the same in every instance and it becomes desirable to be able to change the relation of the opening of the gasolene valve of such carbureter relatively to the opening of the throttle valve of the engine, and the ready accomplishment of such action is the purpose of my invention.

In the drawings herewith, 1 represents a throttle valve having a stem 2, and 3 the gasolene valve having a stem 4, which latter passes through the stem of the throttle valve. The lower end of the stem carrying the gasolene valve is threaded, the pitch of said threads being such that the limited movement of the stem will serve to open the valve sufficiently. The stem of said throttle valve has an arm 5 to which a link 6 is attached; said link being connected at its outer end to a bell-crank 7, pivoted at 8 and having operating means such as the foot treadle 9, or it may be connected to any other form of lever for actuation in any suitable manner.

The stem 4 of the gasolene valve is provided with an arm 10, apertured for a purpose to be hereinafter described, and this arm is connected by means of a threaded rod 11 with a link 12; the latter being connected with a threaded rod 13 carried by the arm 5, by means of a link 14, which in some instances may be curved as shown. The link 12 is connected at its outer end with an arm 16, to which a vertical spindle 17 is connected, and having a controlling lever 18 for operating the same, such lever carrying means whereby it may be locked to a segmental plate 19 when once adjusted. This adjustment is usually made when testing out the engine preparatory to sale or other disposition and is rarely changed except for climatic conditions. A further adjustment, however, may be necessary with different grades of gasolene, and it will be understood, of course, that the adjustment of the valve controlling or regulating mechanism will differ in all engines.

In the adjustment of the mechanism forming the subject of my invention, the character of the gasolene and the required amount to be employed in the operation of the engine under consideration is tested, and the position of the link 12 is adjusted by means of the threaded rod 11 with ref-

erence to its connection with the bar 10; the latter being apertured at 21 to permit engagement of the end of the rod 11 therewith whereby the proper relation between the opening of the gasolene valve and the throttle valve may be established. The bar 10 has been previously adjusted in relation to the valve stem 4 to directly regulate the opening of the gasolene valve, and then held by a bolt 22 passing through the split end 23 of the same. When this has been determined, the controlling lever 18 is fixed and the mechanism is ready for operation. The operator is thus assured that the gasolene valve will open sufficiently to discharge the proper amount of gasolene for any degree of opening of the throttle valve. Upon actuating the foot-lever 9, or other lever or means properly connected to the link 6, the throttle valve will be directly opened through the medium of the arm 5 to which said link is pivotally connected. At the same time the gasolene valve will be opened, and such opening of the latter valve is accomplished in the following manner: As the arm 5 connected to the stem 2 of the throttle valve is being moved by the link 6 to open said valve, it serves to move the link 12 through the medium of the rod 13 and link 14; such movement of the link 12 being in a slightly lateral direction, or, more properly speaking, in the arc of a circle struck from the center of the pivotal connection of said link 12 with the arm 16. This movement of the link 12 causes it to actuate the bar 10, connected to the stem 4 of the gasolene valve, through the medium of the link 11, and thereby open said gasolene valve simultaneously with the opening of the throttle valve.

In addition to the lateral or oscillatory movement of the link 12 from its pivotal connection with the arm 16, it may be moved longitudinally for the purpose of adjusting the extent to which the gasolene valve will open with respect to the extent of opening of the throttle valve, by operating the lever 18. This adjustment when once made, however, rarely requires change, and the movement of the link 12 in making such adjustment has nothing whatever to do with the subsequent movement of said link through the means described for the purpose of operating the gasolene valve with respect to the throttle valve during the running of the engine. By reason of this correlation of the valves, the opening of the gasolene valve is always in the desired proportion with respect to the opening of the throttle valve. The throttle valve also may be provided with a shutter valve 24, to regulate the supply of air admitted to the mixing chamber.

In Figs. 7 and 8, I have shown a simplified form of the adjusting mechanism

forming the subject of my invention, in which I employ a threaded stem 10<sup>a</sup> (in lieu of the bar 10,) and movable upon which is a threaded sleeve 25, to which an arm 11<sup>a</sup>, (taking the place of the rod 11,) is pivotally connected. Although this construction involves the same idea as that shown in Figs. 3, 4, 5 and 6, it will be observed that the particular construction enables me to effect a much easier and finer adjustment of the extent of opening of the valves. In this construction too, it will be noted that the arm 13<sup>a</sup>, (corresponding to the arm 13, as shown in Figs. 3, 4, 5 and 6,) has a fixed pivotal connection for the arm 14<sup>a</sup>, (corresponding to the arm 14 of the other structures). The arm 14<sup>a</sup> is pivotally connected to the link 12, and the pin forming such connection carries a threaded sleeve 26 in which the rod 11<sup>a</sup> is adjustable; the end of the latter being bent for engagement with the sleeve 25.

In the preparatory setting of this device, it is only necessary to operate the threaded sleeve 25, the necessary adjustment of the rod 11<sup>a</sup> with respect thereto being accomplished by movement of the sleeve 26 on said rod, which carries the pivot pin for the rod 14<sup>a</sup> and link 12. In all other respects the operation of this mechanism and the result accomplished is precisely similar to that of the structure shown in Figs. 1 to 6, inclusive.

I claim:

1. In valve mechanism for internal combustion engines, the combination of a throttle valve, a gasolene valve, means for coupling said valves whereby the movement of one directly controls the movement of the other, and mechanism for setting or regulating the extent of opening of said valves relatively to each other, said mechanism comprising an arm connected to one of said valves, connected links extending from said arm, a second arm to which one of said links is attached, a shaft carrying said latter arm, a handle for moving said shaft, and means for locking said handle.

2. In valve mechanism for internal combustion engines, the combination of a throttle valve, a gasolene valve, means for coupling said valves whereby the movement of one directly controls the movement of the other, and mechanism for setting or regulating the extent of opening of the gasolene valve relatively to the throttle valve, said mechanism comprising an arm connected to one of said valves, connected links extending from said arm, a second arm to which one of said links is attached, a shaft carrying said latter arm, a handle for moving said shaft, and means for locking said handle.

3. In valve mechanism for internal combustion engines, the combination of a

throttle valve, a gasolene valve, each rotatably movable to the open or closed positions on the same axis, adjustable means for coupling said valves whereby the movement of one will effect movement of the other, and means operable independently of the adjustable coupling means for setting or regulating the extent of opening of the gasolene valve relatively to the throttle valve.

4. In valve mechanism for internal combustion engines, the combination of a throttle valve, a gasolene valve, each rotatably movable to the open or closed position on the same axis, adjustable means for coupling said valves whereby the movement of one will effect movement of the other, and means operable independently of the adjustable coupling means for setting or regulating the extent of opening of the gasolene valve relatively to the throttle valve.

5. In valve mechanism for internal combustion engines, the combination of a throttle valve, a gasolene valve, each movable to the open or closed position on the same axis, adjustable means for coupling said valves whereby the movement of one valve controls the operation of the other, and means for setting or regulating the extent of opening of the gasolene valve relatively to the throttle valve, including a lever, and locking mechanism for said lever.

6. In valve mechanism for internal com-

bustion engines, the combination of a throttle valve, a gasolene valve, stems for said valves rotatably movable on the same axis, arms carried by said stems, an adjustable connection for said arms whereby the movement of one valve will effect the operation of the other, and means connected to said adjustable connection and operable independently thereof for setting or regulating the extent of opening of the gasolene valve relatively to the throttle valve.

7. In valve mechanism for internal combustion engines, the combination of a throttle valve, a gasolene valve, each movable to the open or closed position on the same axis, means for coupling said valves whereby the movement of one valve directly controls the movement of the other, mechanism for setting the extent of opening of the gasolene valve relatively to the extent of opening of the throttle valve, said mechanism comprising an arm connected to one of said valves, connected links extending from said arm, a second arm to which one of said links is attached, a shaft carrying said latter arm, a handle for moving said shaft, and means for locking said handle.

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

LEE S. CHADWICK.

Witnesses:

MURRAY C. BOYER,  
JOS. H. KLEIN.