



No. 15,136/14.

APPLICATION DATED

22nd December, 1914.

Date claimed for Patent under Sec. 121, 18th Feb., 1914,  
being date of first Foreign Application (in Great  
Britain, No. 4183).

**Under International Convention.**

<i>Applicant</i>	...	...	...	...	FRANK HORNBY.
<i>Application and Complete Specification</i>	...	...	...	...	Received, 22nd December, 1914.
<i>Specification</i>	...	...	...	...	Open to inspection, 19th February, 1915.
<i>Acceptance</i>	...	...	...	...	Advertised, 11th May, 1915.

**Class 53.9.**

*Drawing attached.*

**COMPLETE SPECIFICATION.**

**“An improved element for use in building constructional toys or models.”**

I, FRANK HORNBY, of 274 West Derby Road, Liverpool, England, Manufacturer, hereby declare this invention, and the manner in which it is to be performed, to be fully described and ascertained in and by the following statement:—

This invention relates to an improved part or element for use in the construction of toys or small engineering models, adapted to be built up from interchangeable separate parts, such models being capable of being taken to pieces and the parts utilised to be re-made up into other toys or models as required. It is desirable that as many of the parts as possible used in the construction of such toys or models should be available for fulfilling several functions, in order that the number of parts required in an outfit for building a series of models should be minimised. The object of the present invention is to provide such a part which shall be capable of a variety of uses or functions.

According to this invention the part or element consists of a perforated web piece provided with a tubular boss fitted with a set screw, the element being available for use as an ordinary crank to convert reciprocating into rotary movement, or vice versa,

or as a bearing for horizontal or vertical rods, or as an operating lever.

The invention is illustrated in the accompanying drawings, in which:—

Figs. 1 and 2 are face and side views, respectively, of the element,

Fig. 3 being a vertical section.

The remaining views show applications of the element in toy or model construction,

Fig. 4 showing the element used as an ordinary crank.

Figs. 5 and 6 are face and end views, respectively, showing the element used to form a reinforced bearing for a shaft or spindle.

Fig. 7 shows the element forming a projecting bracket bearing.

Fig. 8 is an example of the use of the element as a rocking lever to impart reciprocating movement to a piece from an oscillating shaft, or vice versa.

Fig. 9 shows its application as a footstep bearing, and

Fig. 10 the application of the part as an operating or hand lever coupled to an actuating cord.

The element comprises a web to which is secured, in any suitable manner, a boss fitted with a grub or pinching screw 3. The

boss is preferably connected to the web by expanding its end into an orifice formed in the web. In the web are formed, preferably, two perforations, a hole 4 and an outer slot 5, or in place of the hole and slot a single slot perforation may be made, and extending if desired to the hole 4. The pinching screw 3 in the boss enables the part to be gripped to a rod or the like when acting as a crank or oscillating element, or when the screw is slackened the boss may then act as a bearing for a rod rotatably mounted therein. In Fig. 4 the element is shown coupled by a bolt 6 to one of the perforated strips 7 used in constructional toys and here acting as a connecting rod, the strip 7 being bolted in the slot 5 of the element 1, the boss of which is gripped to the shaft 8 by its pinching screw 3. In this arrangement, therefore, the strip 7 may work freely over the flush face of the element, the latter acting as a crank as the rod 8 rotates. In the arrangement shown in Figs. 5 and 6, the element is shown used for reinforcing a bearing. In the systems of building up constructional toys from perforated strips and perforated plates such as the plate 9 illustrated in Fig. 5, the journaling of a shaft in one of the perforations of such a plate is apt to wear a groove in the shaft, and it is desirable to provide a more substantial bearing. By fitting an element in accordance with this invention this may be effected, the tubular boss 2 of the part 1 being centralised with the perforation in the plate 9 which is to form the bearing for the shaft 10, the web of the element 1 being secured by bolts 11 passed through the perforations in the web and in the perforated plate 9. The distance apart of the hole 4 in the web and the bore 2a of the boss 2 should correspond with the standard pitch of the perforations in the interchangeable parts of the system. By bolting the part 1 at 11, Fig. 7, to the edge of a perforated plate 9, so that the boss 2 overhangs the edge of the plate, the element forms a very suitable projecting bracket bearing for a shaft 10. Fig. 8 shows an application of the device as a rocking lever, it being gripped by its pinching screw to the rocking shaft 8, and coupled by bolt 11 passing through its slot 5 to a strip 12 slidably mounted in the guides 13, the bolt 11 passing through one of the perforations in the strip 12, which is a form of strip well known in connection with this type of model building. If the bolt connection 11 be left somewhat loose, or lock-nutted, oscillation of the

element 1, as indicated by the arrows, may be utilised to effect a reciprocating slidable movement of the part 12. In Fig. 9 is shown an adaptation of the element 1 to form a footstep bearing for a shaft 10, the element being secured by the bolts 11 to a flanged plate 9a, the boss 2 of the element forming the socket of the footstep bearing. Where it is desired to provide an operating handle in the toy or model for moving some part of the model, say, by means of a connecting cord, an arrangement such as that shown in Fig. 10 may be adopted, the element 1 being gripped by its pinching screw to the shaft 8, which is journalled in, say, a perforated upright strip 14, the actuating cord 15 being connected to the slot 5 in the element which may thus be utilised as a controlling handle

The slot 5 in the web of the element is a feature of considerable importance, inasmuch as when the element is used as a crank, Fig. 4, or a rocking lever, Fig. 8, by securing the strip 7 or 12, or other reciprocating part, at different radial distances along the slot, the throw of the element may be varied for a given oscillation or rotation; and in the case of the footstep bearing shown in Fig. 9, if only ordinary circular perforations or holes were provided in the web of the element, the bore of its boss 2 would coincide with one of the perforations in the plate 9a, when such ordinary perforations in the web were bolted in the standard pitched perforations in the plate, and the part, therefore, would not properly serve as a footstep, but by the provision of a slot in the web the bore of the boss 2 may be adjusted so as not to coincide with the perforations in the plate 9a, the element being bolted through its slot to the standard pitched perforations in the plate 9a.

The drawings show typical examples of the application of the element to constructional toy building from interchangeable separate parts such as referred to, but there are many other analogous uses in such toy or model building to which the element may be put, and its application is not restricted to the examples illustrated.

Having now fully described and ascertained my said invention and the manner in which it is to be performed, I declare that what I claim is:—

1. An element for use in the building of constructional toys or models from interchangeable parts, comprising a web or plate provided with a tubular boss fitted with a

pinching screw, the web of the element having a slotted perforation.

2. An element for use in the building of constructional toys or models from interchangeable parts, comprising a web or plate provided with a tubular boss fitted with a pinching screw, the web of the element having slotted and circular perforations.

3. A crank element for use in the building of constructional toys or models from inter-

changeable parts, substantially as described and shown in the accompanying drawings.

Dated this 21st day of December, A.D. 1914.

EDWIN PHILLIPS,  
Patent Attorney for the Applicant.

Witness—Frank Helps Cain.

FRANK HORNBY.

Element for Constructional Toys.

Fig. 1. Fig. 2. Fig. 3.

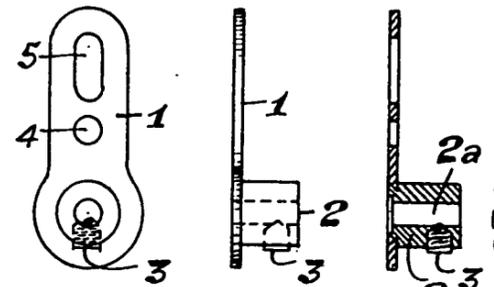


Fig. 4.

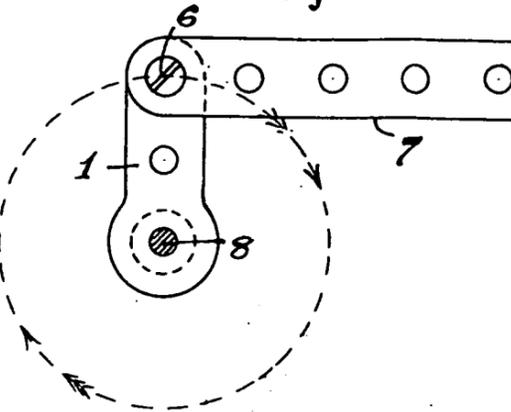


Fig. 5.

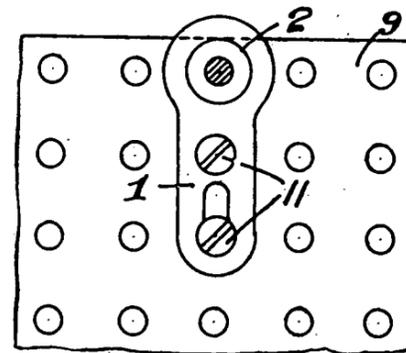


Fig. 6.

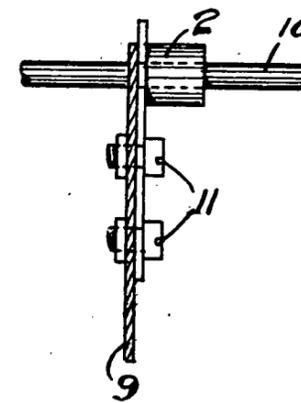


Fig. 8.

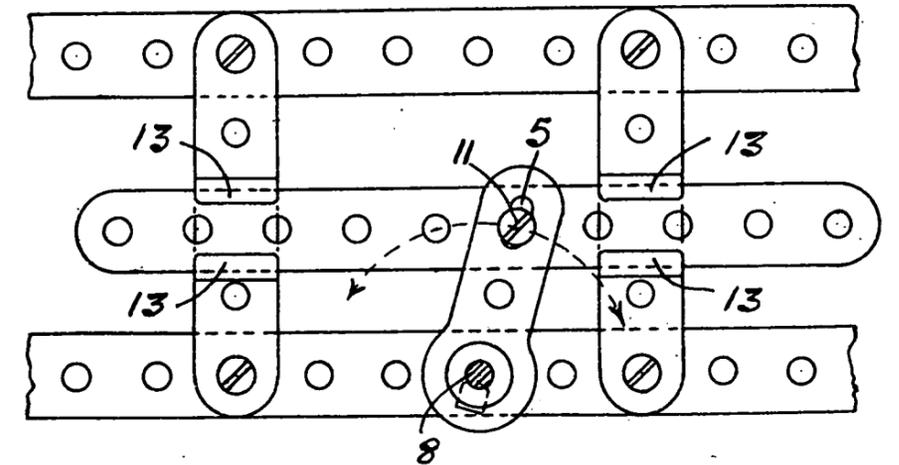


Fig. 7.

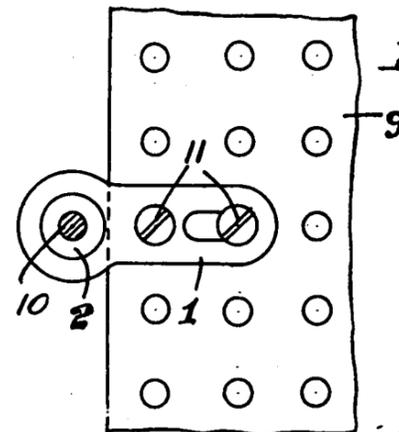


Fig. 9.

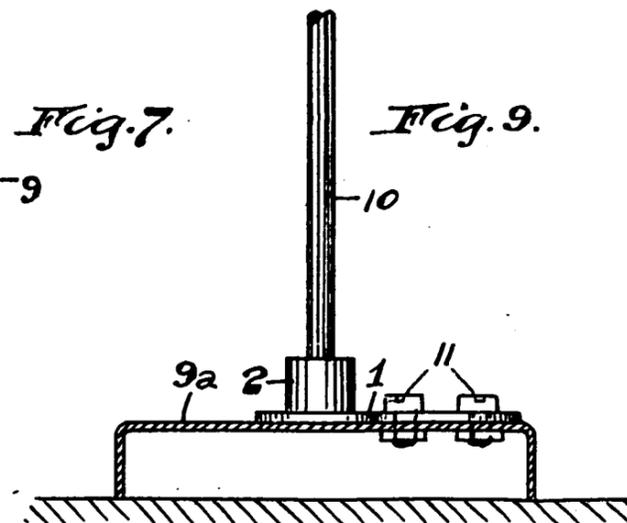


Fig. 10.

