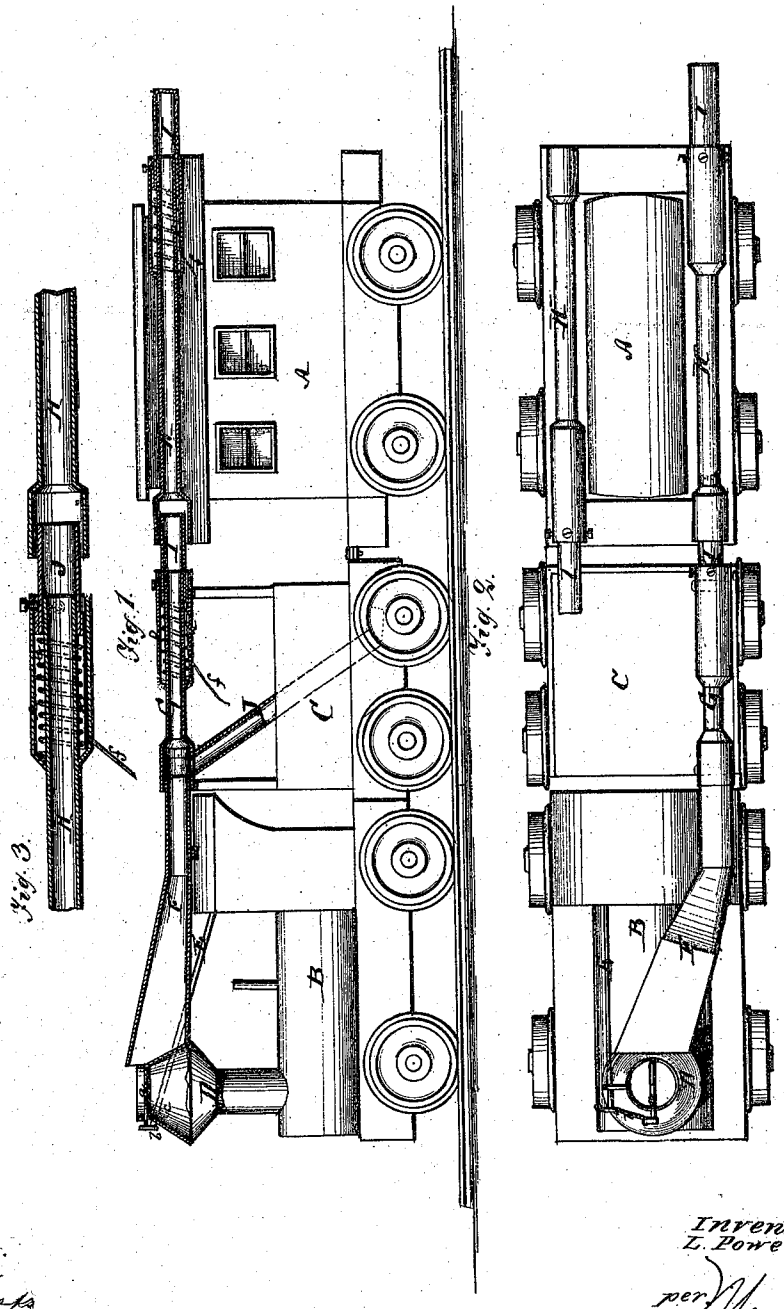
L. Powell,

Spark Arrester.

No. 97,807. Patented Dec. 14. 1869.



Witnesses.
Geo. W. Mabie
Dan'l Brooks

Inventor.
L. Powell.
per
Attorneys.

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

United States Patent Office.

LEMUEL POWELL, OF MILFORD, CONNECTICUT.

Letters Patent No. 97,807, *dated December* 14, 1869.

IMPROVED SMOKE AND SPARK-CONVEYER FOR RAILROAD-TRAINS.

The Schedule referred to in these Letters Patent and making part of the same

To all whom it may concern:

Be it known that I, LEMUEL POWELL, of Milford, in the county of New Haven, and State of Connecticut, have invented a new and improved Railroad Smoke-Conveyer; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 represents a vertical longitudinal section of my improved smoke-conveyer.

Figure 2 is a plan or top view of the same.

Figure 3 is a detail longitudinal section, on an enlarged scale of the same.

Similar letters of reference indicate corresponding parts.

The object of this invention is to prevent the smoke and ashes issuing from the smoke-stack of a locomotive from entering the cars of the train, and thereby preventing the proper ventilation of the cars.

The passengers on railroad trains are, by the smoke and cinders, frequently prevented from opening the windows of the cars, in order to obtain fresh air. To prevent this inconvenience, it has been frequently proposed to conduct the air and cinders back over the train in pipes, fitted upon the cars. Such process has, however, been found inconvenient for various reasons, chiefly, however, because the draught of the locomotive was thereby reduced; also, because the height of the cars was increased, preventing them from passing under bridges, &c., to which they were previously adapted.

My invention is intended to overcome all these difficulties, by providing for a perfect draught, and by removing the conducting-pipes from the highest parts of the cars.

A, in the drawing, represents a railroad-car.

B is the locomotive-engine.

C, the tender of a train.

The smoke-stack D of the engine is provided with a damper, *a*, by means of which its upper aperture can be entirely closed.

The said damper is, by means of a rod, *b*, connected with the crank *c* of a shaft, E, which is operated by the engineer. The latter can thereby open and close the damper at will.

From the smoke-stack projects backward a pipe, F, which is coupled together with a pipe, G, that is supported on one side of the tender.

The pipe on the tender is connected with a pipe, H, on the roof of the car behind it.

Every car is provided with two pipes H H, one on each side.

The pipes, being on the sides, do not reach above, at least not much above the higher middle part of the car-roof, and do not, therefore, prevent the cars from passing under arches, to which they were previously adapted.

The reason for arranging two pipes on each car is to enable the cars to be reversed, and still to be connected with the pipes G and F.

The ends of each pipe G and H are enlarged, and an elastic pipe, I, is secured in the rear end of each pipe G H, so that such pipes I serve to connect the others.

Each pipe I is smaller than the enlarged front end of the pipe H, into which it is fitted loosely, so that air may freely enter the outer annular part of such pipe H.

When the train is in motion, the damper *a* being closed, the smoke and products of combustion pass all into the pipe F, and thence into G and H, and are thus conducted over the train.

The air not only freely enters the front ends of the pipes G H, but also that of the pipe F, which, for this purpose, is left partly open, as shown in fig. 1.

The smoke, as it passes through the aforesaid various pipes, is, by the air, which enters the open front ends of the pipes, rapidly propelled through the same. The draught is thereby made perfect.

When the train is not in motion, the damper *a* is opened, to let the smoke escape in the ordinary manner.

Owing to the rapidity of motion with which trains pass through the air, the latter is caused to enter the pipes F G H with considerable force, so as to push the smoke out, and thereby to produce a draught of greater power than that obtained in the open smoke-stack.

An inclined pipe, J, projects downward from the pipe G, either to the ground or into a water or other reservoir provided on or under the tender.

All cinders that may enter the pipes F G will, in the pipe J, be conducted to the ground, and will thereby be prevented from accumulating in the other passages H.

The pipes I are forced backward, by springs *e*, into the pipes H of the hind cars, and can, by suitable strings or chains *f*, be drawn forward when the passage is to be disconnected.

The elasticity of these pipes allows them to yield to up and down as well as lateral motions of the cars, without interrupting the connection.

That row of pipes H, which is not connected with the smoke-stack, has the pipes I at the front ends, as in fig. 2, so that the same will be in rear when the cars are reversed.

The connection between the pipes F G may be direct, as shown, without an elastic pipe, I.

Having thus described my invention,

What I claim as new, and desire to secure by Letters Patent, is—

1. The pipes F G H I and smoke-stack D, all constructed and arranged in reference to each other, as described.

2. The arrangement of pipes H I, upon each side of a passage-car, but in a reversed direction, to connect with a single pipe arranged on one side of the tender, as set forth.

3. The combination of a stack-pipe, closed at top, and an angular draught-pipe, F, with a series of conducting-pipes, arranged, as described, in a horizontal line below the top of the highest car, but above the window thereof, for the purpose set forth.

4. In combination with pipes to transfer and discharge the smoke behind the moving train of cars, as set forth, an inclined pipe, J, located on the tender, to receive the cinders, and convey them to the ground, or some receptacle, in the manner described.

LEMUEL POWELL.

Witnesses:

A. N. CLARKE,

JOHN H. JACOBS.