

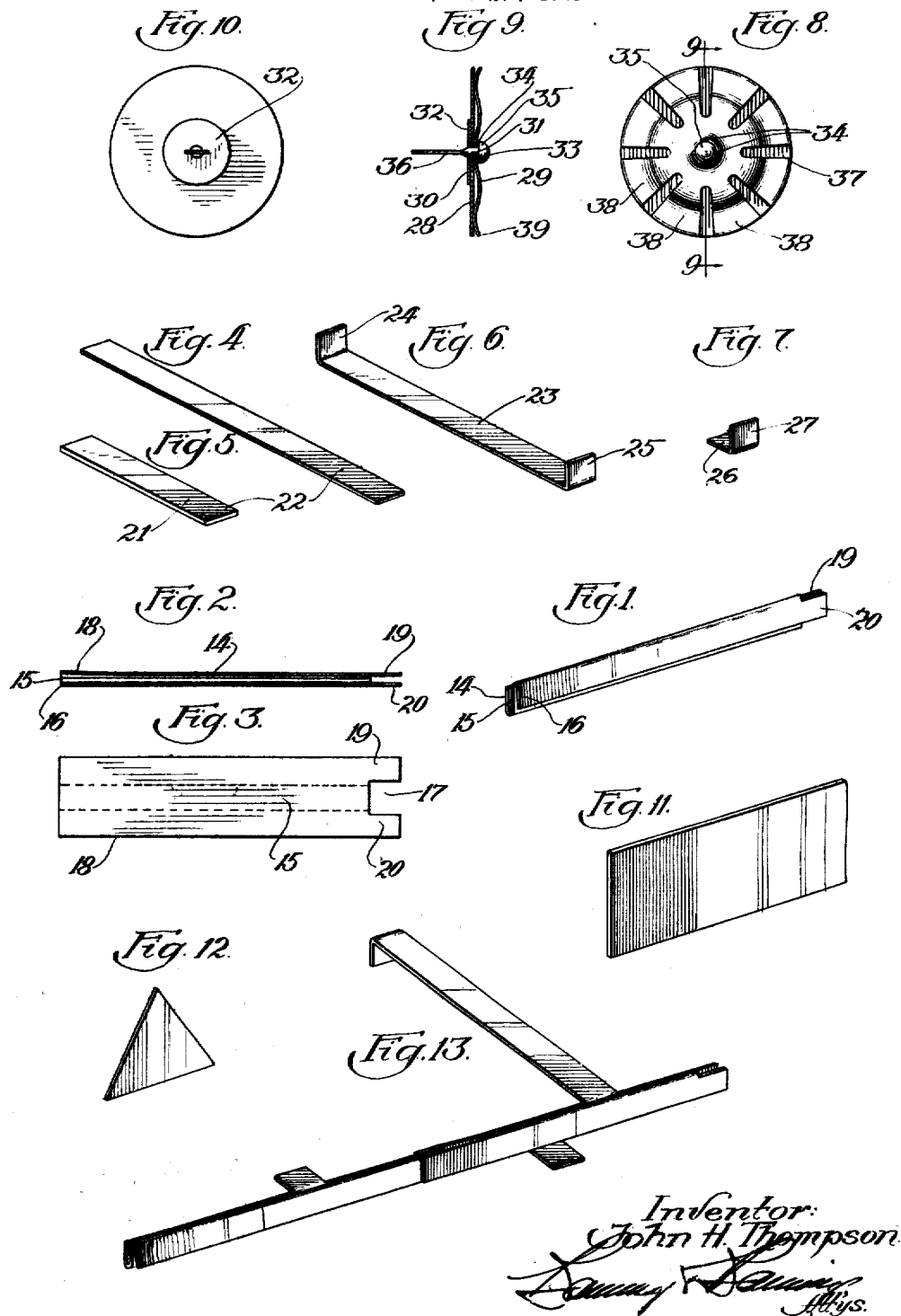
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J. H. THOMPSON

STRUCTURAL TOY

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UNITED STATES PATENT OFFICE.

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STRUCTURAL TOY.

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To all whom it may concern:

Be it known that I, JOHN H. THOMPSON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Structural Toys, of which the following is a specification.

This invention has to do with improvements in structural toys, that is, toys which are intended for use in building up or constructing various toy structures. Such structural toys may be used for building various toy structures such as wind-mills, aeroplanes, bridges, and houses, as well as large numbers of other toy structures and devices.

The structural toy of the present invention is intended for building toy structures of metal. One of the objects of the invention is to provide a series of metal parts or structural forms of more or less standard shape and size, and which may be set together into an almost infinite number of combinations so as to make possible the construction of a correspondingly large number of forms from a relatively few standard parts.

In this connection, another feature of the invention has reference to the provision of standard parts of such form and arrangement that they can be readily clipped or wedged together; and which are so formed and arranged that they will retain their relative positions with a considerable degree of firmness by reason of the spring pressures which are brought into effect.

Another feature of the invention has to do with the construction of these standard parts from sheet metal which is formed or pressed into the desired standard forms; such sheet metal in itself possessing the necessary resiliency and spring like qualities to cause the parts to clip together under the desired pressure.

Other objects of the invention are to simplify the form of the parts and so shape the parts that the desired interchangeability may be secured so that a great many combinations can be brought about with a very small number of standard shapes.

Other objects and uses of the invention

will appear from a detailed description of the same, which consists in the features of construction and combinations of parts hereinafter described and claimed.

Referring to the drawing:

Figure 1 shows a perspective view of one of the standard running strips; looking at the open end thereof;

Fig. 2 shows a plan view corresponding to Fig. 1;

Fig. 3 shows a face view of the sheet metal blank from which one of the running strips is formed;

Fig. 4 shows a perspective view of a long straight connector strip;

Fig. 5 shows a perspective view of a short straight connector strip;

Fig. 6 shows a perspective view of a long bent connector strip;

Fig. 7 shows a perspective view of an elbow;

Fig. 8 shows a front face view of one of the wheels;

Fig. 9 shows a cross section taken on the line 9-9 of Fig. 8, looking in the direction of the arrows;

Fig. 10 shows a back face view corresponding to Figs. 8 and 9;

Fig. 11 shows a perspective view of a flat plate;

Fig. 12 shows a perspective view of a triangular plate; and

Fig. 13 shows a perspective view of a series of running strips set together and with angles and connecting strips in place thereon.

Referring to the various figures, the running strip is illustrated in Figs. 1, 2 and 3. This strip is of generally S-shaped cross section having the three arms 14, 15 and 16 which are more or less parallel to each other. The running strip is in the first place stamped out as a blank of the form shown in Fig. 3. The width of this blank is equal to the combined widths of the three arms 14, 15 and 16 plus the connecting metal; and the length of the blank is equal to the length of the running strip. At one end the blank is cut out to provide the recess 17, which is of width slightly greater than the

width of the central arm 15 so that when the blank is formed into its final form this cut away portion 17 will include not only the width of the arm 15 but also the metal at the two points of fold as is clearly shown in Fig. 1.

In folding up the blank, Fig. 2 clearly shows that the arm 14 is separated a greater distance from the arm 15 at the end 18 than at the other end.

The notched portion 17 serves in effect to provide a pair of lugs 19 and 20 which extend beyond the intervening metal of the arm 15; and when two of the running strips are set together end to end, the lugs 19 and 20 are forced into the widened companion end of the adjacent strip. The manner in which this is done is clearly shown in Fig. 13, which is an assembly view showing how a number of unit parts may be set together in the formation of a simple structure.

The running strips may be set together end to end in the manner just above explained for the provision of a continuous strip of any desired length. A right angle turn may be made at any time by forcing the lugs 19 and 20 over the folded portion at either side of the strip depending upon the direction in which the right angle member is to extend. The ends of the running strip may also be brought together at an angle instead of in a straight way fashion so as to turn a sharp corner at the end of the strip instead of at its middle portion.

In Figs. 4, 5, 6, and 7 I have shown a number of companion elements which may be used in conjunction with these running strips. Each of these companion forms is made of a section of relatively thin sheet metal of approximately the same width as the width of the running strip. Fig. 5 shows a relatively short flat piece 21; Fig. 4 shows a relatively long flat piece 22; Fig. 6 shows a relatively long angle piece 23 whose ends 24 and 25 are bent over at right angles (or in any other desired angle); and Fig. 7 shows an elbow having the arms 26 and 27 formed at right angles to each other (or at any other desired angle). In the assembly of Fig. 13, the use of some of these forms is clearly illustrated.

Figs. 11 and 12 show sections of flat plate which may be used for forming the sides or walls of the objects or for any other suitable purpose. These plates when used should be of substantially the same thickness as the forms shown in Figs. 4, 5, 6, and 7; and all of these supplemental parts should be of a thickness which will wedge easily between the arms of the running strip as will be readily understood.

In Figs. 8, 9 and 10, I have shown in detail the construction of a simple wheel which may also be used in conjunction with the articles herein elsewhere explained.

This wheel includes a circular flat plate 28; a circular spring plate 29 and a rivet element 30 in conjunction with a journal pin 31. The rivet element 30 has a circular head 32 which lies against the circular plate 28, and also has a collar 33 which extends through the center of the spring plate 29 and is riveted down against the same as shown at 34 in Figs. 8 and 9. The journal pin 31 extends through this rivet; said journal pin having a head 35 on one end and having its back end flattened as at 36. This flattened portion increases the width of the pin on its back side so that it cannot come out from the journal rivet; and furthermore, the flattening of the pin makes it of a thickness which will set conveniently between two of the arms of a running strip. In this way the pin may be wedged into place with respect to the running strips.

The spring plate 29 of the wheel is preferably curved as shown in Fig. 9, and slotted with a number of radial slots 37 as shown in Fig. 8. The radial slots serve to provide a series of more or less independent spring fingers 39 which press with a spring pressure against the circular flat back plate 28; and the end portions of the fingers 38 are bent out as shown at 39, so that other forms may be forced between said fingers and the back plate and thus held in place under spring pressure.

It will be evident that the standard forms herein disclosed may be set together into an infinite number of combinations, and I have therefore refrained from illustrating more than a very simple use of certain of these forms. Nevertheless, it will be evident that I do not limit myself to such particular use but contemplate the forms themselves no matter in what particular combinations they may be brought together.

I claim:

1. As a new article of manufacture a toy structural element comprising a running strip formed from a blank of sheet metal having an inwardly extending notch at one end of substantially one-third of its width, said blank being folded substantially at the sides of said notch to provide three substantially parallel arms in conjunction with a pair of endwise extending lugs, and the notch serving to establish a pair of endwise projecting separated lugs at the notched end of the strip, the arms at the other end being separated a greater distance than the distance between said arms at the lug end, and the metal being resilient, for the purpose specified.

2. As a new article of manufacture a toy structural element comprising a running strip formed from a substantially rectangular blank of sheet metal, said blank being folded to provide three substantially parallel arms, said arms being separated a greater

distance at one end of the running strip than at the other end thereof, substantially as described.

3. As a new article of manufacture a structural toy element comprising a wheel
5 consisting of two circular metal plates, and a journal rivet extending through their central portions and joining them together,

one of said plates being radially slotted with a number of slots to provide a series of separated spring lugs, said lugs having their end portions curved to co-operate with the surface of the other plate in spring fashion, and a journal pin extending through the rivet aforesaid, substantially as described. 10

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