(No Model.) 2 Sheets—Sheet 1.

H. BORN & J. PARKIN.

SMOKE ARRESTER AND SEPARATOR.

No. 493,749. Patented Mar. 21, 1893.

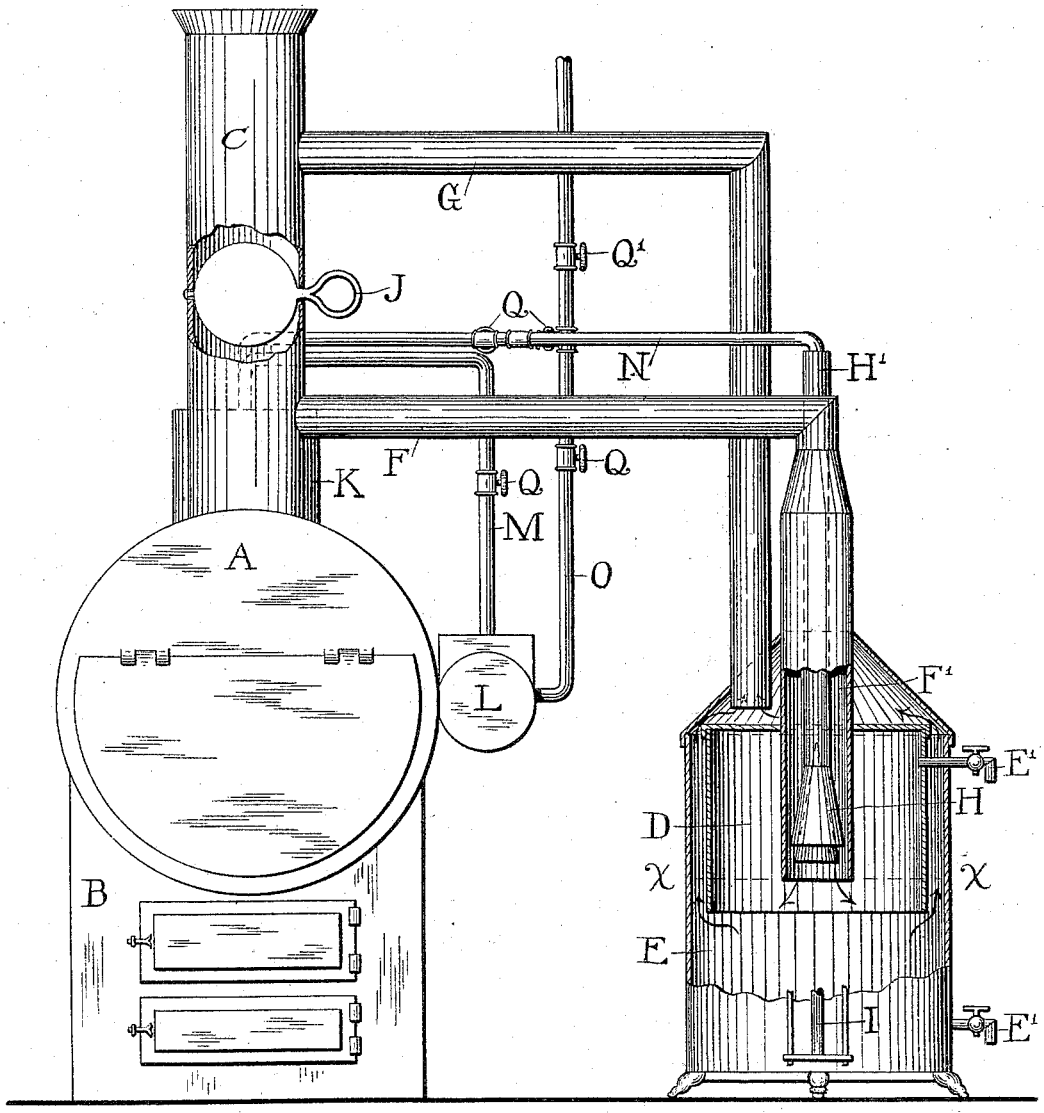

FIG. 1.

WITNESSES:
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H. Born
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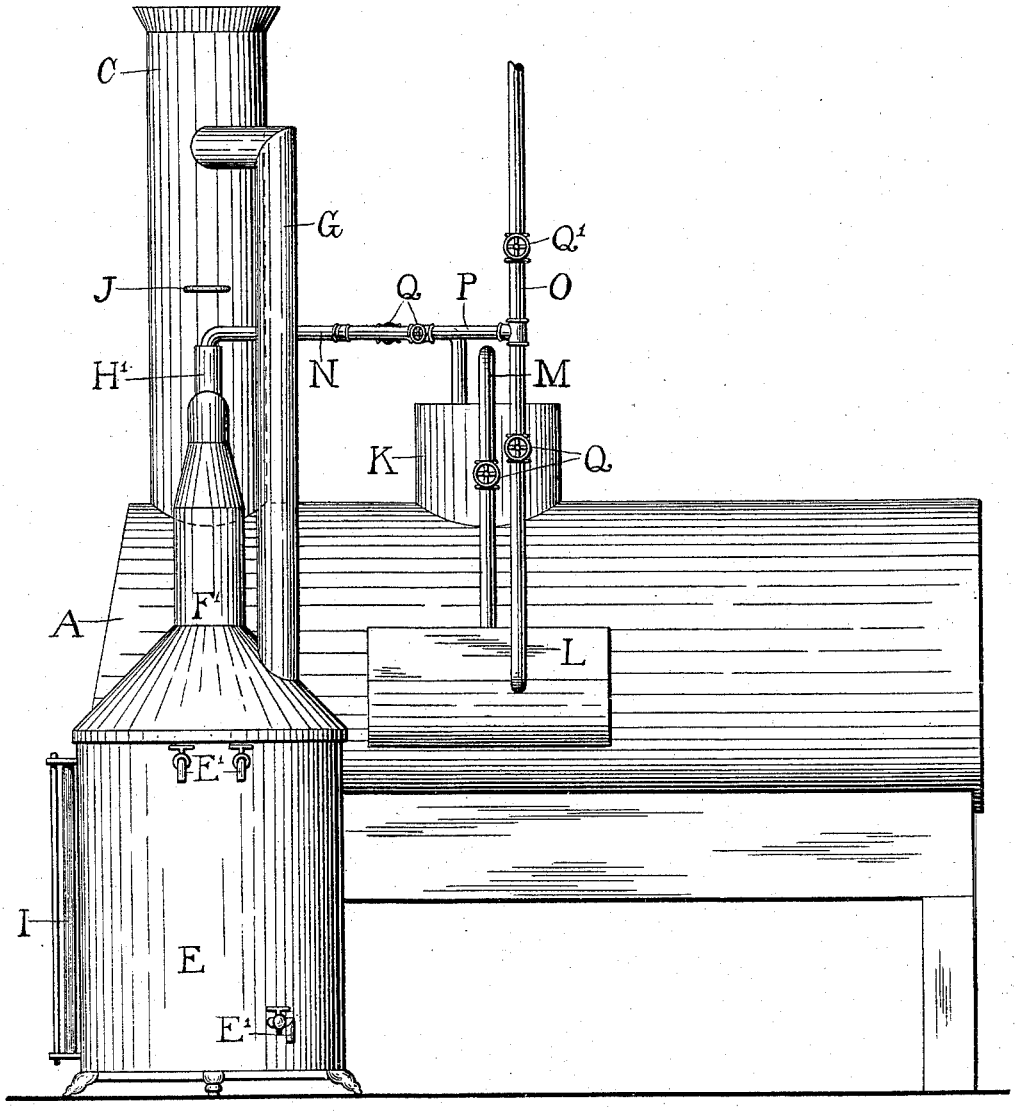

FIG. 2.

WITNESSES:
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UNITED STATES PATENT OFFICE.

HENRY BORN AND JOSEPH PARKIN, OF CLEVELAND, OHIO.

SMOKE ARRESTER AND SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 493,749, dated March 21, 1893.

Application filed July 19, 1892. Serial No. 440,566. (No model.)

To all whom it may concern:

Be it known that we, HENRY BORN and JOSEPH PARKIN, both citizens of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and Improved Smoke Arrester and Separator, of which the following is a full, clear, and complete description.

The nature of our invention relates to an apparatus used in connection with the stack or chimney of a furnace and the dome, or dome and steam chest of a boiler; so constructed that the smoke from said furnace is carried or drawn through water, the gases in the smoke escaping through the stack or chimney while the carbonaceous properties are separated therefrom, in the manner hereinafter fully explained.

That the apparatus may be fully seen and understood by others, reference will be had to the following specification and annexed drawings forming a part thereof.

Figure 1. is a front elevation showing the apparatus in connection with a boiler furnace and having the front of the water reservoir partially broken away and Fig. 2. a side elevation of the same.

Similar letters of reference, designate similar parts in the drawings and specification.

The boiler A, resting upon the furnace B, is provided with the chimney C, said chimney being connected with the inner compartment D Fig. 1 of the reservoir E by means of the pipes F and G. The vertical portion F′ of the pipe F is enlarged to receive the injector H, Fig. 1, which projects above the elbow of the pipe F, as at H′. Sufficient space is left between the sides of the annular chamber F′ and the injector H to permit the smoke to pass by said injector. The enlarged portion of the pipe F, extends only to the water line *x x* Fig. 1, and the base of the injector does not extend to the open base of the pipe F′, as shown in Fig. 1. The reservoir E. is provided with the water gage I, and the faucets E′. for drawing off the water, which the reservoir must contain when in use.

The pipe G. extends from the upper part of the chimney C. into the reservoir E, above the compartment D. Between the pipes F and G in the chimney C is the damper J, shown open in Fig. 1. and closed in Fig. 2.

The dome K and steam chest L, of the boiler A, are connected by the pipe M, while the dome K, is further connected by the pipe N with the top H′ of the injector. The exhaust pipe O, attached at its lower extremity to the steam chest L, is connected to the pipe N, by the pipe P, Fig. 2. The pipes M, N and P, are each provided with a valve Q, and the pipe O, has the two valves Q. and Q′.

In operation the damper J, is closed as shown in Fig. 2. and the smoke arising from the furnace B, passes through the pipe F, and is drawn down to the lower part of said pipe and forced down into the water contained in the reservoir E, by means of the steam injector H. Since the compartment D. is open at its lower extremity, the smoke passes below into the reservoir E, where the carbonaceous particles of said smoke are removed or washed out by the action of the water, forming a residuum suspended in the water or floating thereon depending upon the gravity of the separated carbon. The gases pass up in the direction of the arrows in Fig. 1 outside of the compartment D, and through the pipe F, and the chimney C to the open air. When the valve Q in the pipe P, Fig. 2, is closed the steam passes into the injector H directly from the dome K through the pipe N, or the valve in the pipe N, which is located between the dome and the pipe P, and the valve Q′ in the exhaust pipe O. may be closed, the others being open, when the steam will pass from the dome through the pipes O, P and N, into the injector H.

The same well known principle which governs all injectors applies to this, therefore it is not deemed necessary to encumber these specifications with a detailed description thereof.

Should it be desired to obtain a direct draft and to allow the smoke to pass off in its natural state, it is only necessary to open the damper J, as shown in Fig. 1.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. A smoke arrester and separator, consisting of a water reservoir connected at the top, by the pipe G, with a furnace chimney above the damper, the compartment D, within said reservoir, connected by the pipe F with the lower part of said chimney; the vertical por-

tion of said pipe being enlarged to form an annular chamber, in combination with a chimney damper, between said pipes F and G, the injector H, in the top of said annular chamber, and connected by the pipe N to the boiler dome, the exhaust pipe O, from the steam-chest, connected with the pipe N, by the pipe P, and the pipe M from the dome to the steam-chest; each of the pipes N, P and M having a valve therein, the pipe O having a valve above and below the junction pipe P, substantially as specified.

2. In an improved smoke arrester and separator, the combination of the water reservoir E, the compartment D, within said reservoir E and open at its base, the annular chamber F′, containing the injector H, projecting thereinto and forming an integral part of the pipe F, said pipe opening into the chimney of the furnace, the pipe G in open connection with the chimney and the roof of the water reservoir, the damper between said pipes in the chimney, and the boiler dome connected directly with the projecting portion H′ of the injector H, by the pipe N, and indirectly through the steam chest by means of the pipes M O P and N, said pipes being provided with ordinary valves, in the manner substantially as and for the purpose specified.

3. In a smoke arrester and separator, the water reservoir E, connected at the top by a pipe, with the furnace chimney and a damper in said chimney, below said pipe, in combination with the compartment D, within said reservoir, connected with the chimney, below said damper, by a pipe having an annular chamber formed within its vertical portion, and an injector, situated within said annular chamber, connected with the dome of a boiler and the steam-chest by a series of pipes having valves therein, for controlling the passage of steam through the several pipes, substantially in the manner specified.

In testimony whereof we affix our signatures in presence of two witnesses.

HENRY BORN.
JOSEPH PARKIN.

Witnesses:
W. H. BURRIDGE,
L. F. GRISWOLD.