June 26, 1962 T. F. CREW 3,040,915

AMUSEMENT AND EDUCATIONAL TOY

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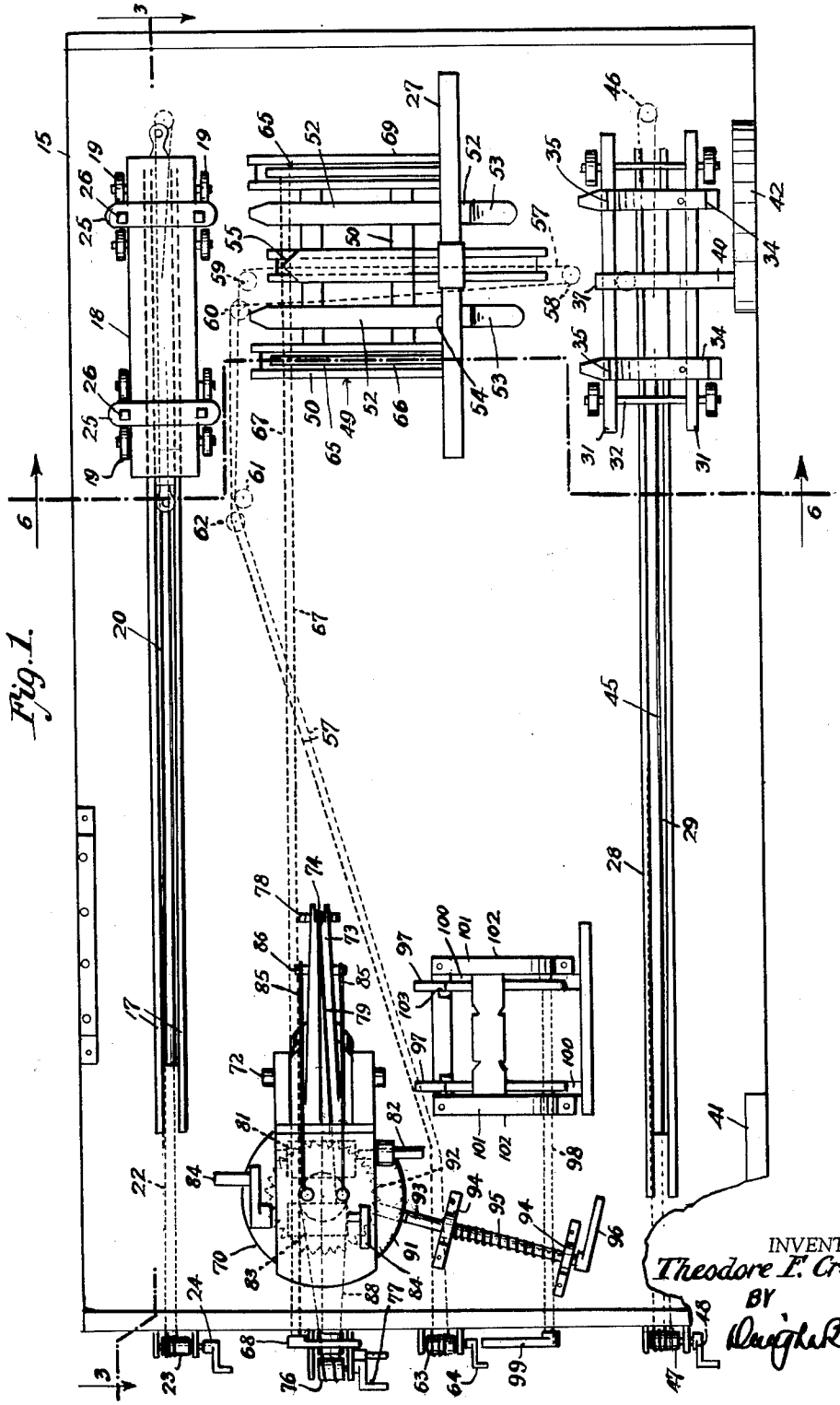


Fig. 1.

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AMUSEMENT AND EDUCATIONAL TOY

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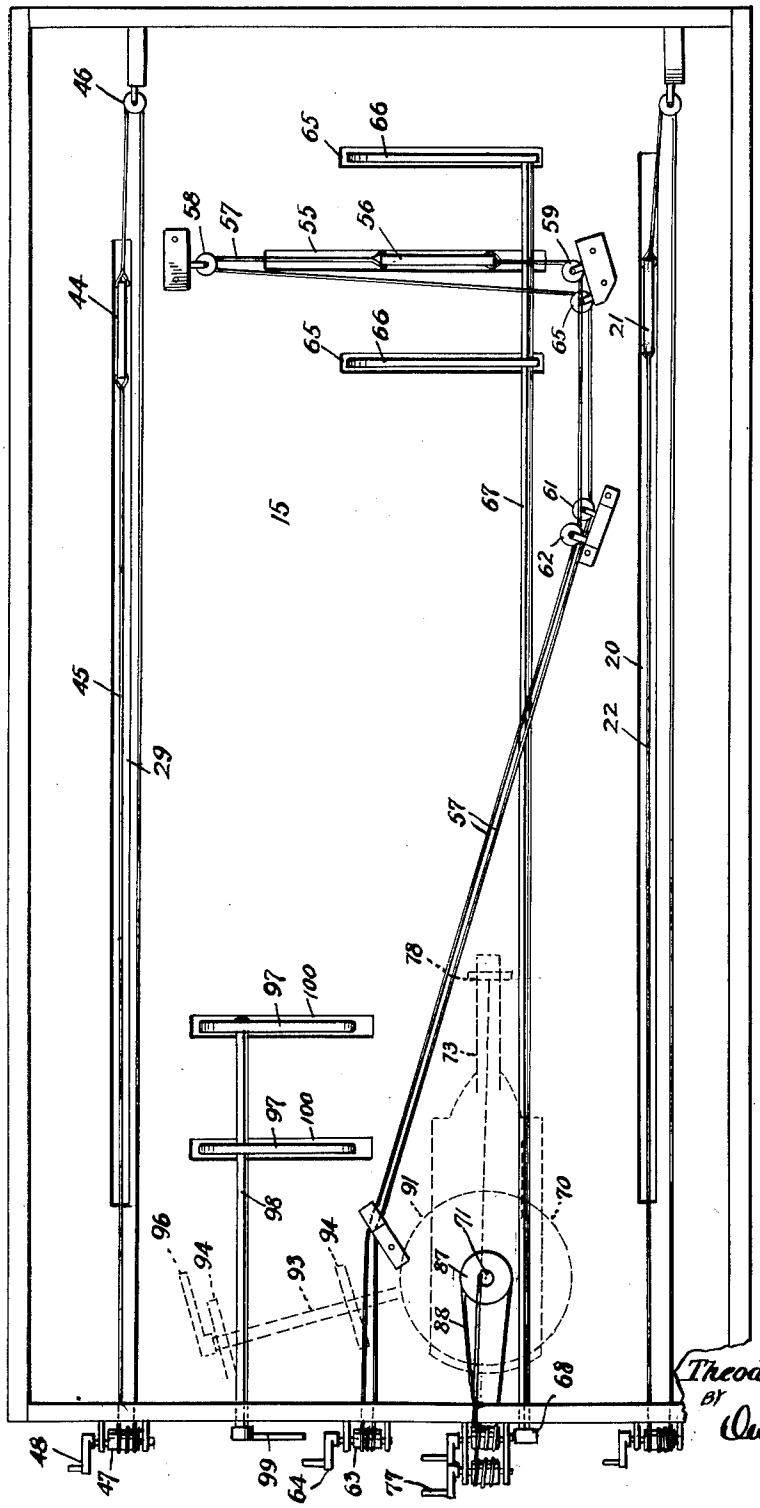


Fig. 2.

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AMUSEMENT AND EDUCATIONAL TOY

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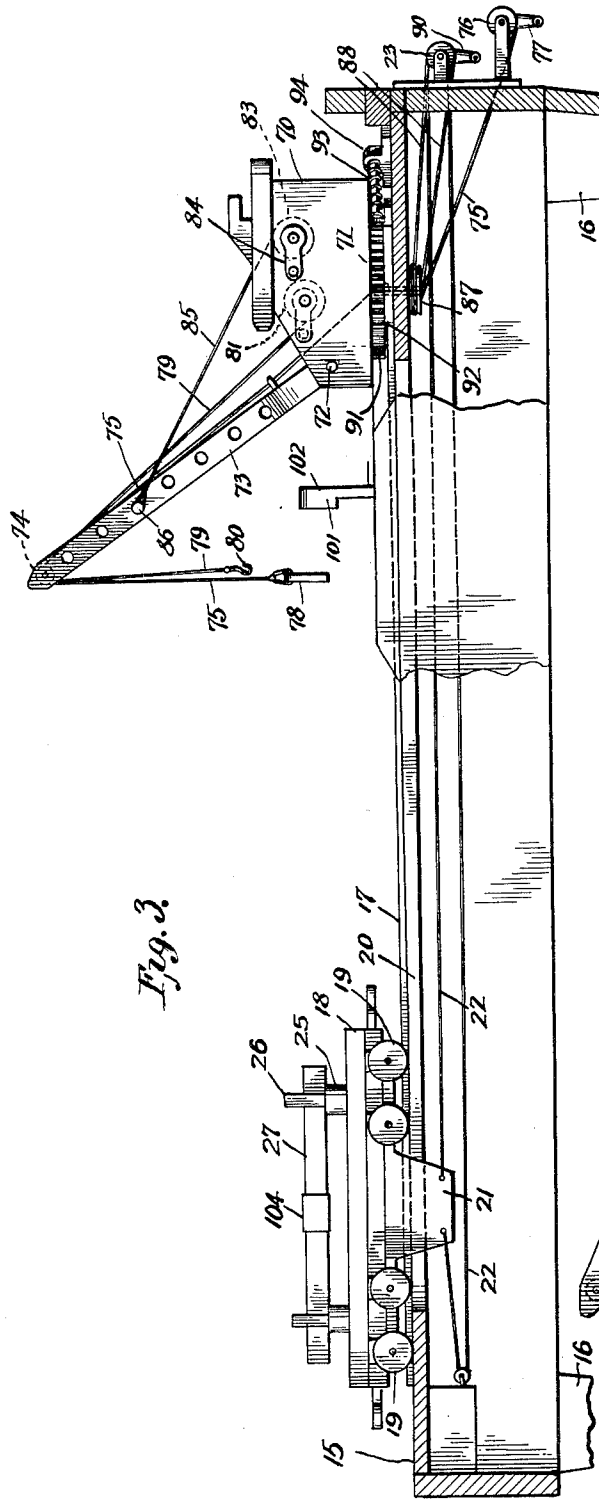


Fig. 3.

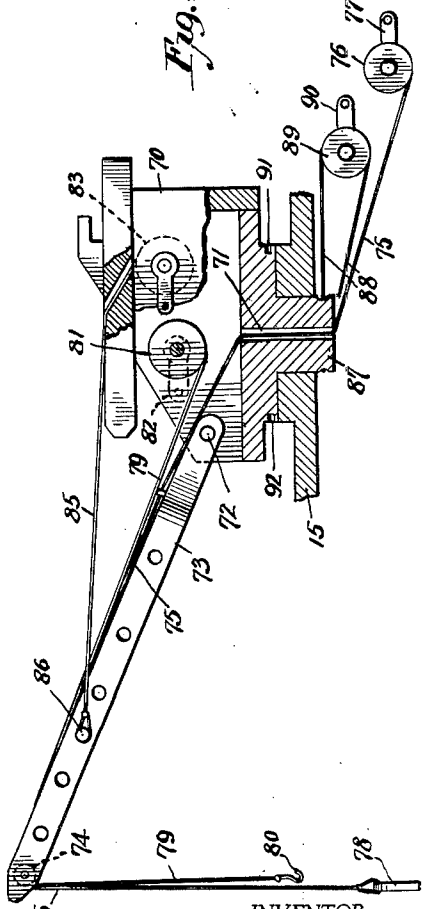


Fig. 4.

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AMUSEMENT AND EDUCATIONAL TOY

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Fig. 5.

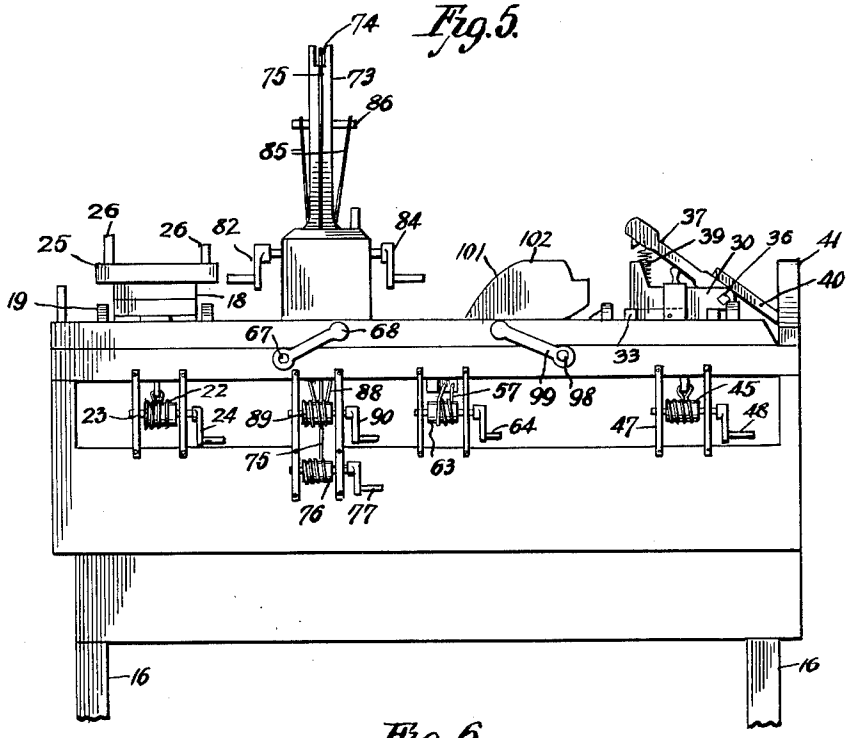
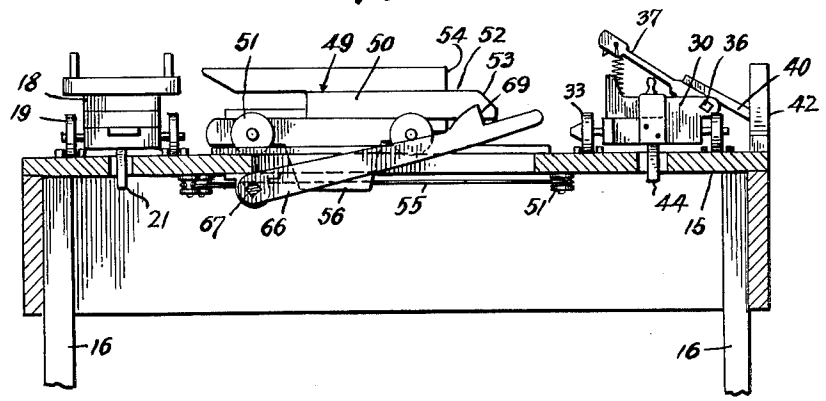


Fig. 6.



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AMUSEMENT AND EDUCATIONAL TOY

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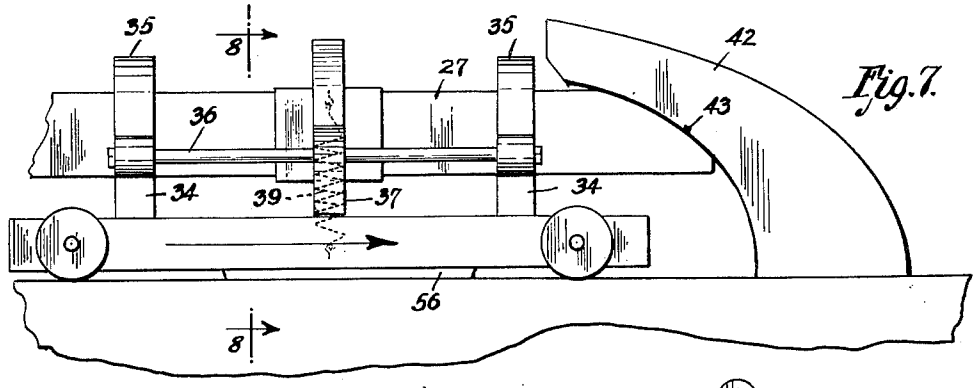


Fig. 7.

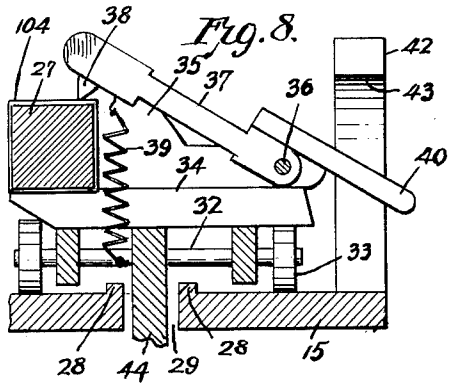


Fig. 8.

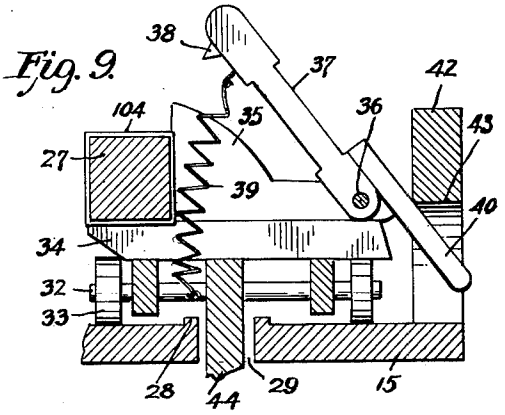


Fig. 9.

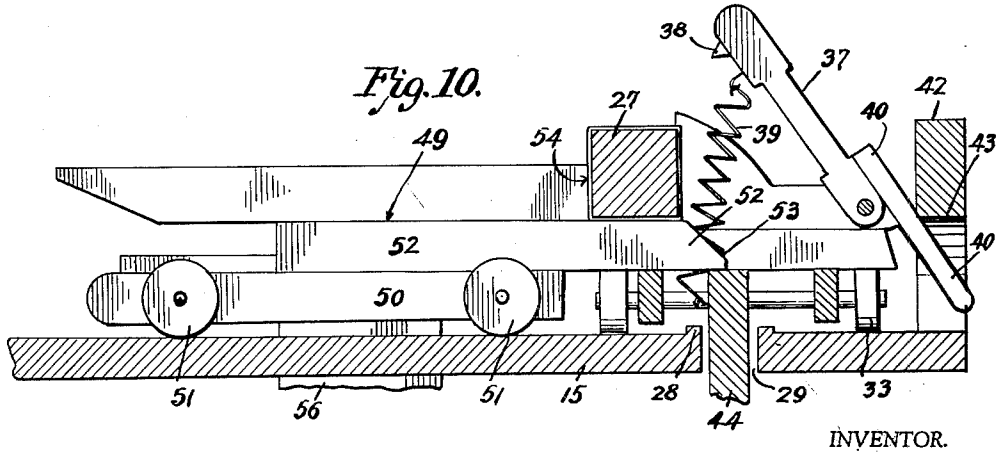


Fig. 10.

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AMUSEMENT AND EDUCATIONAL TOY

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Fig. 11.

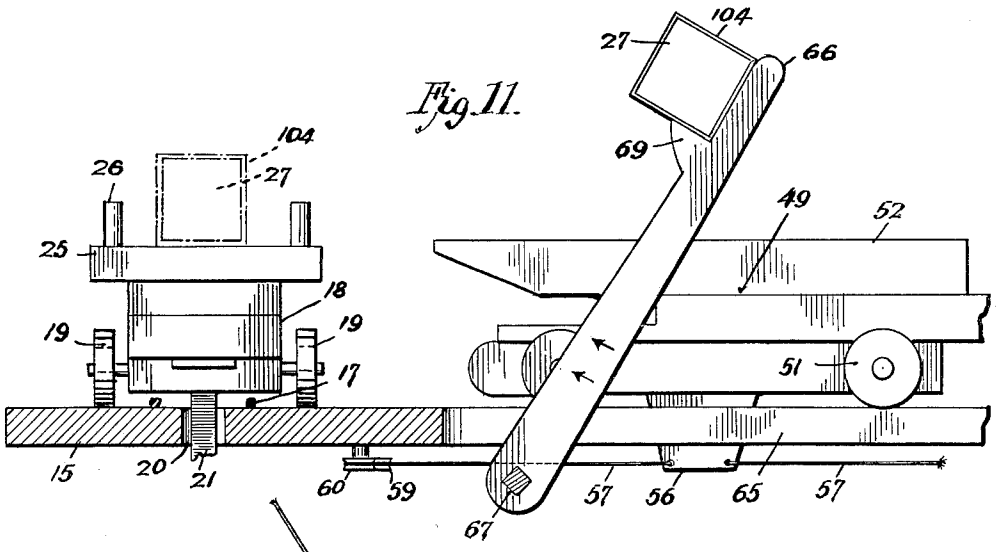


Fig. 12.

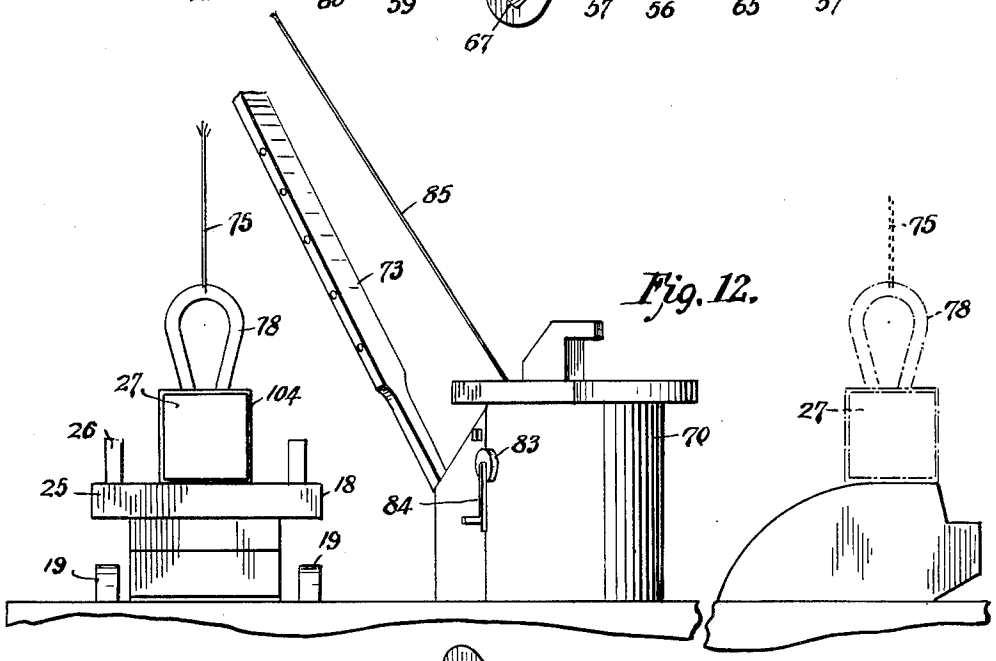
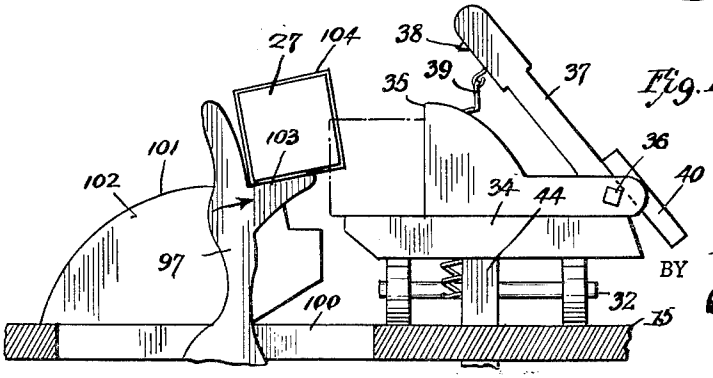


Fig. 13.



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United States Patent Office

3,040,915

Patented June 26, 1962

3,040,915

AMUSEMENT AND EDUCATIONAL TOY

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Filed July 7, 1959, Ser. No. 825,602

3 Claims. (Cl. 214—38)

This invention is a mechanical toy, the primary object of which is to afford entertainment in its operation as well as to develop skill and precision on the part of the operator in properly maneuvering the several elements of the toy in bringing about the desired result.

The invention comprehends generally a base provided with a series of trackways for the movement of article carrying cars thereon with remote control means for moving these cars in desired directions and to proper position, and also remote control means for transferring the articles from one car to another with the ultimate end in view of having the articles reach a precise desired destination. The several transferring means and movable cars are all capable of being controlled individually in their movements or operations from one location, and the various operations necessary in bringing about the maneuverability of the cars or carriers, transferring means and travel of the cars to definite destinations involve the exercise of ingenuity and skill on the part of the operator to bring about the desired result. In the present disclosure the invention involves the carriage of articles or objects resembling logs or beams, transferring such articles from a carrier which has arrived at a definite destination laterally to another carrier, moving the latter carrier to a predetermined destination, thence transferring the articles from the carrier to a transverse carrier and ultimately to the original carrier after the latter has been moved to a position to receive the article. The functions are all carried out by suitable apparatus under the immediate control of an operator at a station point, and the ingenuity, dexterity and skill of the operator determines the efficacy of the operations.

A practical embodiment of my invention is illustrated in the accompanying drawings, which will hereinafter be described in detail, and wherein:

FIG. 1 is a top plan view of a base or platform and illustrating the arrangement of trackways, carriers, conveyors, etc. involving the invention,

FIG. 2 is a bottom plan view of the platform or base and illustrating the manner in which the various movable devices thereon are controlled,

FIG. 3 is a longitudinal sectional view taken substantially upon line 3—3 of FIG. 1,

FIG. 4 is an enlarged transverse sectional view taken through the crane structure utilized in carrying out the invention,

FIG. 5 is an end view of the table or platform showing the mechanism at the control end of the latter,

FIG. 6 is a transverse sectional view taken substantially on line 6—6 of FIG. 1,

FIG. 7 is a side elevation of the car or carrier on the secondary trackway of the mechanical toy,

FIG. 8 is a transverse sectional view taken substantially upon line 8—8 of FIG. 7,

FIG. 9 is a sectional view taken through the carrier on the secondary trackway and illustrating the position assumed by the article clamping lever when it has been moved to article releasing position,

FIG. 10 is a side elevation of the transfer carrier in the position it will assume in receiving an article from the carrier of the secondary trackway,

FIG. 11 is a fragmentary transverse sectional view through the platform or base and illustrating the cradle in the act of transferring an article from the transfer carrier to the car on the primary trackway,

FIG. 12 is a fragmentary end view of the platform illustrating the crane in the act of removing an article from a car or carriage on the primary trackway and transferring it to a secondary car loader, and

FIG. 13 is a fragmentary sectional view showing the position assumed by the loading finger in transferring the article to the carrier on the secondary trackway.

Referring now more particularly to the drawings, the base or platform for the apparatus is indicated generally at 15 and comprises a preferably rectangular smooth surface of suitable size to accommodate the various apparatus hereinafter fully described. This base may rest upon the floor or may be provided wtih suitable legs 16 to support it in a properly elevated position for convenient and comfortable operation by young people who will operate the apparatus. Near one longitudinal edge of the platform or base is a trackway indicated at 17, which trackway is elongated and terminates slightly inwardly from the opposing edges of the base. A car or carrier 18, provided with suitable supporting wheels or rollers 19 overlies this trackway; the upstanding trackways 17 being provided to maintain the car or carrier in proper alignment with a slot 20 disposed between the trackways and substantially coextensive therewith. The car 18 is flat and elongated for the accommodation of the articles it is to transport, such as beams or girders. Depending from the base of car 18 is a plow 21 which projects through the slot 20, and a cord 22 has its ends connected, respectively, to the ends of this plow. This cord 22 extends longitudinally of the platform beneath the slot 20 and passes over a drum or windlass 23 at the operating end of the platform and upon the exterior thereof. It is apparent from this construction that operation of the windlass or drum 23, by means of the handle 24 will cause the car 18 to move longitudinally of the trackway 17 in a direction depending upon the direction of rotation of the drum 23.

The car 18 is provided with spaced apart transverse sills 25 having upstanding posts 26 at their ends, and between which the objects to be transported, such as beams or girders 27 are disposed in seated engagement near their ends upon the sills 25.

Arranged near the opposite longitudinal edge of the platform 15 is a secondary trackway 28, between which there is provided a longitudinal slot 29, similar to slot 20, coterminous with the trackway. Overlying and travelling along the secondary trackway is a car indicated at 30 having spaced longitudinal sills 31 supporting axles 32 which carry supporting wheels 33 to ride upon the surface of the platform. The secondary carrier is provided with spaced apart transverse sills 34 upon which the objects 27 are to rest, and each transverse sill 34 carries a stop 35 spaced inwardly from the innermost edges of the sills a distance substantially equal to the transverse dimension of the movable member 27. Pivoted at one end as at 36 to the opposite side of the secondary carrier and preferably intermediate the ends thereof is a lever 37 having its outer end provided with a prong 38 to engage with the girder member 27 under normal conditions when the said member is resting upon the sill 34 and in engagement with the stop 35. A contractile spring 39 normally holds the lever in downward position engaged with the member 27 as shown in FIG. 8. The opposite end of the lever has connected thereto an outwardly projecting arm 40 to be engaged respectively at the inner and outer ends of the platform or base by the fixed stop members 41—42 carried by the base. These stop members are identical in construction, one of which is illustrated in FIG. 7 where it will be observed that the inner inclined face 43 of the stop member engages the outwardly projecting arm 40 affixed to lever 37 as the car moves along the trackway so as to

lift the lever 37 against the tension of spring 39 to disengage the free end of the lever from the article or girder 27. In between stops, the lever will be in firm contact with the girder or movable member 27 so as to hold the same firmly in position upon the carrier.

Depending from the carrier 30 is a plow 44 to which is engaged the ends of a cord 45, this cord extending at its outer end around a pulley 46 secured to the underside of the platform and thence back to the inner end of the table or platform and around the drum 47 rotatable by means of hand lever 48.

Near the outer end of the table or platform and disposed transversely thereof is a transfer car or carrier indicated generally at 49. This car includes transverse bolsters 50 and supporting wheels 51, as well as spaced parallel longitudinal supporting sills 52, the rear ends of which are beveled or inclined upwardly and inwardly as indicated at 53. Overlying each sill is a stop member indicated at 54, the outer end of which terminates inwardly from the corresponding end of the sill 52 a distance substantially equal to the transverse dimension of the article or beam 27. The sills 52 of the transverse carrier are at such elevation above the platform 15 as to engage beneath an article resting upon the transverse sills of the secondary carrier when the transverse carrier has moved to its limit in the direction of the said secondary carrier. This is clearly shown in FIG. 10 of the drawings.

The transfer carrier overlies a slot 55 disposed transversely of the platform or base near its outer end and downwardly through which projects a plow 56 to which the ends of a cord 57 are connected; the said cord passing over rollers or pulleys 58, 59, 60, 61 and 62 and ultimately passing around drum 63 mounted upon the exterior of the inner edge of the table or platform and whose movements are controlled by operating handle 64. It is apparent from this construction that rotation of the drum 63 in one direction will cause the transverse carrier to move toward the secondary trackway and when rotated in the opposite direction will move in the reverse direction and toward the primary trackway.

The trackway of the transverse car is flanked by a pair of slots 65 which are spaced outwardly beyond the sides of the car and within which operate lift levers 66. These levers are secured at their inner ends to a rod 67 mounted in suitable bearings beneath the platform 15 and longitudinally thereof, this rod extending to the operator's end of the platform and having secured thereto an operating lever 68. These levers have their free ends provided with racks 69 which engage beneath an element or girder 27 resting upon the sills 52 and upon rotation of the lever 67 in the proper direction, these girders will be moved upwardly free of the transfer carrier and will be swung over and dropped upon the platform car 18 of the primary carrier. It is necessary, therefore, that the pivot ends of these lift levers be disposed sufficiently close to the trackway of the primary carrier 18 to permit of this action. The rock shaft 67 is operated only when the transfer car is moved to such position that the object 27 carried thereby is so positioned as to be engaged by the racks 69 when the lift levers are raised. Under normal conditions, the lift levers are in lowered position so as not to in any way interfere with the transverse movements of the transfer car 50.

Arranged for rotative movement near the operator's end of the platform or base 15 is a crane indicated generally at 70. This crane includes the body as shown with a depending hollow central shaft 71 which constitutes the vertical pivot upon which the crane body rotates. This crane has pivoted at its inner end as at 72 a boom 73, the outer end of which carries a pulley 74 over which a cord 75 passes. This cord travels lengthwise along the boom and through the hollow shaft 71 and is attached to a drum 76 rotatably mounted upon the operator's end of the table or platform and is rotated by the crank 77.

The free end of this cord 75 has attached thereto a magnet 78. Also passing over pulley 74 is a cord 79 having a hook 80 at the free end thereof, the opposite end of this cord being attached to a drum 81 mounted upon the crane body 70 and rotated by operation of a crank 82. Also mounted upon the crane body 70 is a second drum 83, operated by a crank 84 and having attached thereto the inner ends of cords 85, the outer ends of which are permanently connected to the boom at 86 near the outer end thereof.

Secured to the hollow shaft 71 beneath the platform 15 is a sheave 87 around which passes a cord 88 over a drum 89 rotatably mounted upon the exterior of the operator's end of the platform and whose arms are controlled by the crank 90.

Interposed between the base of the crane and the platform 15 is an annular member 91 having recesses or grooves therein 92 to be engaged by the inner end of a latch pin 93 slidably mounted upon the upper surface of the platform 15 in bearings 94, and a spring 95 normally urges the pin into engagement with one of the notches or recesses 91 to maintain the crane against rotative movement. An operating lever 96 connected to the outer end of the pin 93 may be operated to release the latch 93 from engagement with the recesses in the annular member to permit rotative movement of the crane when desired. It will be observed with particular reference to FIG. 1 of the drawing that the crane is located sufficiently close to the primary trackway to permit its boom to pass over said trackway and above a car 18 located thereon.

Interposed between the crane and the secondary trackway is a transfer rack which comprises a pair of spaced apart levers 97 secured at their inner ends to a rock shaft 98 rotatably mounted in suitable bearings beneath the platform 15 and having its outer end extending through the end of the platform and having attached thereto an operating lever 99. The levers 97 move through slots 100 disposed transversely of the platform, which slots are flanked by curved upstanding supporting shoulders 101 of end members 102. The free extremities of the levers 97 are shouldered as at 103 to provide supports for one of the elements or beams 27, as shown more particularly in FIG. 13 of the drawing. It will be observed that the levers 97 when swung to their uppermost position as shown in FIG. 13, will have their shoulders disposed above and adjacent to the transverse sills of a car on the secondary trackway, but in normal position will be retracted so as to dispose the shoulders 103 in a position to receive an element or beam 27 from the crane. It will also be observed that the curved surface 101 of the abutments 102 are concentric to the swing of the levers so that in swinging to upright position the ends of the beam or article 27 will slide along the curved surface 101.

In Operation

The beams 27 may be made of light magnetic metal, however, it is preferred in the interest of economy to prepare them of wood encased with a magnetic band 104 intermediate their ends. With one or more beams 27 of substantially rectangular cross section resting upon the transverse sills of the car 18 upon the primary trackway, the windlass 23 will be operated so as to move the car 18 toward the inner or operator's end of the table, this movement continuing until the car rests in such position that the magnet 78 may overlie the magnetic band 104 midway the ends of a beam. The crane is then unlatched and by operation of drum 89 is rotated so that its boom 73 overlies the magnetic band 104 on the element or beam 27. The magnet is then lowered until it comes in contact with the band, after which the boom 73 is elevated by operating drum 83, carrying the beam 27 with it, after which the crane is swung upon its pivot 71 to carry the suspended beam 27 over the transfer rack, whereupon the cord 75 is lowered to deposit the beam upon the shoulders of the levers of the transfer rack. The car 30 of the sec-

ondary track will have been moved to its innermost position in lateral alignment with the transfer rack, at which time its lever 37 will have been raised by engagement of the arm 40 with the operating cam shoulder 41 affixed to the platform. The lever 99 is then operated to swing the beam or element 27 upwardly and over until it rests upon the sills 34 of the car 30 and in engagement with the stop 35. The crank of the drum 47 is then rotated in such direction as to cause the car 30 to move outwardly along the secondary trackway, and as soon as it is moved sufficiently far to disengage the arm 40 from the cam surface 43, the spring 39 will move the free end of lever 37 so that the prong 38 will engage the element 27 so as to hold it firmly during travel of the car along the trackway. When the car reaches its limit of outward travel, the arm 40 secured to lever 37 will engage the cam surface 43 near the outer end of the platform, causing lever 37 to rock upon its pivot in an upward direction to release the beam or element 27. Drum 63 is then rotated in such direction as to cause the cord attached thereto to move the transfer car in the lateral direction toward the secondary car, during which movement the cam surfaces 53 at the outer ends of sills 52 will engage beneath the beam or article 27, lifting it from its position upon the sills 34 of the secondary car onto the top of the sills 53 and in abutment with the member 54 of the transfer carrier. The drum 63 is then again operated to move the transfer car in rearward direction or toward the primary trackway. In the meantime, drum 23 will have been rotated so as to move car 18 along primary trackway to its limit in an outward direction and in substantially transverse alignment with the transfer car. Lever 68 is then moved in such direction as to cause shaft 67 to operate the lift levers 66 to engage the beam or element 27, lifting it from its position upon the transfer car and swinging it up and over onto the sills 25 of the primary carrier 18. This operation is described in connection with the transfer of but a single log or beam 27, but it will be understood that the carrier 18 upon the primary rack may be provided with more of such elements if desired. The several mechanical apparatus here described require proper and accurate manipulation in order to bring about a smooth and continuous operation of the several devices in attaining the objective. The various elements constituting the mechanical toy may be made of any desired material, in any preferred design, and may vary from the specific form here shown. Moreover, additional elements may be added to more accurately define the various operations incident to logging operations and means whereby the finished logs, girders or elements 27 may be transferred by the mechanical means shown to bring about the completed operation.

It is apparent that a mechanical toy constructed in the manner here illustrated and described will afford not only amusement in its operation, but will enhance concentration to the task and careful and accurate manipulation in order to achieve the objective.

In instances where articles to be transported or conveyed are of such character as may be engaged by the hook 80 carried by the crane boom, it will be understood that this may be done by manipulation of the drum 81 which governs the movements of the cord which supports the said hook.

The present disclosure illustrates cars of simple form supported by rollers resting directly upon the platform and whose directions are governed by the trackways as well as the shoes extending through the several slots. By this means, the control cords for bringing about movement of these vehicles are arranged beneath the platform, out of sight of the operator and obviously protected against fouling. It is apparent, however, that these cars may be constructed as replicas of actual railway equipment and may travel with flanged wheels upon rails located upon the exposed or upper face of the platform.

Similarly, the crane structure may be a precise replica of actual crane devices, and the transferring means may take other forms than are shown to bring about proper lateral movements of the articles upon the board for stacking or lodging properly upon the receiving cars or vehicles.

Inasmuch as the various elements employed in carrying out the several operations require precise control in their position as well as in their movements, it is apparent that the operator must necessarily acquire skill in moving the cars accurately to such positions as to bring about the successful transferring operations. The game, therefore, not only provides amusement for the operator but teaches accuracy and precise timing in order that the game may be successfully played or operated.

I claim:

1. An amusement device comprising a pair of spaced apart primary and secondary tracks, a car on each track, a crane movable on a vertical axis between said tracks, a transfer rack interposed between said crane and said secondary track, control means for operating said crane to move an article from the car on said primary track to said transfer rack, means for actuating said transfer rack to deposit said article upon the car on said secondary track, a holding lever pivoted upon the car on said secondary track, an operating cam fixed beside said car to engage and maintain said lever in raised position above said car when the latter is in load receiving position, a spring tending normally to move said lever downwardly into holding engagement with the article upon said car, separate means for moving said cars along their respective tracks, and said holding lever being released to the influence of said spring when the car on said secondary track has moved a predetermined distance beyond said operating cam.

2. An amusement device comprising a pair of spaced apart primary and secondary tracks, a car movable on each track, a cam shoulder fixedly secured adjacent to said secondary track, a holding lever pivoted upon the car on said secondary track having an arm to engage said cam shoulder to raise said lever, a spring connected at one end to said lever and at its opposite end to said car tending normally to hold said lever in lowered position, a crane movable on a vertical axis between said tracks, a transfer rack interposed between said crane and said secondary track, control means for operating said crane to move an article from the car on said primary track and to deposit it on said transfer rack, means for actuating said transfer rack to deposit said article upon the car on said secondary track beneath said raised lever, means for moving the car on said primary track, and means for moving the car on said secondary track beyond said cam shoulder whereby said lever is released to the influence of said spring.

3. An amusement device comprising spaced apart primary and secondary tracks, a car movable on each track, a transverse track interposed between said primary and secondary tracks, a car movable upon said transverse track, a lever disposed transversely of and pivoted upon the car on said secondary track, a cam shoulder affixed adjacent the car on said secondary track and in substantial alignment with said transfer track to move said lever to raised position above said car, sills projecting from the car on said transverse track to engage beneath articles on the car of said secondary track, a pair of lift levers pivotally mounted at their inner ends one upon each side of the car on said transfer track and adjacent to said primary track, separate means for moving the cars on said primary and secondary tracks, means for moving the car on said transverse track, and means for rocking said lift levers to engage the article upon the car on said transverse track and deposit it upon the car on said primary track.

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