March 1, 1949. E. G. BUCHMANN 2,463,355

TOY

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FIG. 1.

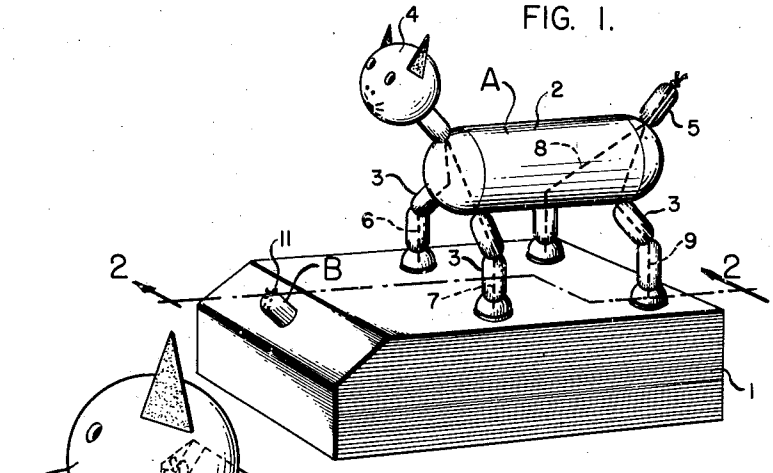
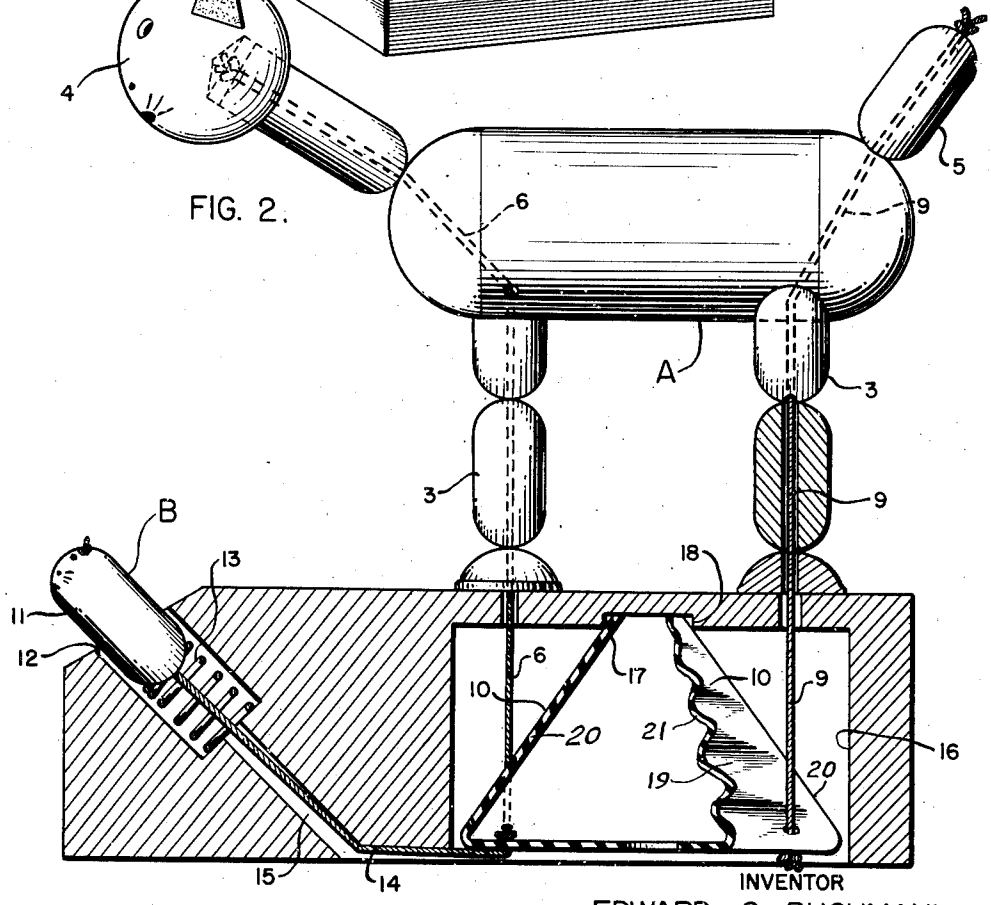


FIG. 2.



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FIG. 3.

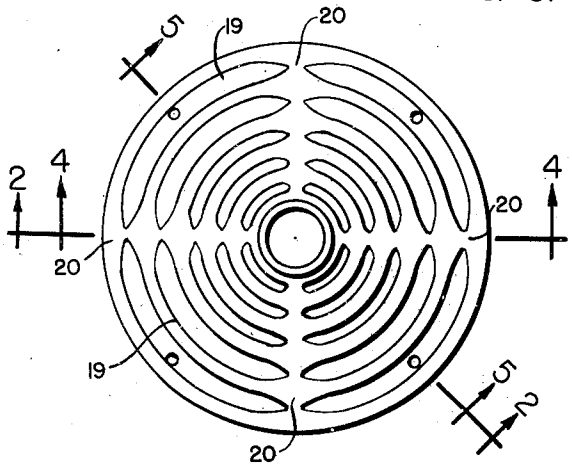


FIG. 4.

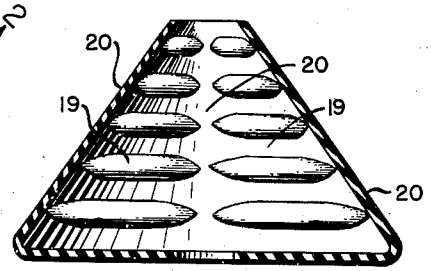


FIG. 5

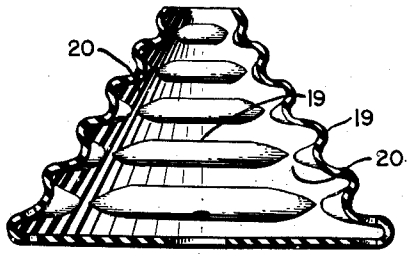


FIG. 7.

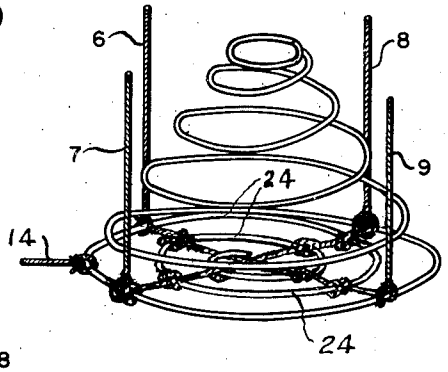
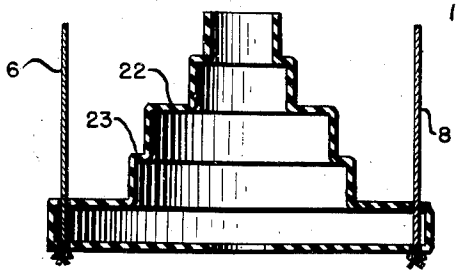


FIG. 6.



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Edward G. Buchmann, Chicago, Ill.

Application March 10, 1948, Serial No. 14,130

4 Claims. (Cl. 46—119)

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This invention relates to toys comprising figures made up of segmentally articulated members in the nature of puppets and marionettes in which the members are held together by internal lacings or cords in such manner that the attitudes of the figures can be varied according to changes in the tension on the lacings. Such devices are to some extent known in the art, with various devices applying tension to the lacings.

The main objects of the present invention are to provide improved means for manipulating the attitudes of the figure whereby the tension is applied to the lacings by compression spring means of such nature that the operator will have better control of the movements of various parts of the figure that are controlled by different lacings; to provide an improved spring structure for this purpose whereby this control is effected by a single spring; and to provide a spring for this purpose which has varying degrees of resistance to longitudinal compression and varying degrees of flexibility along different longitudinal lines about its axis.

A further object of the invention is to provide a toy of this kind in which there is a plurality of figures whose movements are individually and severally controlled in relation to one another by means of a single operating member.

An illustrative embodiment of the invention is shown in the accompanying drawings in which:

Figure 1 is a perspective view of a toy of the general type to which this invention relates.

Fig. 2 is a partly sectional elevation of the same with parts in section to show the interior construction, the section of the base being taken on the line 2—2 of Fig. 1.

Fig. 3 is a top view of a hollow shell structure made of resiliently flexible material, such as rubber, that serves as the tensioning spring for the lacing elements and as the main operating element for manipulating the figures of the toy.

Fig. 4 is a section of the same taken on the line 4—4 of Fig. 3.

Fig. 5 is a section of the same taken on the line 5—5 of Fig. 3.

Fig. 6 is a modified form of spring structure; and

Fig. 7 is a further modified form of spring structure.

In the form shown in the drawings, the particular form of each figure, puppet or marionette is to be understood to be merely typical and illustrative of the application of the invention to manipulatable figures of almost any form that might suit the fancy of the manufacturer.

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The device shown comprises a base member 1 upon which is mounted an animal figure A having a body part 2 resting loosely on segmental leg members 3 and with its head 4 and tail 5 also segmentally connected to the body by lacings 6, 7, 8 and 9 which are threaded through internal bores in the various segments of the figure and then connected to the spring 10, which is arranged to apply tension on the individual lacings and to be manipulated to vary such tension to change the attitudes of the figure A.

The second figure B might be similarly articulated but in the form shown is merely a body 11 representing a mouse or rodent, that is pushed partly out of its hole 12 by a compression spring 13 and has its internal lacing 14 extended through bores 12 and 15 in the base and connected to the spring 10.

The spring 10 is preferably of frusto-conical form and is housed within a large bore 16 extending upwardly from the bottom of the base. The smaller end 17 of the spring is seated in a recess 18 at the upper end of the bore 16 and the lacings 6, 7, 8, 9 and 14 are connected at spaced points around the periphery of the large end of the spring.

In the form shown in Figs. 2, 3, 4 and 5, the spring 10 is a hollow shell of rubber having walls of substantially uniform thickness, such as might be formed by dipping a core of appropriate shape into a bath of latex and then vulcanizing it. The wall thickness is determined by repeated dippings into the liquid rubber, as will be understood.

In its final form, the shell is symmetrical with respect to its vertical axis and is corrugated in radial zones 19 corresponding to the points at which the cords 6, 7, 8 and 9 are attached and uncorrugated along narrow longitudinal lines 20. The corrugations 21 provide regions of longitudinal compression sensitivity of the spring along radial planes passing through the points of attachment of the lacing cords 6, 7, 8 and 9 and the uncorrugated areas 20 define longitudinal lines along which the spring is less sensitive to compression. This arrangement enables the operator to control the compression and flexure of the spring in such manner as to allow him to control the tension on the various lacing elements individually and severally in such manner as to control the movements and attitudes of the figure with a high degree of direction.

The lacing 14 is preferably connected to the large end of the spring at one of the lines 20 so that when the spring is compressed on the cor-

responding longitudinal line, the rodent body 11 will be drawn back into its hole, compressing the spring 13.

In the form shown in Fig. 6, the longitudinal corrugations of the spring are in the form of annular steps 22 and 23 of varying width such as would provide varying degrees of sensitivity to compression along radial zones about the axis of the spring.

In the form shown in Fig. 7, the spring is of wire, wound volutely into conoidal form. This spring flexes readily for local effects on individual lacing elements, but is less responsive to isolation of movement to a single lacing than is the rubber spring of Figs. 3 to 5. Several volute convolutions 24 at the large end of the spring are wound in a common plane and parts of the lacing cords are interwoven with these convolutions 24 to form an operating disc for manipulating the cords.

In operation, when the spring is compressed as a whole by an upward axial thrust, all of the lacings 6, 7, 8 and 9 will be relaxed and the figure A will collapse. The pull upon the lacing 14 will simultaneously draw figure B into its hole against the action of spring 13.

The operator may, however, localize the pressure of his finger or fingers upon marginal regions of the bottom of the spring 10 so as to relax any one or more of the lacings 6, 7, 8 and 9 individually or in any combination thereof. The uncorrugated linear area 20 between the corrugated regions of the spring structure, offers sufficient resistance to compression to localize the effect of marginal pressures on the bottom of the spring to permit quite accurate control of the movements of the figures.

However, when pressure is applied simultaneously to adjoining regions 19 of the spring, the intermediate portion 20 of the spring flexes to avoid interference with the compression of the spring. By manipulation of the operating spring, the operator can effect many different movements of the figures.

It will be understood that numerous details of the construction shown may be altered or omitted without departing from the spirit of the invention as defined by the following claims.

I claim:

1. A toy structure, comprising a base, a figure made up of segmentally articulated members in abutting relation to one another, flexible lacing elements passing loosely through members of said figure to connect them together and to said base, a compression spring having one end bearing on said base and its other end connected at peripheral intervals to said lacing elements for normally applying tension thereto to hold said figure in a predetermined attitude, said spring being formed with radial zones offering various degrees of resistance to longitudinal compression of said spring at and between the points of its connection to said lacing elements to provide for substantial compression of the spring in individual zones independently of other zones for manipulating said figure through localized movement of said radial zones of said spring.

2. A toy structure, comprising a base, a figure made up of segmentally articulated members in abutting relation to one another, flexible lacing elements passing loosely through members of said figure to connect them together and to said base, a compression spring having one end bearing on said base and its other end connected at peripheral intervals to said lacing elements for normally applying tension thereto to hold said figure in a predetermined attitude, said spring being formed of rubber and shaped to provide radial zones offering various degrees of resistance to longitudinal compression of said spring at and between the points of its connection to said lacing elements to provide for substantial compression of the spring in individual zones independently of other zones for manipulating said figure through localized movement of said radial zones of said spring.

3. A toy structure, comprising a figure made up of segmentally articulated members in abutting relation to one another, flexible lacing elements passing loosely through said members to connect them, a base supporting said figure, and a conoidal compression spring having its small end bearing on said base and having its large end directly attached at points on its periphery to said lacing elements for normally applying tension to said lacing elements to hold said figure in a predetermined attitude, said spring being adapted to be manipulated to cause said figure to change its attitudes through relative variation of the tension on individual lacing elements, said spring being longitudinally compressible and being formed to be less resistant to compression on longitudinal lines intermediate said points of attachment than on longitudinal lines passing through the points at which said lacing elements are attached.

4. A toy structure, comprising a figure made up of segmentally articulated members in abutting relation to one another, flexible lacing elements passing loosely through said members to connect them, a base supporting said figure, and a conoidal compression spring having its small end bearing on said base and having its large end directly attached at points on its periphery to said lacing elements for normally applying tension to said lacing elements to hold said figure in a predetermined attitude, said spring being adapted to be manipulated to cause said figure to change its attitudes through relative variation of the tension on individual lacing elements, said spring member comprising a hollow shell of rubber-like composition having its side walls longitudinally corrugated on lines passing through the points at which said lacing elements are attached and being stiffened on longitudinal lines intermediate of such points of attachment.

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