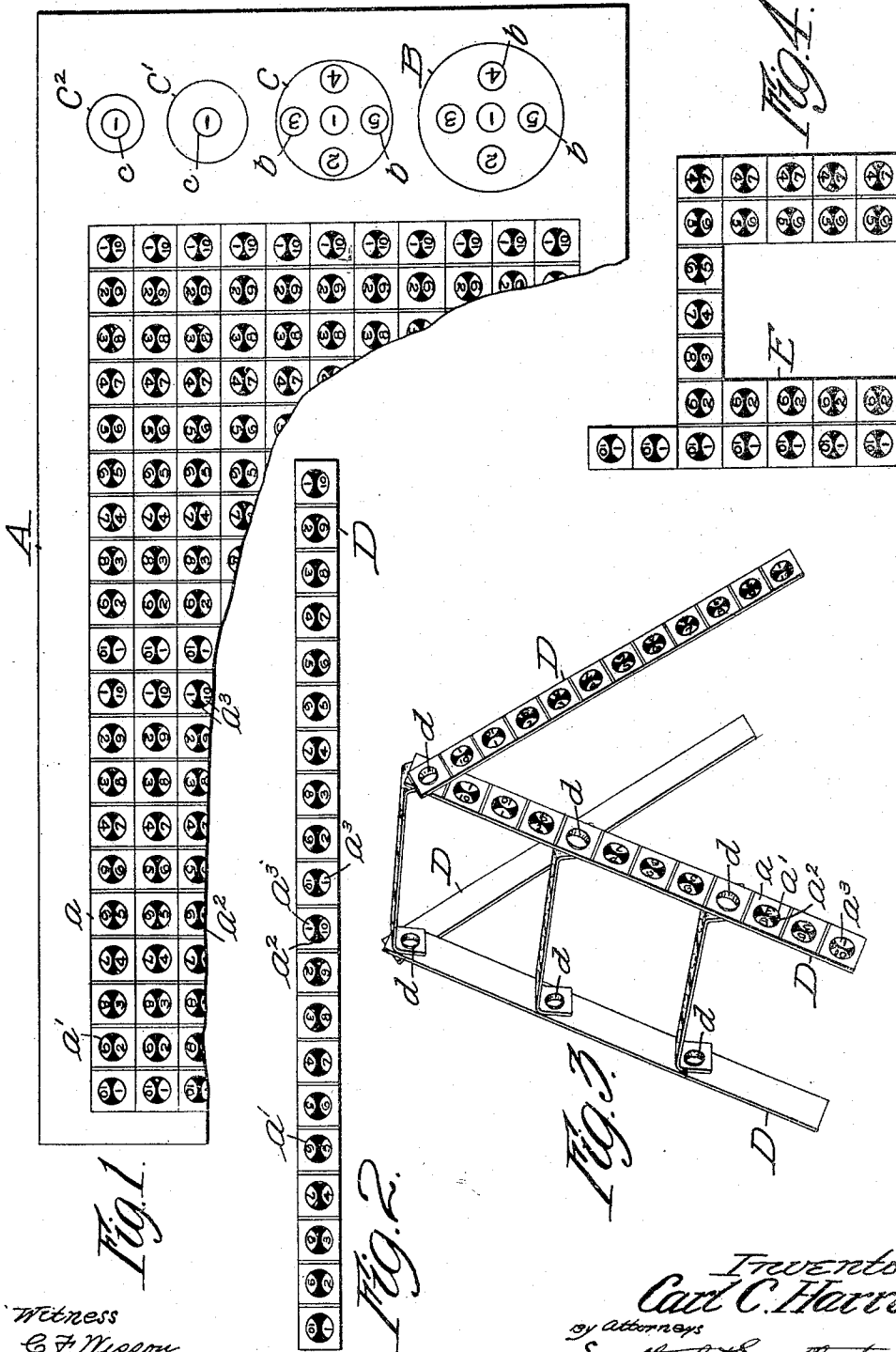


1,206,760.

Patented Nov. 28, 1916.
 2 SHEETS—SHEET 1.



Witness
 E. F. Mason

Inventor:
 Carl C. Harris.
 by Attorneys
 Southgate & Southgate.

UNITED STATES PATENT OFFICE.

CARL C. HARRIS, OF ORANGE, MASSACHUSETTS, ASSIGNOR TO RIVETO MANUFACTURING COMPANY, OF ORANGE, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

STRUCTURAL TOY.

1,206,760.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CARL C. HARRIS, a citizen of the United States, residing at Orange, in the county of Franklin and State of Massachusetts, have invented a new and useful Structural Toy, of which the following is a specification.

The principal objects of this invention are to provide a simplified, cheap toy which will be more interesting than those now on the market, and more especially to provide a toy of this character which can be made in the form of strips of sheet material provided with markings, signs or numerals to indicate where they are to be bent, perforated or joined together, which markings do not affect the strength of the material, but which merely indicate positions; to provide means for identifying similar positions on the different strips, so that they can be cut, perforated, joined or folded in the same place without the necessity of counting up from end to end, thus facilitating the making of symmetrical products; and to provide these strips in such form that with a very simple eyeletting or stapling device different strips can be connected together in a permanent manner, so that the structures made can be kept and used for a considerable period of time, the cheapness of the material employed being sufficient to warrant this use.

Further objects of the invention, in its preferred forms, are to provide these advantages in the form of sheets of any desired sheet material and particularly of paper or card-board, so arranged as to render it possible for a child using the toy to cut the sheets up himself and form strips, plates, or elements for use in building up a toy; to provide means whereby the sheets or strips which he uses for the actual construction of the toy will not be perforated except at the points at which joints are to be made, so that the usual strength of the material will be made full use of and the strip will not be weakened as is the case with toys of this character with which children are most familiar.

The invention also involves the sheet of

material which is used to produce the strips themselves, and the combination of the strips in the form of toys.

Reference is to be had to the accompanying drawings in which—

Figure 1 is a plan of a sheet of material marked to indicate how it is to be cut, folded and perforated according to this invention; Fig. 2 is a similar view of one of the strips or plates after being cut from this sheet; Fig. 3 is a perspective view of a toy formed from a plurality of these strips; Fig. 4 is a view of a member or plate of different form cut from the same sheet; Fig. 5 is a view of another blank showing how the parts of furniture can be represented by means of this invention; Fig. 6 is a perspective view of a toy chair made therefrom and Figs. 7 and 8 are perspective views of modified forms of strips.

Structural toys of the general character represented by this invention so far as I am aware, are made up mainly of plates, particularly flanged plates, which are provided with a series of perforations and are made of metal so that they can be used time after time for the construction of different toys. Although these have been used extensively and have proven successful, yet they are open to some objections. In the first place, the strips have to be made of durable material on account of being provided with so many perforations, and furthermore on account of using the plates over and over, a child using them is practically compelled to destroy one toy before he can build another unless he has a complicated and expensive set. This invention is designed largely to overcome these difficulties by providing plates or strips of a very simple character unperforated until they are ready to be connected together, and consequently strong enough so that they can be used without flanges and cheap enough so that they can be used for permanent toys, thus obviating the necessity of using them over and over.

Referring first to the first three figures of the drawings, Fig. 1 shows a piece of card-board A. On this are printed a series of

symmetrical figures, in this instance, squares a . In the form shown these are arranged in rows, twenty in a row for purposes which will appear. Each square or zone is provided with a circle a' in the center. This circle may be a plain white circle or it may have some other shaped figure, and in this drawing a preferred form is shown, in which appears a black field a'' and two white fields a''' . In the white fields are arranged numerals and it will be noted that in the preferred form the numerals 1 to 10 run from left to right and then begin over again, the numerals 1 to 10 being repeated. These are located in the lower white fields a''' while in the upper white fields corresponding are the same two series of numerals, but beginning at the other end and located the other side up. It will be noted also that the marginal lines of these squares divide up the sheet along longitudinal and transverse lines. In the present instance, parallel lines are shown vertically and transversely and for a purpose which will appear.

In the use of the main portion of the invention as indicated in Fig. 1 the material is intended to be cut preferably into longitudinal strips or plates D as shown in Fig. 2. Each of these plates will, of course, bear circles, squares and numerals as described in connection with Fig. 1. It will be understood, of course that the main blank can be cut into other shapes, L-shaped figures, squares, or shapes indicating articles of furniture or other structures which it is desired to build. A portion of a bench made in this manner is indicated by the plate E shown in Fig. 4. The main use of the device, however, is indicated in Fig. 3. In this case several of these strips D are shown. In the case of the construction of a step ladder for example, as indicated in this figure, four strips D are taken of the same length. Each of these is perforated in the first square, the one that is numbered 9—2 in this case and they are pivoted together in pairs by placing a common eyelet d through the matching perforations. This can be done by any ordinary eyelet punching and setting device and no specific form is indicated herein as any desired kind can be used. The several steps of the step ladder are made by taking strips or plates formed in this instance by cutting the sheets in two between the squares numbered 6 and those numbered 7 along the double lines. Then these strips are bent along the first and last double lines. It will be seen that on account of having the numbers, the points at which the strip is to be cut and also bent are readily identified without danger of error in counting, and consequently all these steps will be made just alike without effort on the part of the child using the toy. The several bent over ends are then secured to

the two main uprights of the step-ladder by eyeletting these bent squares to the same through the circles numbered 4, and 8, from the end. Having determined this point the child using the toy prepares the second one in the same way, and does not have to go through any complicated system of counting in order to get a symmetrical construction. The rest of the article is formed in a similar way and need not be described in detail. It is found in practice that on account of this system of numbering for the purpose of identifying the proper places at which to perforate, join, bend or cut the plates quite complicated toys can be made by a very young child without trouble and that this introduces a feature that is very interesting to the youthful mind. Pictures of many kinds can be furnished with the set at small expense, and the child is at liberty to design other structures as he may see fit. The punching of the holes does not weaken the strips because the eyelets are introduced at this point which actually has the effect of strengthening them. Furthermore on account of having the strips unperforated between joints they are comparatively strong and serve the desired purpose as well as is necessary. The fact that the child is not expected to take the toy to pieces but can keep it indefinitely adds to his interest in the toy because whole sets of furniture and simple machines and other toys can be made and kept for future use. This does away with the chief objection to the ordinary structural toys, namely, that the work done to make a complicated one has to be rendered useless before another one can be made under ordinary circumstances.

It will be noticed that there are several independent circles shown on the sheet A in Fig. 1. One of these circles B, is provided with several inner circles b , such as those described above, each one having a number. A circle C is shown similarly arranged and two other circles C' and C'' each having a single central circle c . It is to be understood that several of these sheets will accompany each set of toys, and these circles are used for the purpose of making pulleys and the like. In the present case two of the circles B can be cut out and a single one of the circular plates C placed between them, the numbered circles b therein being placed to register with each other. It will be seen that by taking two disks B and placing one disk C between them the central circle numbered 1 can be cut out in all of them and the three disks fastened together by introducing eyelets at the twos and fours or through all of the four circles surrounding the central one. This produces a pulley which will receive a string or a rubber band as a belt. The disks C and C' can be used in the same way without fasten-

ing them together, except by the central eyelet.

In Figs. 5 and 6 I have shown a blank F designed solely for the production of a single toy and the toy H produced therefrom. In this case the blank is provided with figures *f*, each representing one elevation or plan of the toy to be produced, and each having circles *a'* as before numbered in various ways according to the shape of the article. These can be combined with the plates or strips formed from the blank A in Fig. 1, or this blank F can be so designed as to combine all the elements necessary as shown. For example, in place of the one figure showing the side view of a chair it might show only the seat, back, and front of the chair. In that case the legs and horizontal strips can be made up from the matter shown in Fig. 1, but in this figure the entire article is shown in the form of several figures representing its different elevations and a plan, and they are cut out and eyeleted together in the desired places as indicated by the numbers. This produces a complete toy as shown at H in Fig. 6. In one of these figures the outlines along which the parts are to be separated are shown as formed of rows of perforations *f'* to permit of ready separation. It will be understood, of course, that the user can punch the perforations at places not indicated by the circles, thus extending the field of use. But in this case he will still use the adjacent numerals and circles for locating purposes.

In Fig. 7 a strip or plate D' is shown which has a longitudinal flange. In this case the numerals are shown outside the circles and instead of the double lines marks are shown stopping short of the edges. In Fig. 8 the strip D² is shown in tape form, preferably put up in a roll and the dots for the perforations and numerals are shown on both sides for additional ease in handling.

In addition to the uses of this invention as a toy, it is capable of being used advantageously for giving instructions in geometry.

It is obvious that the various features of this invention can be modified in various ways without departing from the scope thereof as expressed in the claims. Therefore I do not wish to be limited to the exact details as herein shown and described, but

What I do claim is:—

1. As an article of manufacture, an element or plate for use in building a toy structure consisting of a strip of imperforate sheet material capable of being perforated by a hand punch and having a series of means thereon for indicating a plurality of positions for perforations.

2. As an article of manufacture, an element or plate for use in building a toy

structure comprising a piece of sheet material having a series of marks thereon for indicating a plurality of positions for perforations, said series of marks being located in regular order, the plate also having means for indicating and readily identifying different marks to enable the user to pick out any specific one.

3. A plate for use in building a toy structure comprising a piece of flat sheet material having marks thereon arranged at intervals indicating points at which the material is to be bent, the zones between said points being provided with means indicating and readily identifying different zones to enable the user to pick out specific ones.

4. As an article of manufacture, a plate for use in building a toy structure comprising a piece of flat imperforate sheet material capable of being perforated by a hand punch and divided up into a plurality of zones of equal size divided from each other to indicate where the plate can be bent, said zones being provided with marks for indicating where the plate is to be perforated.

5. As an article of manufacture, an element or plate for use in building a toy structure comprising a piece of imperforate sheet material having a series of means thereon for indicating a plurality of positions for perforations, said means being provided with numerals arranged in regular order to facilitate the identification of any particular one.

6. As an article of manufacture, an element for use in building a toy structure comprising a piece of sheet material having a series of means thereon for indicating a plurality of positions for connections, said means being provided with numerals arranged in regular order to facilitate the identification of any particular one, and extending from each end toward the other end.

7. As an article of manufacture, an element for use in building a toy structure comprising a piece of sheet material having a series of means thereon for indicating a plurality of positions for connections, said means being provided with numerals arranged in regular order to facilitate the identification of any particular one, said numerals running to a certain number and then being repeated.

8. In a structural toy, the combination of a plurality of plates each having arranged thereon a series of marks equally spaced on the several plates for indicating the positions of perforations to be made, means on the several strips for indicating in the same manner the marks at corresponding distances from the ends of the respective strips, whereby the user can readily identify the particular position for placing the perforations or fastening the

several strips to make the strips uniform and enable them to be used for making a symmetrical structure.

5 9. A toy structure made up of a plurality of imperforate plates of sheet material capable of being perforated by a hand punch and each being provided with marks thereon equally spaced apart and similarly located on the different plates for indicating
10 points at which the plates are to be fastened together, and means for permanently fastening the plates to each other to form the structure.

15 10. A structural toy made up of a plurality of imperforate plates of sheet material capable of being perforated by a hand punch and each provided with means regularly spaced thereon for indicating the points at which the plates are to be secured
20 together and eyelets permanently connecting said plates with each other at certain of said points.

25 11. A toy structure made up of a plurality of plates of sheet material, each being provided with marks thereon spaced apart and similarly located on the different plates for indicating points at which the plates are fastened together, and means for permanently fastening the plates to each
30 other to form the structure, each of said plates being provided with numerals arranged thereon in regular order for the purpose of identifying the specific marks at which the connections are made.

35 12. A structural toy made up of a plu-

40 rality of plates of sheet material, each provided with means regularly spaced thereon for indicating the points at which the plates are secured together and eyelets permanently connecting said plates with each other at certain of said points, said plates
45 being provided with two sets of numerals, one set extending from one end and the other from the other end.

50 13. As an article of manufacture, a blank for the manufacture of structural toys consisting of a sheet of material capable of being perforated by a hand punch and having printed or stamped thereon a plurality
55 of rows of symmetrically shaped figures, each of said figures having therein means for indicating a proposed perforation whereby said blank can be cut up into plates which can be secured together by connecting them at the perforations.

60 14. As an article of manufacture, a blank for the purpose described consisting of a sheet of material having printed thereon longitudinal and lateral rows of circles for indicating the position of proposed perforations, and longitudinal and lateral parallel
65 lines forming geometrical figures inclosing said circles, whereby said sheets can be cut up into plates along said lines, the circles being arranged in rows and provided with numerals for assisting in indicating the positions of the circles on the sheet.

In testimony whereof I have hereunto set my hand.

CARL C. HARRIS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."