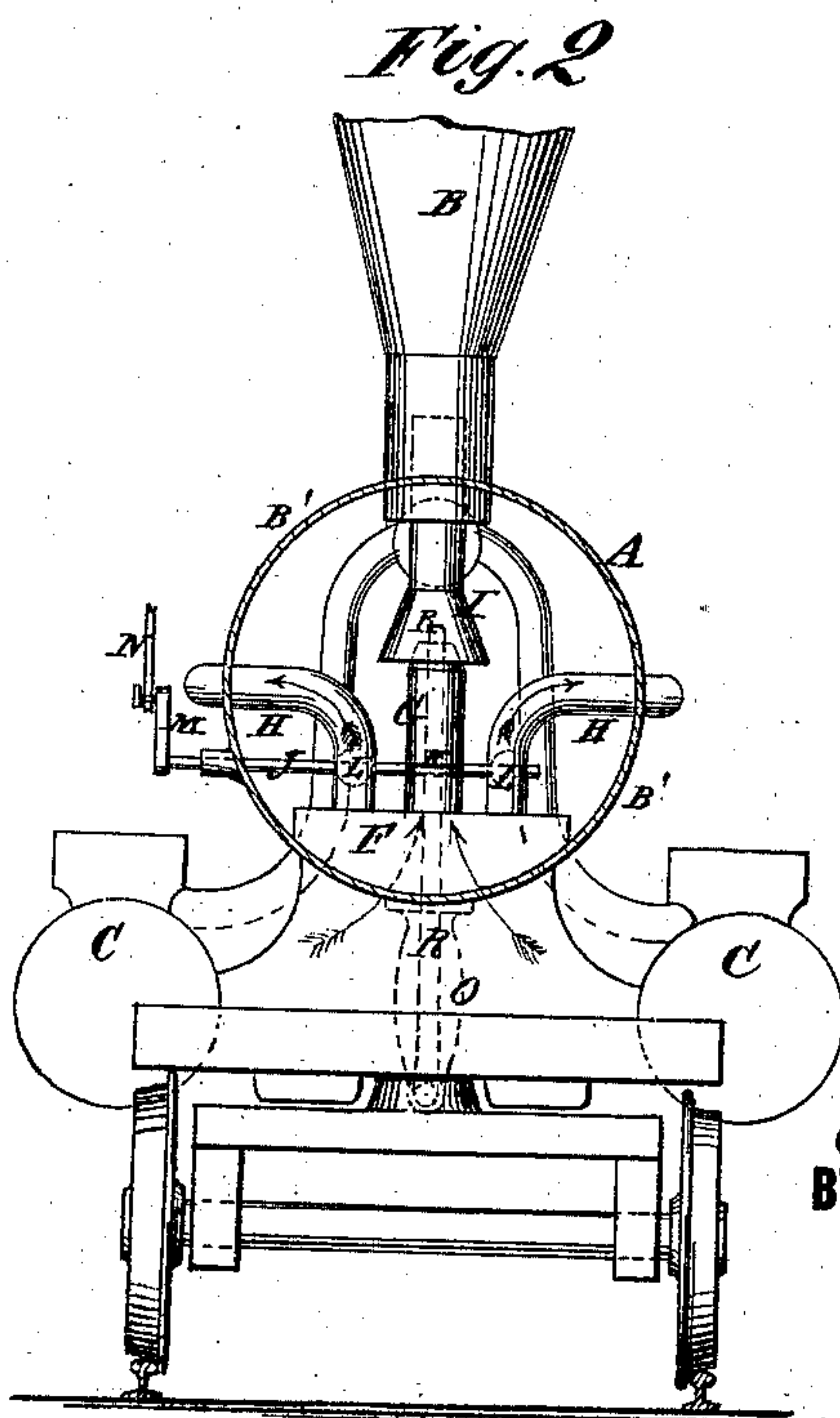
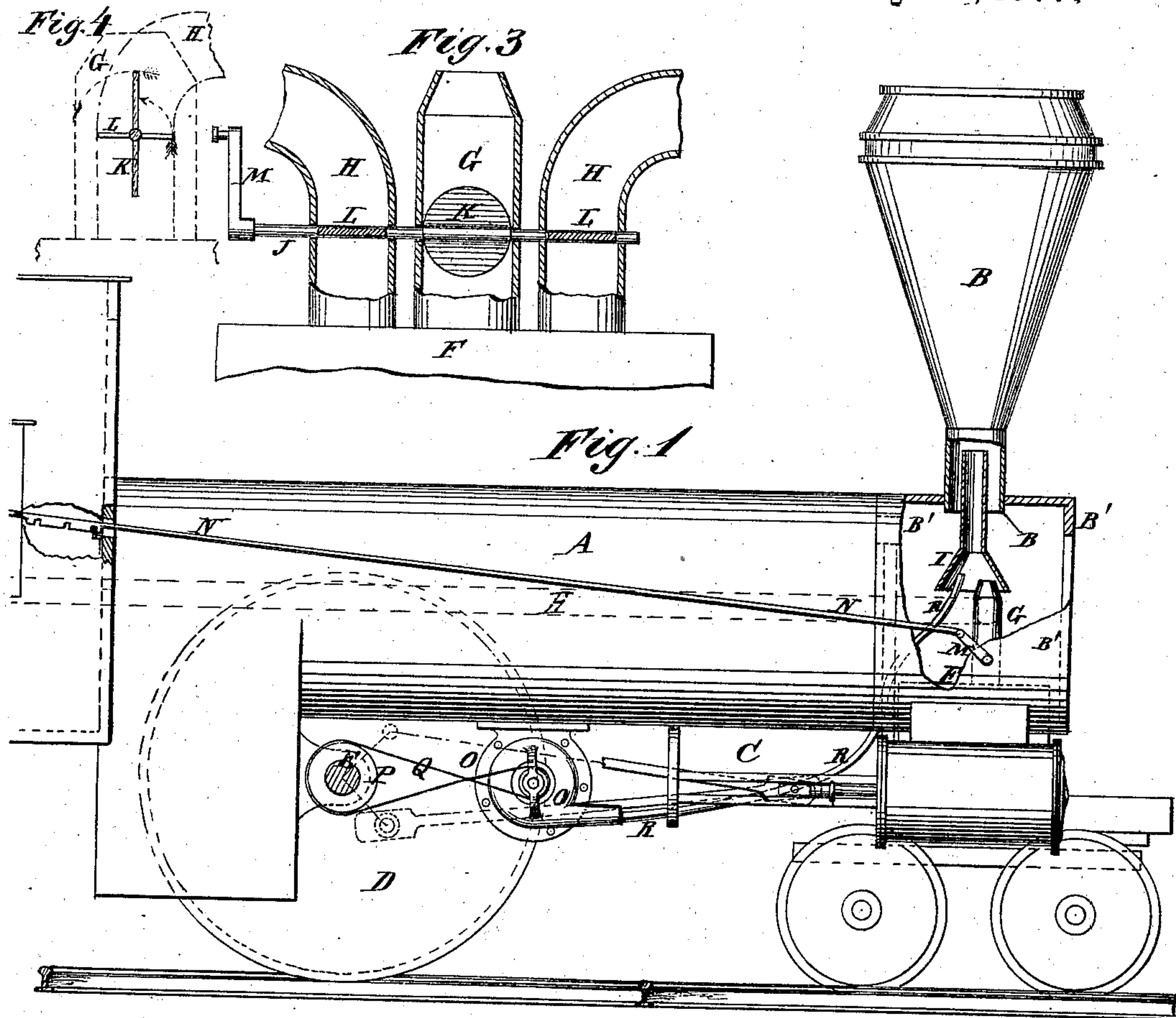


J. D. MURRAY.  
EXHAUST-REGULATORS FOR LOCOMOTIVES.

No. 194,456.

Patented Aug. 21, 1877.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

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## IMPROVEMENT IN EXHAUST-REGULATORS FOR LOCOMOTIVES.

Specification forming part of Letters Patent No. 194,456, dated August 21, 1877; application filed January 3, 1876.

*To all whom it may concern:*

Be it known that I, JOHN DUNMORE MURRAY, of Sarnia Station, in the county of Lambton, in the Province of Ontario and Dominion of Canada, have invented a certain new and useful Improvement in Devices for Regulating the Exhaust-Steam of Locomotives; and I do hereby declare that the following is a full, clear, and exact description of my invention, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawing, which forms a part of this specification, and in which—

Figure 1 is a side view of a locomotive to which my improvement has been applied, parts being broken away to show the construction. Fig. 2. is a front view of the same, the smoke-box being shown in section. Fig. 3 is a detail view of the exhaust-receiver with its pipes and valves on an enlarged scale; and Fig. 4 is a side elevation representing the pipes and their relative size, and showing also the arrangement of the valves and valve-stem.

Similar letters of reference indicate corresponding parts in all the figures.

My invention relates to devices for distributing and regulating the exhaust-steam of locomotives after it has been reheated in the smoke-box; and it consists in the arrangement of the valves within the pipes which distribute the exhaust-steam from the chamber that receives it from the exhaust-ports of the cylinders, in such a manner that, in operating said valves, the passing current of steam shall, by its pressure, assist the engineer in changing the course thereof, substantially as hereinafter more fully set forth.

In the drawings, A represents the boiler; B, the smoke-stack; B', the smoke-box; C, the engines; D, the drive-wheels, and E the drive-wheel axles. F is a box, preferably rectangular in shape, which is located within the smoke-box B', and receives the steam from the exhaust-ports of the cylinders. In the upper side or face of the exhaust-receiver F are formed three holes, into which are inserted three pipes, H G H, the central one of which,

G, is of a capacity equal to that of the two pipes H H combined, enabling it to discharge the same amount of steam from the receiver as the two pipes H H together, which will prevent any back pressure upon the engines when the central pipe is being used alone. I is a pipe, having a funnel-shaped mouth, which receives the steam from pipe G and conducts it up into the smoke-stack B. The pipes H H are bent above the valves and valve-rod, and pass out through opposite sides of the smoke-box B', then pass along the boiler A (one on each side) to the tender, where they are coupled to connecting-pipes for heating the feed-water, or the connecting-pipes may be extended back to the cars for the purpose of utilizing the exhaust-steam to heat them.

The three distributing-pipes H G H are arranged in a line with each other, transversely to the length of the boiler, and are intersected or traversed by a stem or rod, J, upon which the valves L K L are secured, the valve-stem passing diametrically through each valve, as shown. The valves L L are set in a plane with each other and at right angles to the central valve K, all the valves being operated simultaneously by the valve-rod J, by turning which either all the valves may be partially opened to allow the steam to escape through all the pipes at the same time, or the valves L L may be open and K closed, or vice versa, according to what use it is desired to make of the exhaust-steam.

One end of the valve-stem J extends through the wall of the smoke-box B', and to its end is attached a short crank, M, to which is pivoted the end of a rod, N, which extends back along the boiler till it enters the cab, where its handle end is provided with three or more notches to receive a catch-plate, which enables rod N to be so adjusted as to secure valves L K L in any given position.

The herein-described arrangement of the valves on the rod or stem J facilitates their manipulation, for the reason that so soon as they are moved from either position, the passing current of escaping steam will assist the engineer in changing the course thereof, so

that the valves may be operated, and the current of the exhaust regulated in a moment, and with the exertion of but very little force.

Having thus described my invention, I claim and desire to secure by Letters Patent of the United States of America—

The combination of the receiving-chamber F with the distributing-pipes H G H, provided with valves L K L, the valves L L be-

ing set at right angles to K, and located above the receiving-chamber, substantially as and for the purpose herein shown and specified.

JOHN DUNMORE MURRAY.

Witnesses:

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