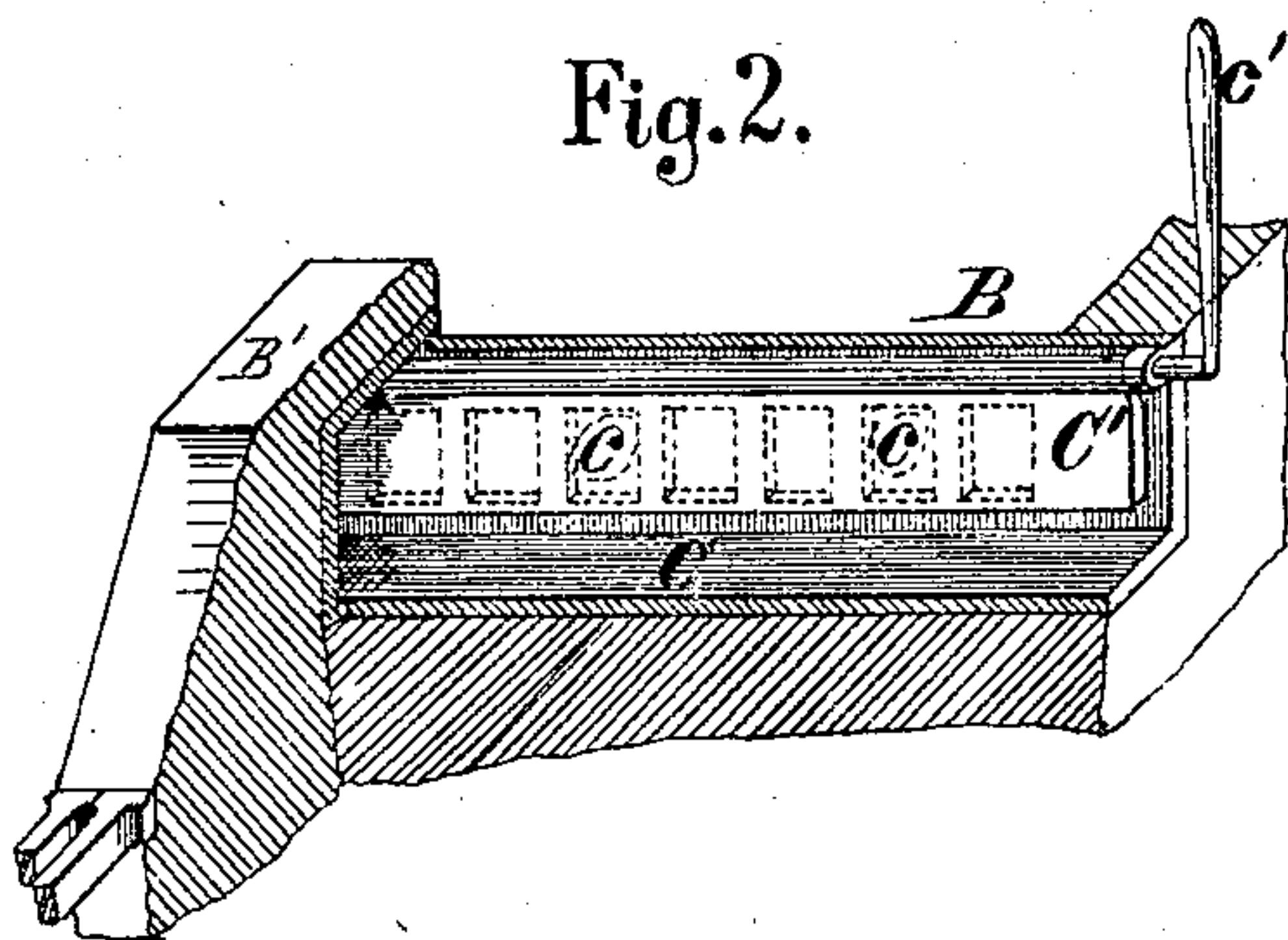
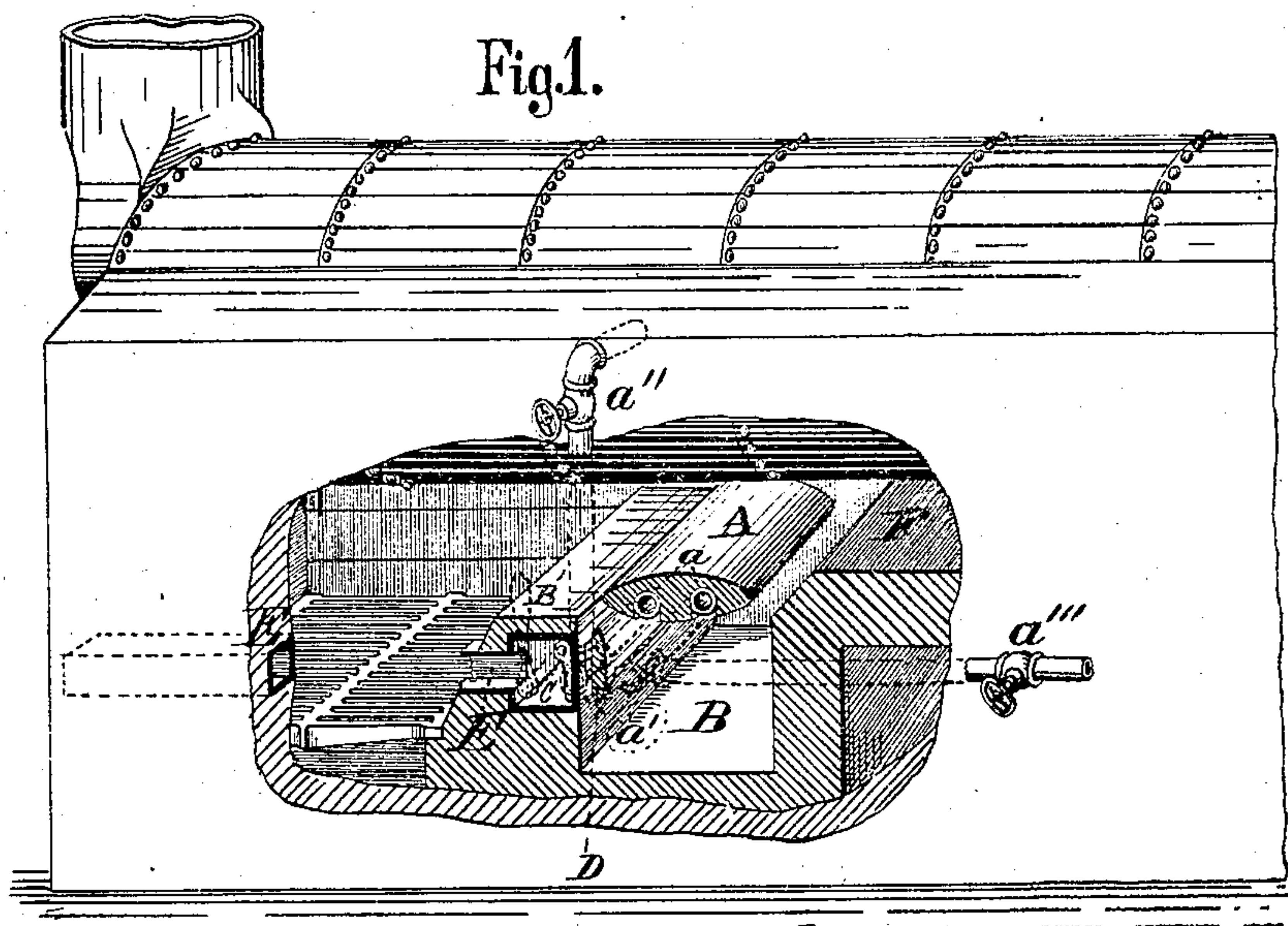


M. A. FOSTER.

Steam Boiler-Furnaces.

No. 136,497.

Patented March 4, 1873.



WITNESSES:

Walter Allen  
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# UNITED STATES PATENT OFFICE.

MICHAEL A. FOSTER, OF ST. LOUIS, MISSOURI.

## IMPROVEMENT IN STEAM-BOILER FURNACES.

Specification forming part of Letters Patent No. 136,497, dated March 4, 1873.

*To all whom it may concern:*

Be it known that I, MICHAEL A. FOSTER, of the city and county of St. Louis and State of Missouri, have invented a certain Improved Gas-Consumer for Steam-Boiler Furnaces, of which the following is a specification:

My invention consists, first, in the arrangement transversely over the smoke-pit of a separator supported by water-pipes, for the purpose of separating the heavier parts of the smoke and gases escaping from the fuel and directing them into the smoke-pit, where they are mixed with a quantity of fresh air introduced into the smoke-pit by a perforated air-pipe arranged transversely in the forward bridge-wall, the perforations of which open into the smoke-pit; the mixed smoke, gases, and air passing out of the smoke-pit between the separator and the rear bridge-wall, coming in contact with the flame passing over the separator, is ignited, and the combustible matter of the same consumed; secondly, in the arrangement of a deflecting-plate in front of the transverse air-pipe, by which the said pipe is protected from the direct heat of the fire, and air deflected so as to cause eddies in the smoke-chamber; thirdly, in the arrangement of the rear wall of the smoke-pit, whose top is inclined and situated at a higher level than the front bridge-wall, the purpose of which is to direct the mixed gases, air, and smoke up in contact with the flame passing over the separator, and cause the same to strike against the bottom of the boiler.

Figure 1 is a perspective view of a steam-boiler furnace with part of side wall removed showing my improvement. Fig. 2 is a detail perspective view, showing the arrangement of the damper in the transverse air-supply pipe.

A is a separating-deflector, supported over the smoke-pit B by water-pipes *a*, one end of which connects to the boiler near to and beneath the water-line, the other end connecting to the bottom of the boiler or mud-drum, as desired; said pipes are provided with "tee"-couplings at their bends, as shown by dotted lines, the outer branches of said coupling *a'* being closed by screw-plugs, which are removed when it is desired to clean the pipes by the introduction of a scraper, and forcing a stream of water through the pipes when dis-

connected from the boiler; said pipes are also provided with stop-valves *a'' a'''*, by which the water-supply may be regulated to said pipes, as desired, or the pipes shut off from the boiler.

Where a battery of boilers is used brick columns may be used to assist in supporting said separator. The separator may be formed of iron, or fire-clay tile, or of any other suitable refractory substance.

C is a transverse perforated pipe, arranged in the bridge-wall B', its perforations *c* opening into the smoke-pit B, as shown in dotted lines in Fig. 2. C' is a damper, pivoted inside the pipe C, and operated by a handle, *c'*, to regulate the supply of air to the smoke-pit B through the openings *c*. D is a deflecting-plate, arranged in front of the air-pipe C, the purpose of which is to protect said pipe C from the direct heat, and to direct the air from said pipe into contact with the smoke and gases passing into the smoke-pit B. E are longitudinal pipes, built in the side walls of the furnace, the open ends of which pass through the front wall of the furnace, the purpose of which is to introduce hot air into the transverse pipe C when desired; in this case the open ends of the pipe C will be closed by suitable covers.

When it is desired to admit cold air into the pipe C the end doors thereof are opened, and the air-heating pipes E may be closed.

F is the rear bridge-wall, arranged higher than the front bridge-wall B', the purpose of which is to direct the mixed air, gases, and smoke from the smoke-pit up against the bottom of the boiler to be consumed.

The operation of the parts will be as follows: The smoke or unconsumed gaseous matter passing off from the fuel is divided by the separating-deflector A, the flame and lighter portions passing over the said separator, the heavier parts being directed down into the smoke-pit, where they are mixed with a quantity of air, (either hot or cold, as desired,) and the mixture passing out of the smoke-pit between the separator A and bridge-wall F is directed up against the bottom of the boiler, and coming in contact with flame passing over the separator A is ignited and consumed.

I claim as my invention—

1. The elliptical separating-deflector A, ar-

ranged in combination with the smoke-pit B and air-supply pipe C, as and for the purpose set forth.

2. The air-supply pipe C, arranged as described, in combination with the deflecting-plate D, as and for the purpose set forth.

3. The elevated rear bridge-wall F, in combination with the smoke-pit B, elliptical separator A, and air-supply pipe C, as and for the purpose set forth.

4. The combination and arrangement of the separator A, water-pipes *a*, smoke-pit B, bridge-wall B', air-supply pipe C, damper C', deflecting-plate D, air-pipe E, and bridge-wall F, as and for the purpose set forth.

MICHAEL A. FOSTER.

Witnesses:

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