

J. A. RICHARDSON.

EXHAUST CONTROLLING DEVICE FOR LOCOMOTIVES.

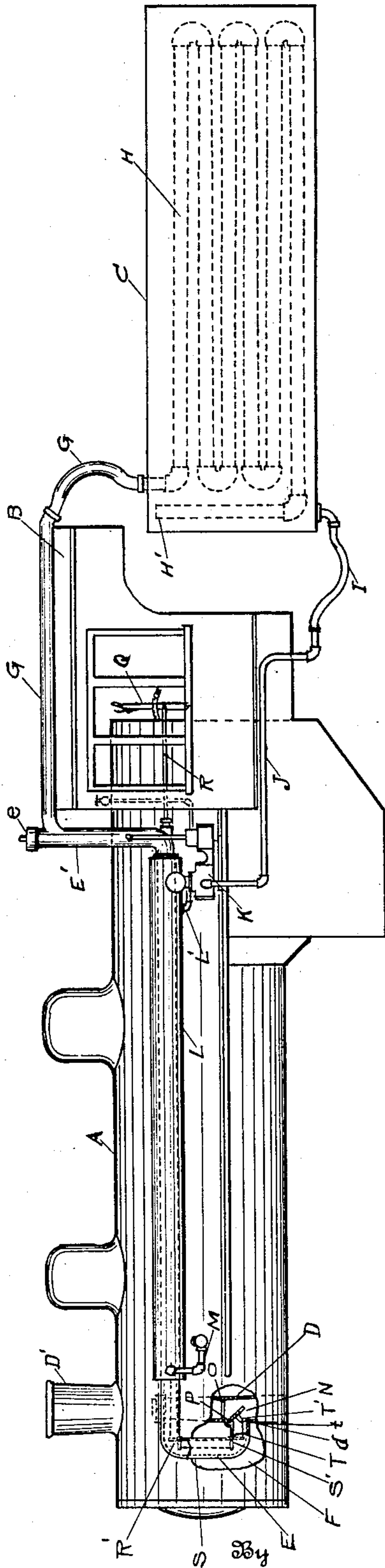
APPLICATION FILED MAY 10, 1909.

954,998.

Patented Apr. 12, 1910.

2 SHEETS—SHEET 1.

Fig. 1.



Witnesses:

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2 SHEETS—SHEET 2.

Fig. 2.

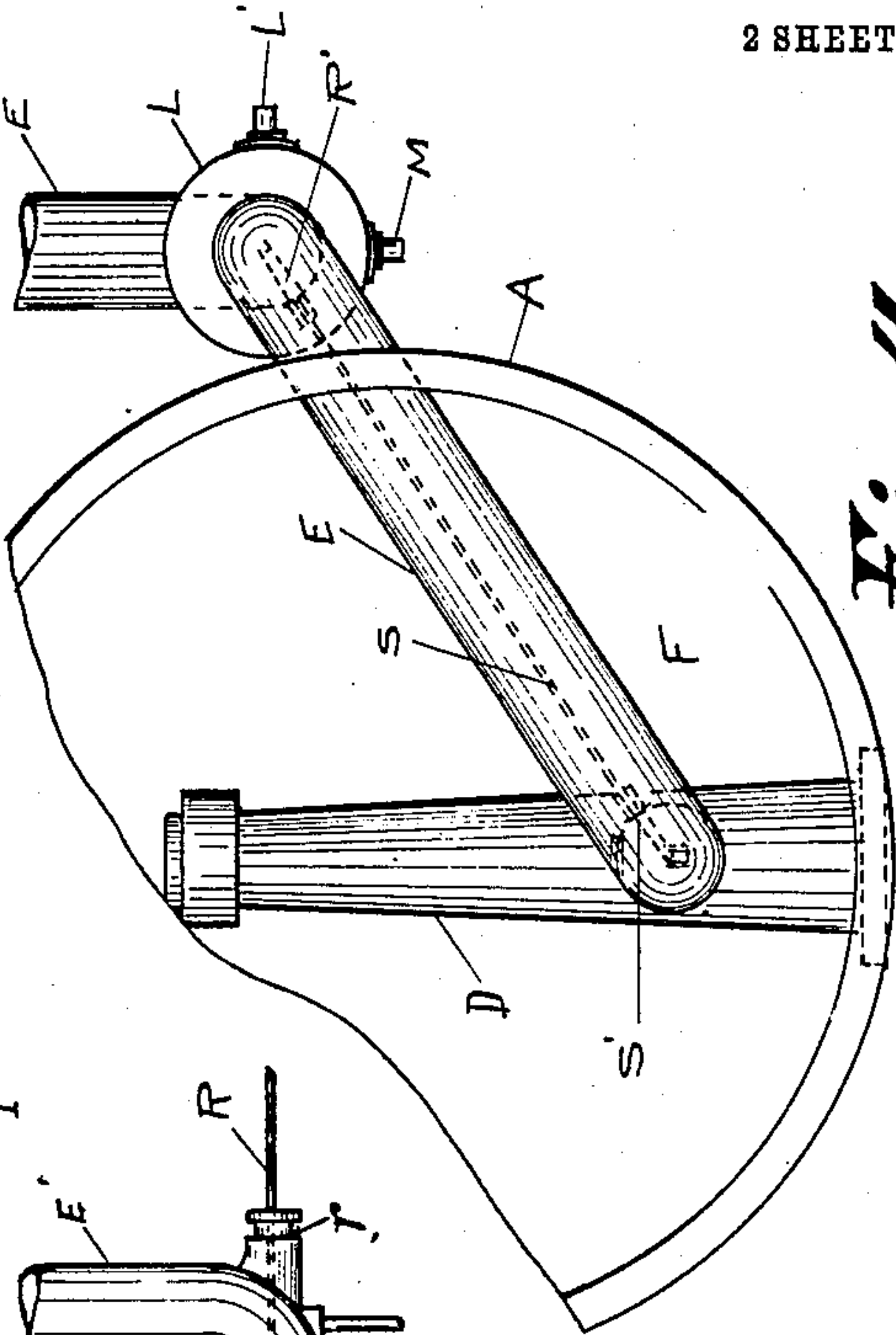
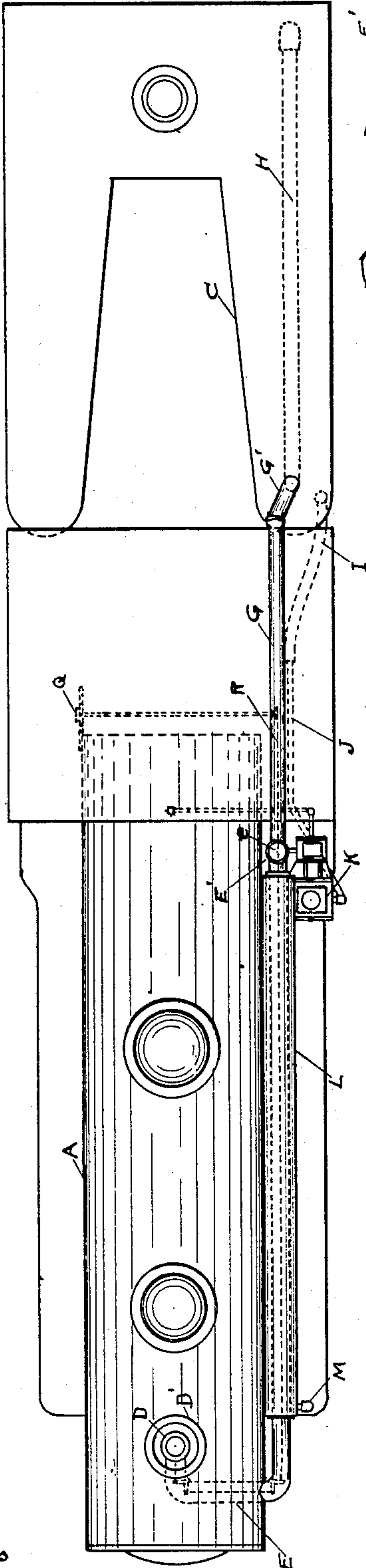
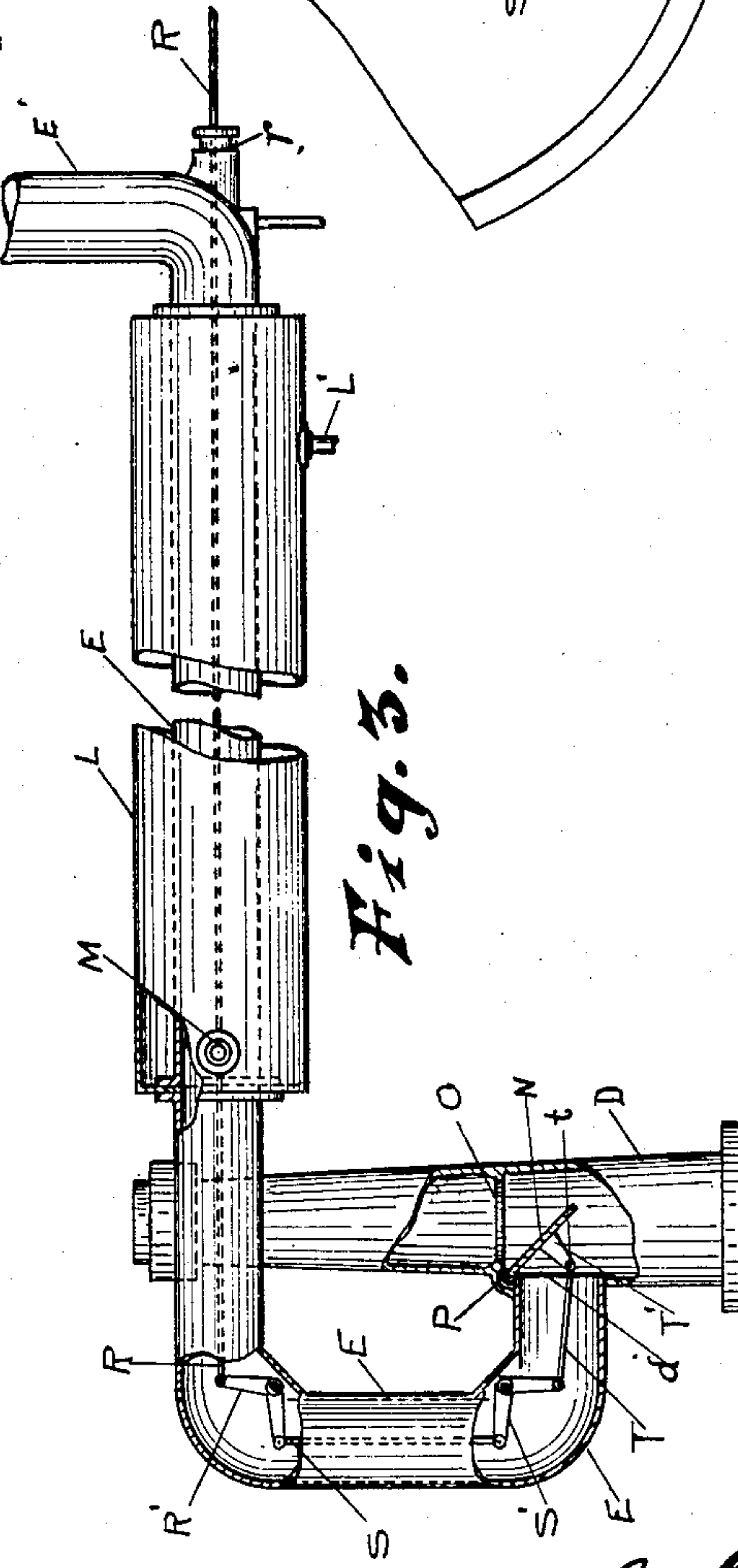


Fig. 4.

Fig. 3.



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UNITED STATES PATENT OFFICE.

JOHN A. RICHARDSON. OF WAUSAU, WISCONSIN.

EXHAUST-CONTROLLING DEVICE FOR LOCOMOTIVES.

954,998.

Specification of Letters Patent.

Patented Apr. 12, 1910.

Application filed May 10, 1909. Serial No. 495,026.

To all whom it may concern:

Be it known that I, JOHN A. RICHARDSON, a citizen of the United States, residing at Wausau, county of Marathon, and State of Wisconsin, have invented new and useful Improvements in Exhaust-Controlling Devices for Locomotives, of which the following is a specification.

My invention relates to improvements in exhaust controlling devices for locomotives.

The objects of my invention are to provide means whereby the engineer may have full control over the exhaust steam and whereby such steam may be utilized either to create a forced draft at any desired pressure, or utilized to heat the feed water in the tank, or to heat such water in its passage from the tank to the boiler.

In the following description, reference is had to the accompanying drawings, in which—

Figure 1 is a side elevation, part in section, of a portion of a locomotive embodying my invention. Fig. 2 is a plan view of the same. Fig. 3 is a detail side view, part in section, of the exhaust nozzle or stand pipe, together with the auxiliary pipe, the controlling valve and its actuating connections. Fig. 4 is a detail view of the same parts in front elevation, showing the same in their relation to the boiler casing.

Like parts are identified by the same reference characters throughout the several views.

A is the boiler casing of a locomotive steam engine. B is the cab, and C the water tank. D is a stand pipe or nozzle through which the exhaust steam from the engine is delivered into the smoke box and in the direction of the smoke stack D'. All of these parts may be of any ordinary construction, except that I provide the stand pipe D with an auxiliary port *d* communicating with an auxiliary pipe E, which leads forwardly and diagonally outwardly in the smoke box F to a point exterior to the casing A and then rearwardly along the exterior surface of the casing to a point near the cab, where it is provided with a vertical extension E' leading to a port controlled by a relief valve *e*, normally closing said port. A pipe G leads from the vertical extension E' backwardly over the top of the cab and is adapted to deliver steam from the pipe E' through a flexible hose G' into a radiator coil H in the water tank, the end of said coil H' being

vertically disposed and arranged to discharge the steam, preferably into the water tank near the top.

The feed water is drawn from the tank, through the hose I and pipe J by means of an injector pump K, which pump delivers the water into a water jacket L surrounding the backwardly extending portion of the pipe E. The discharge port of the pump is connected with the water jacket L through the pipe L' and the feed water is delivered from the other end of the water jacket into the boiler through the pipe M.

The passage of steam from the stand pipe or nozzle D through the auxiliary pipe E is controlled by means of a valve N, which is adapted to seat, either in a position to close the ports *d*, or to close the passage upwardly through the nozzle D in the direction of the smoke pipe D', this passage being provided with a valve seat O. The valve N is preferably a hinge valve, the hinge being located at P, whereby the valve may be swung to either close the port *d* or to close the ported valve seat O, or if desired, the valve may be adjusted to an intermediate position, whereby any desired portion of the steam may be delivered upwardly through the stack and the remaining portion through the auxiliary pipe E. The valve N is actuated from the cab by means of a lever Q operating through the rod R, elbow crank R', rod S, elbow crank S' and rod T, the latter being pivotally connected with a valve arm T' at *t*. The rod R preferably extends through the stuffing box *r* at the elbow where the pipe E connects with the vertical extension E', the rod then running forwardly in the pipe E' and the elbow cranks R' and S', with the rods S and T located within the pipe E, so that the attachment will not increase the number of movable parts exposed on the exterior surface of the locomotive. By thus locating the actuating connections in the steam pipe E, they are not only protected from being struck or bent out of shape, but are also protected from the direct heat of the fire which would otherwise quickly burn out any ordinary connections.

With this construction, the exhaust may be deflected into the auxiliary pipe, either in whole or in part, and to the extent to which it is not required for creating a forced draft through the fire. When so deflected, the heat of the exhaust steam is con-

served in the feed water, not only in the tank C, but also in the injected feed water in jacket L.

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

1. The combination with the smoke box and stack of a steam engine, of a pipe for exhaust steam provided with a discharge port in a position to accelerate the draft through the smoke stack and also provided with a lateral delivery port, an auxiliary pipe leading from said port upwardly and backwardly in the direction of the cab and provided with a suitable outlet for the delivery of steam without passing it through the stack, valve mechanism controlling the delivery of steam through each of said ports and having actuating connections extended longitudinally in said auxiliary pipe and into the cab, said connections being protected from the direct heat of the fire by said pipe.

2. The combination with the smoke box and stack, of a locomotive steam engine, provided with a cab and feed water tank, of an exhaust pipe having a port for delivering steam into the smoke box in the direction of the stack and provided with an auxiliary port, a valve regulating the flow of steam through said ports and arranged to open one as it closes the other, a pipe leading from the auxiliary port into the tank, and valve actuating connections extending from said valve to the cab.

3. The combination with the smoke box and stack of a locomotive steam engine, provided with a cab and feed water tank, of an exhaust pipe having a port for delivering steam into the smoke box in the direction of the stack and provided with an auxiliary port, a valve regulating the flow of steam through said ports and arranged to open one as it closes the other, a pipe leading from the auxiliary port into the tank, and valve actuating connections extending from said valve to the cab, said tank pipe being provided with a relief valve at an intermediate point.

4. The combination with the smoke box and stack of a locomotive steam engine, provided with a cab and feed water tank, of an exhaust pipe having a port for delivering steam into the smoke box and provided with an auxiliary port, a valve regulating the flow of steam through said ports and arranged to open one as it closes the other, a pipe leading from the auxiliary port into the tank, and valve actuating connections extending from said valve to the cab, together with a water jacket inclosing a portion of said tank pipe and having water conducting connection with the tank and boiler, with an injector pump interposed between the tank and said jacket.

5. The combination with the smoke box and stack of a locomotive steam engine, provided with a cab and feed water tank, of an exhaust pipe having a port for delivering steam into the smoke box and provided with an auxiliary port, a valve regulating the flow of steam through said ports and arranged to open one as it closes the other, a pipe leading from the auxiliary port into the tank, and valve actuating connections extending from said valve to the cab, said actuating connections comprising a lever in said cab, and rod and elbow crank connections extending into and along said tank pipe to the valve, substantially as set forth.

6. The combination with a steam exhaust stand pipe of a locomotive steam engine, provided with main and auxiliary delivery ports, of a valve controlling the flow of steam through the auxiliary port, and arranged when opened, to move across the passage to the main port, said main port being arranged to deliver the steam into the smoke box of the locomotive, and said auxiliary port being arranged to conduct the steam to a suitable point of discharge without affecting the draft.

In testimony whereof I affix my signature in the presence of two witnesses.

JOHN A. RICHARDSON.

Witnesses:

C. B. BIRD,
OSCAR BRANDT.