

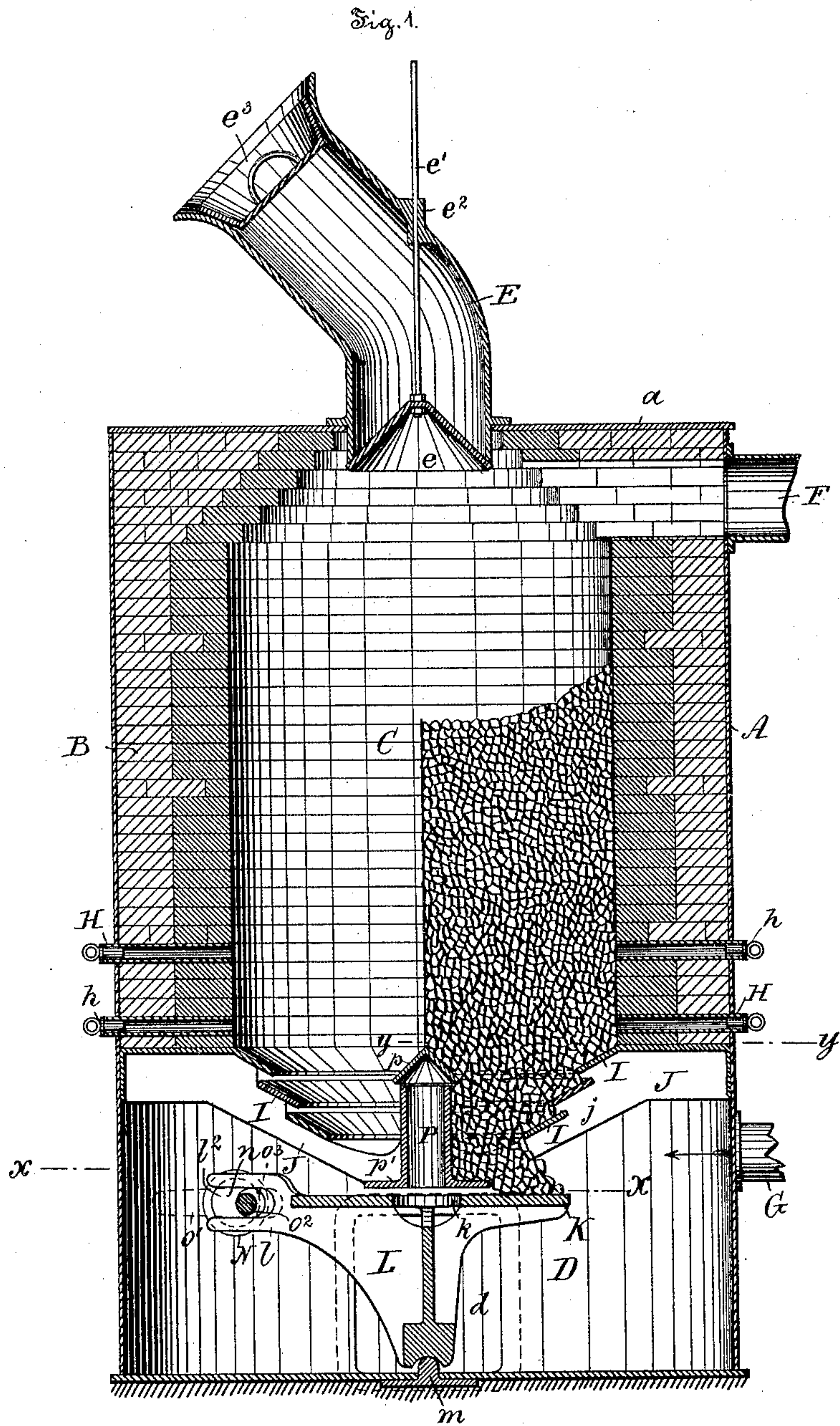
(No Model.)

2 Sheets—Sheet 1.

P. A. N. WINAND.  
GAS PRODUCER.

No. 474,202.

Patented May 3, 1892.



Witnesses:  
Chas. C. Collier.  
John Carlisle

Paul A. K. Winand,  
Inventor:

by Chas. B. Collier,  
att'y.

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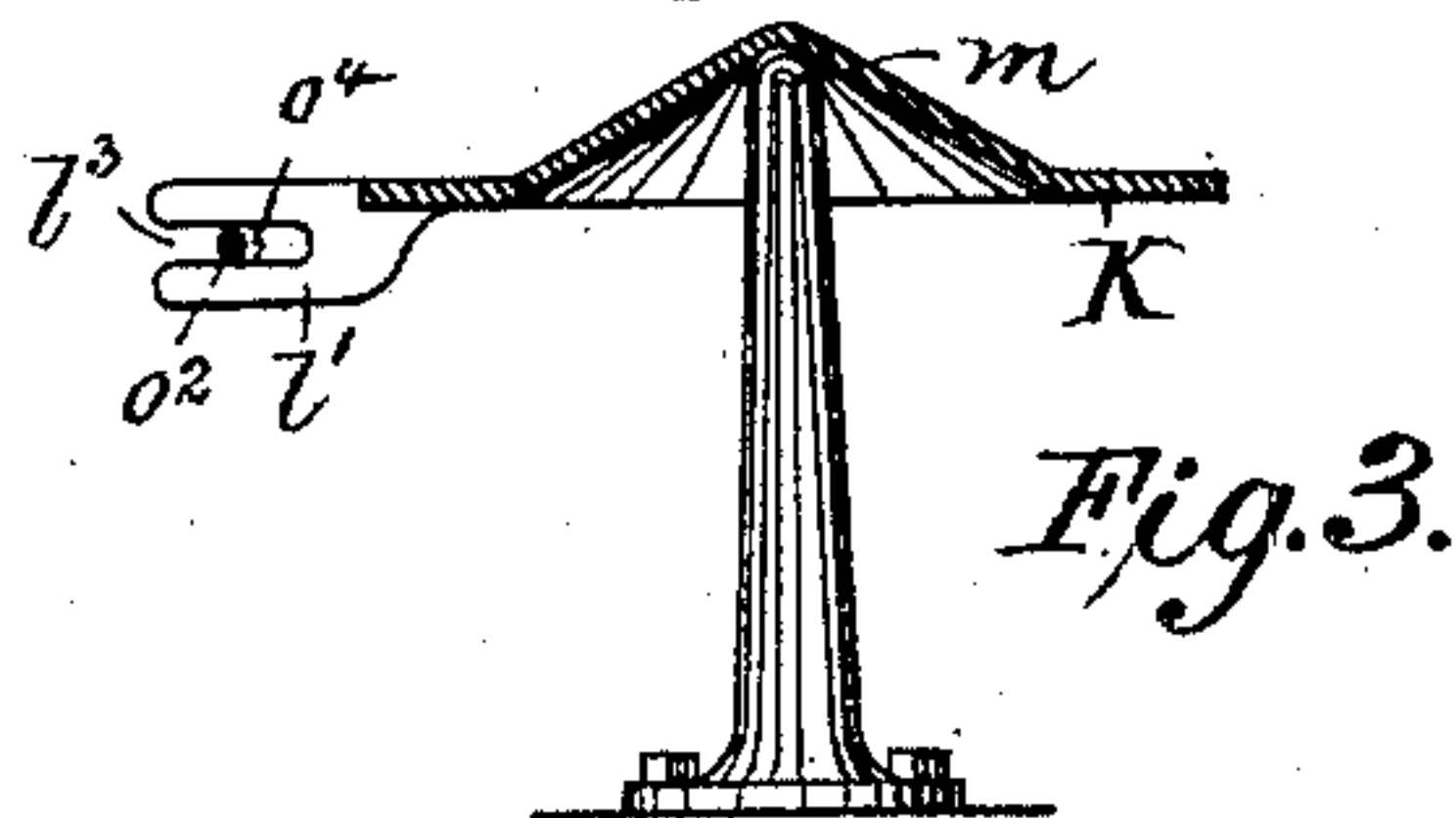
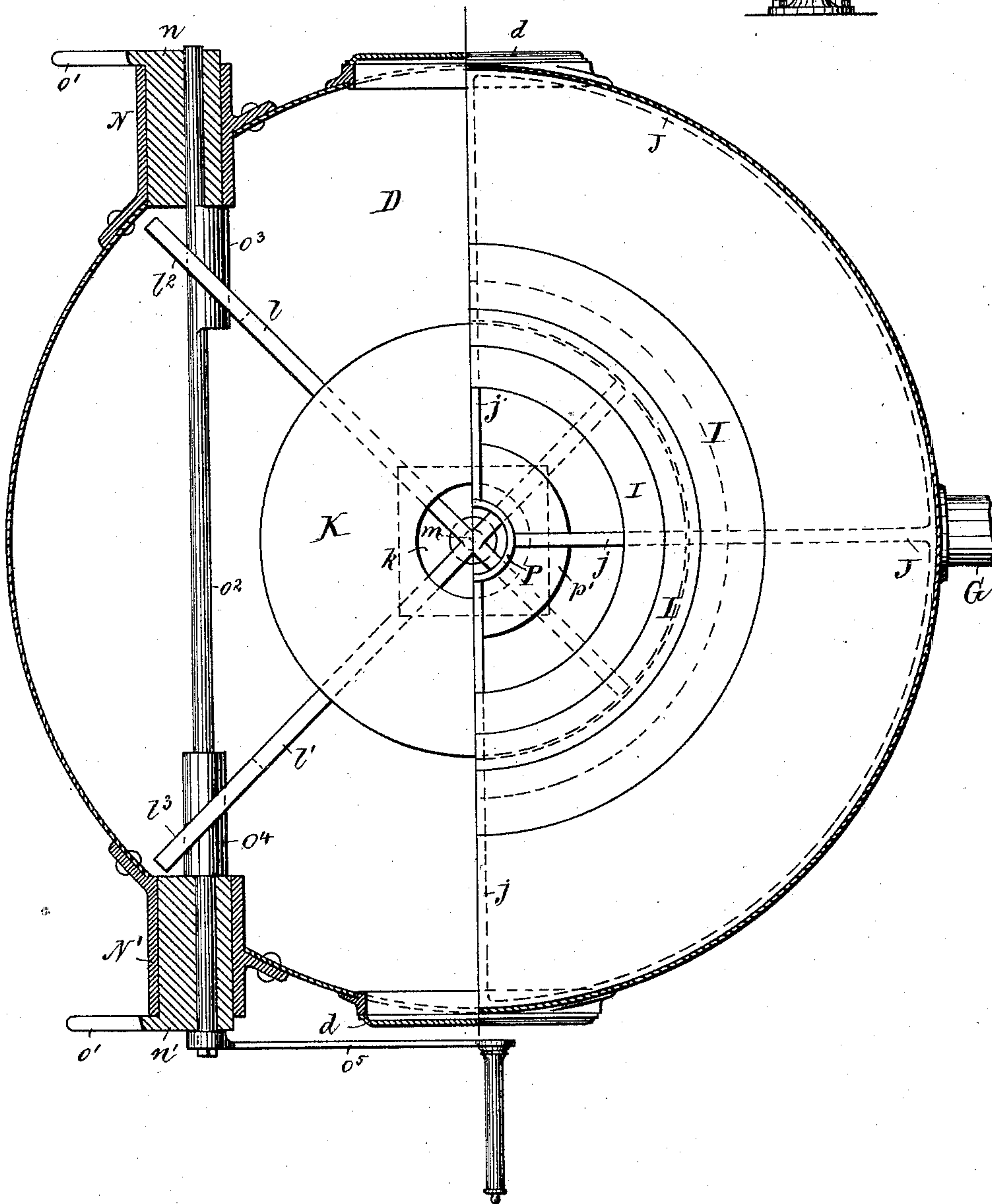


Fig. 2.



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Att'y.



# UNITED STATES PATENT OFFICE.

PAUL A. N. WINAND, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO  
SCHLEICHER, SCHUMM & CO., OF SAME PLACE.

## GAS-PRODUCER.

SPECIFICATION forming part of Letters Patent No. 474,202, dated May 3, 1892.

Application filed March 29, 1890. Serial No. 345,892. (No model.)

*To all whom it may concern:*

Be it known that I, PAUL A. N. WINAND, a subject of the King of Belgium, but now residing at the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Gas-Producers, of which the following is a specification.

My invention relates to improvements in apparatus for generating gas and from more especially solid fuel.

The principal objects of my invention are, first, to provide a producer adapted to permit air or steam or a mixture of air and steam to be admitted to the fuel as freely as possible, so as to reduce the resistance to the air or steam or mixture entering the fuel, and, second, to provide a producer with simple, reliable, and effective means for removing ashes or other non-combustible matter from the combustion-chamber without interrupting or interfering with the making of gas.

My invention consists of a producer constructed and arranged and the parts thereof operating in the manner hereinafter described and claimed.

The nature and characteristic features of my invention will be more fully understood taken in connection with the accompanying drawings, forming part hereof, in which—

Figure 1 is a vertical central section of a producer or generator embodying the features of my invention. Fig. 2 is a view on an enlarged scale, showing to the right a section on the line  $x x$  and to the left a section on the line  $y y$  of Fig. 1; and Fig. 3 is an elevation, partly in section, of the bottom, with its pivotal support and standard in a modified form.

Referring to the drawings, A is the metal casing forming the shell of the producer.

B is a backing of brick-work.

C is an inner lining of fire-brick or other preferred incombustible material and forming the wall of the combustion-chamber.

D is the ash-chamber provided with doors  $d$  to permit of the removal of ashes or other non-combustible matter accumulating therein.

E is a curved feed-hopper bolted or otherwise secured to or onto the top plate  $a$  of the producer and communicating with the interior of the combustion-chamber. The feed-

hopper E is provided with a bell  $e$ , which fits snugly up against the lower part thereof and is provided with a vertical rod  $e'$ , extending through a projection  $e^2$ , cast with or secured to the inner and outer surfaces of said feed-hopper E and forms a bearing for said rod  $e'$ . The upper portion of the feed-hopper is provided with a removable dish-shaped cover or cap  $e^3$ , as shown, for instance, in Fig. 1.

F is an off-take pipe leading from the combustion-chamber of the producer.

G is an inlet-pipe secured to or into the casing A of the ash-chamber and through which the air or steam or mixtures of air and steam passes or pass from a suitable source into the interior of said ash-chamber and thence into the combustion-chamber for effecting combustion of the fuel.

H are sight-tubes extending through the outer casing A and walls B and C of the combustion-chamber. These sight-tubes, provided with removable caps or covers  $h$ , are disposed at suitable distances apart and serve as the means whereby from time to time the condition of the fuel in the combustion-chamber may be readily ascertained.

The lower portion of the wall C of the combustion-chamber may be constructed dish-shaped; but I prefer to provide the lower portion of the wall of the combustion-chamber with a series of rings I of decreasing diameters and overlapping one another in such manner as to prevent the ash or other non-combustible matter accumulating from falling between the series of rings. These rings I, while overlapping each other, are nevertheless so arranged that annular spaces are formed between them to permit air or steam or mixtures thereof to freely pass from the ash-chamber to the fuel in the combustion-chamber.

The circular frame or spider J, provided with radial arms  $j$ , is bolted or otherwise secured at its periphery to the casing or shell A and its opposite extremity is depressed or formed dish-shaped. The solid portions of the frame or spider J support the superimposed brick-work, and the depressed radial arms  $j$  are adapted to receive and support the series of rings I.

Beneath the smallest or lowest ring I, and also the spider J, is located a bottom K, pro-



vided with means, to be presently described, for reciprocating or rocking the same. This bottom may be of any preferred form—for instance, spherical or conical—and provided with one or more apertures, protruding lugs or overlapping parts, or constructed solid; but it is by preference made circular in form with a central aperture  $k$  therein. It may be remarked that irrespective of its form or configuration the diameter thereof is greater than that of the smallest ring I, in order to prevent ashes or other non-combustible matter from falling downward over the periphery of the bottom when the latter is at rest. The bottom K is secured to or formed integral with a central standard or foot L, provided with projecting arms  $l$  and  $l'$ , having slots  $l^2$  and  $l'^2$  formed therein. These arms  $l$  and  $l'$  are located at an angle of ninety (90) degrees (more or less) to each other. The lower extremity of the standard or foot L is formed with a concavity, into which engages a pivot  $m$ , rigidly secured to the base or foundation plate of the producer and so arranged as to permit the foot or standard L, carrying the bottom K, being rocked or oscillated on said pivot, as hereinafter more fully set forth. This standard or foot may, however, be made longer or shorter than shown in Fig. 1 or be wholly dispensed with, and in the latter case pivot  $m$  may be carried up to the height of the outer edge of the bottom or even higher than said edge, in which case the bottom must be made of conical form, as shown in Fig. 3.

N and N' are bearings bolted or otherwise secured to the casing A and supporting eccentric bushings  $n$  and  $n'$ . These bushings, provided with handles  $o'$ , support the shaft  $o^2$ . The shaft  $o^2$  is provided near its respective extremities with cams  $o^3$  and  $o^4$ , formed integral therewith or keyed thereto in any preferred manner. At one of the extremities of the shaft  $o^2$  is mounted a crank  $o^5$  for actuating the same. The slots  $l^2$  and  $l'^2$ , formed in the respective extremities of the projecting arms  $l$  and  $l'$ , embrace the cams  $o^3$  and  $o^4$ , said cams being arranged so that one of them is always in advance of the opposing one, in order that the angular movement imparted to the pivotally-supported bottom when the shaft  $o^2$  is revolved will be such as to cause it to be rocked or oscillated in the different directions required for effectually removing the ashes or other non-combustible material from the combustion-chamber into the ash-chamber beneath without interfering with the making of the gas.

P is a tube having above its upper extremity a protecting-cap  $p$  and provided at its lower extremity with a base-plate  $p'$ . This tube is supported in position by the arms  $j$  of the frame or spider J and extends vertically into the combustion-chamber and furnishes additional means whereby air or steam or mixtures of steam and air may be brought into contact with the fuel of the combustion-

chamber through the opening  $k$  of the bottom K. The actuation of the crank  $o^5$  imparts motion to the shaft  $o^2$ , which in turn actuates the eccentric cams  $o^3$  and  $o^4$  and projecting arms  $l$  and  $l'$ , and thereby rocking or oscillating the bottom K to cause the accumulating non-combustible material in the combustion-chamber to be discharged over the bottom into the ash-chamber. The bottom K is to be shifted or inclined on one or the other side from its normal horizontal position when it is required to grind down more ashes on one side than on the other. This is effected by the eccentric bushings  $n$  and  $n'$  in the bearings N N', which, being set by means of the handles  $o'$ , lift or lower the ends of the shaft  $o^2$ , resulting in depressing one or the other side of the bottom, as desired.

The mode of operation of the producer herebefore described is as follows: The producer is fired in any well-understood manner and the fuel then fed into the combustion-chamber through the feed-hopper by removing the dish-shaped cap or cover and lowering the bell, and when the requisite quantity of fuel has been fed into the combustion-chamber for being converted into gas the bell is drawn upward snugly against the throat of the feed-hopper by means of the vertical rod  $e'$  in any preferred manner. The air or steam or mixtures of air and steam are then by forced draft or otherwise admitted through the inlet-pipe G into the ash-chamber and distributed in an upward direction through the annular spaces between the series of rings I and the aperture  $k$  of the bottom K and central tube P into contact with the fuel in the combustion-chamber for effecting partial combustion thereof, and the gas generated from the fuel therein passes off through the off-take pipe F, located in the upper part of the apparatus for utilization. During the time the producer is making gas the ashes or other non-combustible matter in the combustion-chamber accumulating may be discharged over the bottom K by rocking or oscillating the same on its pivot by means of the crank  $o^5$  without in any way interrupting or interfering with the making of the gas. If it should become necessary during the operation of the producer to discharge the ashes or other non-combustible matter faster from one portion of the combustion-chamber than another, this may be accomplished as hereinbefore fully explained. The ashes or other non-combustible material discharged from the bottom into the ash-chamber and accumulating therein may be removed in any preferred manner through the doors  $d$  by the attendant in charge.

I wish it to be understood that I do not wish to confine myself to the exact form and configuration of parts as described in the foregoing specification, and shown in the accompanying drawings, as the same may be varied without departing from the principle of my invention; but,



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

1. In a gas-producer, a bottom mounted on  
5 a pivot and arms projecting from said bottom, combined with eccentric bushings supported by the producer, a shaft journaled in said bushings, cams on the shaft adapted to engage the projecting arms, and means to rotate  
10 the bushings and the shaft, substantially as described.

2. In a gas-producer, a bottom mounted on a pivot and arms projecting therefrom, each having a slotted end, combined with bearings  
15 secured to the producer, eccentric bushings mounted in said bearings, a revoluble shaft journaled in the bushings, cams on the shaft engaging the slotted ends of the projecting arms, and means to rotate the bushings and  
20 the shaft, substantially as set forth.

3. In a gas-producer having a sealed ash-

pit, a series of superimposed overlapping rings located below the combustion-chamber and supported for the passage of air between them  
25 to said chamber, said rings being of decreased diameter from the top one downward, and a tube extending upward centrally of said rings to the combustion-chamber, combined with a perforated bottom below the series of rings  
30 and the central tube, the area of the bottom being greater than that of the lower ring of the series and the perforation in said bottom registering with the central tube, and a pipe to convey air to the sealed ash-pit, substan-  
35 tially as and for the purpose specified.

In witness whereof I have hereunto set my signature in the presence of two subscribing witnesses.

PAUL A. N. WINAND.

Witnesses:

GEO. W. REED,

CHAS. C. COLLIER.