N° 587 A.D. 1901

Date of Application, 9th Jan., 1901

Complete Specification Left, 9th Oct., 1901—Accepted, 30th Nov., 1901

PROVISIONAL SPECIFICATION.

"Improvements in Toy or Educational Devices for Children and Young People."

I, FRANK HORNBY of 10, Elmbank Road, Sefton Park, Liverpool in the County of Lancaster, Manager, do hereby declare the nature of this invention to be as follows:—

This invention has for its object a toy or educational device for children. There has been a long felt want among young people for some device which will enable them to construct mechanical objects without the laboriousness of turning, boring, and careful adjustment. The present invention is designed to meet this want, and provide means whereby the interest in mechanical construction from an elementary point of view, is enhanced in addition to providing an interesting means of mechanical education.

It comprises a series of pieces so made that they can be built up and fastened together to form various objects, such as railway lines, railway curves, points, inclines, bridges, tunnels, stations, signals, signal boxes, warehouses, hoists, cranes, pulleys &c, a certain amount of study, ingenuity, or intelligence being required to fit them together, so that the invention while being a toy is also a useful educational device. The pieces are made of metal of various shapes and sizes, such as flat strips of various lengths and widths, angle pieces also of various lengths and widths to form framings, railway sleepers and other structures; rounds pieces or rods to form axles and shafts &c; discs for forming wheels; tubes for forming chimneys, funnels; wires for suspension bridges and so on. The straight pieces are perforated with round holes preferably about half an inch apart each way, and a quarter of an inch or thereabouts from the edges. The angle pieces are also pierced with holes but one set are preferably elongated so as to admit of adjustment. By this means the pieces can be fastened together by bolts and nuts, into a great variety of structures, or screws may be used in which case the holes or some of them are tapped. The discs are perforated in the centre and around the edge to the centre at suitable distances. The wheels or discs have a slot at the centre hole, to admit of their being keyed to a rod or shaft. The flat strips are uniform in thickness. The metal rods are grooved longitudinally to admit of the wheels being keyed on by a child by an arrangement as follows. This comprises a small piece of thin flat steel, bent to grip the shaft. One side of the key is bent and shaped in such a manner as to fit in the groove of the shaft, and at the same time to fit into a slot in the wheel. The other side of the key is straight and prevents the wheel sliding along the shaft when not required to be keyed on to it. In the equipment, a small file may be included so as to cut the metal rods to the desired length, also a screw driver, round nosed pliers to work wire into certain simple designs, and screws and bolts. Cardboard can be employed for the roofs and floors &c of warehouses, platforms and tunnels and will lend itself to painted designs. By providing various pieces of different shapes provided with a series of holes, they can be so assembled and fastened together that a child of ordinary ingenuity can build a toy railway station, signal boxes, lines, points and other railway

[*Price* 8*d*.]

accessories without the use of special tools. Also various other objects can be assembled or built up by the exercise of a certain amount of study and ingenuity, and consequently the invention constitutes an educational device for the young as well as a toy.

To give an illustration, the flat pieces can be used for sleepers, the short angle pieces can be bolted thereto, and more flat pieces bolted against the angle pieces with their edges upwards so as to form a toy railway. The moving tongues of the toy railway points can be easily formed by utilizing one of the holes as a pivot, miniature warehouses can easily be built by a suitable assemblage and fastening together of the parts and so on.

Dated this 8th day of January 1901.

W. P. THOMPSON & Co.
Of 6 Lord Street, Liverpool,
Patent Agents for the Applicant.

COMPLETE SPECIFICATION.

"Improvements in Toy or Educational Devices for Children and Young People"

I, FRANK HORNBY of 10, Elmbank Road, Sefton Park, Liverpool in the County of Lancaster, Manager 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 has for its object a toy or educational device for children. There has been a long felt want among young people for some device which will enable them to construct mechanical objects without the laboriousness of turning, boring, and careful adjustment. The present invention is designed to meet this want, and provide means whereby the interest in mechanical construction from an elementary point of view, is enhanced in addition to providing an interesting means of mechanical education.

It comprises a series of pieces so made that they can be built up and fastened together to form various objects, such as railway lines, railway curves, points, inclines, bridges, tunnels, stations, signals, signal boxes, warehouses, hoists, cranes, pulleys, &c, a certain amount of study, ingenuity, or intelligence being required to fit them together, so that the invention while being a toy is also a useful educational device. The pieces are made of metal of various shapes and sizes, such as flat strips of various lengths and widths, angle pieces also of various lengths and widths to form framings, railway sleepers and other structures: rounds pieces or rods to form axles and shafts &c: discs for forming wheels: tubes for forming chimneys, wires for suspension bridges and so on. The straight pieces are perforated with round holes preferably about half an inch apart each way, and a quarter of an inch or thereabouts from the edges. The angle pieces are also pierced with holes but these angle pieces have the holes in one arm of the angle preferably elongated so as to admit of adjustment. By this means the pieces can be fastened together by bolts and nuts, into a great variety of structures, or screws may be used in which case the holes or some of them are tapped. The discs are perforated in the centre and around the edge to the centre at suitable distances. The wheels or discs have a slot at the centre hole, to admit of their being keyed to a rod or shaft. The flat strips are uniform in thickness. The metal rods are grooved longitudinally to admit of the wheels being keyed on by a child by an arrangement as follows. This comprises a small piece of thin flat steel, bent to grip the

shaft. One side of the key is bent and shaped in such a manner as to fit in the groove of the shaft, and at the same time to fit into a slot in the wheel. The other side of the key is straight and prevents the wheel sliding along the shaft when not required to be keyed onto it. In the equipment, a small file may be included so as to cut the metal rods to the desired length, also a screw driver, round nosed pliers to work wire into certain simple designs, and screws and bolts. Cardboard can be employed for the roofs and floors *etc.* of warehouses, platforms and tunnels and will lend itself to painted designs. By providing various pieces of different shapes provided with a series of holes, they can be so assembled and fastened together that a child of ordinary ingenuity can build a toy railway station, signal boxes, lines, points and other railway accessories without the use of special tools. Also various other objects can be assembled or built up by the exercise of a certain amount of study and ingenuity, and consequently the invention constitutes an educational device for the young as well as a toy.

To give an illustration, reference is had to the accompanying drawings, in which,

Figure 1 shows how the invention can be applied to building up a crane running on a railway track;

Figure 2 an end view;

Figure 3 a plan of a railway track;

Figures 4 and 5 detail views of the wheel and axle;

Figure 6 a detail view of the frog.

a (Figures 1, 2 and 3) are the straight flat strips of strong material perforated with a series of holes arranged transversely along the centre line at equidistant intervals apart. *b* are the angle pieces also pierced with holes, *c* interchangeable bolts and nuts capable of being passed through any of the holes. *d* (Figures 1, 2 and 4) are the discs which are perforated with a hole in the centre and provided with a V groove *e* and tread *f* with flange *d* between so that they can be used either as wheels or as pulleys. These discs have a small groove *g* in the centre hole, to admit of their being keyed to a shaft or rod. *h* (Figures 1, 2 and 5) are the metal shaft or rods grooved longitudinally at *j* to admit of the wheels being keyed thereon. *k* the piece of thin flat steel, one side of which has a tongue *m* made to fit in the groove *j* of the shaft, and at the same time to fit into a slot in the wheel. The flat pieces *a* can be used for building the crane shown in Figures 1 and 2, the gib, platform *etcetera* being bolted together as shown and then provided with wheels and axles, and also with a pulley for the hoisting cord to fall over, while a cranked bar *n* passed through holes in the strips forms a winch to wind up the load. The flat strips *a* bolted against the angle pieces *b* also form rails (Figures 1, 2 and 3) on which the wheels run, these rails being fastened together by fish plates also formed of the strips *a* and mounted upon sleepers also formed by the strips *a*, the rails being secured to the sleepers by the angle pieces *b* aforesaid and bolts and nuts *c*. The strips *a* also form guard rails at the crossings and they are bolted to the outer rails by the bolts *c* leaving the space *o* for the wheel flanges. All the bolts are interchangeable. Blocks of metal *r* to which the rails are bolted, form the frogs at the rail crossings. These frogs have flanges *s* to which the ends of two rails *a* can be bolted, and the other pair of converging rails are bolted to the sides of the frog. The holes through the frog for the bolts are made in the form of slots *t* (Figure 6) to enable the frog to be slipped into place on to the bolts *c* after the said bolts have been put into position. The frogs are made reversible, and the pieces *u* at ends act respectively as guards, or as treads for the wheels. The moving tongues of the points can be easily formed of the strips *a* by hinging them to the rails by hinges *p*, or loosely bolting thereto so that they can be moved laterally by the rod *q*. A child of ordinary ingenuity can with the same pieces and parts build a toy railway station, signal boxes, lines, points and other railway accessories without the use of special tools by

a suitable assemblage and fastening together of the parts, provided a certain amount of study and ingenuity be exercised, consequently the invention constitutes an educational device for the young as well as a toy.

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. As a new or improved article of manufacture for forming toys or educational devices for children, flat strips of strong material perforated with a series of holes arranged transversely along the centre line therein at equidistant intervals apart, in combination with interchangeable pins or bolts and angle pieces, substantially as and for the purpose described.

2. As a new or improved article of manufacture for forming toys or educational devices for children, a series of pieces such as flat strips and angle pieces with holes at equidistant intervals apart to form framings, railway tracks, or other structures, rods to form shafts, discs for wheels, tubes for chimneys and so on, the said parts being so made substantially as described, that by the exercise of inventive ingenuity they can be assembled and fastened together to form mechanical and other objects.

3. In a toy or educational device for children of the kind mentioned, the means for fastening the wheels to their axles, which consists of a piece of thin steel bent to grip the shaft and having a laterally projecting tongue adapted to engage in a groove in the shaft and also a groove in the wheel, substantially as described.

4. A series of pieces so constructed and arranged, that by the exercise of inventive ingenuity they can be assembled and fastened together to form mechanical and other toys or devices, substantially as hereinbefore described with reference to and shown in the drawings annexed.

Dated this 9th day of October 1901.

WM. P. THOMPSON & Co.
Patent Agents of Liverpool & London.

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HORNBY'S COMPLETE SPECIFICATION.

(1 SHEET)

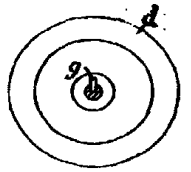

FIG.4.

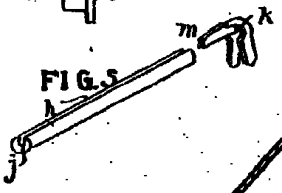

FIG.5.

FIG. 1.

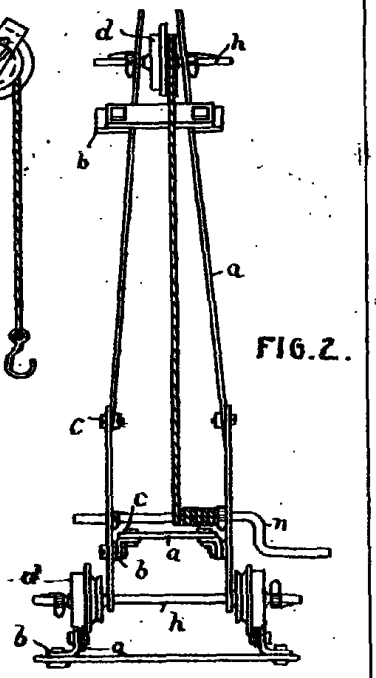

FIG.2.

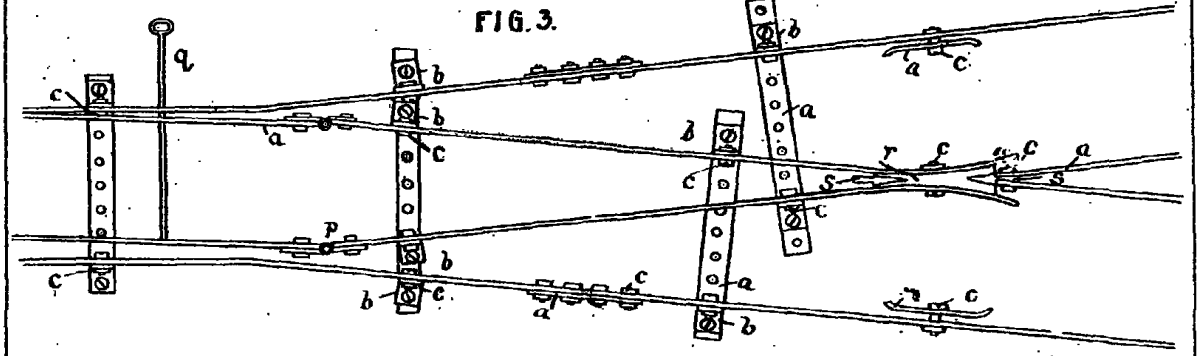

FIG.3.

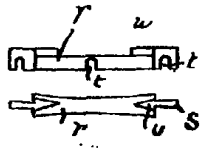

FIG.6.