J. B. ADLER AND T. F. GEHLE.

AUTOMATIC AIR SUPPLY CONTROL FOR INTERNAL COMBUSTION ENGINES.

APPLICATION FILED JULY 30, 1921.

1,413,371. Patented Apr. 18, 1922.

Fig. 1.

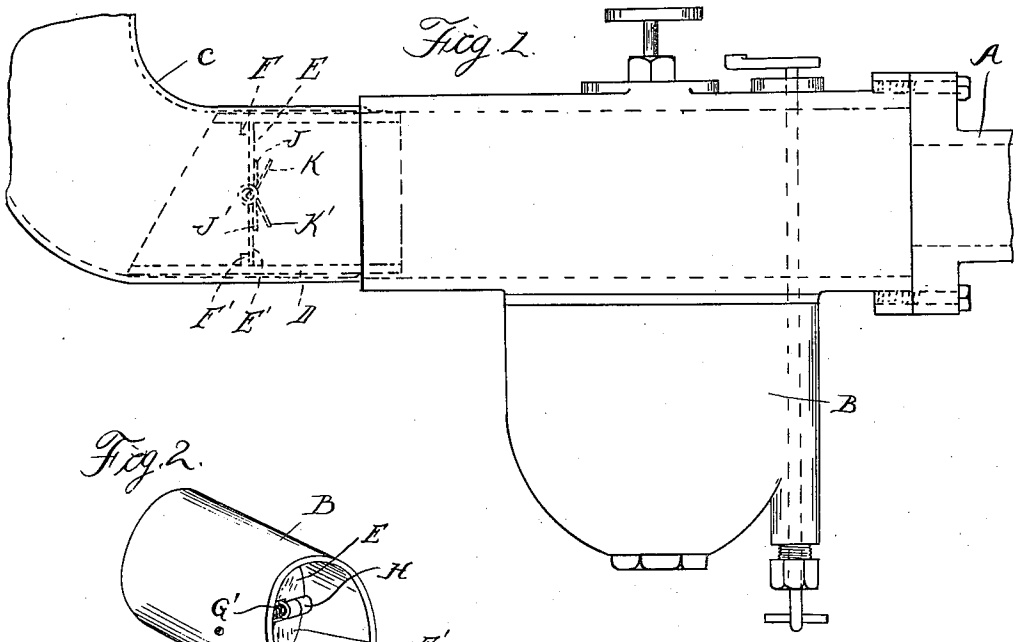


Fig. 2.

Fig. 3.

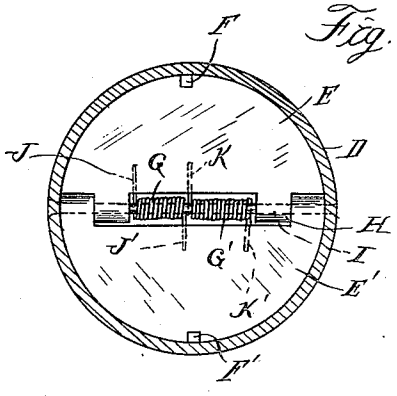
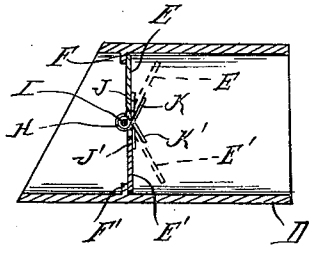


Fig. 4



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AUTOMATIC AIR-SUPPLY CONTROL FOR INTERNAL-COMBUSTION ENGINES.

1,413,371. Specification of Letters Patent. Patented Apr. 18, 1922.

Application filed July 30, 1921. Serial No. 488,743.

To all whom it may concern:

Be it known that we, JOHN B. ADLER and THEODORE F. GEHLE, both citizens of the United States of America, residing at Dearborn, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Automatic Air-Supply Controls for Internal-Combustion Engines, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates to controlling devices for the air supply to internal combustion engines and it is the object of the invention to obtain a better operation and economy in the use of fuel. To this end the invention consists in the construction as hereinafter set forth.

In the drawings:

Figure 1 is an elevation showing a portion of the intake of an internal combustion engine with our improvement attached thereto;

Figure 2 is a perspective view of the attachment;

Figure 3 is an enlarged cross-section thereof; and

Figure 4 is a longitudinal section.

A is the intake manifold of an internal combustion engine, B the carburetor attached thereto, and C the intake pipe to the carburetor which may, if desired, be provided with an air warming device (not shown). D is a cylindrical casing which is insertable in the intake C at a point adjacent to its connection to the carburetor. Within this casing is arranged a pair of complementary segmental valves E and E′ which normally completely close the cross-section but which are yieldable to permit the passage of air. The valves in their normal position resting against stops F and F′ and are yieldably held thereagainst by a spring G. As shown, the valves are mounted upon a central pin H to which they are secured by hinged eyes I. The spring G is preferably a torsional ring sleeved upon the pin H and having arms J and J′ extending oppositely and bearing against the valves E and E′ to press the same against the stops F and F′.

With the construction as thus far described whenever the engine is in operation, the valves F and F′ will be opened to a degree corresponding to the adjustment of the throttle. Thus if the engine is idling, the valves will remain nearly closed, but when the throttle is open, the higher vacuum carried down to the valves F and F′ will open the same to a greater degree, admitting a correspondingly larger volume of air. By properly adjusting the tension of the spring G, any desired effect may be produced, but a still better operation is obtained by a compound spring, the elements of which are brought into action. Thus, as shown in Figures 3 and 4, in addition to the spring G there is provided a second spring G′ sleeved upon the pin H, but the arms K and K′ of this spring do not initially bear against the valves F and F′. When, however, said valves are opened beyond a predetermined angle; they will be brought into contact with said arms K and K′ and the tension of the spring G′ will be added to that of the spring G.

In use, when the throttle is closed to idling position the valves E and E′ will close correspondingly and the vacuum of the manifold is transmitted to the carburetor so as to insure a proper amount of fuel. On the other hand, as the throttle is opened, the valves F and F′ will correspondingly open to supply the additional amount of air required.

What we claim as our invention is,—

1. The combination with the intake of an internal combustion engine and a carburetor attached thereto, of means controlling the air inlet to said carburetor comprising a cylindrical casing or sleeve, a pair of complementary hinged segments for completely closing the cross-sectional area of said sleeve, means for yieldably resisting the initial opening movement of said segments, and additional resistance means for yieldably operating against the further opening movement of said segments.

2. The combination with the intake of an internal combustion engine and a carburetor attached thereto, of means for controlling the air inlet to said carburetor comprising a cylindrical casing or sleeve, a pair of complementary hinged segments for completely closing the cross-sectional area of said sleeve, a pin to which said segments are hinged, stops for limiting the movement of said segments in an outward direction and a plurality of torsional springs sleeved on said pin, one of said springs resisting the initial opening movement of said segments and another of said springs being in-

itially free from said segments and yieldably resisting a further opening movement thereof.

3. The combination with the intake of an internal combustion engine and a carburetor attached thereto, of means for controlling the air inlet to said carburetor comprising a cylindrical casing or sleeve, a pair of complementary segments for completely closing the cross-sectional area of said sleeve, a pin to which said segments are hinged, stops for limiting the movement of said segments in an outward direction, and a plurality of torsional springs sleeved on said pin and successively engageable with said segments to variably resist the opening thereof.

In testimony whereof we affix our signatures.

JOHN B. ADLER.
THEODORE F. GEHLE.