

AN IMPROVED PNEUMATIC RAILWAY SYSTEM.

The accompanying illustration represents a pneumatic railway system, patented by Mr. George W. King, designed to provide, by simple and efficient devices, a continuous air current to the motor on the car body, without leakage, and without friction or pressure on the valves, while requiring no radical changes in the permanent way. Fig. 2 is a longitudinal section of a portion of the air tube or conduit, Figs. 3 and 4 being cross sections, while Fig. 1 represents the application of the system on a street railway. The underground conduit is indicated at A in Fig. 2, and it has a continuous slot over which fold flap valves riveted to the edges of the slot, as shown at G in Fig. 3. The piston, B, consists of a tube of slightly less diameter than the air tube, and on its outer edges are packing rings, F, making a close joint between the tubes A and B, while the upper face of the piston has a central depression serving as a recess for the ends of the valves when they are depressed. A hollow connecting shank, C, is rigidly secured to the piston in this depression, the upper end of the shank being connected with any suitably constructed motor on the car body. The shank is elliptical in horizontal section, its ends serving as openers or spreaders as they pass along in the slot of the tube, making continual communication between the tube and the motor. To gradually open the flaps as the air-connecting shank passes along, the lower longitudinal faces of the latter are provided with horizontal cams having curved under faces, whereby, as the shank passes along the air tube, communication will be had between the atmospheric air and the air in the pocket or chamber formed between the piston B and the tube A, and so much of the valves as is necessary to be spread apart will be relieved of air pressure, thus reducing the frictional wear on the valves to a minimum. To effect such communication with the outer air, the shank, C, is provided with short vertical air channels, D, the upper ends of which open out above the conduit, while their lower ends open into the space, E, below the flap valves when in their lowermost opened position, whereby any compressed air in the pocket between the cylinders will escape. It is claimed that the cost of construction and maintenance under this system will be low, the cars carrying no unnecessary weight, and there being small loss of power by friction, while it is unaccompanied by noise, and the cars can be started and stopped without jerking. The necessary bells, gongs, brakes, etc., may all be worked automatically by the compressed air, which may also, after use in the motor, be utilized to assist ventilation when this is deemed desirable.

For further information relative to this invention address the patentee, No. 1251 High Street, West, Washington, D. C.

The Odor of Musty Volumes.

One of the assistants of the British Museum tells me that visitors to that institution frequently have a hard time getting "acclimated" to the place. An hour spent in the rooms invariably gives the visitor (for the first time) a headache. Sometimes it is only after repeated visits that one is able to indulge his researches without carrying away a headache with him. Women seem particularly sensitive to this curious malady, which is said to arise from the peculiar odor created by the storage of so many books. You can get some idea of what this odor is by going to your bookcase, that has been closed for twenty-four hours, and opening one of the doors; immediately your olfactories will be greeted by the mustiest fragrance imaginable. Bibliomaniacs profess to love this odor, and many declare that they cannot value a book unless it has about it that unmistakable and ineradicable smell which infects a volume when once it has crossed the sea in the hold of a vessel.

William Blades, on the other hand, says that the musty smell betokens the decay of a book, and he cries

out against all bookcases which are tightly closed. It is his theory that books require pure, dry air constantly, and the result of his experiments and experience seems to be that the most healthful kind of bookcase is one that has lattice doors, behind which may be hung thin curtains to keep out the dust.—*Chicago News.*

Explosion of a Dynamite Gun.

At a trial of the Justin dynamite gun, near Rome, New York, on May 27, the gun exploded and hundreds narrowly escaped being killed by the flying pieces. The gun was a 9 inch cannon which had been in use during the late war. The shell that burst the gun weighed 273 pounds without the explosive, which con-

adds greatly to the convenience of passengers. The ventilator is arranged to permit the ready flowing off of water during rain without obstruction to the thorough ventilation of the car at all times.

This car forms the subject of a patent which has been granted to Mr. Orlando Harriman, of No. 43 Wall Street, New York City.

Unfortunate Bridge Building.

Another accident occurred at the Louisville and Jeffersonville bridge, May 14, at Pier 4. The working chamber of the caisson had been built, launched, and was in position between two rows of heavy guide piles, tied together at heads, and the crib was being built upon the caisson roof, 13 courses being in position and partly concreted. The river had been rising rapidly, and the current was very strong, and the water about 28 feet deep. The guide piles at the lower end gave way first, and the other side followed; the caisson and crib, thus unsupported, toppled over and carried with it the caulkers and carpenters, and four men lost their lives, among them Charles P. Mitchell, the superintendent for SooySmith & Co. Mr. Mitchell was struck by one of the falling cross braces, and the other men were carried under the caisson and the floats by the swift current and drowned.

The "six" guide piles were 18 inches in diameter, driven 20 feet into the river bed through 28 feet of water, says the *Courier Journal*, of Louisville. The caisson was 25 by 54 feet on the base and was 24 feet high, including the roof. At the time of the accident the top of the caisson proper was 2 feet under water, but the cutting edge was not quite on the river bed. The caisson was suspended at

the four corners by steel wire rope to the cross bracing supported by the guide piles. According to the report of Louis P. Anshutz, one of the caulkers, these cables parted and at the same time the supporting timbers gave way. The caisson itself is said to have turned completely bottom-side up.

The Iron and Steel Institute will Visit the United States.

The annual meeting of the Iron and Steel Institute was lately held in the theater of the Institution of Civil Engineers, London, the president, Sir James Kitson, occupying the chair. The following papers were read:

On a new form of Siemens furnace, arranged to recover waste gases as well as waste heat, by Mr. John Head, London, and M. P. Pouff, Nevers.

Calculations concerning the possibility of regenerating the gas in the new Siemens furnace, by Prof. Akerman, Stockholm.

On the critical points of iron and steel, by M. F. Osmond, Paris.

On the carburization of iron by the diamond, by Prof. W. C. Roberts-Austen, London.

The changes in iron produced by thermal treatment, by Dr. E. J. Ball, London.

On the Robert-Bessemer steel process, by Mr. F. Lynwood Garrison, Philadelphia.

Aluminum in carburated iron, by Mr. W. J. Keep, Detroit.

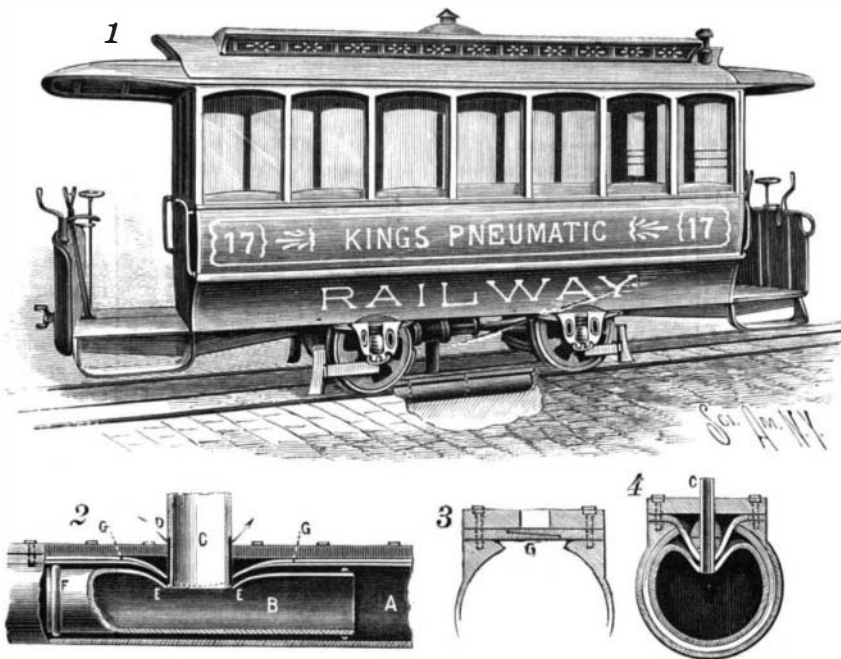
On certain chemical phenomena in the manufacture of steel, by Mr. W. Galbraith, Chesterfield.

The estimation of phosphorus in the basic Siemens bath, by Mr. W. Galbraith, Chesterfield.

On the Rollet process for producing purified castings, by Mr. A. Rollet, St. Etienne.

"The autumn meeting of the Institute is this year to be held in America. The meeting will be held in New York, and we hear," says *Nature*, "rumors of vast preparations that are being made by the hospitable metallurgists and engineers of the United States to wel-

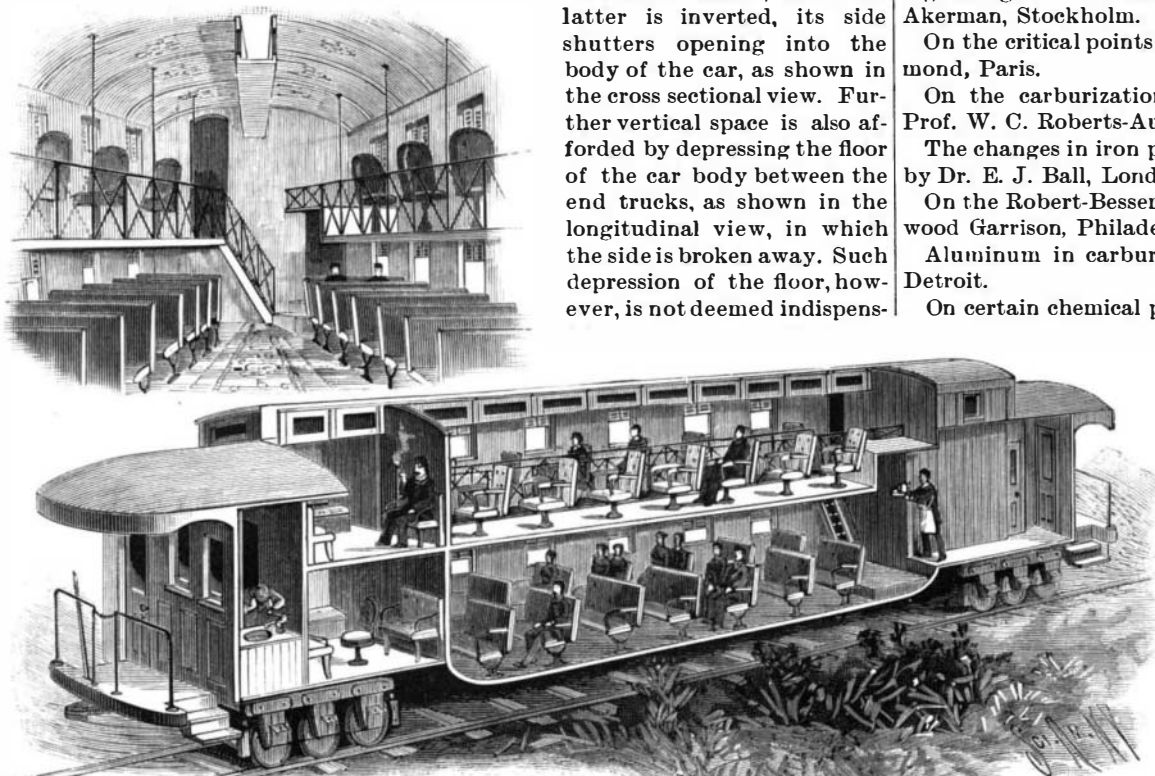
come their British *confreres*. Members are left to make their own way to New York, but upon landing they become the guests of the American Institute of Mining Engineers. From an outline programme we have seen, it would appear that the only limit to the excursion will be the time at the disposal of members, which, those who know American hospitality best will agree, is sure to be exhausted long before the good nature of their hosts."



KING'S PNEUMATIC RAILWAY SYSTEM.

AN IMPROVED PASSENGER CAR.

The illustration shows a car not exceeding in height the usual drawing room coaches, or at the most only slightly so, so that the bridges and tunnels of the regular railway lines can present no obstacle to its passage, but the construction is such as to provide two floors or tiers of seats, thereby largely increasing the carrying capacity of the car. This is effected mainly by the manner in which the space at present occupied by the car ventilator is made available, the sides of the car roof being carried up to the full height of the usual ventilator section, while the latter is inverted, its side shutters opening into the body of the car, as shown in the cross sectional view. Further vertical space is also afforded by depressing the floor of the car body between the end trucks, as shown in the longitudinal view, in which the side is broken away. Such depression of the floor, however, is not deemed indispens-



HARRIMAN'S PASSENGER CAR.

able, for it will be seen that the central aisle of the car is of full height, permitting ready access to the side seats of the main floor therefrom, while the side galleries above, each accommodating only a single row of chairs, do not extend to the full width of the seats on either side of the aisle below. The car is of the ordinary construction at the ends, except that it has a comfortable smoking and lookout room in the upper part, which