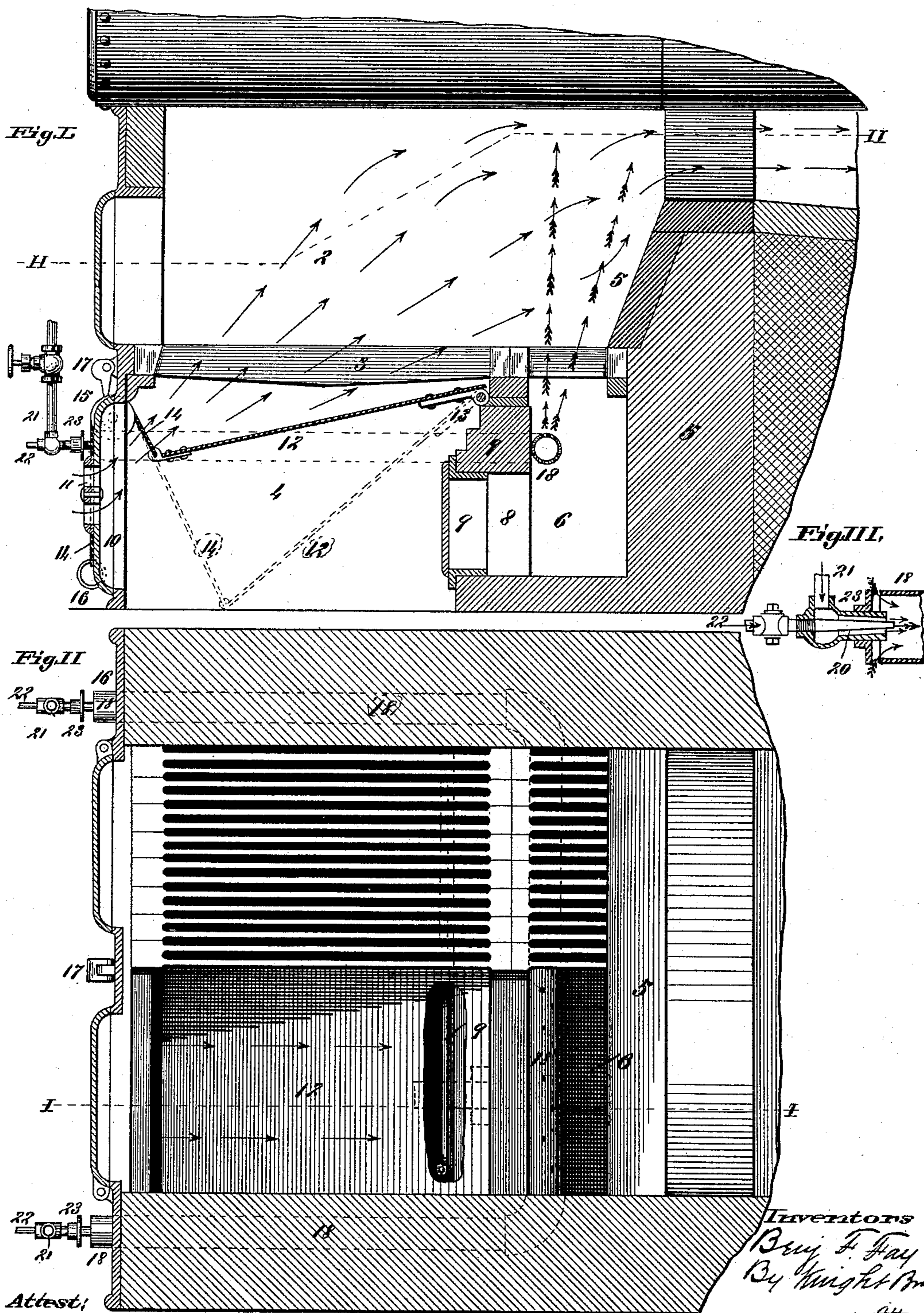


(No Model.)

B. F. FAY.
SMOKE CONSUMER.

No. 417,160.

Patented Dec. 10, 1889.



Attest:
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UNITED STATES PATENT OFFICE.

BENJAMIN F. FAY, OF ST. LOUIS, MISSOURI, ASSIGNOR OF TWO-THIRDS TO
LEO RASSIEUR AND EDWARD H. DUNBAR, OF SAME PLACE.

SMOKE-CONSUMER.

SPECIFICATION forming part of Letters Patent No. 417,160, dated December 10, 1889.

Application filed March 30, 1889. Serial No. 305,370. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN F. FAY, of the city of St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Smoke-Consumers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, and in which—

Figure I is a detail vertical section showing part of a furnace and part of a boiler and illustrating my invention. This section is taken on line I I, Fig. II. Fig. II is a horizontal section taken on line II II, Fig. I. Fig. III is an enlarged detail view.

My invention relates to certain improvements in smoke-consumers for furnaces and the like; and my invention consists in features of novelty hereinafter fully described, and pointed out in the claims.

Referring to the drawings, 1 represents part of a boiler, 2 the fire-box, 3 the grates, 4 the ash-pit, and 5 the bridge-wall, of a furnace.

6 represents a chamber located between the bridge-wall and a partition 7. This chamber is beneath the grate-bars at the inner end of the ash-pit, and access may be had to it through a man-hole 8, closed by a head 9.

10 represents a door to the ash-pit, which may be provided with a damper 11 for the admission of oxygen.

12 represents a plate hinged to the partition 7 or to any other suitable support at 13. (See Fig. I.) The outer end of this plate is supported by means of a cable or cables 14, connected thereto and passing over a pulley 15, journaled in the front of the ash-pit, and having, if desired, a ring 16 on its outer end.

17 represents a dog pivoted over the roller 15, which, when dropped onto the cable passing over the roller, will prevent the inward movement of the cable, while it will not interfere with the outward movement. It will thus be understood that when the cable 14 is pulled outwardly the inner end of the plate 12 will be raised from the position shown in dotted lines in Fig. I toward the position shown in full lines, Fig. I, and by the use of the dog the plate may be held to any adjustment.

18 represents a pipe discharging into the chamber 6. This pipe is designed to deliver steam and air, and, if desired, in addition thereto, water or oil, into the chamber 6. I have shown the pipe passing entirely through the chamber 6, (see Fig. II,) and provided with perforations to allow the steam, &c., to enter the chamber; but, if desired, the pipe may discharge directly into the chamber 6 and not pass through it, the same results being accomplished in either case. I have shown the pipe extending from the chamber 6 to the front of the furnace through the setting. (See dotted lines, Fig. II.)

20 represents a nozzle located in the outer end or ends of the pipe 18. I have shown the pipe 18 with two ends, one on each side of the furnace. Each end would of course be provided with a nozzle.

21 represents a steam-pipe connected to the nozzle, and 22 a water or oil pipe.

23 represents a sliding disk on the nozzle, which may be moved to or from the pipe 18, for the purpose of regulating the space through which the air passes, as shown by the arrows in Fig. III. By sliding this disk in or out on the nozzle, more or less air may be admitted into the pipe.

The operation is as follows: The steam, being turned on in the pipe 21, passes through the pipe 18 and is mixed with the air therein, and passes into the chamber 6 through the pipe 18. From the chamber 6 the gases pass upward through the grate-bars at their inner ends and come in contact with the fuel just in front of the bridge-wall. The air supplying the draft passes, as shown by the featherless arrows in Fig. I, up in front of and over the plate 12 and through the grate-bars. By the use of the plate 12 the draft is caused to pass through the fresh fuel and passes in a diagonal direction from the front of the furnace backward. This is illustrated by the featherless arrows and by the full arrows in Fig. I, which show the direction of the steam and air with and the ignition of the gases escaping from the chamber 6 and the unconsumed gases carried by the draft entering in front of the plate 12, and a consequent more complete combustion and increased efficiency of the fuel used. By an arrangement of this

kind a very thorough combustion of the gases is produced, and the smoke is systematically and to a very great extent consumed. By using the pipe 22 as an oil-pipe gases are
5 formed by the commingling of the steam with the oil, which, being discharged from the chamber 6, may add additional facilities for burning the smoke.

I claim as my invention—

10 1. In a smoke-consumer, the combination of a pipe discharging steam and air beneath and upward through the grate-bars at their inner ends and a plate arranged to cause the draft to pass through the grate-bars at their
15 front ends only, substantially as and for the purpose set forth.

2. In a smoke-consumer, the combination of a pipe discharging steam and air beneath the grate-bars at their inner ends and a
20 hinged plate 12, substantially as and for the purpose set forth.

3. In a smoke-consumer, the combination of the grate-bars, a chamber located beneath

the inner ends of the grate-bars, a partition forming one wall of the chamber, a plate 25 hinged to the partition, and means for raising and lowering the outer end of the plate, substantially as and for the purpose set forth.

4. In a smoke-consumer, the combination of the grate-bars, a chamber located beneath 30 the inner ends of the grate-bars, a closed man-hole leading to said chamber, the hinged plate, and means for raising and lowering the outer end of the plate, substantially as and for the purpose set forth.

5. In a smoke-consumer, the combination of the pipe 18, steam and oil pipes communicating with the pipe 18, a jet, a sliding disk 35 on the jet, and a chamber beneath the grate-bars, into which the said pipe discharges. substantially as and for the purpose set forth. 40

BENJAMIN F. FAY.

In presence of—

EDW. S. KNIGHT,
THOMAS KNIGHT.