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C. H. PAJEAU

1,916,634

TOY CONSTRUCTION BLOCK

Original Filed Jan. 16, 1932

Fig. 1

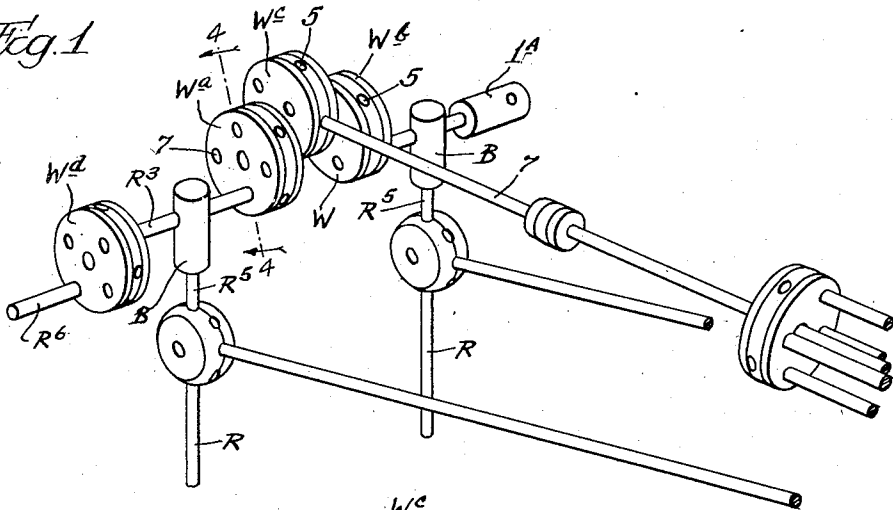


Fig. 4

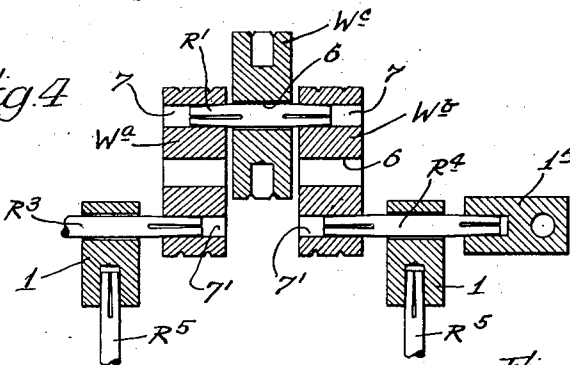


Fig. 2

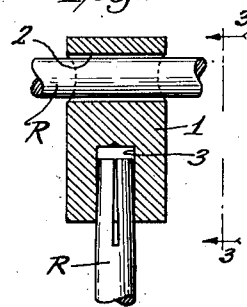


Fig. 3

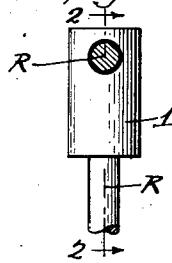
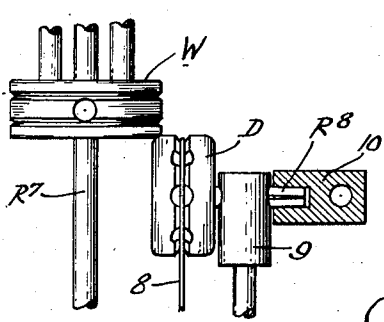


Fig. 5



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TOY CONSTRUCTION BLOCK

Original application filed January 16, 1932, Serial No. 587,013. Divided and this application filed December 10, 1932. Serial No. 646,575.

This application is a division of my application #587,013, filed January 16, 1932, on Toy construction blocks, and relates to an additional structural element which will permit the erection of greater variety of structures, including semblances of mechanism from a structural toy block set comprising rods of uniform diameter and members for rigidly connecting such rods.

Generally speaking, the object of my invention is that of providing a simple, compact and inexpensive structural toy element having one portion constructed so as to afford either a bearing for journaling a portion of such a rod, or a guide in which such a rod can be slid longitudinally; and which will have another portion arranged for gripping an end of such a rod, so that this novel element can be rigidly but detachably secured to such a rod and also can serve as a cap-like stop on the end of a rod for limiting a longitudinal sliding of the rod.

Illustrative of my invention and of the numerous ways in which my novel structural toy block may be employed,

Fig. 1 is a perspective view of a portion of a mechanism showing the use of my novel block both for bearings in which a rod is rotatable and as a stop for limiting the longitudinal sliding of the rod in the bearing, with some of the elements spaced widely to clarify the drawing.

Fig. 2 is an enlarged vertical section taken along the line 2—2 of Fig. 1, with the clearance around a portion of the horizontal rod exaggerated.

Fig. 3 is a side elevation of the parts shown in Fig. 2, taken from the right-hand of that figure and drawn on a somewhat smaller scale.

Fig. 4 is an enlarged section taken along the common axes of the rods which simulate the crank-pin and the crank-shaft portions in Fig. 1.

Fig. 5 is an elevation showing a part of a mechanism simulating a friction drive, showing my novel block used both as a journal and as a stop member.

In United States Patent #1,113,371 I disclosed toy construction blocks consisting merely of cylindrical rods and of rod-connecting disks, each disk having an axial bore and radial bores of the same diameter, and each rod having both ends thereof constructed for wedgingly or yieldingly socketing in

any such bore. With the rods of such a set of toy construction blocks suitably proportioned, a large variety of structures can be erected, but only with all of the constituent blocks relatively stationary, thereby limiting the fascination afforded to older children.

In my copending companion application #587,013 (filed January 16, 1932) I disclosed a novel additional block in the form of a multi-bored wheel for use as a driving pulley, a crank portion and other purposes. However, the size of the there disclosed wheel type of block limits its use for many desirable simulations of mechanisms, and the considerable cost of the there disclosed block. My present invention overcomes these objections by providing a much smaller and less expensive rod-connecting member which can more easily be handled by even a young child and which can be used advantageously in much more limited spaces.

As shown in Figs. 2 and 3, my novel rod-connecting member consists of a cylinder 1 (desirably of wood), having near one end thereof a transverse bore 2 of slightly larger diameter than the rods R of the structural toy set. In addition, this connector has an axial bore 3 extending into it from the other end of the cylinder, and of such a size that an end of any of the uniformly diametered rods will wedge tightly in it. This axial bore preferably extends only part way toward the transverse bore, so as to eliminate the interior burrs which cannot readily be avoided when intersecting bores are formed in wood, and also to avoid the possibility of having the rod end in the axial bore jam a rod extending through the transverse bore.

With my new rod connecting member thus constructed, even a young child can readily socket this member 1 axially on the upper end of a rod R and then turn two such rod-supported members to dispose their transverse bores in alinement, thereby providing the alined bearings 1 of Fig. 1. And when the horizontal rods 4 are respectively slid through the transverse bores 2 of the same two bearings 1, the lost play between each of these bores and the rod extending through it will permit both rotation and longitudinal movement of the said horizontal rods with respect to such a compact connecting member.

Illustrative of some of the purposes which the here presented connecting member can

serve in connection with split-ended rods of uniform diameter, Fig. 1 is a perspective view of part of toy structure simulating a crank-driven reciprocating pump or engine, which structure was pictured in its entirety in my said copending application #587,013.

In this structure, the crank-simulating portion includes three of the wheel-like disks W disclosed in the aforesaid application as each provided with radial bores 5 of rod-gripping size, an axial bore 6 of such diameter as to permit one of the said rods to be slid freely through it, and as also being provided with rod-gripping bores 6 spaced from and extending parallel to the axis of the disk.

In assembling such a crank-simulation, two of these wheel-like disks W_a and W_b are first connected, as shown in the upper portion of Fig. 4, by a short rod R¹ which extends freely through the larger-diametered axial bore 6 of the central disk W_c, each end of this rod being forcibly slid into one of the non-axial transverse bores 7 of the two outer disks so as to compress that rod sufficiently for having it tightly gripped. This is done while the two outer disks are held in axial alinement, so that the transverse bores 7¹ which are diametrically opposite to the aforesaid bores 7 are also in alinement. Then two other rods R³ and R⁴ have their adjacent ends slid towards each other into the said bores 7¹ to cause these rods to be tightly socketed in the two outer disks and in alinement with each other, thereby completing the simulation of a crank in which the upper horizontal rod R¹ forms a crank-pin, the two outer disks W_a and W_b form crank arms, and the alined rods R³ and R⁴ are alined stub shaft portions.

To support this crank assembly rotatable, each of these stub shaft rods R³ and R⁴ is then slid through the cross-bore 2 in one of my novel construction toy elements, which elements are hereafter termed "cap members". Then one end of each of two rods R⁵ is grippingly socketed in the longitudinal bore 3 of one of these cap members, these rods being connected to stationary elements of the toy construction set in any customary manner. Another disk W_d carrying a handle-forming rod R⁶ can be attached to the outer end of one of the rods R³ to constitute a hand crank, and a rod R⁷ extending into a radial bore 5 in the central disk W_c can constitute a piston rod. Another cap member 1 A can also be tightly fitted over the free end of the shaft stub rod R⁴ with that end extending into its longitudinal bore, as shown in Figs. 1 and 4, so that this cap member 1 A serves as a stop member for limiting the sliding of the crank and shaft assembly in one direction.

Fig. 5 shows a friction drive portion of a structural toy assembly in which one of the disks W has an upright rod R⁷ extending freely through the axial bore of the disk,

and in which an edge portion of this disk rests on a peripheral portion of a second disk D which is peripherally grooved so as to be rotated by a belt 8. This second disk is fast upon one end of a short horizontal rod R⁸ which extends loosely through the cross-bore in an upright cap member, and another cap member 10 is tightly fitted upon the other end of the said rod R⁸. Thus assembled, the upright cap member 9 affords the single bearing for the shaft-like rod R⁷, while the companion cap member 10 serves as a stop for engaging a side of the cap member 9 to limit the longitudinal sliding of the shaft-rod and the disk mounted on the latter.

Thus my simple cap members readily afford connections between rods which permit a longitudinal sliding of the rod (as in Fig. 2), a journaling of a rod with freedom for rotation (as in case of the cap members 1 A in Figs. 1 and 2, or of the cap member 9 in Fig. 5), or a limiting of the sliding of a rod in one direction (as in the case of the cap member 1 A of Fig. 1, or 10 of Fig. 3).

In commercial practice, these cap members preferably are of wood, but I do not wish to be limited either in this respect or to the configuration of this novel type of element, since many changes might be made without departing either from the spirit of my invention or from the scope of the appended claims.

I claim as my invention:

1. A toy construction block for use with rods of uniform diameter, comprising a cap member having a bore extending part way into it from one end of that member, the bore being of such a size as to fit tightly over an end portion of a rod; the cap member also having a cross-bore extending through it between the inner end of the last named bore and the other end of the cap member, the cross-bore being sufficiently larger in diameter than a rod to permit the rod to slide freely through it.

2. A toy construction block for use with resilient rods of uniform diameter, each of which rods has each end thereof slitted to permit a diametric contraction of that end, comprising a cylinder having an axial bore extending part way into it from one end of the cylinder, the bore being of such a size as for grippingly fitting over the slitted end portion of a rod; the cylinder also having a cross-bore extending through it between the inner end of the said axial bore and the other end of the cylinder, the cross-bore having its axis intersecting and at right angles to the axis of the cylinder, and the cross-bore being sufficiently larger in diameter than a rod to permit a rod to be slidably inserted through it and thereafter to permit free rotation of the rod within the cross-bore.

Signed at Evanston, Illinois, Dec. 2nd, 1932.

CHARLES HAMILTON PAJEAU.