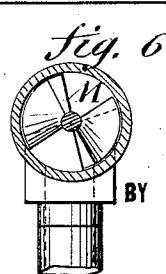
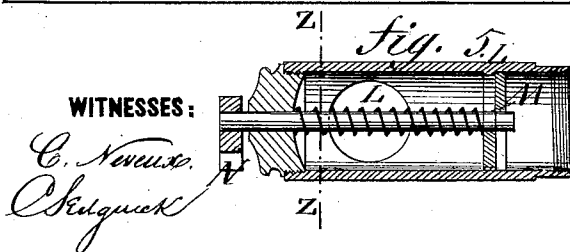
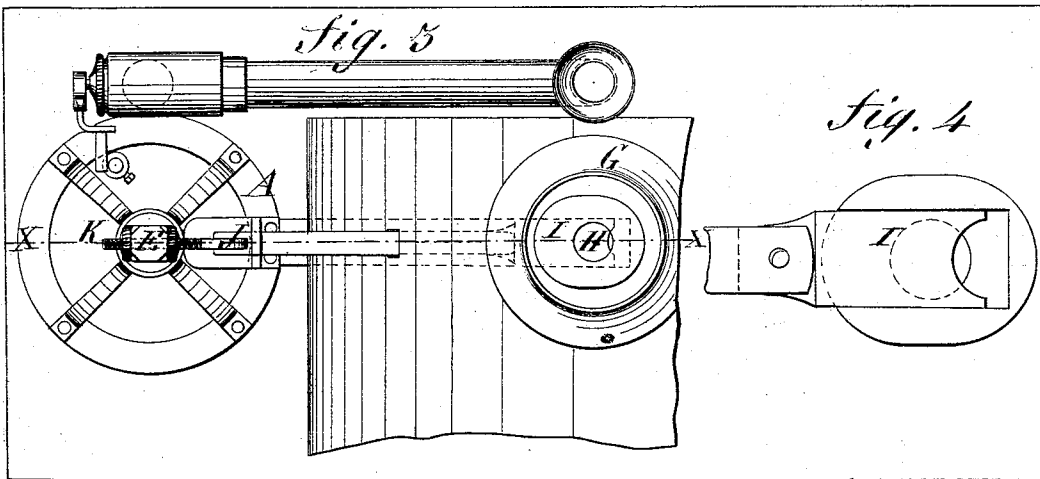
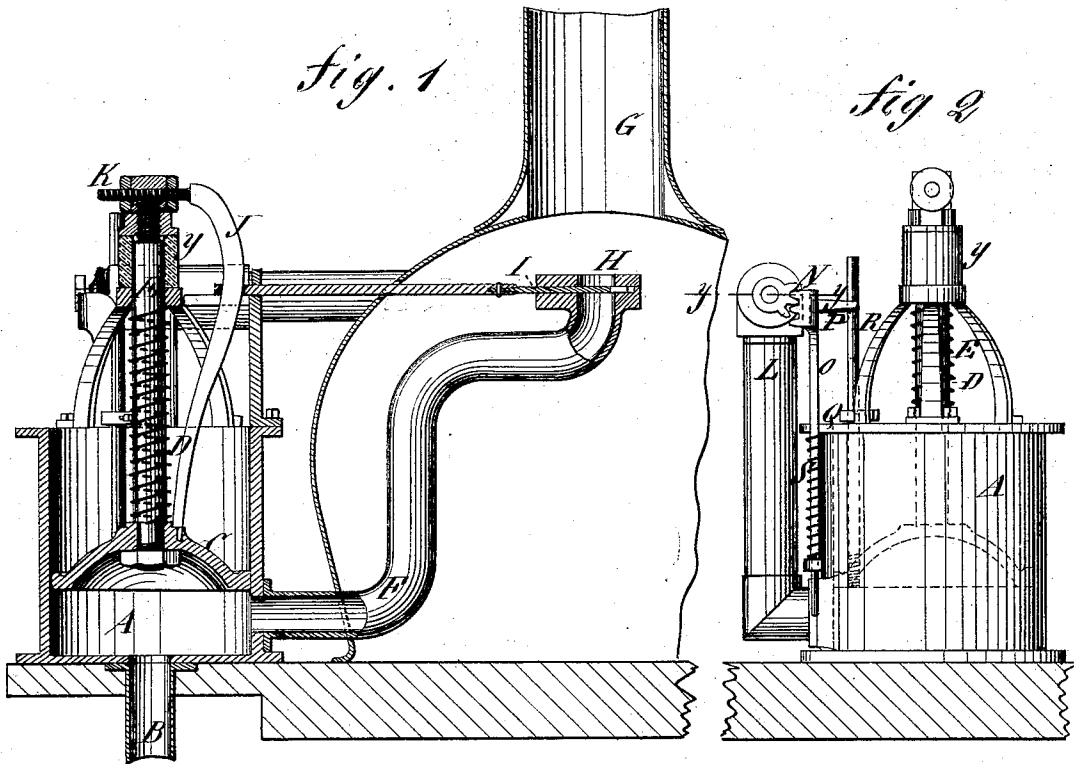


C. C. GREGORY.
Exhaust-Regulators.

No. 157,201.

Patented Nov. 24, 1874.



WITNESSES:

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INVENTOR:

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BY

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UNITED STATES PATENT OFFICE.

CHARLES C. GREGORY, OF FREDERICKTON, CANADA.

IMPROVEMENT IN EXHAUST-REGULATORS.

Specification forming part of Letters Patent No. **157,201**, dated November 24, 1874; application filed July 25, 1874.

To all whom it may concern:

Be it known that I, CHARLES CURRIE GREGORY, of Frederickton, in the province of New Brunswick and Dominion of Canada, have invented a new and Improved Exhaust-Regulator, of which the following is a specification:

My invention is designed to improve the draft of a locomotive or other engine furnace in which the exhaust is discharged into the smoke-stack. It consists in the construction and arrangement of parts, as hereinafter described and claimed.

Figure 1 is a sectional elevation of my improved exhaust-regulating apparatus, taken on the line *x x* of Fig. 3. Fig. 2 is also a side elevation. Fig. 3 is a top view. Fig. 4 is a top view of the regulating-valve on the nozzle, through which the steam discharges into the smoke-pipe. Fig. 5 is a sectional elevation of the escape-pipe for excess of steam in the receiver, taken on the line *y y* of Fig. 2; and Fig. 6 is a cross-section of Fig. 5 on line *z z*.

Similar letters of reference indicate corresponding parts.

A represents the receiver, into which the steam escapes directly from the engine by the pipe B. This cylinder contains a piston, C, working up and down in it steam-tight, and having a spring, D, coiled around its stem E, to resist the pressure of the steam. Below the piston the exhaust-pipe F is connected with the cylinder for discharging the steam into the smoke-pipe G, through its nozzle H, for accelerating the draft. As the steam enters the receiver it will force up the piston and expand until the pressure is equal to that at the nozzle, when the spring will begin to react on the steam, and, while steam remains in the receiver to be forced out, will maintain a continuous uniform blast at the nozzle. The parts may be so proportioned that the steam will be exhausted from the receiver at the moment of receiving another exhaust from the cylinder, thus making the blast in the smoke-pipe very uniform; but, as a further means of more effectually regulating the blast, I have provided a valve, I, in the nozzle for

opening and closing it, to regulate the escape by opening the passage wider when the greatest pressure exists in the receiver, and closing it when the pressure decreases; and, for operating the valve by the piston, I have connected the curved bar J to the piston and its rod, to rise and fall with them, and arranged the rod to work in a slot in the stems of the valve H, so as to open it when the piston rises, and close it when the piston falls. The rod J is adjustable, forward and backward, by the screw K, to vary the valve, as it may be required to do, to set it properly and to change it from time to time.

By this contrivance the escape at the nozzle may be made continuous, and the pressure uniform. In case the steam should, at any time, enter the receiver in excess of the means of escape by this apparatus, the excess will be automatically allowed to escape through the pipe L by the opening of the valve M therein, which I have provided for the purpose, said valve being geared at N with a rod, O, which is lifted by the piston, when it arrives at a certain predetermined height, and opens the escape. In this case the piston is caused to lift the rod O, by means of an arm, P, on it, with which a collar, Q, on a rod, R, projecting up from the piston, comes in contact. The collar is adjustable up and down on the rod, to be set for opening the escape-valve at any required height of the piston or pressure of steam in the receiver. A spring, S, throws rod O down again and closes the valve.

Any approved contrivance that will answer the same purpose may be substituted for the arm P, rod R, and collar Q, for causing the piston to work the escape-valve. A bellows, or other like expanding and contracting contrivance, may be substituted for the cylinder—a piston and spring—for expanding and regulating the escape of the steam into the smoke-stack. A rubber spring, Y, is combined with the piston-rod, so as to relieve the shocks when the piston falls.

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

1. The chamber A, having yielding side or piston, and pipes B and F, in combination with rod J, valve I, and nozzle H, as and for the purpose described.
2. The rod J, combined with the piston, expansion-chamber, and the regulating-valve I, for operating it in the manner described.
3. The rod O, spring S, arm P, rod R, and

adjustable collar Q, combined with the escape-valve M and the piston C, for operating said valve, as described.

CHARLES CURRIE GREGORY.

Witnesses:

JOHN F. BRECKER,
CHARLES M. HALLETT.