

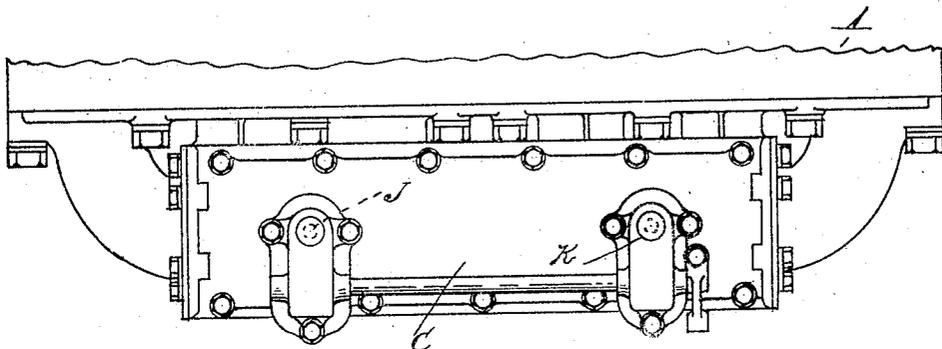
A. BACHLE.  
INTAKE MANIFOLD FOR INTERNAL COMBUSTION ENGINE  
APPLICATION FILED SEPT. 9, 1918.

1,379,327.

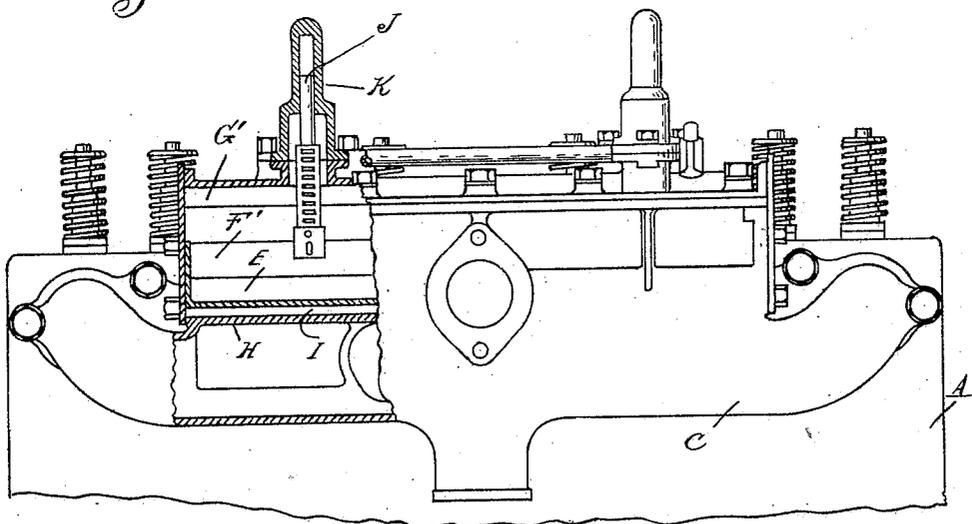
Patented May 24, 1921.

2 SHEETS—SHEET 1.

*Fig. 2.*



*Fig. 1.*



Inventor  
Andrew Bachle

*Whittemore, Hubert & Whittemore.*

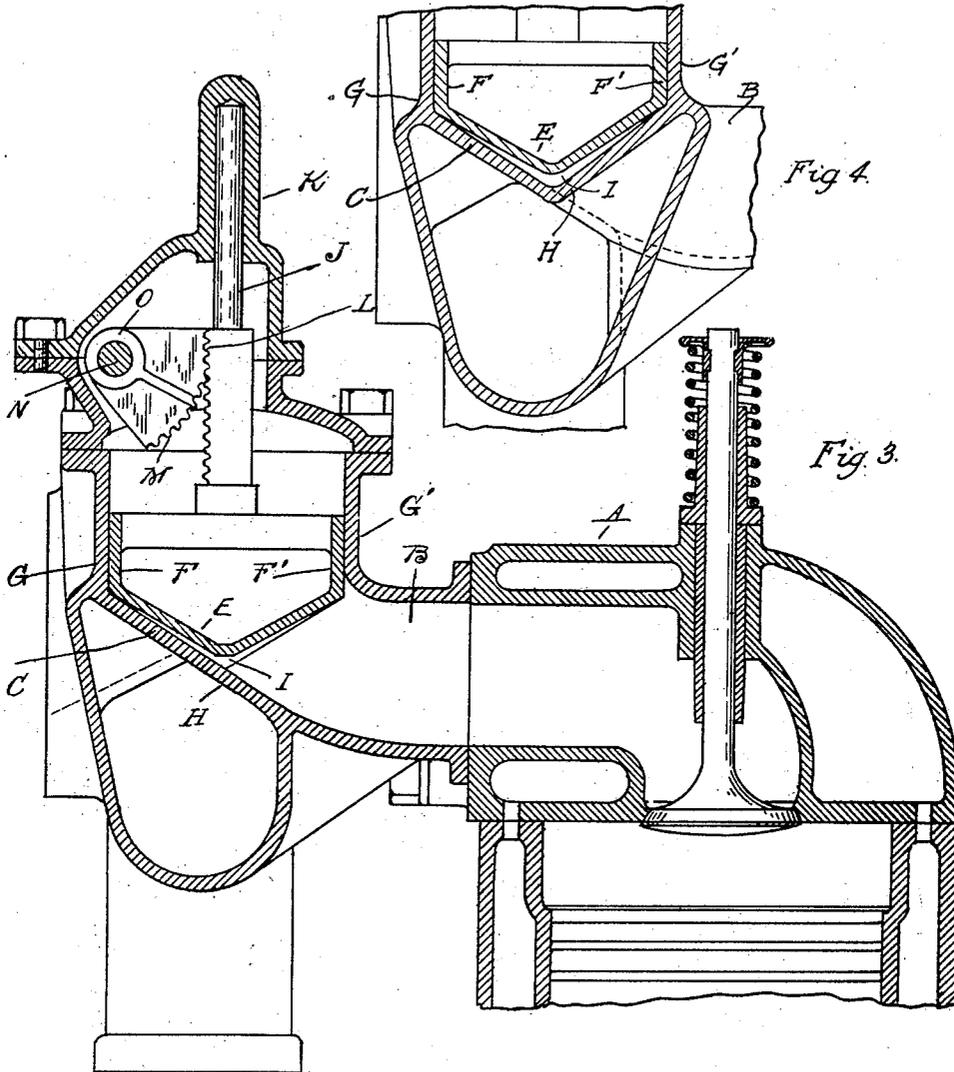
Attorneys

A. BACHLE.  
INTAKE MANIFOLD FOR INTERNAL COMBUSTION ENGINES.  
APPLICATION FILED SEPT. 9, 1918.

1,379,327.

Patented May 24, 1921.

2 SHEETS—SHEET 2.



Inventor  
Andrew Bachle

By *Whittmore, Hulbert & Whittmore*

Attorneys

# UNITED STATES PATENT OFFICE.

ANDREW BACHLE, OF DETROIT, MICHIGAN.

INTAKE-MANIFOLD FOR INTERNAL-COMBUSTION ENGINES.

1,379,327.

Specification of Letters Patent.

Patented May 24, 1921.

Application filed September 9, 1918. Serial No. 253,346.

*To all whom it may concern:*

Be it known that I, ANDREW BACHLE, a citizen of the United States of America, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Intake-Manifolds for Internal-Combustion Engines, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates to internal combustion engines and more particularly to the multi-cylinder type which are desired for using relatively low-grade fuels. It is the object of the invention to obtain uniformity in the character of the explosive mixture with varying loads and varying speeds. To this end the invention consists in the construction as described.

In the drawings:

Figure 1 is a sectional side elevation of a portion of a multi-cylinder internal combustion engine to which my improvement is applied;

Fig. 2 is a top plan view thereof;

Fig. 3 is a cross section through the outer line of an intake passage;

Fig. 4 is a detail cross-section of the manifolds taken at a point just aside of an intake passage.

A are the cylinders of a multi-cylinder internal combustion engine, B are the intake passages in the cylinders, and C is the common manifold for supplying the explosive gas to said passages from the carbureter. As usually constructed, the manifold is a conduit of fixed dimensions through which the explosive mixture is passed at varying velocities according to the degree to which the throttle is open. Thus with full open throttle the velocity of the gas through the manifold is relatively high, but when the throttle is in idling position the movement of the gas through the manifold is sluggish. Where low-grade fuels are used for forming the explosive mixture there is a tendency for the liquid to fall out from the air where the velocity is not high, and furthermore with low velocity there is not the mixing of the air with the liquid which is necessary in the formation of a good explosive gas.

I have overcome the defects just described by substituting for a manifold or intake conduit of fixed dimensions one in which the cross-sectional area may be varied. I have further provided means for throttling

by this variation in cross-section, thereby insuring the same velocity in all positions of adjustment.

In detail the manifold C is provided with an adjustable wall E preferably of a substantially V-shaped cross-section and having parallel side portions F and F' which slidably engage walls G and G' of the fixed member. This fixed member has a V-shaped portion H of slightly different angle from that of the portion E so as to leave a space I at the center between the walls, said space gradually tapering toward the opposite sides. The member E is connected with adjustment mechanism which, as shown, comprises guide stems J slidably engaging bearings K and having racks L which are in mesh with rack segments M mounted on a rock-shaft N. This rock-shaft is journaled in bearings O and may be actuated by a suitable lever to move the member E into different positions of adjustment.

With the construction as described, when the member E is in the position of adjustment shown in Fig. 3 a restricted passage is formed which is sufficient only to permit the flow of gas to the engine when idling. When, however, the shaft N is rocked the member E will be separated from the wall C enlarging the cross-sectional area of the passage and permitting a larger volume of gas to flow to the engine cylinders. Thus there will be a variation in the volume proportionate to the work, but the velocity of the gas while passing through the manifold is substantially the same in all positions of adjustment. Furthermore, this construction dispenses with the necessity of a separate throttle, as the member E will produce the desired throttling effect.

What I claim as my invention is:—

1. In an internal combustion engine of the multi-cylinder type, the combination with an intake manifold extending to a plurality of cylinders, of an adjustable wall for said manifold, said wall and manifold having cooperating V-shaped portions of slightly different angle, there being a space between the apices of said portions, and means for adjusting said wall to vary the cross sectional area of said manifold.

2. In an internal combustion engine of the multi-cylinder type, the combination with an intake manifold extending to a plurality of cylinders, said manifold having parallel walls and a V-shaped portion between said

walls, of an adjustable member within said manifold having parallel walls slidably engaging the parallel walls of said manifold, and a V-shaped portion of different angle  
5 from that of the V-shaped portion of said manifold, there being a space between the apices of said V-shaped portions, and mechanism for adjusting said member to vary the cross sectional area of said manifold.  
10 3. In an internal combustion engine, the combination with a manifold having inlet and outlet passages with a single wall separating the same, of means for varying the

cross-sectional area of said inlet passage uniformly throughout substantially the length  
15 thereof.

4. In an internal combustion engine, the combination with a manifold having adjacent inlet and outlet passages, of a wall extending longitudinally within said inlet passage and forming throughout substantially  
20 its length a passage, said wall being adjustable to vary the cross-sectional area of said last-mentioned passage.

In testimony whereof I affix my signature. 25  
ANDREW BACHLE.