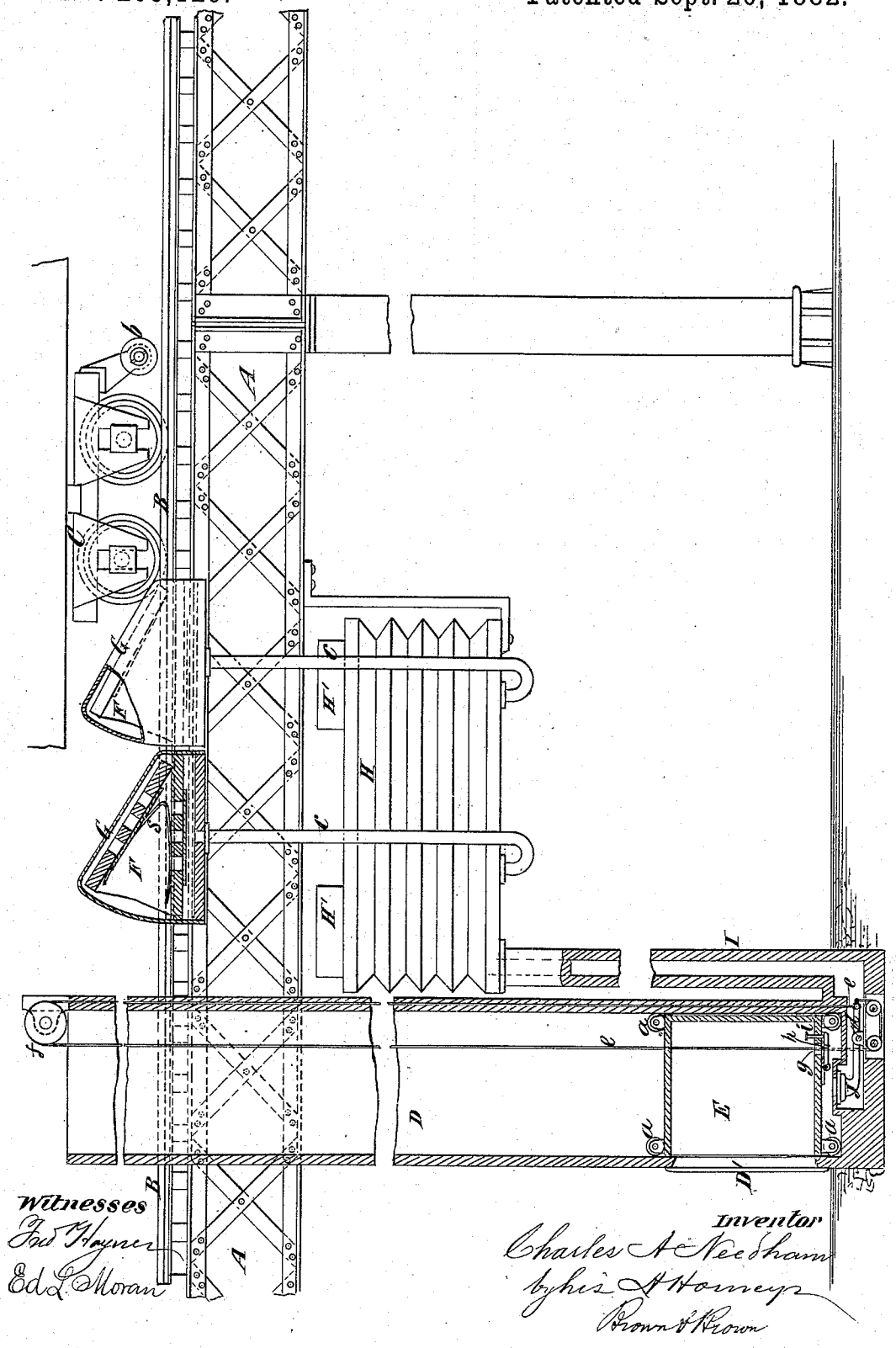
(No Model.)

C. A. NEEDHAM.

PNEUMATIC ELEVATOR FOR RAILWAYS.

No. 265,129. Patented Sept. 26, 1882.



N. PETERS. Photo-Lithographer. Washington, D. C.

UNITED STATES PATENT OFFICE.

CHARLES A. NEEDHAM, OF NEW YORK, N. Y., ASSIGNOR TO HIMSELF AND E. P. NEEDHAM, OF SAME PLACE.

PNEUMATIC ELEVATOR FOR RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 265,129, dated September 26, 1882.

Application filed July 24, 1882. (No model.)

To all whom it may concern:

Be it known that I, CHARLES A. NEEDHAM, of the city of New York, in the county and State of New York, have invented a certain new and useful Improvement in Pneumatic Elevators for Railways, of which the following is a specification.

My invention is more especially intended for use in connection with elevated railways for the convenience of passengers in reaching the elevated stations; but it is also applicable to any situations in connection with railways where it is desired to elevate passengers or other loads.

The invention consists in the combination, with an air shaft or tube, an elevator-car fitting therein, and a railway-track, of a pump or pumps adapted to be operated by passing trains to compress air, a pipe or conduit for conducting the air so compressed to the air tube or shaft below the car, and valves for controlling the admission of air to said tube or shaft and the exit of air therefrom.

The invention also consists in the combination with the above, of a pressure regulator or accumulator placed between the pump or pumps and the air tube or shaft, and in which a surplus quantity of compressed air is contained for operating the elevator-car. The valve for controlling the egress of air from the air tube or shaft is preferably arranged on the floor of the car, and by opening it air may be allowed to escape through the car.

The accompanying drawing represents a sectional elevation of a part of an elevated-railway structure, an elevator, and appurtenances embodying my invention.

A designates a portion of an elevated-railway structure, and B designates the track along which cars are to travel, as indicated by the truck C.

D designates an air-tube or elevator-shaft extending upward to and above the track B, and provided at the bottom with a door, D′; and E designates an elevator-car adapted to move upward and downward in said tube or shaft. The car may be provided with friction-rollers *a* to cause it to travel easily and freely in the tube or shaft D, and it is so constructed as to form an air-tight or nearly air-tight fit between itself and said tube or shaft. Hence when compressed air is admitted under the car its pressure will force the car upward in the tube or shaft.

F F designate two pumps, arranged adjacent to the track B. These pumps are here shown as of the bellows form; but pumps of other construction may be used, and one or more may be used, as may be necessary. These bellows-pumps are arranged in such relation to the track B that the cars in passing will operate upon their movable boards to compress air, and they may be provided with springs *s*, whereby they may be expanded after they have been so collapsed by the passage of the cars. The trucks C of the cars may be each provided with a roller, *b*, adapted to operate on the movable boards of the bellows-pumps, and the latter may be provided with covers or hoods G for protecting them from the weather. These covers or hoods must, however, be constructed so as to permit the rollers *b* to operate on the pumps as the cars pass along. The air compressed by the two pumps F may be conducted through pipes C′, to an accumulator or pressure-equalizer, H, which is constructed so that it may be expanded by air-pressure, and has weights H′ applied to it for maintaining the air under pressure.

I designates a conduit or air-pipe for conducting compressed air to the lower end of the air shaft or tube D below the car E. At the bottom of the air tube or shaft D is a valve controlling the admission of air to said tube or shaft, and the valve J here shown is pivoted at *d*; but any other valve of suitable form may be used. The valve J may be operated in the usual way by a hand-rope, *e*, passing through the car and over a wheel, *f*, at the upper end of the tube or shaft D.

In the floor of the car E is an opening, *g*, which is controlled by a downwardly-opening valve, *h*, and on this valve is a push pin or piece, *i*, which projects through and above the floor of the car, and may be operated by the foot of the elevator attendant to open the valve. When it is desired to raise the elevator-car the valve J is opened and compressed air is admitted to the tube or air-shaft D, and when

it is desired to lower the car the valve J is closed and the foot is pressed on the pin *i*, and the valve *h* is opened to allow the air to escape from below the car through the car. The opening *g* may, if desired, be provided with a trunk extending through or beyond the car, so that the occupants of the car will not be subjected to the blast of escaping air.

It will be seen that my elevator is advantageous, because it may be operated without an independent motor; and it is absolutely safe, because the car cannot fall while there is air-pressure below it.

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

1. The combination, with an air shaft or tube, an elevator-car fitting therein, and a railway-track, of a pump or pumps adapted to be operated by passing trains to compress air, a pipe or conduit for conducting the compressed air to said air tube or shaft, and valves for controlling the admission of air to said tube or shaft and its exit therefrom, substantially as specified.

2. The combination, with an air shaft or tube, an elevator-car fitting therein, and a railway-track, of a pump or pumps adapted to be operated by passing trains to compress air, an accumulator or pressure-equalizer in which the compressed air is stored, a pipe or conduit connecting said accumulator or pressure-equalizer with said air shaft or tube, and valves for controlling the admission of air to said shaft or tube and the exit of air therefrom, substantially as specified.

3. The combination, with an air shaft or tube, an elevator-car fitting therein, and a railway-track, of a pump or pumps adapted to be operated by passing trains to compress air, a pipe or conduit for conducting the compressed air to said shaft or tube, a valve for controlling the admission of compressed air to said shaft or tube, and a valve in the floor of the car for controlling the exit of air through or past the car, substantially as specified.

CHAS. A. NEEDHAM.

Witnesses:
FREDK. HAYNES,
ED. L. MORAN.