

knives on to riddles, which remove the long straws and dust; is then elevated to the screw-presses. These presses are large cylinders of sheet-iron, with an archimedean screw working inside. The bags are hung on rings, which work up and down these cylinders, and the chaff is delivered into the bags down the screw. As the bags fill, the screw, working on the chaff in the bag, gradually presses it tight, and at the same time forces the bag downwards till it is full. When one bag is filled, the chaff descends the other press at once; so all that has to be done is to put on the empty bag and remove the full bag alternately. A machine of this kind would be valuable not only to a large landowner, who requires large supplies of chaff for horses and sheep, but also to threshing-machine owners, as they could utilize their engines in the off-season, when threshing is finished; and, making such good samples of chaff as these machines do, would no doubt obtain plenty of employment. The same makers show four smaller chaff-cutters, one of much the same pattern as just described, but without the screw-presses. The chaff is elevated in precisely the same manner, and merely drops into the bags, which have to be pressed by manual labour. The other machines have no travelling-wheels, are fitted with elevators, but no riddles, and can be worked by horse-power. Messrs. Reid and Gray exhibit four chaff-cutters. The largest is very similar to the duplex, but has only one screw-press, so that it could not get through so much work in a given time, as the press would have to be stopped to fix on an empty bag. In other respects the two machines are practically the same. The three smaller ones, of the kind in most general use, have riddles, but no elevators, and can be worked with any kind of power.

*Horse-powers.*—Horse-powers of different sizes, one- and two-horse, both direct-acting and on the intermediate principle, are shown by the same two firms. One only, made by Messrs. Andrews and Beaven, calls for any special remark. It has two pinions acting on the shaft, which lessens the risk of a break if the horses are started with a jerk, and also keep the motion continuous.

Among the less important implements are two corn-crushers of a handy size. Both are placed on iron stands, and are of much the same pattern, except that Messrs. Andrews and Beaven's machine has an automatic feeder to control the supply of grain to the crusher, and that their machine is of lighter construction than Messrs. Duncan's. The horse-hoes were both rather light, and looked more like market-garden than the heavier farm work. The "Triumph," made by Messrs. Wallace and Stotham, of Auckland, has two revolving discs in front to cut the weeds growing close to a crop, the usual teeth to stir the ground, and double mould-boards to ridge the soil up, and would do very well for cultivating root crops or maize. Messrs. Duncan's hoe is of the ordinary kind, with teeth adjustable to different widths, which can be taken off and replaced with mould-boards, and used as a ridging-plough. A machine, which has the appearance of a huge grass-mower, shown by Mr. G. Fraser, of Auckland, is intended to cut ti-tree and small scrub up to 1½ in. in diameter. It is made exactly on the lines of a grass-mower, and, well horsed, would no doubt cut small scrub; but the driving-power is rather far from the knife, and a slightly larger piece of scrub than usual would be very likely to cause a break, or, at least, a bend in the connecting-rod. A hand-power grass-seed thresher by Messrs. Andrews and Beaven should be very useful to small farmers who save a little grass-seed, especially cocksfoot, for which the machine is particularly intended. It is very light and simple in construction, and could easily be worked by a boy.

*Cream-separator.*—The machine that created the most interest was the De Laval Cream-separator shown by Messrs. Mason and Struthers, as, during the latter part of the time the Exhibition was open, the separator was to be seen in action every day. The separator exhibited was of the smallest size, and presents the appearance of an iron bowl with a tin cover, supported on an iron pillar. Within this bowl is a heavy cylinder made of the best Swedish steel, prolonged into a spindle which passes through the pillar, with a pulley at its lower end. Taking off the tin covers, a small cone is seen at the bottom of the cylinder, on the apex of which the milk descends in a continuous stream, and, as the cylinder rotates at the rate of six thousand revolutions per minute, a complete and instantaneous separation of the cream and skim-milk takes place by the action of centrifugal force. A flange is placed inside the cylinder to give the milk the same speed as the cylinder itself, and the cream, being the lighter, is whirled to the centre and rises up to the top, where it escapes through a small slot into the upper tin cover, and is discharged through the spout. The heavier portion, or skim-milk, hangs to the sides of the rotating vessel, and is forced up a small tube to the lower tin cover, and finds its way out by another spout. The milk to be operated on must be either fresh from the cow, or, if not, warmed up to 90° Fahr., and runs from a large vat with an automatic valve on the spout, which effectually prevents any overflow, down a funnel on to the apex of the cone in the cylinder; and, as long as the supply of milk lasts, all that is necessary is to provide receptacles for the cream and the skim-milk. The spindle below the cylinder is fitted with a speed-indicator, so that the attendant can make sure of the requisite speed before starting work. The management of the machine is easily learnt: in fact, the one at the Exhibition was worked by the man in charge, who had no previous experience, without a hitch from the first. The advantages of this method over the old one of setting the milk for so many hours and skimming the cream are obvious, as, besides the actual gain of from 15 to 20 per cent. more cream, it can be separated as fast as it comes from the cow, and a great deal less space is required for storage purposes; and, finally, the labour of cleaning a number of milk-dishes—really a most important operation in a dairy—is done away with. There is no doubt as to the complete separation of the cream and milk, for, if the skim-milk be put through the machine a second time, not a drop of cream will be obtained. This machine—the smallest size—is capable of separating as much as sixty gallons of milk per hour—large enough, in fact, for a dairy of a hundred cows. The operation is cleanly, and waste is reduced to a minimum—the only waste at all is a thin coating of cream left inside the upper part of the cylinder, which never increases, whatever quantity be put through, and is inappreciable compared to the waste that was unavoidable in the old method. The machine can be driven by steam-, horse-, or water-power, and requires less than one horse-power to work it at the proper speed. The power is conveyed to an intermediate by a belt, and from thence to