can be detached at pleasure. The whole is simple and light in appearance, and is constructed almost entirely of wrought iron.

Mr. Smith's (of Woolston) apparatus was about the same as we have seen it on former occasions. It consisted of an eight-horse portable engine, made by Clayton and Shuttleworth; a windlass upon a carriage exceedingly simple in its construction, made by Humpries, of Pershore; and anchors, pulleys, snatch blocks, and implements made by Messrs. Howard. The cultivator and scarifier of Mr. Smith, are well known to our readers, both three tined and five tined; and the method of working them by ropes may be thus briefly described. The anchors are iron frames, having strong curved tines, which are drawn into the ground by the strain of the pulleys hooked to them; and the windlass has two drums, with horizontal axles, hung side by side on separate bearings, in a timber frame, strongly constructed, and mounted on four travelling wheels. To keep it in a fixed position, the windlass is linked to the engine by a chain; and the whole is worked by a strap from the engine fly-wheel. In working, when the implement arrives at the headland, the steam is shut off; the pinion in the transverse shaft, being shifted sideways, is out of gear with the drum winding up the rope; and the other drum, which has been paying out rope, is then slipped into gear with it. The whole apparatus is exceedingly simple, and is easily worked. On the first occasion of trying it at Chester, a ridging body of Messrs. Howard was attached to the cultivator, which turned up some excellent work.

Mr. Rickett's rotatory steam cultivator is a new machine. It consists of a ten-horse locomotive engine, with a horizontal shaft behind, driven by pitch chains, and revolving in radial links in the direction contrary to that of the wheels. On the shaft, there are tines or cutters which enter the soil at the bottom of the furrow, cut upwards, and either break up or invert the soil. In one or two mechanical details we consider this machine defective; pitched chains do not work well, having too much friction. The rotatory digger is liable to clog, which brings the engine "up," or stops it; and the digger revolves in an opposite direction to the machine's forward course. The result is that all the cutting action of the digger on the soil has to be overcome by the propelling power of the engine; whereas if the digger revolved in an opposite direction, like a paddle-wheel, it would materially help the work to be done. There are also too many shafts, which crowd the action of the machine; the steering apparatus is likewise defective, which prevents turning easily, so as to begin a new stitch immediately along the one already done. The power used to obtain motion was from 16 to 18 horse; the cylinder 5½ inches in diameter, with a ten-inch stroke. There was about 90lb. pressure of steam, and the engine goes nearly 200 revolutions per minute. The cutters in revolving struck against the boiler, which ought not to have been the case, had a proper trial been made of the engine before it was sent to the show. We need scarcely remark that the engine stuck fast in the field, to the regret of many, but not to the astonishment of those who know anything of machinery, and who might have safely predicted the results which it produced. Mr. Crawley's set of ploughs, each containing two plough bodies fixed heel to heel, for working up and down the field without turning at the ends, was tried by Fowler's tackle, but failed to do their work in a proper manner.

THE TRIALS.

The trials took place in a field at Blacon, where the soil was very hard on the surface and stiffish below, and fully strong enough for testing the working powers of the implements and engines. It was a clover ley, and could not have been broken up for some time preceding. Messrs. Fowler, Mr. Boydell, and Messrs. Howard (working Smith), time the several competitors; and as Mr. Rickett was stuck fast in the field below, the interest of the ploughing from day to day was principally concentrated upon the three named. The work done by Smith's implements was as good as it well could be; and every practical farmer who saw it declared that they should desire nothing better for breaking up the soil, and thoroughly pulverising it and cleaning it of its filth; but there were a great number who preferred to have the soil turned over, and could not realise the idea of perfect cultivation without a thorough inversion of soil. The interest, therefore, gradually settled down, with the exception of one or two marvellous feats of Boydell, upon Fowler's operations.

There is one thing, we believe, clearly established by the trials of steam ploughs fixed in a frame—unless the land is pretty even several portions of it are left untouched, for the implements are too rigidly in a line, and have no independent action to touch