RAILWAY MATTERS.

M. GIFFARD, of injector fame, has invented a method of fitting railway carriages which eliminates oscillation. The carriage is suspended by powerful springs at each end; and at the trials recently made in the presence of some members of the French Association for the Advancement of Science, the carriage was found to be so steady that reading and writing could be easily carried on.

WESTINGHOUSE BRAKE.—Up to a recent date, the Westinghouse brake has been under the exclusive control of the engineer, now it can be applied to the entire train by any person, in any car, while the train, in case of derailment, also applies the brake to itself, adding an immense impeding force to the obstacles which it encounters.

AN engine on the New Jersey Midland road has been fitted with a smoke-burning arrangement in the fire-box. On one of the early trips of the engine as the fireman opened the furnace door to throw in a shoveful of coal, the gas burst out with such volume and force as to throw him entirely off the engine. In falling the struck on his head in a culvert and was killed. Another fireman was put on in the dead man's place, and in a short time he had his face terribly burned. One would suppose it would now be rather difficult to find a fireman for that engine

EXPERIMENTS recently made by Mr Forney, of New York showed that the temperature in the smoke-box of a locomotive when first starting was 270 deg, and when working at its maximum capacity on a steep grade and with a heavy train it was as high as 675 deg. The average temperature while running was, in three trials on different parts of the road, as follow.—Average steam pressure, 98 8 lb; average temperature, 499 8 deg. Average steam pressure, 106 lb.; average temperature, 535 1 deg Average steam pressure, 112 2 lb.; average temperature, 554 deg.

THE *Albany Express* of recent date says:—"It may be noted as an extraordinary occurrence that no less than 3650 tons of steel rails for the New York Central tracks arrived here last week. The rails are manufactured in Wales, and are of the Barrow and Landworth brands. The following is the order and load of each boat as they arrived: Barge Watson, 425 tons; Erertsen, 420 tons; Town, 200 tons; Freeman, 300 tons; Clay, 250 tons; Ogden, 300 tons; Thomas, 480 tons; Austin, 600 tons, Van Stantford, 675 tons. Total 3650 tons." The *Bulletin of the American Iron and Steel Association* adds, "Only a few miles from Albany the Troy Bessemer Steel Works are standing idle for want of orders."

AMONG the various articles deposited in the corner stone of the New York New Coal and Iron Exchange, which was laid a few weeks ago, was a document containing the following curious scrap of history.—"The first locomotive that ran on a railroad on this Continent was imported from England by this company, was ordered in England by Horatio Allen, assistant engineer, was shipped from Liverpool, April 3rd, 1829, on board the packet ship John Jay; arrived in New York 17th of May, 1829; was sent up the river to Rondout, and arrived the 4th of July, 1829; from thence was transported by canal, and arrived at Honesdale, July 23rd, 1829, and on the 8th of August made the trial trip. This locomotive was built at Stourbridge, England, and the boiler is now in use at Carbondale, Penn'a."

RAILWAY accidents in England are tame affairs compared with those which occur in our Indian Empire. In Bombay a train has lately been driven into a river torrent. An up goods train which left Bir station shortly before midnight on July 25, arrived about half an hour afterwards at the Sowjee Nullah bridge, and without any warning of danger "the engine and thirty-one vehicles next to it went bodily into the Nullah." The bridge had been previously injured by the flood, and the weight of the train caused its immediate destruction. The driver Miller and the guard Harris were drowned, but a European fireman, Joyce, managed to save himself by clinging for seven hours to the branches of a tree. It is scarcely to be expected that a catastrophe of this kind could frequently reward the negligence of English railway officials. Until the interlocked system of signals is established companies must be satisfied with collisions with luggage trains.

A NEW TUBULAR BOILER WITH INTERNAL FURNACE.

We are not aware of another form of boiler which so nearly fulfils the essential conditions of economy that have been laid down by our best scientific authorities, viz., that the products of combustion should travel in opposite direction to the current of the water, and combine at the same time the advantages of internal firing. There can be no doubt that the tendency to priming to which vertical boilers as a type are given, is due to restricted evaporating surface, increased by the great distance of the hottest part—the furnace—from the same, thus generating the mass of the steam below, and compelling it to travel a great distance before reaching the steam space, and so dragging up with it a quantity of water. This is admirably obviated in the internally fired horizontal boiler, which, apart from avoiding the considerable loss of heat from an external furnace, makes the formation of scale less injurious, by presenting a convex surface to any deposit in such places where the heat is most intense. The opposite effect is found in all externally fired boilers, and experience has taught it to be a very serious drawback. But the horizontal—Cornish or Lancashire—boiler is decidedly somewhat deficient in circulation of the water, particularly when the feed-water is introduced above the flues, near the evaporating surface, as is now recommended by the associations whose only object is the "security of boilers" from explosion Apart from this, that type of boiler is deficient in effective heating surface when compared with the bulk of water it will hold, and therefore must be made of large diameter, which is unsuited to high pressure. Multitubulars, however, which overcome this difficulty most completely, impose in many cases difficulties to cleaning. By a combination of the four features, viz, the horizontal, the vertical and multitubular character, with the internal furnace, these difficulties are overcome, and we can readily believe that with the boiler of which we illustrate two types above—and of which a number of various sizes are now working in France and Germany—a very marked economy over the "elephant" boiler has been obtained.

With the very inferior coal used in Alsace and its district an evaporation of nine or ten pounds of cold water per pound of coal is by no means an ordinary result, yet this is the ordinary working data which we receive from reliable sources, not that of mere trials with careful stoking and clean surfaces, which are very apt to mislead. With good coal in a set trial, and the result reduced to evaporation at and from atmospheric pressure, the above quantity would not be far from being doubled. Our illustrations represent a view of one of the small boilers, and a section of another of larger size, and it will be seen that in the former no brickwork setting is required, while in the larger one it is very much simplified. The latter also shows a superheating apparatus, E F G It will be seen that an important feature in the boiler is that the top and bottom covers, R, have bolted joints, and are readily removed, thus affording access to the tubes, B, for cleaning by passing a brush, or something similar, through them. That the deposit in these tubes must be very insignificant from their position, and the current of the water, is fully borne out in practice, for most of the impurities are precipitated on the loose plate, L, when the water begins to rise and becomes heated. K and S are the blow-off and feeding pipes respectively, C is the outlet for the products of combustion, after having circulated round the tubes in their descent, and H is a manhole to facilitate examination and cleansing of the tubes outside.

We doubt the advisability of the present tendency to introduce the feed at the hottest part of the boiler, viz., close to the evaporating surface. This practice must undoubtedly give rise to priming, and also check combustion to some extent by cooling the furnace unnecessarily. In the Cornish type this is done to avoid risk of leaky back-pressure valves, and to equalise the difference in expansion and contraction between the top and bottom in the boiler, which latter is, of course, a very good reason. But the type of boiler here illustrated would not be affected in the same way, and, therefore, the entrance of the feed below its gradual rise, and the heated envelope of the internal flue through cold water being kept away from it, must act very beneficially in point of economy.—*Iron.*