E. D. McCRACKEN.

Locomotive and Dummy Engine.

No. 213,224. **Patented Mar. 11. 1879.**

Fig. 2.

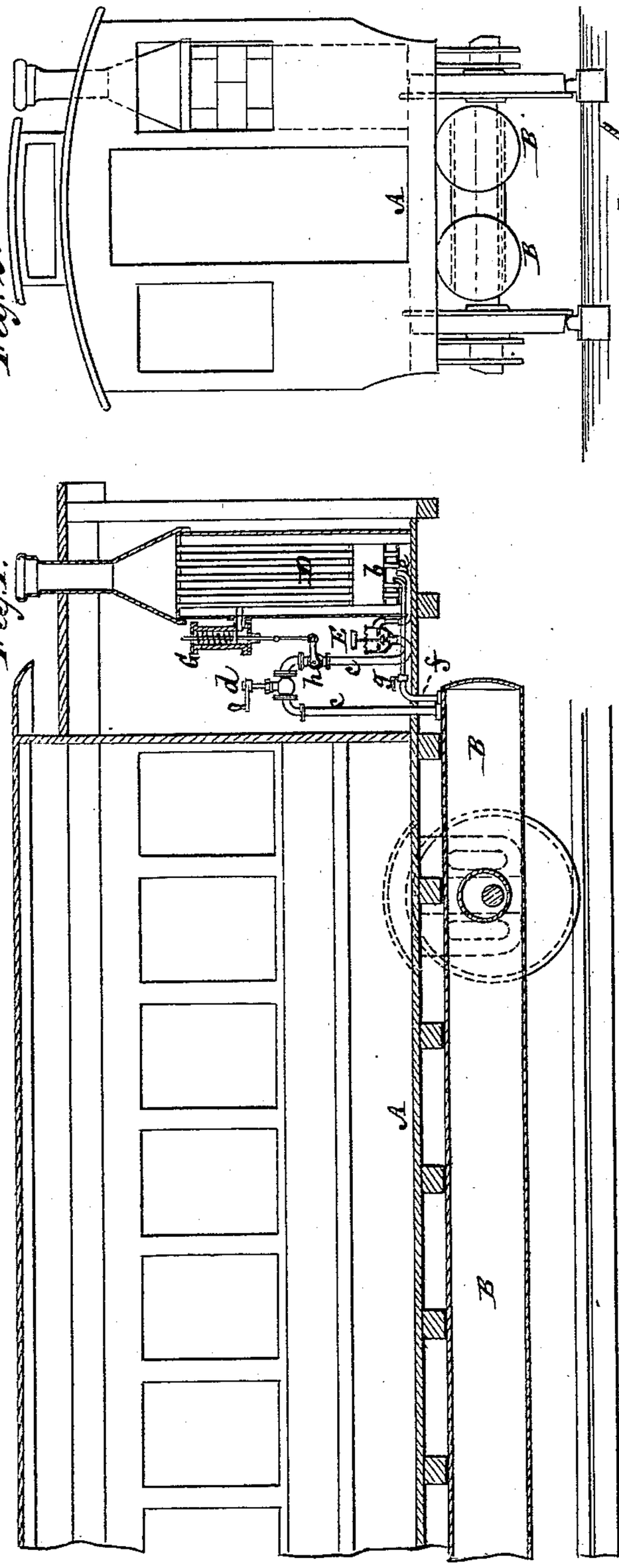

Fig. 1.

Fig. 3.

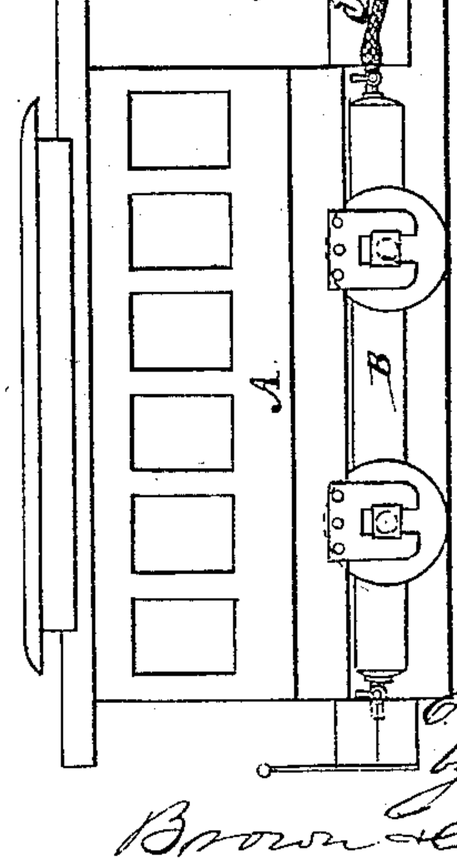

Fig. 4.

Witnesses

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UNITED STATES PATENT OFFICE.

EDWIN D. McCRACKEN, OF CHICAGO, ILLINOIS, ASSIGNOR TO EDWARD P. RICE, OF SAME PLACE, AS TRUSTEE FOR SAID McCRACKEN.

IMPROVEMENT IN LOCOMOTIVE AND DUMMY ENGINES.

Specification forming part of Letters Patent No. **213,224**, dated March 11, 1879; application filed August 21, 1878.

To all whom it may concern:

Be it known that I, EDWIN D. McCRACKEN, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful improvements in means of employing gaseous fluids for generating steam for locomotive-engines and on railroad-cars, of which the following is a description, reference being had to the accompanying drawings, forming part of this specification.

This invention is more especially designed to be applied to dummy-engines and cars on street-railroads; but it is also applicable to elevated and other railroads, and may be used either for the purpose of generating steam to work the propelling-engine or for heating the car or cars in cold weather, or for both purposes.

The invention consists in a combination of one or more gas-reservoirs under the body or bodies of a car or train of cars with the furnace of a steam-boiler on said car or one of the cars of the train, for propelling or heating the car or cars; likewise, in a combination, with a series of cars in a train, of a series of gas-reservoirs under the bodies of said cars, flexible tubes and couplings connecting the reservoirs of one car with another, and a steam-boiler on the locomotive or locomotive-car, having its furnace heated by the gas from said reservoirs.

The invention also consists in a safety device having steam-communication with the boiler, in combination with a stop-valve connected with the reservoir, for supplying gaseous fluid to heat the boiler, whereby, upon there being an excessive pressure of steam, the supply of gas is shut off.

Furthermore, the invention consists in a combination, with a railway-car and a steam-boiler heated by gas for propelling or warming the car, of a gas-regulating valve constructed to operate as a safety-valve in case of the car being overturned, by shutting off the supply of gas to the furnace of the boiler of the car or locomotive.

In the accompanying drawings, Figure 1 represents a longitudinal vertical section of a railroad-car with my invention applied; Fig. 2, a front view of the same; Fig. 3, a side view, upon a smaller scale, of a series of cars, showing the arrangement of a connected series of gas-reservoirs relatively with the cars; and Figs. 4 and 5 are sectional elevations, upon a larger scale, of certain automatic devices for shutting off the supply of gas in case of an excessive pressure and in case of the overturning of the car.

A indicates one, two, or more railroad-cars, or it might be a locomotive-engine, to which the cars are hitched. Beneath the bottoms of said cars, locomotive-engine, or car, or either or all of them, are arranged gas-reservoirs B, preferably in pairs, on opposite sides of the longitudinal center of the car or engine, or both, with the axles of the running-gear passing through them. These reservoirs, which are extended the whole length of the car or engine, and by their center of gravity being kept low, conduce to the steadiness of the car, are suitably connected to work in concert, and, in case of being arranged under a series of cars or vehicles in a train, are coupled together by a hose or flexible pipe and coupling, C, between the several vehicles, as shown in Fig. 3, thus providing an extended reservoir supply of gas.

In some cases, however, a single gas-reservoir arranged beneath the floor of the locomotive-engine or car, or its attached car or cars, might be used.

Such reservoir or reservoirs it is designed to charge with gas of any suitable description for heating purposes—as, for instance, with a mixture of carbonic oxide and hydrogen or light carbureted hydrogen. Combined with said reservoir or reservoirs is a steam-boiler furnace and boiler, D, which is heated by the gas from the reservoirs through means of a double-plate Bunsen burner, *b*, bed of asbestus, or any other suitable burner in the furnace, the connection between said burner and the reservoir in direct communication with it being made by a pipe, *c*, fitted with a hand stop-cock, *d*, and connected with a gas-regulator, E, from which the gas is conveyed at an approximately uniform pressure by a branch pipe, *e*, to the burner. Another pipe, *f*, fitted with a stop-cock, *g*, serves to convey gas from the reservoir to an auxiliary or jet burner, for the purpose of keeping up a small flame by which to ignite the main

burner *b* at any time after it has been temporarily extinguished.

The boiler D may either be used for working the engine to propel the car, or for heating the car or cars by steam, and may either be arranged on the locomotive-car itself, or on any other car in the train; and when arranged on the locomotive-car, the gas to the furnace-burner may be drawn from a reservoir under any of the other cars, and the locomotive or locomotive-car either be provided or not with gas-reservoirs.

The pipe *c*, by which the gas is supplied to the main burner, is fitted with a stop-cock, *h*, which is connected with and controlled by a safety device, G, attached to the steam-boiler D. This safety device may consist of a simple piston arranged within a close cylinder, and exposed on its one side to the pressure of steam from the boiler against a spring-power or load on its other side, whereby, should the pressure of steam in the boiler become excessive, said safety device will more or less, or wholly, close the cock *h*, and so shut off the supply of gas to the furnace.

Furthermore, the gas-regulator E, which, like other gas-regulators, has its regulating-valve *k* attached to a controlling pressure-disk, *l*, is constructed to perform another important function besides that of regulating the pressure of the gas to the burner. Thus its valve *k* is a loaded one, having a spring, *m*, applied to close it, and a weighted cup or receptacle, *n*, connected with it on the reverse side to the spring, and operating in a reverse direction to the latter, to restrain the spring from closing the valve. Said cup is loaded with shot, or other loose or detachable weight or weights, so that should the locomotive or car be overturned said weight or weights will become detached or scattered, and the valve *k* be closed by the spring *m* to shut off the supply of gas to the furnace. Accordingly the valve *k* becomes a safety-valve, that shuts off the gas in case of accident without interfering with its operation as a valve for regulating the pressure of the gas to the furnace when the engine or car is running.

The boiler D is here shown as a vertical tubular one; but it may be of any suitable construction.

I claim—

1. The combination of one or more gas-reservoirs under the body or bodies of a car or train of cars, with the furnace of a steam-boiler on said car or one of the cars of the train, and a pipe leading from the reservoir to a burner within the furnace of the steam-boiler, substantially as described.

2. The combination, with a series of cars in a train, of a series of gas-reservoirs under the bodies of said cars flexible coupling devices connecting the reservoirs of one car with the other, and a steam-boiler on the locomotive or locomotive-car, having its furnace heated by the gas drawn from said reservoirs, essentially as described.

3. The combination of one or more gas-reservoirs under the body or bodies of a car or train of cars, a steam-boiler on said car or one of the cars of the train, a gas-regulator, E, having pipes connecting with the gas-reservoir, and with a burner in the furnace of the boiler, a safety device, G, attached to the boiler and having a steam-connection therewith, and a stop-valve in the pipe connecting the regulator and gas-reservoir, said valve being connected to the safety device, all substantially as and for the purpose described.

4. The combination, with a railway-car and a steam-boiler heated by gas for propelling or warming the car, of a gas-regulating valve, having a spring applied to close it, and having a counteracting pressure applied to it by means of one or more automatically-detachable weights, whereby, in case of the car being overturned, said valve will be automatically closed to shut off the supply of gas, essentially as specified.

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Witnesses:
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