

(No Model.)

J. C. CARROLL.

EXHAUST RELIEF AND CONTINUOUS BLAST FOR ENGINES.

No. 353,018.

Patented Nov. 23, 1886.

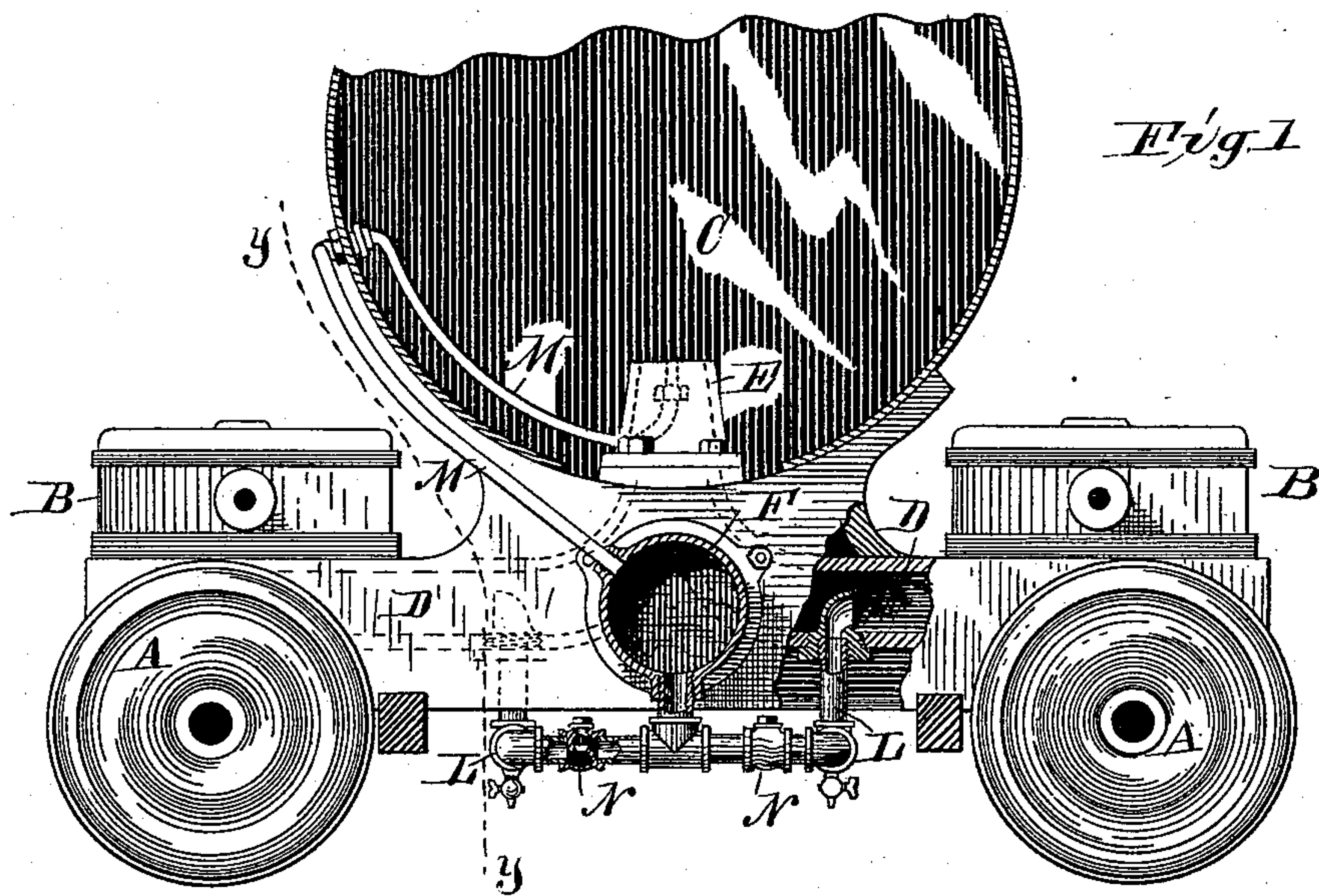
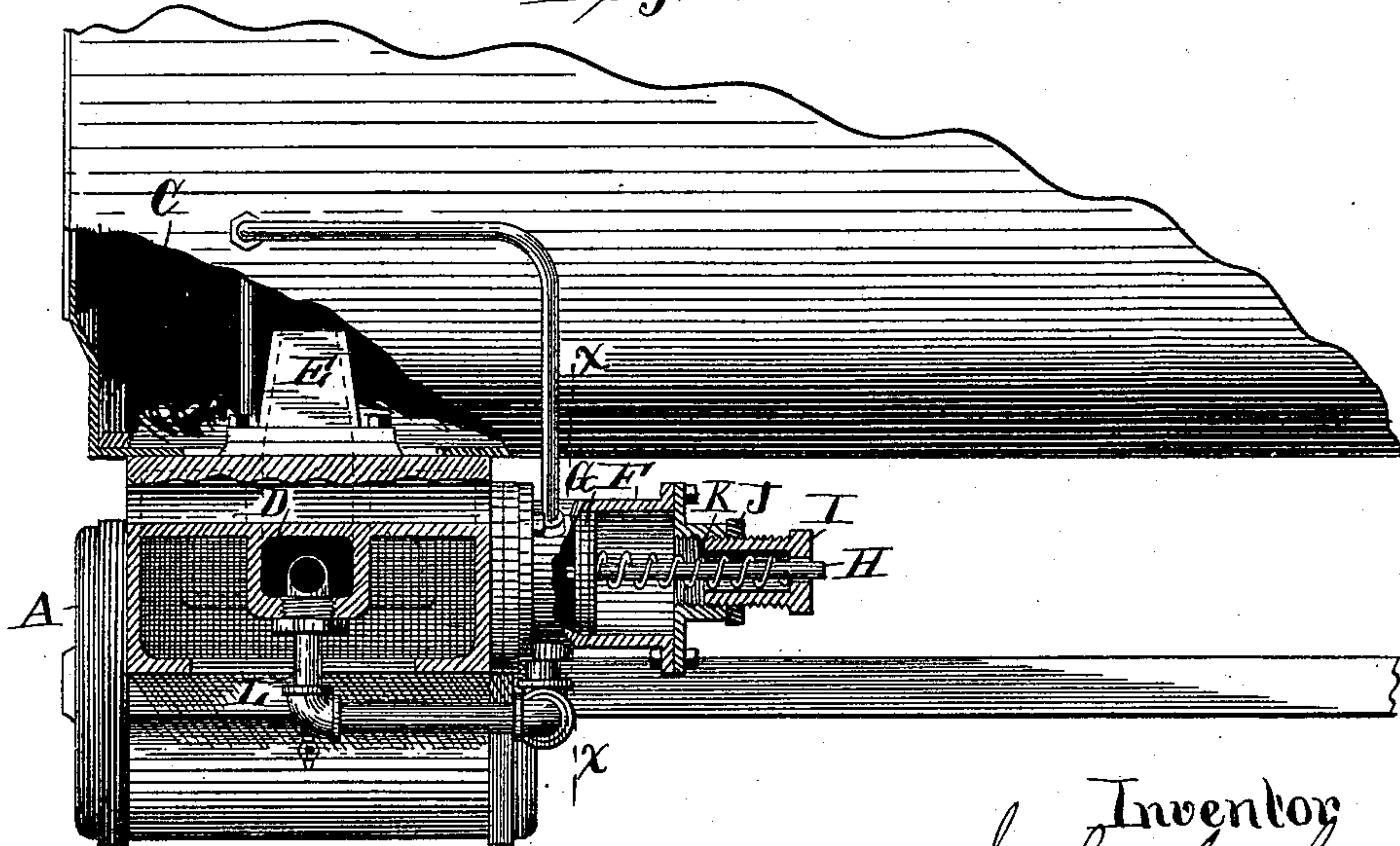


Fig. 2.



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EXHAUST-RELIEF AND CONTINUOUS BLAST FOR ENGINES.

SPECIFICATION forming part of Letters Patent No. 353,018, dated November 23, 1886.

Application filed July 3, 1886. Serial No. 207,058. (No model.)

To all whom it may concern:

Be it known that I, JOHN C. CARROLL, of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented a new and useful Exhaust-Relief and Continuous Blast for Engines; and I do hereby declare the following to be a full, clear, and exact description of said invention, reference being had to the accompanying drawings, and to the letters or figures of reference marked thereon, which form a part of this specification.

The objects of my invention are, first, to provide additional relief to an engine in certain contingencies from the reaction of its exhaust-steam; and, second, to secure a steady and continuous draft by means of a constant discharge of exhaust-steam through the smoke-discharging passage, whereby great economy of fuel is secured.

The invention, to be hereinafter distinctly claimed, consists in the peculiar construction and arrangement of the parts of my newly-invented device.

My invention is especially well adapted for use in locomotive-engines.

In the accompanying drawings, Figure 1 is a vertical cross-section of a smoke-box of a locomotive, showing also the ends of the steam-cylinders and steam-chests and exhibiting my device in vertical section in connection therewith. The view is on line *xx* of Fig. 2. Fig. 2 is a vertical longitudinal section of parts of Fig. 1 on line *yy* of Fig. 1.

The same letters refer to like parts in both views.

A A are the steam-cylinders of a locomotive.

B B are the steam-chests, and C is the smoke-box at the base of the smoke-stack.

D D are the exhaust-steam pipes, leading from the cylinders into the smoke-box, being, in the locomotive in the drawings, shown as coming together just below the smoke-box, and entering the smoke-box in a single pipe, terminating in a nozzle, E.

A cylinder, F, is provided with a steam-tight piston, G, having a rigid stem, H, which passes through and is supported, and has reciprocal movement in the top of the hollow compression-nut I. The compression-nut I is externally screw-threaded and turns in a corresponding screw-thread in the rear head

of the cylinder F, through which it passes, and is provided with a jam-nut, J, for locking it in position when adjusted in or out in the head of the cylinder. A coiled spring, K, about the stem H bears at one end against the top of compression-nut I, and is adapted to force the piston G forward toward the opposite end of the cylinder F. A pair of education-pipes, L L, having their receiving ends at some place in the exhaust-pipes D D, and provided with check-valves N N, lead from the exhaust-pipes to the cylinder F, into which they open in front of the piston G. The receiving ends of the education-pipes L L have their mouths (preferably trumpet-shaped) open toward the cylinders A A, these education-pipes being adapted for receiving or taking a part of the exhaust-steam from the pipes D D as it is being discharged intermittently therethrough and conveying it into the cylinder F. From the exhaust-steam cylinder F discharge-pipe M leads into the smoke-box C, and has its end preferably nearly coterminous with the end of the nozzle E.

Now, while the working-engine discharges its steam intermittently from the cylinders A A through the exhaust-pipes D D into the smoke-box C, whereby a fluctuating draft is produced through the fire-box, flues, and smoke-stack, it will be seen that by my device a portion of the exhaust-steam will when being intermittently discharged be taken from the pipes D D into the exhaust-steam cylinder F, forcing the piston G back upon the spring K, the recoil of which will when the pressure of the intermittently-discharged steam ceases force the steam in the cylinder F out through the discharge-pipe M into the smoke-box in a stream lasting until the repeated discharge through pipes D D begins again, thus securing a constant outward discharge of steam into the smoke-box and smoke-stack, whereby a correspondingly constant draft through the fire-box, flues, and smoke-stack is obtained and a steady but lessened consumption of fuel is secured. As the exhaust-pipes usually terminate in a contracted end or nozzle, (like nozzle E,) and as thereby when large amounts of steam are being rapidly discharged through the exhaust-pipes the steam is more or less impeded and dammed up and the free and full action of the engine

hindered, it will be seen that my device becomes an exhaust-relief, affording an auxiliary and independent way of egress for the exhaust-steam from the pipes, thereby relieving them
5 from their temporarily overburdened condition and obviating any liabilities of undue back-pressure from the exhaust-steam.

I have shown and described two eduction-pipes; but I do not wish to require two pipes
o unvaryingly, as one pipe would supply cylinder F with some steam and would to some extent relieve the exhaust-pipes; but two pipes are shown and described, as both exhaust-steam pipes should preferably be supplied with eduction-pipes.
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I am aware that a device has been constructed for taking the entire supply of exhaust-steam into a chamber against a reacting piston, as shown in English Patent No. 3,258
o of 1874, and I do not claim the device there shown and described.

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

1. A steam-cylinder, F, provided with a steam and spring actuated piston, in combination with one or more eduction-pipes, L L, provided with check-valves, said pipes leading from the exhaust-steam pipes of an engine to the cylinder F, and a discharge-steam pipe, M, leading from the cylinder F into the smoke-box of the engine, substantially as described.
25 30

2. In an engine, steam-cylinders A A, smoke-box C, and exhaust-steam pipes D D, in combination with an exhaust-steam cylinder, F, provided with a steam and spring actuated piston, G, eduction-pipes L L, provided with check-valves N N, and a discharge-steam pipe, M, all substantially as described.
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In testimony whereof I affix my signature in presence of two witnesses.

JOHN C. CARROLL.

Witnesses:

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