2 Sheets--Sheet 1.

T. H. NEAL.

Means of Transmitting the Power of Stationary Engines through the Medium of Compressed Air.

No. 162,678. Patented April 27, 1875.

Fig. 1.

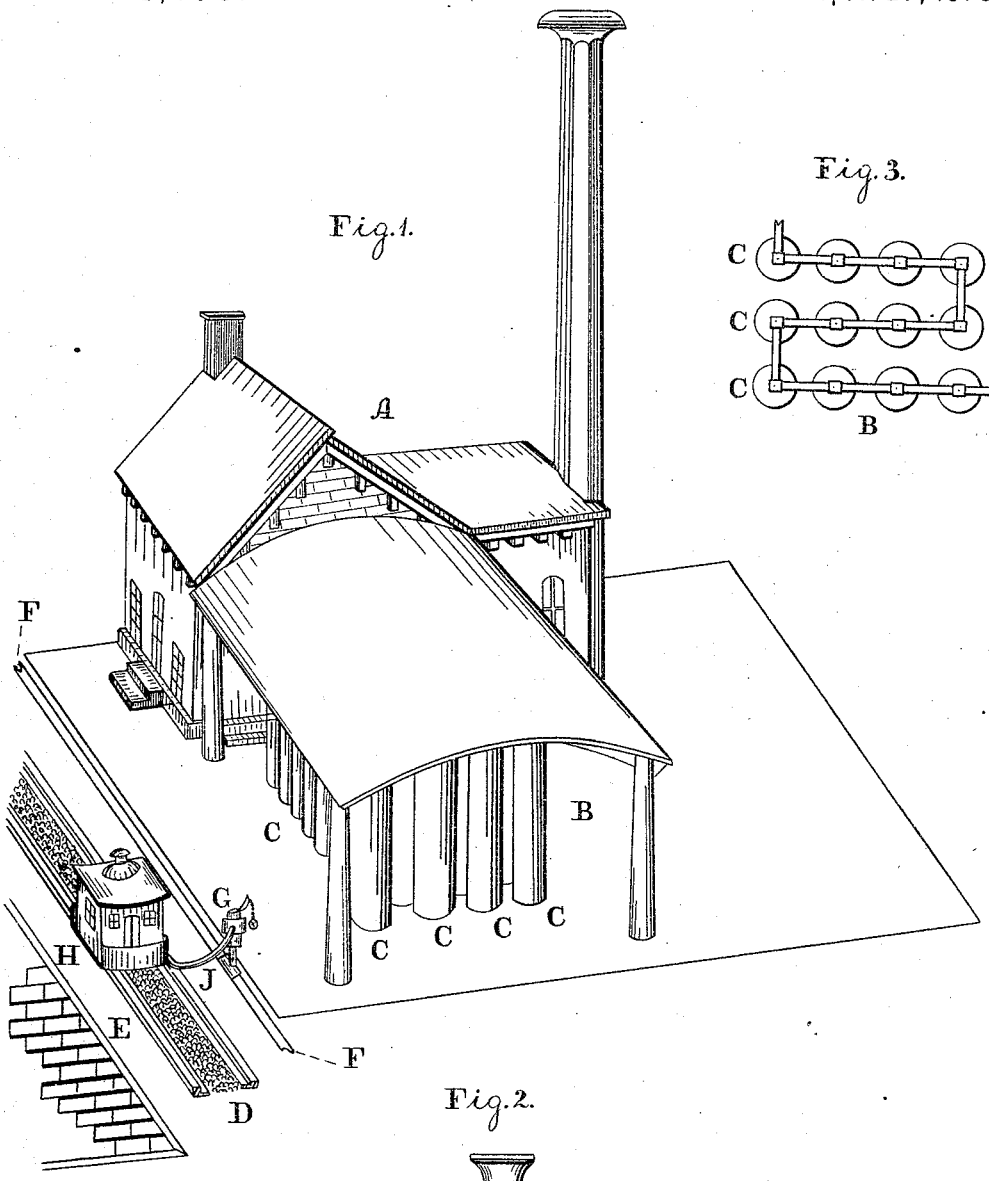
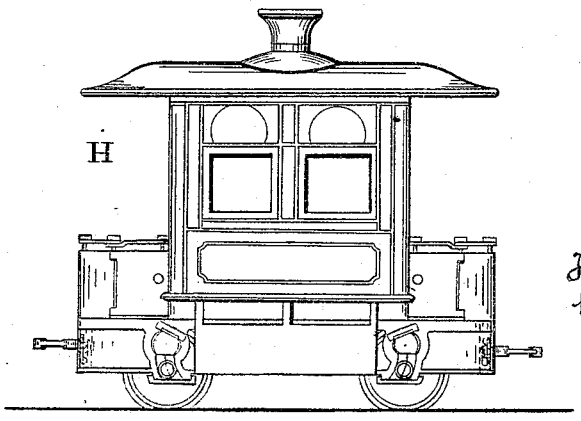


Fig. 3.

Fig. 2.



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2 Sheets--Sheet 2.

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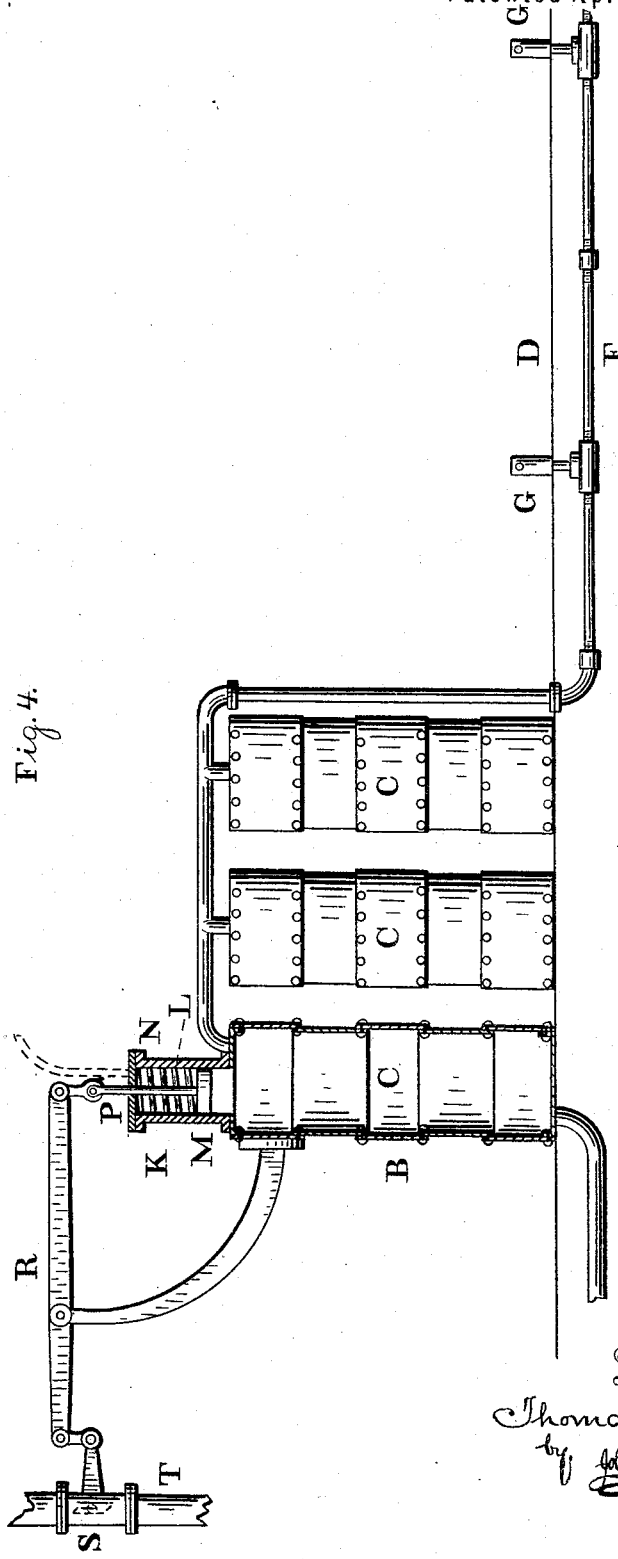
Fig. 4.



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UNITED STATES PATENT OFFICE.

THOMAS H. NEAL, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF ONE-HALF HIS RIGHT TO MARCUS F. RICHARDSON, OF SAME PLACE.

IMPROVEMENT IN MEANS FOR TRANSMITTING THE POWER OF STATIONARY ENGINES THROUGH THE MEDIUM OF COMPRESSED AIR.

Specification forming part of Letters Patent No. **162,678**, dated April 27, 1875; application filed October 24, 1874.

To all whom it may concern:

Be it known that I, THOMAS H. NEAL, of the city and county of Philadelphia, and the State of Pennsylvania, have invented a new and useful Improvement in the Method and Means of Transmitting the Power of a Stationary Engine through the Medium of Compressed Air; and I do hereby declare the following to be a clear and exact description of the nature thereof, sufficient to enable others skilled in the art to which my invention appertains to fully understand, make, and use the same, reference being had to the accompanying drawings making part of this specification, in which—

Figure 1 is a perspective view of the device embodying my invention. Fig. 2 is a side view of a car employed in my invention. Fig. 3 is a top view of a detached portion. Fig. 4 is a side view, partly in section, of a detached portion of the invention.

Similar letters of reference indicate corresponding parts in the three figures.

My invention relates to a method of transmitting the power of a stationary engine by means of compressed air.

The route of the cars through a city will be provided with a line of tubes or tubing above or below the pavement, with a number of attachments at different points, so that a small locomotive-car can have its power replenished whenever necessary. The engineer, simply taking one end of a flexible tube which is attached to the engine, and passing to the curb-stone or sidewalk where the air plug or attachment exists, makes connection with said air attachment and the car receives its supply, the moment's delay being no more than the ordinary attention to horses.

The invention consists of an air-holder constructed of a series of tubes, which are separate from each other and extend vertically, so that they are accessible on all sides for purposes of examination, and may be readily multiplied in the event of an extension of the use of the power or required storage thereof, the series being employed as a distributer to permit the holder to withstand the great pressure. With the air-holder will be combined a governor, which, operated by the variation in the pressure of air, will automatically control the speed of the pumping-engine.

Referring to the drawings, A represents a room, in which will be stationed an engine for supplying an air-holder, B, with air under great pressure. This air-holder consists of a series of tubes or cylinders, C, which are arranged vertically and sufficiently close to each other, and communicate with each other by means of pipes or other appliances, which permit the air to pass from one tube to the other. D represents the street of the city, and E a line or route of car-tracks laid thereon. Communicating with the air-holder is a system of piping, the pipes F of which are arranged below the street or sidewalk pavement, and extend in the direction of the length of the car route or track.

At proper intervals there are arranged air plugs or attachments, G, which are located on the pavements or elsewhere, so as to be conveniently accessible, and connected to the underneath system of piping, said plugs or attachments having suitable valves for applying and cutting off the air, which is directed to the same from the air-holder through the pipes F.

The locomotive-car H is provided with a flexible tubular connection, J, which may be carried with the car, and, when required, is attached to the plugs G, for conveying a charge of compressed air to said car.

The object of the invention is to dispense with animal power for the propulsion of cars, and especially is this desirable at the present day, when horses are being worn out with car-work at a fearful rate.

The cars will be constructed with mechanism to be operated by compressed air and impart power thereof to the wheels of the cars for propulsion of the latter.

The air will be pumped into the air-holder and pass thence to the system of piping. A governor will be employed for controlling the speed of the engine in proportion to the demand for the compressed air. This governor, K, consists, in the present case, of a spring-pressed head or piston, M, which is fitted in a tube or chamber N, communicating with one

of the cylinders C of the air-holder. The stem P of the piston is attached to an arm, R, which is connected to the valve S of the steam-pipe T of the pumping-engine.

The engine pumps the air into the holder B, and fills the series of tubes thereof, and as long as the supply therein and demand thereof are equable the spring L keeps the piston M at a state of rest. When the pressure increases the power of the spring is overcome, and by means of the connection between the engine-piston and valves S the latter is closed, so that less steam is passed to the engine, whereby the engine pumps less, and accordingly regulates the supply of air to the holder B. In the event of danger from great pressure the action of the piston will entirely cut off the steam.

When there is much demand for the air-power, and the supply in the holder decreases, the piston falls, and causes the valve S to open to a greater extent, so that the engine will pump more rapidly, and thus quickly replenish the air-holder.

As has been stated, the cylinders C are arranged vertically and separated from each other. This permits access to the sides thereof for inspection, calking, &c., and allows of the erection and location of additional cylinders when the enlargement in the line or route requires an air-holder of greater capacity.

The car will be run in proximity to one of the air plugs or attachments G, and the connection J engaged therewith. The valve or cock will be turned on, whereby a charge or volume of compressed air enters the air-receiver of the car. The valve is then shut off and the connection J disengaged from the attachment G, and the car can then be propelled by the proper manipulation of the air through suitable machinery.

When the car is about to expend its power it will be stopped near another air plug or attachment and another charge taken in, as in the first case.

It is evident that by these means the power of a stationary engine may be readily transmitted elsewhere, the compressed air being the medium thereof.

The air-holder is made of a series of tubes or cylinders, which receive the accumulated supply of the compressed air, and by thus distributing the air in said series there is caused an equilibrium of pressure, and thus the tendency of explosion overcome.

I am aware that it has been proposed to distribute compressed air through a street-main, and make such attachments thereto that the air may be employed in factories and buildings, and for propulsion of cars. I therefore disclaim, broadly, the principle of the distribution of compressed air; but

What I do claim is—

The combination, with a stationary pumping-engine, a system of piping, F, along a car-route, and communicating attachments G, of an air-holder, B, consisting of a series of cylinders, C C, extending vertically, separated from each other, and provided with a governor for automatically controlling the speed of the pumping-engine, all as set forth, and for the purpose described.

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Witnesses:
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