

# PATENT SPECIFICATION



Application Date: May 11, 1921. No. 13,345/21.

177,430

Complete Accepted: Mar. 30, 1922

## COMPLETE SPECIFICATION.

### An Eccentric for use in Building Constructional Toys.

I, FRANK HORNBY, of Meccano Limited, Binns Road, Old Swan, Liverpool, British subject, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to an eccentric for use in the building of constructional toys or models made up of interchangeable parts, the various parts being capable of being built up into models which may afterwards be taken to pieces and the parts used in building other models. It is desirable in such constructional toy systems for each part to have several uses, and that the parts in order to be economically manufactured and in quantity should be made from sheet metal by press tools. A toy eccentric has been proposed, the sheave made of two sheet metal discs secured together by tongue pieces punched from one or both discs which were passed through apertures in the opposing disc and bent over, the strap for the eccentric being formed as a closed ring sheet metal stamping, but in that arrangement no means was proposed for positively spacing the sheave cheeks apart and the strap ring rotated on the tongue pieces, which would not be a satisfactory arrangement, whereas in the present invention the sheave cheeks are spaced positively apart by a central disc which also forms a circular bearing for the strap ring.

According to this invention, the eccentric sheave consists of a central disc and two outer cheek plates of slightly larger diameter than the central disc thus forming a peripherally flanged sheave. The eccentric strap is a single piece sheet metal stamping consisting of a ring adapted to fit over the central disc

between the projecting flanges provided with an arm in which is a perforation or perforations by means of which the eccentric can be pivotally connected to the part to be reciprocated. The flanged eccentric sheave formed by the three discs is provided with one or more apertures for the rod or shaft eccentric to the sheave, and where a series of such eccentric apertures is provided they may be arranged at different radial distances from the sheave centre to enable the eccentric to have different throws.

The invention is illustrated in the accompanying drawings in which Figs. 1 to 4 show the various parts from which the eccentric is built up, Fig. 1. being a view of the stamped sheet metal strap. Fig. 2. the central disc of the sheave and Figs. 3 and 4 the cheek plates. Fig. 5. is an end view showing the parts of the eccentric assembled. Figs. 6, 7 and 8 are diagrammatic views showing the action of the eccentric for different adjustments of the throw.

The eccentric consists of a strap, Fig. 1, of stamped sheet metal comprising a ring 1 on which is an arm 2, the latter having one or more perforations 3 the pitch of which may advantageously conform to the standard pitch of the perforations in the other parts of the constructional toy system. The sheave of the eccentric is built up of three stamped sheet metal plates, Figs. 2, 3 and 4, a central disc plate 4 of such a diameter as to fit within the bore 5 of the strap 1 and two sheet metal outer cheek plates 6, 7. The three plates 4, 6 and 7 are secured together by rivetting after the strap 1 has been positioned round the central disc and between the outer plates. This may be effected by means of tubular bosses 8, reduced portions 9 on which are

passed through apertures 10 formed in the cheek plates and the central disc and rivetted over at 11 to secure the three plates together. The bosses have bores 5 12, as shown in Figs. 4 and 5, so that a driving rod or shaft may be inserted through any one of the bosses. If desired the eccentric may only be arranged for one definite eccentricity or 10 throw, in which case only the one boss would be required, but it is desirable in order to rivet the discs closely together to have a series of rivetting bosses, and advantage is taken of this fact to arrange 15 the bosses at different radial distances from the centre of the sheave and thus enable the eccentric to be set so as to give different throws. As will be seen for instance in Fig. 6, the bores *a*, *b*, and 20 *c*, of the three bosses are at various radial distances, so that by inserting the driving shaft 13 in the aperture *a*, Fig. 6, the throw of the eccentric will be *x*, the diameter of the dotted circle, whereas by 25 inserting the shaft in the aperture *b* the throw of the eccentric becomes larger being then represented by the diameter *y*, and similarly if the shaft be inserted in the third aperture *c* the throw 3 becomes still larger as shown by *z*. In operation the arm 2 of the eccentric is bolted at 14 by one of its end holes to a sliding strip or rod 15 or other element of the toy system which it is desired to 30 reciprocate, the strip in the form shown sliding in the guides 16.

An eccentric as described may be very cheaply manufactured entirely from stamped sheet metal parts, and owing 40 to the different throws available due to the different eccentricities of the apertures *a*, *b*, *c*, it may be utilised in a variety of ways. Although only three rivetting bosses have been shown, 45 it is obvious that four or a greater

number of bosses might be provided and the range of eccentricity thus further increased.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. An eccentric for use in the building of constructional toys or models from 55 interchangeable parts in which the sheave of the eccentric is built up from three sheet metal discs secured together, the central disc being of smaller diameter than the two outer discs so as to produce 60 a peripherally flanged sheave.

2. An eccentric for use in the building of constructional toys or models from interchangeable parts in which the sheave is provided with a series of apertures at 65 different radial distances from the sheave centre for the purpose of enabling the eccentric to be set on the driving shaft to give different throws.

3. An eccentric for use in the building 70 of constructional toys or models from interchangeable parts in which the sheave of the eccentric is formed of stamped sheet metal plates, the central plate or disc being of smaller diameter than the 75 outer cheek plates, and the plates being rivetted together by a tubular boss or bosses into which the driving shaft fits.

4. The eccentric for use in the building of constructional toys or models, substantially as described and shown in Figs. 1 to 8 inclusive of the accompanying drawings.

Dated this 30th day of April, 1921.

For the Applicant,  
A. J. DAVIES,  
Patent Agent,  
37, Moorfields, Liverpool.

85

[This Drawing is a reproduction of the Original on a reduced scale]

Fig. 1.

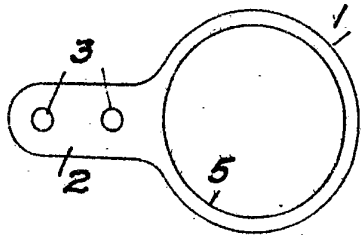


Fig. 2.

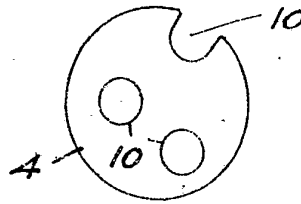


Fig. 3.

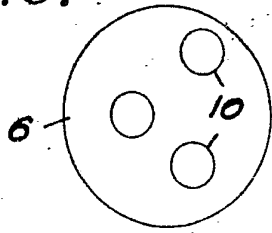


Fig. 4.

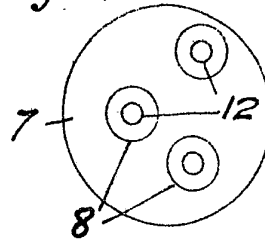


Fig. 6.

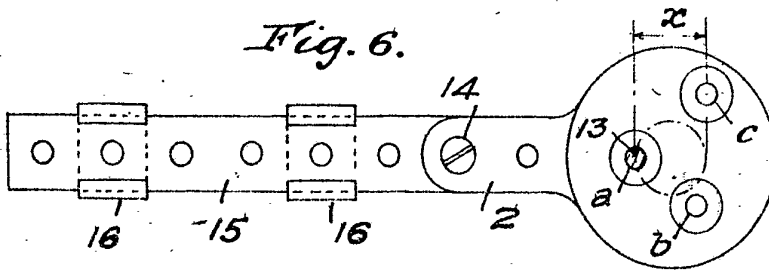


Fig. 7.

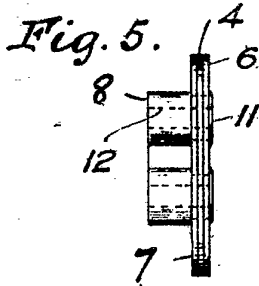
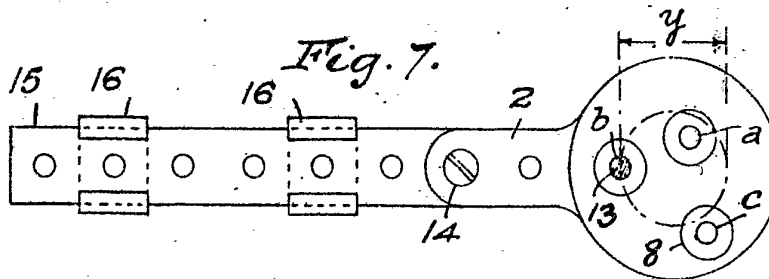


Fig. 8.

