a very severe indictment of the British character. As a matter of fact, it is not positively known but what one of the Bell machines was imported into the United States, and that it was in use on a gentleman's farm until his death, and it is not known that any American inventors ever had an opportunity of seeing it. However, the sting of the Britannica's observations in this regard is removed to a large extent by a further perusal of the article in question. We read: "The success of Bell's machine gave it a high place in public estimation. * *

* After a hopeful start the success of this machine has not been so decided as was at first anticipated; it was found to be too heavy in draught, too liable to derangement, and (in the first issues of it) too easily broken in some of its parts to be fitted for general use. * * * Such specimens as first got into the hands of farmers were so imperfectly constructed that they did not work satisfactorily, and this brought discredit on his invention.

* * * The true explanation (that is, of what the Britannica calls 'the strange neglect of Bell's machine for twenty-five years') is that the country was not ready for such a machine, manual labor was abundant and cheap," etc.

Whatever may be thought of the competing claims for English or American priority in invention, the fact remains that it was the American and Canadian machines which were adopted by English manufacturers, and which to-day control probably nine-tenths of the world's markets for such apparatus.

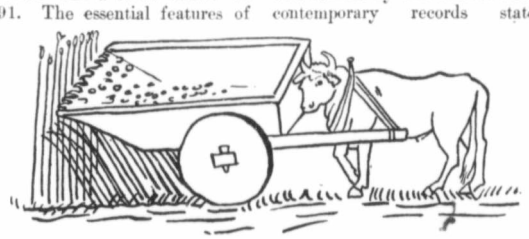
It is worthy of note when "identity in principle" is spoken of that Obed Hussey himself, in writing in 1854 stated: "Bell of Scotland used scissors. His machines presented to the grain an edge of pointed blades which operated like a series of tailor's shears, and it was soon pronounced a failure."

The supporters of Bell, moreover, seem always to have neglected to note the fact that certain features of his (Bell's) machine were apparently copied from the Ogle machine above referred to, such as the adjustable reed, etc.

The interest this aroused in Great Britain in harvesting machines is illustrated by the fact that from the closing of the Crystal Palace in 1851 there were no less than twenty-eight inventions registered and English patents granted for inventions relating solely or partially to reaping or mowing machines, but none of them were of great importance.

In the summer of 1855, at a competitive trial of reapers, about 40 miles from Paris, the three machines exhibited—were from America, England and Algiers. The following was the result in a field of oats: The American machine cut an acre in 22 minutes; the English in 66 minutes; and the Algerian in 72 minutes. It was this trial which prompted the remarks in the French journal with which the present article opens.

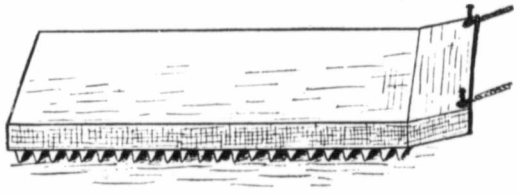
The first distinctive mowing machine was made under patents granted in 1844. The first patent on a self rake reaper dates from 1851, and in an automatic twine binder 1875. Wire binding apparatus was patented in 1874 and a sheaf carrier in 1891. The essential features of the modern harvesters are very much the same to-day as they were forty years ago, excepting that the oridnary mowing machines and reapers in use prior to 1870 have been almost altogether superseded by the automatic self-binding machines. Harvesters are now successfully adapted to rice, maize, and sugar cane, but numerous efforts to perfect a cotton harvester or picking machine have not yet received unqualified approval.



Early Roman Stripper.

THRESHING MACHINES.

It is to England, or rather Scotland, also that the world must look for the original invention of the threshing machine. A British patent was granted to Andrew Meikle in 1788, and this was the first successfully operated machine. In 1800 a fanning mill was added to the machine but it was still very imperfect and was stationary, being run by water power, and the grain had to be brought to it to be threshed. Various machines seem to have been used in Great Britain to some extent in the succeeding half century, but the flail continued to be the common implement down to 1830, or even later. The dearness of labor on this side of the pond and some other reasons caused the flail to be used relatively less in this country than in Europe, and a threshing machine was patented here as early as 1789, though nothing is known about this apparatus. Another machine was patented in the United States in 1802, and in 1822 two gentlemen of Vermont patented an apparatus moved by two horses which contemporary records stated would, with a driver and four men, thresh and clean about twenty-five bushels of wheat an hour. In the years 1830 and 1831 no less than sixty patents for threshing machines were issued by the United States Patent Office. The first practical combination of threshing and cleaning devices in one machine, and that portable, was made by Hiram A. and John A. Pitts, whose first patent, dated 1830, covered an improvement on a railway or tread power. Afterward they conceived the idea of combining this improvement with the old fashioned thresher, and with the common fanning mill in a portable frame, and their patent for this combination was issued in 1837. Since that date more than 5,000 patents have been issued in the United States for threshing machines or parts thereof.



A Greek Thresher.

An Egyptian Threshing Floor.

At first horses were the universal power applied, but gradually the modern steam power thresher has been evolved, in which the bundles are fed to the machine, which cuts the bands, threshes, winnows, sieves the grain and stacks the straw. An automatic band-cutting and grain-feeding attachment was invented in 1881, a pneumatic stacker, in 1896. A valuable improvement to the engine was the adapting of the fire box to the use of straw as fuel, thus materially reducing expenses on that score.

Prof. William H. Brewer, in an article on this subject, written many years ago, said:

"A hundred years ago to cut 100 bushels of wheat required about three days' work (which could not be delegated to other power); to bind and stack it four days; to thresh and clean it five days, which with the other processes between standing grain and the merchantable product would amount to some fifteen days' actual manual (and most'y very hard) labor for each 100 bushels. A day's labor would not give more than six or seven bushels of grain through these processes." While exact data regarding modern processes were not available, Professor Brewer thought that the product per man per day would now range from 50 bushels upward.

The threshing of 10 to 12 bushels of wheat with a flail was considered a good day's work for one man, and 25 to 30 bushels a day with three horses, a man and a boy was a common resu't. The camparative value of the flail and the modern threshing machine was demonstrated at the Paris Exposition of 1855. Six men were set to work with flails, and in one hour threshed 36 liters of wheat. In the same time Pitt's American machine threshed 740 liters; Clayton's English machine 410; Duvoir's French machine 250, and Pinet's French machine 150. A Paris journal reporting this trial, said "This American machine literally devoured the sheaves of wheat. The eye cannot fol'ow the work which is effected between the entrance of the sheaves and the end of the operation. It is one of the greatest results, which 3t is possible to attain."

In California and Washington where the grain is ready for threshing as soon as it is cut, a combined thresher and harvesting machine of the header type, mounted on a single platform, is in quite common use. The heads of grain are carried directly from the harvester by elevators into the threshing machine, from which the threshed grain is delivered into bags ready for shipment. Similar machines

Continued on page 81