MECCANO PARTS AND HOW TO USE THEM—PART 3

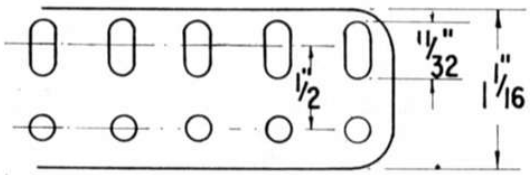

FIG.1

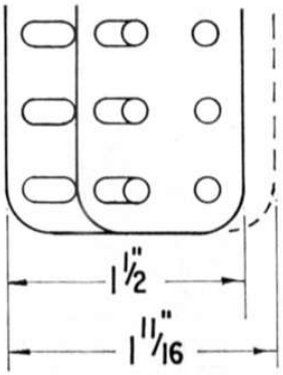

FIG.1a

GIRDERS

BY B. N. LOVE

Strength is a prime consideration for any structural engineer, but so is lightness and economy. Frank Hornby was fully aware of these principles and since he started off with tinplate, design of his basic parts was critical if they were to prove durable. Fortunately the simple process of putting a right-angled bend into a strip of metal alters its characteristics to suit the engineer admirably. Take any strip of notepaper, for instance, which is quite unrigid and floppy and then put a fold down the centre of its length. The strip is still flexible but not so floppy as before. Now open out the fold to a Vee shape and you have instant rigidity along the length of the strip. You have, in fact, formed an elementary girder! It really is as simple as that.

Angle Girders came into the system very early on in its history when the name "Meccano" was rapidly being established as an international household word and its design, being so fundamentally simple and satisfactory, has hardly been altered since. This is certainly true of the Angle Girder which forms the rigid framework of so many Meccano models. Most readers are familiar with its properties but the manufacture of the Angle Girder is a story of its own. Strip steel, $1\frac{1}{16}$ in. wide and $\frac{1}{32}$ in. thick, is passed into a piercing press from which it emerges in a continuous length punched with the familiar pattern of holes shown in Fig. 1. A second machine 'crops' the continuous lengths into standards as required for the full range of Angle Girders and a further machine puts the right-angled fold into the finished parts before the cleaning and plating process.

In its unfolded form, the Angle Girder is known as the Flat Girder (which is really a contradiction in terms.) It should be more properly named the "Wide Perforated Strip" as it possesses no rigid properties of its own. However, when it is combined with the standard Angle Girders as shown in Fig. 2, it provides a strong web for the compound channel girder thus formed. Flat Girders came on to the Meccano scene as a standard part at about the time of the First World War. They were listed as a part number in $5\frac{1}{2}$ in. length only but were not even included in the top set of the day, Outfit No. 6. Consequently, they seldom featured in the manuals of instructions but they did appear in the first advanced model of the famous Meccano Loom, (beyond the scope of the No. 6 Outfit) in 1919, if not earlier. Since that time they steadily became a popular choice for the model-builder as their versatility was disclosed and exploited. The basic dimensions of the Flat Girder are shown in Fig. 1.

Elongated slots are the key to the versatility of the Flat Girder although 'centre line' dimensions of the holes still conform to the half-inch standard. Fig. 1a shows the 'spread' available when a pair of Flat Girders are lapped over each other and this can be extended by lapping slot to slot. Since Flat Girders are available in ten sizes from $12\frac{1}{2}$ in. downwards, the Meccano constructor has a whole range of adaptable plates at his disposal.

The chassis members of Fig. 2 show one aspect of the Flat Girder

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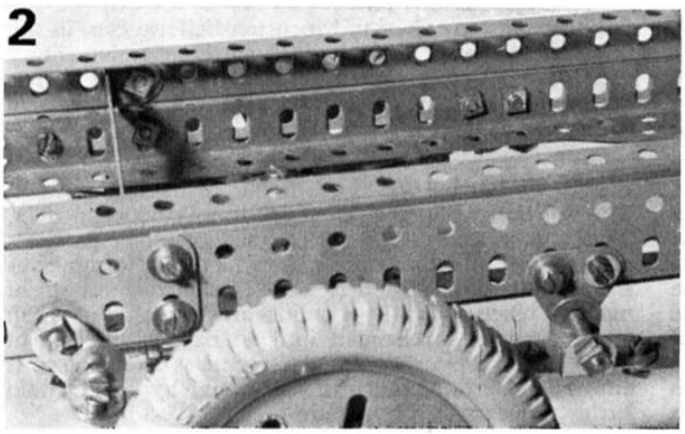
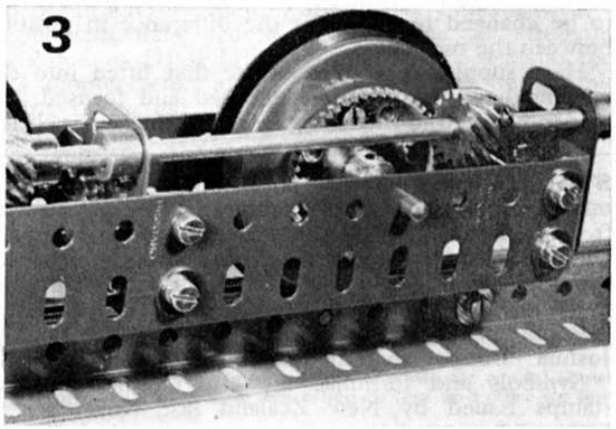
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