J. TROTTER.

DRAFT REGULATING DEVICE FOR LOCOMOTIVE ENGINES.

APPLICATION FILED MAY 1, 1914.

1,111,776. Patented Sept. 29, 1914.

Fig. 1

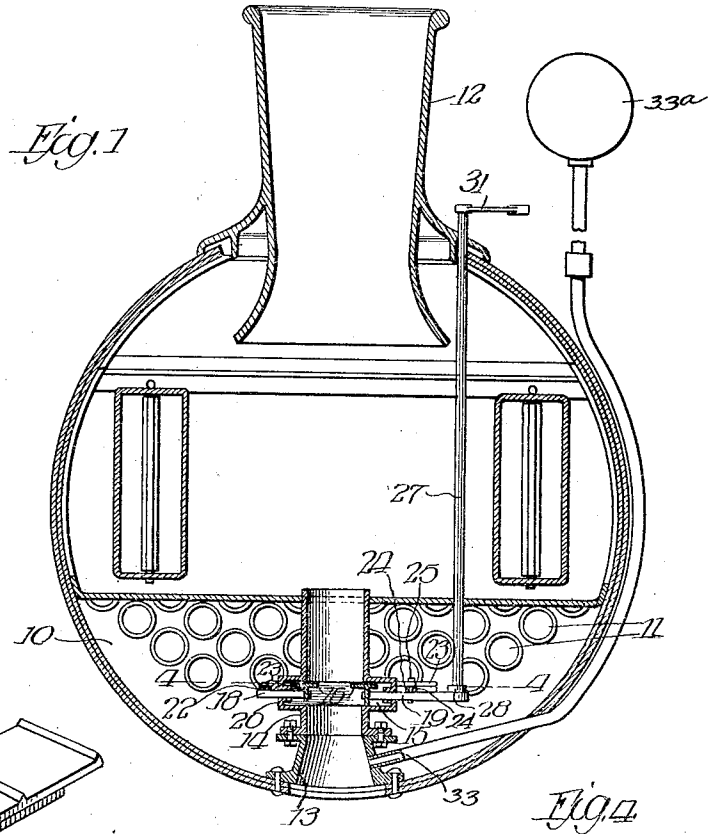


Fig. 2

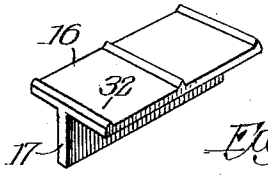


Fig. 3

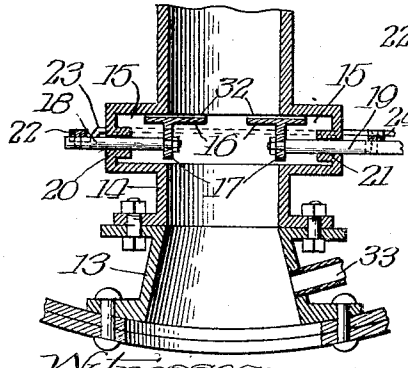
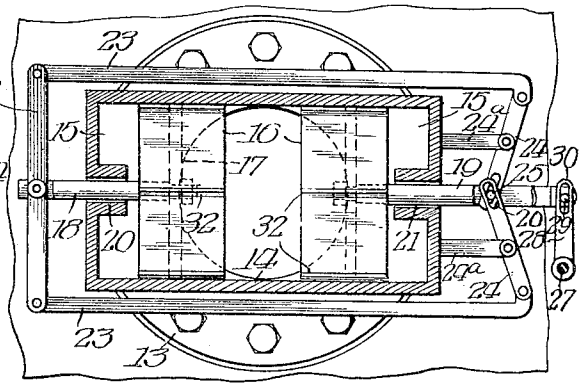


Fig. 4



Witnesses:

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DRAFT-REGULATING DEVICE FOR LOCOMOTIVE-ENGINES.

1,111,776. Specification of Letters Patent. **Patented Sept. 29, 1914.**

Application filed May 1, 1914. Serial No. 835,603.

To all whom it may concern:

Be it known that I, JAMES TROTTER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Draft-Regulating Devices for Locomotive-Engines, of which the following is a specification.

This invention relates to improvements in draft regulating devices for locomotive engines, and one of the objects of the same is to provide an improved device of this character having means whereby the diameter or size of the exhaust nozzle may be increased or decreased to vary the back pressure in the exhaust pipe and the steam passages, from the cylinder to the atmosphere, whereby the effect of the exhaust in creating the forced draft may be effectively controlled from the cab of the engine.

To the attainment of these ends, and the accomplisment of other new and useful objects, as will appear, the invention consists in the features of novelty in substantially the construction, combination and arrangement of the several parts, hereinafter more fully described and claimed, and shown in the accompanying drawing illustrating the invention, and in which

Figure 1 is a vertical transverse sectional view of the smoke box of a locomotive engine, having a draft regulating device applied thereto, constructed in accordance with the principles of this invention. Fig. 2 is a detail perspective view of one of the cut offs or slides. Fig. 3 is an enlarged vertical sectional view of the exhaust nozzles. Fig. 4 is a horizontal sectional view taken on line 4—4, Fig. 1.

Referring more particularly to the drawing, the numeral 10 designates generally the smoke box of an engine, having the flues 11 discharging thereinto and the stack 12 leading therefrom.

Arranged at a low elevation in the smoke box and directly in line with the stack 12 is an exhaust nozzle comprising a support or base 13 and a nozzle proper 14. The nozzle proper is shaped to form two opposed chambers 15 projecting laterally beyond the nozzle and having communication with the interior thereof. These chambers are arranged some distance from the tip of the nozzle and mounted to slide in the chambers are cut offs or slides 16 which are arranged opposed to each other and are of a size to fit loosely in the chambers and to be moved toward and away from each other in the directions toward and away from the center of the nozzle, and into and out of the respective chambers 15, and yet are adapted to be arrested short of each other in their movements in directions toward each other. These slides are provided with depending portions 17 to which are connected bars or rods 18, 19 that extend through suitable bearings 20, 21 in the walls of the respective chambers 15 and these bars 18, 19 project some distance beyond the walls.

Connected with the bar 18 is a transverse bar or rod 22 which is of a length so that the extremities will extend beyond both sides of the bar 18 and connected with these extremities are links 23 which extend in a direction toward the bar 19 and disposed between and connected with the bar 19 and the extremities of the respective bars 23 are links 24, which preferably have a pin and slot connection 25, 26 with the bar 19, and are fulcrumed as at 24ª. With this construction it will be manifest that when the bar 19 is moved in its bearings 21, to move the slide or cut off connected therewith, toward or away from the other slide or cut off, both of the slides will be simultaneously moved and the pin and slot connection will permit of such movement.

In order to vary or regulate the size of the steam column, and thereby control the draft on the fire bed as well as control the effect of the exhaust or back pressure in the pipe and steam passages, all that is necessary is to adjust the slides or cut offs 16 so as to increase or decrease the opening in the nozzle. This is accomplished by adjusting the bar 19, in any suitable manner, preferably from the cab in the engine by means of a rock shaft 27 arranged vertically and connected with the bar 19 through the medium of a link 28, having a pin and slot connection 29, 30 with the bar. This shaft 27 preferably extends through the top of the smoke box and has connected therewith an arm 31, and this arm 31 has connected with it any suitable mechanism arranged within and operable from the cab of the engine, by means of which the shaft 27 may be rocked and the slides or cut offs 16 adjusted.

It will be noted that the steam coming from the exhaust will impinge the lower faces of the cut offs or slides 16, which has a

tendency to force the upper faces of the slides against the upper walls of the chambers 15 and thereby create friction. In order to obviate this and to cause the slides to move freely when adjusted, spaced reduced portions 32 are provided on the upper face of each slide which extend lengthwise of the movement of the cutoffs, and which act in the nature of bearings that contact with the wall of the chambers. These ribs also form passages so that the steam entering the chambers 15, will pass through the passages, across the faces of the cutoffs to keep such faces clean and thereby prevent the accumulation and corrosion of foreign particles, which accumulation would seriously interfere with the operation of the cutoffs.

In order to readily ascertain the degree of pressure in the nozzle or pipe, a suitable pressure gage, (not shown), may be provided in a convenient position in the cab of the engine, and this pressure gage is connected with the nozzle by means of a suitable connection or pipe 33 leading from and communicating with the nozzle.

Obviously many changes may be made in the details of construction and in the combination and arrangement of the several parts without departing from the spirit of this invention.

What is claimed as new is:—

1. In a variable exhaust for engines, an exhaust nozzle, opposed cut offs movable transversely of the nozzle toward and away from the center of the nozzle, chambers formed in the nozzle for receiving the respective cut offs, and spaced bearings disposed between the upper face of the cut offs and the upper wall of the respective chambers to reduce friction therebetween and to form a passageway for the steam across the upper face of the cut offs.

2. In a variable exhaust for engines, an exhaust nozzle, opposed laterally opening chambers having communication with the nozzle, a cutoff embodying separated members, one of which members is arranged to move loosely in each of the chambers whereby the steam will pass through the chambers and around the cutoffs, and both members movable in directions toward and from the center of the nozzle, a journal connected with each of the members, each of the journals having a bearing in one of the walls of each of the chambers and extending through that wall to the outside of the chamber, and means exterior of the chambers and nozzle connecting the said members for movement in unison.

3. In a variable exhaust for engines, an exhaust nozzle, opposed laterally opening chambers having communication with the nozzle, a cutoff embodying separated members, one of which members is arranged to move in each of the chambers, and both members movable in directions toward and from the center of the nozzle, a journal connected with each of the members, each of the journals having a bearing in one of the walls of each of the chambers and extending through that wall to the outside of the chamber, spaced ribs connected with the cutoffs and extending lengthwise of the direction of the movement of the cutoffs, said ribs forming a passage for the steam from the chamber and across the face of the cutoff, means exterior of the chambers and nozzle connecting the said members for movement in unison, and means for actuating the members from the cab of the engine.

4. In a variable exhaust for engines, an exhaust nozzle, opposed laterally opening chambers having communication with the nozzle, a cutoff embodying separated members, one of which members is arranged to move in each of the chambers, and both members movable in directions toward and from the center of the nozzle, a journal connected with each of the members, each of the journals having a bearing in one of the walls of each of the chambers and extending through that wall to the outside of the chamber, spaced ribs on the upper face of each of the said members, said ribs extending lengthwise of the direction of the movement of the members and contacting with and movable over the top wall of the respective chambers to form a passage for the steam through the chambers and across the face of the cutoff, and means exterior of the chambers and nozzle connecting the members for movement in unison.

5. A variable exhaust for engines embodying an exhaust nozzle, opposed laterally extending chambers opening into the nozzle, a cutoff member in each chamber said members being separated from each other and movable toward and away from each other, means supporting the members from the end walls of the respective chambers and for sliding movement in the chambers, means holding the members spaced from the wall of the chamber to form a passage for the steam through the chamber and across the face of the member and means exterior of the nozzle and chambers for simultaneously and correspondingly actuating the members.

6. A variable exhaust for engines, embodying an exhaust nozzle, opposed laterally extending chambers opening into the nozzle, a cutoff member in each chamber, said members being separated from each other and movable toward and away from each other, means supporting the members from the end walls of the respective chambers and for sliding movement in the chambers, means exterior of the nozzle and chambers for simultaneously and correspondingly actuating the members, and spaced ribs projecting above the upper face of each of the mem-

bers and forming bearing points for the members against the top of the respective chambers, said ribs extending lengthwise of the direction of movement of the cutoffs.

7. In a variable exhaust for engines, an exhaust nozzle, opposed laterally opening chambers having communications with the nozzle, a cutoff embodying separated members, one of which members is arranged to move in each of the chambers, and both members movable in directions toward and from the center of the nozzle, a journal connected with each of the members, each of the journals having a bearing in one of the walls of each of the chambers and extending through that wall to the outside of the chambers, means exterior of the chambers and nozzle connecting the said members for movement in unison, and a gage connected with the nozzle for indicating the degree of pressure in the nozzle by the adjustment of the cutoffs.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 28th day of April A. D. 1914.

JAMES TROTTER.

Witnesses:
FRANK N. REED,
J. H. JOCHUM, Jr.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."