side. The affair is worked by simply wheeling it along between the ridges; the fans catch the tops to right and bend them suddenly inwards over the box, when the bugs drop in and there they are safely housed to await future tortures according to the whim of the operator. It is light, simple and cheap, and if at all what is professed for it, must save an immense amount of tedious labor.

Root-Cutters.

Roots fed whole, especially turnips, are attended with great danger. Animals have been known to choke on them and die from the effects in a few minutes. But besides this most important consideration, cut or chopped roots feed more speedily than when whole. *Reason*: There is less physical energy expended in mastication and in rendering them fit generally for the digestive process in the stomach, and the energy thus saved in the mouth is utilized in the stomach.

This stands to reason. Medical men counsel us human beings neither to take active exercise immediately before nor immediately after our meals, and why? simply because by doing so we sit down to eat with our system in a state of semi-exhaustion, and the stomach, partaking with the other organs of this state, is sensibly disabled from properly performing its functions. Over-exert any one organ and all suffer more or less.

Feeders, generally, are cognizant of the necessity of cutting turnips. They all do it; but how? Many with a spade, some with a hoe, others with a large butcher knife, and we have often seen well-to-do farmers, on biting cold winter evenings, sit down

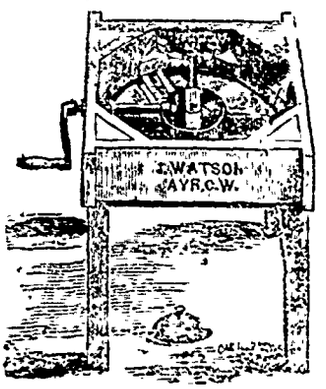

Fig. 1.

tailor-fashion on the barn floor, and with the patience of Job, cut and hack away for two mortal hours at a time, with a piece of rusty scythe blade roped to a stick for a handle.

Now these may do in a manner, that is to say, they they are preferable to nothing at all, and, therefore, not to be despised where better cannot be afforded, but just consider the amount of time and labor expended in their use, and after all, what an utter lack of uniformity in their work when completed.

The Root-cutter is intended to supersede all these efforts and remedy their defects, and it is but a poor economy that would urge a rigid adherence to them when the other can be procured. Especially is this the fact when the roots are to be prepared for sheep, for the amount of hand-cutting then is simply enormous.

The best of English Root-cutters may now be had of Canadian manufacture; and besides them, there are some other excellent ones of Canadian invention.

A cheap, simple and very serviceable implement of the latter class is illustrated by our first cut. It consists of a square box braced firmly on four wooden legs. Two iron bars or ridges cross the centre of the box, from side to side, cutting each other at right angles, and the bottom of the box, which constitutes the cutting apparatus, is made to revolve horizontally. This bottom consists of a heavy, circular, cast-iron plate—heavy enough to acquire considerable momentum in revolution, and in it are inserted two knives, adjusted so as to slice anything resting on them above. The turnips are thrown in. Their own weight, of course, keeps them constantly pressing downwards. The handle is turned and the bottom begins to revolve, carrying the turnips along with it until they are stopped by one or other of the cross-bars, when the slicing process commences, each piece, as it is separated, falling directly under the cutter. A heavy fly-

Fig. 2.

wheel opposite the handle enables the operator to turn it with ease. This is an excellent little implement, and very popular with those who have used it.

For more extensive use, the best machine now in the market, is of English invention, and generally known under the name of Gardiner's Cutter. The distinctive feature of this machine, and that which marks its superiority over all others, is the construction of its cylinder, which is of barrel form, made of metal, and equipped with steel knives, set at uniform distances along its convex circumference. Two of these knives are simply blades, stretching across the whole width of the cylinder and are designed solely for slicing. The others are arranged in a series of rectangular little blades, the edge of each being shaped

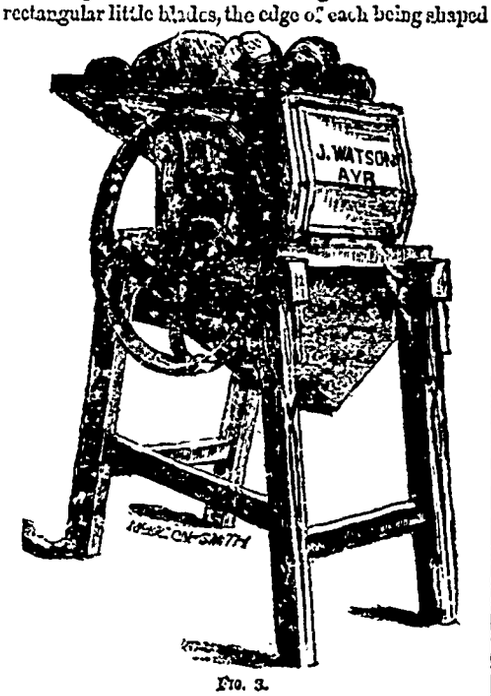

Fig. 3.

like two sides of a square, and their use is to cut up the roots into strips from five-eighths to three-fourths of an inch square. The iron grating seen in front, prevents the turnips, &c., from slipping when the machine is cutting. When cattle only are to be supplied, the handle is turned in the ordinary way, and the roots are sliced off, each piece, as in the former, falling under the cutter. When, on the other hand, the feed is to be prepared for sheep, the motion is simply reversed, when the smaller or stripping knives are called into play. This machine may be driven either by hand or power. It is, of course, considerably more costly than our first, but then the perfection and quantity of its work are such that we cannot see how any stock farmer can get along well without it. It will pay for itself in a single season, where many head of cattle are to be attended to.

Our third cut illustrates what is known as the "American" Root-cutter, which is preferred by some on account of its cheapness. It is got up on much the same principle as Gardiner's, does its work very well comparatively but is considerably smaller, and costs only about half the price of the other.

The "Gardiner" machine, mentioned above, is, we might add, the one which took the large medal for the "First degree of merit," at the late International Industrial Exhibition, held at Buffalo.

Improved Implements.

A discussion was had at the evening meeting of the New-York State Agricultural Society, Sept. 29th, on the "Benefit of Improved Implements of Agriculture," and was opened by Hon. GEORGE GEDDES, who read the following suggestive paper:—

"In 1851, the first world's fair was held in England. At this fair, American harvesting machines and American plows took the prizes, and then and there it was demonstrated that grain could be cut by machinery better and cheaper than by the hands of skilled farm laborers. In 1852, the New-York State Agricultural Society held at Geneva in this State, a trial of all the various implements, except plows, that were then offered by the manufacturers for the use of farmers. The trial was exhaustive, and really marks the year from which we may date the rapid march of improvement. There were then shown all the important reapers and mowers that had been invented up to that time, and though the committee was very much astonished at the excellence of the machines, and commended them to the public in very decided terms that certainly were fully justified by the trial, yet as one of that committee, I now say that the best reaper and the best mower there shown, have since been so much beaten by other machines that to-day no good farmer would accept as a gift the premium machine of 1852, any sooner than he would accept on the same terms, one of the Bull plows that were thought to be good tools before Jethro Wood invented the cast-iron plow. At Geneva, the inventors were brought, with their machines, face to face, and each saw where and just how his machine failed, and where some other excelled. The immediate consequences were greatly improved machines, and to this day improvement has been continued.

At first the reaper had but little advantage, except in doing its work better, over hand labor. The cost of harvesting an acre of wheat was but little less when a reaper was used than it was when the old grain cradle was employed, and it was not until there was connected with the devices for cutting the grain, others for delivering it in gavels by the power of the horses, that great economy as well as more perfect work was secured. And up to the date of that improvement there was a constant effort to produce combined machines, that should both mow and reap as occasion might require. But the "Self-Raking Reaper" made the harvesting of grain as much less costly in manual labor, as had the mower made the business of securing the hay crop. Now the reaper or mower will easily do the work of six men who use the tools that were in universal use before the year 1852. That is to say, a man or even a boy and a pair of horses, now do as much work with a machine, and do it vastly better in cutting grain or hay, than did six strong men twenty years ago. These cutting machines are followed by other improved machinery that very much lessen the work of securing the hay and grain crops.

One result of this improved machinery is a demand for more mechanical skill in the management of a farm. The mere laborer perhaps, has less general knowledge now than most farm hands had a quarter of a century ago. An immigrant just from over the sea can soon be taught to bind grain and to handle hay tolerably well if he tries. But he must have a very well qualified teacher."