(No Model.)

E. E. MORRELL.

GAS MANUFACTURING APPARATUS.

No. 495,900. Patented Apr. 18, 1893.

Fig. 2

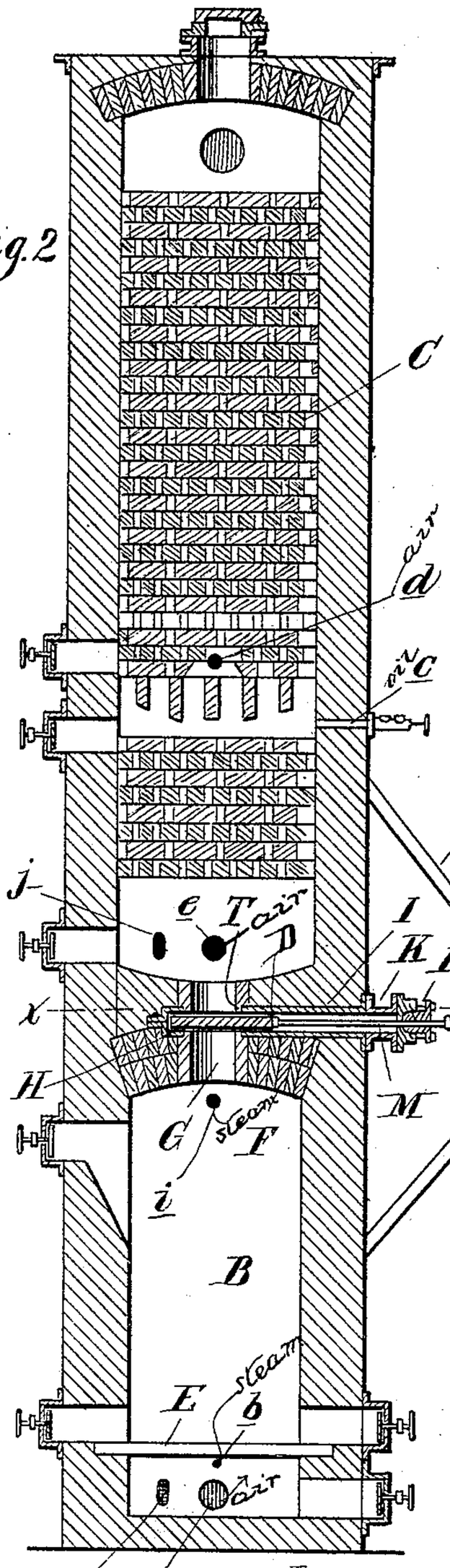


Fig. 1

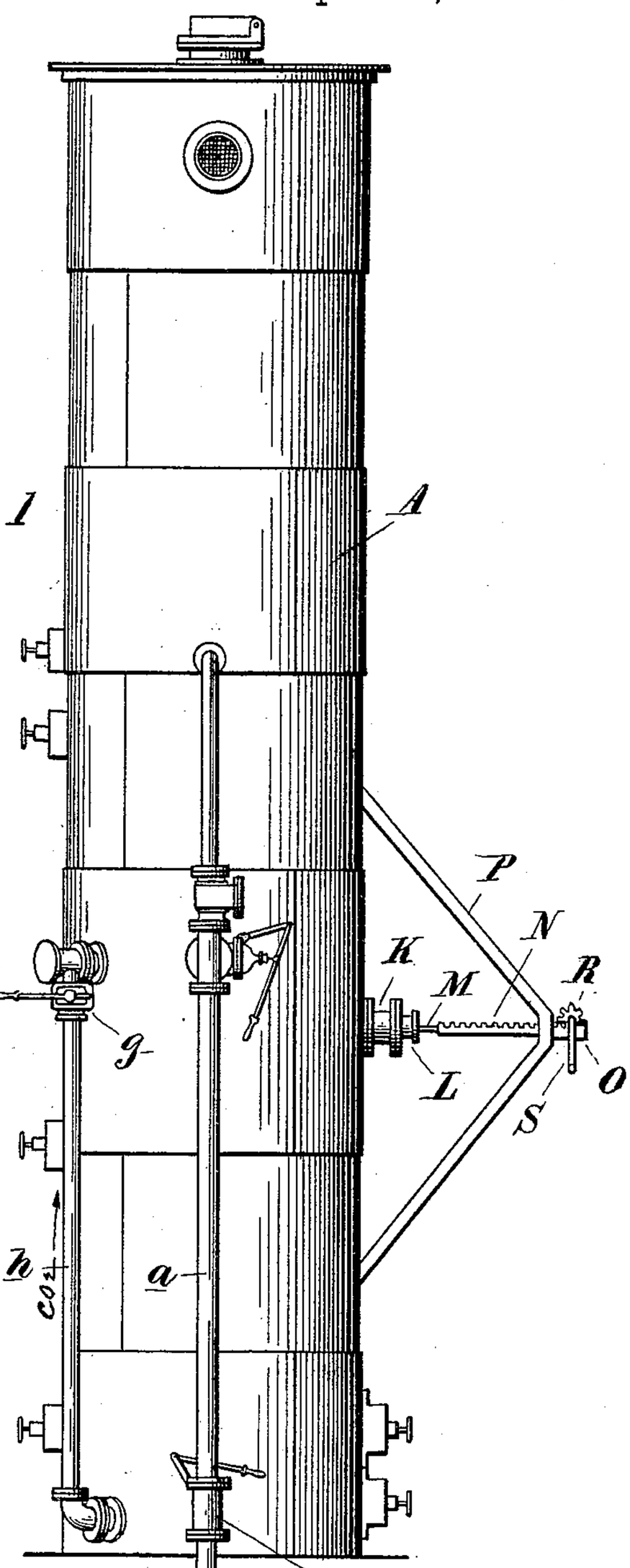
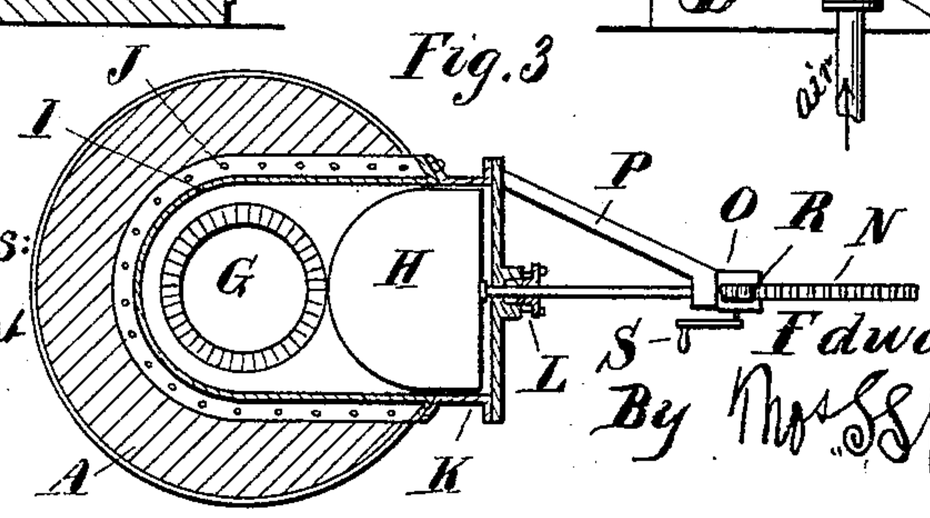


Fig. 3



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UNITED STATES PATENT OFFICE.

EDWARD E. MORRELL, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE NATIONAL GAS AND WATER COMPANY, OF SAME PLACE.

GAS-MANUFACTURING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 495,900, dated April 18, 1893.

Application filed August 29, 1891. Serial No. 404,048. (No model.)

To all whom it may concern:

Be it known that I, EDWARD E. MORRELL, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Gas-Manufacturing Apparatus, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to new and useful improvements in gas manufacturing apparatus, and relates especially to that class of apparatus designed to manufacture so-called water gas, either for fuel or illuminating purposes, and the invention consists in the peculiar construction of a cupola, comprising a combustion chamber, a super-heating chamber, a connecting passage and a valve for controlling said passage, so that gas can be made by an up blast or a down blast through the combustion chamber, and further in the peculiar construction of the valve used in controlling said passage, whereby it may not be burned out in the use of the apparatus.

The invention consists further in the peculiar construction, combination and arrangement of the various parts as more fully hereinafter described and claimed.

In the drawings, Figure 1 is a side elevation of a cupola embodying my invention. Fig. 2 is a vertical, central, longitudinal section of Fig. 1. Fig. 3 is a cross section on line *x x* in Fig. 2.

A is a casing preferably cylindrical in form and also preferably containing within a single vertical casing a combustion chamber B and a super-heating chamber C, the two being separated by a partition or cross wall D. The super-heating chamber is preferably filled with open brick work as is usual in such constructions and the combustion chamber provided with suitable grates E and doors for filling and emptying and working with the fire therein.

F is an arch formed at the top of the combustion chamber and forming a portion of the partition, and G is a passage-way connecting the combustion chamber with the super-heating chamber.

H is a valve controlling said passage-way. This valve preferably consists of a single casting of suitable size to close the passage and to engage in a seat or bearing I which is recessed in the wall of the passage-way and is preferably formed by a yoke shaped metallic channeled frame J as plainly shown in Fig. 3. This is preferably made in two parts extending to the outside of the cupola and there provided with a bonnet H and a stuffing box L in said bonnet, through which the valve stem M passes. This stem at its outer end is provided with a rack bar N which is guided in bearings O supported by the braces P secured to the side of the cupola.

R is a pinion meshing with said rack bar and a suitable crank handle S is connected to said pinion for rotating the same to move said rack bar and with it the valve in or out to open or close the passage-way G.

It will be seen that the inner edge T of the side of the frame in which the valve slides is recessed in the walls of the passage way, so that it is some distance back from the direct line of the blast. When valves have been arranged in previous constructions in passages where the heated air from the combustion chamber was delivered, the seat would frequently burn out and cause trouble and cost for renewals. By arranging this seat in a recess in the walls of the passage and arranging the valve so that when it is retracted its edge is withdrawn from the edge of the passage, the blast in passing therethrough does not heat it to a destructive point, and a valve of this kind will have a much longer life with efficient service than any other.

In using my apparatus, the valve H being open, the combustion chamber being charged with coal, a blast of air is fed through the pipe *a* which enters beneath the grates. Steam is also admitted through the aperture *b*, the air and steam passing through the combustion chamber through the passage G and into the super-heating chamber, and at the proper time oil is injected through the injector *c* into the super-heating chamber.

Supplemental air pipes *d* and *e* may be used to supply air to aid in the combustion in the super-heating chamber.

In the manufacture of fuel gas the valve H

is closed as is the valve *f* controlling the pipe *a* and the valve *g* in the by-pass *h* is opened. Steam being admitted through a pipe discharging at *i* at the top of the combnstion chamber will cause a downward draft through the fire, which will find exit through the pipe *h* and around the combustion chamber outside of the cupola, and will enter the super-heating chamber through the aperture *j*. Thus with a single charge in the combustion chamber, by simply reversing the operation of the device and shutting off the oil supply, I may make fuel or illuminating gas as desired.

What I claim as my invention is—

1. In a gas cupola made of a single shell, an apertured arch dividing it into a lower combustion chamber and a super-heating chamber directly communicating through the apertures, a valved by-pass leading from the bottom of the combustion chamber directly into the bottom of the super-heating chamber, a valve controlling the apertures between the two chambers, and steam supply pipes entering the lower combustion chamber only at top and bottom, substantially as described.

2. In a gas manufacturing apparatus, the combination of a cupola, consisting of a single shell divided into two chambers one directly above the other, an apertured partition constituting the dividing wall between the chambers forming the cap of one and the base of another, a valve for closing the apertures in the partition, a yoke-shaped channeled frame counter-sunk into the partition beyond the walls of the apertures, a valved by-pass from the bottom of the combustion chamber into the bottom of the super-heating chamber, and a steam supply pipe entering the combustion chamber at top and bottom, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

EDWARD E. MORRELL.

Witnesses:

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