

No. 876,421.

PATENTED JAN. 14, 1908.

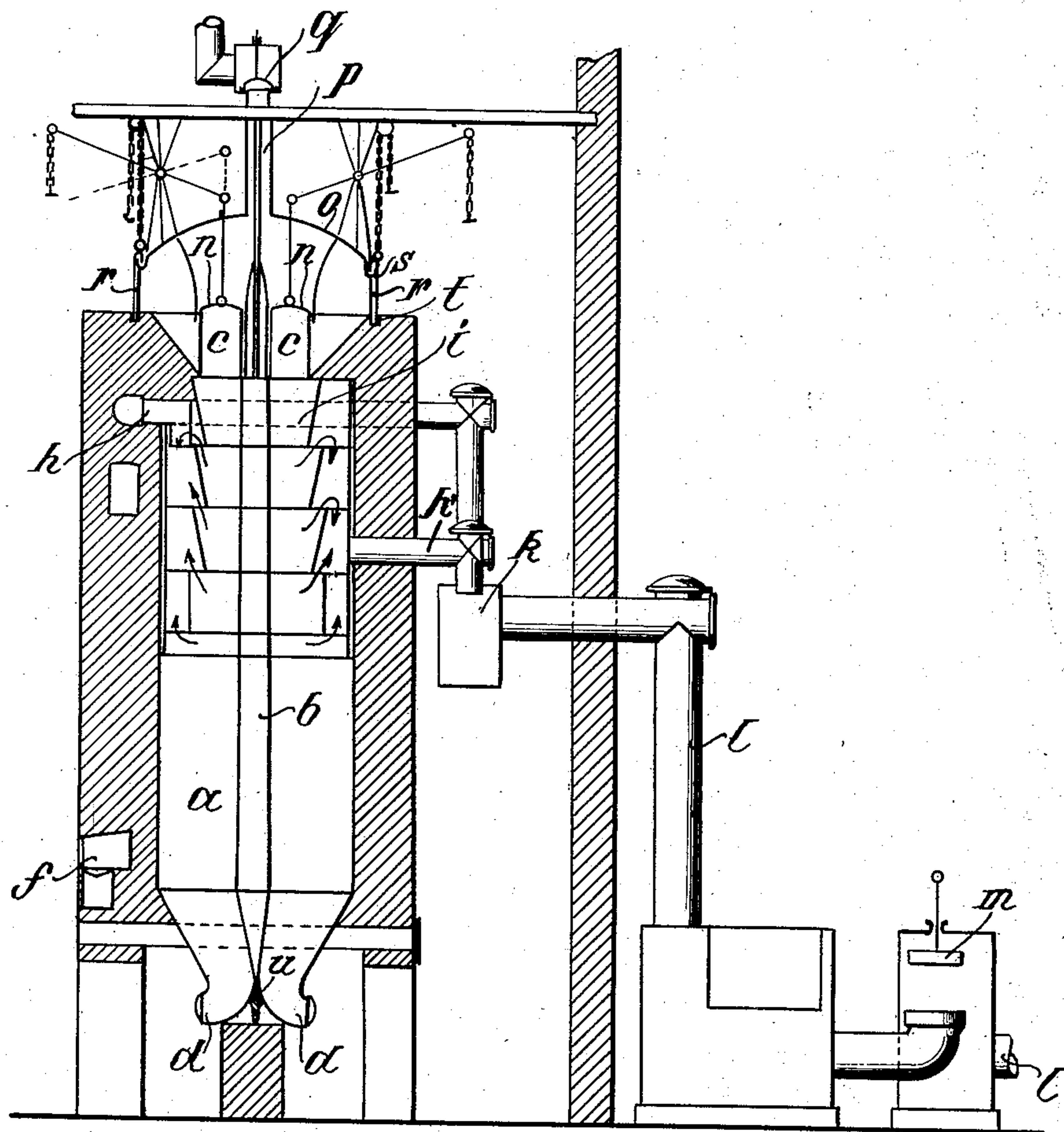
M. ZIEGLER.

KILN FOR COKING PEAT OR SIMILAR MATERIAL.

APPLICATION FILED DEC. 4, 1906.

2 SHEETS—SHEET 1.

Fig. 1.



WITNESSES

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INVENTOR

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2 SHEETS—SHEET 2.

Fig. 2.

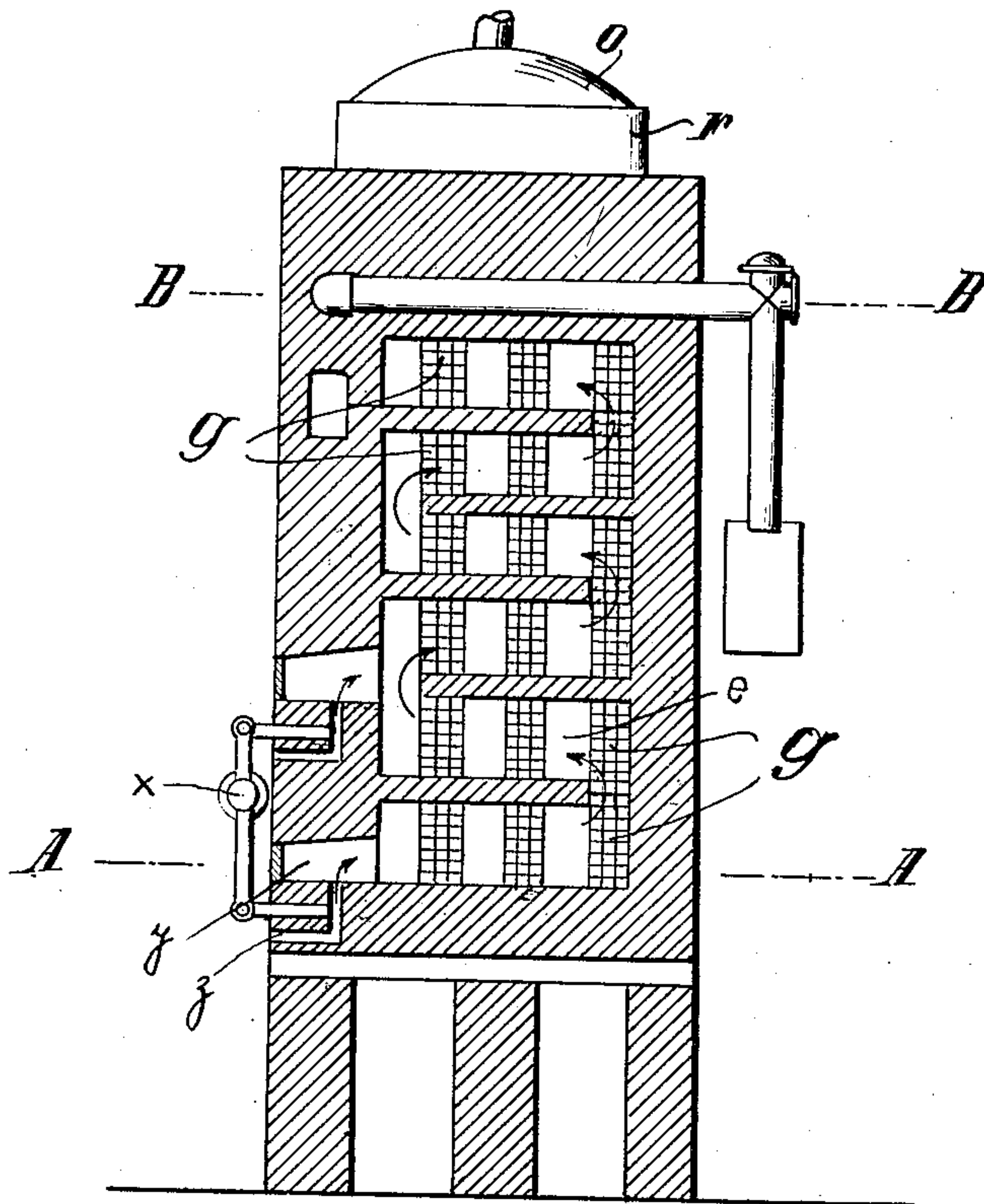
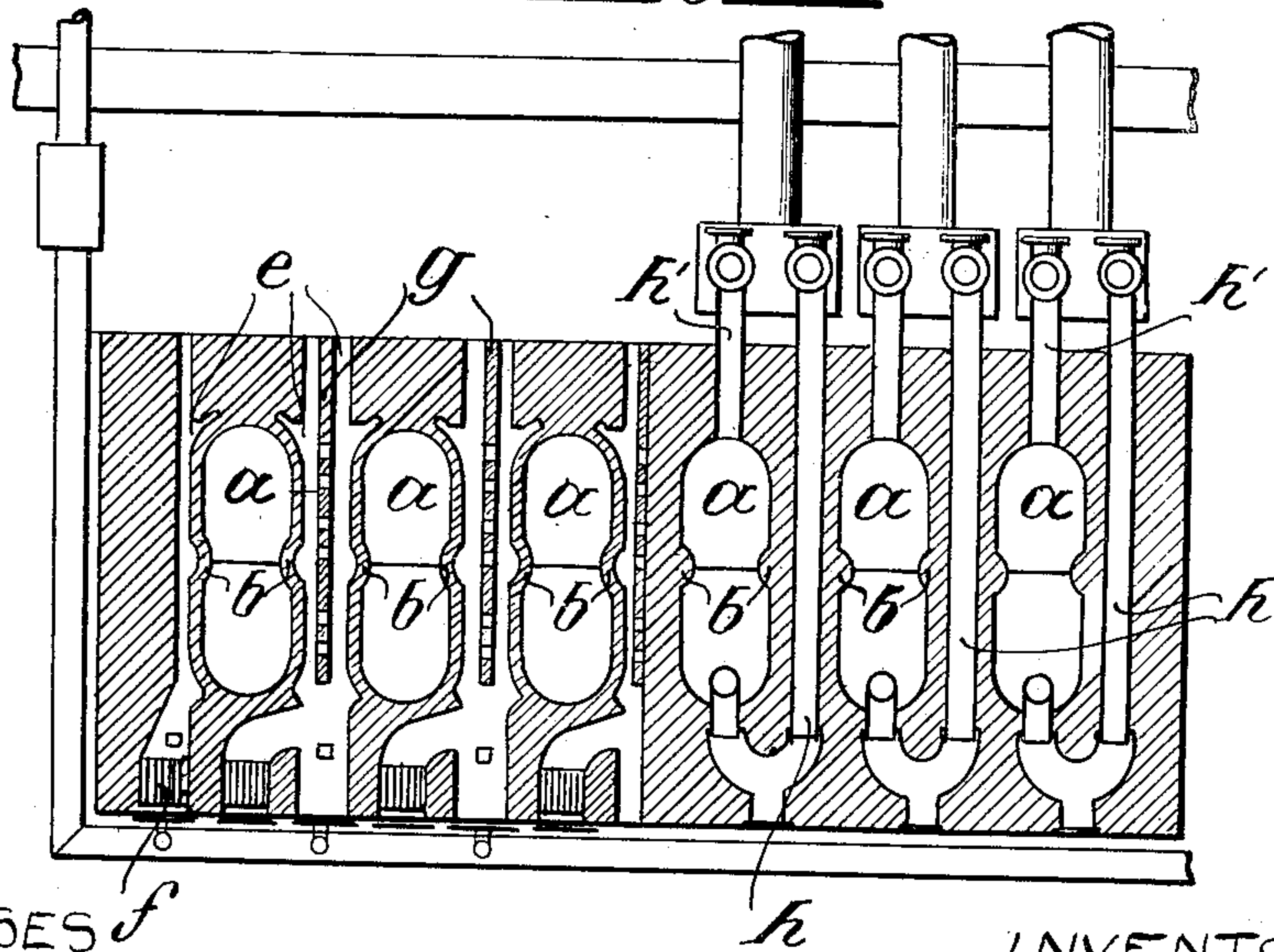


Fig. 3.



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# UNITED STATES PATENT OFFICE.

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## KILN FOR COKING PEAT OR SIMILAR MATERIAL.

No. 876,421.

Specification of Letters Patent.

Patented Jan. 14, 1908.

Application filed December 4, 1906. Serial No. 346,243.

*To all whom it may concern:*

Be it known that I, MARTIN ZIEGLER, engineer and manager, subject of the German Emperor, residing at Beuerberg, Upper Bavaria, in the Kingdom of Bavaria, Germany, have invented new and useful Improvements in Kilns for Coking Peat or Similar Material, of which the following is a specification.

The present invention relates to an oven which has a plurality of retorts in which peat, lignite or wood can be coked.

Heating chambers or flues are arranged between the retorts. The retorts are filled from above and their charging openings are closed by means of devices which are able to be raised and lowered. A hood is arranged over the closing devices, through which the gases which escape from the retorts when filling the same can escape, so that the persons occupied in filling them are not troubled by the gases. Walls which are preferably arranged in steps one over another may be built in the retorts according to the present invention, between which walls the charging material goes down and which divide off free chambers in the retort which serve for collecting the gaseous products of distillation.

It is preferable that the material to be coked sinks uniformly inside the retorts, as the coking process depends in a certain sense on the manner of withdrawing the coked peat. Likewise it is necessary that the sides of the retorts are always uniformly heated so that disturbances in the firing plant, or variations in the admission of the heating means, can not influence the transmission of heat to the retorts. The mode of sucking the gases up from the retort is most intimately connected with the process of coking. It may, for example, happen, in retorts provided with step-like partition walls, that the process is carried out on one side of the retort quicker than on the other.

In accordance with the present invention the conditions of a correct coking process are fulfilled and the defects of known devices are removed.

The uniform emission of the gases from the retort is furthered by the cross-section of the retort being constructed in the center, so that the charge is divided into two sections by the constriction, of which sections each is provided with a charging and a discharging opening, as well as a special suction pipe. If

the position where the two suction conduits unite is situated unequally distant from the openings of the conduits in the retort, the conduit opening which lies nearest to this place is, in accordance with the present invention, arranged deeper than the opposite conduit opening, in order to equalize the different effects of the tendency of the gases to rise up and of the resistances in the two suction conduits, so that the same velocity exists in both conduits and an equal quantity of gas is supplied in the same unit of time.

As the quantity of gas to be generated substantially depends on the mode of firing, the present invention has for its object means for bringing about a uniform firing which makes possible the uniform gasification of the combustible material. These means consist in gratings being arranged in the heating chambers situated between the retorts which take up the surplus heat of the heating means which are supplied, in order to give off this surplus heat later to the sides of the retort temporarily at times when the supply of the heating means sinks below the normal amount.

In order that the invention may be more clearly understood reference is made to the accompanying drawings in which one embodiment is represented by way of example, and in which:—

Figure 1 is a vertical section through a retort; Fig. 2 is a vertical section through a heating chamber situated between two retorts, and Fig. 3 is a cross-section on two different lines in Fig. 2, *i. e.* the left hand half on the line A—A and the right hand half on the line B, B.

Similar letters of reference refer to similar parts in all views.

The retorts *a* are arranged in one block one beside another in a row. (See Fig. 3.) Each retort is narrowed or constricted in the center at *b*, so that two parts of the retort chamber which are separated one from another by the contraction are formed by means of this constriction. The constriction extends the entire length of the retort chamber, *i. e.* from the charging openings *c* to the discharging openings *d*. Each part of the retort chamber is provided with a charging opening *c* and a discharging opening *d*.

Heating chambers *e* are situated between the separate retorts. These heating cham-



bers are heated either by the combustible gases of a direct fire *f* or by means of the gas of a gas-generator which is burned in the heating chambers *e* with the admission of air.

5 For the case in which the generator gas is supplied, the heating chambers *e* are connected with a gas conduit *x* through channels *y*. These channels *y* may be formed as combustion chambers into which the air for  
10 combustion is connected through channels *z*. The hot gases to be burned then flow into the heating chambers *e*.

In accordance with the present invention gratings *g* are arranged in the heating  
15 chambers, said gratings consisting of fire proof material. These grates are played upon by the burning gases and are intensely heated. The heat which they receive is given off by them again with an insufficient supply  
20 of the heating means and thus they regulate the heating of the sides of the retort. They cause the condition of the heating of the retorts to be continuously permanently maintained, notwithstanding variations in  
25 the supply of the heating means, and assure a uniform process of gasification.

In accordance with the present invention suction conduits *h* and *h'* for the gas open in  
30 the upper part of the retort chamber at opposite sides. These openings are separated one from another inside the retort chamber by the columns of the charging material, which are bounded in the form of  
35 construction of a retort shown in Fig. 1 at two opposite sides by step-like partition walls *i* which are of inverted frusto conical form placed one above the other. The  
40 suction pipes *h* and *h'* open together in a wide receptacle *k* which is connected through a conduit *l* with the condensing device and the suction device. A stop-valve *m* is inserted in this conduit *l*, by means of which  
45 valve air can be prevented from entering into the retort through the discharge opening *d* when discharging the coked material, the valve *m* being so adjusted that the pressure existing in the retort is kept equal to the pressure of the outer atmosphere.

In the form of construction given by way  
50 of example shown in Fig. 1 the opening of the suction conduit *h'* is situated lower than the opening of the suction conduit *h* situated at the opposite side of the construction of the retort, because the path of the conduit *h'* up  
55 to the place where the gases which are drawn through this conduit combine with the gases sucked through the conduit *h* is shorter than the length of the suction conduit *h*, and because the condition is to be fulfilled that  
60 equally large quantities of gas are to be conducted in a unit of time from both sides of the construction of the retort. In the arrangement shown in Fig. 1 gases flow with a greater velocity in the conduit *h* which are developed  
65 on the left hand side because the emission

forces in the free chamber at the mouth of the suction conduit *h* is greater than at the right hand side at the mouth of the conduit *h'*. For this reason, corresponding to the difference of the effective columns of gas at both  
70 sides and to the slighter power of emission connected therewith on the right hand side, the velocity at which the gases are admitted into the conduit *h'* will be less than the velocity of admission of the gases in the conduit  
75 *h*. This difference is again equalized by the resistances caused by the longer path in the conduit *h*. Thus it is within one's power to produce like conditions of motion of the means to be supplied in both suction con-  
80 duits by varying the position of the openings of the suction conduits at both sides of the columns of the charge.

The charging openings *c* of each retort are each adapted to be closed by means of a bell  
85 *n* which is capable of being raised and lowered. The means for closing each retort are arranged under a hood *o* which is connected with an outlet pipe which can be closed by a valve *q*. The charging material is placed in  
90 the space situated round the bells *n*, said space being tightly closed by a cylinder *r* which dips with a fold into a groove *s* arranged on the hood *o*, said grooves being  
95 filled with water, sand, powdered fire-brick or the like, and the lower edge of which is sunk into a groove running round the charging opening of each retort, said groove being filled with a similar material, in order to  
100 tightly close the hood and the charging openings outside. This cylinder *r* forming a double lock is suspended on suitable lifting apparatus.

The manner of working the double lock, of each retort when filling the same is as follows:  
105 At first the bells *n* remain closed, whereas the cylinder-cover *r* is raised. The space under the hood and round the bells *n* is then filled with the charging material and the cylinder *r* is lowered until an upper and  
110 lower edge dip into the grooves. Hereupon the bells *n* are raised, whereon the charging material rolls into the opening *c*. The gases escaping from the retort escape above through the hood and through the conduit. A valve *q*  
115 is arranged in the conduit *p*, said valve serving the purpose of regulating the draft in the conduit. If an irregular slipping of the material should occur, the defect can be easily remedied by opening the valve *q* and the  
120 cylinder *r*. A tongue *u* is arranged between the discharge openings *d* at the lower end of the conically narrowed part of the retort. The edge of the tongue is directed upwards. The uniform emptying of the retort is effect-  
125 ed by means of this tongue in such a way that the coked material does not need to be pushed out by means of rods.

Although I have described and shown specific means for closing the charging openings  
130



c I do not claim such means as any suitable closing means may be substituted for the means shown.

What I claim as my invention and desire to secure by Letters Patent is:—

1. A coke-oven for peat, lignite and wood, comprising in combination a plurality of retorts each vertically constricted in the center and having charging and discharging openings, means adapted to normally close said charging and discharging openings, means for heating said retorts and gas-emission means communicating with said retorts.

2. A coke-oven for peat, lignite and wood, comprising in combination a plurality of retorts each constricted in the center and having charging and discharging openings, means adapted to normally close said charging and discharging openings, step-like walls in said retorts receding from one another, whereby chambers are formed outside said walls and on two sides of the retorts communicating with said retorts, means for heating said retorts and gas-emission means communicating separately with said chambers on each side of the retorts.

3. A coke-oven for peat, lignite and wood, comprising in combination a plurality of retorts each constricted in the center and having charging and discharging openings, means adapted to normally close said charging and discharging openings, step-like walls in said retorts receding from one another whereby chambers are formed outside said walls communicating with said retorts, means for heating said retorts, a gas suction conduit, and a plurality of conduits connected with the latter conduit communicating separately with said chambers at points situated one higher than the other so that the point of connection situated nearer to the said main conduit is lower than the point of connection opposite the same.

4. A coke-oven for peat, lignite and wood, comprising in combination a plurality of retorts each constricted vertically in the center and having charging and discharging openings, means adapted to close said charging openings and means adapted to close said discharging openings, step-like walls in said retorts receding from one another whereby chambers are formed outside said walls communicating with said retorts, said retorts being situated side by side whereby heating flues are formed between the same, fireproof gratings in said flues, means for heating said flues, a gas suction conduit, and a plurality of conduits connected with the latter conduit communicating separately with said chambers at points situated one higher than the other so that the point of connection situated nearer to the said main conduit is lower than the point of connection opposite the same.

5. A coke-oven for peat, lignite and wood,

comprising in combination a plurality of retorts each vertically constricted in the center and having charging and discharging openings, means adapted to normally close said charging openings and means adapted to normally close said discharging openings, step-like walls in said retorts receding from one another whereby chambers are formed outside said walls communicating with said retorts, means for heating said retorts, a gas suction conduit, a plurality of conduits connected with the latter conduit communicating separately with said chambers at points situated one higher than the other so that the point of connection situated nearer to the said main conduit is lower than the point of connection opposite the same, and a valve in said gas suction pipe adapted to close the same and to prevent the admission of air into said retorts when said discharge openings are opened.

6. A coke-oven for peat, lignite and wood, comprising in combination a plurality of retorts each constricted vertically in the center and having charging and discharging openings, means adapted to normally close said charging openings and means adapted to normally close said discharging openings, said retorts having grooves round said charging openings, a hood having a groove movable over said charging openings, means adapted to raise and lower said hood, a cylinder having a rim at one end adapted to engage said groove in said hood, the other end of said cylinder adapted to engage said groove round said charging opening, an upward-directed tongue situated between the two discharge openings of a retort, step-like walls in said retorts receding from one another whereby chambers are formed outside said walls communicating with said retorts, said retorts being situated side by side whereby heating flues are formed between the same, fireproof gratings in said flues, means for heating said flues, a gas suction conduit, a plurality of conduits connected with the latter conduit communicating separately with said chambers at points situated one higher than the other so that the point of connection situated nearer to the said main gas suction conduit is lower than the point of connection opposite the same and a valve in said suction conduit adapted to close the same and to prevent the admission of air into the retorts when said discharge openings are opened, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

MARTIN ZIEGLER.

Witnesses:

MATHILDE K. HELD,  
LOUIS D. MUELLER.