

(No Model.)

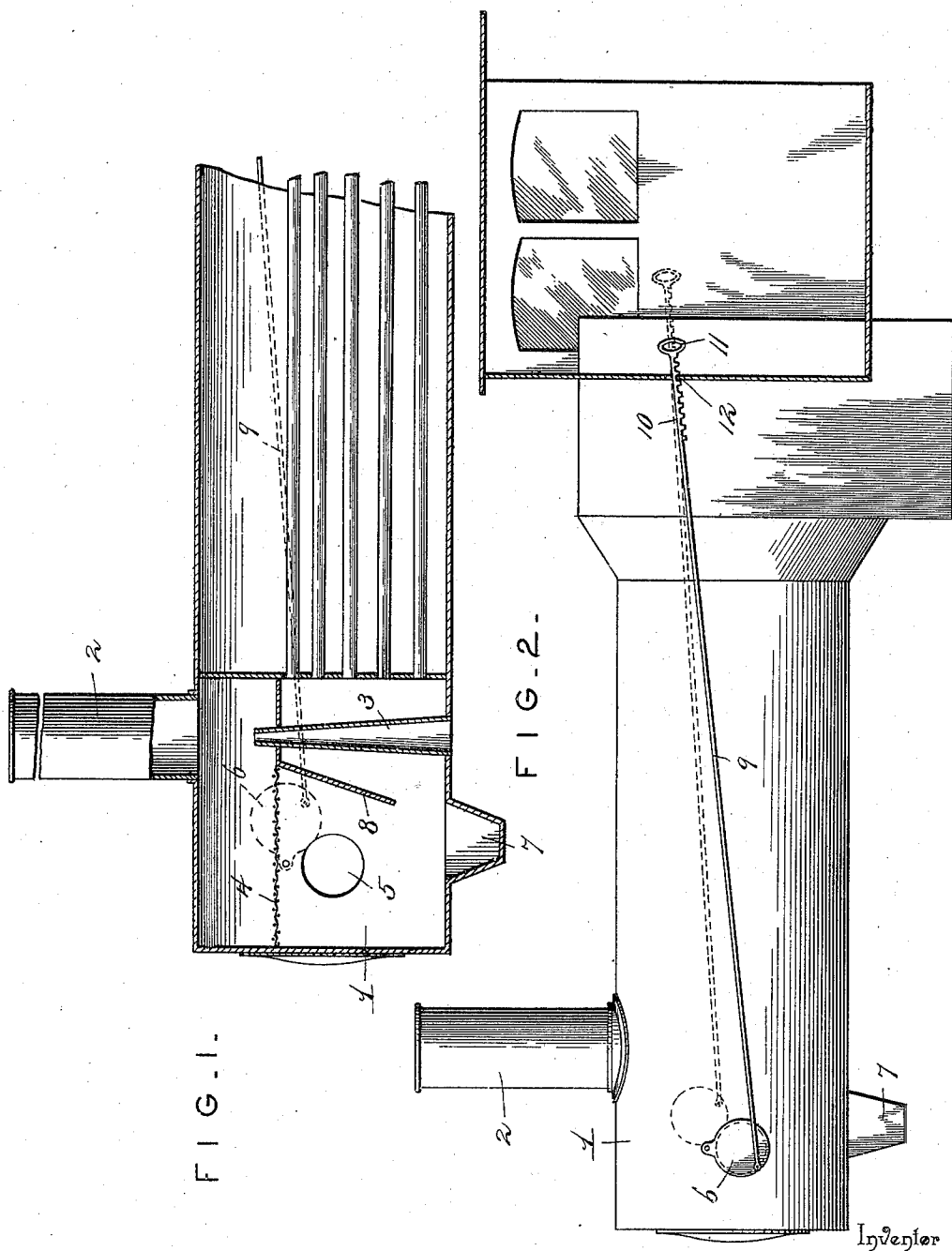
2 Sheets—Sheet 1.

J. FREW.

DRAFT REGULATOR FOR LOCOMOTIVES.

No. 579,389.

Patented Mar. 23, 1897.



Witnesses

Harry L. Amer.
J. E. Hays

By His Attorneys,

James Frew.

C. A. Snow & Co.

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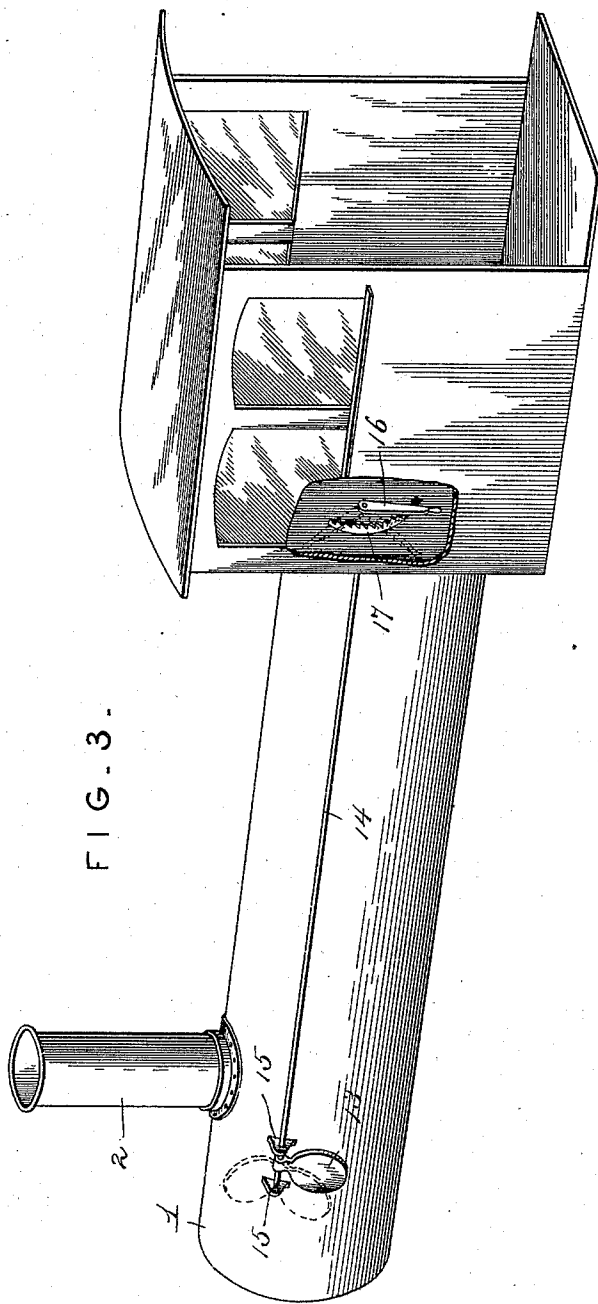
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Inventor

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[Signature]

Chas. Snow & Co.

UNITED STATES PATENT OFFICE.

JAMES FREW, OF CHIPPEWA FALLS, WISCONSIN.

DRAFT-REGULATOR FOR LOCOMOTIVES.

SPECIFICATION forming part of Letters Patent No. 579,389, dated March 23, 1897.

Application filed March 18, 1896. Serial No. 583,759. (No model.)

To all whom it may concern:

Be it known that I, JAMES FREW, a citizen of the United States, residing at Chippewa Falls, in the county of Chippewa and State of Wisconsin, have invented a new and useful Draft-Regulator for Locomotive-Engines, of which the following is a specification.

My invention relates to an improved draft-regulating and cinder-removing device for use in connection with locomotive-engines, the same consisting in a combination and arrangement of parts whereby air may be admitted to the smoke-chamber of the locomotive below the plane of the screen or netting, which is employed for retaining the sparks or particles of unburned fuel, said draft-regulating device being used in connection with the ordinary means for discharging exhaust-steam through the smoke-stack for promoting a draft, to provide such a relative arrangement of parts as to facilitate the removal of cinders from the screen or netting, and, furthermore, to provide means for preventing the chilling of the front boiler-sheet and the contiguous portions of the flues.

Further objects and advantages of this invention will appear in the following description, and the novel features thereof will be particularly pointed out in the appended claim.

In the drawings, Figure 1 is a longitudinal section of a portion of a locomotive, showing draft-regulating and cinder-discharging devices constructed in accordance with my invention. Fig. 2 is a partial side view to show the gate and means for operating the same. Fig. 3 shows a slightly-modified form of gate and means for communicating motion thereto from the cab.

Similar numerals of reference indicate corresponding parts in all the figures of the drawings.

1 designates a smoke-chamber which, as in the ordinary construction, is formed by a forward extension of the boiler, the stack 2 communicating with said chamber, and a steam-exhaust nozzle 3 being arranged to discharge coaxially with the stack.

The wire screen or netting 4 is arranged horizontally in the smoke-chamber below the plane of the upper extremity of the exhaust-nozzle instead of in the smoke-stack, as in the

ordinary construction, and arranged below the plane of this screen is a lateral port 5, formed in the side of the chamber and fitted with a controlling-gate 6, adapted to be opened more or less to allow a greater or less influx of air to the smoke-chamber. The usual cinder-receptacle 7 is formed in the bottom of the smoke-chamber for the reception of cinders which are too large to pass through the screen, said receptacle being arranged below the plane of the port 5, whereby in case of accumulated cinders becoming heated sufficiently to ignite the port may be opened to cool them below the point of ignition, and thus fire, which is common in the ordinary forms of smoke-chambers, such fire resulting in injury to side sheets and the front portion of the smoke-arch, is prevented.

Arranged in front of the exhaust-nozzle and in rear of the lateral port 5 is a forwardly and downwardly inclined deflector 8, which thus protects the nozzle and the front boiler-sheet and contiguous portions of the boiler-flues from cold air admitted through the port, and at the same time causes the draft admitted through the port to pass upwardly through the screen 4, whereby when small cinders have accumulated upon the upper surface of the screen and tend to interfere with the draft they may be blown out or discharged through the stack by opening the port. In the drawings I have shown no means for discharging the contents of the cinder-receptacle 7, it being understood that any of the ordinary devices employed for this purpose may be applied. Hence it will be seen that the force of the draft through the stack, caused by the exhaust through the nozzle 3, may be reduced more or less, according to the extent of opening of the port 5, in order to prevent excessive draft in starting the engine or in ascending grades, and in descending grades or when the locomotive is at rest the opening of the port 5 will prevent the production of draft, and hence will reduce the generation of steam to avoid the waste of fuel.

Various means may be employed for operating the gate from the cab of the engine, the means shown in the drawings consisting of a rod 9, provided at its rear end with a notched shank 10 and a handle 11, the notched shank being adapted to engage with a suitable pro-

jection or stud 12 contiguous to the cab. In Fig. 3 I have shown a slightly-modified form of gate and operating means consisting of a wing 13, fixed to a rock-shaft 14, the rock-shaft being mounted in bearings 15, arranged upon the exterior surface of the boiler extension and being fitted at its rear end with an operating-lever 16, which is disposed to engage the teeth of a segmental rack 17.

It will be seen that in both of the devices which I have illustrated for operating the gate means are provided for securing the gate in any desired position to cause more or less exposure of the port, whereby the draft of the engine may be positively controlled to suit the load and the conditions under which the locomotive is operating.

A further advantage of the improved construction resides in the fact that it prevents the escape of sparks or incandescent fuel, and hence avoids the danger of fires occasionally started from this cause. Furthermore, inasmuch as the deflector is arranged in advance of the exhaust-nozzle and extends below the plane of the inlet-port, the latter being disposed below the plane of the screen, the draft admitted by the port is prevented from passing under the deflector and thus forcing the products of combustion back into the flues and at the same time cooling the nozzle. The deflector causes all of the air admitted to pass upwardly through the screen, and thus remove cinders therefrom to prevent accumulation and obstruction. Furthermore, the deflector is arranged at such an inclination and in such a position with relation to the stack—namely, with its upper edge contiguous to and in front of the plane of the nozzle—that the angle of reflection of air entering through the opening 5 throws it directly into the sack, and thus still further adds to the efficiency of the device by preventing any portion of the air from passing

downwardly beneath the lower edge of the deflector and thereby chilling the parts in rear thereof. In other words, the plane of the deflector, if extended, would pass within the stack. Thus the mouth or lower end of the stack is in a common plane with the deflector.

Various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

Having described my invention, what I claim is—

The combination of the smoke-box of a locomotive-boiler formed in one side intermediate its top and bottom with a valve-controlled air-inlet opening, and in its bottom portion with a cinder trap or receptacle, the steam-exhaust nozzle extending upwardly within the smoke-box and adjacent to the front flue-sheet of the boiler, a deflector 8 extended from said front flue-sheet of the boiler and arranged in advance of the nozzle and at an inclination, said deflector being set at a slight angle to a vertical plane so as to lie in a plane intersecting both the stack and the cinder trap or receptacle, whereby large cinders are deflected downwardly into the trap or receptacle, and whereby air entering the side inlet-opening is reflected upward into the stack, and a horizontal intercepting screen extending from the upper end of the inclined portion of the deflector to the front end of the smoke-box and disposed in a plane above the side air-inlet opening, substantially as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

JAMES FREW.

Witnesses:

I. A. ANDERSON,
M. ENNATINGER.