

C. F. ERICKSON.

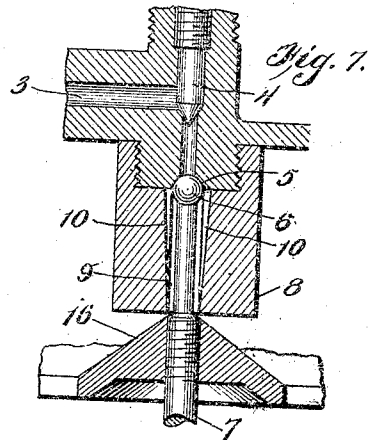
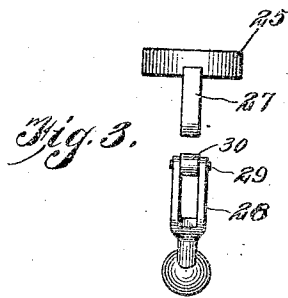
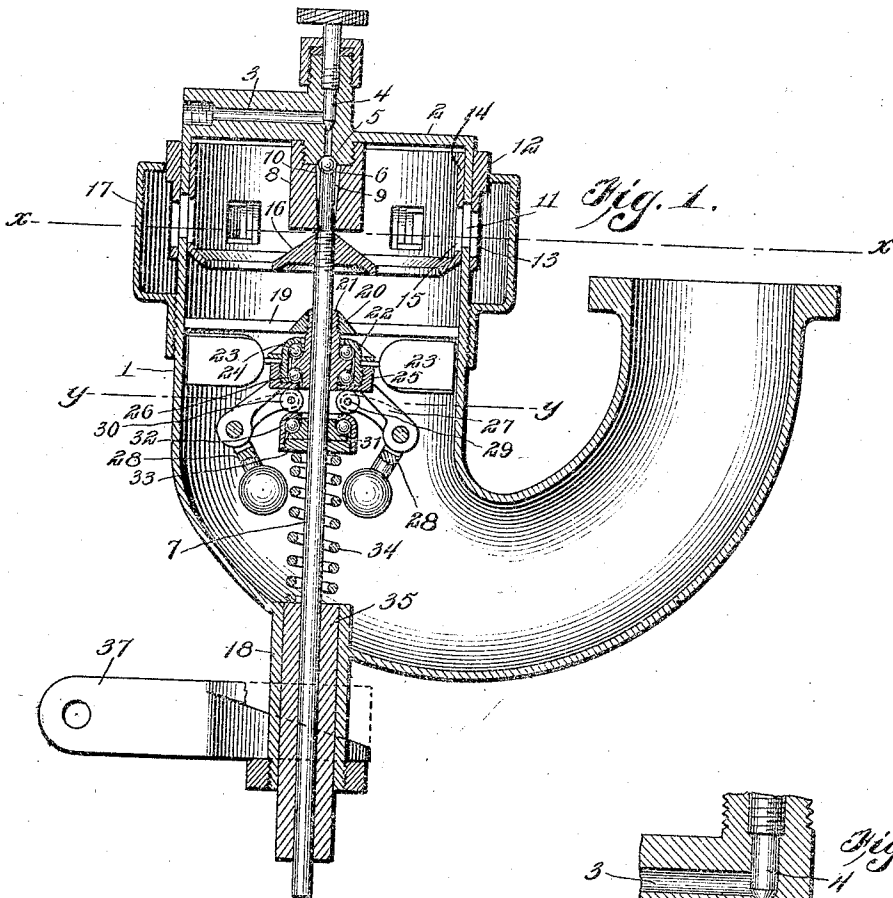
CARBURETER.

APPLICATION FILED DEC. 8, 1911.

1,061,995.

Patented May 20, 1913.

2 SHEETS—SHEET 1.



Witnesses

Louis R. Heinrichs
W. B. Hilliard.

Charles F. Erickson
Inventor

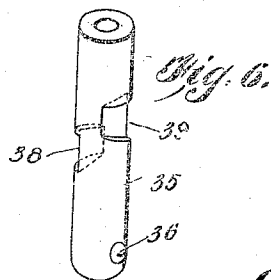
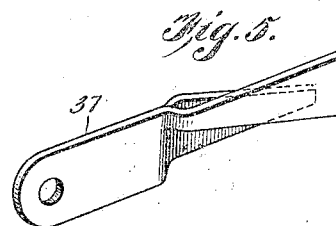
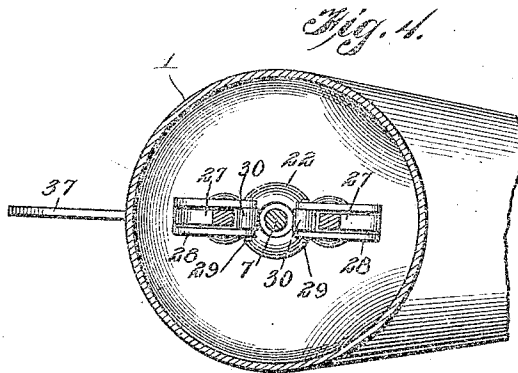
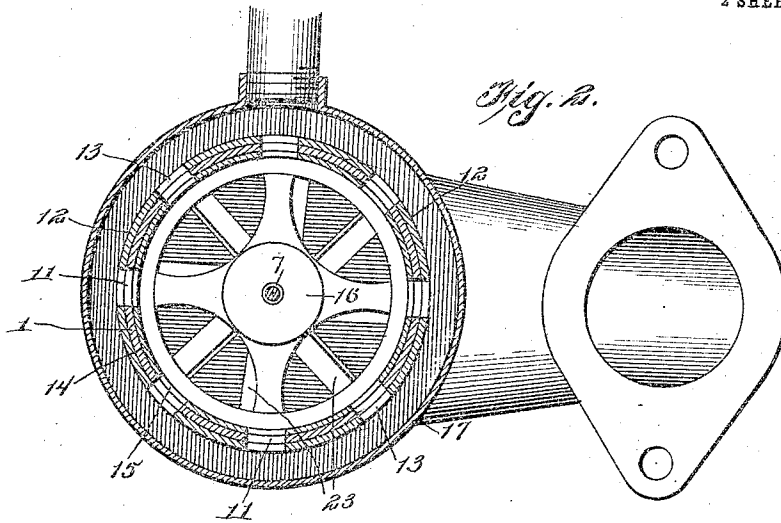
By Victor J. Evans
Attorney

1,061,995.

C. F. ERICKSON.
CARBURETER.
APPLICATION FILED DEC. 8, 1911.

Patented May 20, 1913.

2 SHEETS-SHEET 2.



Witnesses

Louis R. Hennrichs
U. B. Hillyard.

Charles F. Erickson
Inventor

By Victor J. Evans
Attorney

UNITED STATES PATENT OFFICE.

CHARLES F. ERICKSON, OF BROOKLYN, NEW YORK.

CARBURETER.

1,041,595.

Specification of Letters Patent.

Patented May 20, 1913.

Application filed December 8, 1911. Serial No. 664,597.

To all whom it may concern:

Be it known that I, CHARLES F. ERICKSON, a subject of the King of Sweden, having declared my intention of becoming a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented new and useful Improvements in Carbureters, of which the following is a specification.

Carbureters of the type most generally in use have air inlets and fuel inlets which, while adjustable remain fixed after being adjusted regardless of the speed of the engine. When the engine is running slowly, the consumption of fuel is small and as the speed increases the fuel is used up more rapidly; but as the inlet remains fixed, as stated, the action of the engine is not always dependable.

The present invention provides a carbureter in which the air and fuel inlets may be adjusted but which inlets vary according to the speed of the engine so that when the engine is running at a high rate of speed the inlets are opened to a greater extent than when the engine is running slow, hence, as a result the action of the engine is uniform and may be depended upon.

The invention contemplates a governor mechanism which is actuated by the amount of mixture consumed by the engine, said governor mechanism being utilized to vary the effective size of the air and fuel inlets according to the speed of the engine and the amount of gaseous mixture being consumed.

The invention further contemplates means for offering a greater or less resistance to the operation of the governor mechanism so that the supply of mixture to the engine may in a degree be regulated at the will of the operator independently of the action of the governor whereby the movement of said governor may be retarded more-or-less according to the result to be attained.

The invention consists of the novel features, details of construction and combination of parts, which hereinafter will be more particularly set forth, illustrated in the accompanying drawings and pointed out in the appended claims.

Referring to the drawings, forming a part of the specification: Figure 1 is a vertical central section of a carbureter embodying the invention. Fig. 2 is a horizontal section on the line $x-x$ of Fig. 1. Fig. 3 is a de-

tail view of the governor mechanism. Fig. 4 is a horizontal section on the line $y-y$ of Fig. 1. Fig. 5 is a detail view of the slide adapted to cooperate with the sleeve attached to the rod or stem to which the means are attached for regulating the effective size of the air and fuel inlets. Fig. 6 is a detail view of the sleeve with which the slide cooperates. Fig. 7 is a sectional view of the fuel feeding nozzle and concomitant parts, showing the same on a larger scale.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings, by the same reference characters.

The body of the carbureter is indicated at 1 and may be of any construction and is usually hollow to admit of the gaseous mixture passing therethrough. In the construction shown, the body 1 is of tubular form and approximately of U-shape and is adapted to be connected to the intake or supply pipe leading to the engine in any manner. One member of the U-shaped body is of larger diameter than the other member and is adapted to receive the covering mechanism and the means for controlling the air and fuel inlets. The receiving end of the body is closed as indicated at 2 and is formed with an enlargement having a passage 3 for the supply of fuel, said passage being adapted to be connected with the feed pipe leading to the tank or reservoir containing the gasoline or other gas-producing agent. A valve 4 threaded into an extension of the end 2 controls the passage 3. The valve seat 5 is formed at the delivery end of the passage 3 and is adapted to be closed by means of a valve 6, which latter may be of any form and carried by a rod or stem 7. A nozzle 8 makes a screw thread connection with an extension projecting from the inner side of the end 2 and this nozzle has a flared opening 9 which receives the valve 6 and the upper end of the rod or stem 7. The opening 9 is contracted at its lower end and channels or grooves 10 are formed in the walls thereof to provide passages for the fuel when the carbureter is in operation.

A plurality of openings 11 are formed in the sides of the body 1 near the closed end 2 and constitute air inlets. A band 12 encircles the upper portion of the carbureter and has openings 13 corresponding in position and number with the inlet openings 11. A proper adjustment of the band 12 admits

of regulating the size of the openings 11 to admit more or less air according to the nature of the gaseous mixture to be supplied to the engine. An air regulator 14 is attached to the rod or stem 7 so as to move therewith and is approximately of cup-form, said regulator fitting within the body 1 and having openings 15 in its side walls corresponding in number and position with the air inlet openings 11. Movement of the regulator 14 varies the size of the inlet openings 11 as will be readily understood. The horizontal or bottom portion of the regulator 14 has openings for the passage of the air and fuel. The central portion of the bottom of the regulator 14 is closed and of conical form as indicated at 16, so as to direct the fuel outwardly toward the opening in the outer portion of the bottom of the regulator to meet with the incoming air so as to provide a mixture which is subsequently agitated by means of a rotary fan to break up any particles of fuel to insure the formation of a homogeneous gaseous mixture to attain the best possible results from combustion. The apex of the conical generator 16 of the air regulator comes opposite the discharge of the nozzle 8. The air regulator 14 is moved automatically with the rod or stem 7 by a governor mechanism presently to be described. A jacket 17 surrounds the upper portions of the body 1 and is adapted to have warm air supplied thereto from any source, whereby the conversion of the fuel into gas is greatly facilitated.

The rod or stem 7 is mounted in a tubular portion 18 at the bottom of the body 1 and in a support 19 secured within the body at a point between the upper and lower parts thereof. The support 19 may be of any construction so long as it admits of a gaseous mixture passing freely thereby and at the same time provides a substantial sustaining means for the upper part of the rod or stem 7. The central portion of the support 19 has a cone 20 which is centrally apertured and internally threaded. A short bearing sleeve 21 has its upper end threaded to the cone 20 of the support 19 and receives the rod or stem 7 which is mounted therein to move vertically, said sleeve having an annular enlargement which forms upper and lower cones. A hub 22 is mounted upon the bearing sleeve 21 and has fan blades 23 connected thereto. The upper end of the hub 22 is curved inwardly to form a cup which overhangs the upper cone, balls 24 being interposed between the upper cone and the said cup. A nut 25 is threaded to the lower end of the hub 22 and has an inner extension end lapping the lower cone of the bearing sleeve so as to support balls 26 which are interposed between the said lower cone and the inner extension of the nut 25. The upper and lower ball bearings between the

hub of the fan and the bearing sleeve 21 admit of the fan rotating freely with a minimum amount of friction from vertical or lateral stress. The nut 25 has oppositely disposed arms 27 which incline outwardly and downwardly. Governor arms 28 are pivotally connected to the lower ends of the arms 27 and each of the governor arms is of elbow-form, the pendent member being weighted at its lower end and the upper member being forked to embrace the arm 27 and having the fork members connected by means of a pin 29 upon which a roller 30 is mounted. A cone 31 is pinned or otherwise secured to the rod or stem 7 so as to move therewith. A cup 32 is mounted upon the cone 31 and balls are interposed between the cone 31 and cup 32 to admit of the latter rotating freely. A nut 33 is threaded into the lower end of the cup 32 and holds it to the cone 31. The rollers 30 are in contact with the cup 32 and when the weighted ends of the governor arms 28 fly outward, the horizontal members of the governor arms are depressed at their inner ends and move the cup 32 downwardly and the rod or stem 7 therewith with the result that the valve 6 is moved away from the seat 5 to a greater or less extent and the air regulator 14 lowered thereby uncovering the openings 11 to admit a greater amount of air to mix with the increased quantity of fuel being supplied. A spring 34 of helical form and of the expansible type is mounted upon the rod 7 and exerts an upward pressure upon the cone 31 to hold the valve 6 seated and the air regulator 14 elevated. The upper end of the spring 34 is adapted to engage the lower end of the cone 31 whereas its lower end engages the upper end of a sleeve 35 mounted upon the rod 7 and secured thereto and arranged within the tubular extension 18 of the body 1. A set screw 36 threaded into an opening of the sleeve 35 serves to secure it to the rod 7 in an adjusted position. Vertical movement of the sleeve 35 varies the tension of the spring 34 whereby greater or less resistance may be offered to the movement of the governor mechanism whereby provision is had for regulating the action of the governor mechanism according to existing conditions to attain the best possible results. The sleeve 35 may be adjusted vertically by any means and as shown a slide 37 is used and is adapted to be connected with a lever of any type (not shown) under control of the operator when the carbureter is installed. The slide 37 is forked, and the forked members embrace opposite sides of the lower portion of the rod 7 and pass through openings formed in the tubular extension 18 and engage cut away portions 38 and 39 in opposite sides of the sleeve 35. The inner edges of the forked members of the slide 37 incline to correspond

with the inclined edges of the cut away portions 38 and 39. When the slide 37 is moved forward, the sleeve 35 is elevated thereby compressing the spring 34 and causing it to offer a greater resistance to the rotation of the fan 23 thereby retarding the action of the governor mechanism. Outward movement of the slide 37 causes a depression of the sleeve 35 with the result that the tension of the spring 34 is lessened, thereby decreasing the resistance offered by said spring to the rotation of the fan 23 with the result that the action of the governor mechanism is facilitated to admit of a greater amount of air and gas being supplied to the engine.

In the practical operation of a carbureter embodying the invention, it is obvious that the rod or stem 7 may be moved by a governor mechanism of any type so long as the same is actuated by the gaseous mixture drawn through the carbureter by the engine when in operation. It is to be understood that the carbureter is adapted to be connected to the engine in any suitable way. The fuel passage 3 may be regulated by the valve 4 and the air inlets 11 are adapted to be controlled by the band 12 in the manner stated. Proper adjustment of the parts 4 and 12 admits of a gaseous mixture of proper consistency being obtained. When the engine is in operation air is drawn through the inlets 11 and fuel through the passage 3, said fuel commingling with the air and forming a gaseous mixture which, passing through the fan 23, causes the same to rotate. The velocity of the fan 23 will depend upon the rapidity with which the gaseous mixture is drawn through the carbureter, hence, as the speed of the engine increases, the gaseous mixture will be drawn through the carbureter rapidly thereby increasing the degree of rotation of the fan and since the governor mechanism depends upon the rapidity of rotation of the fan, the valve 6 and the air regulator 14 will be moved a distance corresponding to the degree of rotation of the governor arms. Should it, from any cause, be desired to retard the action of the fan and consequently the governor mechanism, the slide 37 may be pressed forward, thereby increasing the tension of the spring 14. On the other hand, should it be desired to facilitate the operation of the governor mechanism, the slide 37 is drawn outward, thereby decreasing the tension of the spring 34 and diminishing its retarding action in a manner hereinbefore stated. A slight movement of the stem 7 suffices to fully unseat the valve 6, after which a continued movement of the stem 7 serves to cut off the supply of liquid fuel by reason of the valve 6 moving downwardly in the tapered opening 9. The slide 37 may serve as means for throttling

the engine, but if preferred a separate valve may be provided either to act jointly with the slide 37 or independently thereof as throttling means. The speed of the engine may be increased by increasing the tension of the spring 34, whereby greater force is required to move the valve 6 downwardly in the opening 9 after being moved away from its seat 5 to the fullest extent. By varying the tension of the spring 34 the friction between the moving parts is likewise varied and the greater the friction the greater the force required to rotate the fan, hence it follows that the speed of the fan may be controlled by varying the tension of the spring 34 and in turn controls the governor mechanism which automatically regulates the supply of the air and fuel to the engine.

It will be understood from the foregoing taken in connection with the accompanying drawings that the invention supplies a carbureter for use in connection with internal combustion engines which, when set is automatic in operation to supply an increased amount of fuel as the speed of the engine increases or to diminish the supply of gaseous mixture to the engine as the speed of said engine slackens. The fan in addition to forming actuating means for the governor mechanism also serves to agitate the mixture to insure a thorough incorporation of the air and gas thereby producing a homogeneous mixture which insures the best possible results in the operation of the engine.

From the foregoing description, taken in connection with the accompanying drawings, the advantages of the construction and of the method of operation will be readily apparent to those skilled in the art to which the invention appertains, and while I have described the principle of operation of the invention, together with the device which I now consider to be the best embodiment thereof, I desire to have it understood that the device shown is merely illustrative, and that such changes may be made when desired as are within the scope of the claims appended hereto.

I claim:—

1. A carbureter comprising a body having a fuel inlet and an air inlet and adapted to have the gaseous mixture drawn there-through by the action of the engine, a valve for regulating the fuel inlet, an air regulator for varying the effective size of the air inlet, and a centrifugal governor mechanism having connection with the fuel controlling valve and the air regulator and adapted to be actuated by the passage of the gaseous mixture through the carbureter to uncover the fuel and air inlets to a greater or less extent proportionately to the speed of the engine.

2. A carbureter for internal combustion

engines, the same comprising a hollow body having fuel and air inlets, independent means for regulating the inlets to admit of obtaining the proper proportion of air and fuel, a valve for closing the fuel inlet, an air regulator for the air inlet, and centrifugal governor mechanism having connection with said valve and air regulator and adapted to be actuated by the passage of the gaseous mixture through the carbureter to move the said valve, an air regulator to uncover the fuel and air inlets to a greater or less extent proportionately to the speed of the engine.

3. A carbureter for internal combustion engines comprising a hollow body adapted to have the gaseous mixture drawn there-through by the action of the engine, said hollow body having fuel and air inlets, a valve for closing the fuel inlet, an air regulator for the air inlet, a governor mechanism adapted to be actuated by the passage of the gaseous mixture through the carbureter to move the said valve and air regulator to admit a greater or less amount of fuel and air proportionately to the speed of the engine, and means for retarding the action of the governor mechanism by manual control thereof to meet existing conditions.

4. A carbureter for internal combustion engines comprising a hollow body provided with fuel and air inlets, means for controlling said inlets, and a governor mechanism adapted to be actuated by the passage of the gaseous mixture through the carbureter and having connection with the inlet controlling means to admit of varying the supply of fuel and air proportionately to the speed of the engine, said mechanism including a fan for mixing the air and gas and adapted in turn to operate the governor mechanism.

5. A carbureter having a fuel inlet, a nozzle having connection with the fuel inlet and formed with a tapered opening, a valve arranged to operate within the tapered opening of the nozzle and adapted to close the fuel inlet, and a governor mechanism adapted to be operated by the passage of the gaseous mixture through the carbureter to unseat the said valve to a greater or less extent proportionately to the speed of the engine.

6. In a carbureter, the combination of a hollow body provided in its sides with air inlets, an air regulator arranged within the hollow body and approximately of cup-form and having openings in its sides corresponding in number and position with the air inlets in the sides of the hollow

body, and a governor mechanism having connection with said air regulator and adapted to be actuated by the gaseous mixture passing through the carbureter to uncover the air inlets to a greater or less extent proportionately to the speed of the engine.

7. In a carbureter, the combination with a hollow body provided with fuel and air inlets, means for controlling said inlets, a rod having connection with the inlet controlling means, a governor mechanism adapted to be actuated by the passage of the gaseous mixture through the hollow body to uncover the said inlets to a greater or less extent proportionately to the speed of the engine, a spring for exerting and retarding influence upon the governor mechanism, a sleeve forming an abutment for one end of said spring, and a slide having a portion forked and having the forked ends formed with oppositely inclined portions to engage with the said sleeve to effect movement thereof for varying the tension of the spring.

8. In a carbureter, the combination of a hollow body having fuel and air inlets, means for controlling said inlets, the same comprising a rod, a fan mounted upon the rod and adapted to be actuated by the passage of the gaseous mixture through the carbureter, and a governor mechanism carried by said fan and adapted to move the said rod to a greater or less extent depending upon the speed of the engine to uncover the before-mentioned inlets to admit of a proportionate supply of fuel and air according to the rapidity of rotation of the said fan.

9. In a carbureter, the combination of a hollow body provided with fuel and air inlets, means for controlling said inlets, a rod having connection with the said inlet controlling means, a fan rotatably mounted upon said rod and adapted to be actuated by the passage of the gaseous mixture through the hollow body, a governor mechanism carried by said fan, means carried by the said rod to receive the action of the said governor mechanism, a spring exerting a pressure upon the said rod to move it in opposition to the governor mechanism, and means for varying the tension of said spring to offer a greater or less resistance to the action of the governor mechanism.

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

CHARLES F. ERICKSON.

Witnesses:

S. H. REGENHARD,
LAWRENCE WEST.