No. 652,631. Patented June 26, 1900.

# J. PENDER.

## CARBURETER.

(Application filed July 8, 1899.)

(No Model.)

*Fig. 1.*

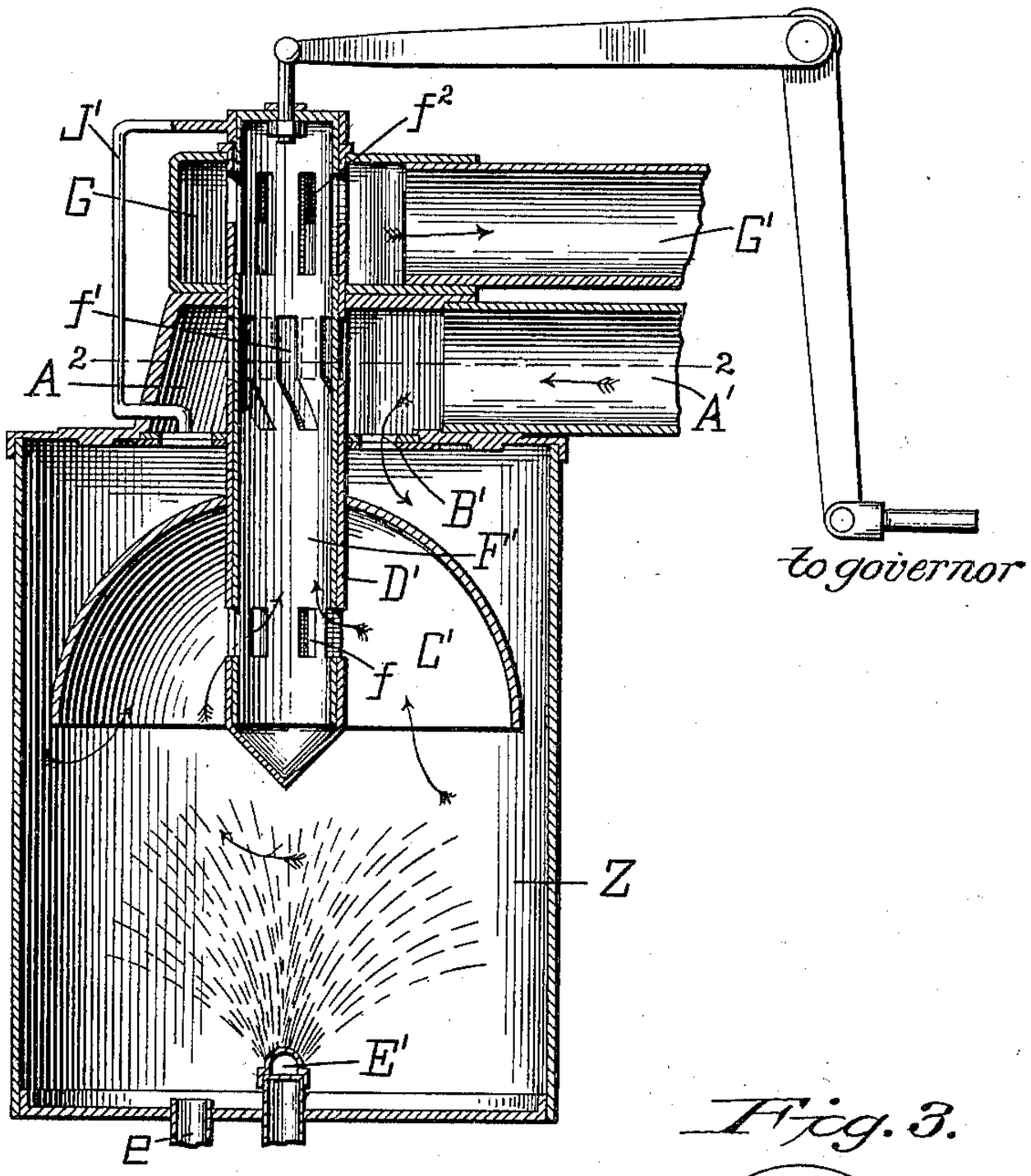



*Fig. 3.*

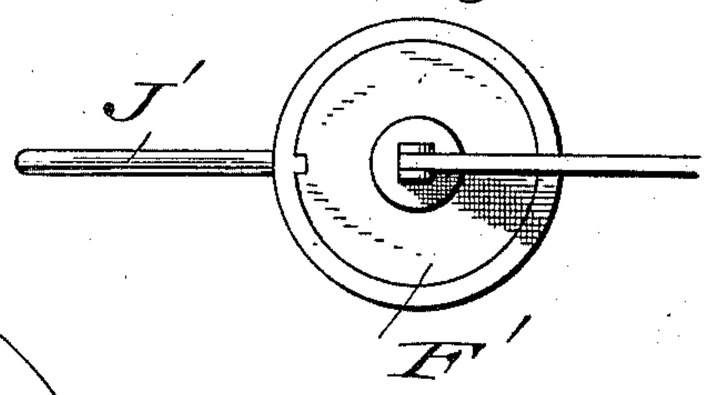
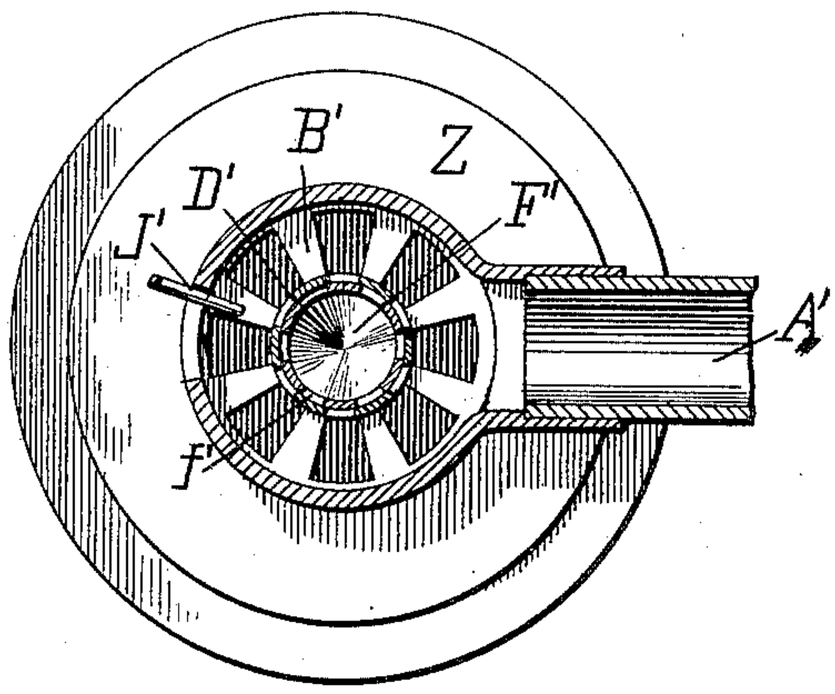



*Fig. 2.*

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# UNITED STATES PATENT OFFICE.

JOHN PENDER, OF BRUNSWICK, VICTORIA.

## CARBURETER.

SPECIFICATION forming part of Letters Patent No. 652,631, dated June 26, 1900.

Original application filed March 15, 1898, Serial No. 673,961. Divided and this application filed July 8, 1899. Serial No. 723,228. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN PENDER, a subject of the Queen of Great Britain and Ireland, residing at the Nail Works, Tinning street, Brunswick, in the Colony of Victoria, have invented certain new and useful Improvements in Carbureters; and I hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form part of this specification.

This application is a division of my application Serial No. 673,961, filed March 15, 1898, (see Patent No. 637,658, of November 21, 1899;) and the present invention is an improved carbureter for producing combustible gases and is especially adapted for use with explosive gas-engines.

The invention consists in the novel construction, combination, and arrangement of parts hereinafter described and claimed, and illustrated in the accompanying drawings, wherein—

Figure 1 is an enlarged central vertical section through the carbureter. Fig. 2 is a transverse section thereof on line 2 2, Fig. 1, looking downward. Fig. 3 is a detail top plan view of valve F′ and connections.

The operative parts of the engine proper are not claimed herein and need not be described, and the connections of the carbureter thereto are shown in my said patent and need not be described herein, as the carbureter is applicable to various forms of engines.

The carbureter, as shown, is formed of an outer cylinder or casing Z, having a diaphragm-valve B′ in its top communicating with an air-inlet chamber A, above which is a gas or mixture outlet chamber G, and passing through said chambers into the casing is a ported tube D′, in which is a ported valve F′, by which communication between said inlet and outlet chambers and the casing is controlled. Surrounding the tube in the casing is a bell C′, and below the bell is a hydrocarbon spray E′. The chamber A is connected with a suitable air-supplying apparatus and the chamber G with the engine-cylinders or apparatus for using or storing the products of the carbureter.

The air enters the carbureter Z at A′ and passes downwardly past the diaphragm-valve B′, which is loosely retained beneath the carbureter-cover and has ports within it adapted to register with similar ports in the cover. The air then passes over the top of a bell or cap C′, which is secured around the central stationary tube D′, which projects out of the carbureter and has three tiers of ports $f f' f^2$. Ports $f$ are in the body of the carbureter. Ports $f'$ are in the inlet-chamber A, communicating with inlet-pipe A′, and ports $f^2$ are in the higher outlet-chamber G, communicating with an outlet-pipe G′. Within tube D′ is a valve-tube F′, having three series of ports respectively adapted to register with the ports $f f' f^2$. Before the air passes the edge of the bell C′ and enters the lower ports $f$ in the stationary tube D′ it passes through the gasolene or other spirit spray which is being constantly discharged into the body of the carbureter from the spraying-nozzle E′, and all the oil that is not carried away in suspension by the passing air collects at the bottom of the carbureter and overflows through a pipe $e$ back into a reservoir. The lower ports $f$ are rectangular in shape and greater in height than in width, and in both the tube and the valve they are of the same proportions. The upper ports $f^2$ are also of the same proportions as the lower ones, save that in either the tube or the valve they are longer, so that the discharge is never choked. The intermediate ports $f'$ in the tube are rectangular, while in the valve they are also rectangular in their upper part, but inclined to the axis of the valve in bottom extensions. By these inclined extensions a more gradual cut-off is effected. When the diaphragm-valve B′ is closed, the passage of the air is through A′, the intermediate ports $f'$, and the top tier of ports $f^2$ to the outlet-pipe G′, in which case it does not enter the carbureter. Having acquired its charge of spray, the oil-vapor passes through the lower ports $f$ in the stationary tube D′ and through corresponding ports in the tubular valve F′ therein. This valve F′ is capable of two motions—a rotary and a vertical—the former being produced by hand at will and the latter by the governor automatically, as hereinafter described. The vapor then passes to the top of the tubular valve and through the upper ports $f^2$ therein and

the ports in the surrounding stationary tube to the pipe G′. From thence it passes to the point of use or storage. If the charge of air is being too greatly enriched, the charge is weakened either by lifting the tubular valve F′ or by the same being turned around. The valve F′ may be shifted automatically by any suitable governor mechanism, such as is shown in my said patent, for example. As shown, it can be shifted by hand by the handle J′. The top of this handle is slidably but not rotatably connected by a ring to the top of valve F′, permitting valve F′ to move vertically through the said ring; but the valve will be partially rotated when J′ is moved. At its bottom handle J′ is connected to the diaphragm B′. When the ports in B′ are closed, the air instead of passing over the bell C′ and through the spray finds a passage through the intermediate ports *f′* in valve F′ and tube D′.

The two different adjustments of the valve are provided for the following reasons: One of the adjustments (the vertical) is operated by the bell-crank lever shown and an ordinary governor operated by the engine; but this does not give a chauffeur of the spirited class sufficient control over his automobile when climbing hills or wanting to pass a rival on the road. Another adjustment (the rotary) is therefore furnished. This is completely under his control. The handle J′ of this is situated near his seat, and by it he can, in addition to regulating the spray, regulate the enrichment of the charge. He has therefore a most effective control, when necessary, over the speed of his motor.

Having thus described my invention, what I therefore claim as new, and desire to secure by Letters Patent, is—

1. In a carbureter, the combination of a spraying-chamber, an air-inlet communicating therewith, a mixture-outlet a tube having sets of ports opening to the spraying-chamber, to the air-inlet, and to the mixture-outlet, and a valve in said tube having sets of ports adapted to register with the respective ports in the tube substantially as described.

2. The combination in a carbureter, of a chamber, means for spraying oil therein, an air-inlet and a mixture-outlet, a ported diaphragm and cover, a cap, a stationary tube having an upper, an intermediate and a lower tier of ports, communicating respectively with the vapor-outlet, the air-inlet and the spraying-chamber, a tubular valve in said tube capable of a rotary and a vertical motion therein and also having three tiers of ports adapted to register with those in the tube, said valve and diaphragm being partially rotatable by hand, substantially as described.

3. The combination of a spraying or mixing chamber and the air-inlet and mixture-outlet passages thereof, a tube transfixing both the inlet and outlet passages and projecting into the chamber, said tube having ports communicating with the chamber and with each passage; with the rotatable and longitudinally-movable valve in said tube provided with ports adapted to register with the ports in the tube.

4. In a carbureter, the combination of a spraying or mixing chamber and the air-inlet and mixture-outlet passages thereof, a tube transfixing both the inlet and outlet passages and projecting into the mixing-chamber, said tube having ports communicating with each passage and with the chamber, and the rotatable and longitudinally-movable valve in said tube provided with ports adapted to register with the ports therein, means for rotating said valve and means for shifting it longitudinally in the tube, substantially as described.

5. In a carbureter, the combination of a spraying-chamber, and the air-inlet and mixture-outlet passages thereof, a tube transfixing both the inlet and outlet passages and projecting into the chamber, said tube having ports in the chamber and in both passages; with the tubular valve in said chamber provided with ports adapted to register with ports in the tube, means for rotating said valve, means for longitudinally adjusting said valve in the tube, means for regulating the admission of air into the spraying-chamber, and a bell in said chamber, surrounding the tube and interposed between the air-inlet and the spraying-nozzle, for the purpose and substantially as described.

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

JOHN PENDER.

Witnesses:
EDWIN PHILLIPS,
CECIL W. LE PLASTRIER.