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A. C. GILBERT

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CONSTRUCTION TOY

Filed Aug. 5, 1927

2 Sheets-Sheet 1

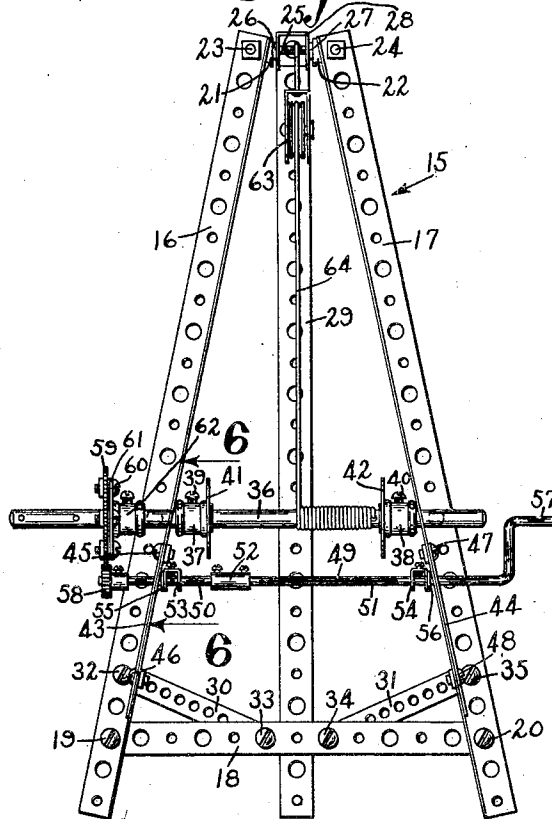
Fig. 1.



Fig. 2.

Fig. 3.

Fig. 4.



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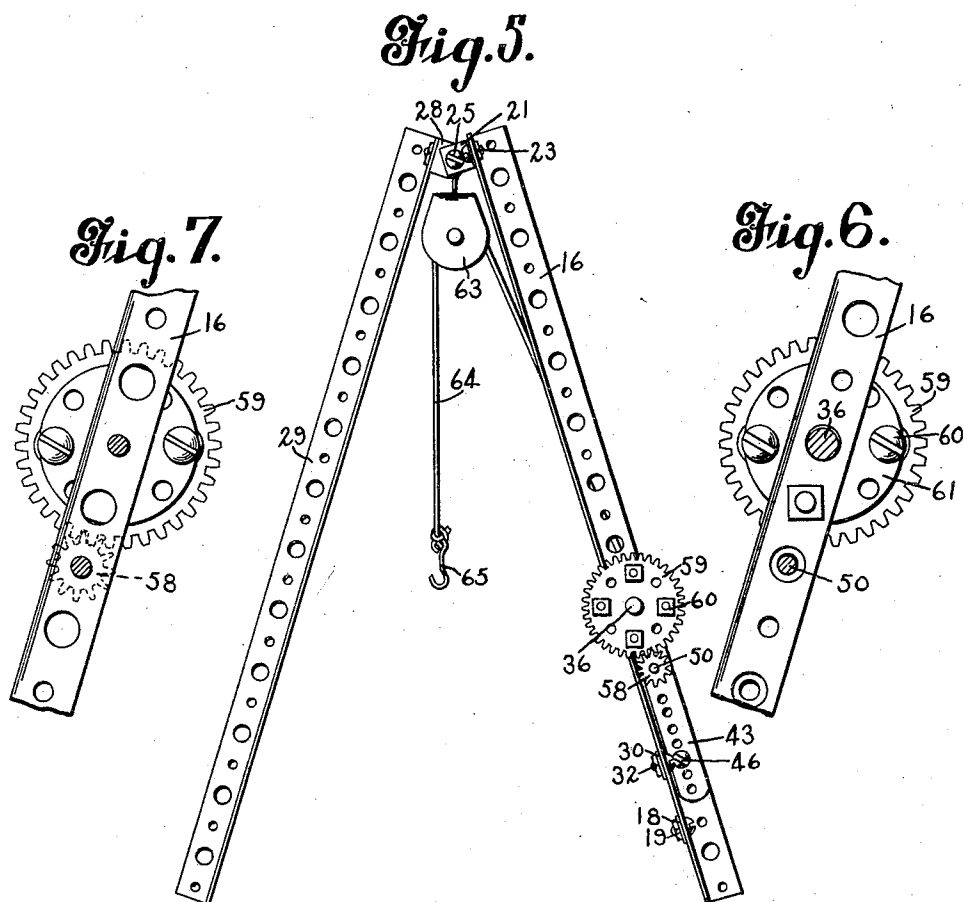
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UNITED STATES PATENT OFFICE

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CONSTRUCTION TOY

Application filed August 5, 1927. Serial No. 210,806.

This invention relates to construction toys, and more particularly to a construction toy made up to a certain extent of fairly light sheet metal parts in which each part is provided with openings evenly spaced according to a standard, so that the elements of a set may be arranged and secured to one another in various ways in simulation of full sized mechanisms.

In toy building sets as heretofore known, it has been the practice to punch or otherwise provide spaced holes in the parts according to the size of the screws or other elements intended to pass through the holes. It is customary to make all the screws and elements intended to pass through the holes of a standard size, and the openings in the various parts are all made to conform to the standard selected. I have found that with certain types of elements; for instance, those having portions therein formed at an angle to one another that the openings do not coincide when these elements are nested together, due to the fact that the material of which the elements are formed has an appreciable thickness which causes the displacement of one element laterally on the other, bringing the holes out of alignment, and making it impossible to fit the screws, or other elements, therein readily unless these elements are made considerably smaller than the holes.

It is, in general, an object of the present invention to provide a novel arrangement for securing toy elements of the above type together, in which the defects of the present known means are eliminated.

In a more specific aspect, it is an object of the invention to provide an arrangement of toy building parts in which evenly spaced holes are provided in which the alternate holes are made of relatively larger diameter.

A further object of the invention is to provide a toy construction element embodying the above features and having more rigidity than those previously known.

To these and other ends, the invention consists in the novel features and combination of parts to be hereinafter described and claimed.

In the drawings,

Fig. 1 is a plan view of a construction element made in accordance with my invention;

Fig. 2 is a view similar to Fig. 1, but showing two of these elements secured together;

Fig. 3 is an end view, in section, along line 3—3 of Fig. 2;

Fig. 4 is an elevational view of a toy built up out of elements embodying my invention;

Fig. 5 is a side elevational view of the toy shown in Fig. 4;

Fig. 6 is a view taken along line 6—6 of Fig. 4; and

Fig. 7 is a view similar to Fig. 6, but showing a modified form.

Referring to the drawings in which I have shown some preferred embodiments of my invention, the reference numeral 8 indicates a type of construction element in the form of a metallic strip L-shaped in cross-section and having two elongated portions 9 and 10 formed at right angles to one another, each of these portions being provided with rows of holes evenly spaced therein according to a standard. Each of the rows of holes is arranged along a center line equally spaced from the sides of the strips; for instance, the center line of the row shown in Fig. 1 is midway between the edge 11 and face 12 of strip 8. The holes are alternately large and small, as shown at 13 and 14.

Referring to Figs. 2 and 3, it will be seen that in these figures I have shown two strips similar to that shown in Fig. 1 assembled one on another, in order to provide a strip of greater length, or for any other object that may be desirable in toy construction. The upper strip 8^a is displaced laterally on strip 8, by the portion 10, to the extent of the thickness of the material of which strip 8 is made. Since the holes in each strip are spaced along similar center lines relative to the edges of the strip, it will be readily understood that the holes, although evenly spaced according to a standard, cannot be made to coincide owing to the displacement which is clearly shown in Fig. 2. However, by providing every other hole of a given row of larger diameter than its neighbor it is possible to adjust one strip on the other, so that a large hole in one strip is brought opposite

a small hole in the other, the difference in dimensions of the holes taking care of the displacement of one strip on the other, so that screws, shafts, etc., may be readily inserted through the holes without binding therein.

It will be readily understood that although I have shown but a single form of strip in Figs. 1 and 2 that the various pieces of the toy construction set will be provided with similar holes, in order that the several elements may be secured together in any desired manner.

The strips for construction toy sets have heretofore been made of a flat strip which, while it resists bending in the plane of the strip, is quite flexible when bent in a direction at right angles thereto. The strips shown in Figs. 1 to 3, inclusive, have portions formed at right angles to one another which resist bending in all directions, resulting in a strip having considerably more rigidity than those previously known. While in Figs. 1 to 3, inclusive, it would appear that the holes 13 and 14 are provided in portion 9 only, it will be understood that portion 9 has a similarly arranged row of holes.

In Figs. 4 to 7, inclusive, I have shown a toy built up out of elements embodying the features of my invention, the toy shown being in the form of a hoist. Referring to these figures, the hoist, which in general is indicated by the reference numeral 15, comprises two similar strips 16 and 17, L-shaped in cross-section, joined together near their lower ends by a strip 18, screws 19 and 20 passing through strips 16, 17 and 18 to join these parts together. The strips 16 and 17 converge upwardly and are secured together at their upper ends by means of angle brackets 21 and 22, secured on the ends of strips 16 and 17 by bolts 23 and 24, while bolt 25 passes through the outwardly extending ends of the brackets 21 and 22, the brackets being spaced apart by nuts 26 and 27 provided on bolt 25. Received on bolt 25 between the nuts 23 and 24 is a U-shaped member 28, having secured thereto a downwardly extending strip 29 similar to strips 16 and 17, these three strips forming a tripod adapted to support the operative elements of the hoist. In order to give the structure sufficient rigidity I have provided struts 30 and 31 which, as shown in Fig. 4, connect strips 16 and 17 to strip 18, by means of bolts 32, 33, 34 and 35.

At an intermediate point in strips 16 and 17, a shaft 36 is supported, shaft 36 passing through two of the corresponding large sized openings 14 and being prevented from displacement in the strips 16 and 17 in an axial direction by collars 37 and 38, secured to shaft 36, by means of set screws 39 and 40, respectively, the outer ends of collars 37 and 38 bearing against the inner faces of strips 16 and 17, while on the inner ends of the

collars 37 and 38 are face plates 41 and 42.

On either side of the strips 16 and 17, on the outer faces thereof, are strips 43 and 44, secured to strips 16 and 17, by means of bolts 45, 46, 47 and 48, and mounted in strips 43 and 44 in a shaft 49, comprising two parts 50 and 51 joined together by a connector 52, shaft 49 being prevented from axial displacement in strips 43 and 44, by means of U-shaped thrust means 53 and 54, washers 55 and 56 being interposed between the thrust means 53 and 54, and strips 16 and 17, respectively. On one end of shaft 49 is a crank 57 while on the opposite end of the shaft is a gear 58, in mesh with a gear 59, secured by means of bolts 60 to a face plate 61 mounted in any suitable manner on collar 62, secured on shaft 36.

Suspended from bolt 25 is a block 63, a cord 64 being secured to and wound around shaft 36 and passing through block 63, the cord 64 having a hook 65 tied on the outer end thereof.

The operation of the hoist will be readily understood from the above description. The crank 57 being rotated by the hand of an operator, rotates the shaft 36 through the gears 58 and 59, winding up or unwinding the cord 64 according to the direction of rotation of the crank, whereupon various articles suspended from the hook 65 may be elevated or lowered, as desired. In reference to these figures, it will be noted that I have provided two shafts of different diameters, which are shown supported in the strips, the large holes supporting the shaft of largest diameter, while the smaller shaft is supported in the smaller holes provided in the supplemental strips attached to the legs of the hoist. It will be readily understood, however, that in a toy building set various other combinations of parts may be made in which the fact that alternate large and small holes are provided may be taken advantage of, it being possible with gears of appropriate size to dispense with the supplemental strips altogether.

In Fig. 7, I have shown a slightly different arrangement of the shafts than that shown in Figs. 4 to 6, inclusive, in which both shafts are of the same dimension and pass through the same sized openings, it being readily understood that both shafts could also be of the larger dimension and pass through large openings.

While I have shown a preferred embodiment of my invention, it will be readily understood that the same is not to be limited to all the details shown, but is capable of modification and variation within the spirit of the invention and the scope of the appended claims.

What I claim is:

1. In a construction toy, an elongated strip L-shaped in cross-section provided with two

elongated portions formed at right angles to one another, each of said portions being provided with alternate large and small holes therein evenly spaced according to a standard, a second similar strip nested in the first strip and adjusted thereon so that a large hole of one strip is opposite a small hole of the other, and fastening means passing through registering holes of said strips to secure the strips together.

2. In a construction toy, an elongated strip L-shaped in cross-section provided with two elongated portions formed at right angles to one another, each of said portions being provided with alternate large and small holes therein evenly spaced according to a standard, a second similar strip nested in the first strip and adjusted thereon so that a large hole of one strip is opposite a small hole of the other, and fastening means passing through registering holes of said strips to secure the strips together, said fastening means being but slightly smaller in diameter than the diameter of the smaller of said opposite holes.

3. A toy construction element for a toy construction set, wherein the elements are provided with holes evenly spaced according to a standard, said element comprising a strip, said strip being provided with portions formed at an angle to one another, each of said portions being provided with a row of circular holes therein evenly spaced according to a standard, and the holes of each row being alternately large and small, whereby said strip may accommodate itself to various other elements of the toy construction set.

4. A toy construction element for a toy construction set, wherein the elements are provided with circular openings evenly spaced according to a standard, said element comprising an elongated strip-like member, said member being provided with a row of uniformly spaced circular openings therein, said openings having their centers in substantial alignment along the length of the strip and being spaced according to a standard, and the said openings being alternately large and small whereby said strip may accommodate itself to various other elements of the toy construction set.

In witness whereof, I have hereunto set my hand this 2d day of August, 1927.

ALFRED C. GILBERT.