

N<sup>o</sup> 8554



A.D. 1913

*(Under International Convention.)*

Date claimed for Patent under Patents and Designs }  
Act, 1907, being date of first Foreign Appli- } 13th Jan., 1913  
cation (in Germany), }

Date of Application (in the United Kingdom), 11th Apr., 1913

Accepted, 23rd Oct., 1913

COMPLETE SPECIFICATION.

Improvements in Constructional Toys.

We, NÜRNBERGER METALL- & LACKIER-WAARENFABRIK, vorm GEBRÜDER BING  
ACTIENGESELLSCHAFT, of 16, Blumenstrasse, Nuremberg, in the Empire of  
Germany, Manufacturers of Metal Articles, do hereby declare the nature of this  
invention and in what manner the same is to be performed, to be particularly  
5 described and ascertained in and by the following statement:—

The object of the present invention is a constructional toy for making toy  
machines, toy factory plant, and the like. Toys of this kind are usually built  
up of separate bars which have to be connected together.

10 According to the present invention we provide a constructional toy which  
comprises three groups of constructional elements, namely, (a) rods or bars of  
resistant material, more particularly metal; (b) joint members acting as sockets  
for the purpose of connecting these rods and bars together and (c) locking  
members in order to tighten up the various connections.

15 By employing socket connections of this type it is not necessary to perforate  
the bars, which is obviously a great advantage. The socket-like joint members  
will be described in detail by a reference to the accompanying drawings. The  
locking devices comprise wedge-like members which are adapted to wedge  
together the bars and joint members, and these wedges are preferably carried  
20 on rings or the like adapted to slide over the bars. In addition to, or in some  
cases instead of, these locking members other locking devices may be employed  
which essentially consist of rings or the like adapted to slide on the bars but  
containing an internal spring, preferably a split spring. These latter devices  
are very suitable when wheels have to be connected with the bars. They are  
25 also very useful when the parts are to be connected in such manner as to be  
rotatable but not displaceable longitudinally.

Further modifications of our invention will be described in detail with refer-  
ence to the drawings.

In the accompanying drawings:—

30 Figures 1—3 illustrate a T-shaped joint member; whilst  
Figures 4—6 show the corresponding wedge member; and  
Figure 7, the finished connection.

A T-shaped piece is provided with bores *b* and *c* of the same diameter in  
both arms. The width of the bores is such that the T-shaped piece can turn

[Price 8s.]



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loosely and be easily displaced on the cylindrical rod  $d$  with the least possible play. The bores are enlarged at the ends to form a wedge shaped groove  $e$ .

The wedge member  $f$  is formed with a plate or head which provides for handling. A hole  $g$  of the exact width of the bores or passages in the T-shaped piece, is provided in the centre of the plate, so that the wedge member can also turn loosely and be easily displaced on a bar or rod. The member  $f$  has a wedge-shaped projection  $h$ , which extends in the axial direction of the bore  $g$ , is curved on its inner face corresponding to the contour of this bore, and fits into the grooves  $e$  in the T-shaped piece.

By simply fitting together the two parts hereinbefore described it is easily possible to firmly connect the joint piece  $a$  with the bar or rod  $d$ . The child only requires to turn the wedge member relatively to the joint member until the wedge projection stands opposite the groove, whereupon the wedge easily slips into the groove when a slight pressure is applied. The wedge projection is pressed inward so far that it rests firmly on the bar, so that both parts are now prevented from turning and from being displaced longitudinally relative to the bar. This connection may be made at any suitable point on the bar.

The connection of the round bars or rods with other suitable joint members, like those shown in Figures 8—14, may be made in similar manner, and by means of these connection can be made with other bars or rods. The form illustrated in Figure 8 enables two rods or bars to be connected at an acute angle, and the joint member provided with four bores or passages at right angles to one another, as illustrated in Figure 11, enables four rods standing at right angles to one another to be connected together. Such joint members or unions are only capable of being made of strong materials.

Of course wedge pieces may be provided which have wedge-shaped projections on both sides. Also instead of a single wedge-shaped projection a ring of a larger number, for instance, four such projections, may be provided. The manufacture of the unions or joint members is thereby simplified because their respective wedge grooves as a whole form a conical enlargement which may be made by turning or milling.

Such a joint member is illustrated in Figures 15—17 and the corresponding wedge member in Figures 18—20.

The joint member has at both ends of its longer bore and at the outer end of its central bore a conical enlargement  $m$ . A conical neck  $o$  which is divided into four wedge-shaped projections by means of four slots, is provided on the wedge member  $f'$ . In making the connection between these parts it is unnecessary to turn the wedge member into a suitable position relatively to the joint member. As, however, the pressure which must be exerted in fitting the two parts together is distributed over four wedge-shaped tongues, whilst in the construction first described only a single tongue had to be pressed in, it appears doubtful whether a child would be able to exert the necessary pressure merely with its fingers to enable a firm connection to be made. The tool illustrated in Figures 21 and 22 is therefore provided.

This tool consists of a pliers  $p$  having an outer mouth  $s$  and an inner mouth  $t$ . The jaws are forked at  $q$  and recessed at  $r$ . The width of the outer mouth when the jaws are closed is such that a joint member together with the wedge member which is to be pressed into it can be gripped. By means of this pliers a perfectly firm connection can be made. In order again to release the connection, the head of the wedge member is held with the inner mouth  $t$  and the joint member released by being turned with the fingers.

In addition to the rods or bars  $d$ , the joint members  $a$  and the wedge members  $f$  and  $f'$ , rings  $u$  may be employed which are passed on to the rods  $d$  and secured against lateral displacement but not against rotation, as is shown in Figures 23—26.

A groove  $v$  is formed in the ring  $u$  for receiving a clamping spring  $x$  which projects beyond the inner periphery of the ring (Figures 23 and 24). When

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the ring is pushed on to a rod *d* against the resistance of the spring, any further displacement is prevented, but it is quite possible to easily rotate the ring on the rod. By forming the ring as a wheel hub (Figure 25) no further attachment of the wheel is necessary. The spring pressure is so calculated that the wheel will not be displaced sideways of itself, but can still easily rotate. Such rings may also be employed for securing bodies against displacement on the rods *d*. Should a joint member, for example, have to turn but not be displaced on a rod, a ring *u* is pushed against each of its end faces (Figure 26). The possibility of the ring *u* rotating of itself does not in this case come in question.

The arms of the joint members may also be tapered and provided with axial slots. In this case the wedging is effected by means of clamp rings provided with an inner cone. These are drawn by hand, or by means of the tool illustrated, over the arms of the joint members after their bores have received the rods.

Any suitable kinds of working machines, transmissions and the like and also models of working appliances, useful articles and building constructions can be made from the constructional elements.

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

1. A constructional toy, more particularly for making working toy machines, provided with three groups of constructional elements, namely: (a) rods or bars of resistant material, more particularly metal; (b) joint members acting as sockets for connecting the said rods or bars together; and (c) locking members, substantially as described.

2. A constructional toy as in Claim 1, in which are employed rings having an internal clamping spring for fitting on the rods or bars, substantially as described.

3. A construction of the toy, as in Claim 1, in which the locking members are formed as easily displaceable wedge members on the rods or bars and have one or more wedge-shaped projections fitting into suitable grooves in the joint members, substantially as described.

4. A construction of the arrangement as in Claim 1, in which the arms of the joint members are tapered and rendered resilient by axial nicks or slots, whilst the locking members may be formed as clamp rings fitting over the tapering arms, substantially as described.

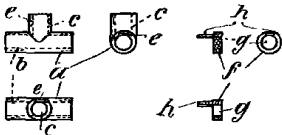
5. A construction of the arrangement as in Claim 1, in which the joint members are provided at the ends of their bores with conical enlargements and the perforated locking members with a projecting multi-slotted and suitably tapered spigot, substantially as described.

6. A tool for making and releasing the connection between the parts claimed in Claims 1, 3 and 4, consisting of pliers having an outer mouth for compressing the parts to be united and an inner mouth for releasing the united parts, substantially as described.

Dated this 10th day of April, 1913.

WM. P. THOMPSON & Co.,  
6, Lord Street, Liverpool; and at  
Bradford & London,  
Agents for the Applicants.

*Fig. 1 Fig. 2 Fig. 4 Fig. 5*



*Fig. 3*

*Fig. 6*

*Fig. 7*



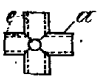
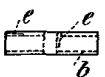
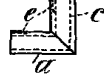
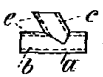
*Fig. 8*

*Fig. 9*

*Fig. 10*

*Fig. 11*

*Fig. 12*



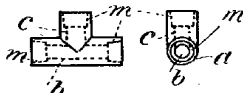
*Fig. 13*



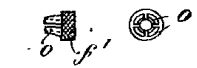
*Fig. 14*



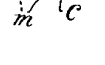
*Fig. 15. Fig. 16.*



*Fig. 18. Fig. 19.*



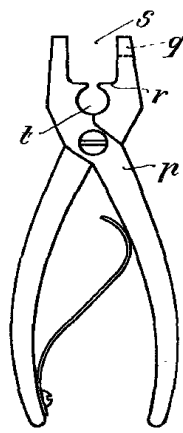
*Fig. 17.*



*Fig. 20.*



*Fig. 21.*



*Fig. 22.*



*Fig. 23.*

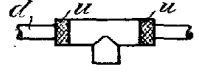


*Fig. 24.*



*Fig. 25.*

*Fig. 26.*



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

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SHEET 1.

Fig. 1 Fig. 2 Fig. 4 Fig. 5

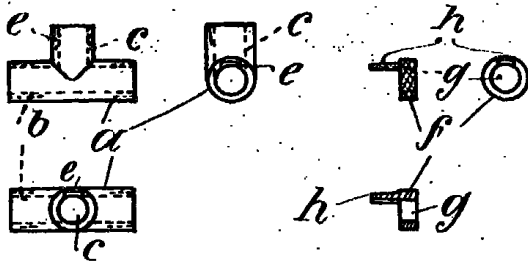


Fig. 3

Fig. 6

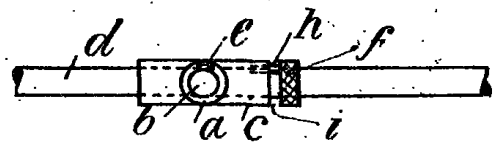


Fig. 7

Fig. 8

Fig. 9

Fig. 10

Fig. 11

Fig. 12

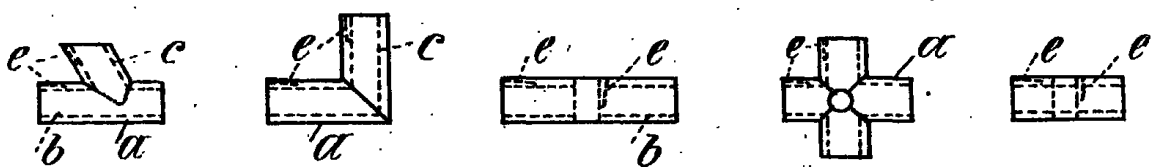
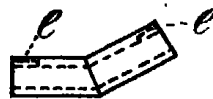


Fig. 13

Fig. 14



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

Fig. 15. Fig. 16.

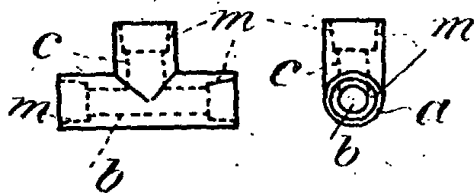


Fig. 18. Fig. 19.

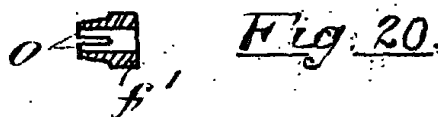
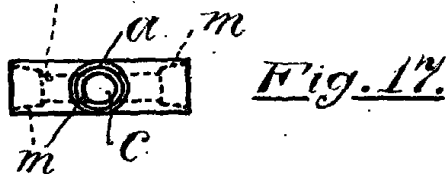


Fig. 21.

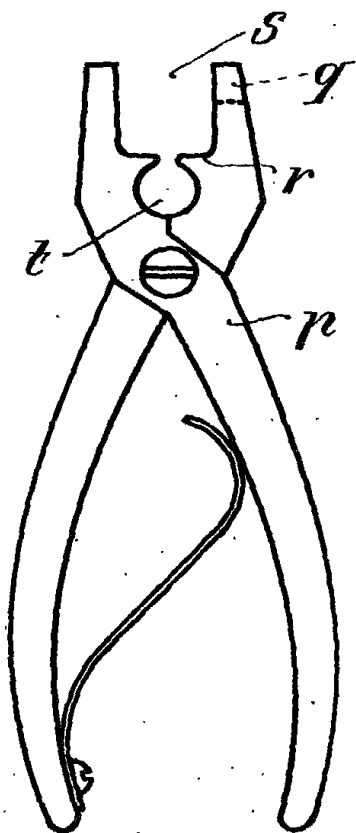


Fig. 22.

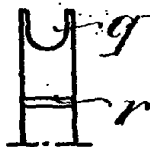


Fig. 23.

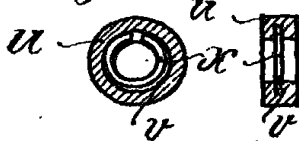


Fig. 24.

Fig. 25.

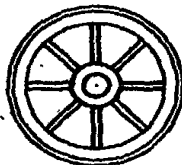


Fig. 26.



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