

No. 658,589.

Patented Sept. 25, 1900.

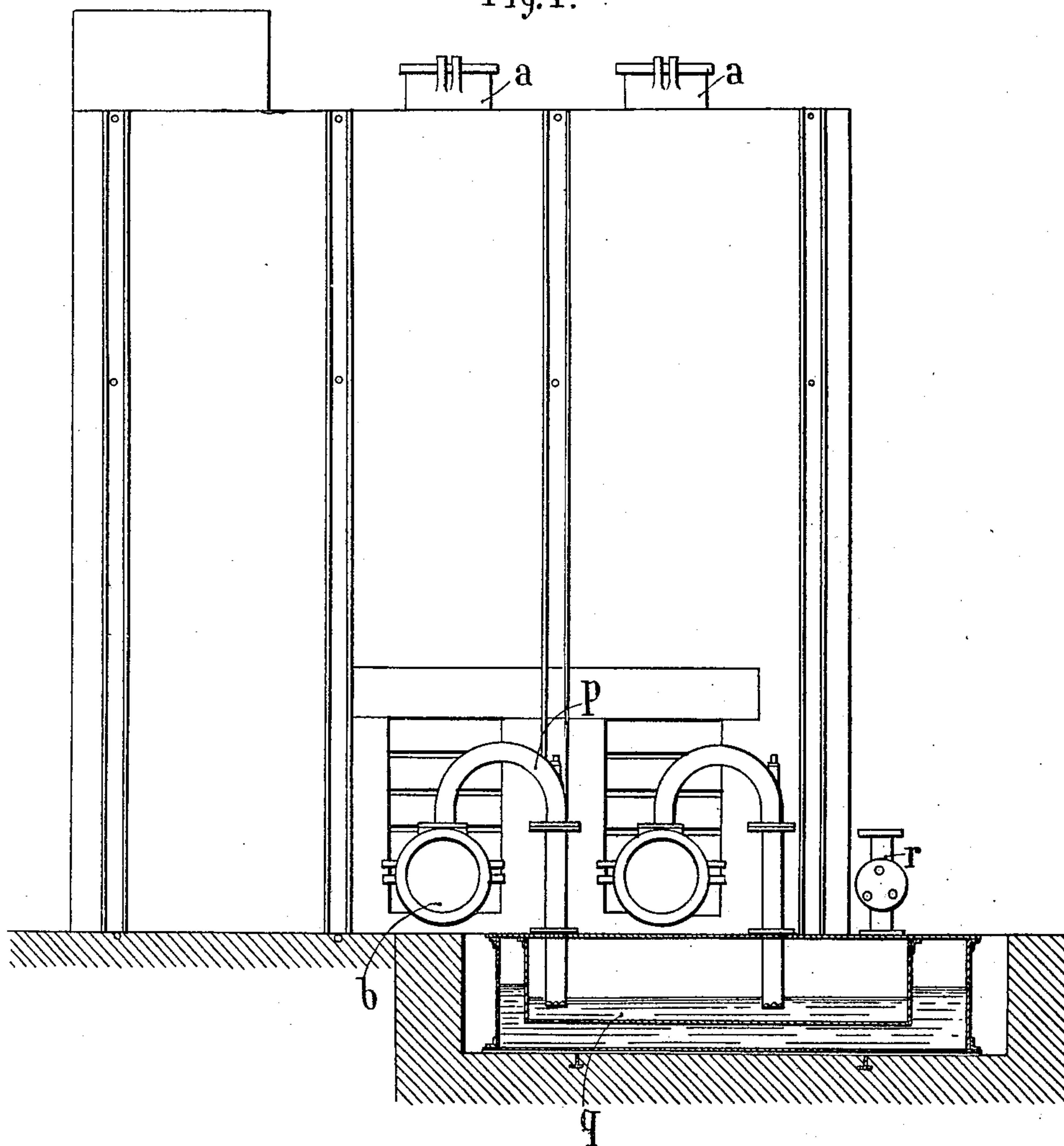
H. RICÉ.  
APPARATUS FOR MANUFACTURING GAS.

(Application filed June 1, 1900.)

(No Model.)

5 Sheets—Sheet 1.

Fig. 1.



Witnesses:

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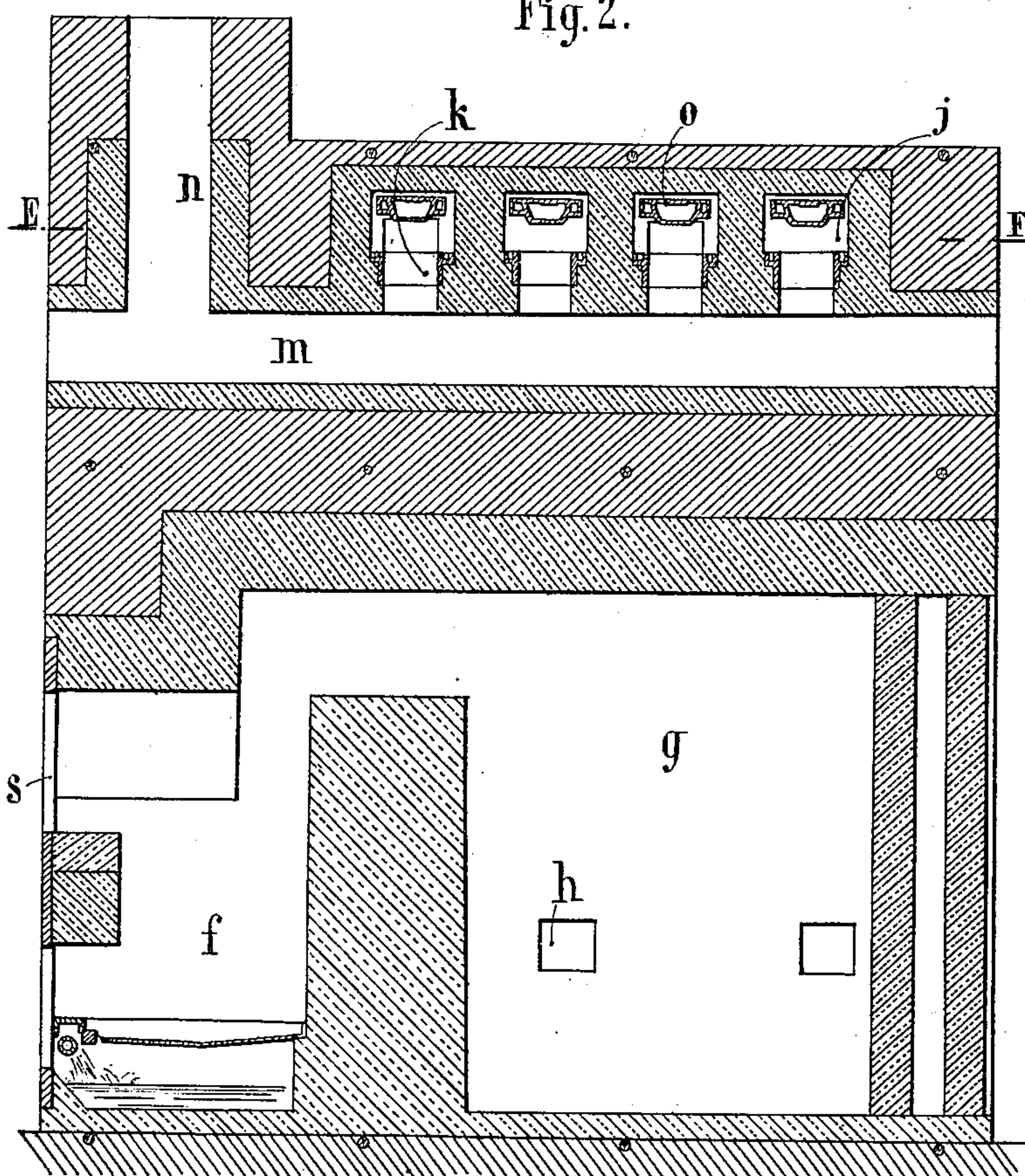
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Fig. 2.



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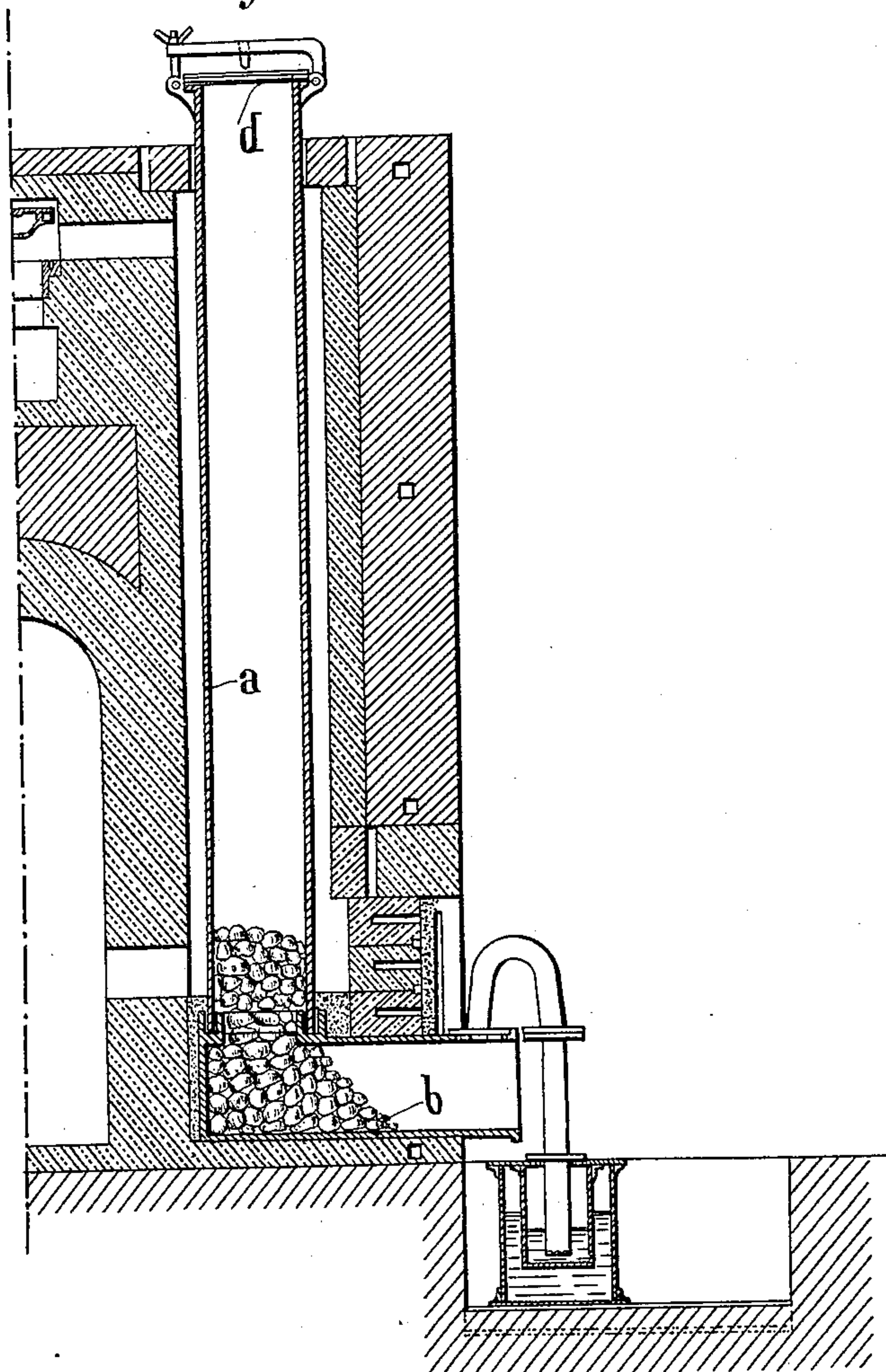
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Fig. 3.



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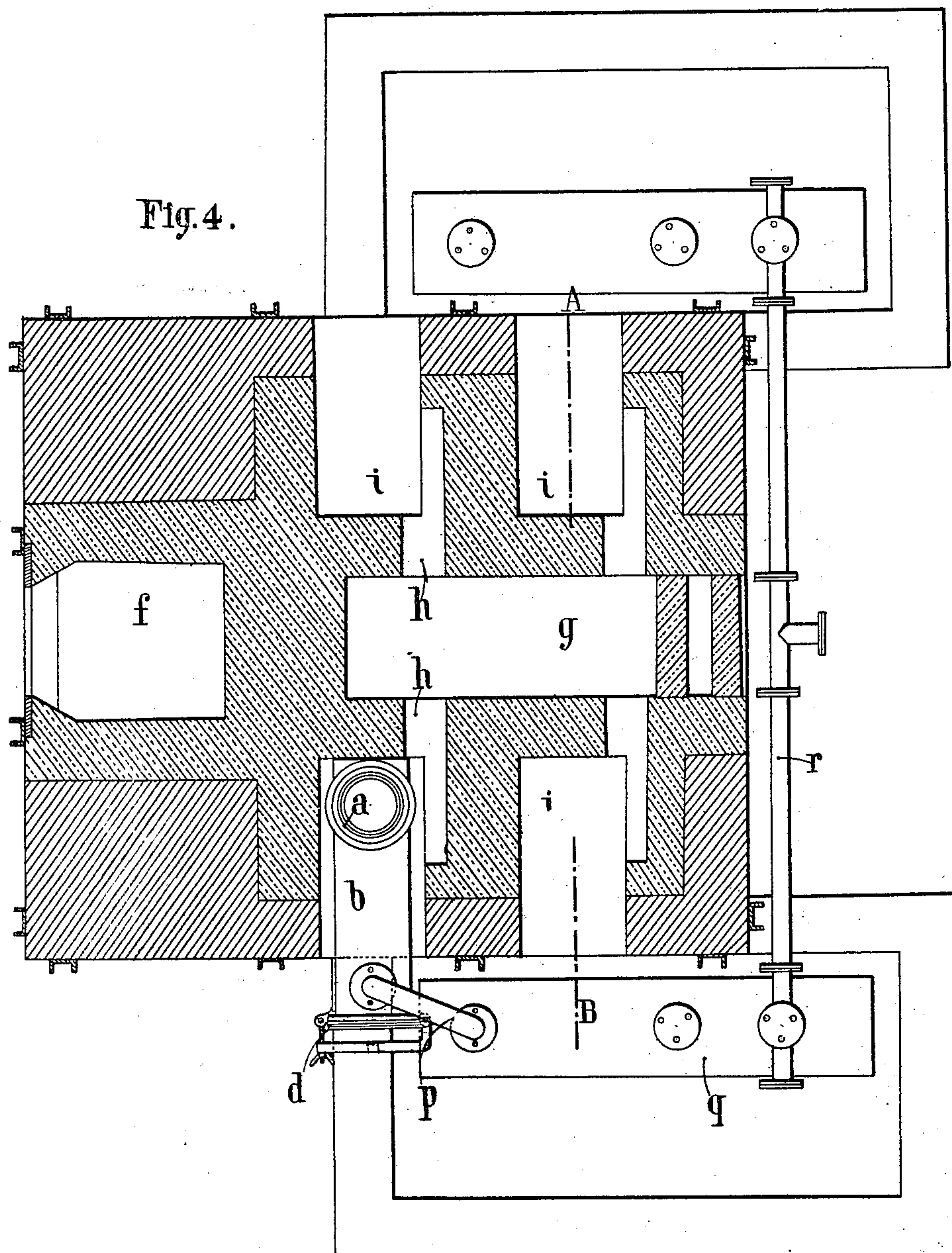
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APPARATUS FOR MANUFACTURING GAS.

(Application filed June 1, 1900.)

(No Model.)

5 Sheets—Sheet 4.



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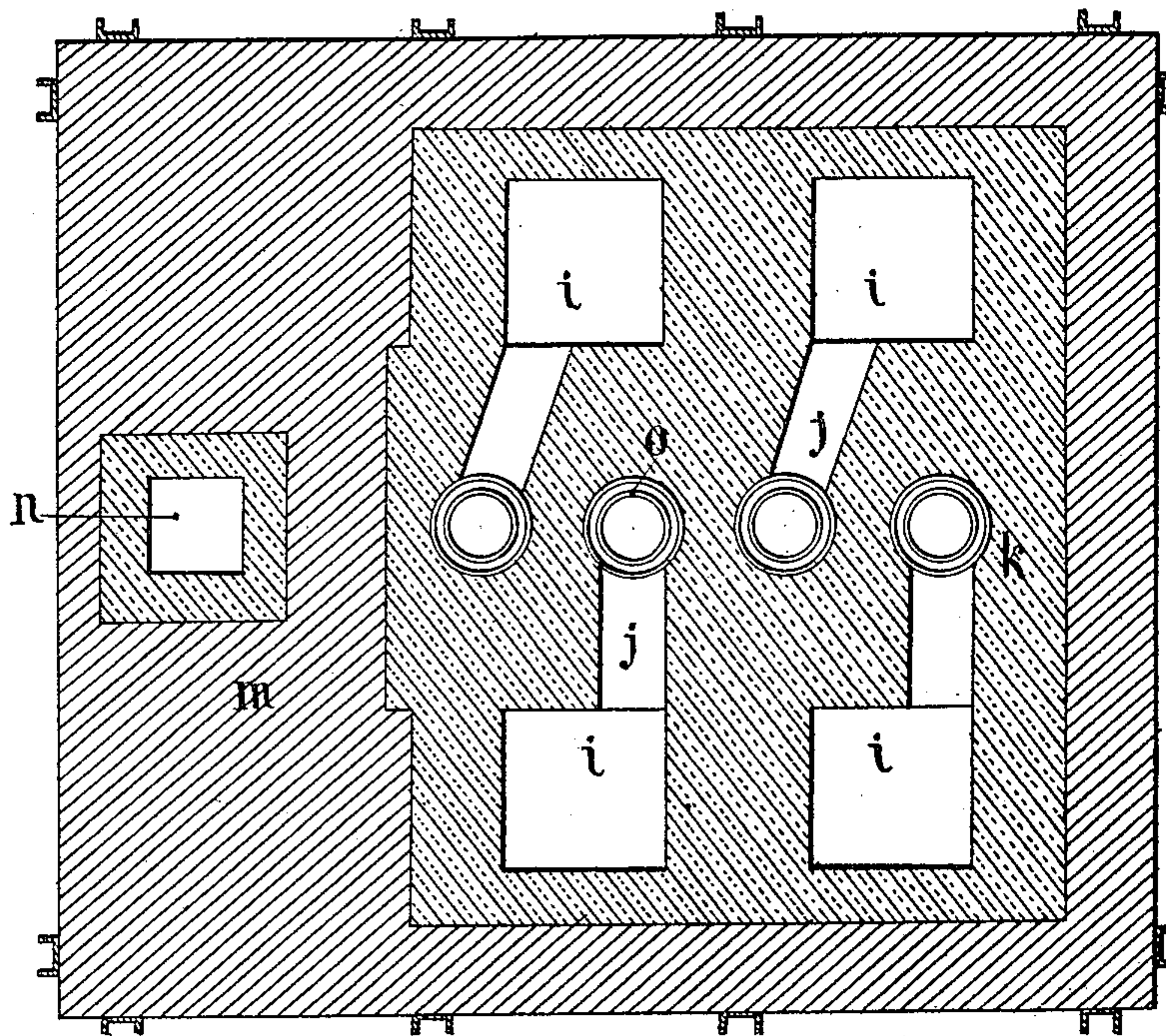
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(No Model.)

5 Sheets—Sheet 5.

Fig. 5.



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# UNITED STATES PATENT OFFICE.

HENRI RICHE, OF PARIS, FRANCE.

## APPARATUS FOR MANUFACTURING GAS.

SPECIFICATION forming part of Letters Patent No. 658,589, dated September 25, 1900.

Application filed June 1, 1900. Serial No. 18,746. (No model.)

*To all whom it may concern:*

Be it known that I, HENRI RICHE, gas manufacturer, a citizen of France, residing at 28 Rue St. Lazare, Paris, France, have invented certain new and useful Improvements in Apparatus for the Manufacture of Gas, of which the following is a specification.

This invention has for its object improvements in apparatus intended to convert fire-wood into gas and working according to the well-known principle of inverted distillation. These improvements relate chiefly to arrangements by which the products of the distillation are purified before leaving the retort, being caused to pass through a thick layer or a column of incandescent coal residues resulting from a great number of previous distillations, which residues are steadily renewed by the additional residues of the successive charges.

The characteristic feature of this apparatus or furnace lies in the particular arrangement of the retort, which is of a very simple and economical construction, for allowing the above-mentioned result to be obtained.

In order that my invention may be readily understood, I will describe it with reference to the accompanying drawings, in which—

Figure 1 represents a side elevation of the furnace. Fig. 2 is a vertical section of the same through the axis of the heating-chamber. Fig. 3 represents a transverse axial section of the furnace through one of the retorts—say through the line A B of Fig. 4. Figs. 4 and 5 are horizontal sections of the same, respectively, through the lines C D and E F of Fig. 2.

As will be seen from the drawings, the apparatus consists of a gas-furnace having vertically-arranged retorts, which are heated from outside to a red heat—say 800° to 900° centigrade—by the flames of a furnace with heating-chamber in the central part of the masonry.

The retorts *a*, which are made of cast-iron or other suitable material, may be of any convenient shape; but I prefer to make them cylindrical. They are arranged vertically and bear by their lower part on a horizontal and cylindrical piece *b*, which I shall call a "thermal filter" or "purifying apparatus." The retort *a* and piece *b* are united by means of a

rib-and-groove device *c*, fitted on the cylinder *b*, in which I insert a refractory mastic compressed by the sole weight of the retort, which is allowed to expand itself freely upward. The head of the retort is closed by a cover *d* and the cylinder *b* by a door of any convenient construction.

Behind the furnace *f* is arranged the central heating-chamber *g*, in the lower part of which openings *h* are provided, leading to the vertical flues *i*, of fire-brick, wherein the retorts *a* are placed. The several flues *i* are set in communication by means of conduits *j* and *k* with a main conduit *m*, leading to the chimney *n*. Damper-doors *o* are arranged at the upper part of the conduits *k*.

Every horizontal cylinder *b*, upon which bears the retort, is fitted with a curved and diagonally-arranged pipe *p*, causing the products of the distillation to cross the washing apparatus *q*, from which they are discharged through the piping *r* to the gasometer or the utilizing apparatus.

This apparatus works in the following manner: The furnace *f* being lighted, the air passes across the fire-grate and the fuel is converted into Siemens gas, which mixes with the air entering through the door *s*. This gas is burned in form of long flames in the central heating-chamber *g*, wherein the combustion is perfected. The burned gases pass then at a very high temperature through the openings *h* to the vertical flues *i*, rise along the said flues, and flow across the conduits *j* *k* (provided with damper-doors) and the main conduit *m* to the chimney *n*. When the apparatus, and in particular the retort, has been brought to a sufficiently high temperature, the retort *a* is opened and charged with a little quantity of coke or charcoal, so as to fill the rear part of the cylinder *b* and the lower part of the retort *a*, as shown in Fig. 3. When this coke or this charcoal has been raised to a red heat, the retort is charged with the wood to be distilled, after which the cover *d* is closed and tightened. Now the distillation commences, and the resulting gases are filtered by passing through the incandescent column of coal in the lower end of the retort and in the cylinder *b*, where they are purified on one side by cementing the coal in destroying its tar-vapors and on the other side by con-



verting into carbonic oxid all their proper oxygenized elements. The advantage of this immediate and economical purifying method is to increase in a large scale the volume and the weight of the produced gas by addition of the gases being formed from the condensable bodies of the simple distillation. It requires neither manual labor nor expense, as the purifying material is produced by the distilled fuel, itself falls naturally in the place where it is to be employed, and is automatically renewed by the succession of the charges. The purified gas is collected at the front part of the cylinder *b* and sent by the curved pipe *p* to the washing and cooling tank *q* and from the latter through the piping *r* to the gas-reservoir or to the utilizing apparatus.

In the accompanying drawings I have shown an apparatus or a furnace having four retorts—say four gas-producing elements; but it will be easily understood that I do not limit myself to this particular number, which may be varied according to the size and power of the apparatus.

Having now particularly described and ascertained the nature of my invention and in what manner the same is to be performed, I declare that what I claim is—

1. In an apparatus for the manufacture of gas, a furnace, a heating-chamber provided therein, a series of vertical flues in commu-

nication with said chamber, a vertical retort arranged in each of said flues and adapted to be heated externally, a conduit *k* in communication with each of said flues and provided with a suitable damper, a separate cylinder connected to the bottom of each of said retorts, a washing-tank, and connections between said tank and cylinders, substantially as described.

2. In an apparatus for the manufacture of gas, a furnace, a heating-chamber provided therein, a series of vertical flues in communication with said chamber, a vertical retort arranged in each of said flues and adapted to be heated externally and further provided with a suitable top or cover, a separate filtering or purifying device connected to the lower end of each of said retorts, a washing-tank, a connection between said tank and filtering device, a series of conduits *k* each provided with a damper, a series of conduits *j* for establishing communication between said conduits *k* and said vertical flues, and a suitable outlet-pipe connection for said tank.

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

HENRI RICHE.

Witnesses:

EMILE KLOTZ,  
EDWARD P. MACLEAN.