Dec. 24, 1935. V. G. McCULLY 2,025,295

EDUCATIONAL AND AMUSEMENT APPLIANCES

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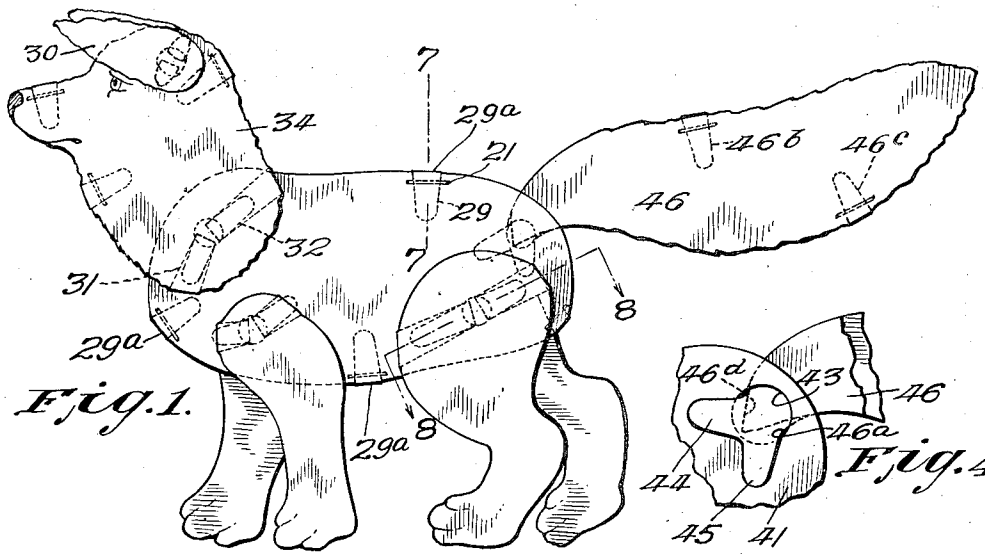


Fig. 1.

Fig. 4.

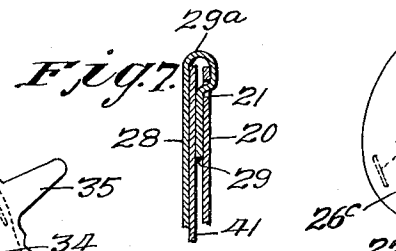


Fig. 7.

Fig. 3.

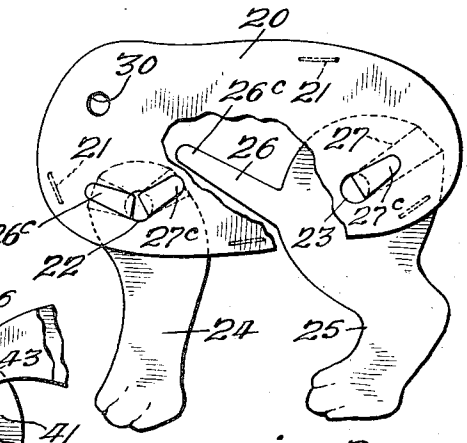


Fig. 2.

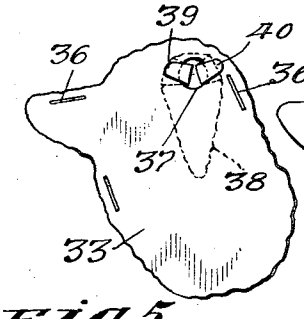


Fig. 5.

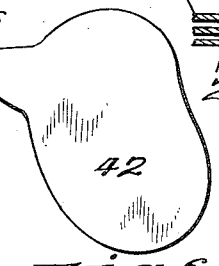


Fig. 6.

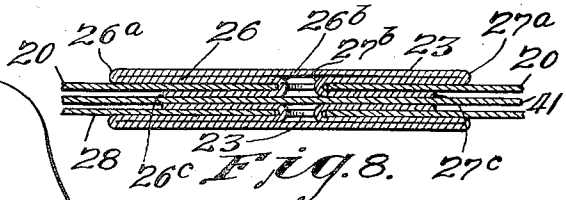


Fig. 8.

INVENTOR
VERNA GRISIER McCULLY,
BY
P. Frank Samuels
ATTORNEY

Dec. 24, 1935. V. G. McCULLY 2,025,295

EDUCATIONAL AND AMUSEMENT APPLIANCES

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Fig. 9.

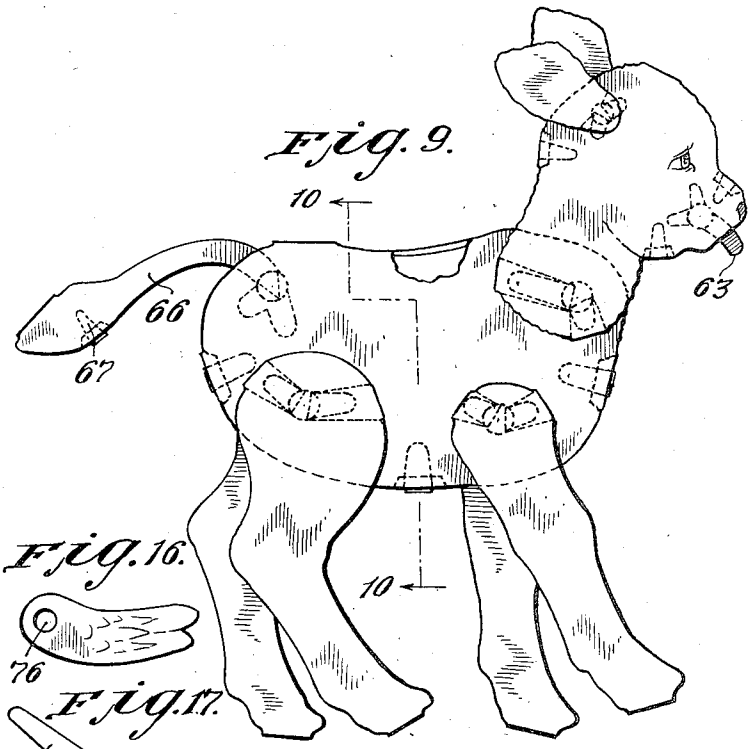


Fig. 12.

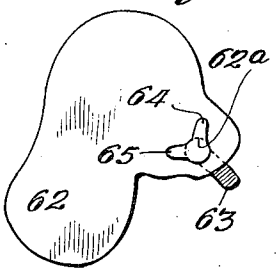


Fig. 16.

Fig. 17.



Fig. 10.

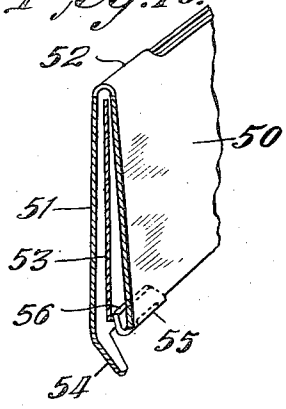


Fig. 18.

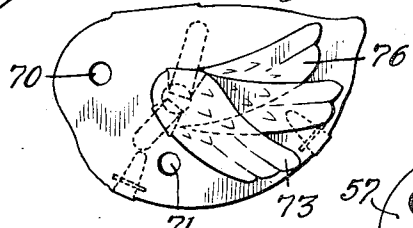




Fig. 11.

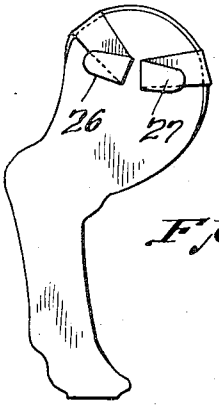
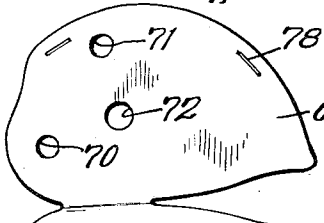


Fig. 13.



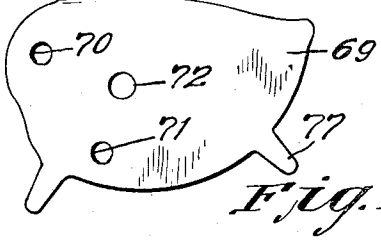


Fig. 15.



Fig. 14.

INVENTOR
VERNA GRISIER McCULLY
BY
P. Frank Adams
ATTORNEY

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2,025,295

UNITED STATES PATENT OFFICE

2,025,295

EDUCATIONAL AND AMUSEMENT APPLIANCES

Verna Grisier McCully, New York, N. Y.

Application July 14, 1934, Serial No. 735,123

6 Claims. (Cl. 46—157)

This invention relates generally to educational and amusement appliances or devices and is more particularly directed to a method and means of producing replicas of animate and inanimate figures and objects, by utilizing appropriately shaped patterns or forms of parts of the figure or object to be reproduced and effecting their jointure, whereby certain elements or components of the complete assembly may be adjusted relatively to others thereof, for permitting of the simulation of movements of which the corresponding parts of the figure or object reproduced may be capable, or for presenting the figure or object in various postures or positions.

As is well known, there are many types of so-called jointed dolls and animals which are assembled from patterns produced by printing, or otherwise, upon a sheet of paper or cardboard, the several patterns constituting a doll or animal being cut from the blank and put together in their proper relationship. In these earlier conceptions, the connection of the movable parts to the supporting pieces of the assembly has been effected in a variety of ways, usually by metal eyelets or rivets, or by short lengths of cord or elastic knotted in engagement with the associated parts. However, it has long been recognized that these connecting media not only detract from the appearance of the complete assembly, but are difficult of application, especially by the child user, for whom articles of the kind are primarily designed. Numerous unsuccessful attempts have been made to overcome the difficulties in the attachment of the movable parts and to impart to the figures or objects a more realistic aspect, as, for example, by providing such parts with integral peripheral projections of an annular outline, which are designed to be inserted in circular holes of smaller diameter in the sections from which the movable parts are supported. These failures may be attributed, largely, to the fact that, in many instances, as with the peripheral projections just referred to, the assembly of the parts is really rendered more difficult, because of the care that must be exercised in entering the projections through the holes of lesser diameter and in subsequently conditioning the jointures to function as contemplated. Further, this type of jointure does not give the figure the requisite stability and, obviously, fails to adequately respond to the demand for greater realism in appearance, even in those assemblies where the movable parts have been most carefully connected to their supports.

Therefore, it is the primary object of this invention to provide a method and means of producing articulated figures and objects, of various kinds, wherein the objectionable characteristics of existing devices, as hereinbefore pointed out, will be eliminated, in an entirely simple and practical manner.

More specifically, the object of this invention is to provide a method and means of improving the appearance of assembled figures and objects, produced from patterns or forms of any suitable material, by effecting the jointure of the movable members thereof, with those parts from which they are designed to be supported, in a manner whereby the interlocking media will be completely concealed and such members will appear to merge into the supporting portions, similarly to the complemental members of the figure or object of which the assembly is a replica.

It is a further object of my invention to simplify the method of producing figures and objects embodying relatively movable parts, by utilizing integral media, for effecting the interconnection of such parts, which may be readily manipulated into their functioning positions and which will maintain the parts in their original assembled association for a predetermined range of relative movement, to a degree of permanency that it has not been possible to heretofore attain, thereby materially adding to the effective durability of the figures or objects produced.

Another object is to provide for the production of jointed figures and the like, from flat stock or material, which, in addition to embodying the aforesaid characteristics and advantages of this invention, will be more stable than existing devices, this extremely desirable end being attained by the employment of spacing surfaces which contribute to the reinforcement of the structure as a whole and also insure complete freedom of movement of the articulated parts, by eliminating the possibility of jamming or binding of oppositely placed connections.

Other objects and advantages flowing from the practicing of my invention, will doubtless present themselves as the description proceeds, and I would have it clearly understood that I reserve unto myself all rights to the full range of equivalents, both in structure and in avenues of use, to which I may be entitled under my invention in its broadest aspect.

For the purposes of this disclosure, I have elected to illustrate and describe certain preferred embodiments of my invention, as it may be followed in producing articulated figures or objects from assembled patterns cut from a blank

of suitable material upon which they may be outlined, as in the standard types of so-called cut-out toys and designs. This is merely illustrative, however, and is not to be construed, in any sense, as a limitation of the scope of my invention, which, as will become manifest, is susceptible of taking other forms and of being otherwise practically utilized within the purview of the appended claims.

In the drawings:

Figure 1 is a side elevation of the representation of a fox, produced in conformity with my invention.

Figure 2 is a view in elevation of the right body section, with attached right fore and hind legs of the figure of the fox, the body section being broken away to disclose the mode of interconnecting the legs therewith.

Figure 3 is a side elevation of the left body and head sections of the assembly of Figure 1, with their complemental spacers associated therewith, the body being partly broken away to show the tail connection.

Figure 4 is an enlarged view of the tail connection shown in Figures 1 and 3.

Figures 5 and 6 are respectively views in elevation of the right head section and the head spacing surface or reinforcement, as embodied in the assembly of Figure 1.

Figure 7 is a transverse section on the line 7—7 of Figure 1.

Figure 8 is a longitudinal section on the line 8—8 of Figure 1.

Figure 9 is a side elevation of the representation of a calf produced by a modified form of structure.

Figure 10 is a sectional view taken on the line 10—10 of Figure 9.

Figures 11 and 12 are respectively views of the side-forming sections of the head and the spacer designed to be associated therewith, the latter carrying the tongue of the animal depicted in Figure 9.

Figure 13 is an elevation of a leg composed of two integral sections, superposed one upon the other by a fold, as in the formation of the head of Figure 11.

Figure 14 is a top plan view of the leg of Figure 13.

Figure 15 shows the manner in which my invention may be practiced in forming the body of a bird or chicken, the two sides being integral.

Figures 16 and 17 are plan views of pieces adapted for producing the wing of a bird, wherein the wing components will be capable of relative movement when connected to the body, and

Figure 18 is illustrative of the mode of assembly of the wing sections to a body, such as shown in Figure 15.

Referring now to the drawings in detail, in which like characters of reference are employed to designate similar parts in the several views, and more particularly to the structure of Figures 1 to 8, inclusive, **20** indicates the right body section of an appropriate outline, which may be slotted in juxtaposition to its periphery, as at **21**, and provided with a series of annular openings **22** and **23**, adjacent the front and rear ends thereof, to receive the means whereby the right fore and hind legs **24** and **25** are attached thereto, as hereinafter described.

The fastening means for each leg comprises a pair of integral elongated tabs or prong-like shaped extensions **26** and **27**, projecting from oppositely located points on the upper peripheral portion thereof, which are designed to be folded upon themselves in reverse directions, for functioning in connecting the leg to the body section for relative rotative movement. This is preferably accomplished by initially folding each tab inwardly upon the contiguous surface of the leg, as at **26***a* or **27***a*, and then making a second transverse fold or crease, as at **26***b* or **27***b*, intermediate of the first fold and the free end of the tab, the surfaces defining the folds **26***b* and **27***b* of the respective tabs being in juxtaposition to each other, so that the tab portions **26***c* and **27***c* thereof, beyond the latter folds, may be poised in association, at an angle of approximately 90° to the leg surface for entry in and passage through the appropriate receiving openings **22** or **23**, as the case may be, in the body section, to be subsequently disposed parallel to and in contact with the inner surface of said section, the leg, obviously, abutting upon the outer surface of the body section.

As will be observed, when the leg is mounted, as just described, the tab-receiving orifice **22** or **23**, in the body section functions as a bearing surface for the edges of the tabs or extensions, the width of the bearing-traversing portions thereof, corresponding approximately to the diameter of the bearing. This insures continuous contact of the coacting bearing surfaces, throughout the range of movement of which the leg is capable and eliminates lost motion between the parts; the inherent resiliency of the material from which the leg pattern with its integral tabs or extensions is cut, contributing to the attainment of this highly desirable and important objective of my invention.

Similarly to the right body section, the left body section **28** is apertured, as at **28***a*, for the reception of the fastening media of the left fore and hind legs, the latter section being provided with peripheral extensions or tabs **29** which are adapted to be folded inwardly on the line **29***a*, and entered in the slots **21** of the right body section **20**, from the outer side thereof, in the assembly of the patterns, as hereinafter set forth. Each of the two body sections is also provided with an opening **30**, suitably placed for the reception of the tabs **31** and **32** of the right and left head pieces or patterns **33** and **34**, respectively, which correspond generally, in shape and in their application and mode of functioning to the leg attaching tabs **26** and **27**, as heretofore described.

The right and left head pieces are adapted to be interconnected by the tabs **35**, integral with the left head piece, formed for entering in the receiving slits **36** of the opposite head piece, as in the interlocking of the two body sections, the head pieces being respectively apertured, as at **37**, for the connection of the ears **38** thereto for relative movement, the latter members embodying tabs **39**, **40**, which are folded similarly to the leg retaining tabs and function in a corresponding manner.

To prevent the oppositely positioned leg and ear tabs from tearing or becoming distorted or otherwise damaged in the rotative movement of the members which they support, due to jamming or interlocking, one with the other, I may employ guards or spacing elements **41** and **42**, one for the body and one for the head. Each of these elements is complemental to the sections with which it is designed to be associated and is adapted to be interposed therebetween, the section **41** having an opening **43** for the

reception of the integral tabs **44—45** of the tail-piece **46**. These tabs **44—45**, preferably, merge, taking a V-form, and in mounting the tail are compressed or rolled toward each other to facilitate their passage through the opening **43**, whereupon they may be expanded into flat contact with the contiguous surface of the body section, the neck portion **46***a* from which the tabs diverge, being sized relatively to the diameter of the aperture **43** to maintain continuous contact between the interconnected surfaces of the tail and its support, as in the leg jointures.

As will be manifest, these guards or spacing elements also function as reinforcements for the body and head portions of the figure and materially add to the stability of the mountings of the movable members carried thereby, in addition to imparting to the figure a more realistic appearance than it is possible to obtain where the jointure of the appendage to the body is unconcealed, or is accomplished by some form of connection partly or wholly external of the body.

In the assembly of the cut patterns, the fore and hind legs are joined to the respective body sections, as described, following which the head sections, with which the appropriate ears have been previously associated, are hinged thereto. The body spacer or guard **41**, to which the tail **46** has been connected, and the head element **42** are then located between the complemental outer body and head sections and the latter tied together by engaging the peripheral tabs or projections **29—35** of the left body and head sections with the slots **21—36** of the right body and head sections, in the manner which is clearly evident from Figures 1 and 7. Of course, the number of tabs and receiving slots may be varied to meet production or other requirements, and they may be located otherwise than shown; also the tabs may be integral with the right body and head sections, or the individual sections may be provided with alternately arranged tabs and slots, the tabs folding in opposite directions affording greater security in the connection of the matable patterns. The tail **46**, as shown, is composed of two similar pieces, retained in mated relation by the interconnection of the tabs and slots **46***b*, **46***c*. Each of these tail pieces may embody the heretofore described tabs **44—45** or they may be omitted from one thereof, the piece terminating within the zone of the tail-attaching tabs, as shown in dotted line at **46***d* in Figure 4. Obviously, the tail may comprise a single pattern, embodying the attaching tabs.

In the assembly illustrated in Figures 9 to 12, inclusive, the right and left body sections **50—51** are integrally joined for folding one upon the other along the line **52** defining the back of the figure, the sections being interlocked, following the placement of the spacer **53** therebetween, by the cooperating tabs **54** and slots **55**, the latter, as will be noted, being disposed on the line of the periphery of the body section **50** by the formation of the peripheral protuberances **56**, which are adapted to be turned or folded inwardly, to lie against the inner surface of the section, as shown in Fig. 10. The complemental head pieces **57—58**, likewise, are integrally joined for folding along the line **59**, the parts being interlocked by the entry of the tabs **60** in the slots **61** of the peripheral extensions **61***a*, to retain the head insert or spacer **62** therebetween, the latter carrying the representation of a tongue **63** comprising two integral parts, folded one upon the other, one of them embodying tabs **64—65**. Similarly, the tail-piece **66**, comprises two integral sections, foldable in the same manner and held along their free edges in mated relation by the coacting slots and tabs, as at **67**.

Figure 15 shows the formation of the integral sections of the body of a bird, the two pieces **68—69**, matable by a proper fold, being apertured, as at **70** and **71** for the reception of the head and leg-forming patterns, and at **72** for the connection of the wings thereto, the latter of which may comprise one or more parts. Where the wing consists of more than one piece, one thereof, **73**, is provided with integral tabs **74—75** foldable in the manner of the tabs **26—27** of the leg members, for entry in and retention within the cooperating bearing aperture **72**, the remaining sections of which the wing may be constituted, such, for example, as shown in Figure 16, being apertured, as at **76**, for the passage of the tabs of the wing piece **73** therethrough, prior to their connection to the body, it being obvious that the several pieces of the wing assembly are disposed in superposed relation for rotative movement on the axis formed by the tabs **74—75**, as will be apparent from Figure 18. The folded body sections of the bird figure are held together by the peripheral tabs **77** and cooperating slots **78**, which may be produced in either of the ways heretofore described, or otherwise, the legs (not shown) being appropriately formed and attached to the body sections by suitable tabs or extensions, as in the other figures shown.

In some instances, in the interest of greater realism in appearance, and to add to the rigidity of the figure as a whole, the legs may be of double stock, as shown in Figures 13 and 14, each leg being composed of two integrally connected complemental patterns, adapted to be folded to superpose one upon the other, the pattern forming the outside leg embodying the heretofore described attaching tabs or extensions **26—27**. Similarly, the pattern of any other part herein shown and described as of a single thickness of material, may be built up of two or more integrally or otherwise joined complemental pieces, it being understood that the spacers associated with the head and body sections, or either of them may be omitted, if desired in a specific assembly, or where the material employed for producing the patterns precludes the possibility of the attaching tabs of the movable members on opposite sides of the figure from interlocking or otherwise interfering.

The patterns of the various parts entering into the assembly of a figure, may be delineated on a sheet of paper, cardboard or other material, from which they may be cut, folded and put together, it being manifest that a plurality of sheets bound together in book form may be utilized in providing patterns for a single figure or for several. Of course, the cut patterns may be marketed ready for assembly, or the complete figure, as produced by the practicing of my invention may be supplied to the trade. For instance, the several patterns constituting a complete figure may be stamped from metal and the parts assembled by machine or hand operations. Again the use of two unlike materials may be resorted to in the production of the patterns for a particular figure or representation, the body and head sections, for example, being formed of wood, while the articulated members, with their integral attaching tabs, may be of metal or other material which will lend itself to attachment to the body for movement as described.

In the production of representations of the human figure, the arms, legs and head provided with the described attaching tabs, are connected, to the matable torso pieces or the intermediate spacers, as the case may be, for articulation. If desired, each of the limbs, in such representations, may be composed of two or more sections, connectable by cooperating tabs and apertures for relative articulation, thereby materially adding to the realism of the reproduction and increasing the range of manipulation of the parts.

While I have described my invention more or less specifically, as practiced in the production of the figures shown, it will be understood that in lieu of connecting the head pieces, for instance, to both spacers, they may be connected to but one of the latter, irrespective of whether the head sections are integrally or otherwise joined. This, of course, also applies to any other parts which have been described as connected to two pieces, as the tongue or tail of an animal, for example, such variations being within the scope of my invention and being governed by production or other requirements.

In addition to reproducing animate figures of various kinds and types in miniature, or in full size, if desired, as where my invention might be employed in educational work, replicas of innumerable objects may be produced for amusement and instructive purposes, by means of appropriate patterns. As an example, apart from the articulated representations of the human figure and those of the lower animals, objects having normally movable structural elements, as wheeled vehicles, windmills, steam shovels and other machinery or mechanisms may be reproduced, with a degree of fidelity in appearance and movement that has not, heretofore, been attainable by the use of so-called cut-out patterns or designs.

I claim:

1. A means for producing a figure having articulated members, from sheet material, comprising a plurality of patterns adapted to cooperate to complete the figure, certain of said patterns being provided with apertures, and devices for supporting other of said patterns from said apertured patterns whereby the jointure of the two types of patterns will be concealed, said devices comprising oppositely disposed elongated peripheral extensions of the supported patterns formed for entry through said apertures and foldable in opposite directions on either side of the supporting patterns, the surfaces of said devices intermediate of their folds coacting with the aperture to form a bearing for the rotative movement of the supported member.

2. A pattern for a member of a figure adapted to be produced from sheet material, said pattern including attaching means embodying integral extensions diverging from its periphery and foldable inwardly toward each other on the surface of the pattern to provide an axis on which the pattern is rotatable relatively to another part of the figure and in opposite directions to maintain such axis and prevent lateral displacement of said member, said attaching means underlying the pattern of which they are a part and being wholly concealed thereby when conditioned for functioning.

3. A pattern for a member of an articulated figure adapted to be composed of a multiplicity of patterns, said pattern including integrally formed attaching means diverging from the periphery thereof and engageable within an orifice in another pattern of such figure, the ends of said extensions, when engaged within said orifice, overlying the inner surface of the orifice-embodying pattern to maintain the connected patterns in assembled relation, for movement of said extension-carrying pattern on a transverse axis within the orifice-engaging zone of said extensions, said attaching means and the orifice within which they are engaged being completely concealed by the pattern of which said attaching means are a part.

4. A figure composed of sheet material sections joined by integrally formed surfaces, certain of said sections being provided with apertures, others embodying peripheral extensions adapted to be folded in opposite directions intermediate their ends to form surfaces to traverse the apertures in which said extensions are entered, the portions of said extensions on either side of said surfaces being parallel to the respective figure sections, whereby said surfaces are free to rotate within their cooperating apertures and lateral movement of the connected sections is simultaneously prevented, the outer faces of the sections embodying said extensions completely concealing said extensions and the apertures in the other sections with which they are associated.

5. A pattern for a member adapted to be connected to a supporting part of a figure for articulation, formed from sheet material and embodying elongated extensions diverging from the periphery thereof, the respective extensions being adapted to be folded at their point of juncture with the periphery for disposition in converging relationship on the contiguous surface of the pattern, and again intermediate of the first fold and the free end thereof to locate the portions of the two extensions beyond the said second folds in juxtaposition for entry through a receiving aperture in such supporting part, the juxtaposed portions being subsequently disposable parallel to the surface of the support upon which they abut, to function as retainers, the said extensions when conditioned for functioning, being completely concealed by the overlying and uninterrupted surface of the pattern.

6. A figure composed of members formed of sheet material, certain of the members being articulated, comprising members provided with apertures and other members connectable thereto for relative rotative movement, said latter members embodying tabs divergent from their peripheries, the respective tabs of each connectable member being adapted to be folded toward each other upon the inner face thereof and subsequently folded for entry in an aperture of another member, for interconnecting the two members for the aforesaid relative rotative movement, the tabs and apertures being completely concealed by the uninterrupted frontal surface of the articulated member.

VERNA GRISIER McCULLY.