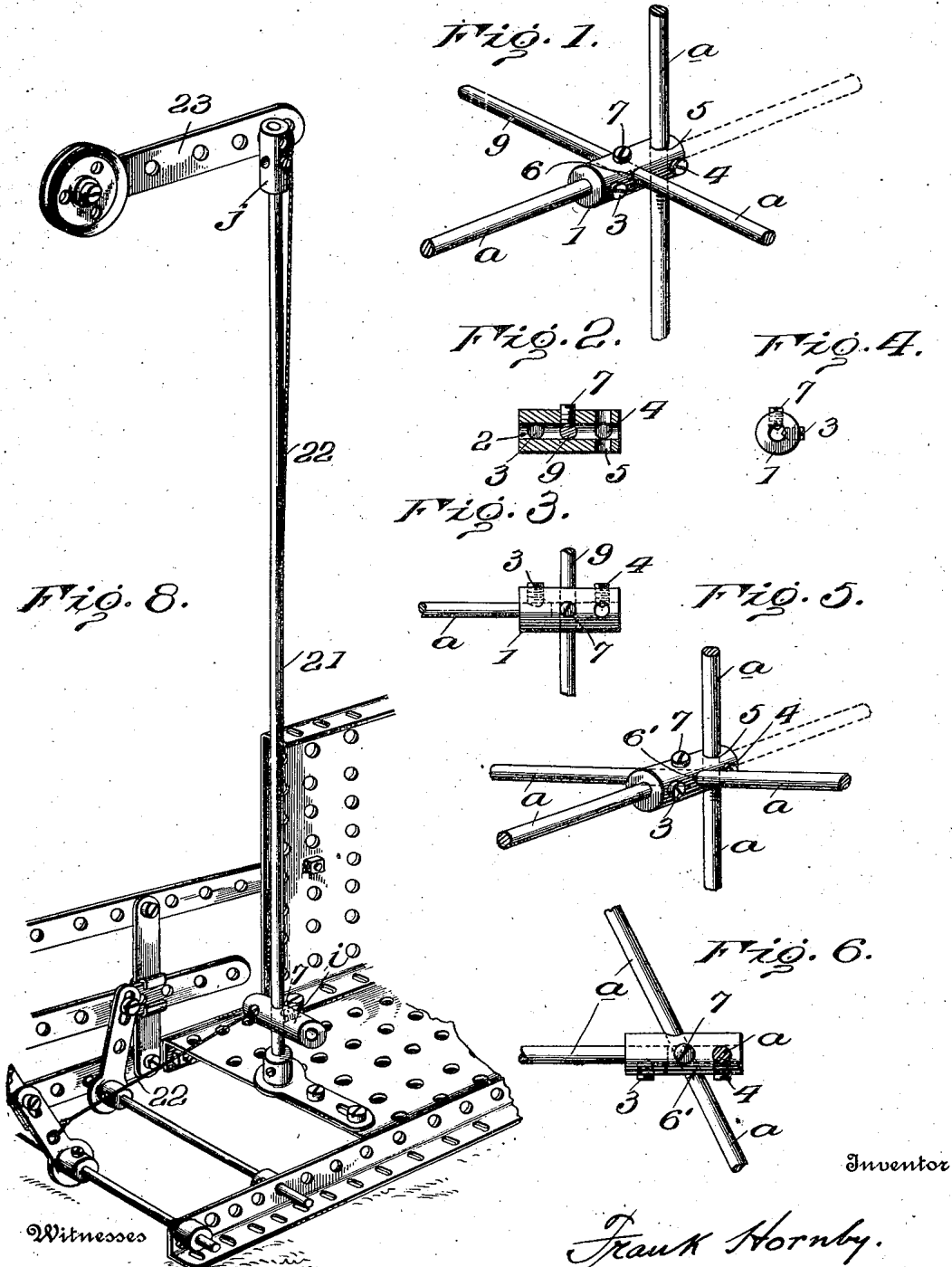


F. HORNBY.  
 TOY OR WORKING MODEL.  
 APPLICATION FILED FEB. 28, 1914.

1,166,688.

Patented Jan. 4, 1916.  
 2 SHEETS—SHEET 1.



Inventor

*Frank Hornby.*

By *Mauro, Cameron, Lewis & Cassie*  
 Attorneys

Witnesses

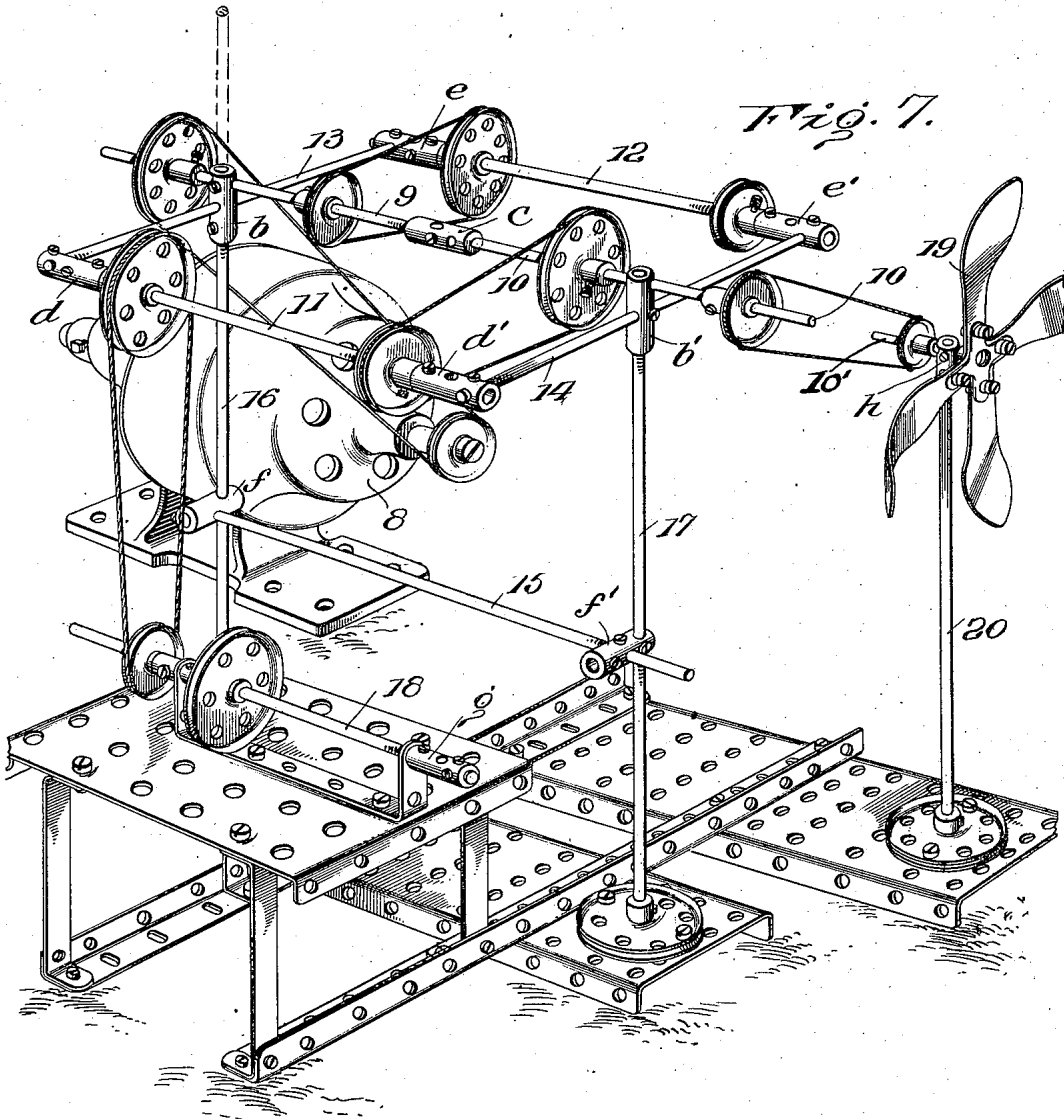
*R. C. Fitzhugh*  
*Jan. A. Anderson*

F. HORNBY.  
TOY OR WORKING MODEL.  
APPLICATION FILED FEB. 28, 1914.

1,166,688.

Patented Jan. 4, 1916.

2 SHEETS—SHEET 2.



Inventor

Witnesses  
R. C. Fitzhugh.  
Jan. H. Anderson.

Frank Hornby.  
By  
Mauro Cameron Lewis & Macie  
Attorneys

# UNITED STATES PATENT OFFICE.

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

## TOY OR WORKING MODEL.

1,166,688.

Specification of Letters Patent.

Patented Jan. 4, 1916.

Application filed February 28, 1914. Serial No. 821,740.

*To all whom it may concern:*

Be it known that I, FRANK HORNBY, a subject of the King of Great Britain, and resident of Liverpool, England, have invented a new and useful Improvement in Toys or Working Models, which invention is fully set forth in the following specification.

This invention relates to an improved toy coupling device for use in the construction of toys or small engineering models adapted to be built up from standard separate parts, such parts being capable of being taken apart and remade into other toys; and to the combination of such device with other parts of such toys or models.

In such construction of toys it is frequently desirable to connect rods or shafting arranged at different angles to extend a length of shafting, rod or the like, to provide bearings at and intermediate the ends of shafting, to provide chucks on the ends of shafts, to provide guides on rods for cords or the like, and to provide connections between the ends of rods and movable elements, such as semaphore arms and fans, etc. The toy coupling of this invention may be used for these and other purposes in toy outfits of which it is adapted to form part. Preferably the coupling element is tubular or longitudinally perforated or bored, the cross-section of said perforation being approximately the same as that of the rods, shafting, or the like in combination with which the coupling is employed. At each end the coupling is provided with securing or retaining means, here shown as pinching screws, that intersect said longitudinal perforation; and at one end said element is provided with a transverse perforation or bore arranged in a plane passing through one of said pinching screws. If desired, another similar perforation may be provided at the other end of said element in the same relation to the other pinching screw. In addition to said transverse perforation or perforations, the coupling is provided with one or more additional transverse perforations disposed intermediate the end pinching screws, said intermediate perforation or perforations being disposed in planes at right angles to the axis of said element or obliquely thereto, and being provided with retaining means or screws adapted to hold the shafting or the like therein.

The toy coupling and the combination of the same with the rods, shafting and the

like with which it is employed in the construction of toys and working models, will be better understood by reference to the accompanying drawings illustrating several embodiments of the inventive idea, and wherein:—

Figure 1 is a perspective view of one form of the coupling shown connecting together three lengths of shafting, the intermediate perforation or hole being disposed at right angles to the axis of the device or element; Fig. 2 is a vertical longitudinal section through the coupling shown in Fig. 1; Fig. 3 is a plan view; Fig. 4 is an end view of the coupling; Fig. 5 is a perspective view showing the intermediate perforation or hole disposed obliquely to the axis of the coupling; Fig. 6 is a plan view of the parts shown in Fig. 5; Figs. 7 and 8 are perspective views of two models, showing various uses of the coupling in combination with the rods, shafting and the like with which it is employed.

Referring to the drawings, wherein like reference letters and numerals indicate like parts, 1 indicates the improved coupling device which is in the form of a tubular element of metal or other suitable material having a longitudinal perforation or bore which is of the same cross-section as shafts, axles, rods, and the like *a*, in combination with which said device is employed. As shown in the accompanying drawings, the rods, axles, shafting, and the like are circular in cross-section, but it will be understood that these parts may be made of any suitable shape in cross-section, so long as the longitudinal perforation or bore 2 is made of similar shape. At each end of said device or element there is provided suitable retaining means, here shown in the form of pinching screws 3 and 4 fitted into threaded holes which intersect said longitudinal perforation or bore, so that by inserting the ends of the separate pieces of rod or shafting into the device and then tightening up the screws 3 and 4, the parts are secured in position and a rigid continuity of the shafting is obtained.

The coupling has a transverse perforation or bore 5 intersecting the longitudinal perforation or bore 2 in the plane of pinching screw 4, whereby said screw or other equivalent securing means may be available for gripping a rod disposed either axially in the bore 2 (as indicated in dotted lines, Fig. 1),

or transversely in the bore 5. If desired, a second transverse perforation or hole may be formed in the other end of said device or element in similar relation with the other pinching screw or retaining member 3.

Between the retaining members or screws 3 and 4 one or more transverse perforations or holes 6 are provided to intersect bore 2. In the arrangement shown in Fig. 1, hole 6 is formed at right angles to the hole 5. A retaining member or pinching screw 7 is positioned at the intersection of perforation 6 and bore 2 and is adapted to grip a length of shafting or the like when inserted in either of said perforations. It will be observed that the coupling shown in Fig. 1 can be utilized for connecting together shafting or rods disposed in three different directions, and it will be appreciated that such a device is extremely useful in constructing small braced toy structures or models.

In the expression of the inventive idea shown in Figs. 5 and 6, an intermediate transverse hole 6', instead of being formed at right angles to the longitudinal perforation or bore 2, is disposed obliquely thereto, as clearly shown in Fig. 6. As previously indicated, several such intermediate perforations or holes, and of different angular inclinations, may be provided.

While many advantages of the coupling in combination with rods or shafting with which it is employed, may be secured even though said transverse perforations are of a cross-section different from that of the longitudinal perforation or bore 2, said transverse perforations or holes are preferably of the same cross-section as said longitudinal perforation or bore and of the same cross-section as the rods, shafting, and the like in combination with which the device is employed, to the end that the standard sized rods or shafts employed may be used in any of said perforations, thus largely increasing the uses to which said device may be put in combination with the other parts of the toys or models in the construction of which it plays such an important part.

Some of the numerous practical uses to which the improved device may be put in combination with rods, shafting, and the like are indicated in Figs. 7 and 8. In Fig. 7, the device is shown at *b* and *b'* as bearings for shafting that is rotated from a motor 8. At *c* the device is shown as a coupling connecting the two parts 9 and 10 of said shafting; and at *d* and *d'* and *e* and *e'* it is used as bearings for counter shafts 11 and 12, respectively, the devices in these positions being supported by rods 13 and 14, rod 13 passing through the device at *b* and rod 14 that at *b'*. The device is shown at *f* and *f'* supporting a rod 15, rods 16 and 17

also passing therethrough. It will be observed that the device is used with great effectiveness in bracing together various parts of toys or models. At *g* the device is shown mounted on one end of a shaft which is driven in any suitable manner, the device at this point being used as a chuck. At *h* it is shown in the same relative position as indicated at *b*, a shaft 10', which is driven from shaft 10, projecting through the transverse opening in the end of the device and having a fan 19 mounted thereon, said device also having a rod 20 projecting into its longitudinal perforation or bore.

In Fig. 8, the device is shown at *i* mounted on a rod 21, the pinching screw that secures the device to the rod being shown in dotted lines. A cord 22 passes through the transverse perforation in the end of the device and is connected to one end of a semaphore arm 23. At *j* the device is shown as mounted on the end of rod 21, which latter projects into the bore of the device, and the semaphore arm is pivoted to said device by any suitable means, as by a pin held in the transverse perforation in the end of said device by a pinching screw (not shown) said pin passing through one of the openings in the semaphore arm.

While for the purpose of illustration two mechanical expressions of the improved device or element are shown in combination with other parts which are used in the construction of toys and working models, and while there is illustrated a number of practical uses to which the improved device or element may be put in combination with the other parts of the toys or working models, it is to be understood that these are merely for illustrative purposes only; that changes may be made in the improved device or element without departing from the spirit of the invention which is defined in the appended claims; and that various practical uses other than those indicated in the drawings may be made with the improved device or element in combination with other parts of the working models.

What is claimed is:—

1. The combination, in a working model, toy or the like, of rods, shafting, or the like of the same cross-section with a longitudinally perforated element provided with pinching screws at each end, said element also having a transverse perforation intersecting the longitudinal perforation and being arranged in a plane passing through one of said pinching screws, and a second transverse perforation intermediate the end pinching screws, said intermediate perforation being also provided with a pinching screw.

2. The combination, in a working model, toy or the like, of rods, shafting, or the like of the same cross-section, with a longitu-

dinally perforated element provided with pinching screws at each end, said element also having a transverse perforation intersecting the longitudinal perforation and being arranged in a plane passing through one of said pinching screws, and a second transverse perforation intermediate the end pinching screws, said intermediate perforation being also provided with a pinching screw, the longitudinal and transverse perforations being of the same cross-section to receive the said rods, shafting or the like.

3. The combination, in a working model, toy or the like, of rods, shafting or the like of the same cross-section, with a longitudinally perforated element, retaining means intersecting said perforation and provided at each end of said element, said element also having a transverse perforation intersecting said longitudinal perforation and being arranged in a plane passing through one of said retaining means, said element also having intermediate said retaining means a second transverse perforation intersecting said longitudinal perforation and arranged at right angles to said first-mentioned transverse perforation, and retaining means associated with said second transverse perforation.

4. The combination, in a working model, toy or the like, of rods, shafting or the like of the same cross-section, with a longitudinally perforated element, retaining means intersecting said perforation and provided at each end of said element, said element also having a transverse perforation intersecting said longitudinal perforation and being arranged in a plane passing through one of said retaining means, said element also having intermediate said retaining means a second transverse perforation intersecting said longitudinal perforation and arranged at right angles to said first-named transverse perforation, and retaining means associated with said second transverse perforation, said longitudinal and transverse perforations being of the same cross-section to receive said rods, shafting or the like.

5. The combination, in a working model, toy or the like, of rods, shafting or the like of the same cross-section, with a longitudinally perforated element, retaining means intersecting said perforation and provided at each end of said element, said element also having a transverse perforation intersecting said longitudinal perforation and arranged in a plane passing through one of said retaining means, said element also having a second transverse perforation intersecting said longitudinal perforation, and retaining means associated with said second transverse perforation, all of said perforations being of the same cross-section.

6. The combination, in a working model, toy or the like, of rods, shafting or the like of the same cross-section, with a longitudinally perforated element, retaining means intersecting said perforation and provided at each end of said element, said element also having a transverse perforation intersecting said longitudinal perforation and arranged in a plane passing through one of said retaining means, said element also having a second transverse perforation intersecting said longitudinal perforation, and retaining means associated with said second transverse perforation, all of said perforations being of the same cross-section and of the same cross-section as that of said rods, shafting or the like.

7. A longitudinally perforated element, pinching screws intersecting said perforation, said element having a transverse perforation intersecting said longitudinal perforation and arranged in a plane passing through one of said pinching screws, said element also having a second transverse perforation intersecting said longitudinal perforation and at right angles to said other transverse perforation, and a pinching screw associated with said second transverse perforation.

8. As an article of manufacture, a coupling device for use in toy building construction the same having a through main or longitudinal perforation or bore and a through intersecting transverse perforation or bore, and a single securing means at the intersection of said perforations adapted to secure a rod, shaft or the like in either perforation.

9. As an article of manufacture, a coupling device for use in toy building construction the same having a through main or longitudinal perforation or bore and a through intersecting transverse perforation or bore, and a pinching screw at the intersection of said perforations adapted to secure a rod, shaft or the like in either perforation.

10. As an article of manufacture, a coupling device for use in toy building construction the same consisting of a cylindrical metallic element having a through main or longitudinal perforation or bore and a through intersecting transverse perforation or bore, and a pinching screw at the intersection of said perforations for securing a rod, shaft or the like in either perforation.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

FRANK HORNBY.

Witnesses:

GEO. JONES,  
RALPH L. SCOTT.