Agricultural Emplements.

Steam Cultivation.

We gave in a recent issue a few articles on steam cultivation, and the probability of its adoption in Canada, at an early period. Let us continue the subject.

The reports of farms cultivated by steam under one system or another, which for many months back have been made public fully demonstrated the advantages derivable from the use of steam power in the important operations of tillage These may be briefly enumerated as follows:—1st, a considerably less number of horses are required; 2nd, the work is more efficiently done, and at the most favorable time and 3rd, far better crops are grown, and at greatly reduced costs.

In calculating the expense of steam cultivation, it is important to estimate the favorable changes which are effected by it in the character of the soil, both as regards drainage and tillage operations, and we cannot better express this than by the following extract from the report of the Royal Agricultural Society of England on the steam plough trials at Leeds.

"That culture by steam power is destined to supersede that by horse power to an enormous extent can scarcely be doubted by those who witnessed the trials. On the very light sons cultivation may be effected at perhapsas low a price peracre by horse as by steam power; but we think it an error to measure the advantages of the two systems by their direct relative cost. It is the time and manner in which it is done that gives value to the operation; for instance a ploughing or scarifying during the dry autumnal months may be of the greatest possible benefit, whereas the same operation in the winter might be a positive injury. But as farmers can never command a sufficient amount of horse power for the busy season, they must then be dependent on the auxiliary power of steam, which is not only the sole auxiliary power to be had, but will also be found the cheapest power, even on light soils, if deep cultivation be adopted. On all well-drained land, open furrows will be obliterated. These not only cause a waste, but offer a serious impediment to the well-working of reaping and mowing machines"

On farms cultivated by steam, every after-operation requires less power, and only half the number of operations are required to produce the same results; this is accounted for in two ways—first, the land will be generally dealt with at the most suitable season of the year, and when it is in the best condition for the purpose, which is immediately after the removal of the crops: secondly, the implements can be made to work quite under the roots of weeds, and by this means get the land into clean condition; improved crops being the result, will also tend to keep the land clean.

The comparatively rapid motion of the implements when worked by steam power lays the soil so lightly that the atmosphere can take the greatest effect upon it; and the land being broken up when hard and dry in autumn, remains in a rough state, thus allowing the frost to act on the subsoil and to pulverize the soil by degrees, leaving it in a most desirable state for the reception of the seed,—much better than could be effected by the clod-crusher or any other mechanical application.

Another important point is gained by avoiding the indented path produced by the treading of the horses by which the "pan" (on strong land particularly) becomes so solid as to be impervious to water, and too hard for the roots of plants to penetrate through it into the subsoil.

Indeed, great as are the advantages of steam power in enabling the tiller of any kind of soil to get through his work in the busy season in a way which he could not otherwise do for want of sufficient horses—and in a style far superior to that in which it could be done if he had the command of sufficient horse power at the moment favorable for its employment—it is most probably on clay land that the greatest advantage will be apparent from steam cultivation.

When we consider that a team of horses and men such as are used in England for clay land tillage, weigh at least two tons, and that this weight must pass over every ten inch strip of earth before it can be turned over as a furrow slice, it will be evident that the already dense soil will be made more solid by the tramping of the horses, and thus left in a scarcely more favorable condition for the action of the atmosphere than before it was moved To counteract this, how many subsequent operations are required, crossings, and re crossings, repeated ploughings and harrowings, until at last, if the season be favorable, the soil is reduced to a tolerable tilth, but if there is a wet autumn and spring, or an unfavorable winter sets in, every clay land farmer knows how deficient is the result in proportion to the cost and labor expended.

Contrast all this with the operation of the steam ploughing tackle No matter how busy the horses or oxen may be at the favorable moment, the steam engine may be brought out, and the plough or cultivator, as may be most suitable, carried on two large wheels, neither of which travels on the land which has been moved, and which distributes its weight (27 cwt.) over 40 inches breadth (thus reducing the weight carried on each 10 inches width to less than one-sixth what it is by horse-power)—passed rapidly through the stubborn soil, loosening and laying it in such a manner that the dry autumn atmosphere takes immediate effect upon it, and the rain and frost of winter leaves it, when spring comes, in such a soft and wholesome condition as no horse cultivation can ever effect.

The various plans which have been introduced for the purpose of steam cultivation, are, 1st. Traction engines passing over the land and drawing the tillage implement after them. 2nd. The guideway system, in which a traction engine works on a permanent railway laid on the land 3rd The (direct traction) system in which an engine works along one headland, and an anchor along the opposite one, whilst the implement is drawn to and fro by an endless rope passing round a pulley on the engine, and one on an anchor. 4th. The stationary system—in which the engine and windlass are stationary—and the implement is worked by a wire rope passing round pulleys and anchors, placed at various convement situations.

The results achieved on the 1st and 2nd plans have been so costly and unsatisfactory, whilst the difficulties attending their employment are essentially so insurmountable, that they may be dismissed without further description.

Where a farm is laid out in large fields, no stationary windlass can compete with a set of tackle where the engine and anchor move along their respective headlands. With a stationary windlass, of whatever kind, as soon as 10 or 12 acres are finished, horses have to be fetched, and either the ropes and anchors or the engine and windlass removed, thus causing both loss of time, increasing the labor of the men, and diminishing the quantity of work that can be got through in the day But when the land is laid out in small irregular fields with crooked fences, or when it is desired to apply an ordinary portable engine, we recommend a stationary windlass with tackle, fitted with the new compensating brake, and although more parts and more labor and rope will be required, it will be found best adapted to contend with the adverse circumstances of occupations not specially laid out for steam tillage

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Hay Cutters.—A Missourian has patented an invention which consists in improving hay and straw cutters by the application thereto of a grinding plate that takes up the wear on the knife as fast as it occurs, a peculiar support for the cutter blade, and also novel means for operating the feed roll. These are said to cause the machine to operate with less labor and to cut the hay or straw more uniformly than is usual.

Endless Chain Tread Powers.

Tread powers have been extensively used both in England, the United States and Canada, during the past few years, but an objection was sometimes raised to them that they were hard on the horses. To those of long experience, however (we mean horses), they seemed to offer no great trouble. A late invention in the gear work of these machines facilitates the work for the horse whilst it secures equal velocity.

Among the principal improvements claimed for this power over others before in use, are the application of wheels of greater diameter which generate the force and motion, and using connecting and multiplying cog-wheels and shafts by which an infinite variety of forces and velocities of the band-wheel may be obtained, while the travel and labor of the horses remain unchanged; and at the same time the several gears and shafts having a corresponding strength to each other, as the ratio of the squares of their several velocities require, thereby securing the greatest ease in working, greater durability, and at the same time adapting them to every possible want of the farmer, planter, and mechanic.

The perfect and, at the same time, simple adjustability of all the working parts of the horse powers, by which the best possible results may be obtained at all times. without regard to amount of use or wear, is superior to that of any other ever made, as nearly ten years constant and extensive use has demonstrated, not an instance being known where they have become useless and inefficient from any amount of wear of the several working parts.

In the power all the gearing is removed from under the horses and inside the power, to the outside, where it can at all times be seen and cared for, and readily attached or transposed for the purposes for which it is to be used, as also from side to side of the power as is desired.

This power also is the only one provided with heavy cast-iron flanged track throughout the entire circuit of the small wheels, both last features being of great utility. The angle of elevation necessary to operate it is never greater but often less than that of any other Railroad Power, and is less than one and a half inches to the foot, with horses weighing one thousand pounds each, and without harness.

The one-horse power is mostly used for light work and where it is necessary to be removed to a new position, as in sawing wood at railway stations, and in the wood lot, among the trees and without roads, for the purpose of driving log cross-cut saw mills; also for mechanical purposes, where the room occupied is a great consideration; also, for threshing grain among farmers with small crops and small barns to operate them in.

When it is consistent, it is always preferable to use the wide power, as its cost is but little more than the narrow. While it is preferable for one horse alone, its effective force with two horses is increased nearly one hundred and fifty per cent. Again, the work is much easier for the team when two horses are used together and no changing of team is required. Whenever an excess of force is generated by both horses, the power should be lowered to a less angle of elevation, until their weight and travel just equal the resistance or work being done, thereby making it still easier for the team.

The weight of the two-horse power is about 1,700 pounds, that of the one-horse power 1,350 pounds.

Dull Mowing Knives increase the draft of the machine more than is imagined. At a trial of reapers by the American Institute, at Poughkeepsie, it was found by a careful dynamometer test that the draft of each machine was nearly one third greater when the knives were dull, and in this test the knives were only moderately dull, having been used to mow only one acre. It is therefore important to keep the knives sharp. Any one can prove the truth of this statement by himself trying a sharp and then a dull scythe. He will declare that there is even more than one-third difference.

A Cement Roller.—The *American Agriculturist* thus describes it:—The roller consists of segments eight inches thick, thirty inches diameter, made of concrete, or a mixture of one part of cement and four parts of sand, with a V edge. The centre, in which the axle works, is made of four pieces of hard wood, cut so that the wear is upon the ends of the fibres, and channeled upon their outer edges. The centres are fastened in the mould, and the cement is cast around them, where it sets and hardens, holding them firmly. The segments are strung together upon an iron axle, one inch in diameter, fitted into a frame. A tongue is fastened in the usual manner, and two horses are required to draw it.