

(No Model.)

E. SCHRABETZ.
GAS GOVERNOR FOR GAS ENGINES.

No. 312,906.

Patented Feb. 24, 1885.

Fig. 1

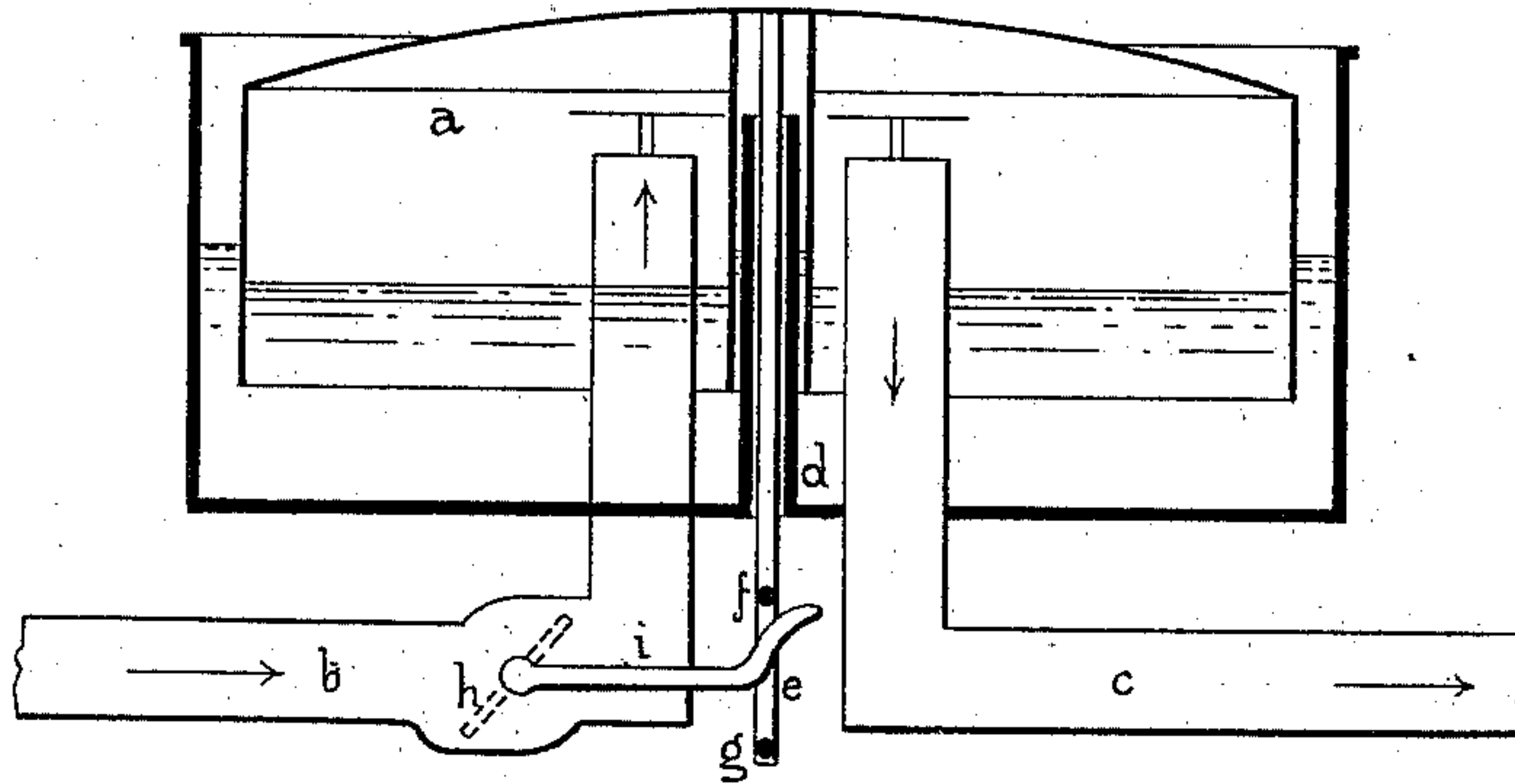


Fig. 2

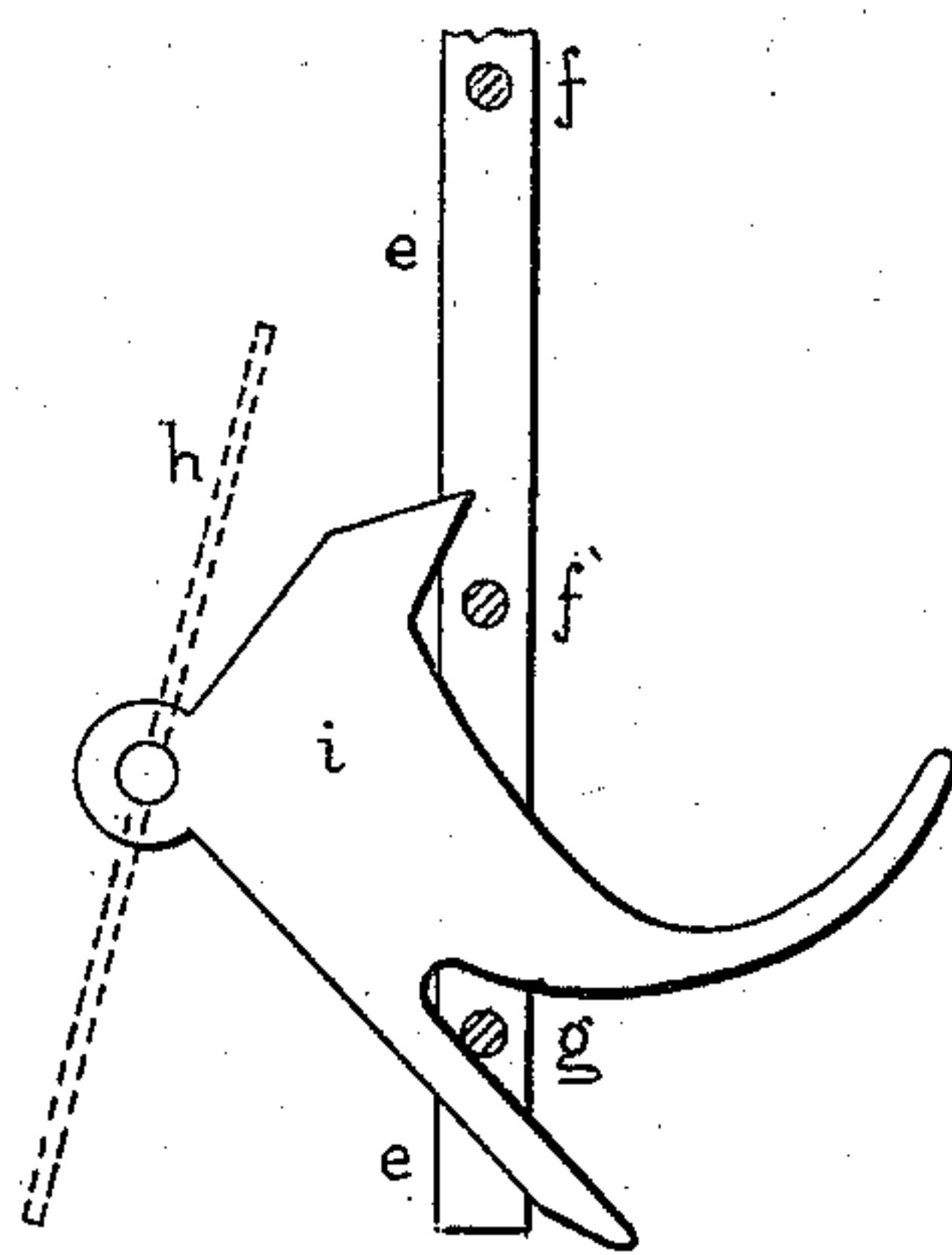
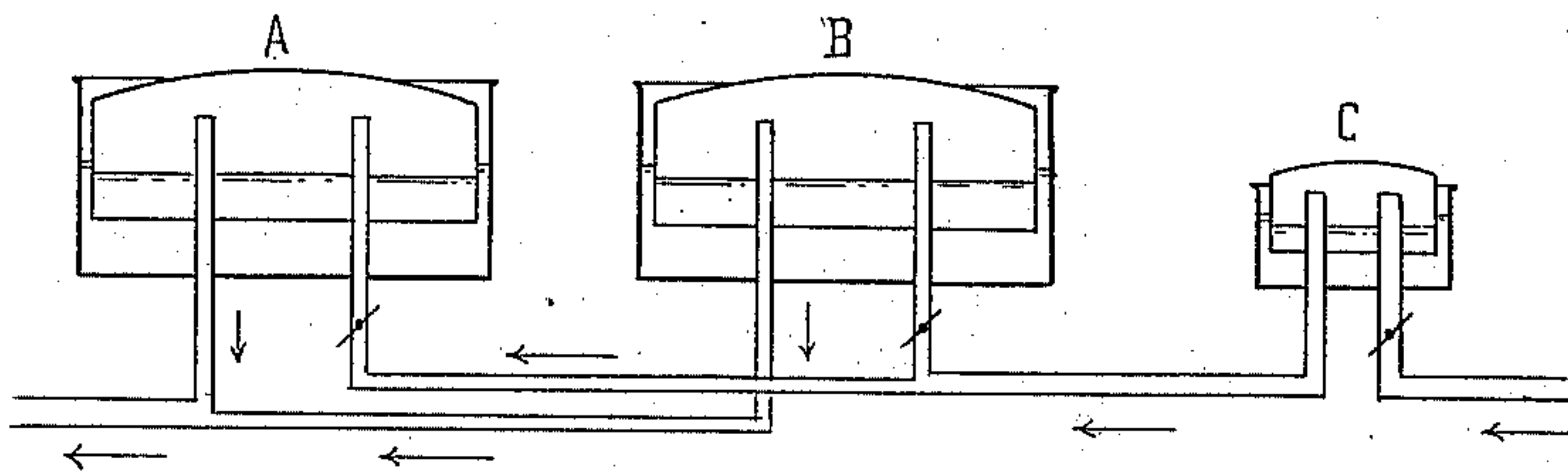


Fig. 3



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UNITED STATES PATENT OFFICE.

EMIL SCHRABETZ, OF VIENNA, AUSTRIA-HUNGARY.

GAS-GOVERNOR FOR GAS-ENGINES.

SPECIFICATION forming part of Letters Patent No. 312,906, dated February 24, 1885.

Application filed June 2, 1884. (No model.) Patented in Belgium May 16, 1884, No. 65,171; in England May 17, 1884, No. 7,875; in France May 17, 1884, No. 162,192; in Germany May 17, 1884, No. 29,623; in Austria-Hungary September 13, 1884, No. 30,580 and No. 41,376, and in Italy September 30, 1884, XVIII, 17,209.

To all whom it may concern:

Be it known that I, EMIL SCHRABETZ, a subject of the Emperor of Austria-Hungary, and a resident of Vienna, in the Empire of Austria-Hungary, have invented certain new and useful Improvements in Gas-Governors for Gas-Engines, of which the following is a specification.

The object of the present invention is to counteract the influence of the irregular consumption of gas in gas-motors upon the gas-pressure in the gas-main pipe, which manifests itself in a flickering of the flames fed from the main pipe.

The apparatus forming the subject of the present invention is intended to be interposed in the main pipe leading to the gas-motor; and it consists of a light gas-holder, *a*, Figure 1, preferably a cylinder with vertical sides floating in a liquid. The gas enters from the main pipe through a pipe, *b*, below the holder, and passes off to the gas-engine through a pipe, *c*. The holder is weighted in such a manner that the gas in the same is under a lower pressure than the lowest pressure in the feed-main. An essential feature is that the vertical sides of the holder are thin, and that their lower edges are sharp and cutting. When the engine draws gas through the pipe *c*, the holder *a* will sink, and as, owing to its sides being thin and cutting, it displaces only a very small quantity of liquid, and has only a very small resistance to overcome, this movement takes place without any perceptible variation of the pressure in the holder, and therefore the gas enters the holder through the pipe *b* during the suction under unaltered conditions. Thus the flickering of the flames fed by the pipe *b* or the connecting main pipe is prevented. The holder *a* sinks rapidly at each filling of the working-cylinder of the engine, and rises slowly until the next filling is taken from the holder.

Hitherto in governing the speed of gas-engines generally one of the two following methods was used. According to one method, the proportionate quantity of gas in each charge was varied as required. According to another method, some of the charges of the cylinder were made without any admixture of gas, and such charges are known under the name of "dead charges."

In using the apparatus forming the subject of the present invention, the amount of gas remaining unconsumed in the above-described method of charging will gradually accumulate in and lift the gas-holder *a*. The holder can of course only have a limited play. When the holder assumes the highest position and is then stopped, the pressure would increase in the holder and diminish on the next charge being taken therefrom. The flames must then necessarily flicker. In this highest position, moreover, there would be no room for any spared gas, and the holder must then play in its highest position, and thus cause repeated flickering. To prevent this I regulate the feeding of the gas by any suitable construction of check-valve or trap or cock, or similar device. This cut-off with variable opening I combine with any suitable construction of gear actuated by the holder, so that while the holder is rising the feeding will diminish, and will be entirely stopped just before the holder assumes its highest position. When, on the contrary, the holder goes down in consequence of the admission of gas being too slow, the cut-off device will be gradually opened.

The connection of the holder with the valve must be such that the continuous rising or sinking of the holder produces the above-described effect, but that the oscillations of the holder produced by a single charge of the working-cylinder of the engine will not actuate the cut-off valve when the admission and the consumption of gas are equal.

In order to obviate the necessity of regulating at each dead charge, I increase the dead play of the gear actuated by the holder, so that the holder can rise more, and so that the regulation takes place in variable intervals, according to the irregularity of the working of the engine. Hitherto in using the ordinary governors with rubber bellows each dead charge changed the pressure in the conduit.

Fig. 1 shows a suitable form of apparatus constructed according to the present invention. A rod, *e*, extends downward through the tube *d*, which also serves as a guide for the holder. This rod *e* is provided at its lower end with stops *f* and *g*. In the feed-pipe *b* a throttle-valve, *h*, is provided, which

is connected with the lever *i*, the other end of which is situated between the stops *f* and *g*.

The operation of this device is quite clear from what has been said above. The distance
5 between the stops *f* and *g* allows a free play to the holder within certain limits without affecting the throttle.

As the downward motion of the holder is very rapid, I prefer to provide the lever *i* at
10 its end engaging with the stops with suitable sliding surfaces, in order to open the throttle only slowly, especially when the holder is near its highest position. A stop between the prongs of a bifurcated lever may also be employed.
15

It is advantageous to provide the lever *i* with more than two prongs working together, with a corresponding number of stops, whereby something like a rack-and-pinion gear is
20 obtained. By suitably forming the sliding surfaces or cams on the lever *i* it is possible to cause the throttle to be actuated at will in any position of the gas-holder. Fig. 2 shows such an arrangement with two prongs and
25 three stops, wherein one stop is worked upon after the other.

I have described my invention referring to the arrangement shown in Figs. 1 and 2, in which the driving mechanism is connected
30 centrally with lever and throttle, because this is the simplest and most advantageous; but I may equally well arrange the apparatus in such a way that the gas-holder drives the gear from any other point, and I may equally well
35 employ any known mechanism for communicating motion to the valve.

From the above description it is very easy for any competent engineer to substitute a valve, or sliding valve, or any equivalent mechanism for the throttle.

The holder may be provided with a counterbalancing-weight.

When the consumption of gas is great, I feed the gas to the engine through a number of apparatus placed side by side, or I use one
45 or more larger apparatus, which, being of stronger construction, have a less easy play, and then connect the said larger apparatus with a small one, which compensates the small variations of pressure left by the large apparatus. The pressure in the small apparatus
50 should be greater than that in the large apparatus.

I may arrange a set of apparatus in the course of the main pipe, one behind the other.
55 I prefer, however, the connection shown in Fig. 3.

Feed-regulators for the large apparatus A and B may be dispensed with, although their use is preferred.

I claim—

An apparatus consisting of a floating gas-holder with thin vertical sides, in combination with a gas-feed regulator which within certain limits allows a free play of the holder, substantially as and for the purpose set forth.
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In testimony whereof I have affixed my signature in presence of two witnesses.

EMIL SCHRABETZ.

Witnesses:

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