

F. HORNBY.  
 ECCENTRIC.  
 APPLICATION FILED AUG. 31, 1921.

1,412,117.

Patented Apr. 11, 1922.

Fig. 1.

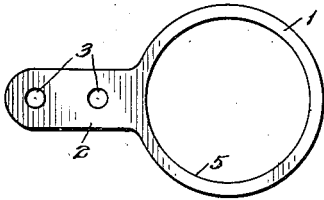


Fig. 2.

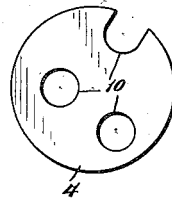


Fig. 3.

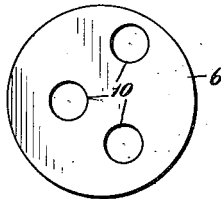


Fig. 4.

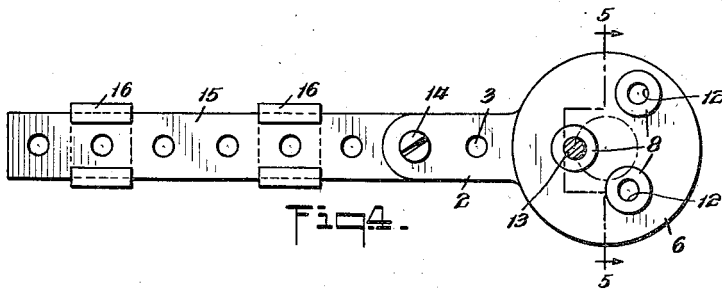


Fig. 5.

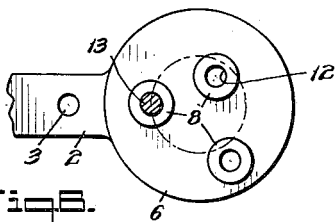


Fig. 7.

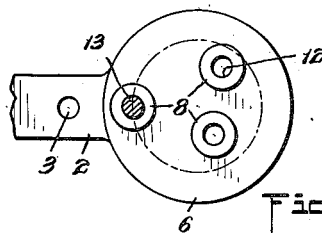
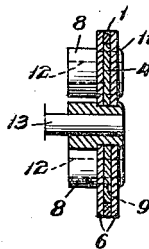


Fig. 6.



INVENTOR  
*Frank Hornby*  
 BY  
*Dunn, Goodlett, Massie & Scott*  
 ATTORNEYS

# UNITED STATES PATENT OFFICE.

FRANK HORNBY, OF LIVERPOOL, ENGLAND, ASSIGNOR TO MECCANO LIMITED, OF LIVERPOOL, ENGLAND, A BRITISH CORPORATION.

## ECCENTRIC.

1,412,117.

Specification of Letters Patent. Patented Apr. 11, 1922.

Application filed August 31, 1921. Serial No. 497,239.

*To all whom it may concern:*

Be it known that I, FRANK HORNBY, a subject of the King of Great Britain, residing at Liverpool, England, have invented a new and useful Improvement in Eccentrics, of which the following is a specification.

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.

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 are one or more 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 sheaves, 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.

One embodiment of the invention is illustrated in the accompanying drawings in which:

Fig. 1 shows an eccentric strap;

Fig. 2 shows a perforated central disc of a sheave;

Fig. 3 shows a cheek plate of a sheave;

Fig. 4 shows an assembled eccentric connected to a perforated strip;

Fig. 5 is a section of such eccentric taken on line 5—5 of Fig. 4; and

Figs. 6 and 7 are fragmentary views similar to Fig. 4 illustrating different throws of the eccentric.

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 and 3, 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. The plate 4 and two plates 6 are secured together by riveting 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 riveted over at 11 to secure the three plates together. The bosses have bores 12, as shown in Figs. 4 and 5, so that a driving rod or shaft 13 may be inserted through any one of the bosses.

If desired, the eccentric may only be arranged for one definite eccentricity or 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 riveting bosses, and advantage is taken of this fact to arrange 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 shown in Figs. 4, 6 and 7, the bosses 8 are spaced at different radial distances from the centre of the sheave, so that the throw of the eccentric may be made small, medium or large by inserting the shaft 13 in a particular one of the bosses, the resulting throw in each case being indicated by dotted circles in said figures.

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 reciprocate, the strip in the form shown sliding in guides 16.

An eccentric as described may be very cheaply manufactured entirely from stamped sheet-metal parts, and owing to the different throws available due to the different eccentricities of the apertures in the various bosses 8, it may be utilized in a variety of

ways. Although only three riveting bosses have been shown, it is obvious that four or a greater number of bosses might be provided and the range of eccentricity thus  
5 further increased.

What I claim is:

1. An eccentric, comprising a circular sheet-metal disc having a number of eccentric perforations each adapted to receive a  
10 bearing for the eccentric shaft, an eccentric strap to cooperate with said disc, and means for maintaining said strap and disc in operative relation.

2. An eccentric, comprising a circular  
15 sheet-metal disc having a plurality of eccentric perforations, said perforations being of various eccentricity, an eccentric strap to cooperate with said disc, means for maintaining said strap and disc in operative relation,  
20 and tubular bearing-elements for said perforations.

3. A sheave for eccentrics, comprising a circular sheet-metal disc of one diameter and having a number of perforations, two sheet-  
25 metal discs of larger diameter and having perforations registering with said first-named perforations, and means for securing said circular disc between said larger discs, said means comprising a plurality of tubular

bearing-elements mounted in said registering 30 perforations.

4. An eccentric for use in the construction of working models, toys or the like, embodying a sheave comprising three sheet-metal discs, the central disc being circular and  
35 of different diameter than the other two discs, a strap comprising a stamped sheet-metal closed ring fitting said central disc, and an arm on the ring provided with perforations to register with standard pitch  
40 perforations on other elements of a toy building outfit.

5. An eccentric for use in the construction of working models, toys or the like, comprising a sheave built up from three  
45 sheet-metal discs, the central disc being of smaller diameter than the outer discs, and a number of tubular rivets to hold the three discs together and provide bearing surfaces.  
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6. In combination with a flanged sheave built up of sheet-metal discs secured together, an eccentric strap formed of a sheet metal stamping and comprising a closed  
55 ring fitting the sheave and an arm on the

FRANK HORNBY.