Nov. 12, 1946. L. SEGAL 2,410,875

KNOCKDOWN TOY

Filed June 14, 1946

Fig. 1

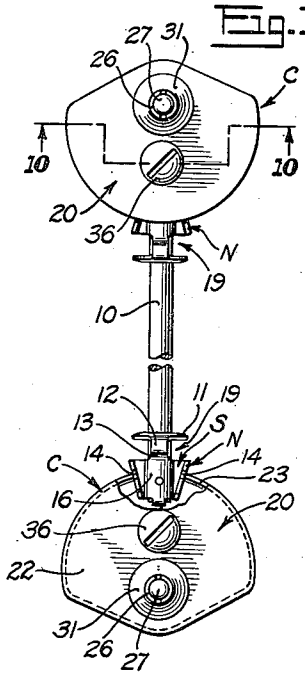


Fig. 3

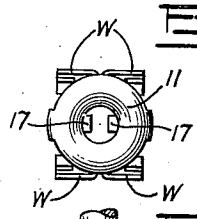


Fig. 2

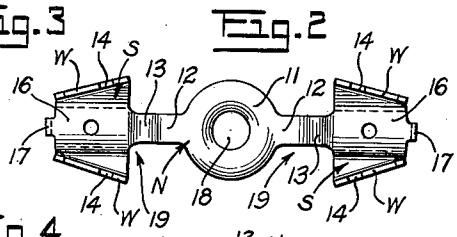


Fig. 4

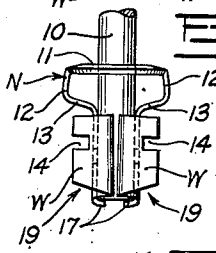


Fig. 5

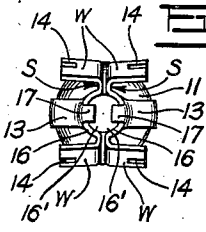


Fig. 6

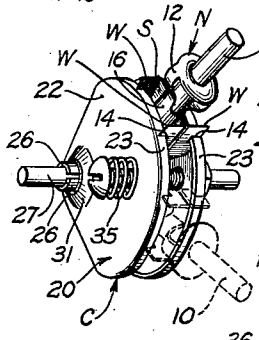


Fig. 7

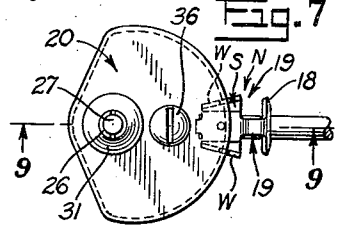


Fig. 8

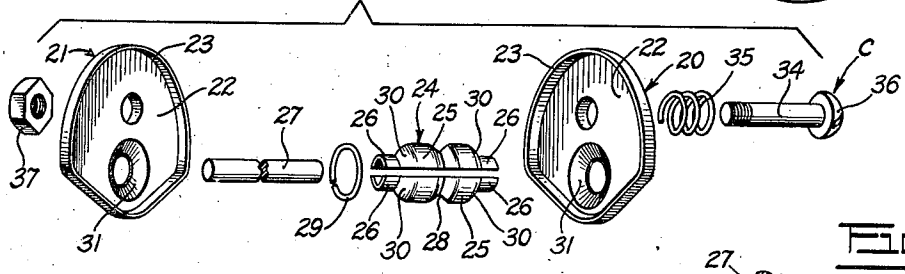


Fig. 9

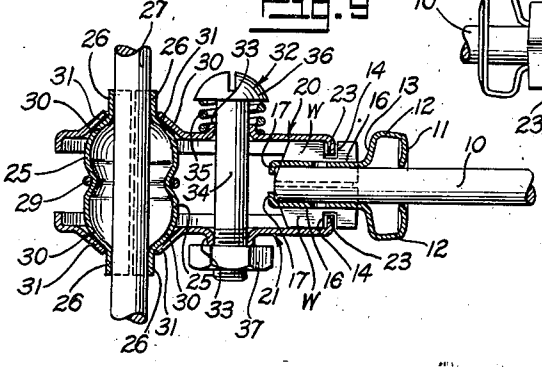
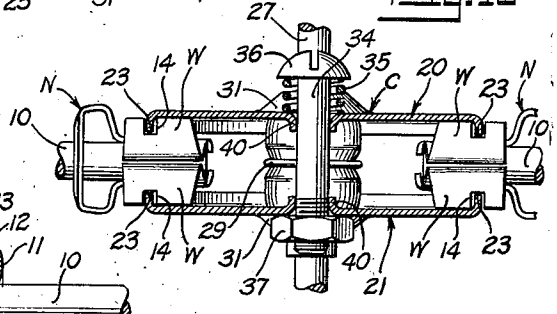


Fig. 10



INVENTOR.
Louis Segal
BY
Em Palmer
ATTORNEY

Patented Nov. 12, 1946

2,410,875

UNITED STATES PATENT OFFICE

2,410,875

KNOCKDOWN TOY

Louis Segal, New York, N. Y.

Application June 14, 1946, Serial No. 676,674

18 Claims. (Cl. 46—29)

1

This invention has to do with knockdown and erector toys especially adapted for convenient assembly of miniature structures to simulate automotive vehicles and certain types of buildings, bridges, and parts thereof although other structures than those referred to may be constructed with the invention herein disclosed. The invention has as an important object the provision of a support having spaced clamping members embodying arcuate track means removably and slidably disposed in arcuately alined slots of laterally extending wings of complementary depending sections adapted to removably clamp rod or brace means insertible in guide means common to and bridging the complementary sections. The invention has as a further object the provision of spaced clamping means for arcuately and slidably guiding a rod holder or nipple of relatively thin sheet metal stock adapted to be progressively and automatically formed in a conventional punch press. Another object is to provide a simplified nipple or rod holder which may be quickly formed and produced in large quantities at a relatively low cost. Another object resides in the provision of a split bushing or bearing for positioning the spaced clamping members for the nipple or rod holder a predetermined distance apart and for appropriately clamping a shaft against dislodgement relative to the spaced clamping members. Another object is realized in the provision of means for actuating the spaced clamping members to tighten or loosen the latter against or from the split bushing and against or from the laterally extending wings of the nipple. Another object is to maintain the spaced clamping members which may be in the form of partial discs or segments in yieldable engagement with the winged and complementary sections of the rod or brace sustaining nipple when the latter is in an unclamped relation with the spaced segments. Another object is to provide a one piece sheet metal nipple having annular guide means for receiving a rod or a brace to be clamped and having depending complementary sections carried by and depending from the annular guide means for straddling and removably embracing the rod or brace inserted into the guide means, the complementary sections being provided with notched wings adapted to be actuated to move the sections towards each other to removably clamp or embrace these sections against the rod or brace. Specifically another object of the invention is concerned with a serviceable nipple wherein the head thereof is characterized by an annular guard or guide and depending and inwardly offset and resilient limbs, and wherein the lower portion of the nipple is characterized by companion or complementary contiguously disposed but separable rectilinear and tapered sides having laterally extending and

2

spaced wings provided with spaced slots disposed on an imaginary arc having a common origin for receiving spaced arcuate track means or flanges of spaced segments or supporting members for movably guiding arcuate displacement of the nipple about the spaced segments. Other objects, advantages, and functional and structural features of the invention will appear from the following detailed specification taken with the accompanying drawing wherein:

Fig. 1 is a side view of a fragmentary portion of a knockdown or demountable toy illustrating the connectors according to my invention.

Fig. 2 is a plan view of a nipple or brace holder prior to folding or bending its complementary sections relative to the upper guide or annulus.

Fig. 3 is a plan view of the nipple or brace holder.

Fig. 4 is a front view of Fig. 3.

Fig. 5 is a bottom view of Fig. 4.

Fig. 6 is a fragmentary perspective view of the demountable toy illustrating a connector or support on which the rod or brace holder or nipple is mounted.

Fig. 7 is a side view of Fig. 6.

Fig. 8 is an exploded view of one form of connector according to the invention.

Fig. 9 is a sectional view on the line 9—9 of Fig. 7, and

Fig. 10 is a transverse sectional view on the line 10—10 of Fig. 1, however, illustrating a slightly modified connector.

Illustrative of the embodiment disclosed, connectors each generally denoted C adjustably sustain nipples or holders each broadly designated N adapted to removably clamp and support the tie rods or braces 10 against removal.

Each nipple or holder N embodies an annular guard or guide 11 from which depends the separable complementary sections comprising the diametrically disposed arms or limbs 12 having the inwardly and downwardly projecting or offset portions 13. Also forming a part of the complementary sections 19 are the substantially trapezoidal and downwardly converging sides S each having spaced and inclined or biased but laterally extending flanges or wings W each interrupted by a notch or slot 14, these wings being normal to the plane of the rectilinear portions of the complementary clamping sides. Each side S of a nipple or holder N comprises an arcuate or substantially semi-circular bearing portion 16 each having at its bottom portion an inwardly turned lip or stop 17.

The complementary clamping sides S are rectilinear but are interrupted by the semi-circular bearing portions 16 each characterizing an internally arranged groove 16' and the latter in fact may be said to constitute a bore for closely receiving a rod or brace 10. The annulus or guide 11,

the depending offset limbs 12 and the depending sides S are formed out of a single piece of sheet material. For purposes of specification the head of a nipple may be said to be formed by the annulus or guard 11 and its depending and offset resilient limbs 12. The inside rectilinear faces of the companion sides S are normally disposed in juxtaposition and are separated or diverged from each other upon the insertion of a rod 10 into the complementary bearing portions 16 or in other words in the bore defined by the grooves 16', and of course this bore is in alinement with opening 18 of the ring or annulus 11. Thus a rod 10 if inserted into the spaced sides S of the complementary sections 19 spread the nipple that is the sides S thereof and if removed from the latter the resilient limbs 12 automatically retract the complementary sections 19 to again arrange the sides S in close juxtaposition. If rod 10 be inserted into the guide opening 18 of the guard or annulus 11 and into the complementary grooves 16', eventually the diametrically alined lips or stops 17 limit such insertion.

Spaced segments or members 20 and 21 characterize a support for a rod holder or nipple N. As illustrated, the segments are partial discs each having a substantially semi-circular portion 22 having an inwardly overhanging circumferentially disposed or semi-annular flange or track 23 adapted to be removably receivable in the alined slots or notches 14 in the spaced and sloping wings W of the tapered or complementary sides S. The guide notches or slots 14 of each wing W are along an imaginary arc or circumference equidistant from the origin of the latter. Consequently a nipple N may be arcuately and slidably displaced along the spaced guides or track means 23 or the latter may be slidably and arcuately shifted relative to the nipple.

For normally holding a pair of companion segments 20 and 21 in a predetermined spaced relation, a split sleeve or bearing generally denoted 24 is employed. This bearing or bushing 24 is characterized by complementary semi-cylindrical hollow bearing portions 25 provided with reduced and hollow semi-annular ends 26 for closely receiving a shaft 27. Apart from the end portions 26 the remaining portions of the split and cylindrical bushing 24 is enlarged or expanded and is appreciably spaced from but surrounding shaft 27 although its intermediate portion is desirably indented to provide an annular groove 28 in which the split annular and resilient wire or spring 29 is disposed for normally holding the complementary bearing portions or sections 25 yieldingly together. With the rod or shaft 27 inserted in the split sleeve or bushing 24, the bearing sections 25 thereof are slightly separated against the resistance of the split wire retaining ring 29. However the reduced ends or necks 26 of the sections 25 appropriately clamp the inserted shaft 27.

The ends 30 of the intermediate and expanded portions of sections 25 are rounded and tapered, converging outwardly and characterize stop means for the tapered hubs or annular sockets 31 integral with and overhanging the outer faces of the segments 20 and 21.

For effectively maintaining sockets 31 against the tapered ends 30 of the expandible and contractible bushing 24 to sustain the flanges or tracks 23 a predetermined distance apart, clamping means comprising a bolt and nut arrangement broadly designated 32 (Fig. 9) is employed. It will be observed that annular collars or necks 33 are struck out of the segments or sustaining plates 20 and 21. These collars slidably receive the partly threaded shank 34.

Surrounding one of the necks 33 and effectively positioned thereby is a normally expanded helicoidal spring 35 which also surrounds a part of shank 34. The ends of spring 35 abut the slotted head 36 integral with shank 34 and neck 33 of the sustaining or segmental plate 20. By manipulating the internally threaded nut 37 cooperating with annular neck 33 projecting from the segment or plate 20, the inwardly overhanging tracks 23 may be securely clamped in the circumferentially alined slots or notches 14 against the wings W, thus precluding their displacement relative to the segments 20 and 21. By such clamp-action the complementary sections 19 of a nipple N are urged towards each other, thus causing the complementary bearing portions 16 thereof to firmly bind or clamp against the rod or brace 10. On tightening of nut 37, the complementary bearing sections 26 more firmly clamp the rod or shaft 27, thus precluding accidental dislodgement thereof from the connector C and more particularly from the spaced segments or members 20 and 21. On loosening nut 37, nipples N may be slidably displaced along the circumferential tracks or flanges 23 and if desired they may be completely removed from the connector or the spaced segments 20 and 21 may be slidably displaced relative to the nipple for a similar purpose. On such loosening, however, the complementary bearings 16 unclamp rod or brace 10 and consequently the latter may be removed from the unclamped nipple N. Where the nut 37 is loosened but the rod is not removed from the unclamped nipple, the latter of course may be shifted arcuately along the connector and at such time helicoidal spring 25 yieldingly bears against one of the segments or supports and consequently the complementary or companion section 19 maintain their yieldable engagement with the loosened nipple. It is apparent that on tightening of nut 37, a dual function arises, namely, the brace or rod 10 is clamped against removal and shaft 27 is precluded from being withdrawn from the connector. On loosening of nut 37, rod 10 may be detached from the nipple and shaft 37 may be conveniently withdrawn from the connector.

In the form according to Fig. 10 the annular neck flanges 40 are struck inwardly of the nipple supporting sections 20 and 21. In other aspects the form according to Fig. 10 is along the lines illustrated in Figs. 1–9 inclusive.

Various changes may be made in the details of construction and arrangement of parts without departing from the spirit of the invention or sacrificing any of the advantages thereof inherent therein.

I claim:

1. In a knockdown toy, brace means, a nipple comprising complementary sections defining a bore for removable reception of said brace means, each of said sections having spaced wings projecting laterally therefrom and provided with spaced and alined slots, spaced members having arcuate track means removably projecting into said slots for guiding arcuate displacement of said nipple about said members, and means for clamping said track means against said wings for clamping said sections against said brace means.

2. In a knockdown toy, brace means, a nipple comprising complementary sections defining a bore for removable reception of said brace means, each of said sections having spaced wings pro-

jecting laterally therefrom and provided with spaced slots disposed on the loci of an arc, spaced members having arcuate track means removably projecting into said slots for guiding arcuate displacement of said nipple about said members, and means for clamping said track means against said wings for clamping said sections against said brace means.

3. In a knockdown toy, brace means, a nipple comprising complementary sections defining a bore for removable reception of said brace means, each of said sections having spaced wings projecting laterally therefrom and provided with spaced and arcuately alined slots, spaced members having arcuate track means removably projecting into said slots for guiding arcuate displacement of said nipple about said members, means for clamping said track means against said wings for clamping said sections against said brace means, and means carried by said sections to limit the insertion of said brace means into said bore.

4. In a knockdown toy, brace means, a nipple comprising complementary sections defining a bore for removable reception of said brace means, each of said sections having spaced wings projecting laterally therefrom and provided with spaced and arcuately alined slots, spaced members having arcuate track means removably projecting into said slots for guiding arcuate displacement of said nipple about said members, means for clamping said track means against said wings for clamping said sections against said brace means, and means for yieldingly sustaining said track means against said wings in the unclamped relation of said sections and brace means.

5. In a knockdown toy, brace means, a nipple comprising a guide having an opening for receiving said brace means, complementary sections depending from said guide and in alinement with said opening for removable reception of said brace means, each of said sections having spaced wings projecting laterally therefrom and provided with spaced and alined slots, spaced members having arcuate track means removably projecting into said slots for guiding arcuate displacement of said nipple about said members, and means for clamping said track means against said wings for clamping said sections against said brace means.

6. In a device for sustaining a brace, a nipple, comprising a head having a guide including an opening and having limbs depending from said guide, complementary clamping sides depending from said limbs and having separable and contiguous internally disposed faces and complementary grooves interrupting said faces and defining a bore in alinement with said opening for removably receiving said brace, each of said sides embodying laterally extending and spaced wings having spaced and alined slots, spaced members removably straddling said sides and having arcuate means removably extending into said slots for movably guiding displacement of said nipple relative to said members, and means for removably clamping said arcuate means against said wings for removably clamping said sections against said brace.

7. In a device for sustaining a brace, a nipple comprising a head having guide means including an opening to removably receive said brace and having spaced limbs depending from said guide means, juxtapositioned and complementary clamping sides depending from said limbs and

having separable and contiguous bearing portions defining a bore in alinement with said opening for removably receiving said brace, each of said sides embodying laterally extending and spaced wings having alined and spaced slots, spaced members removably straddling said sides and having arcuate means removably extending into said slots for movably guiding displacement of said nipple relative to said members, and means for removably clamping said arcuate means against said wings for removably clamping said bearing portions against said brace.

8. In a device for sustaining a brace, a nipple comprising a head having guide means including an opening for removably receiving said brace and having spaced and offset limbs depending from said guide means, juxtapositioned and complementary clamping sides depending from said limbs and having separable and contiguous bearing portions defining a bore in alinement with said opening for removably receiving said brace, each of said sides embodying laterally extending and spaced wings having spaced slots disposed on an imaginary arc, spaced members removably straddling said sides and having arcuate means removably extending into said slots for movably guiding displacement of said nipple relative to said members, and means for removably clamping said arcuate means against said wings for removably clamping said bearing portions against said brace.

9. In a device for sustaining a brace, a nipple comprising a head having guide means including an opening for removably receiving said brace and having spaced and resilient limbs depending from said guide means and straddling said brace, juxtapositioned and complementary clamping sides depending from said limbs and having separable and contiguous bearing portions defining a bore in alinement with said opening for removably receiving said brace for yieldably separating said sides and bearing portions, each of said sides embodying laterally extending and spaced wings having spaced slots, spaced members removably straddling said sides and having arcuate means removably extending into said slots for movably guiding displacement of said nipple relative to said members, and means for removably clamping said arcuate means against said wings for removably clamping said bearing portions against said brace.

10. In a device for sustaining a brace, a nipple comprising a head having guide means including an opening for removably receiving said brace and having spaced limbs depending from said guide means, juxtapositioned and complementary clamping substantially trapezoidal sides merged with and depending from said limbs and having separable and contiguous bearing portions defining a bore in alinement with said opening for removably receiving said brace, each of said sides embodying laterally extending and spaced and inclined wings having spaced and alined slots, spaced members removably straddling said sides and having arcuate means removably extending into said slots for movably guiding displacement of said nipple relative to said members, and means for removably clamping said arcuate means against said wings for removably clamping said bearing portions against said brace.

11. In a device for sustaining a brace, a nipple comprising a head having guide means including an opening for removably receiving said brace and having spaced limbs depending from said guide means, juxtapositioned and complementary

clamping sides depending from said limbs and having separable and contiguous bearing portions defining a bore in alinement with said opening for removably receiving said brace, each of said sides embodying laterally extending and spaced wings having arcuately alined and spaced slots, spaced members removably straddling said sides and having arcuate means removably extending into said slots for movably guiding displacement of said nipple relative to said members and having annular struck out means, a bolt embodying a head and having a shank removably projecting into said struck out means, a clamping member mounted on said shank and spring means surrounding said shank and abutting said head and one of said struck out means.

12. In a device for sustaining a brace, a nipple comprising a head having annular means to removably receive said brace and having spaced limbs depending from said annular means, juxtapositioned and complementary clamping sides depending from said limbs and having separable and contiguous bearing portions defining a bore for removably receiving said brace, and each of said sides embodying laterally extending and spaced wings having spaced and alined slots.

13. In a device for sustaining a brace, a nipple comprising a head having guide means including an opening to removably receive said brace and having spaced, resilient and normally retractible limbs depending from said guide means, juxtapositioned and complementary clamping sides depending from said limbs and having separable and contiguous bearing portions defining a bore in alinement with said opening for removably receiving said brace, and each of said sides embodying laterally extending and spaced wings having spaced and alined slots.

14. In a device for sustaining a brace, a nipple comprising a head having guide means including an opening to removably receive said brace and having spaced limbs depending from said guide means, juxtapositioned and complementary clamping and substantially trapezoidal sides depending from said limbs and having separable and contiguous arcuate bearing portions defining a bore in alinement with said opening for removably receiving said brace, and each of said sides embodying laterally extending inclined and spaced wings having spaced and alined slots.

15. In a device for sustaining a brace, a nipple comprising a head having guide means including an opening to removably receive said brace and having spaced limbs depending from said guide means, juxtapositioned and complementary clamping sides depending from said limbs and having separable and contiguous arcuate bearing portions defining a bore in alinement with said opening for removably receiving said brace, each of said sides embodying laterally extending and spaced wings having spaced and alined slots, and stop means projecting from said arcuate portions to limit the insertion of said brace into said bore.

16. In a device for sustaining a brace, a nipple comprising a head having guide means including an opening to removably receive said brace and having spaced limbs depending from said guide means, juxtapositioned and complementary clamping sides depending from said limbs and having separable and contiguous arcuate bearing portions defining a bore in alinement with said opening for removably receiving said brace, each

of said sides embodying laterally extending, inclined and spaced wings having alined and spaced slots, spaced members having arcuate track means removably projecting into said slots for slidably guiding said nipple, sockets extending from said members, a bushing comprising complementary separable sections having expanded portions interposed between said members and having bearing means projecting through said sockets, shaft means removably mounted in said bushing, and means for urging said members towards each other for simultaneously clamping said bearing portions against said brace and concomitantly clamping said bearing means against said shaft means.

17. In a device for sustaining a brace, a nipple comprising a head having guide means including an opening to removably receive said brace and having spaced limbs depending from said guide means, juxtapositioned and complementary clamping sides depending from said limbs and having separable and contiguous arcuate bearing portions defining a bore in alinement with said opening for removably receiving said brace, each of said sides embodying laterally extending, inclined and spaced wings having alined and spaced slots, spaced members having arcuate track means removably projecting into said slots for slidably guiding said nipple, sockets extending from said members, a bushing comprising complementary separable sections having expanded portions interposed between said members and having reduced portions to limit displacement of said members on said backing, bearing means extending from said reduced portions and projecting through said sockets, shaft means removably mounted in said bushing, and means for urging said members towards each other for simultaneously clamping said bearing portions against said brace and concomitantly clamping said bearing means against said shaft means.

18. In a device for sustaining a brace, a nipple comprising a head having guide means including an opening to removably receive said brace and having spaced limbs depending from said guide means, juxtapositioned and complementary clamping sides depending from said limbs and having separable and contiguous arcuate bearing portions defining a bore in alinement with said opening for removably receiving said brace, each of said sides embodying laterally extending, inclined and spaced wings having alined and spaced slots, spaced members having arcuate track means removably projecting into said slots for slidably guiding said nipple, sockets extending from said members, a bushing comprising complementary separable sections having expanded portions interposed between said members and having reduced portions to limit displacement of said members on said bushing, bearing means extending from said reduced portions and projecting through said sockets, shaft means removably mounted in said bushing, spring means abutting one of said members, and means for urging said members towards each other against the resistance of said spring means for simultaneously clamping said bearing portions against said brace and concomitantly clamping said bearing means against said shaft means.

LOUIS SEGAL.