

(No Model.)

H. COUSIN.

APPARATUS FOR MANUFACTURING ACETYLENE GAS.

No. 604,229.

Patented May 17, 1898.

Fig. 1

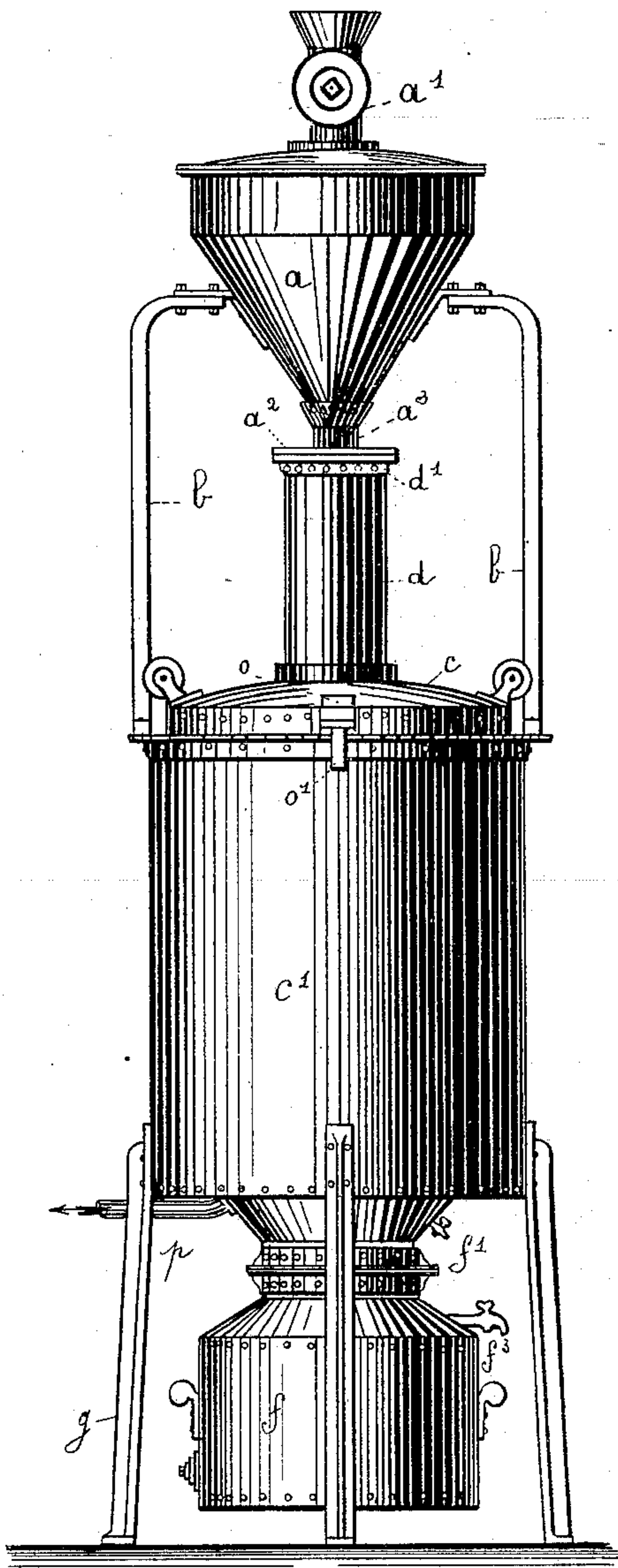
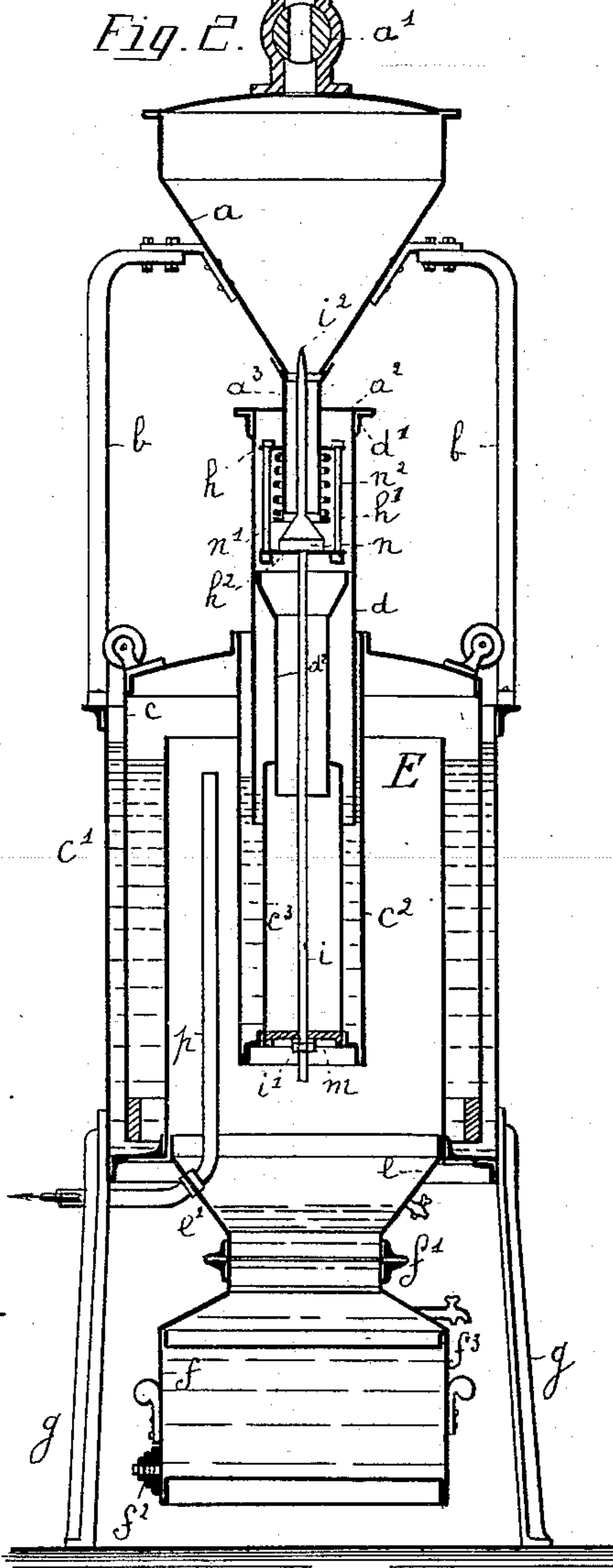


Fig. 2



WITNESSES:

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# UNITED STATES PATENT OFFICE.

HENRI COUSIN, OF PARIS, FRANCE.

## APPARATUS FOR MANUFACTURING ACETYLENE GAS.

SPECIFICATION forming part of Letters Patent No. 604,229, dated May 17, 1898.

Application filed May 1, 1897. Serial No. 634,699. (No model.) Patented in Belgium November 28, 1896, No. 124,866; in Luxemburg March 19, 1897, No. 2,788, and in England April 3, 1897, No. 8,552.

*To all whom it may concern:*

Be it known that I, HENRI COUSIN, a citizen of the Republic of France, residing at Paris, France, have invented certain new and useful  
5 Improvements in Apparatus for Manufacturing Acetylene, (for which I have obtained Letters Patent in Belgium, No. 124,866, dated November 28, 1896; in Luxemburg, No. 2,788, dated March 19, 1897, and in England, No.  
10 8,552, dated April 3, 1897,) of which the following is a specification.

This invention relates to apparatus for manufacturing acetylene from calcium carbide; and it consists in improvements in the arrangement or construction thereof, the object  
15 of the invention being to regulate the generation of the acetylene automatically and safely according to its consumption, so that the internal pressure remains uniform, and to obtain a pure gas not liable to clog the burners.  
20

Referring to the drawings, Figure 1 is a view in elevation of the improved apparatus for manufacturing acetylene. Fig. 2 is a vertical central section of Fig. 1.

25 Similar letters of reference indicate corresponding parts.

In the drawings, *a* represents the hopper, which consists of a funnel-shaped receptacle closed on the top and fitted with a cock *a'*,  
30 through which the hopper is charged with carbide. The hopper is supported by the guides *b* of the gas-holder bell *c*, which are fixed, as usual, upon the holder-tank *c'*, so that the bell has not to support the hopper. The  
35 gas-holder consists of the annular tank *c'* with the floating bell *c* and of a smaller bell *d*, fixed by its upper flange *d'* to the large flange *a''* of a pipe *a'''*, attached to the bottom end of the hopper *a*. The lower end of the small  
40 bell *d* dips into the annular hydraulic seal-tank formed by a down-pipe *c''*, riveted to the crown of the bell *c* at the top and joined by a Z-iron to the rising pipe *c'''*. In consequence of this arrangement the bell can rise and fall  
45 freely without having to overcome any frictional resistances. The bottom *e* of the gas-holder tank *E* is made conical with a pipe *e'* at the center, to which the bottle-shaped generator *f* is bolted, which contains the water  
50 or liquor for decomposing the carbide and collects the deposit of lime.

The whole apparatus is supported on feet *g* and occupies a small floor-space.

The device for regulating the supply of carbide to the generator *f* is arranged as follows:  
55 A square frame is formed of a plate *h* or its equivalent, surrounding the pipe *a'''* inside the bell *d* and connected by bolts *h'* to another cross-bar *h''*, which has formed on it or carries a conical valve *n*. A valve-seating *n'* is  
60 screwed upon or otherwise fixed to the end of the pipe *a'''*, and between the flange of the seating *n'* and the plate *h* a helical spring *n''* is placed and compressed, so that it has a tendency to lift the frame and valve and close  
65 the orifice of the pipe *a'''*. To the valve *n* or plate *h''* a rod *i* is fixed, which is threaded at its bottom end, and a nut *i'* is screwed upon it and fixed in position by a lock-nut or its equivalent. The rod *i* passes freely through  
70 a hole in a cross-bar *m*, fixed in the pipe *c'''* of the hydraulic seal.

The nut is so adjusted that when the bell *c* is in its lowest position the valve *n* fully opens the outlet-orifice from the hopper. The  
75 rod *i* is prolonged upward at *i''* to agitate the carbide in the pipe *a'''* and prevent it from sticking. When the bell *c* rises, the spring *n''* lifts the valve *n* against its seating and closes the outlet, after which the bell can continue to rise freely to its highest position.  
80 To prevent the spring from being weakened by the weight of the bell when the apparatus is not working, projecting lugs or handles *o* are riveted to the bell, by which it can be lifted, and hinged supports *O'* or their equivalents are fixed to the tank, which when turned  
85 up under the handles *o* hold up the bell high enough to allow the spring *n''* to close the valve *n*.  
90

The apparatus works as follows: At starting the bell is lifted and held up by the supports *O'* in the manner described, so that the valve is closed. Granulated carbide is supplied to the hopper *a* through the cock *a'*, which  
95 then is closed. The generator *f* is filled with water by pouring it into the central hydraulic seal till it overflows over the edge of the inner wall *c'''* into the generator *f*. A tap *f'* is arranged on the conical bottom of the gas-holder to draw off excess of water, though the  
100 action of the apparatus will not be interfered



with if the water-level inside the holder should be higher. The supports  $O'$  are then turned down, so that the bell can drop, when the cross-bar  $m$  encounters the nut  $i'$  and draws  
 5 the valve down, allowing carbid to fall through the small bell  $d$  and internal pipe  $d^2$  into the generator  $f$ , and gas is produced and fills the gas-holder. The gas is drawn off for consumption through the pipe  $p$  or led into a  
 10 purifier. If the production is greater than the consumption, the bell  $c$  rises and the spring  $n^2$  closes the valve, whereby the production of gas is stopped or reduced till the quantity in the holder is reduced and the bell  
 15 sinks down again, when the cross-bar  $m$  again strikes against the nut  $i'$  and the valve is pulled open by the bell, allowing a further supply of carbid to drop into the decomposing-chamber, this operation being then re-  
 20 peated. To charge the hopper while the apparatus is working, a closed funnel-shaped receptacle, as indicated by dotted lines, filled with granulated carbid is screwed or pressed upon the cock  $a'$ , and when the latter is  
 25 opened the carbid drops into the hopper  $a$ , after which the cock is closed again and the receptacle removed. Water can be filled in at any time during the working through the hydraulic seal. The liquid deposit of lime  
 30 can be drawn off through an opening closed by a screw-plug  $f^2$  while the apparatus is working, and for completely emptying the bottle-shaped generator  $f$  can be taken off, a tap  $f^3$  serving to empty the same to below the  
 35 flange. The shapes and relative sizes of the parts of the apparatus may be varied from those shown on the drawings.

The advantages of the improved apparatus hereinbefore described are the following:  
 40 Acetylene is produced regularly and safely, as the holder need only be small and contain a small quantity of gas at a time even where a large supply is required. The pressure of the gas is perfectly uniform, as the floating  
 45 gas-holder or bell carrying neither the supply of carbid nor water nor the deposit of lime is not subject to variations of load and moves freely without any friction in consequence of the hydraulic seal used. The lime deposit  
 50 can readily be removed and the apparatus charged with carbid while working. The gas produced is free from ammonia, owing to the large quantity of water contained in the generator, and is not liable to clog the burner  
 55 even if no purifier is used. A small quantity of carbid being dropped at a time into a large quantity of water, no appreciable rise of temperature occurs and a maximum yield of

acetylene is obtained, while overproduction is entirely prevented. The apparatus is compact and occupies little space and can be handled conveniently and without danger.

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

1. In an apparatus for generating acetylene, the combination of a suitable frame, a hopper supported thereby and having an outlet-orifice at its lower end, a sleeve extending downwardly from said hopper and surrounding the outlet-orifice, an inner sleeve fixed to the aforesaid sleeve, a gas-holder guided in said frame, an outer casing extending downwardly from the top of the gas-holder and arranged within the same, an inner casing  
 75 extending upwardly from the lower part of the outer casing, said outer sleeve on the hopper extending down between the said casings and said inner sleeve extending down into the inner casing, a spring-retracted valve-stem  
 80 passing through the outer casing and inner sleeve and having a valve above said inner sleeve for opening and closing the said outlet-orifice of the hopper, means for guiding the valve-stem, means connected with the  
 85 outer casing for lowering the valve-stem and unseating the valve, and a generator located below and within said holder, substantially as set forth.

2. In an apparatus for generating acetylene, the combination of a supporting-frame, a hopper provided with a valve-seat, a valve carried by said hopper, a spring attached to the hopper and adapted to seat said valve, a gas-holder guided by said frame, a generator  
 95 located below and within said holder, an outer casing secured to said holder and extending into the generator, an inner casing concentric with said outer casing, an outer sleeve secured to the hopper and extending into the said  
 100 outer casing, an inner sleeve attached to said outer sleeve and extending into said inner casing, a valve-stem extending downwardly through the inner sleeve and the inner casing, and a nut threaded on the end of the  
 105 valve-stem and adapted to be engaged by the outer casing as the gas-holder descends, whereby the valve is unseated, substantially as set forth.

In testimony that I claim the foregoing as  
 110 my invention I have signed my name in presence of two subscribing witnesses.

HENRI COUSIN.

Witnesses:

C. DE PENADI,  
 EMILE PICHU.