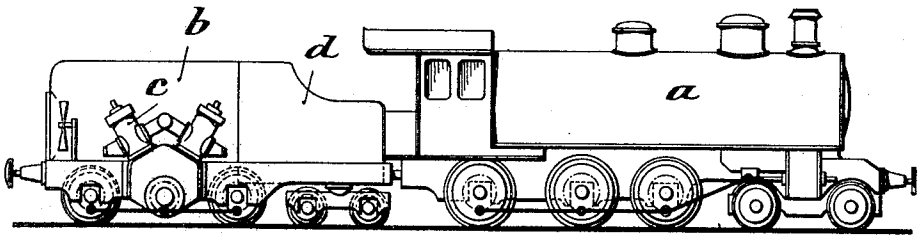
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J. BUCHLI

COMBINED STEAM AND INTERNAL COMBUSTION LOCOMOTIVE

Filed Sept. 25, 1923



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COMBINED STEAM AND INTERNAL-COMBUSTION LOCOMOTIVE.

Application filed September 25, 1923. Serial No. 664,687.

To all whom it may concern:

Be it known that I, JACOB BUCHLI, a citizen of the Swiss Republic, residing at Baden, Felsenstrasse 2, Switzerland, have invented certain new and useful Improvements in or Relating to Combined Steam and Internal-Combustion Locomotives, of which the following is a specification..

This invention relates to combined steam and internal combustion locomotives and has for its object to provide such a combined power unit which does not suffer from the disadvantages of those previously proposed.

Various suggestions have been made to construct on a single frame or chassis a combined steam and internal combustion engine locomotive but in practice certain constructional difficulties arise as the ideal conditions in each form of power unit are somewhat contradictory and interfere with one another. For example in the case of an internal combustion engine the number of revolutions with relation to the power output is higher than in the case of a steam engine, while further the design of the crank shafts also presents difficulties.

According to this invention the benefits of both forms of propulsion are obtained without any of the disadvantages which usually result from combining the two systems by constructing the locomotive in two or more separate parts or power groups which are coupled together, one or more vehicles constituting each group and one group being driven by steam and the other by internal combustion engines.

One construction according to this invention is illustrated somewhat diagrammatically in the accompanying drawings, in which the combined steam and internal combustion engine locomotive is constituted by an ordinary steam locomotive *a* and an internal combustion engine locomotive *b* coupled together. The steam locomotive is of standard construction and the internal combustion engine is so designed that in addition to the actual engine *c* it also carries reservoirs for water and fuel *d* to serve the requirements of both locomotives.

This combination of a steam engine and an internal combustion engine each mounted upon a separate vehicle or chassis possesses great constructional and economical advantages. The complete independence of the two systems makes it possible to increase the power of the standard steam locomotive merely by coupling it to an internal combustion locomotive and thus to increase its utility to a considerable extent. If either of the locomotives breaks down, the remaining portions, for example the steam locomotive, can readily be coupled to another internal combustion locomotive. Any trouble which arises in the internal combustion engine while the vehicle is actually running can be remedied by disconnecting the coupling rods and continuing the run on steam only. The driver and the stoker who are accommodated in the usual cab of the steam locomotive are protected from the injurious effects of vibrations which are inseparable from the internal combustion engine.

By suitably selecting the diameter of the driving wheels on both steam and internal combustion engine vehicles it is possible to run the internal combustion engine at the ideal number of revolutions quite independently of the number of revolutions at which the steam engine is working. Further the internal combustion engine built in standard form can be tested as a whole in the shop before being mounted upon the locomotive chassis or frame or after being removed therefrom. As this engine is mounted on a vehicle which is quite distinct from that which carries the steam engine it is protected from the adverse effects of dirt and water and the waste heat can be made use of by being employed to heat the feed water in the tank which is adjacent to it.

By having the steam and internal combustion engines each mounted upon their own frame or chassis the combined steam and internal combustion engine according to this invention in no way limits the space available for the boiler which unlike other combined locomotives can therefore be of standard construction. Further all the parts are readily accessible and the adhesion of the combined locomotive is much superior to that of ordinary locomotives.

I claim:

1. In a combined steam and internal combustion engine locomotive, the combination of at least two power units or groups coupled together for operating independently of each other, each group being formed by at least one vehicle, and one group being propelled by steam and the other by internal combustion engines, one of said power units

carrying the fuel and water for both groups.

2. In a combined steam and internal combustion engine locomotive the combination of at least two power units or groups coupled together but operating independent of each other, each group being formed by at least one vehicle, and one group being propelled by steam and the other by internal combustion engines, the latter carrying the fuel and water for both groups.

In testimony whereof I have affixed my signature in presence of two witnesses.

JACOB BUCHLI.

Witnesses:

A. F. CALCOEN,

AUGUST RUIGG.