Dec. 17, 1935. W. E. GATCHEL 2,024,969

DUPLEX LOCOMOTIVE

Filed Dec. 7, 1932

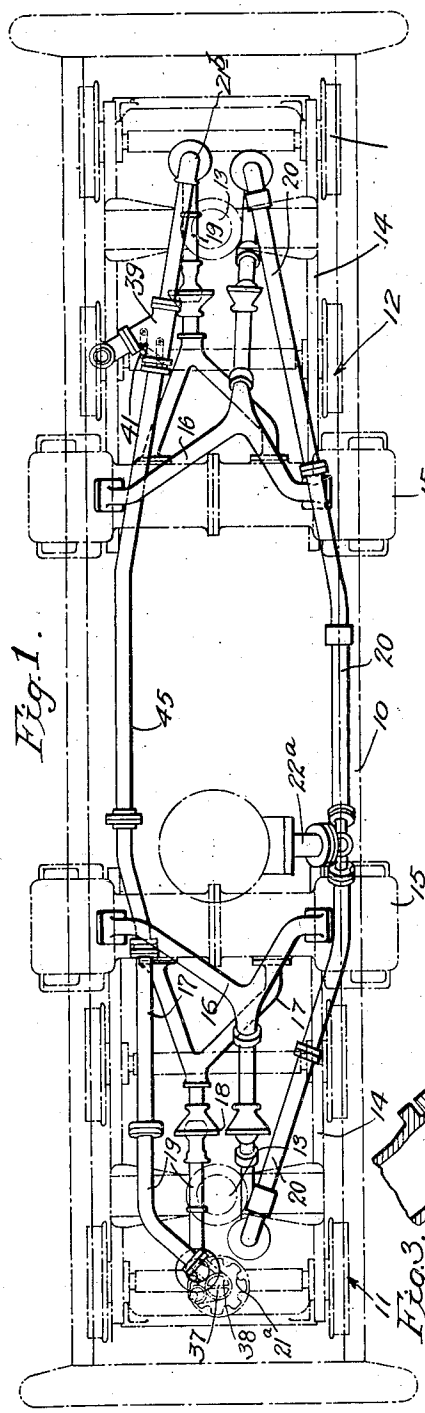

Fig. 1.

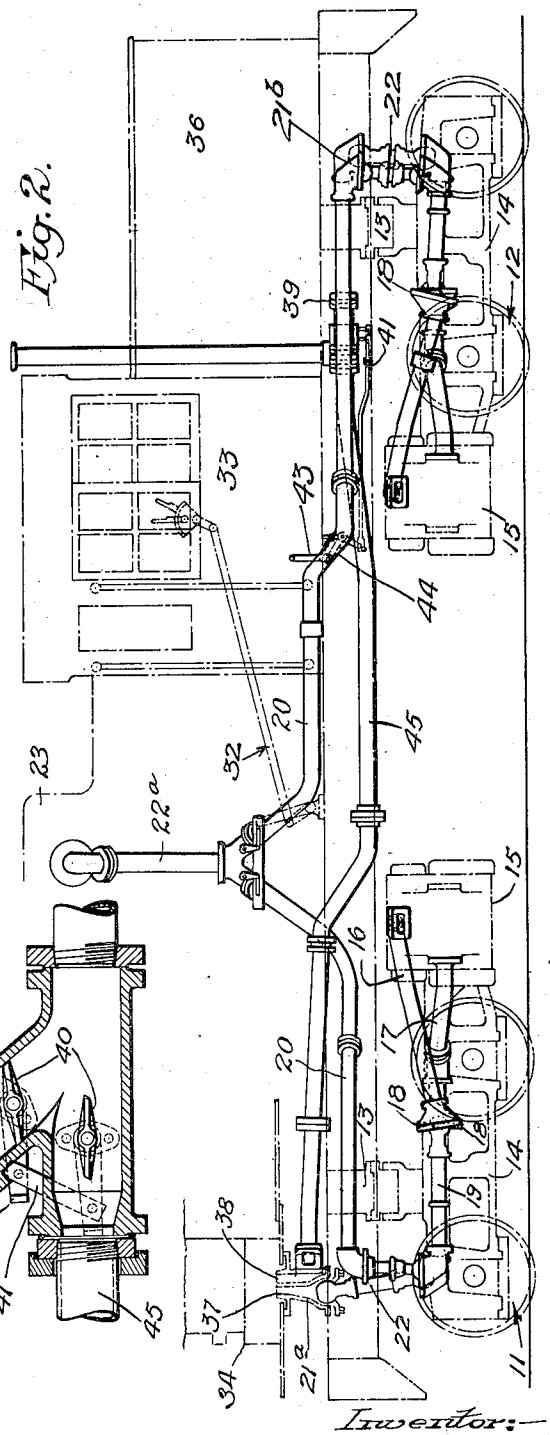

Fig. 2.

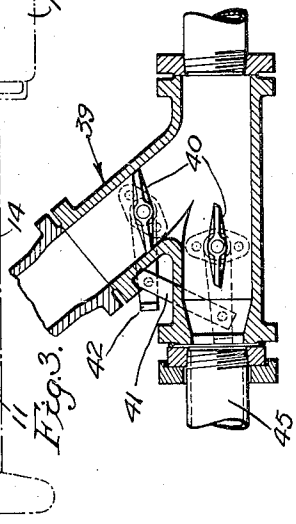

Fig. 3.

Inventor:—
Walter E. Gatchel
By his Attorneys
Howson & Howson

Patented Dec. 17, 1935 2,024,969

UNITED STATES PATENT OFFICE

2,024,969

DUPLEX LOCOMOTIVE

Walter E. Gatchel, Wilkes-Barre, Pa., assignor to Vulcan Iron Works, Wilkes-Barre, Pa., a corporation of Pennsylvania

Application December 7, 1932, Serial No. 646,188

6 Claims. (Cl. 105—41)

This invention relates to duplex locomotives, and has for an important object thereof the provision in a device of this character of an arrangement permitting the use of supporting trucks having relatively small driving wheels, thus providing greater tractive effort and rendering the locomotive suitable for use with steep grades and heavy loads.

A further object of the invention is to provide in a construction of this character an arrangement affording a long total wheel base distributing the weight on the road bed while at the same time employing a short rigid wheel base in each truck permitting the use of the apparatus on tracks having sharp curves.

A still further object of the invention is the provision in apparatus of this character of an arrangement such that the exhaust from one of the trucks may be passed through a water supply tank or through the smoke box to provide draft at the will of the engineer.

A still further object of the invention is the provision of an arrangement of this character affording a convenient method of providing steam and exhaust connections.

These and other objects I attain by the construction shown in the accompanying drawing wherein, for the purpose of illustration, I have shown a preferred embodiment of my invention and wherein:

Fig. 1 is a side elevation of a duplex locomotive constructed in accordance with my invention;

Fig. 2 is a plan view showing the steam supply and exhaust connections;

Fig. 3 is a detail sectional view through the exhaust control mechanism employed with the rear truck in the construction shown in Figs. 1 and 2.

Referring now to the drawing, the numeral 10 generally designates a locomotive main frame supported from front and rear trucks 11 and 12 through pivots 13 which, as illustrated, are preferably disposed more nearly adjacent the outer axle of each truck. Pivots 13 are preferably of such character that when the truck is otherwise disconnected the truck may be separated from the main frame 10 by vertically shifting the frame. Each truck comprises a frame structure 14 supporting a pair of driving cylinders 15, each driving cylinder 15 having driving connections, not herein shown, with the wheels at the corresponding side of the truck. The cylinders of each truck have a common steam supply manifold 16 and a common exhaust manifold 17, these manifolds preferably, as illustrated, projecting toward the pivotal connection of the truck to the frame and connecting through a universal joint 18 with a longitudinally-extending conduit 19. Longitudinally-extending conduits 19 are placed in communication with steam supply conduits 20 or exhaust outlets 21 through vertically-extending conduit sections 22 which are universally connected at their opposite ends to the conduits 19 and to the supply conduits 20 or exhaust outlets 21. Steam supply outlets 20 comprise branches of a header 22*a* leading from the steam dome 23 or any other supply point of the boiler. The exhaust manifold 17 carried by the front truck frame communicates with the smoke box 34.

The exhaust from the rear truck is optionally deliverable through a stack 35 extending upwardly through the water tank 36 or to the smoke box of the locomotive. In accomplishing this result, I provide an exhaust outlet 21*a* at the smoke box which has two passages 37 and 38 with one of which the exhaust from the front truck communicates. The rear exhaust outlet 21*b* instead of communicating directly with the stack is placed in communication therewith through one branch of a Y fitting 39. Each branch of this Y fitting has a butterfly valve 40 arranged therein, the butterfly valves 40 moving oppositely to close their respective branches so that upon simultaneous movement thereof, as through link 41 connected to arms 42 upon the stems of these valves, one branch is closed and the other branch is opened. Manipulation of the interconnected valves 40 may be achieved in any suitable manner; in the present instance I have indicated an operating element 43 disposed in the cab and connected through suitable link and lever mechanism 44 with link 41. The second branch of Y 39 is connected with the second passage 38 of exhaust outlet 21*a* through a suitable conduit 45. Thus, the exhaust form the front truck serves to continuously supply draft while that of the rear truck may be selectively employed to heat boiler water or supply draft.

Since the construction illustrated is, obviously, capable of a certain range of change and modification without in any manner departing from the spirit of my invention, I do not wish to be understood as limiting myself thereto except as hereinafter claimed.

I claim:

1. In a duplex locomotive, a frame supporting a locomotive boiler including the usual smoke box, a water tank supported from said frame and arranged at the opposite end thereof from said smoke box, a stack extending through the water

tank, a pair of trucks supporting said frame and one arranged at each end thereof, steam cylinder means for actuating the wheels of each truck carried by the truck, and exhaust connections from the cylinder means of one of said trucks to said smoke box and stack.

2. In a duplex locomotive, a frame supporting a locomotive boiler including the usual smoke box, a water tank supported from said frame and arranged at the opposite end thereof from said smoke box, a stack extending through the water tank, a pair of trucks supporting said frame and one arranged at each end thereof, steam cylinder means for actuating the wheels of each truck carried by the truck, an exhaust connection between the cylinder means of one truck and the smoke box, and means to selectively connect the exhaust of the cylinder means of the other truck with said smoke box or stack.

3. In a duplex locomotive, a frame supporting a locomotive boiler including the usual smoke box, water-heating means supported by said frame and arranged at the opposite end thereof from said smoke box, a pair of trucks supporting said frame and one arranged at each end thereof, steam cylinder means for actuating the wheels of each truck carried by the truck, and exhaust connections from the cylinder means of one of said trucks to said smoke box and water-heating means.

4. In a duplex locomotive, a frame supporting a locomotive boiler including the usual smoke box, water-heating means supported by said frame and arranged at the opposite end thereof from said smoke box, a pair of trucks supporting said frame and one arranged at each end thereof, steam cylinder means for actuating the wheels of each truck carried by the truck, an exhaust connection between the cylinder means of one truck and the smoke box, and means to selectively connect the exhaust of the cylinder means of the other truck with said smoke box or water-heating means.

5. In a duplex locomotive, a frame supporting a locomotive boiler including the usual smoke box, a water tank supported from said frame and arranged at the opposite end thereof from said smoke box, a stack extending through the water tank, a pair of trucks supporting said frame and one arranged at each end thereof, steam cylinder means for actuating the wheels of each truck carried by the truck, exhaust connections from the cylinder means of one of said trucks to said smoke box and stack, and means to selectively connect the exhaust from said cylinder means with said smoke box or stack.

6. In a duplex locomotive, a frame supporting a locomotive boiler including the usual smoke box, water-heating means supported by said frame and arranged at the opposite end thereof from said smoke box, a pair of trucks supporting said frame and one arranged at each end thereof, steam cylinder means for actuating the wheels of each truck carried by the truck, exhaust connections from the cylinder means of one of said trucks to said smoke box and water-heating means, and means to selectively connect the exhaust from said cylinder means with said smoke box or stack.

WALTER E. GATCHEL.