Dec. 24, 1946. C. K. STEINS 2,413,119

LOCOMOTIVE

Filed Oct. 9, 1944

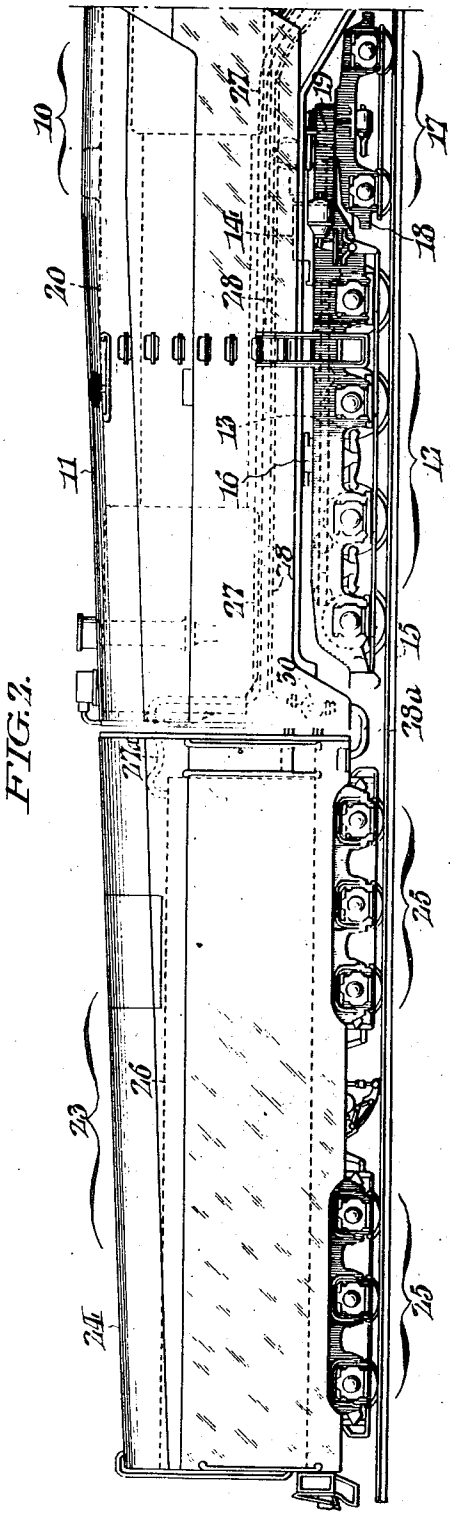


FIG. 2.

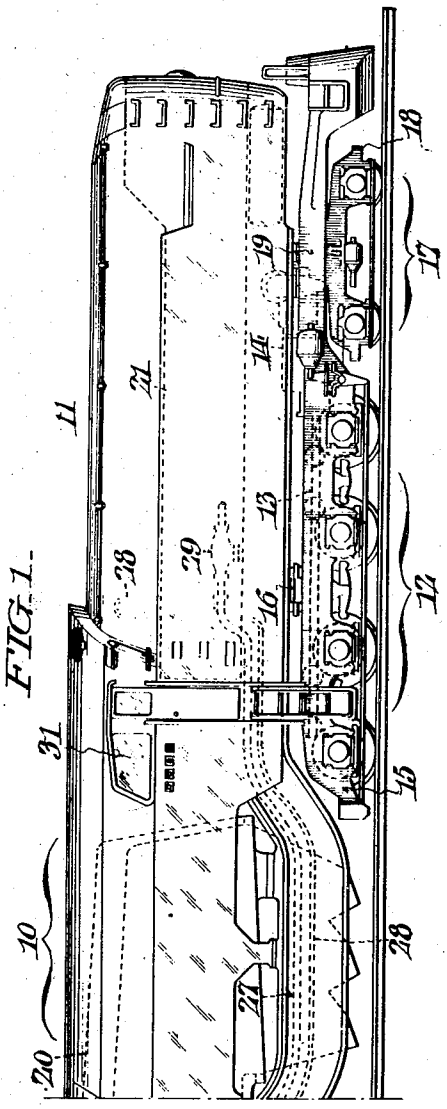


FIG. 1.

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LOCOMOTIVE

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4 Claims. (Cl. 105—73)

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This invention relates to locomotives. More specifically it has reference to steam locomotives of the type described in U. S. Patent No. 2,338,212, granted to me on January 4, 1944, characterized by having a main section with a boiler in its rear end, fuel and water storage spaces in its front end, and independently-swivelled multi-wheel trucks respectively beneath the boiler and beneath the front end; and a water-carrying trailer section or tender coupled to said main section.

In connection with locomotives of the kind particularly referred to, I aim to provide the transfer of water from the tender to the storage space in the front end of the main section to compensate for the decrease in weight as the fuel is used up, or from said front end storage space to the tender when the fuel supply is replenished, so that the load may be evenly appropriated between the two separately powered trucks and the tractive effect of the drivers of said trucks kept uniform.

One way in which the foregoing and other objects and advantages may be readily realized in practice will appear from the following detailed description of the attached drawing, wherein Figs. 1 and 2, taken together show the complete elevation of one side of a steam locomotive conveniently embodying the present improvement.

With more specific reference to the drawing, it will be seen that the illustrated locomotive has a main section 10 whereof the body 11 is supported at the front and rear ends by two counterpart similarly-arranged eight-wheeled driver trucks 12. Each of these trucks is powered through a line shaft and gear mechanism shown in dotted lines and generally indicated by the numeral 13, by a steam turbine 14 supported on the frame 15 of the truck, said frame having a swivel connection at 16 with the body 11. Associated with each powered truck 12 is a smaller four-wheeled pilot truck 17 whereof frame 18 is swivelly connected in turn at 19 to the forward end of the frame 15 of said driver truck. With this arrangement it is possible for the main section 10 of the locomotive to traverse track curves of standard radii notwithstanding the great length of its body 11. Longitudinally arranged in the body of the main section 10 of the locomotive is a boiler 20 which is fired from its front end. Forward of the boiler in the body 11 is a compartment for coal or oil, and a tank 21 for storage of water. Coupled to the main section 11 of the locomotive is a trailer section or tender 23, the body 24 of which is supported by two independently swivelled six-wheeled trucks 25. Within the body of the tender is a tank 26 for boiler feed water. Space may also be set apart in the tender 23 for fuel storage, if desired.

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In order to make possible transfer of water from the front end of the main section 11 of the locomotive to the tender 23, or vice versa, I have, in accordance with my invention, provided a conduit system comprising two separate pipe lines 27 and 28. As shown, these pipe lines 27 and 28 extend along the main section 11 of the locomotive between the tank 22 in said main section and the tank 24 in the tender 22, the terminals at 27a and 28a being flexible. Interposed in the pipe line 27 is a displacing means in the form of an ejector 29 (Fig. 1) which may be steam operated, and which when actuated, serves to transfer water from the forward tank 21 to the rear tank 26. Similarly disposed in the pipe 28 is a displacing pump 30 (Fig. 2) for transferring water from the tender tank 26 to the tank 21 at the front of a locomotive. Thus ballast water may be transferred from the tender to the front end of the main section 11 of the locomotive or conversely to compensate for changes in the fuel supply as it is used up or as it is replenished, so that the load weight is equally distributed between the two powered trucks 12 of the main section 10 and the tractive effect of the several drivers of these trucks maintained uniform to the advantage of precluding slippage, particularly at starting of the locomotive. Ordinarily I provide manual means (not shown) in the medially-located crew cab 31 of the locomotive for controlling the operation of the ejector 27 and the pump 30. However, if desired, suitable means may be substituted for automatically controlling transfer of the water as required for maintenance of equal weight distribution on the two two powered trucks 12.

While, by the way of exemplification, I have shown and specifically described my invention as incorporated in a locomotive having separate trailer or tender, it is to be understood that, within the scope of the appended claims, it may be as readily adapted to other types of locomotives, for example, single section locomotives in which the boiler is arranged between fore and aft storage spaces respectively for fuel and for water, and in which the body is supported at opposite ends by separately powered and independently swivelled trucks in generally the same manner as herein shown. It will also be apparent that my invention may be utilized to advantage in still other types of locomotives for maintenance of equal weight distribution on the drivers.

Having thus described my invention, I claim:

1. A locomotive having a rigid frame supported by two individually-powered trucks, a boiler mounted on the frame over one of the trucks and constituting a definite unvarying load thereon, and compartments for carrying fuel and ballast water mounted on the frame over the other truck; in combination with a coupled tender provided with a water storage reservoir, and means whereby water can be transferred from the tender tank to the locomotive tank and vice versa to compensate for weight loss or increase due to fuel consumption or replenishment in order that a definite constant load may be maintained on said other truck.

2. A locomotive having a rigid frame supported by two individually-powered trucks, a boiler mounted on the frame over one of the trucks and constituting a definite unvarying load thereon, and compartments for carrying fuel and ballast water mounted on the frame over the other truck; in combination with a coupled tender provided with a water storage reservoir; piping connecting the water compartment on the locomotive with the water storage reservoir in the tender, and means constructed and arranged to effect the transfer water from the tender to the locomotive and vice versa by way of the piping to compensate for weight decrease or increase due to fuel consumption or replenishment, thereby to maintain a definite constant load on said other truck.

3. The invention defined in claim 2, wherein the boiler is mounted on the rear end of the locomotive frame and the fuel and water compartment on the front end; and wherein the tender trails the locomotive.

4. The invention defined in claim 2, wherein the piping includes two conduits; and wherein the transfer means includes a displacing device for transferring water from the locomotive to the tender through one of the conduits, and a displacing device for transferring water from the tender to the locomotive through the other conduit.

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