

(No Model.)

L. LAZERUS.
FEED DEVICE FOR LOCOMOTIVES.

No. 530,998.

Patented Dec. 18, 1894.

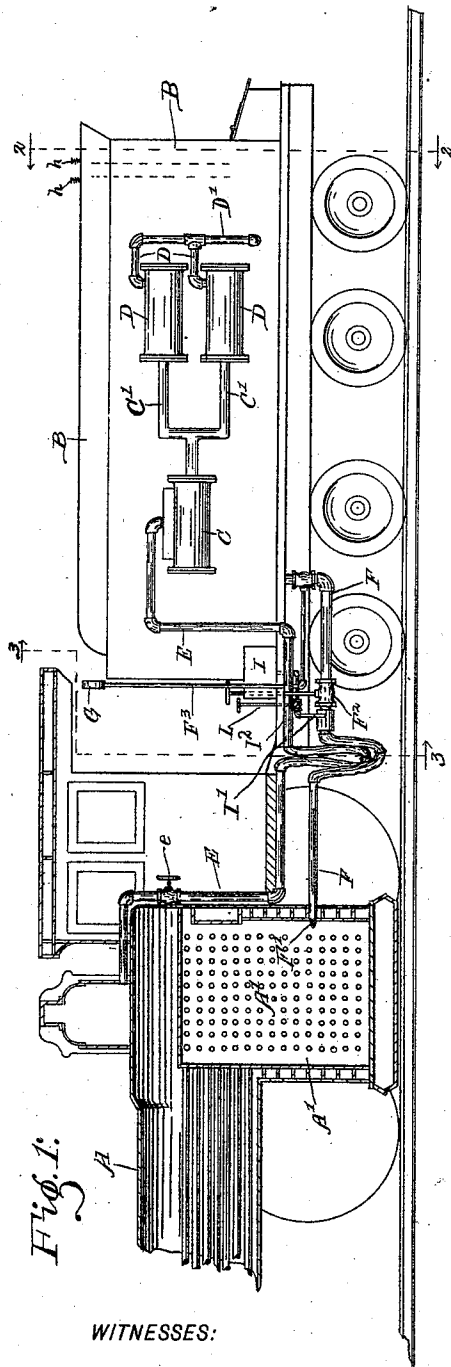


Fig. 1.

WITNESSES:

J. Edgar Burton.
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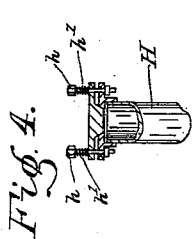


Fig. 4.

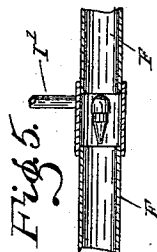
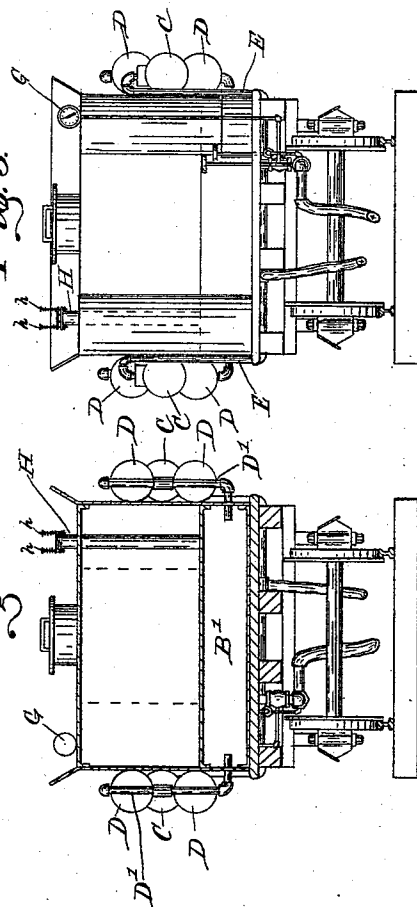


Fig. 5.

Fig. 3.

Fig. 2.



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FEED DEVICE FOR LOCOMOTIVES.

SPECIFICATION forming part of Letters Patent No. 530,998, dated December 18, 1894.

Application filed August 18, 1894. Serial No. 520,701. (No model.)

To all whom it may concern:

Be it known that I, LAZER LAZERUS, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in a Combined Blast and Fuel-Feed Device for Locomotives, of which the following is a specification.

The object of my said invention is to provide a means whereby fuel may be either partly or wholly supplied to a locomotive, and also, where other fuel is used, means by which the combustion of such fuel may be accelerated.

A locomotive and tender provided with my said invention will be first fully described and the novel features thereof then particularly pointed out in the claims.

Referring to the accompanying drawings, which are made a part hereof, and on which similar letters of reference indicate similar parts, Figure 1 is a view of a tender and a fragment of a locomotive provided with my said invention, the side of the locomotive being broken away to show the apparatus more plainly; Fig. 2, a transverse sectional view on the dotted line 2 2; Fig. 3, an end elevation of the tender, as seen from the dotted line 3 3; Fig. 4, a detail view of the upper end of the escape pipe and safety valve, and Fig. 5 a detail of the union between the hydrocarbon and air pipes.

In said drawings the portions marked A represent the locomotive boilers, including the fire-box or combustion chamber; B, the tender; C, the steam cylinders of the air pumps; D, the air cylinders of said air pumps; E, a steam-pipe leading from the locomotive boiler to the steam cylinder C; F, a pipe leading from the compressed air reservoir to the locomotive fire-box; G, a gage attached thereto; H, an escape pipe, and I a hydrocarbon receptacle.

The locomotive A is or may be of a usual or any desired construction, and has the usual fire box A' and the various mechanism with which a locomotive is usually supplied.

The tender B is of a different construction from that which is common, as illustrated in the drawings, and is provided with an air chamber B' which is adapted to receive and hold compressed air, and this chamber is usu-

ally and preferably of considerable capacity and is preferably located at the bottom of the tender below the fuel space in front of the fire-box of the locomotive.

The steam cylinders C may be of a usual construction for pumping purposes, and are provided with steam from the locomotive boiler through the pipes E. The piston C' is preferably bifurcated, and each branch, C', leads to and operates in one of the two attached air pumping cylinders D, as shown. There are preferably two of these steam cylinders, one on each side of the tender, as shown.

The air-pumping cylinders D are preferably four in number, two to each steam cylinder, and are operated in a usual and well known manner from said steam cylinders. Pipes D' lead therefrom and discharge into the air reservoir B'.

The pipes E are ordinary steam pipes, and preferably lead from the steam dome on the locomotive boiler to the steam cylinders C. As they pass between two moving parts they are provided with the usual flexible couplings common to such constructions, and are also provided with suitable valves, as *e*, whereby the stream may be turned on and off at pleasure.

The pipe F leads from the air reservoir B' directly to the fire-box A', where it has a nozzle F' pointing into said fire-box. A valve F² is provided to turn on or off and regulate the blast of air. A branch pipe F³ leads up to the gage G, and this latter serves to indicate the pressure in the reservoir. Leading up from the air reservoir to the outside is a pipe H which has a cap H' tightly fitted on to its seat, and provided with springs *h'* by which it is held on to said seat. Adjusting screws *h* regulate the pressure of the springs, as well as hold the cap from being wholly removed. The pressure on the springs is so adjusted as to equal the pressure desired in the reservoir, and when the pressure exceeds what has been predetermined, the springs will yield and a portion of the air escape.

The hydrocarbon receptacle I is a tank or reservoir of any convenient shape and size secured in or upon the tender, and a pipe I' leads therefrom down to and connects with the pipe F in such a manner that hydrocar-

bon from said receptacle may mingle with the blast of air on its way from the air reservoir to the fire-box or combustion chamber. A valve I² serves to shut off or regulate the supply of hydrocarbon. As shown in Fig. 5, the union between the pipes I' and F is of a character common in inspirators, so that the air-blast has a tendency to draw on the hydrocarbon supply rather than to check it.

The operation is, generally speaking, that the combined air and hydrocarbon is driven into the fire-box and acts both as a blast and as an addition to the fuel, assisting materially in both particulars in making a hot fire, and thus generating the steam. The air reservoir or tank B' is always kept charged with a sufficient quantity of air so that this apparatus may be put in use at once when desired, without waiting for the generation of steam after a fire is first kindled, although, as is well known, a small amount of steam is generally kept up in a locomotive, and, therefore, the air can ordinarily be pumped whenever desired.

My said invention is not only applicable where, as has so far been described, ordinary fuel is used, but it is of especial value where a hydrocarbon fuel is exclusively used, in which case a hydrocarbon tank or reservoir would occupy a large portion of the space in the tender, or substantially the same space as is usually provided for the fuel; and the small hydrocarbon tank could then be charged from time to time from the larger tank, or, by appropriate attachments, the fuel could be conducted directly from such larger tank to the air pipe.

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

1. The combination, with a locomotive and its tender, of an air pumping apparatus secured to said tender, an air reservoir or tank within said tender with which said pumping apparatus connects, a steam-pipe leading from the locomotive to said pumping apparatus, to furnish steam for operating same, and an air pipe leading from said air reservoir or tank to the fire-box of the locomotive, the section between the tender and locomotive being provided with a suitable coupling said several parts being arranged and operating substantially as set forth.

2. The combination of a locomotive pro-

vided with the usual fire-box, a tender provided with an air reservoir or tank, an air pumping apparatus mounted upon said tender, a steam pipe leading from the locomotive to said pumping apparatus whereby it is operated, connections between the air cylinders and said reservoir or tank, a pipe leading from said reservoir to the fire-box of said locomotive, and an escape pipe provided with a safety valve connected to said reservoir or tank.

3. The combination of the locomotive A having the fire-box A', the tender B having air reservoir or tank B', the air-pumping apparatus consisting of steam cylinder C and air-pumping cylinders D D, a bifurcated piston operating from said steam cylinder to said air-pumping cylinders, pipes D' D' from said air-pumping cylinders to said air reservoir or tank B', a pipe F leading from said air reservoir to said fire-box where it is provided with a nozzle F', a branch pipe F² terminating in a gage G, a valve F², a steam pipe E leading from the locomotive to the steam cylinder C and provided with a valve e, and an escape pipe H having a cap H' secured thereto by bolts h and springs h', the whole being combined, arranged and operating, substantially as shown and described and for the purposes set forth.

4. The combination of a locomotive, its tender, an air reservoir in said tender, an air pumping apparatus mounted on said tender and connected with said reservoir, a pipe leading from the locomotive to said pumping apparatus to supply steam for operating the same, a pipe leading from said reservoir to the fire box of the locomotive with a suitable coupling in the section between the tender and locomotive, a hydro-carbon reservoir and a pipe leading from said hydro-carbon reservoir to said air pipe with which it communicates by a suitable connection and suitable valves for controlling the flow of hydro-carbon, air and steam through the different parts of said apparatus, substantially as set forth.

In witness whereof I have hereunto set my hand and seal, at Indianapolis, Indiana, this 10th day of August, A. D. 1894.

LAZER LAZERUS. [L. S.]

Witnesses:

CHESTER BRADFORD,
JAMES A. WALSH.