

May 6, 1958

L. E. CARSON
CONSTRUCTION TOY

2,833,082

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2 Sheets-Sheet 1

FIG. 1.

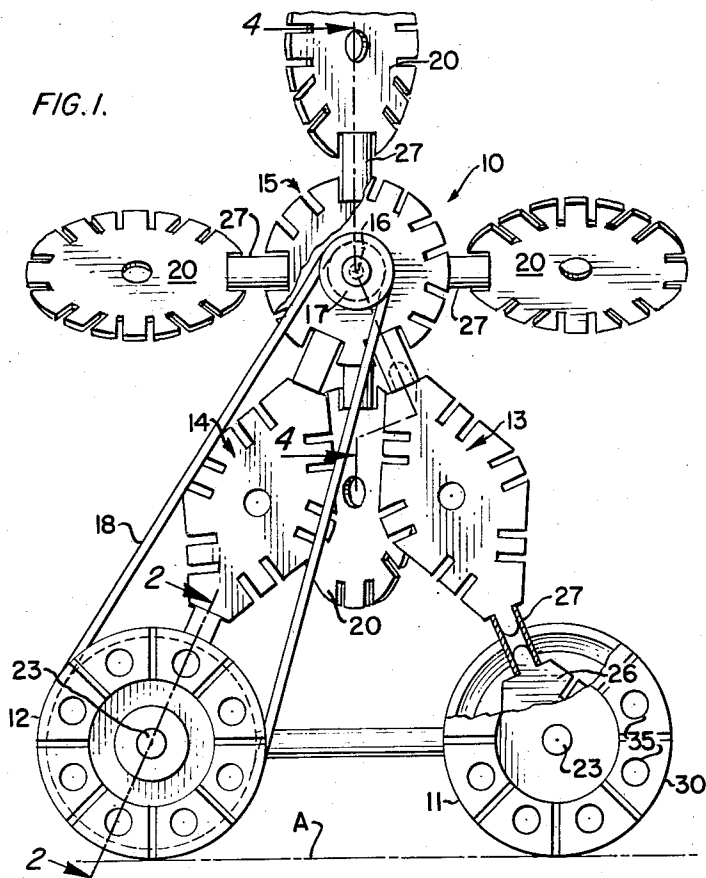


FIG. 2.

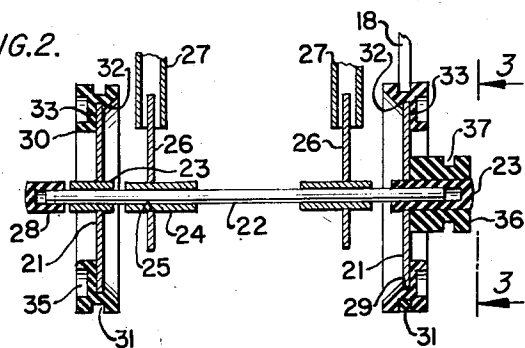
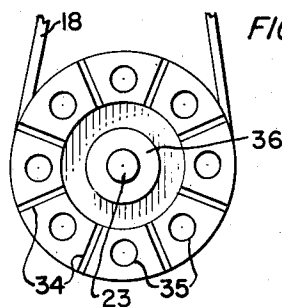


FIG. 3.



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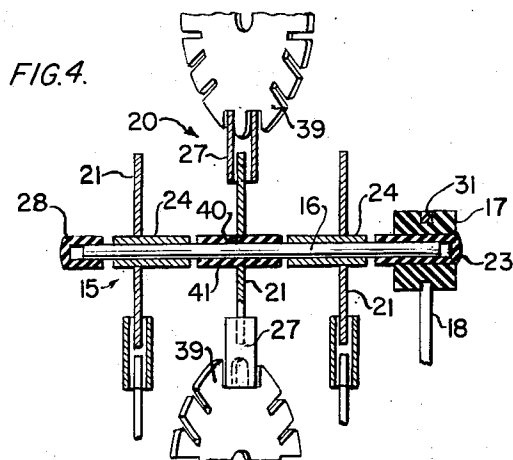
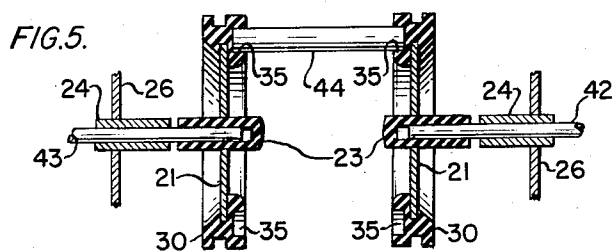
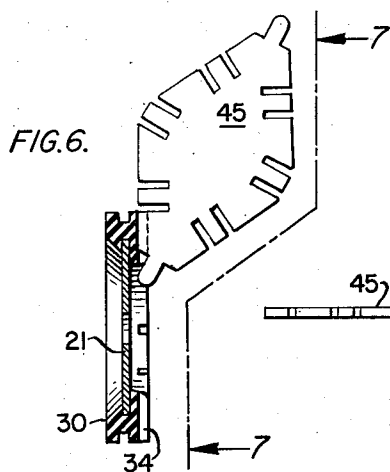
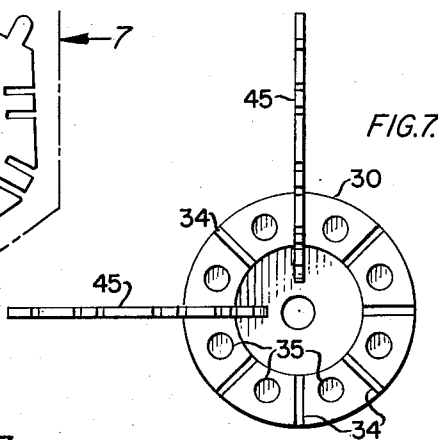
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2 Sheets-Sheet 2



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2,833,082

CONSTRUCTION TOY

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Application August 5, 1954, Serial No. 447,979

2 Claims. (Cl. 46—23)

The present invention relates to a toy and more particularly to improvements on the assemblable construction toy disclosed in my prior Patent No. 2,414,716.

While the toy disclosed in my prior patent embodies various versatile construction features comprised of geometrical pieces and tubular connective elements, the present invention is related to improvements which render assemblies of such structures mobile, and/or capable of transmitting rotary and linear motion.

A toy according to the foregoing patent may be used to construct a variety of models which simulate various full size structures or devices. The subject matter of the present application adds novel features which adapt the structure of said models to roll on various surfaces, and to transmit rotary and linear motion by pulleys, crank elements, and the like.

It is an object of the invention to provide a novel and simple means for adapting assemblable construction toys to mobile operation and also to render them capable of transmitting mechanical movements by pulleys and belts.

Another object of the invention is to provide a novel tire structure for disc shaped members which may have a variety of uses in constructing various models comprising rotating elements.

Still another object of the invention is to provide a novel means for connecting rotating elements to shafts or axles.

A further object of the invention is to provide a variety of resilient members which are capable of frictionally connecting various parts of assemblable construction toys together.

Another object of the invention is to provide a means for combining pulleys, fans, crank elements, shafts and wheels to be used in simple assemblable construction toys.

It is a particular object to provide an assemblable toy construction embodying a minimum number of various members adaptable to a large variety of assemblage structures, both mobile or static with parts or assemblies arranged for a variety of mechanical movements.

It is a further object to provide such a toy with parts and pieces easily manipulated and assembled together by the fingers of children of all ages.

Other objects and advantages of the invention will be apparent from the following specification, appended claims, and drawings in which:

Fig. 1 is a side elevational view of a toy model, partly sectional in two places, showing rotary elements in connection therewith and in accordance with the present invention;

Fig. 2 is a fragmentary, sectional view taken along the line 2—2 of Fig. 1;

Fig. 3 is an elevational view taken along the line 3—3 of Fig. 2;

Fig. 4 is a fragmentary, sectional view taken along the line 4—4 of Fig. 1;

Fig. 5 is an axial sectional view of rotating elements in accordance with the present invention assembled to provide a crank element;

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Fig. 6 is an axial sectional view of a rotating element of the present invention showing a novel type of blade supported thereby; and

Fig. 7 is an elevational view taken along the line 7—7 of Fig. 6.

As shown in Fig. 1 of the drawings a toy model 10 is provided with wheels 11 and 12 arranged for mobility on a surface A. The wheels 11 and 12, together with their axle and journal members, support the frame structures 13 and 14 which, in turn, are arranged to support the shaft structure 15 carrying the shaft 16 on which a pulley 17 is mounted. Engaging the pulley 17 is a belt 18 which engages the wheel 12 whereby the model 10, when rolled along the surface A, causes rotary motion to be transmitted from the wheel 12 to the belt 18 which in turn rotates the pulley 17 and the shaft 16.

As shown in Fig. 2 of the drawings, the wheel 12 of the toy shown in Fig. 1 comprises a circular disc piece 21 fixed to a shaft 22 by means of a resilient sleeve 23 which frictionally engages the shaft 22 and a central opening in the disc 21. Preferably, the assembly is accomplished by first inserting the sleeve 23 into the central opening and then inserting the shaft within the sleeve, whereby the shaft tends to expand the sleeve somewhat radially so as to cause it to engage the central opening in a snug fashion. The shaft 22 is rotatably mounted in flexible tubular elements 24 which are frictionally engaged in central holes 25 in the triangular pieces 26. The pieces 26 may be any one of several structural pieces disclosed in the patent hereinbefore referred to.

As shown in Figs. 1 and 2 and also in Fig. 4, short tubular members 27 interconnect the structural members of the toy by engaging slots therein, all as completely disclosed and described in my former patent above referred to.

The circular piece 21 hereinbefore referred to is engaged at its periphery by an internal annular groove portion 29 in a resilient tire 30 which is arranged to provide a wheel element for toy models in accordance with the present invention. The tire 30 is also provided with a peripheral groove 31 which is adapted to engage a belt 18 as shown in Fig. 1 of the drawing. On opposite sides of the groove 29 the tire is provided with lip portions 32 and 33. These lip portions engage the sides of the disc structure 21 and the portion 32 may be stretched or deflected when being installed on, or removed from, the periphery of the disc. For convenience in such operations the lip 32 is relatively short compared to the lip 33 which extends inwardly toward the axis of the disc 21 a greater distance than does the lip 32. Thus the lip 32 may be stretched over the periphery of the disc 21 with ease when being installed or removed therefrom.

In the side of the tire 30 and extending into the lip 33 are radially disposed slots 34 which are adapted to engage any of the structural pieces. With reference to Figs. 6 and 7 of the drawings the slots 34 are shown as frictionally engaging diamond shaped pieces 45 which may be used to simulate fan blades or other structures as desired. Positioned intermediate the radially disposed slots 34 are circular recesses 35 which are arranged to frictionally engage the tubular connective elements described in my prior patent, and shown here in Fig. 5 as a crank pin. Such a crank pin structure will be hereinafter described in detail.

Referring again to Fig. 2 of the drawing it will be seen that the resilient sleeve 23 extends beyond the piece 21 and supports a small diameter pulley 36 which is provided with a belt-engaging groove 37 in the periphery thereof. The pulley 36 when used on a model such as that shown in Fig. 1 of the drawings may be employed to change the operating ratio between the wheel 12 and rotating assembly 20. However, it will be understood

that the belt 18 must be shortened for such change, or it may be a stretchably resilient type belt. As shown in Fig. 4 of the drawings the pulley 17 is similar to the hereinbefore described pulley 36, and the pulley 17 engages a resilient sleeve 23 which is frictionally engaged to the shaft 16. The shaft 16 is freely rotatably mounted in tubular elements 24 which are frictionally engaged with the circular pieces 21, similar to those described in Fig. 2 of the drawing.

Positioned on the opposite end of the shaft 16 from the pulley 17 is a resilient hub or cap 28 which may serve as an endplay member. The rotating assembly 20 is provided with a circular piece 21 having tubular elements 27 supporting simulated fan blades 39 thereon. The piece 21 of Fig. 4 is provided with a central opening 40 frictionally engaged with a resilient sleeve 41 which also frictionally engages the shaft 16. Thus the pulley 17 is frictionally engaged with the shaft 16 by means of a sleeve 23 and drives the fan 20 by reason of its frictional engagement with the sleeve 41 which is similarly engaged with the shaft 16.

As shown in Fig. 5 of the drawing a pair of discs 21 are fixed to shafts 42 and 43 by means of resilient sleeves 23 while the shafts 42 and 43 are supported in tubular elements 24 frictionally engaged in bearing pieces 26. Tires 30 on the discs 21 are arranged to face each other at their circular recess portions 35 and a cylindrical crank pin 44 comprised of one of the aforementioned tubular elements interengages facing recesses 35 of the tires 30 providing a crank pin radially spaced from the axes of the shafts 42 and 43. Thus a model constructed in accordance with the present improvements may include a crank shaft structure.

It will be understood that various elements as disclosed in the former patent may be used as bearing supports for the shafts or axle structures of the models. For example, it may be found desirable to employ other than a triangular or a circular member for use as a support piece 26 illustrated in Figs. 2, 4 and 5 of the drawings. All of these structures, having central openings therein, are adapted to receive and frictionally engage tubular elements 24 in which various shaft members may be rotatably mounted. The present improvements render the construction of toy models made in accordance therewith mobile and capable of transmitting rotary or linear motion, and provide for the construction of many

variations of machinery models additional to those which may have been constructed in accordance with the teachings of the former patent hereinbefore referred to.

Having thus described the invention and the present embodiments thereof, it is desired to emphasize the fact that further modifications may be resorted to in a manner limited only by a just interpretation of the following claims.

I claim:

1. In a construction toy a circular disk-shaped piece having a circular axial bore therethrough for detachable receiving a cylindrical cooperating element, a resilient tire having an internal annular groove engaging and surrounding the edge of said piece, said tire having inwardly directed annular lips on opposite sides of said groove, one of said lips being longer and extending a greater distance from the bottom of said groove than the other of said lips, the longer lip having an axially directed circular recess therein of the same size as the axial bore arranged to frictionally support a said cylindrical cooperating element therein.

2. A construction toy device comprising a relatively thin, flat, disk-like member, including a portion defining a central bore therethrough adapted to receive a rod-like element; and a tire of substantially greater thickness than said member and having an internal annular groove engaging and fully surrounding the peripheral edge of said thin member, said tire having radially directed annular resilient lips forming the opposite sides of said groove; one of said lips having at least one axially directed recess therein also adapted to receive a rod-like element.

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