

Dec. 21, 1943.

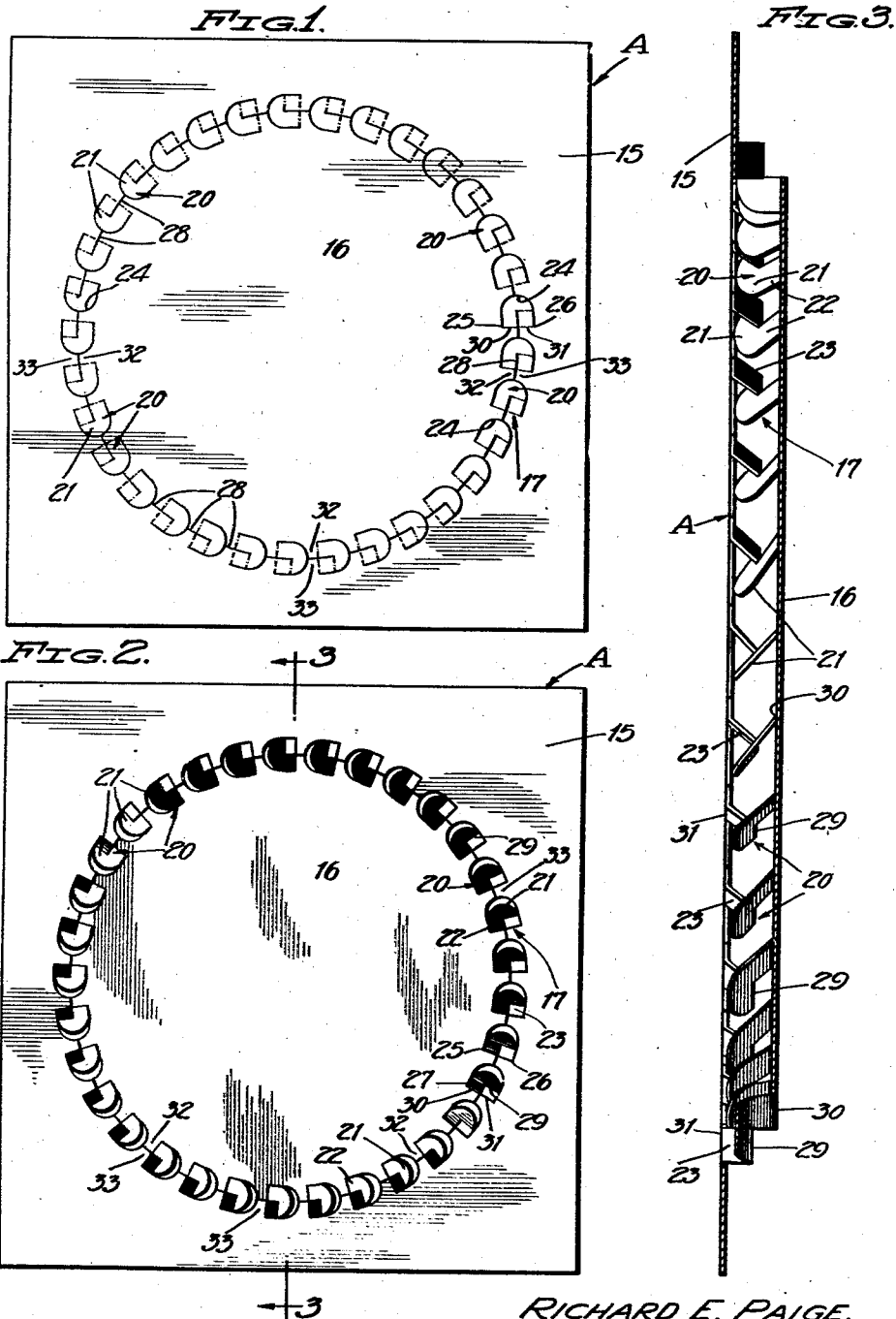
R. E. PAIGE

2,337,126

DISPLAY DEVICE

Filed June 1, 1940

4 Sheets-Sheet 1



RICHARD E. PAIGE.
INVENTOR.

BY *Ely Pattison.*

ATTORNEYS.

WITNESS:

E. H. [Signature]
[Signature]

Dec. 21, 1943.

R. E. PAIGE

2,337,126

DISPLAY DEVICE

Filed June 1, 1940

4 Sheets-Sheet 2

A
FIG. 4.

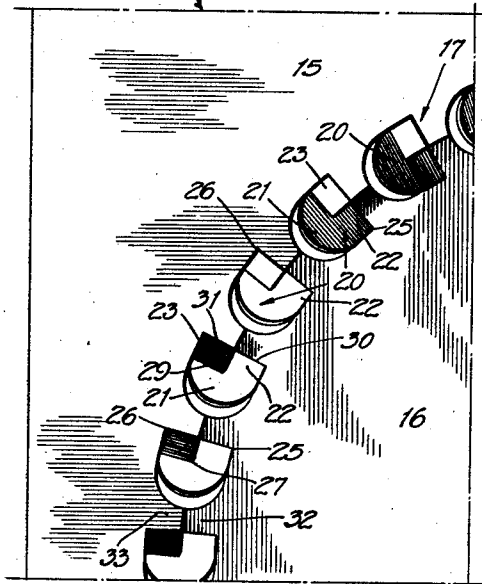


FIG. 5.

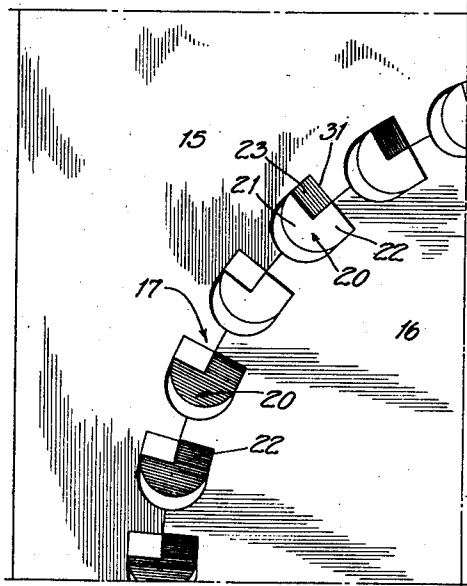


FIG. 6.

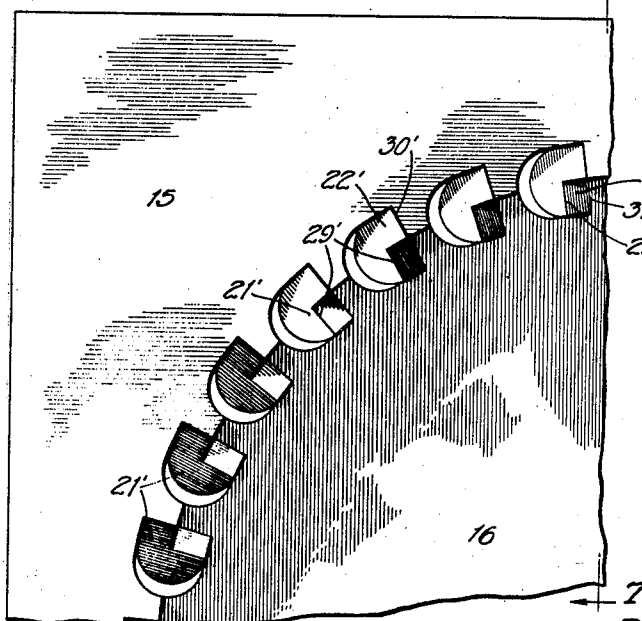
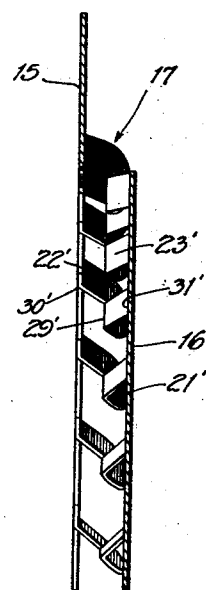


FIG. 7.



RICHARD E. PAIGE,
INVENTOR.

BY *Ely Patterson*

ATTORNEYS.

WITNESS:

Edw. J. Lusk
WITNESS

Dec. 21, 1943.

R. E. PAIGE

2,337,126

DISPLAY DEVICE

Filed June 1, 1940

4 Sheets-Sheet 3

FIG. 8.

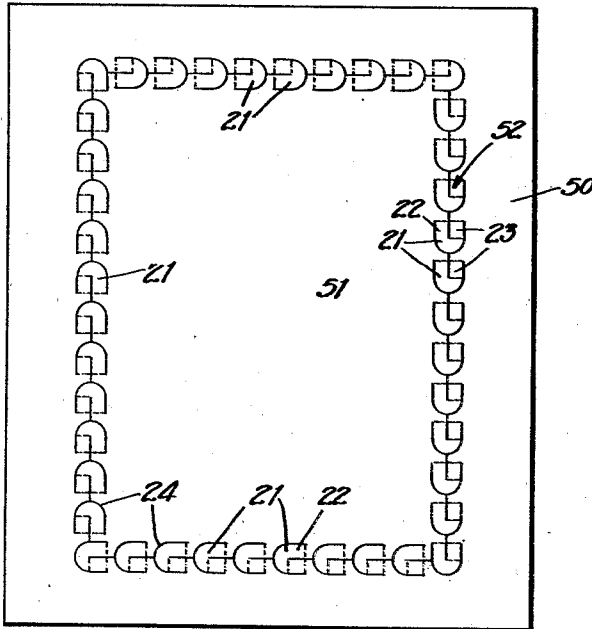


FIG. 10.

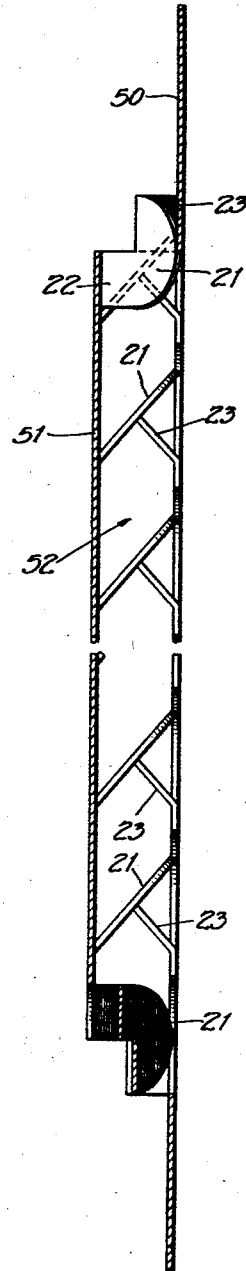
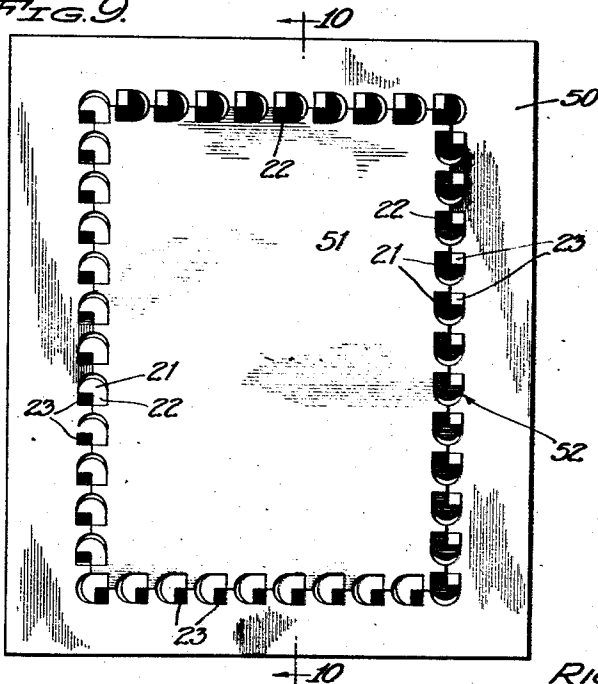


FIG. 9.



RICHARD E. PAIGE.
INVENTOR.

BY *Ely & Patterson*
ATTORNEYS.

WITNESS:
William L. Lundy
1943

Dec. 21, 1943.

R. E. PAIGE

2,337,126

DISPLAY DEVICE

Filed June 1, 1940

4 Sheets-Sheet 4

FIG. 11.

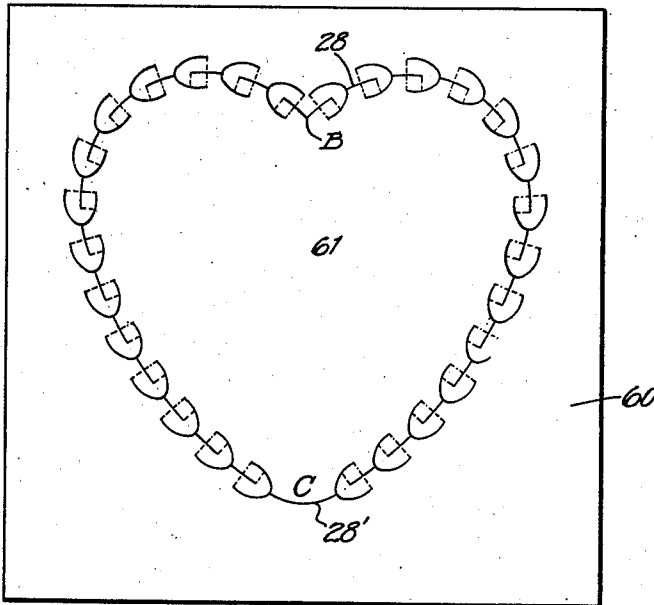


FIG. 12.

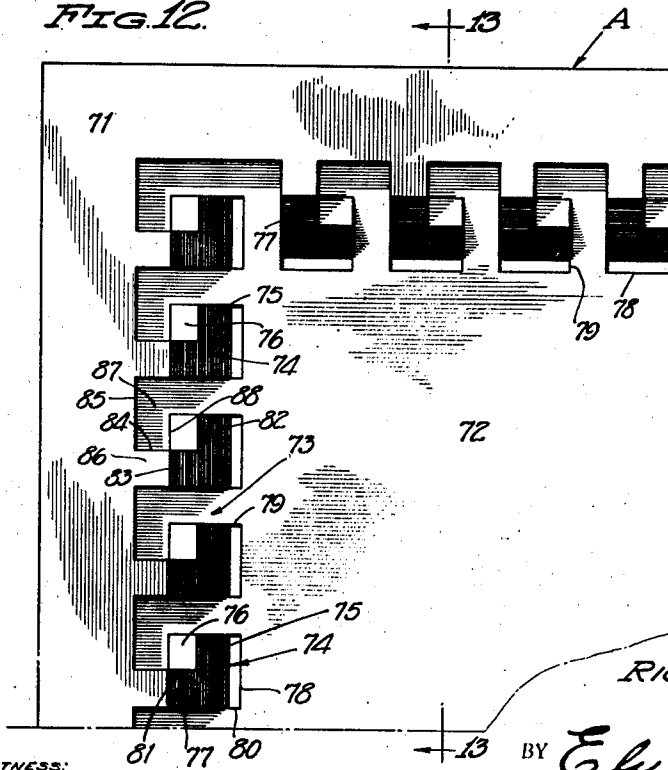
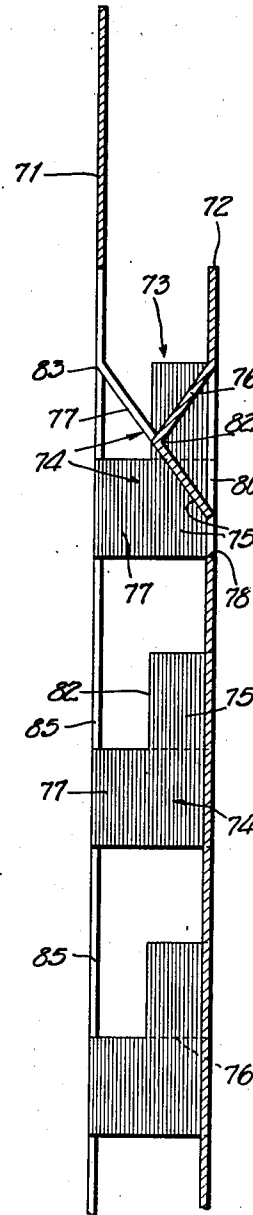


FIG. 13.



RICHARD E. PAIGE.
INVENTOR.

BY

Ely Patterson.
ATTORNEYS.

WITNESS:

Edwin J. Lusk
1943.

UNITED STATES PATENT OFFICE

2,337,126

DISPLAY DEVICE

Richard E. Paige, Flushing, N. Y.

Application June 1, 1940, Serial No. 338,309

2 Claims. (Cl. 40—124.1)

This invention relates to a new and improved method of making articles from blanks of foldable material and more particularly, the invention pertains to a new method of cutting and scoring a blank of foldable material whereby integrally connected sections thereof may be moved to positions in different planes and at the same time, maintain intact the integral connection between the sections thereof.

I am aware of the fact that articles such as described above are not, as broadly as stated, new. For example, as broadly as above stated, examples of such devices are illustrated in the Beckelman Patent No. 2,080,997 issued May 18, 1937, and in my own prior Patent No. 2,113,432 issued April 5, 1938, the present invention being considered as an improvement over the inventions disclosed in these two patents.

The Beckelman patent, above mentioned, illustrates display devices of both rectangular and circular form in which a single blank of foldable material is cut or slitted to provide at least two integrally connected areas which are capable of relative shifting movement into positions in off-set planes without disrupting the integral connection between the areas.

In the rectangular form of the Beckelman invention, the two areas are shifted relatively, in a direction parallel to each other. Because of this fact, the areas cannot be integrally connected throughout the length of their borders, the integral connections between the areas being limited to three sides only thereof. When such a device is employed, an open space invariably results along the unattached adjacent border edge of the areas and it requires a cover element or panel to cover this space. Further, in the rectangular form, the integral connections when of an ornamental nature, can be employed upon two opposite sides only.

In the circular forms as illustrated in both aforementioned patents, the areas are shifted relatively in an axial direction to position the areas in off-set planes. While this construction permits of a continuous or uninterrupted integral connection between the areas, of a continuous ornamental nature, it also has disadvantages, since it is, for practical purposes at least, limited to the circular form. In fact, it cannot practically be embodied in oval form for the reason that axial relative movement of the areas when of oval form, throws the areas out of registration or alinement resulting in a distorted effect.

It is the object of the present invention to overcome the disadvantages of the two patents

heretofore mentioned and to provide a construction by which two or more integrally connected areas formed from a single blank of foldable material may be of any desired shape or form and yet be capable of movement to positions in off-set planes without disrupting the integral connections of the areas, without disturbing true registration or alinement of the areas in any position to which they are capable of movement, and yet provide continuous or uninterrupted integral connection between the areas throughout the entire border portions thereof, if and when desired.

A feature of the invention resides in a novel form of hinge connection between two sections of a single blank of material which hinge connection permits of rectilinear movement of the two sections, the said hinged connections being of such construction as to eliminate all relative axial movement of the members and yet permit of relative movement of the members into off-set planes.

Another feature of the invention resides in the provision of a novel construction of hinge connection which will permit of forming two integrally connected sections of a blank, of any desired shape or contour and permit of their movement into off-set planes and yet maintain registration of the sections in their off-set positions.

Still another feature of the invention resides in a novel hinge construction which will permit of the use of hinge or connecting elements of various ornamental forms, shapes and designs.

Other features of the invention relate to certain novel and improved constructions, arrangements and combinations of parts hereinafter described and particularly pointed out in the claims, the advantages of which will be readily understood and appreciated by those skilled in the art.

The invention will be clearly understood from the accompanying drawings illustrating the invention in its preferred forms and the following detailed description of the constructions therein shown.

In the drawings:

Figure 1 is a plan view of a flat blank of foldable material illustrating the blank as cut and scored in accordance with one form of the present invention,

Figure 2 is a plan view of the blank illustrated in Figure 1 after the same has been broken out and the sections thereof moved into off-set planes,

Figure 3 is a transverse sectional view on an

enlarged scale, the view being taken substantially on the line 3—3 of Figure 2,

Figure 4 is a fragmentary plan view on an enlarged scale illustrating that form of the invention shown in Figures 1, 2 and 3,

Figure 5 is a fragmentary plan view illustrating a slightly modified form of the invention,

Figure 6 is a fragmentary plan view illustrating a still further modified form of the invention,

Figure 7 is a detail sectional view taken substantially on the line 7—7 of Figure 6,

Figure 8 is a plan view of a blank illustrating the invention as carried out in rectangular form,

Figure 9 is a view illustrating the blank shown in Figure 8 after it has been broken out to form the display,

Figure 10 is a longitudinal sectional view on an enlarged scale, taken substantially on the line 10—10 of Figure 9,

Figure 11 is a plan view of a blank illustrating the invention as carried out in heart shape form,

Figure 12 is a fragmentary plan view illustrating a still further modified form of the invention, and;

Figure 13 is a transverse sectional view taken substantially on the line 13—13 of Figure 12.

Referring specifically to the drawings and particularly to Figures 1 through 4, the blank is designated A. This blank may be made from any suitable material which lends itself readily to scoring and creasing and which is capable of folding or bending upon the score lines, of which cardboard is one good example.

In the drawings, the blank is illustrated as of rectangular form but this showing is to be considered as conventional since the blank may be of any desired shape.

The blank is divided into three sections, namely an outer section 15, an inner section 16 and an intermediate section 17.

While as heretofore stated, the outer section 15 may be of any desired form, in that form of the invention illustrated in Figures 1 through 4, the inner section 16 and the intermediate section 17, are both of circular form.

The intermediate section 17 is slitted or cut and scored to provide a plurality of hinge elements for connecting the inner and outer sections together in such a manner as to permit of relative rectilinear movement of said sections as distinguished from the relative axial and parallel reciprocating movements of the inner and outer sections of the devices of the Beckelman and Paige patents, heretofore mentioned. In other words, in the devices of the present invention, relative movement of the inner and outer sections is in a straight line only, in a direction at right angles to the planes of the sections.

The hinge elements heretofore referred to are designated 20 and each consists of a body portion 21 from which project two parallel legs 22 and 23, said legs being of equal length. The body portion of each hinge element has a curved edge formed by a curved slit 24 which extends from a point 25 upon the outer periphery of the inner section to a point 26 upon the inner periphery of the outer section 15. Each of the hinge elements 20 is slit lengthwise which slit extends from the point 27 of its respective hinge element to the slit 24 forming the curved edge of the next adjacent hinge element in a clockwise direction in the drawings. These slits are designated 28 in the drawings and are of curved or arcuate form.

The leg 22 of each hinge element is a rigid

extension of its respective body portion, while the leg 23 of each hinge element is hingedly connected to its respective body portion by a cut score line 29. A cut score line 30 extends from the point 25 upon the outer periphery of the inner section 16 to a point substantially central of the ends of the slit 28 and a cut score line 31 extends from the point 26 upon the inner periphery of the outer section to a point substantially central of the ends of the slit 23, and these score lines 30 and 31 form respectively the ends of the legs 22 and 23.

This arrangement of slits and score lines divides the intermediate section 17 into the hinge elements 20 and the areas 32 and 33 in the form of projections extending respectively outwardly from the periphery of the inner section 16 and inwardly from the inner periphery of the section 15, these extensions being separated from each other by the slit 28.

The score line 30 heretofore mentioned serves to hingedly connect the leg 22 of the hinge element 20 to the projection 32, while the score line 31, serves to hingedly connect the leg 23 of the hinge element to the projection 33.

While in the foregoing description I have described but one hinge element and its manner of attachment to the inner and outer sections 15 and 16, it is to be understood that the inner and outer sections are joined together by a number of such hinge elements and that in the preferred form, the entire intermediate section 17 is divided into hinge elements 20 and areas 32 and 33.

In that form of the invention illustrated in Figures 1 through 4 of the drawings, the sections 15 and 16 are adapted to move to positions in which the section 15 will be forward of the section 16, while in that form of the invention illustrated in Figure 5 of the drawings, the sections are moved to positions in which the section 16 occupies a position forwardly of the section 15.

When it is desired to produce a device in which the section 16 occupies a position to the rear of the section 15, the score lines 29 and 30 are formed upon the rear face of the blank while the score line 31 is formed upon the front face of the blank.

By this construction the two sections are hingedly connected together by hinge elements which, when pressure is exerted upon the inner section 16, permit of its movement to a position at the rear of the outer section 15 as illustrated in Figure 3 of the drawings.

In order to produce a device in which the inner section 16 will move to a position forwardly of the outer section 15, it is only necessary to reverse the formation of the score lines 29, 30 and 31.

For example, if the score lines 29 and 30 were formed upon the front face of the blank instead of upon the rear face thereof, and the score line 31 formed upon the rear face of the blank instead of upon the front face thereof, the direction of relative movement of the sections would be opposite to that above described and the inner section would then move to a position forwardly of the section 15.

In Figures 6 and 7, there is shown a slightly modified form of the invention as illustrated in Figures 1 through 4.

While in that form of the invention illustrated in Figures 6 and 7, the inner section 16 moves to the rear of the outer section 15, it will be noted that the position of the hinge elements is the reverse of that shown in Figure 4, the rigid legs

22 of the hinge elements being disposed outwardly while the hinged legs 23 of the hinge elements are disposed inwardly.

In this form of the invention, the rigid leg 22' of each hinge element is hingedly connected to the outer section 15 by a cut score line 30' upon the front face, while the hinged leg 23' of each hinge element is hingedly connected to its respective body portion 21' of the hinge element by a cut score line 29' formed upon the front of the blank and to the inner section 16 by a cut score line 31' formed upon the rear face of the blank.

It is also to be understood that if the score lines 29' and 30' in this form of the invention be formed upon the rear face of the blank and the score line 31' be formed upon the front face of the blank, the direction of relative movement of the sections 15 and 16 would be reversed and the inner section 16 would move to a position forwardly of the outer section 15.

In Figures 8 through 10 of the drawings, I have illustrated a still further modified form of the invention.

In this form of the invention, while the hinge elements are of the same mechanical construction as in the heretofore described forms, their arrangement and position are different than in any of the previously illustrated embodiments.

By reference to Figures 8 and 9, it will be noted that the outer section 50, the inner section 51 and the intermediate section 52 in which the hinge elements are formed, are all of rectangular form and that the hinge elements are arranged in a rectangular series instead of a circular series as in the previously described forms.

In this form of the invention, the hinge elements are of the same construction as in the previously described forms in that they consist of a main body portion 21, a rigid leg extension 22 and a hinged leg extension 23 and, as in the form of the invention illustrated in Figures 1 through 4 of the drawings, the rigid leg extension of the body portion of each hinge element is hingedly connected to the inner section 51, the hinged leg extension being hingedly connected to the outer section 50. However, in the form illustrated in Figures 8 through 10 of the drawings, the hinge elements are so formed that their curved edge 24 is positioned opposite to that which it occupies in the previously described forms. Also in this form of the invention illustrated in Figures 8 through 10, the arrangement of slits and scores is the same as in that form of the invention illustrated in Figure 5 of the drawings with the result that the inner section 51 moves to a position forwardly of the outer section 50. It will be obvious, however, that the arrangement of slits and scores could if desired, be the same as in the form illustrated in Figure 4 of the drawings in which case, the inner section 51 would move to a position to the rear of the outer section 50.

In Figure 11 there is illustrated another adaptation of the invention in which the hinge elements are arranged in a heart shaped series as distinguished from the circular and rectangular series in the previously described forms.

In this form of the invention, the outer section 60 is of rectangular form or shape, the inner section 61 being of heart shape and the hinge elements are arranged in two sets or series with the hinge elements in each set oppositely disposed with respect to those of the other set. It will also be noted that in this form of the invention,

the hinge elements extend in opposite directions from two spaced points substantially central of the side edges of the blank, said points being designated B and C in the drawings. In the upper portion of the blank, the end slit 28 of one set of hinge elements connects with the end slit 28 of the other set of hinge elements at the point B, while at the point C a slit 28' connects the ends of the two sets of hinge elements.

As for the hinge elements themselves, they are mechanically of the same construction as heretofore described and may be arranged in any of the heretofore described positions and the slits and scores may also be formed to permit of the inner section 61 moving to a position either rearwardly or forwardly of the outer section 60.

In Figures 12 and 13 of the drawings, I have illustrated still another embodiment of the invention, the principle, however, being the same as in the heretofore described forms.

As in the other forms of the invention, there is an outer section 71, an inner section 72 and an intermediate section 73 which latter is slitted and scored to form hinge elements 74.

In this form of the invention, each of the hinge elements comprises a body portion 75 from which project two parallel legs 76 and 77. The body portion of each hinge element is of true rectangular shape or form having a straight edge formed by a straight slit 78 and two spaced slits 79 and 80 which extend in spaced parallel relation from the ends of the slit 78, the legs being formed by a slit 81 extending parallel with the slits 79 and 80 and disposed centrally thereof.

The leg 76 of each hinge element is hingedly connected to its respective body portion thereof by a front cut score line 82, while the leg 77 of each hinge element is in the form of a rigid extension of its respective body portion which rigid extension terminates at a front cut score line 83. There is a slit 84 which forms a continuation of the slit 81 which forms the leg members and the outer end of the slit 84 of each hinge element is connected with the slit 80 of the next adjacent hinge section reading in a clockwise direction in Figure 12, by a slit 85.

This arrangement of slits and score lines divides the intermediate section into the hinge elements 74, a plurality of rectangular areas in the form of rigid elements 86 projecting from the inner edge of the outer section 71 and a plurality of L-shaped rigid projections 87 extending from the outer edge of the inner section 72.

The projections 83 are defined by portions of the slits 80 and 84 and the front score line 83, the L-shaped projections being defined by the slit lines 79, 80, 84 and 85, and a rear cut score line 88 which latter connects the slit 79 with the slits 81 and 84 and also forms a hinged connection between the legs 76 of its respective hinge element and its respective L-shaped projection 87.

In the foregoing description, I have described but one hinge element, but it is to be understood that the inner section 72 and the outer section 71 are joined together by a plurality of such hinge elements and that in the preferred form of the invention, the entire intermediate section 73 will be divided by slits and score lines as described to form a series of such hinge elements closely adjacent to each other.

In the form of the invention illustrated in Figures 12 and 13 of the drawings, the blank and the inner, outer and intermediate sections are of rectangular form, and the hinge elements are arranged in four separate or distinct series,

there being a series of hinge elements extending parallel with each of the side edges of the inner and outer sections 71 and 72.

It will also be noted that in this form of the invention, the hinge elements of each series are arranged or positioned at right angles to the hinge elements of each of the series upon opposite sides thereof as distinguished from the arrangements in the remaining forms of the invention.

In that form of the invention illustrated in Figures 12 and 13 of the drawings, the score lines as described are of such character that when the blank is broken out upon the slits, the inner section moves to a position at the rear of the outer section, but it is to be understood that as in the other forms of the invention, reversal of the score lines will form a device which when broken out upon the slit lines will cause movement of the inner section to a position forwardly of the outer section.

From the foregoing, it will be apparent that the present invention provides a new principle of slitting and scoring a single blank of material to provide within the blank, a plurality of sections which are movable relatively to each other in a rectilinear direction as distinguished from the axial and reciprocating movements of all previous devices of this nature with which I am familiar.

It is to be understood that the several forms in which the invention have been herein embodied are merely illustrative of its adaptations and that the invention is not to be limited to these forms, but may be practiced in such other forms as rightfully fall within the scope of the appended claims.

Having thus described the invention what is claimed is:

1. In a knockdown display device of the character described, an inner section, an outer section, and a slitted section spacing the outer section from the inner section, said slitted section being scored to provide a plurality of hinge connections between the inner and outer sections which permit of relative rectilinear movement of the inner and outer sections in a direction at right angles to the planes of the sections, each of said hinge elements comprising a body portion, a leg member projecting from the body portion and forming a rigid extension thereof, means for hingedly connecting said leg member to the outer section, a second leg member projecting from the body portion, means for hingedly connecting said second mentioned leg member to the body portion, and means for hingedly connecting said second mentioned leg member to the inner section.

2. In a knockdown display device of the character described, an inner section, an outer section, and a slitted section spacing the outer section from the inner section, said slitted section being scored to provide a plurality of hinge connections between the inner and outer sections which permit of relative rectilinear movement of the inner and outer sections in a direction at right angles to the planes of the sections, each of said hinge elements comprising a body portion, a leg member projecting from the body portion and forming a rigid extension thereof, means for hingedly connecting said leg member to the inner section, a second leg member projecting from the body portion, means for hingedly connecting said second mentioned leg member to the body portion, and means for hingedly connecting said second mentioned leg member to the outer section.

RICHARD E. PAIGE.