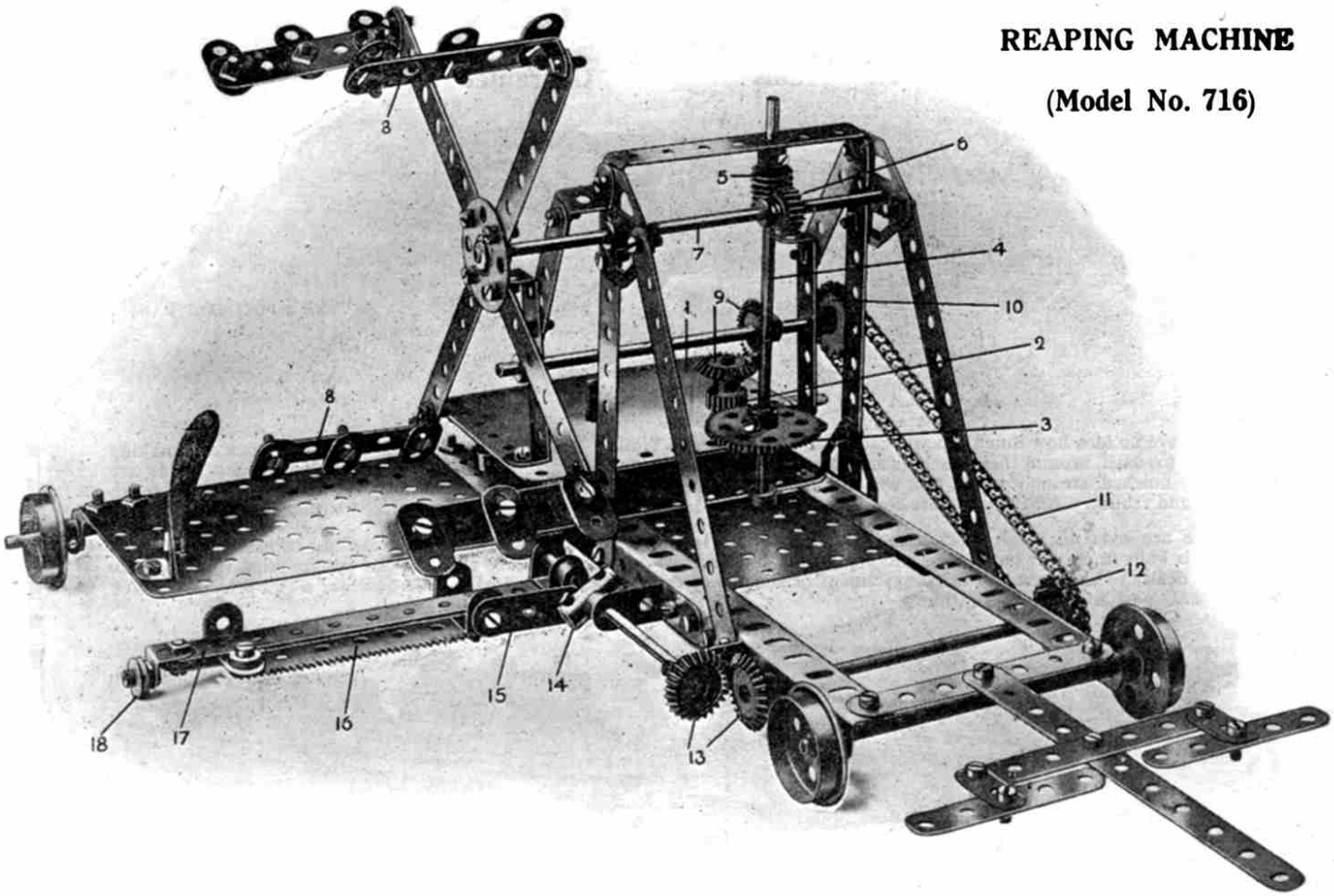
A NEW MECCANO MODEL

REAPING MACHINE

(Model No. 716)



This new Meccano model of a Mowing and Reaping Machine is specially interesting, not only as a model but also as a reminder of the progress made in methods of reaping since the days of the sickle and the scythe. Great advances have been made in recent years, and it is a far cry from Bell's first reaper to the giant steam-harvesters of to-day.

FROM very early times up to the 19th century the sickle provided the only means of reaping corn. The reaper grasped a number of stalks with one hand, and cut through them close to the ground with a sweep of his sickle. From a modern point of view this process was ridiculously slow. Considerable improvement was effected when the scythe supplanted the sickle, for this implement enabled a man to mow at least ten times as much grain in a day as was possible with the sickle. To-day, however, neither sickle nor scythe take any part in reaping operations, except on a very small scale. Their place has been taken by wonderful machines that have made possible the cultivation and reaping of the great grain fields of the world.

First Reaping Machines

The first reaping machine was invented about 1831 by a Scotsman, the Rev. Patrick Bell, of Carmylie, Forfarshire, and his original machine is now in the South Kensington Museum. Bell's reaper was quickly followed by two others, the inventions respectively of Obed Hussey and Cyrus W. McCormick, both Americans.

The cutting arrangements in these American machines worked on the principle of a reciprocating sickle, and consisted of a set of saw blades oscillating backward and forward through slots in toothed pieces of metal fixed at intervals along a horizontal bar. The action is practically the same as that of a pair of scissors having one blade fixed and the other free to move.

In order to prevent the corn from falling in front of the blades after it was cut, McCormick patented (in 1834) a device known as a "reel." The reel is still in use, and on modern machines consists of a round frame with horizontal slats so distributed that, as the reel rotates, they bend over the corn in front of the sickle at the instant of cutting, thus causing the cut stalks to fall behind the blades.

One of the great difficulties that faced the early inventors was the removal of the cut stalks from the track of the sickle, for if they remained where they fell they would be trodden upon by the horses when the next swath was cut. In Bell's machine this difficulty was overcome by a kind of canvas apron travelling constantly over rollers, which deposited the cut stalks in safety on one side of the machine. This travelling apron is still in use on modern machines.

Machine Binds Its Own Bundles

Reaping machines were later improved by the addition of a platform upon which men could stand and bind the cut corn into bundles as they received it from the travelling apron, instead of having to walk behind the reaper to do the binding. This improvement saved a great deal of time, but it was superseded about 1873 by a machine that did its own binding. At first wire was used for tying bundles, but it was quickly found that it was not

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New Meccano Models (*cont. from page* 121)

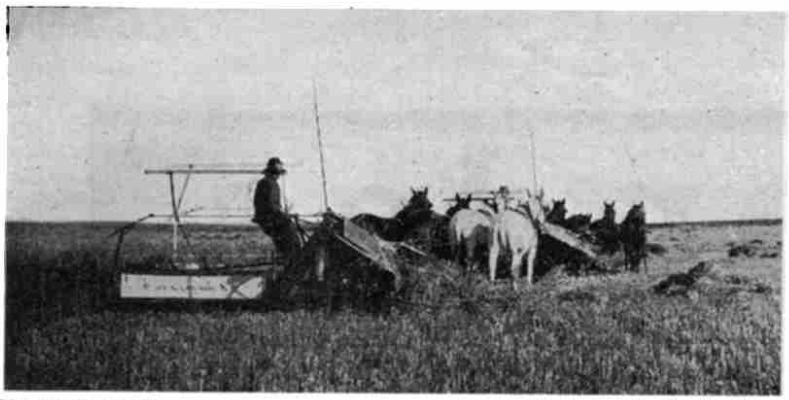


Photo by courtesy of [*Supt. of Emigration for Canada*

A Reaper at Work in Canada

satisfactory. Small pieces of wire became mixed with the threshed grain, and even with the flour, giving rise to serious possibilities. Hemp twine was then substituted for wire, with excellent results.

A modern self-binder cuts the corn, picks up a bundle of it, passes a cord around it and ties the cord with a knot, finally depositing the finished bundle either on the ground or on a platform on the machine. All this is done automatically, and the mechanism requires no attention.

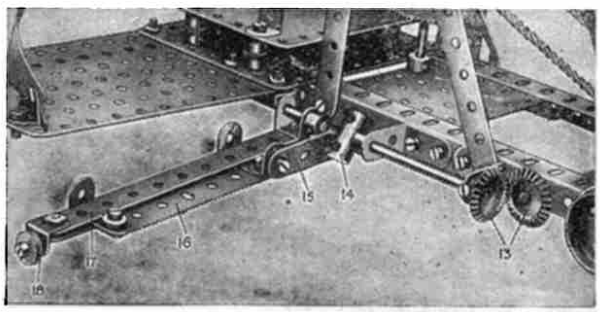
Wonderful Steam Harvesters

After being cut, the corn has to be passed through a process called threshing, by which the grain is separated from chaff and straw. Formerly threshing consisted of beating the ears with an implement called a flail, and this method is often mentioned in the Bible. Threshing in this manner was very slow, however, and was quite useless for harvesting on a big scale, and so threshing machines came to be invented. The first really practical machine was that of a Scottish machinist, Andrew Meikle, produced about 1813, and soon improvements were added until the wonderful machines of to-day were evolved. The early threshing machines were worked by teams of horses, but later steam power was utilised with greatly improved results.

It was found that the vast harvesting operations of Canada and the United States could be still further speeded up by combining the processes of reaping and threshing. This is done by means of a "steam-harvester." A traction engine takes the place of horses, the grain is cut but not bound into bundles, and a travelling apron carries it to the threshing mechanism. The whole process is thus automatic and continuous.

The Meccano Reaper

The illustration on the previous page shows a Meccano model (No. 716) of a Reaping Machine, which may be constructed with the assistance of the following details. The spindle of the Meccano clockwork motor (1) carries a pinion (2) engaging a gear wheel (3) on the rod (4) at the top of this rod (4) is a worm (5) driving a ½" pinion (6) on a rod (7) which carried the arms (8) that sweep towards the knife.



Details of Meccano Reaper

The driving spindle of the motor also drives through bevel pinions (9) a 1" sprocket wheel (10) coupled by a chain (11) to another 1" sprocket wheel (12) which in turn drives through bevel wheels (13) a coupling (14). This coupling acts as a crank and is connected by 1" strip lock-nutted (15) to the cutter (16). The cutter is formed by a rack strip guided to and fro by two 1" × ½" angle brackets between two 5½" strips (17) spaced apart by washers at each end. The outer end of these strips is fitted with a ½" pulley (18) on which the cutter knife travels. The remainder of the detail of the model will be made quite clear from our illustration. When completed the model works in a very realistic manner.

This model may be made with a No. 7 Outfit, but those who have a No. 4 or No. 5 Outfit will be able to build it with the addition of certain extra parts. The following is a full list of parts required.

Parts required for construction of Meccano Reaper (Model 716) :

7 of No. 2	2 of No. 12a	4 of No. 20	8 of No. 37a
6 „ „ 3	4 „ „ 12b	1 „ „ 23	6 „ „ 38
8 „ „ 5	1 „ „ 13	1 „ „ 24	1 „ „ 41
1 „ „ 6a	2 „ „ 14	2 „ „ 26	1 „ „ 48
2 „ „ 8a	2 „ „ 15	1 „ „ 27a	2 „ „ 48a
14 „ „ 10	1 „ „ 15a	4 „ „ 30	1 „ „ 48b
1 „ „ 11	2 „ „ 16b	1 „ „ 32	1 „ „ 52a
7 „ „ 12	1 „ „ 17	58 „ „ 37	1 „ „ 83

7 of No. 59
1 „ „ 63
16" „ „ 94
1 „ „ 110
7 „ „ 111b
1 „ „ 125
3 „ „ 126a

OUR MAIL BAG

H. Vial (Kidderminster).—Thanks for photo of yourself surrounded by your Hornby Train system and Meccano models. They look fine!

J. Candler (Tulse Hill, S.W.).—You are probably right when you say that most boys have no idea how a gas-meter works. We will try to find room for an article on this subject, sometime. There are lots of Meccano girls, John, who derive great pleasure from building Meccano models, but, of course, girls as a rule do not take as much interest in things mechanical as boys. We are always very glad to see Meccano boys when they come to Liverpool, so hurry up and come along!

Manual Tubis (Philadelphia).—Yes, the Philadelphia-Camden bridge will be the largest suspension bridge in the world, but not for long. New York proposes to build one a great deal larger; it will cross the Hudson River and the centre span will be 3,240 feet long.

A. Scott (Cunnamulla, Aus.).—Your suggestion for a Meccano calendar is a good one, and we will see if it cannot be adopted. We will try to find a correspondent for you in India.

G. Tippings (Golborne).—We are sorry you have had such poor luck so far in forming a Meccano Club. Better leave it over now until next autumn, and then try again. Your stamp queries are being replied to by separate post.

S. F. Hazelton (Chelmsford).—We will consider your suggestion for a general "Queries" column. We fear there would go up a strong protest from the majority of our readers if we were to discontinue our Stamp Column even for a few issues. We can only add new features by enlarging the "*M.M.*" Let us give you a piece of information quite privately, just between ourselves:—We shall shortly add a new feature dealing with a new hobby for boys. This will be a hobby almost as attractive as Meccano itself. Now you may have three guesses!

F. Spear (Lauriston).—We have no room for serial stories just at present. In fact, we find that most of our readers prefer interesting and informative engineering and other articles, such as we are now printing.

E. P. Peterson (Chicago, Ill.).—Indeed you are not too old to derive pleasure from Meccano. We know of a number of men who get a great deal of enjoyment from Meccano model-building. "Anywhere from 5 to 70 years is the Meccano age," you know.

J. Alston (Camberwell).—We get lots of riddles sent to us by readers and these will find their way into our "Puzzle" column, but your's is hardly suitable, we fear. "John and James were brothers. John said to James, 'Your father is not my father and your mother is not my mother.' What is John?" After much thought we can only come to the sorrowful conclusion that he is what David said in his heart all men were! Perhaps some of our readers can provide an answer which shows John in a better light.

J. C. Rishworth (Tiptur, India).—We read your last letter with great interest. If at any time you are able to send us photos of the country and the work you describe so well, we will endeavour to publish them.

Rex Andrews (Wichita, Kansas).—We are very sorry to learn that a terrible Kansas storm tore down your aerial. Unless we are badly mistaken, no storm is strong enough to blow away your enthusiasm for Meccano.

J. E. Govan (Birkdale).—You need have no uneasiness about our publishing further serial stories for some time. We have no room for them. By all means send along the article that you have written for us. We wish more boys would try their hands at writing suitable articles for our columns for we like to encourage those who have any literary ability.

S. A. Saunders (Smethwick).—

"There was an old man of Nantucket
Who kept all his "dibs" in a bucket,
His daughter named Nan
Ran away with a man,
And as for the bucket—Nantucket."

Terrible, Sydney!

Buera Hamman (Colorado Springs, U.S.A.).—We regret that you are ill and hope you will soon be restored to perfect health. It is very nice to learn that Meccano has helped you to spend the long wearisome hours more pleasurably.

L. Fletcher (Glasgow).—We are pleased to know that you take such a great interest in railways, and that you know so much about them. We are rather surprised to learn from you that the average life of a locomotive is only thirty years. We suggest that perhaps it would live longer if it didn't smoke so much!