No. 614,041. Patented Nov. 8, 1898.

S. M. VAUCLAIN.

COMPRESSED AIR LOCOMOTIVE.

(Application filed Dec. 29, 1897.)

(No Model.) 2 Sheets—Sheet 1.

FIG. 1.

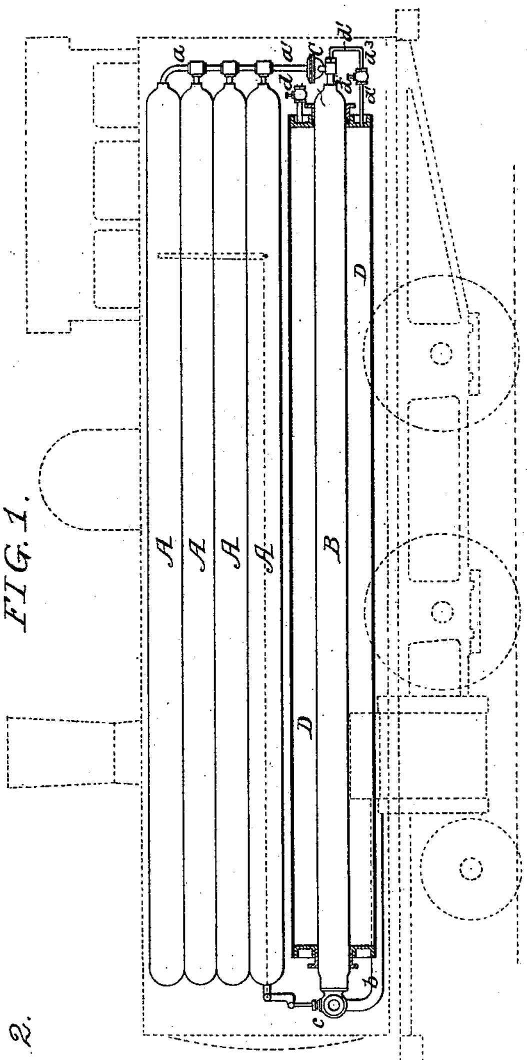
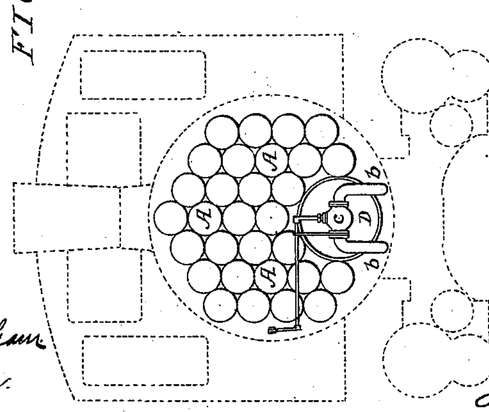


FIG. 2.



Witnesses:
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(No Model.) 2 Sheets—Sheet 2.

Fig. 3.

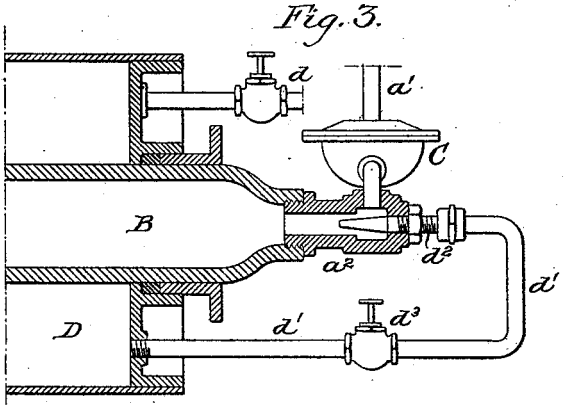
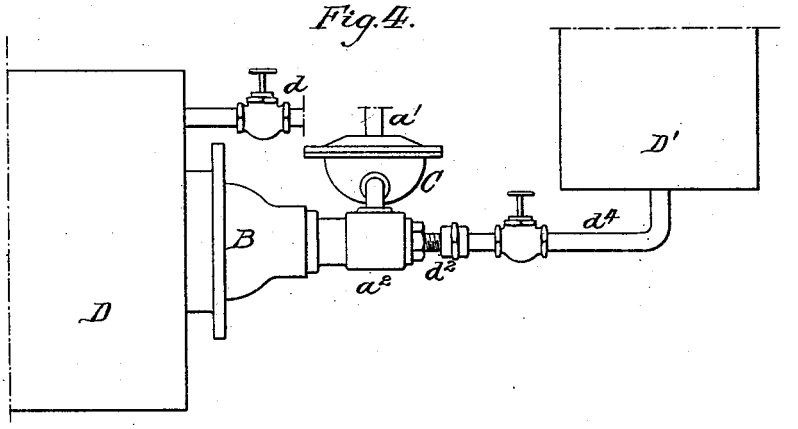


Fig. 4.



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UNITED STATES PATENT OFFICE.

SAMUEL M. VAUCLAIN, OF PHILADELPHIA, PENNSYLVANIA.

COMPRESSED-AIR LOCOMOTIVE.

SPECIFICATION forming part of Letters Patent No. 614,041, dated November 8, 1898.

Application filed December 29, 1897. Serial No. 664,303. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL M. VAUCLAIN, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Compressed-Air Locomotives, of which the following is a specification.

My invention relates to certain improvements in compressed-air locomotives; and the main object of my invention is to so construct a locomotive of this type that in the event of the reducing-valve becoming unmanageable an explosion will not occur.

A further object of the invention is to inclose the auxiliary reservoir within a hot-water cylinder or drum which communicates with the auxiliary reservoir, and a still further object is to lubricate the cylinders by the admission of a given amount of hot water to the auxiliary reservoir.

In the accompanying drawings, Figure 1 is a longitudinal view of a locomotive, the air-reservoirs and connections being shown in full lines, while the outline of the locomotive is shown in dotted lines. Fig. 2 is an end view showing the reservoirs and their connections in full lines and the frame in dotted lines. Fig. 3 is an enlarged view of one end of the auxiliary reservoir. Fig. 4 is a view of a modification.

My invention can be applied to any of the well-known types of compressed-air locomotives, and I have deemed it best, in order not to confuse the drawings, to simply show the locomotive by dotted lines.

A are elongated tubes arranged side by side, as shown, in which the air under pressure is stored. The tubes are made extra heavy, so as to withstand a much greater pressure than the actual pressure of the air. These tubes are connected together by pipes *a* at one end and to an auxiliary reservoir B by a pipe *a'*. Between the auxiliary reservoir and the storage-reservoirs is a reducing-valve C, of any of the well-known types, by which the pressure is reduced before the air is admitted to the auxiliary reservoir. This auxiliary reservoir is connected at the opposite end to a supply pipe or pipes *b*, leading to the air-cylinders of the locomotive. A controlling-valve *c* is situated at the junction of the pipe *b* with the reservoir B, and this valve is operated from a lever in the cab of the locomotive through suitable connecting mechanism.

Surrounding the auxiliary reservoir B is a hot-water drum D. This hot-water drum is charged in any suitable manner through the pipe *d*, which is provided with a suitable valve. Extending from the drum D is a pipe *d'*, which is connected to a nozzle d^2, which extends into the pipe a^2, leading from the reducing-valve to the auxiliary reservoir. The pipe *d'* is provided with a valve d^3 for regulating the amount of hot water or steam sprayed into the reservoir B.

The drum D can be charged at the terminal station through the pipe *d* with hot water at a temperature above the boiling-point, and during the trip the hot water can be admitted to the interior of the auxiliary reservoir through the pipe *d'* and nozzle d^2 in the form of a fine jet of steam or hot water, where it is absorbed by the compressed air. Thus the temperature of the air is not only increased by the surrounding body of hot water in the drum D, but also by the injection of a given amount of steam or hot water in the form of a spray, so that when the air is admitted to the cylinders it is much higher in temperature and more moist than if allowed to escape without preheating. Furthermore, the cylinders are lubricated to a certain extent by the moisture introduced.

By the above-described arrangement, in the event of the reducing valve becoming disarranged and allowing the air under full pressure to enter the reservoir, the reservoir is of sufficient strength to withstand the pressure, and as the air cannot enter the hot-water drum, which is made of much lighter material, it is almost impossible to explode an engine built on this plan.

In Fig. 4 I have shown a modification in which the nozzle d^2 is connected to a separate hot-water reservoir D' by a valved pipe d^4. In this case the hot water in the reservoir D is not disturbed.

I claim as my invention—

1. The combination in a compressed-air lo-

comotive, of a storage-reservoir, an auxiliary reservoir connected thereto, a reducing-valve in the said connection and a hot-water drum inclosing the said auxiliary reservoir, substantially as described.

2. The combination in a compressed-air locomotive, of a storage-reservoir, an auxiliary reservoir connected thereto, a reducing-valve in the said connection and a hot-water drum inclosing the said auxiliary reservoir and communicating therewith, substantially as described.

3. The combination in a compressed-air locomotive, of a series of storage-reservoirs, an auxiliary reservoir connected thereto, a reducing-valve in said connection, a hot-water drum surrounding the said auxiliary reservoir, a pipe leading from the drum to the inlet-pipe of the auxiliary reservoir and terminating there in the form of a spray-nozzle, substantially as described.

4. The combination of a storage-reservoir, an auxiliary reservoir connected thereto, a reducing-valve in the said connection, a hot-water drum surrounding the auxiliary reservoir, a supply-pipe therefor, a pipe leading from the hot-water drum to a spray-nozzle in one end of the auxiliary reservoir, a pipe connected to the other end of the auxiliary reservoir, and a controlling-valve in said pipe, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

SAMUEL M. VAUCLAIN.

Witnesses:

JAMES G. KEYS,

JAS. H. M. HAYES.