V. H. HALLOCK.

Exhaust Mechanism.

No. 206,783. Patented Aug. 6, 1878.

Fig. 1.

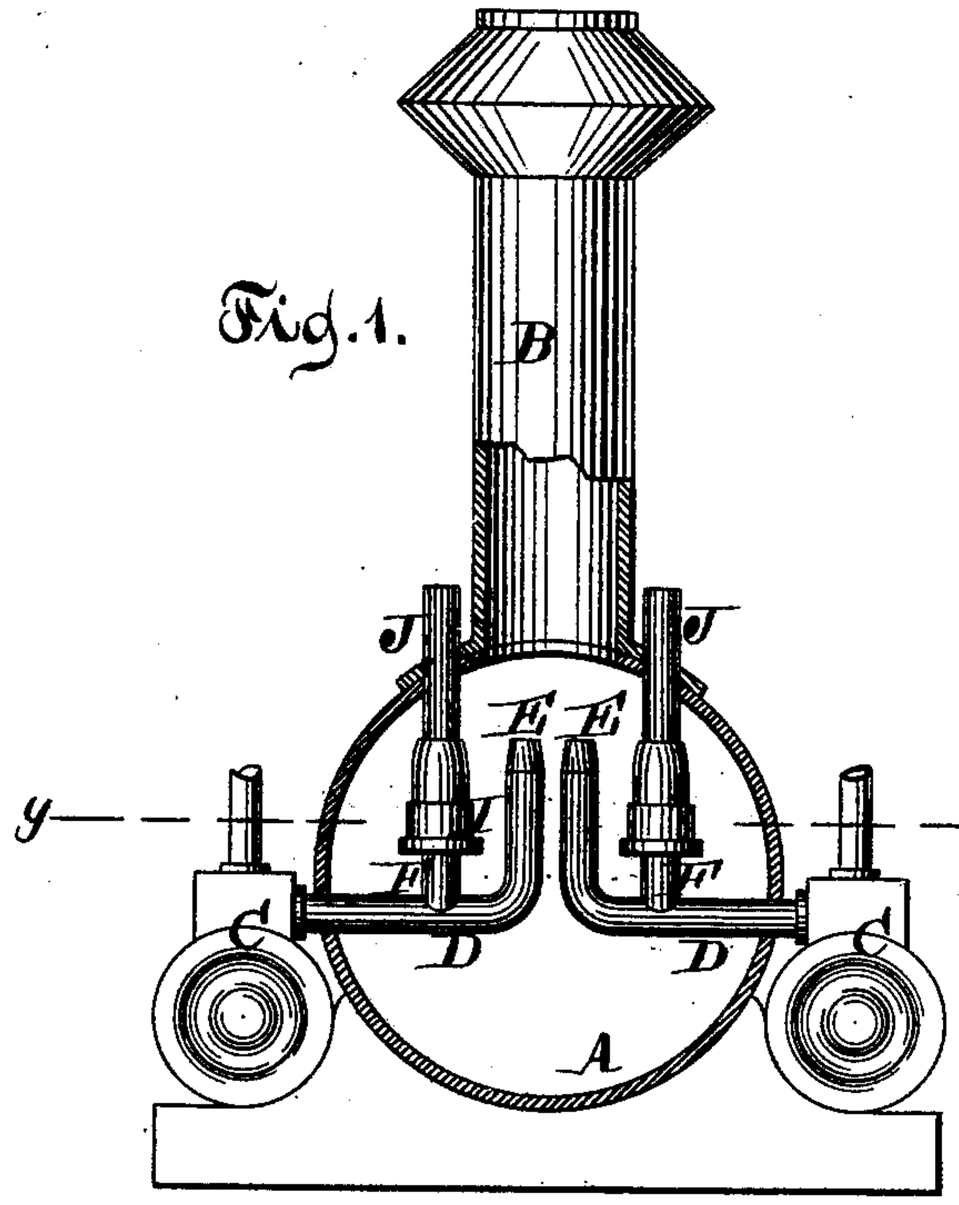


Fig. 3.

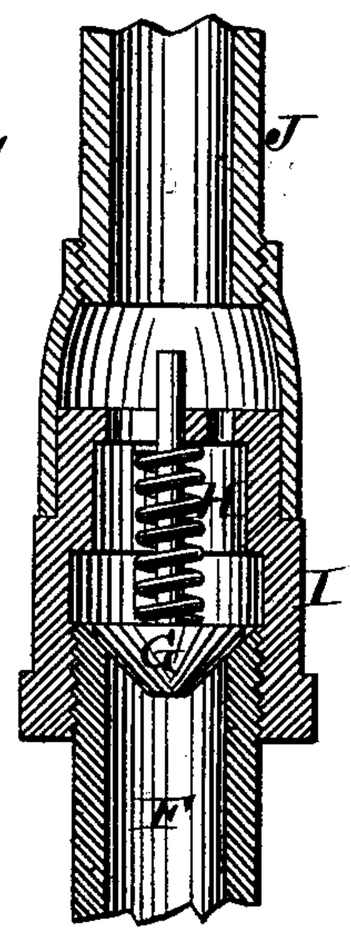
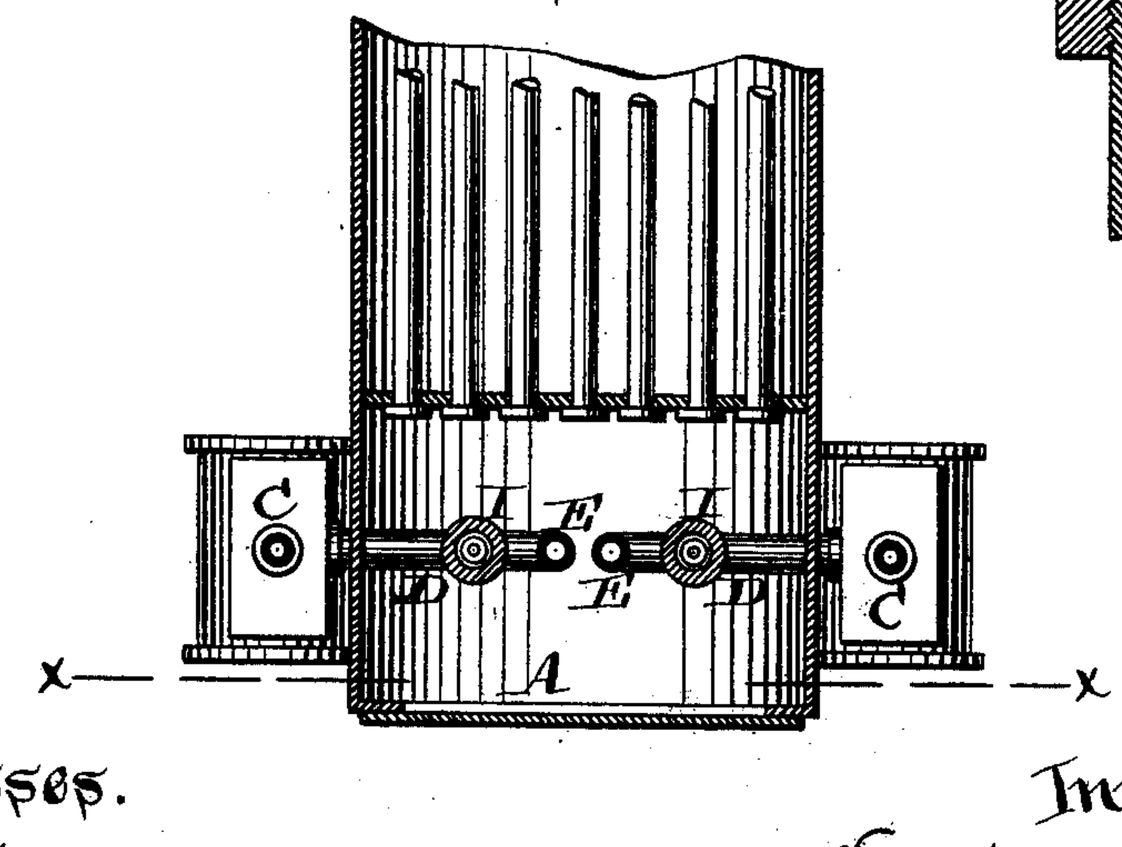


Fig. 2.



Witnesses.

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UNITED STATES PATENT OFFICE.

VALENTINE H. HALLOCK, OF QUEENS, NEW YORK.

IMPROVEMENT IN EXHAUST MECHANISMS.

Specification forming part of Letters Patent No. **206,783,** dated August 6, 1878; application filed February 2, 1878.

To all whom it may concern:

Be it known that I, VALENTINE H. HALLOCK, of Queens, in the county of Queens and State of New York, have invented a new and Improved Automatic Blast-Regulator for Exhaust-Nozzles, which invention is fully set forth in the following specification, reference being had to the accompanying drawing, in which—

Figure 1 represents a transverse vertical section in the plane *x x*, Fig. 2. Fig. 2 is a horizontal section in the plane *y y*, Fig. 1. Fig. 3 is a detached sectional view of the pressure-relieving valve on a larger scale than the previous figures.

Similar letters indicate corresponding parts.

This invention consists in the combination, with the exhaust-pipe of a steam-cylinder, and with the exhaust-nozzle leading into the smoke-stack, of a valve situated between the steam-cylinder and the nozzle, said valve being depressed on its seat by a spring or other equivalent means, and allowing a portion of the exhaust-steam to blow out before it reaches the nozzle whenever the pressure of the exhaust-steam exceeds a certain limit, whereby the draft regulates itself independent of the pressure of the exhaust-steam, undue pressure on the steam-piston is avoided, and a saving in fuel is effected.

Many devices have been made for regulating the blast of exhaust-nozzles; but all of these are based on a change in the size of the mouth of the nozzle, and the majority of them have to be operated by levers or other mechanical means. It has also been proposed to regulate the exhaust by means of conical plugs filling the blast-issues, and released from said issues by the action of live steam. No account of the varying pressure of the exhaust-steam is taken in the construction of these devices; but when the most desirable draft is reached by working the engine at a given speed, any increase of pressure on the nozzle caused by an increased speed of the engine creates a disturbing influence on the fire, and causes a wasteful discharge of unconsumed fuel. Furthermore, when the pressure upon the nozzles becomes excessive it causes a back-pressure on the steam-piston, thereby reducing the working capacity of the engine. These disadvantages are avoided by my invention.

In the drawing, the letter A designates the smoke-chamber of a steam-boiler of that class known as "locomotive-boilers," the products of combustion being carried off through the smoke-stack B, which is secured to the top of the smoke-chamber. To the sides of said steam-boiler are firmly secured the steam-cylinders C C, from which extend the exhaust-pipes D D into the smoke-chamber. These exhaust-pipes are bent upward, and each of them is provided with a nozzle, E, situated beneath the smoke-stack B. From each of said exhaust-pipes extends a branch pipe, F, the inner end of which forms the seat for a valve, G, (see Fig. 3,) which is depressed by the action of a spring, H, and the pressure exerted by this spring on the valve can be regulated by a screw-cap, I, which engages with a screw-thread cut on the branch pipe F. From this cap arises a pipe, J, which extends out in the open air. The spring which depresses the valve G on its seat may, however, be arranged in any suitable manner, or it may be replaced by a weight; but it is desirable that the pressure exerted by the weight or spring on the valve can be regulated by suitable mechanism. The position of the valve-seat may also be changed to suit convenience.

If my blast-regulator is used on an engine with a single steam-cylinder, the exhaust-nozzle is placed directly beneath or in line with the center of the smoke-stack.

The valves G are adjusted according to the pressure of the exhaust-steam, which is found by experience to produce the best draft under given circumstances, and whenever the pressure of the exhaust-steam exceeds this limit the valves are raised and a portion of the steam escapes through the pipes J, so that the blast remains uniform, and undue back-pressure on the steam-pistons is avoided.

It will be seen from this description that my blast-regulator is entirely automatic after the valves G have been adjusted to the desired pressure, and a steady blast of uniform power is produced, so that no fuel is wasted.

What I claim as new, and desire to secure by Letters Patent, is—

The exhaust-pipe D, leading from the steam-

cylinder into the smoke-box, and having a branch pipe, E, within smoke-box, provided with a valve, G, and a nozzle, J, terminating outside of the smoke-box, constructed substantially as shown and described, for the purpose set forth.

In testimony that I claim the foregoing I have hereunto set my hand and seal this 25th day of January, 1878.

VALENTINE H. HALLOCK. [L. S.]

Witnesses:
W. HAUFF,
E. F. KASTENHUBER.