

(No Model.)

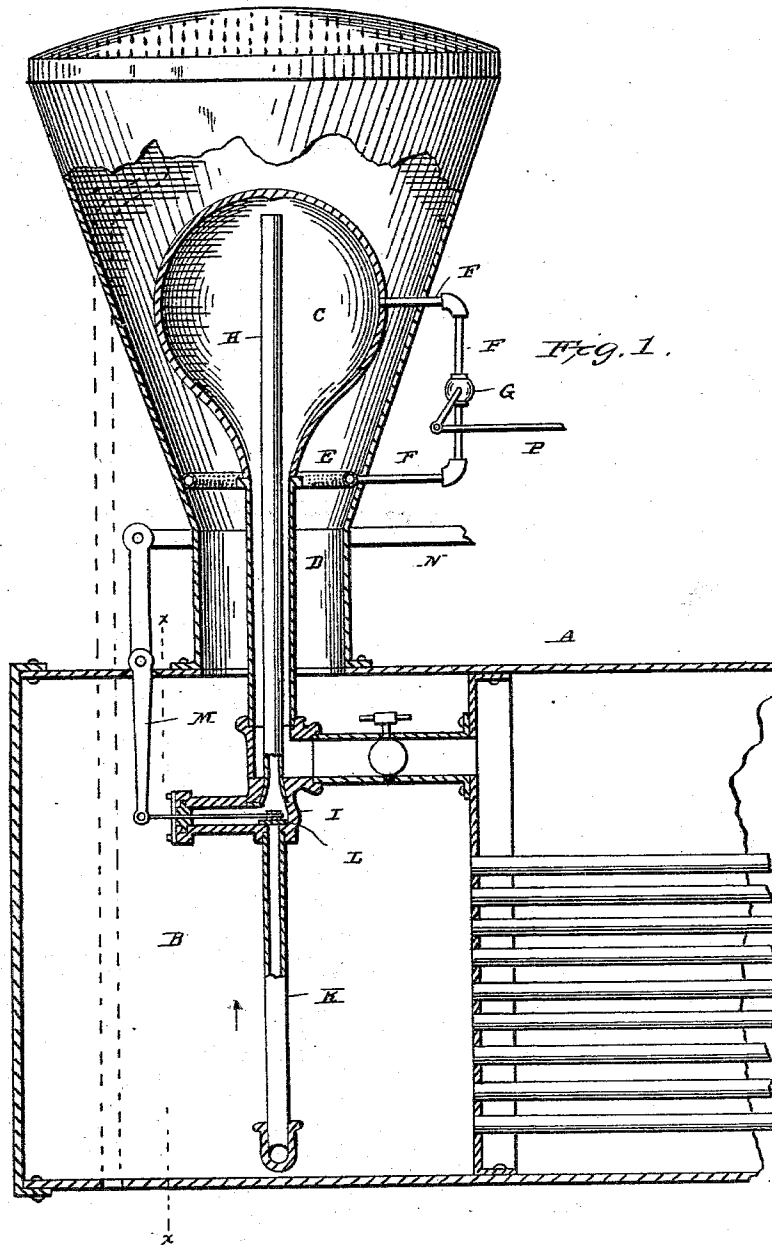
2 Sheets—Sheet 1.

H. D. BANNISTER.

DRAFT REGULATOR.

No. 288,914.

Patented Nov. 20, 1883.



Witnesses.
Edwin L. Jewell.
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2 Sheets—Sheet 2.

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Fig. 2.

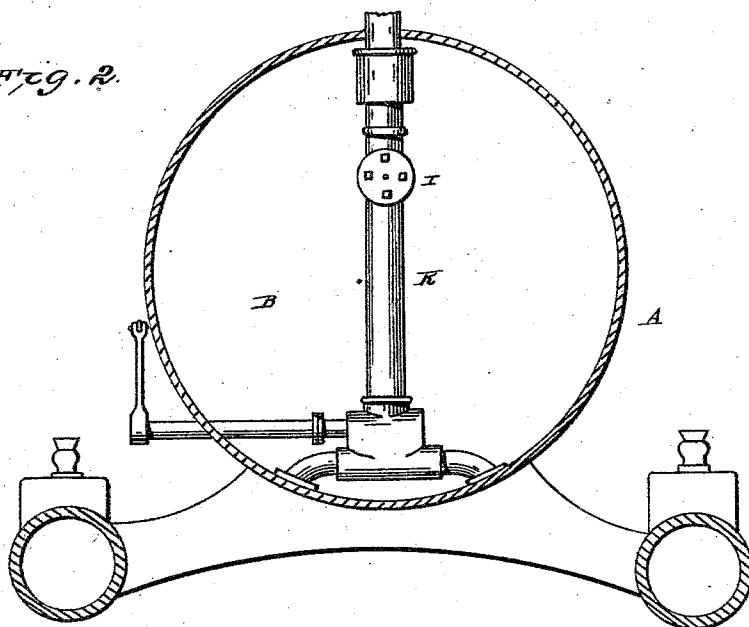


Fig. 4.

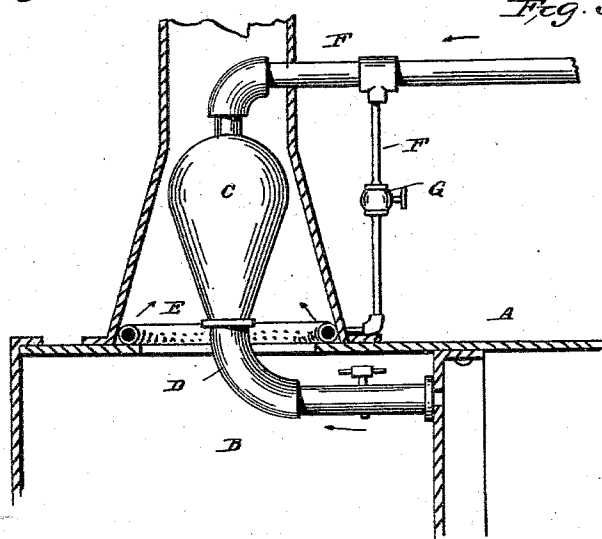
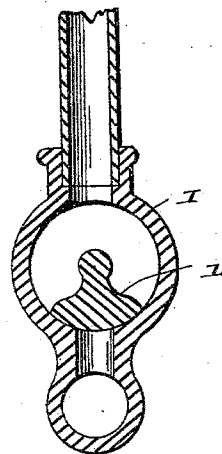


Fig. 3.



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UNITED STATES PATENT OFFICE.

HENRY D. BANNISTER, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO
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DRAFT-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 288,914, dated November 20, 1883.

Application filed March 16, 1883. (No model.)

To all whom it may concern:

Be it known that I, HENRY D. BANNISTER, of Chicago, in the county of Cook, and in the State of Illinois, have invented certain new and useful Improvements in Draft-Regulators; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

This invention relates to certain improvements in steam-boilers and furnaces; and it has for its objects to consume the smoke and provide a rapid draft through the furnace, and thereby economize fuel and provide for the rapid generation of dry or superheated steam, as more fully hereinafter set forth. These objects I attain by the means illustrated in the accompanying drawings, in which—

Figure 1 represents a vertical sectional view of a portion of a locomotive-boiler and my invention as applied thereto; Fig. 2, a transverse vertical section on the line *x x* of Fig. 1; Fig. 3, a sectional view, showing a valve employed in connection with my invention; and Fig. 4, a sectional view of a portion of a stationary boiler, showing my invention applied thereto.

In the drawings, the letter A indicates the shell of the boiler, which may be of the usual or any approved construction, and B the smoke-box thereof.

The letter C indicates a superheater constructed of metal, of a pear or balloon shape, preferably, or approximating thereto. The said superheater is located in the smoke-stack, being supported therein in any convenient manner, its lower end connecting with a downwardly-extending pipe, D, which connects with the boiler above the water-line thereof.

The letter E indicates a blower, which consists of an annular pipe located in the lower part of the smoke-stack, and provided with a series of perforations, as shown. The said blower is connected by means of a pipe, F, with the upper part of the superheater, which is provided with a valve, G, by means of which steam may be supplied from the superheater

and blown into the smoke-stack through the perforations in the annular pipe, so as to create a draft and decompose and consume the smoke or products of combustion passing out of the stack.

When employed in connection with a locomotive-boiler, a pipe, H, extends up through the pipe D into the superheater, the said pipe being connected to a valve-chest, I, which connects with a pipe, K, leading to the steam-chest of the cylinders. The said valve-chest is provided with a valve, L, the valve-rod of which passes through a suitable packing-box, and connects with a lever, M, having a rod, N, extending back to the cab, in order that the valve may be readily operated by the engineer. In this case also the valve-rod of the valve G is provided with a rod, P, extending back to the cab, to permit said valve to be conveniently operated.

In the modification shown in Fig. 4 of the drawings the pipe connecting with the upper part of the superheater extends back to the safety-valve of the boiler and connects with the casing of the same.

The valves for regulating and controlling the flow of steam in my improved device may be of any description; but I prefer the form shown in Fig. 3, in which an oscillating valve is arranged to work in a cylindrical valve-chamber, this form of valve being specially applicable when located at the lower end of the tube K, as indicated in Fig. 2.

The operation of my invention will be understood in connection with the above description, and is as follows: When it is desired to urge the draft and consume the smoke, the steam is admitted to the blower from the superheater by turning the valve in the pipe F, and escapes in a thoroughly dry and superheated condition, and is discharged in numerous jets into the smoke-stack. When used on a locomotive-boiler, the waste steam may be utilized, as indicated in Fig. 1 of the drawings; but when employed on a stationary boiler the steam is generally taken direct from the boiler. The superheated steam escaping into the smoke-stack and coming into contact with the highly-heated products of combustion is de-

composed, the oxygen uniting with the carbon of the escaping products consuming the same, the resulting carbonic acid passing off. The hydrogen liberated is burned, assisting in heating the superheater, and thus all solid carbon—such as cinders—is burned and prevented from escaping into the atmosphere.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination, with a steam-boiler, of a superheater connected with the boiler, and a blower connected with the superheater, and located in the lower part of the smoke-stack, the superheater being enlarged and located in the enlarged part of the smoke-stack above the blower, the connecting-pipes being provided with suitable valves for controlling the flow of steam, substantially as specified.

2. The combination, with the superheater connected with the boiler, and the blower connected with the superheater, of the pipe leading from a valve-chest connected with the steam-chests of the cylinders, the valve, and its operating mechanism, whereby the steam may be superheated and employed in a dry state, and also for consuming the smoke and creating a draft in the furnace, substantially as set forth.

In testimony whereof I affix my signature, in presence of two witnesses, this 24th day of May, 1882.

HENRY D. BANNISTER.

Witnesses:

G. F. McKNIGHT,
E. H. GRIGGS.