

only countries in which the plough has been brought to a state worthy of being considered effective, and even in Britain the most important amendments to it are not two centuries old. England took the lead in improvement by rendering the form more



JAPANESE STRIPPER.

neat and effective, and by attaching wheels to aid in keeping the plough in a proper upright position.

Without following in detail the slow but steady development of agriculture and its concomitant implements and machinery, we arrive at the great achievements connected with modern husbandry—namely, the introduction of steam in the field, and the use and application of threshing machines, reapers and binders.

Although it is no more than a quarter of a century since cultivation of the land by steam came into successful operation, it is upwards of three centuries since it was foreseen to be possible. So long ago as 1618, David Ramsay and Thomas Wildgoose took out letters-patent for engines and machinery to plough the ground without the aid of oxen and horses; and nine years afterwards, other ingenious men obtained letters-patent for machines to effect a similar purpose. It is, however, to the efforts of Messrs. Fowler, Howard and Coleman that the present efficient work of the steam plough is due. In every sense of the term, the systems of

the first two-named are the most popular; each has its advocates and its advantages. In both the chief elements are an engine, anchors, a wire rope, and a balance plough. The operation in Fowler's system is what is called the direct—the pull of the

implement being directly to and from the engine; in Howard's system, the round-about operation is adopted, the implement being drawn at right angles. Both inventors have introduced two engines, working simultaneously on opposite headlands. In ordinary working, steam ploughs accomplish an acre an hour. There are now upwards of five thousand in use in England and Scotland, though Americans are strangely behind in the employment of this invention.

Various attempts were made to supersede the flail by a machine, but with little success till 1787, when Andrew Meikle, an ingenious Scotch mechanic, produced a threshing mill so

perfect that, after having run the gauntlet of over a century of improvers, it is essentially the machine of its original inventor.

The attempts which for the last three-quarters of a century have been made to accomplish the process of reaping by machinery have now been crowned with the most complete success. Yet reaping by machinery is no modern invention. Pliny the elder, who was born early in the first century of the Christian era, found a reaping machine in Gaul. He says: "In the extensive fields in the lowlands of Gaul, vans of large size, with projecting teeth on the edge, are driven on two wheels through the standing corn by an ox yoked in a reverse position. In this manner the ears are torn off, and fall into the van." Palladius, about four centuries later, found a similar appliance for reaping corn in Gaul. In modern times the idea of a mechanical reaper appears to have originated with a Mr. Capel Lloft, who in 1785 suggested a machine something after the pattern of the ancient one above described. Between that time and the

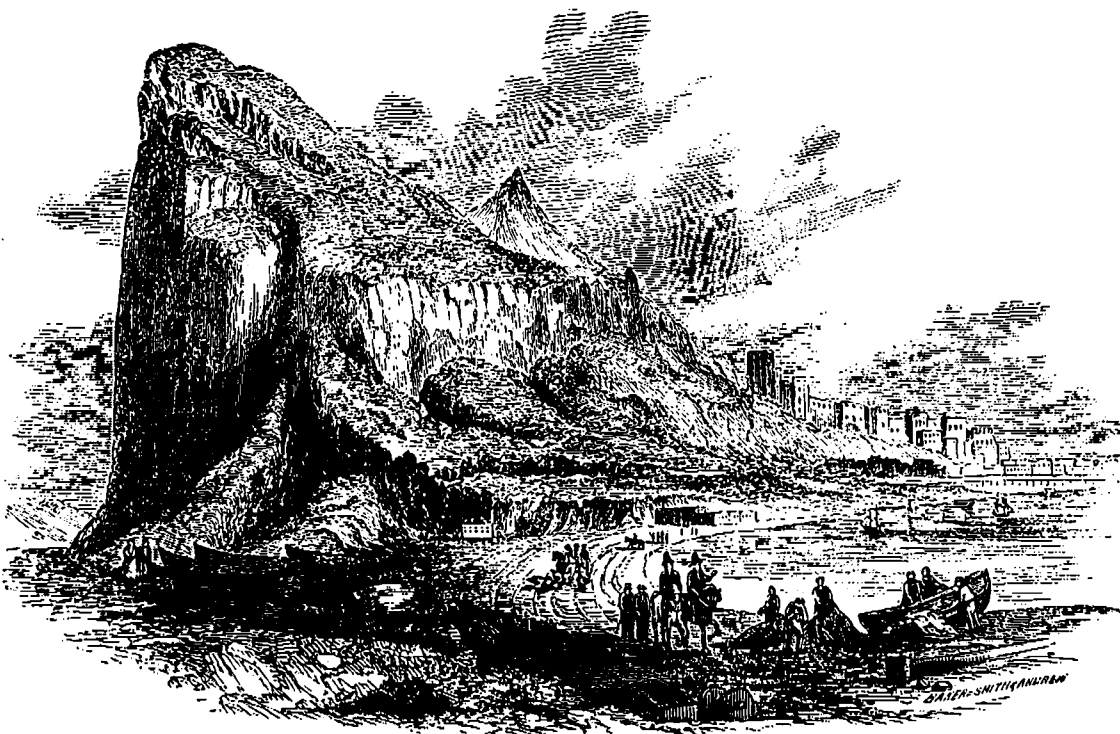
Great Exhibition of 1851, in London, from which the use of mechanical reapers may be said to date, the patents taken out for reaping machines were very numerous. In 1826, the Rev. Patrick Bell, of Carmylie, Scotland, constructed an efficient and simple machine, which long continued in use, and several features of which are observable in the reapers of the present day. The inventor of this, the first machine of the kind in Scotland, received a public testimonial from agriculturists, in consideration of the services he had rendered to agriculture. In America, Obed Hussey, McCormick, Whiteley, Miller and others were the fathers of the reapers now so extensively used throughout this continent, and which, in their great improvements by later inventors and manufacturers, have reached a very acme of perfection, and which, in their use and application, have in a great measure revolutionized the agricultural system of the past, and have placed fresh vigor and activity in the harvest field.

Old Tusser sums up the whole "husbandry furniture" of his day—the 16th century—in twenty-one verbose and doggerel verses. At the last London Exhibition there were exhibited agricultural implements and machines, and other articles more or less connected with the working of the farm, to the number of over 5,000, the value of which was estimated at upwards of \$1,000,000. The calling of the husbandman is no longer the slumbrous life it used to be. Its quiet, poetical felicity has been mightily disturbed. Farmers are now men whose talk is not always of oxen; and their ideas stretch beyond the stable and the byre. Sneers at the



FLAIL THRESHING.

slow, dull toiler of the soil are altogether without point now-a-days, for there is no department of industry in which more energy and skill are exhibited. Poets in search of similes for stagnation or "holy calm," must not hope to find them in the fields; they must search for them in the grass-grown courts and squares of cities.



GIBRALTAR (HELD OVER FROM JULY NUMBER).