W. ROLLINS.

CARBURETER.

APPLICATION FILED APR. 25, 1918.

**1,360,445.** **Patented Nov. 30, 1920.**

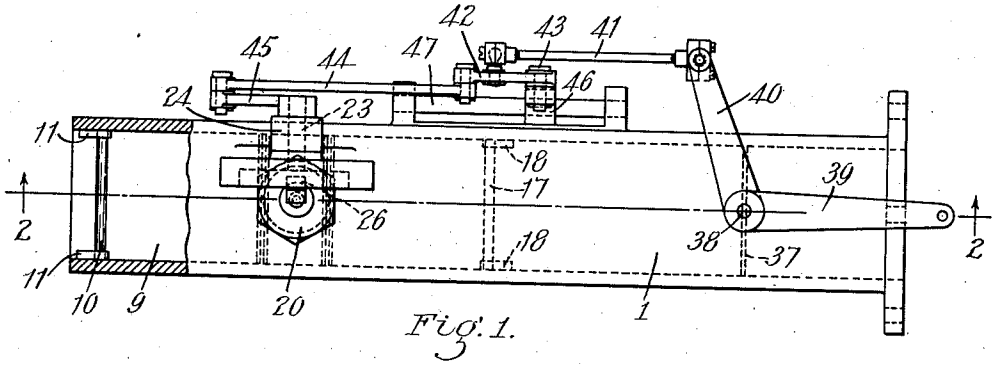


Fig. 1.

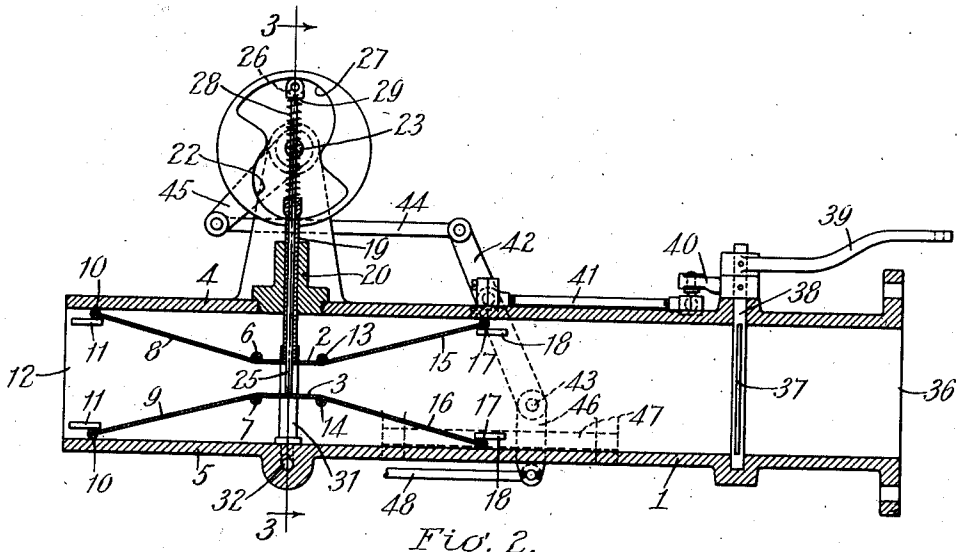


Fig. 2.

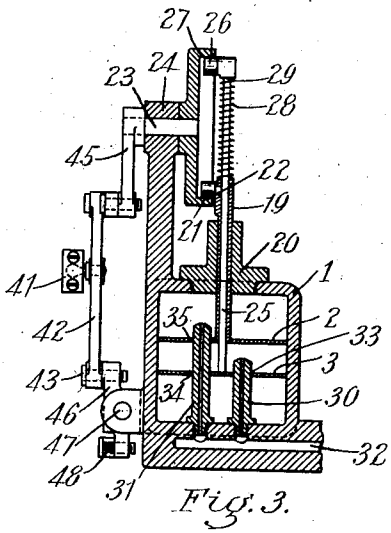


Fig. 3.

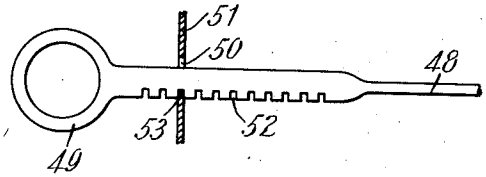


Fig. 4.

Inventor.

Wingate Rollins,

By his attorney

Charles N. Goodwin

# UNITED STATES PATENT OFFICE.

WINGATE ROLLINS, OF HYDE PARK, MASSACHUSETTS.

## CARBURETER.

1,360,445. Specification of Letters Patent. Patented Nov. 30, 1920.

Application filed April 25, 1918. Serial No. 230,618.

*To all whom it may concern:*

Be it known that I, WINGATE ROLLINS, a citizen of the United States, residing at Hyde Park, in the county of Suffolk and State of Massachusetts, have invented new and useful Improvements in Carbureters, of which the following is a specification.

This invention relates to improvements in carbureters for internal combustion engines and has for its object to provide a simple, compact and inexpensive carbureter embodying in substance a variable Venturi tube which is capable of being operated to regulate the proportions of air and gas to accord with the speed of or the work to be performed by the engine to which the same is attached.

Another object of the invention is to provide means for accomplishing the variation in the size of the Venturi tube either simultaneously with or independently of the operation of the throttle.

The invention consists in the combination and arrangement of parts set forth in the following specification and particularly pointed out in the claim.

Referring to the drawings:

Figure 1 is a plan view of a carbureter embodying this invention, a portion of said carbureter being shown in section.

Fig. 2 is a longitudinal section of a carbureter taken on the line 2—2 of Fig. 1.

Fig. 3 is a transverse section taken on the line 3—3 of Fig. 2.

Fig. 4 is a detail view of the venturi operating and locking device.

Like numerals refer to like parts in all views of the drawings.

In the drawings, 1 is a casing, in the present embodiment consisting preferably of a rectangular tube through which the air and fuel vapor are mixed and conveyed to the cylinder of the engine to which the carbureter is attached. Arranged within the casing 1 are parallelly disposed members or planes 2 and 3, which are likewise disposed parallel with opposite walls 4 and 5 respectively of said casing 1.

The parallel planes 2 and 3 are preferably disposed at equal distances from the median axial line of the casing or tube 1 and are adapted to be moved toward and away from each other simultaneously to vary the area of the portion of the tube between said parallel planes to effect the increase or reduction of the gas or air passing through the casing.

In order to confine the air entering said casing to the space between said parallel planes, said parallel planes have connected to the edges 6 and 7 thereof inclined members 8 and 9 respectively. These inclined members are pivotally attached to the edges 6 and 7 and extend outwardly therefrom into engagement with the walls 4 and 5 respectively of said casing, and they are, together with the parallel planes 2 and 3, of the same width as the casing 1 so as to completely close all portions of said casing except that between said parallel planes.

The portions of the inclined members 8 and 9 which engage the walls 4 and 5 are provided with enlargements 10 constituting bearing members which are arranged to slide between the walls 4 and 5 and longitudinally disposed ribs 11 arranged parallel with said walls 4 and 5, thus preventing the ends of said inclined members from moving away from said walls 4 and 5, presenting a gradually restricted passage toward the inlet end 12 of the casing 1, through which air is to be drawn to the mixing chamber of the carbureter.

The edges 13 and 14 of the parallel planes 2 and 3, opposite to the edges 6 and 7 thereof, are likewise pivotally connected to inclined members 15 and 16, similar in construction to the members 8 and 9. These members extend outwardly into engagement with the walls 4 and 5 of the casing and are provided with enlargements 17 which slide longitudinally of the casing between the walls 4 and 5 and ribs 18 arranged parallel with said walls; said planes 2 and 3 and the connected inclined members 8 and 9 and 15 and 16 form in substance a Venturi tube which is adapted to be increased or diminished in size to accord with the speed and work of the engine to which the carbureter is attached.

To accomplish the movements of said planes 2 and 3 toward and away from each other, a sleeve 19 is attached to the outer face of the plane 2 and extends from said outer face to the exterior of said casing through a bushing 20 attached to the wall 4 of said casing. To the outer end of said sleeve is attached a roll 21 which has en-

gagement with a cam 22 secured to a shaft 23 journaled to rotate in a bearing 24 preferably supported by the casing 1.

The plane 3 has attached thereto a rod 25, said rod extending within the sleeve 19. To the outer end of the rod 25 is attached a roll 26 also adapted to be engaged by a cam 27. The cams 22 and 27 are oppositely disposed and arranged to rotate simultaneously with the shaft 23, and these cams, which are open cams, accomplish the separation of the planes 2 and 3, thus increasing the size of the passage through the casing 1.

To reduce the size of said passage, a spring 28 is provided, said spring being mounted upon the rod 25 between the outer end of the sleeve 19 and a shoulder 29 formed on said rod, and capable of exerting a yielding pressure upon said rod 25 and sleeve 19 to draw the planes 2 and 3 together when the cams 22 and 27 are moved to allow such an action.

The casing 1 is provided with means for supplying fuel thereto, which means preferably consists of a pair of nozzles 30 and 31 preferably mounted in the bottom wall 5 of said casing and extend transversely thereof. A fuel supply passage 32 is formed in the casing adjacent to the outer ends of said nozzles and adapted to conduct fuel from a suitable reservoir, not shown in the drawings, to each of said nozzles. The nozzle 30 extends into the casing substantially to the center thereof, while the nozzle 31 extends preferably a substantial distance beyond the center, and these nozzles pass through openings 33 and 34 formed in the plane 3, while the nozzle 31 is at times adapted to extend through an opening 35 formed in the plane 2.

The object of the difference in height between the nozzles 30 and 31 is that when the planes 2 and 3 are near together so that only a minimum amount of air is passing therebetween, then the discharge end of the nozzle 31 will be entirely covered by the plane 2 and fuel will be drawn only from the nozzle 30, which, at this time, will be discharging into the passage between said planes, but when the passage between said planes is widened, such, for instance, as when the speed of the engine is increased, or when the load on the same is increased, a richer mixture will be necessary and much more of it must be supplied in order to meet the demands for power; consequently, the second nozzle will be brought into action and discharge its fuel, together with the nozzle 30, into the passage, through which the air is being drawn to the carbureter.

Arranged in the casing 1 between the variable venturi hereinbefore described and the end 36 of the casing which is secured to the end of the engine is a throttle valve 37 of the usual pivoted type, said valve including a shaft 38 journaled to rotate in the side walls 4 and 5. One end of the shaft extends through the wall 4 and has attached thereto an operating lever 39, said lever being connected with the usual operating lever, not shown in the drawings.

It is desirable that the throttle 37 and the variable venturi be connected together so that they may be operated simultaneously by the movement of the operating lever, and to accomplish this result, a lever 40 is secured to the shaft 38 and connected by means of a link 41 to a floating lever 42 pivoted at 43.

The lever 42 is, in turn, connected by a link 44 with a lever 45 secured to the shaft 23. Thus when the shaft 38 is rocked the shaft 23 will likewise be rocked through the instrumentalities just described and movement imparted to the planes 2 and 3 simultaneously with the movement of said throttle 37. It is sometimes necessary to operate the planes 2 and 3 independently of the throttle 37 and also to alter the positions of the planes 2 and 3 with respect to the position of the throttle 37, and to accomplish this result, the pivot 43 is mounted upon a sliding block 46 adapted to be reciprocated upon a rod 47 which constitutes a guide therefor by means of a link 48 connecting said block with suitable operating instrumentalities, such, for instance, as a ring 49 attached to the end of said link 48.

Means are provided for locking the link 48 in various positions so that the block 46 may serve as a fulcrum for the lever 42 when the planes 2 and 3 are to be actuated simultaneously with the throttle 37. For accomplishing this result the link 48 may be extended through a slot 50 formed in a stationary plate 51 and notches 52, formed at suitable distances apart, will permit the lower portion of said stationary plate, as at 53, to enter said notches and serve as a stop therefor. See Fig. 4.

When the planes 2 and 3 are to be operated by the movements of the link 48, the pivotal point of the link 41 upon the lever 42 will serve as the axis for said lever 42, said axis being held stationary by the usual locking means for the throttle 39, said means being well known to those skilled in the art and therefore not shown in the drawings.

Having thus specifically described my invention, what I claim and desire by Letters Patent to secure is:

A carbureter having, in combination, a rectangular casing, a pair of planes arranged parallel with the walls of said casing, a pair of nozzles projecting transversely into said casing, the ends of said nozzles being disposed at different distances from the center of said casing, one of said

nozzles projecting through one of said planes only and the other of said nozzles adapted to project through both of said planes, and means adapted to move said planes in unison toward and from each other to diminish or increase respectively the area of passage therebetween and adapted to cut one of said nozzles into or out of operation.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

WINGATE ROLLINS.

Witnesses:
CHARLES S. GOODING,
SYDNEY E. TAFT.