not be able to compete with canals for economical transport, and as much of this as possible was a water level to be some day as he expected transformed into a canal. Of the 34 miles, 29¾ were a dead level. Five inclines, of which four were within the first four miles, carried the road 984 feet vertically in 3306 yards, and four inclines at the West end lowered it again 739 feet in 2112 yards. Two twelve mile levels were to be worked by locomotives. "There are few curves," says Mr. Clarke, "of less than 1,000 feet radius on European railways, whilst the swivelling truck enabled us (Americans) to build much less expensive lines than those of England, for we could now avoid hills and other obstacles at will." The curves on the High Peak were all of 132 feet radius, the rails were cast to that curve, and it was an immense saving to have them all uniform, and the rails to the exact radius. The locomotives were not truck engines, they were four wheel engines, and the wheels only, 3 feet 6 inches centres were closer together than the wheels of a truck usually are, and as close, in fact, as they could be placed. Round these curves between 43 and 44 degrees of curvature; these engines, with the device of running on the flanges on the outside guard rail, ran easily enough, and the locomotives, though small, on this beautifully laid road, heavy rails and broken stone ballast, could handle a very respectable train, as much as could be brought up the inclines at two hauls. Mr. Clarke further says: "The climbing capabilities of a locomotive upon smooth rails were not known until in 1852, Mr. Latrobe tried a temporary gradient of 10 per cent. This daring feat has never been equalled." Now this statement is somewhat rash. The question of gradients and adhesion was about as exhaustively gone into on a score of private railways in England as it could be before the experiments on the Cromford and High Peak, made in the interest of the Mont Cenis railway, conclusively settled the maximum gradient that it would be safe to use across the Alps previous to the opening of the Mont Cenis tunnel. With ordinary locomotives a 10 per cent. rise is not practicable, on a very fine day, the Cromford and High Peak engines with a very ingenious sanding arrangement could go up the Hindlow plane of 1 in 13. On a wet day they could not; but the Fell engines, which were tried on this road preparatory to their being sent to France, could go up any plane, (and the steepest, the Upper Goyt, was a little better than 1 in 7,) and take one or two waggons behind her. The author is not aware, and is much surprised thereat, that the principle of the Fell engine has ever been tried in America on some of the temporary roads, the switchbacks that Mr. Clarke seems to think are peculiarly an American invention. From the experiments on this road, they are perfectly reliable up to gradients of 1 in 12, and will take their own weight behind them up such a grade. The one in use on the Cromford and High Peak weighed a little over 13 long tons, say 30,000 lbs., and she could take easily 4 cars, each weighing with their load 15,000 lbs. or 60,000 lbs., together double her own weight, up the Whaley plane, averaging 1 in 13, or a rise of 406 feet in the mile. Mr. Clarke can scarcely have known of these engines, which worked for three years the continental traffic between France and the East of Europe, or he would not have made some of the statements in this Magazine article. Another great mistake made in connection with English and European practice is the general idea of Mr. Clarke and others in America that everything there is stationary and unchanged, and that the time of evolution and improvement has long since set in Europe, to be found now only in America. Says Mr. Clarke: "The Stephenson type of engine once fixed has remained unchanged in Europe, except in detail, to the present day. European locomotives have increased in weight and power, and in perfection of material and workmanship, but the general features are those of the locomotives built by the great firm