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MODERN BRITISH LOCOMOTIVES.

Although railway gages are no wider than they were, and consequently the space at the disposal of locomotive builders is limited, there is a continual progress being made in the efficiency of the locomotive engine. The machine itself is so complicated that the proper proportions of many of its parts are still matters of experiment; and many engines have been built especially to attain a maximum result, only to reveal on trial that the weight is improperly distributed on the wheels, or that the springs are ineffective on heavy grades or around sharp curves.

In England, the progress of locomotive building is noticeable on several grounds. The Great Western Railway, Brunel's masterpiece, with its 7 foot gage, for many years has possessed engines which no narrow (4 feet 8½ inches) gage railway could hope to rival. In their boilers, nearly 2,000 square feet of heating surface gave a tremendous steam-making capacity; and the admirable proportions of the whole engine, and the concentration of the heavier parts around and above the center of gravity, made them remarkable for steadiness, even at a speed of 60 miles an hour, the usual rate of travel on Great Western express trains, and their economy in fuel and repairs has yet to be surpassed. But the numerous connections with narrow gage lines have at last made the broad gage a serious disadvantage to this line; and its conversion into one of the ordinary dimensions will before long be completed.

In the meantime, the narrow gage engine is being improved till it seems fairly in the way to become as big and as powerful as the width of the track will let it. The London and Brighton Railway, a line with a very heavy passenger traffic, has made much advance in this direction, under the guidance of Mr. W. Stroudley, the company's locomotive engineer, and we give herewith an engraving, showing in section his latest work; it is an engine named the Grosvenor, which possesses many points of interest, and which has already performed some notable feats.

The first thing in the representation of this engine that strikes the critical observer is the large heating surface. The firebox is of unusual dimensions, the outside shell being 72¼ inches by 46, and the inside 66 by 40⅞ by 71. The diameter of the boiler is 53 inches, and the tubes are 206 in number, and of 1¾ inches outside diameter. The tubes are distributed nearly all over the cross section of the boiler, giving a high water level; and dryness of steam is insured by use of a steam dome. The cylinders are inside, giving the engine the additional steadiness imparted by concentrating the weight; their dimensions are 17 by 24 inches, and they are supplied by ample steam pipes, 3 inches in diameter. The slide valves travel 4 inches, and give ¼ inch lead with a maximum travel, the outside lap under the same circumstances being ⅞ inch. The driving wheels are 6 feet 9 inches in diameter, and the leading and trailing wheels, 4 feet 6 inches. The two latter pairs of wheels have leaf springs, 3 feet 6 inches by 5 inches wide; while the driving wheels have volute springs, as shown, which are, perhaps, the one feature in the design which is open to criticism. The weight on these springs is no less than 14 tuns, and this pressure must tell on the springs, rendering them very liable to set under so heavy a load; and the excellent devices for tightening them up can only defer the time when they will go to the scrap heap. The total weight of the engine is 33 tuns.

The tender is of unusual dimensions, to allow of long runs without stopping for water; it will hold 2,520 gallons, and has a warming apparatus of 153 square feet of heating surface, so that cold water need never be pumped into the boiler. The tender runs on 3 pairs of wheels, and weighs 15 tuns 6 cwt

It will be predicted that this engine has a great power of making steam, and of keeping up the supply; and this surmise has been verified by feats actually performed. The Grosvenor recently took a special train from Portsmouth to London, 87 miles, in 1 hour 50 minutes, the average speed being 48 miles an hour. But a still greater proof of the staying power —to borrow a term from the race course—of the engine was a run from London to Brighton, 50½ miles, in 1 hour 10 minutes, with 22 railway carriages in the train. This last will be regarded as an extraordinary speed with such a load, especially when it is remembered that the railway is troubled with many long and heavy grades.

An invention of Mr. Stroudley's calls for special mention. It is a speed indicator, consisting of a fan with straight arms, revolving in a brass casing and sending water up a copper pipe which terminates in a glass gage tube. The hight at which the water stands shows the speed at which the engine is traveling. It certainly is a convenient appliance, and is said to be exceedingly accurate.

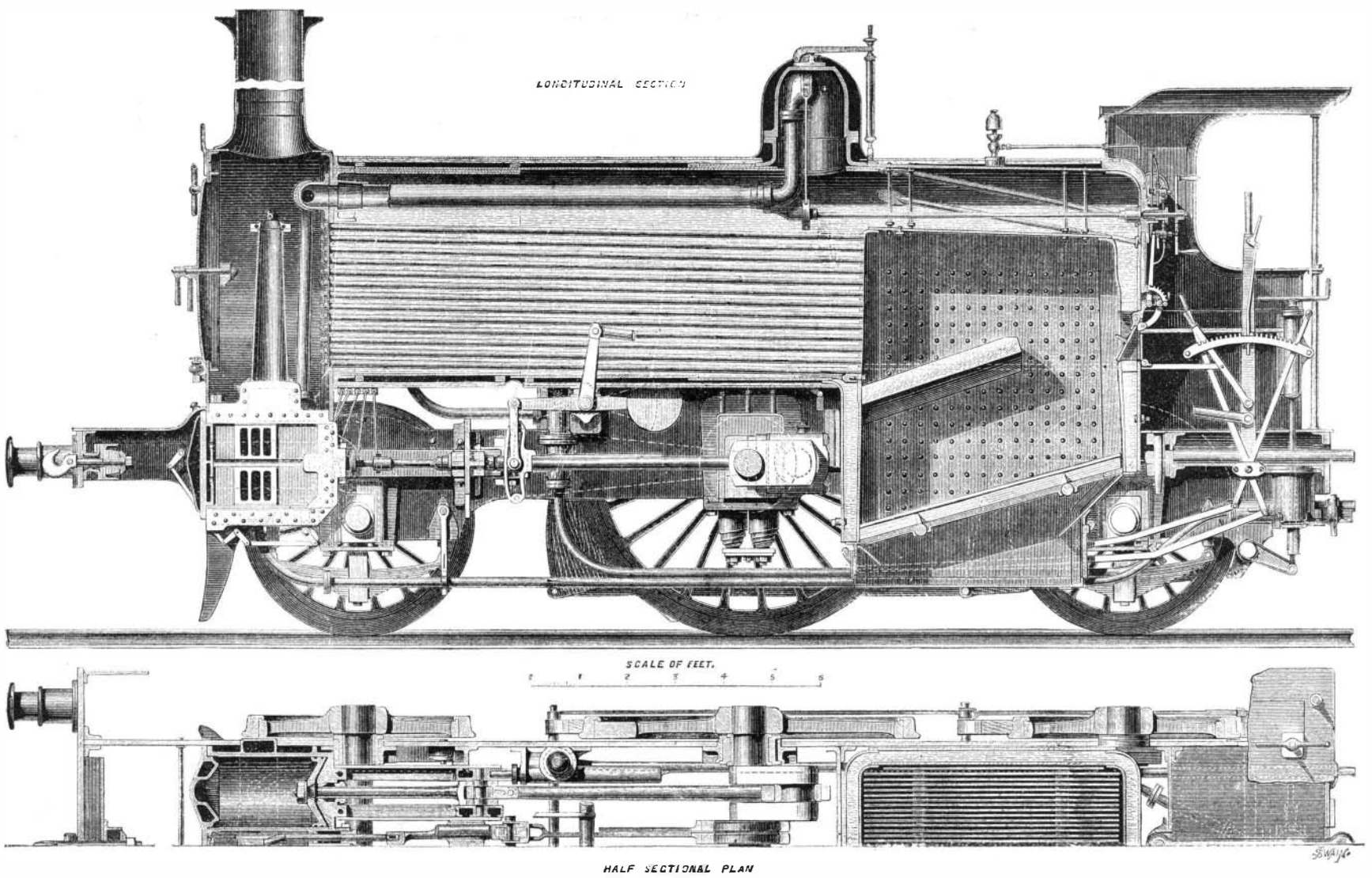
THE National Tube Works Company has just been awarded a gold medal by the Mechanics' Institute Fair, San Francisco, Cal., for the merits of their patent enamel water pipe. Their address can be found in our advertising columns.

A Skillfully Executed Job.

A new and interesting experiment in house-moving was performed in this city, not long ago, at No. 116 West Twenty-fourth street, in the presence of a number of prominent builders and inspectors. About a month ago the Society St. Crescent de Paul determined to build on the vacant lots in rear of their Twenty-third street building. A survey of the land being made, it was discovered that the wall of the five-story brick livery stable adjoining, occupied by S. C. Mott, encroached eighteen inches on their property. The owner was notified to remove the wall to the eastward, and Weeks and Brothers, builders, were authorized to tear it down and rebuild. Mr. Weeks did not like to pull down the wall, and hit upon a plan for moving it bodily.

Ten yellow pine timbers, 12 by 12 inches, planed on the upper surface, were let in horizontally under the wall, at equal distance, just above the foundation, and at right angles to its face. "Needles," builders call them. The upper surface of each needle was profusely greased, and a smaller needle, planed surface down, inserted along each larger one. Spur braces fixed at the foot in these upper timbers held the wall plumb. The jack screws, working horizontally, were set at the ends, on one side of the ten upper needles. This being done, an eighteen inch slit was taken off vertically from the stable building just inside the wall. At 7 o'clock in the morning, says the New York *World*, a man at each jack screw began to work it, and the wall moved an inch safely. "Go on!" said the boss, with some little excitement, and this time one of the ten men did not work his rack as much as the rest. The overseers were a little nervous at this, but the wall carried the lazy needle along with the rest. By 10 o'clock the 4,900 square feet of wall were pushed up tight against the open side of the stable, and the whole was perfectly plumb and unshaken. The men in the stable pursued their usual avocations during this performance, which attracted a crowd of interested spectators.

ACCORDING to Dr. Schuller of London, the bad effects of chloroform on the *pia mater* are neutralized by nitrate of amyl. This substance, it is stated, even in cases of complete anæsthesia, arrests suffocation, reëstablishes normal respiration, and allows the pulse to regain its vigor. This, if demonstrated beyond doubt by further necessary investigations, will be an important discovery, since it tends to neutralize the serious danger which now in many instances attends the use of chloroform.



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