

No. 612,342.

Patented Oct. 11, 1898.

C. HUMFREY.  
GAS PRODUCER.

(Application filed June 10, 1898.)

(No Model.)

2 Sheets—Sheet 1.

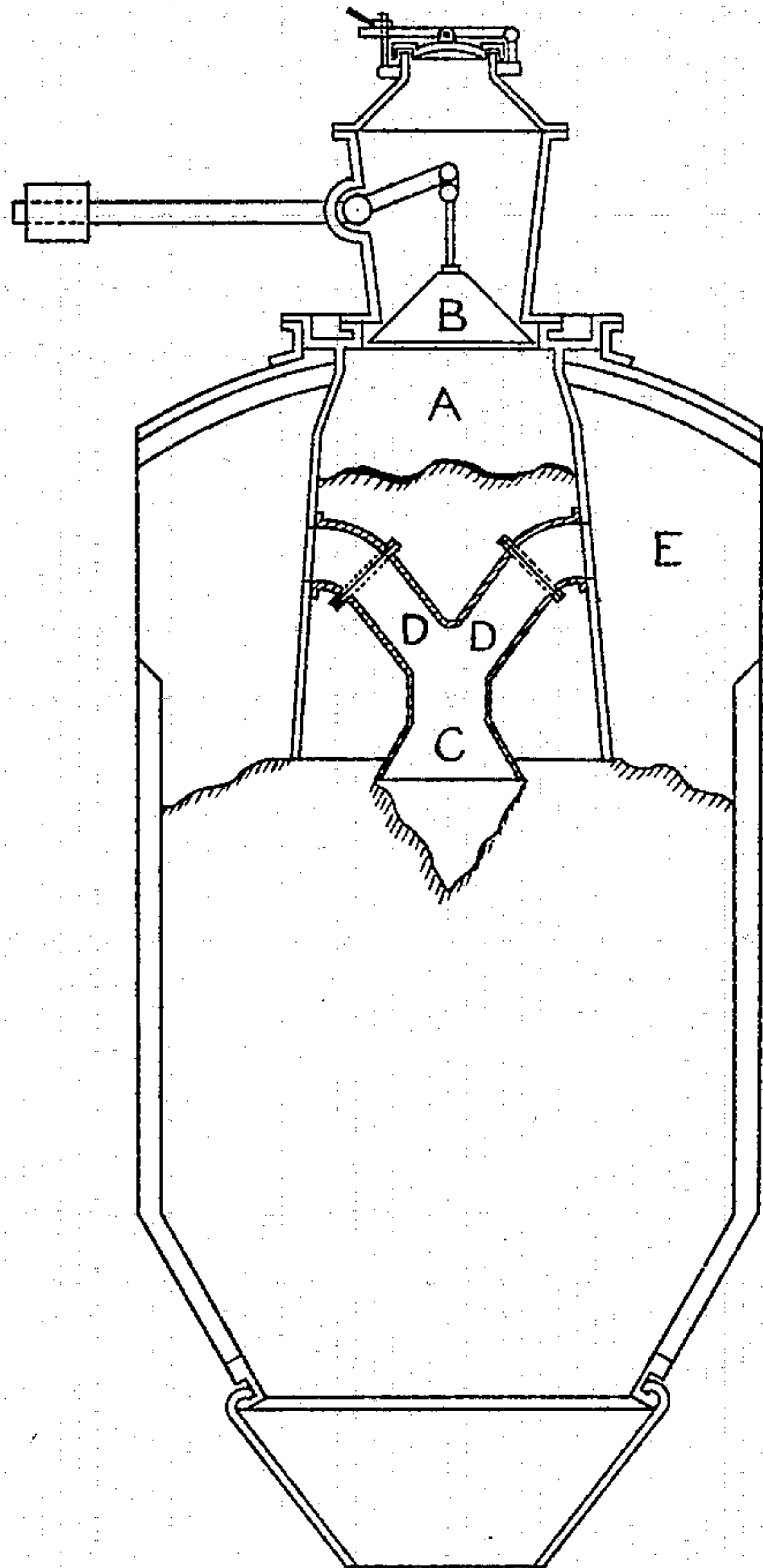


FIG. 1.

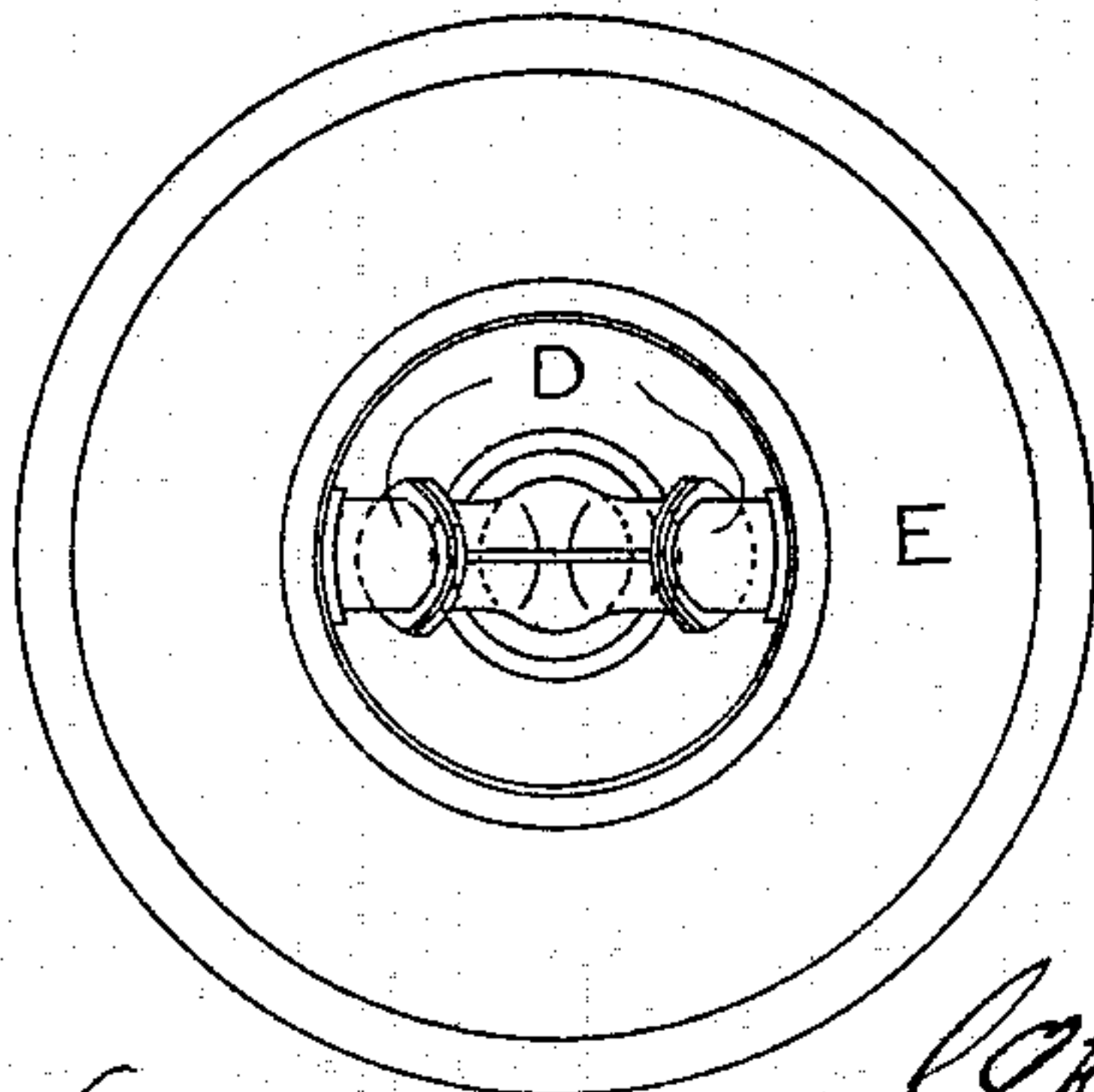


FIG. 2.

Witnesses  
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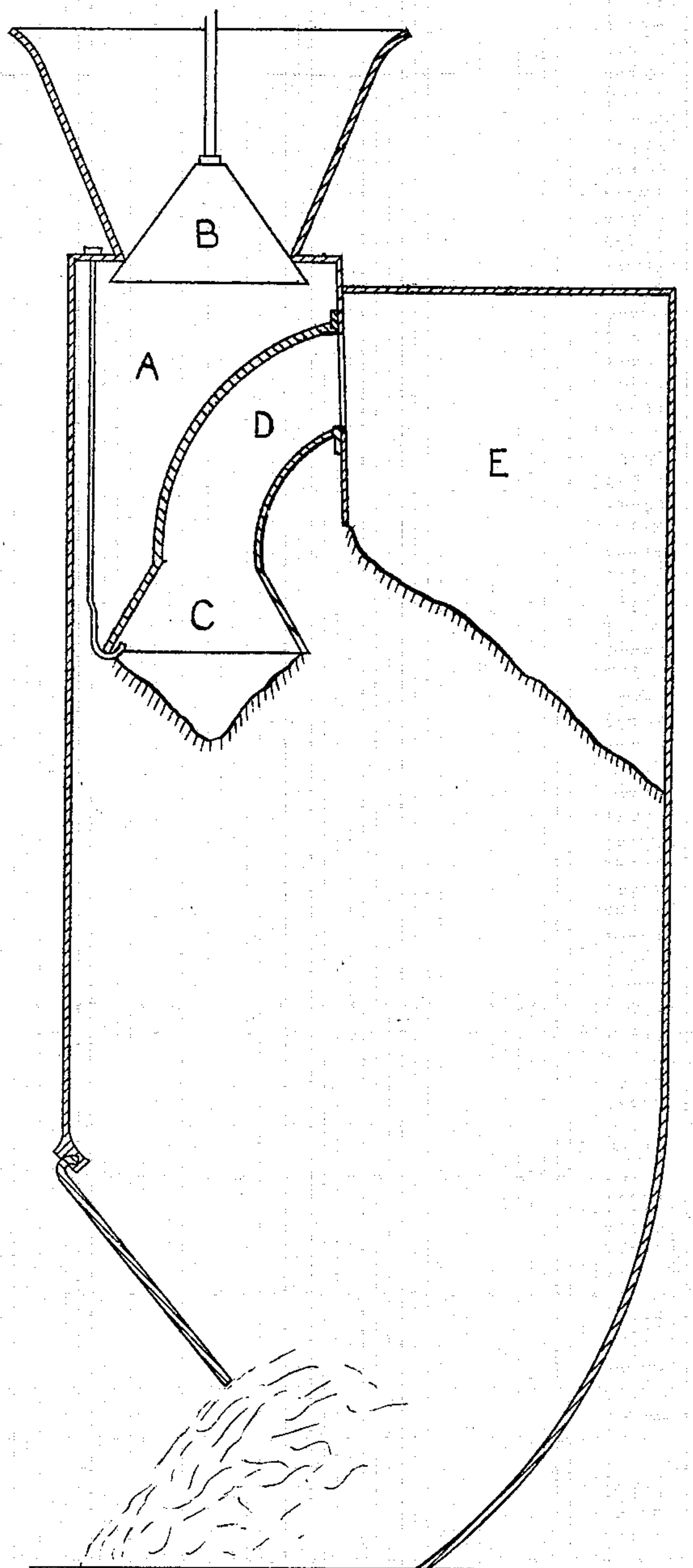
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FIG. 3.



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# UNITED STATES PATENT OFFICE.

CHARLES HUMFREY, OF NORTHWICH, ENGLAND.

## GAS-PRODUCER.

SPECIFICATION forming part of Letters Patent No. 612,342, dated October 11, 1898.

Application filed June 10, 1898. Serial No. 683,054. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES HUMFREY, a subject of the Queen of Great Britain, and a resident of Winnington Park, Northwich, in the county of Chester, England, have invented certain new and useful Improvements in Gas-Producers, (for which I have made application in Great Britain, No. 28,367, dated December 1, 1897,) of which the following is a specification.

In gas-generators to which the fuel is supplied through a hopper, bell, or receiver at the top the space below that hopper, bell, or receiver is usually practically dead and useless for gasifying. This is almost equally the case whether the hopper be along the side or along the center of a rectangular gas-generator or in the center of a cylindrical one. The hopper acts to a certain extent as a retort, the gases and vapors passing downward under its curb and out into the upper portion of the generator through the fuel, where they mingle with other escaping gases, and the vapors are to a certain extent disassociated by coming in contact with the fuel through which they pass. Now my invention is designed to convert this dead-space below the hopper into a gasifying one, and thus largely increase the yield of the furnace and incidentally lessen the amount of tarry matters which escape without being converted into permanent gases.

My invention is best described by aid of the accompanying drawings, in which—

Figure 1 shows a sectional elevation, and Fig. 2 a plan, of my invention as applied to a Mond circular gas-producer; Fig. 3, a sectional elevation of a rectangular producer.

In the drawings, A is the ordinary inverted hopper below the bell B. C is a similar but smaller-sized bell or inverted hopper below the hopper A. From the upper part of this bell C one or more tubes or passages D lead the gases collecting in the bell to the space E in the upper portion of the gas-generator above the fuel. The bell C can be suspended from the upper part of the hopper by means of suspension-bolts fastened or hooked to the lowest points of such bell, as shown in Fig. 3; but in practice I have found that when

two strong cast-iron pipes, such as D, Fig. 1, are used they are amply sufficient to support the bell C without suspension bolts or hooks.

The action of my apparatus is as follows: The air and steam entering the bottom of the gas-producer pass nearly uniformly up through the mass of fuel and are converted into permanent gas. This gas passes partly up through the bell C and partly into the space E between the sides of the main hopper or receiver A and the sides of the producer. The bottom of the bell C is placed so much lower than the bottom of the hopper A as to make the distance from the hearth of the gas-producer to the surface of the fuel below C somewhat less than the distance from the hearth to the surface of the fuel between the walls of the gas-generator and the hopper or receiver, as shown in the drawings.

Although I have described my invention only in connection with two forms of gas-generator, it is obvious that it can be applied to almost any other gas-producer, the shape of the hopper and the pipe or pipes D being altered to suit the varying conditions.

I claim as my invention—

1. The combination in a gas-generator having a main internal hopper or bell of a second inverted hopper or bell a gas-space above the fuel in the generator and a conduit or conduits connecting the lower inverted hopper or bell with the said gas-space.

2. The combination in a gas-generator of a feed-hopper closed at top, an inverted-bell mouth immersed in the fuel below that hopper and a conduit therefrom connecting the bell-mouth with the space above the surface of the fuel open to the gas-exit, substantially as described.

3. In a gas-generator in which only a portion of the upper surface of the fuel is open for the escape of gas, one or more conduits connecting the fuel a little below the surface in the inclosed portion with the gas-space above the open portion, whereby the gas is enabled to escape from the inclosed portion about as freely as from the open portion.

4. The combination with hopper A of a gas-exit mouth C below hopper A and below the surface of the fuel and nearer the hearth



than the edge of hopper A or than the upper surface of the fuel beyond substantially as described.

5 5. The combination in a gas-producer of the closed hopper A having a valve device B with the bell C, conduit D and open gas-space E substantially as described.

In witness whereof I have hereunto signed my name, this 25th day of May, 1898, in the presence of two subscribing witnesses.

CHARLES HUMFREY.

Witnesses:

W. H. BEESTON,  
J. MCLACHLAN.