(No Model.)

J. T. ELLIS.

SMOKE CONSUMER.

No. 534,553. Patented Feb. 19, 1895.

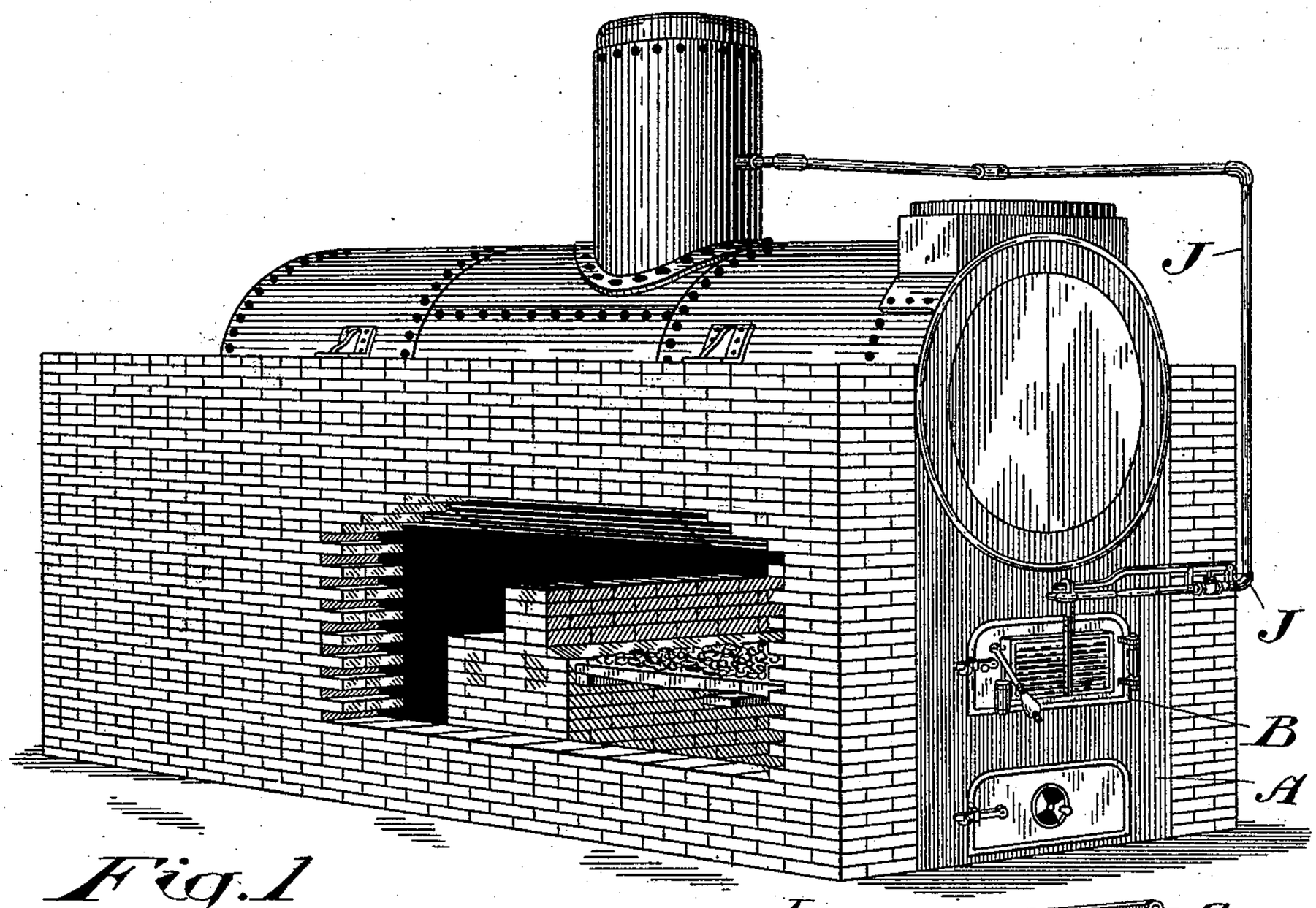

Fig. 1

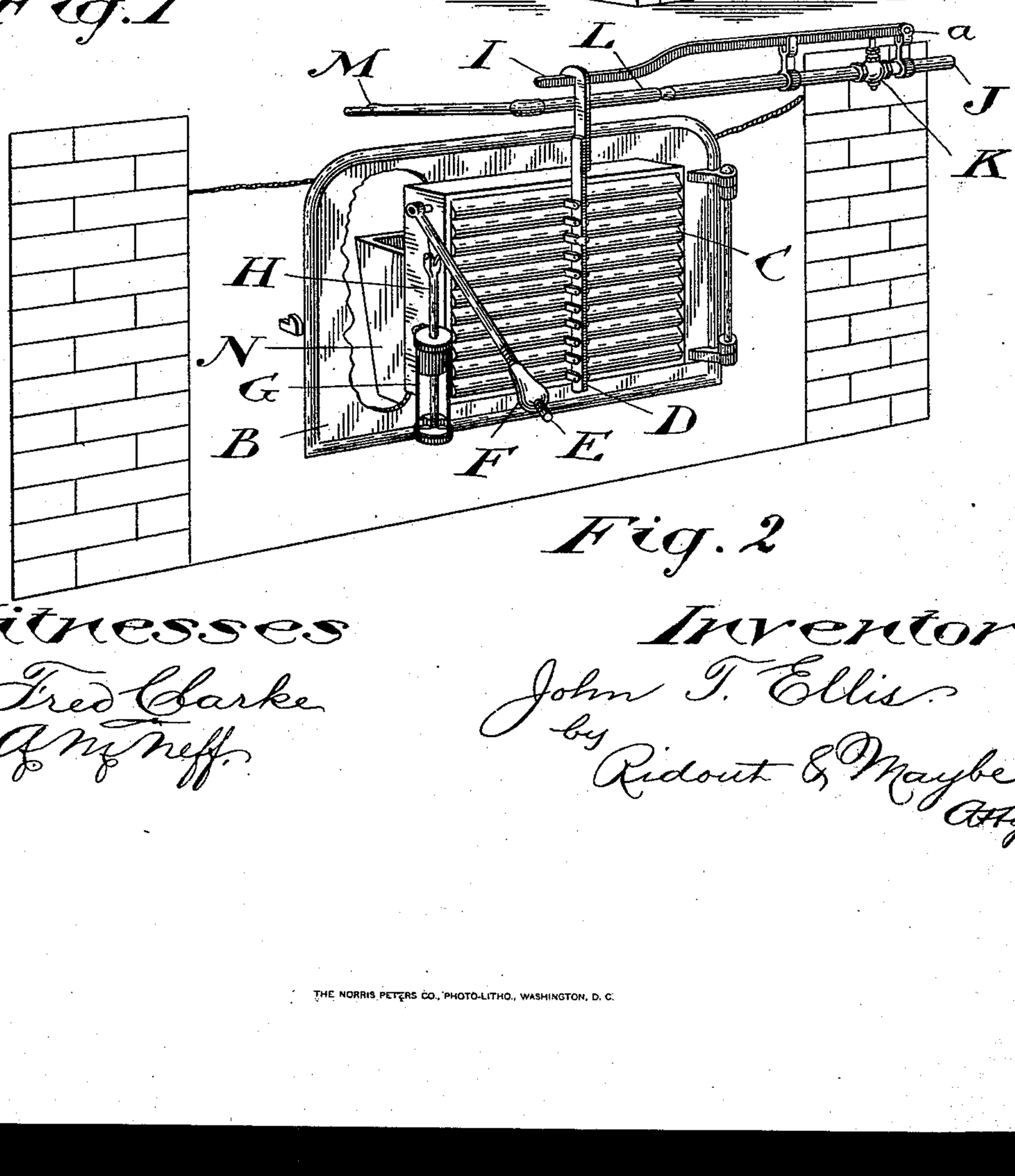

Fig. 2

Witnesses
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UNITED STATES PATENT OFFICE.

JOHN T. ELLIS, OF CLEVELAND, OHIO.

SMOKE-CONSUMER.

SPECIFICATION forming part of Letters Patent No. 534,553, dated February 19, 1895.

Application filed December 21, 1894. Serial No. 532,601. (No model.)

To all whom it may concern:

Be it known that I, JOHN THOMAS ELLIS, of the city of Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and Improved Smoke-Consumer, of which the following is a specification.

The object of my invention is to devise certain improvements upon the smoke consumer described and claimed in Letters Patent of the United States of America, numbered 491,775, dated February 14, 1893, and it consists, essentially, in such alterations of the method of operating the air admitting shutters and steam jet valve shown therein as are hereinafter more particularly described and then definitely claimed.

Figure 1, is a perspective view of a steam boiler provided with my improved smoke consumer. Fig. 2, is a perspective view showing in detail my improved smoke consumer.

In the drawings like letters of reference indicate corresponding parts in the different figures.

On reference to Fig. 1, the general arrangement of my smoke consumer will be easily seen.

As there is nothing novel in the construction of the boiler, fire grate and bridge, no detailed description of them is necessary.

A, is the front of the furnace provided with the furnace door B. This door B, has an opening through it, protected by a series of shutters C, connected together, as indicated, by the bar D, so that when motion is communicated to one, a like motion is imparted to the others. One of the shutters has an arm E, rigidly connected to its spindle. This arm is provided with an adjustable weight F, which tends to keep the shutters in a closed position.

G, is a cylinder or dash pot, the piston rod H, of which is loosely pivoted to the arm E. This cylinder is filled with oil and has downwardly opening valves in its piston head so that when the piston is raised, the oil in the cylinder rapidly and easily flows through the piston head. When, however, the piston rod is forced downward, the valves close and the oil reaches the upper part of the piston by slowly forcing its way round the edges of the somewhat loosely fitting piston head. I do not claim anything peculiar in the construction of this cylinder or dash pot, as different arrangements would be necessary according as oil or other liquid is used, or ordinary air. Any arrangement allowing the piston to be rapidly drawn to the top of the cylinder and which permits only of a slow and gradual descent, will answer the purpose of my invention.

It will be seen that the upper end of the bar D, is hooked so as to engage with the pivoted lever I, when the door is closed. This lever is pivoted at *a*, on the pipe J, which is connected, as shown, to the steam dome of the boiler. This lever rests on the stem of the valve K, and is provided with suitable guides to hold it in position.

L, is an injector of ordinary construction formed in the steam pipe K, close to the fish tail mouth M, of the pipe. By the action of this injector, a certain amount of air is drawn into the pipe along with the steam. As the operation of the jet from the fish tail mouth is the same as in my previous patent, a further description of its action is unnecessary.

On reference to Fig. 2, it will be noticed that a fender N, is formed on the inside of the door B. This fender forms a space into which the cold air enters before it reaches the furnace which air is thus heated before it escapes into the furnace with the steam and air from the fish tail mouth M, thus supplying the fire with heated air at the proper position and temperature to produce combustion of the smoke.

The operation of my invention is as follows:—By grasping the arm E, the door B, may be opened. At the same time, the piston rod H, is raised, the shutters C, opened and the bar D, raised and its hooked end disengaged from the lever I, thus opening the valve K, and permitting a jet of steam and air to escape from the fish tail mouth M. After the fuel has been placed in the furnace, the door is closed and the piston rod H, begins slowly to descend, thus gradually closing the shutters C, and when it has descended far enough, closing the valve K, by the action of the hooked end of the bar D, on the lever I. This arrangement is simpler, more effective and more certain in its operation than that shown in my prior patent, and is much more easily adjusted to regulate the length of time dur-

ing which the air and steam are admitted to the furnace. This arrangement is most easily effected by altering the position of the weight on the arm E, though further adjustment may be made by making the piston head fit the cylinder with greater or less accuracy.

What I claim as my invention is—

1. In a smoke consumer, an injector extending into a furnace; a valve controlling the passage of steam in the said injector, and a lever controlling the movement of said valve, in combination with a suitably supported vertical bar adapted to engage with the said lever, and a cylinder or dash pot, the piston rod of which controls the movement of the said vertical bar, substantially as and for the purpose specified.

2. In a smoke consumer, an injector or steam pipe extending into a furnace; a valve controlling the passage of steam in the said injector or steam pipe, and a lever controlling the movement of said valve, in combination with a vertical bar adapted to engage with the said lever; a door having an opening therein; a series of shutters pivotally connected to the said bar, for controlling the admission of air through the said opening, and a cylinder or dash pot, the piston of which controls the movement of the said shutters, substantially as and for the purpose specified.

3. In a smoke consumer, the combination of the steam pipe J, conveying steam to the interior of the furnace; the valve K; the pivoted valve controlling lever I; the bar D, adapted to engage with the lever I, and pivotally connected to the shutters C, closing an opening in the door B; the arm E, connected to the spindle of one of the shutters, and the cylinder or dash pot G, adapted to control the movement of the arm E, substantially as and for the purpose specified.

4. In a smoke consumer, the combination of the fish tail mouth M; injector L; steam pipe J; the pivoted valve controlling lever I; the bar D, adapted to engage with the lever I, and pivotally connected to the shutters C, closing an opening in the door B; the arm E, connected to the spindle of one of the shutters, and the cylinder or dash pot G, adapted to control the movement of the arm E, substantially as and for the purpose specified.

5. In a smoke consumer, the combination of the steam pipe J, conveying steam to the interior of the furnace; the valve K; the pivoted valve controlling lever I; the bar D, adapted to engage with the lever I, and pivotally connected to the shutters C, closing an opening in the door B; the arm E, connected to the spindle of one of the shutters, and provided with an adjustable weight, substantially as and for the purpose specified.

Cleveland, December 10, 1894.

JOHN T. ELLIS.

In presence of—
EDITH M. CAMPFIELD,
T. M. MURPHY.