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R. J. LOHR ET AL

2,629,967

SPRING DRIVEN WHEELED TOY

Filed Aug. 17, 1948

2 SHEETS—SHEET 1

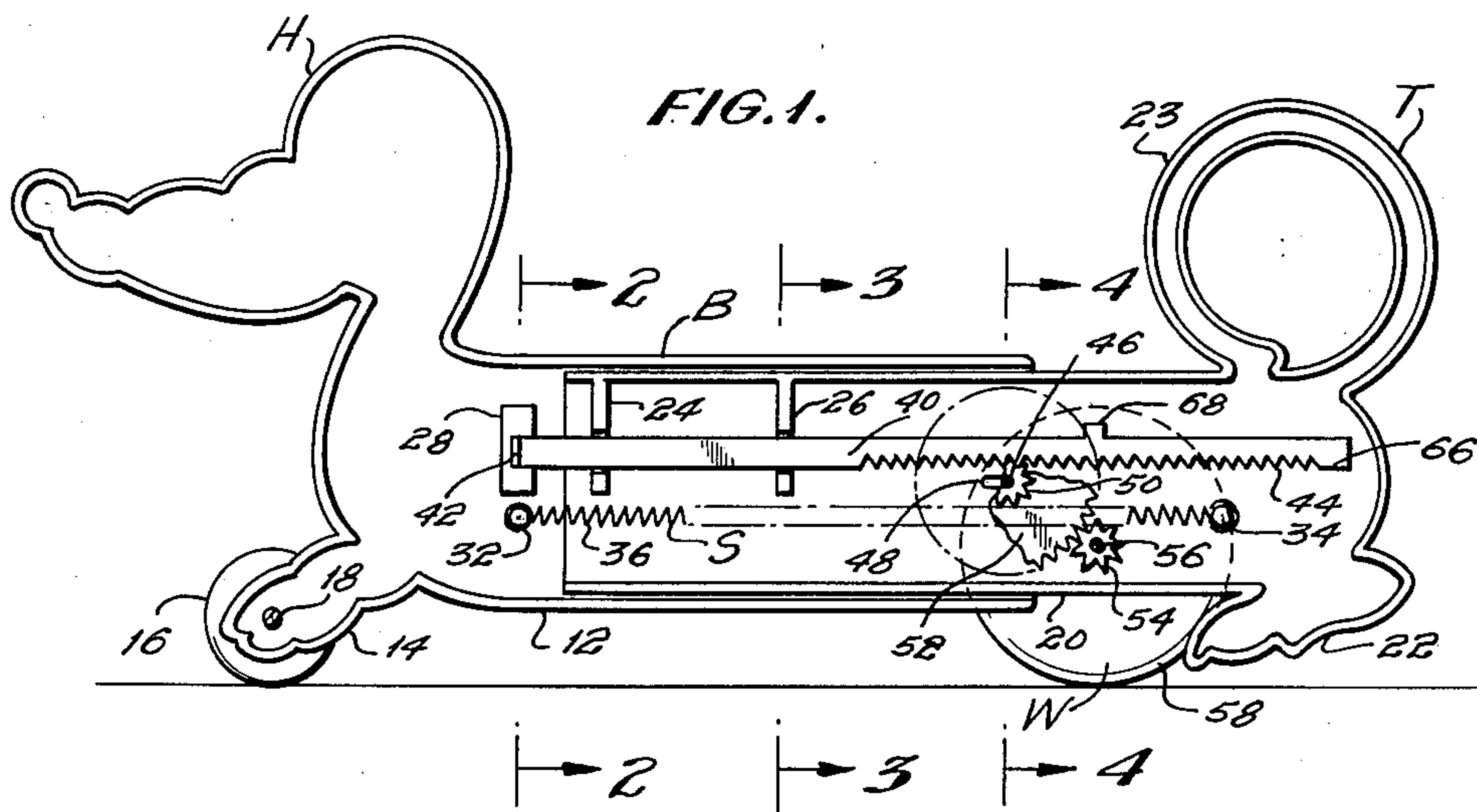


FIG. 2.

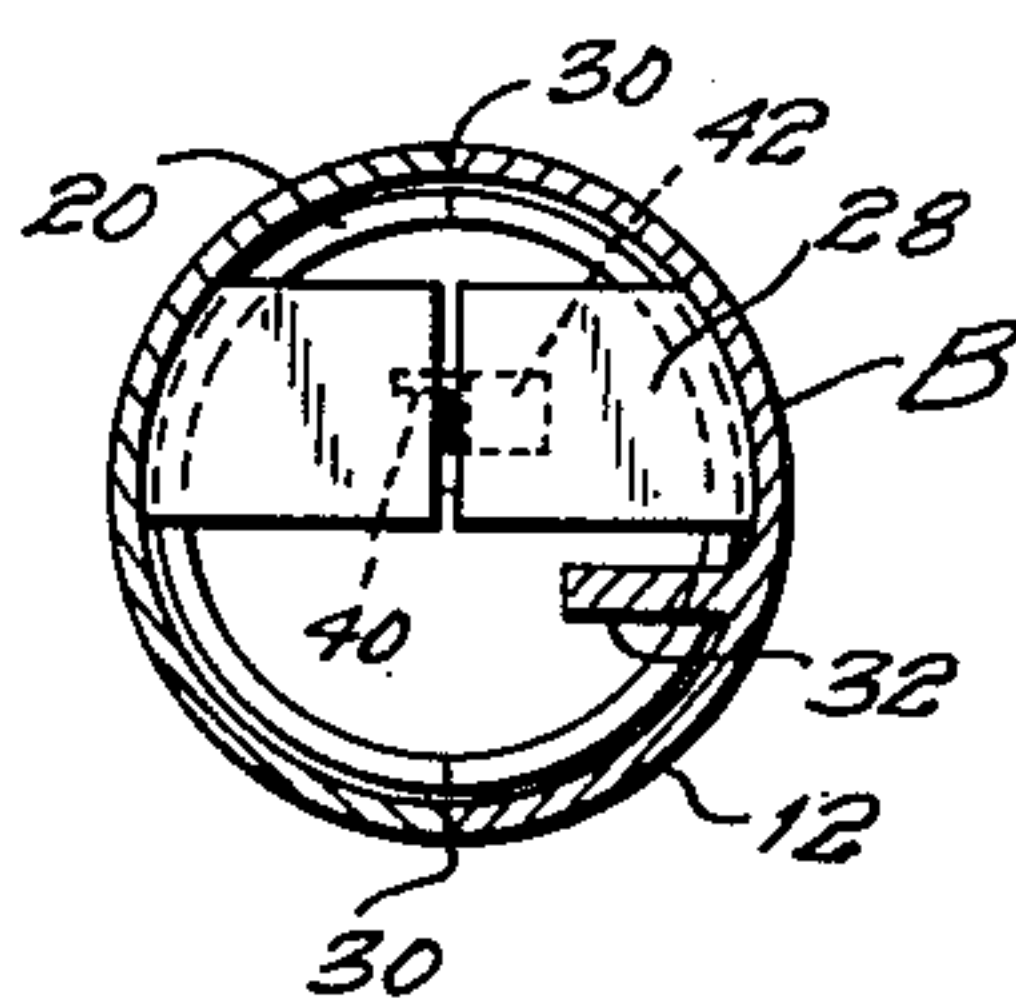


FIG. 3.

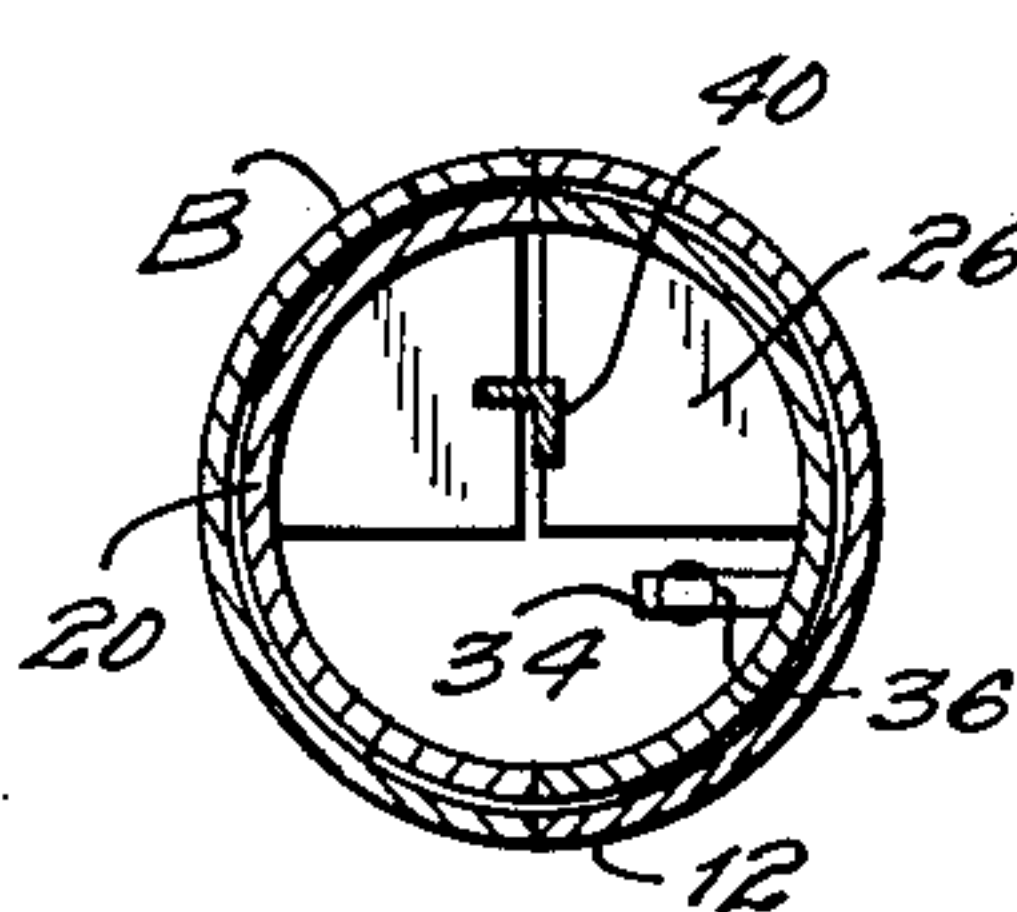


FIG. 4.

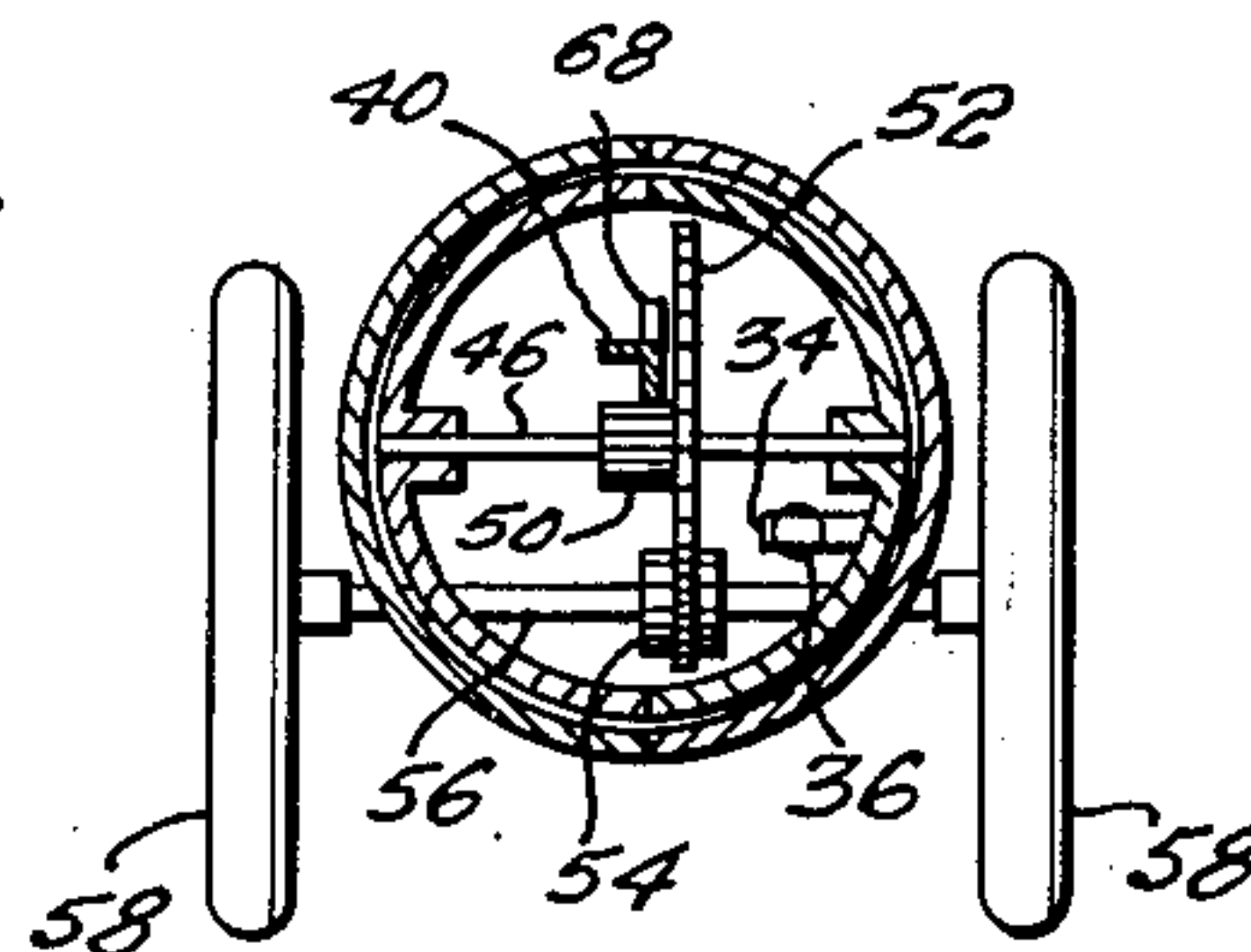
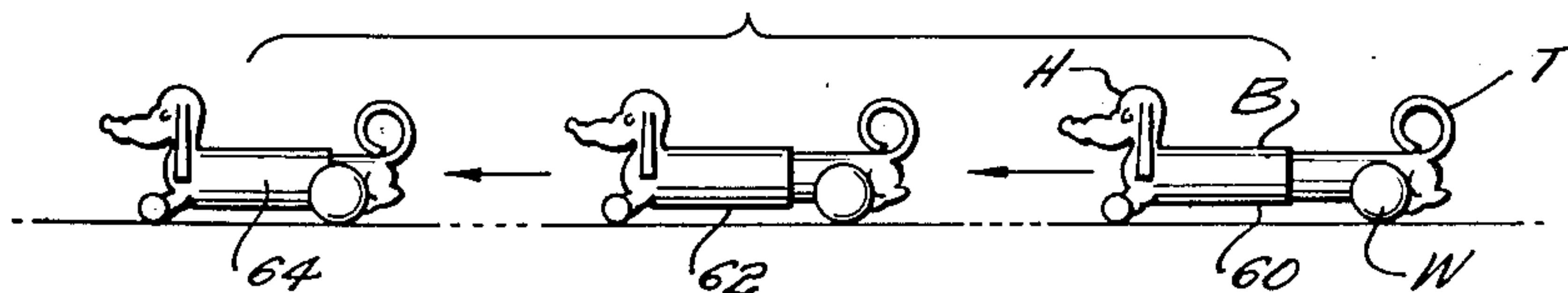


FIG. 5.



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2 SHEETS—SHEET 2

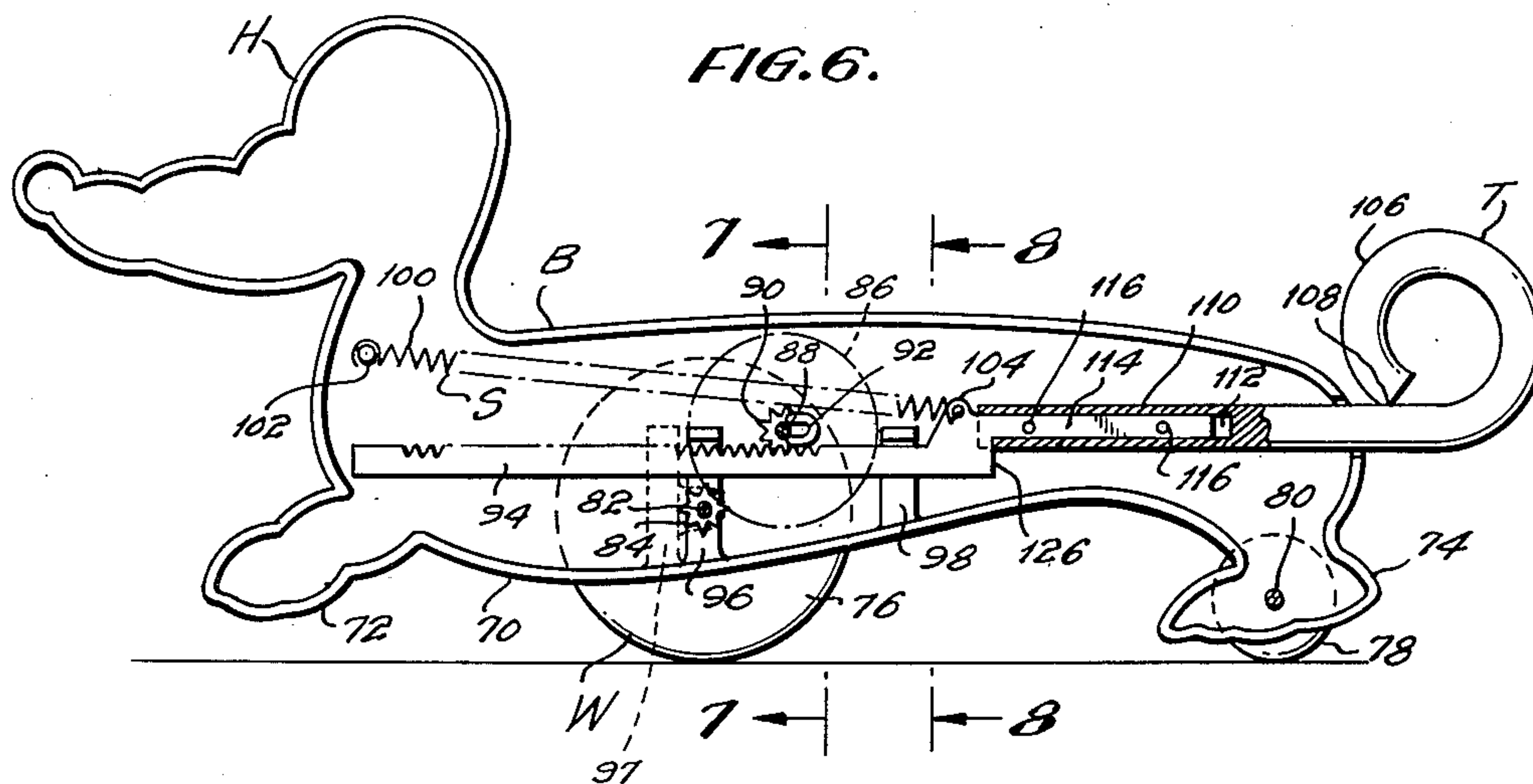


FIG. 7.

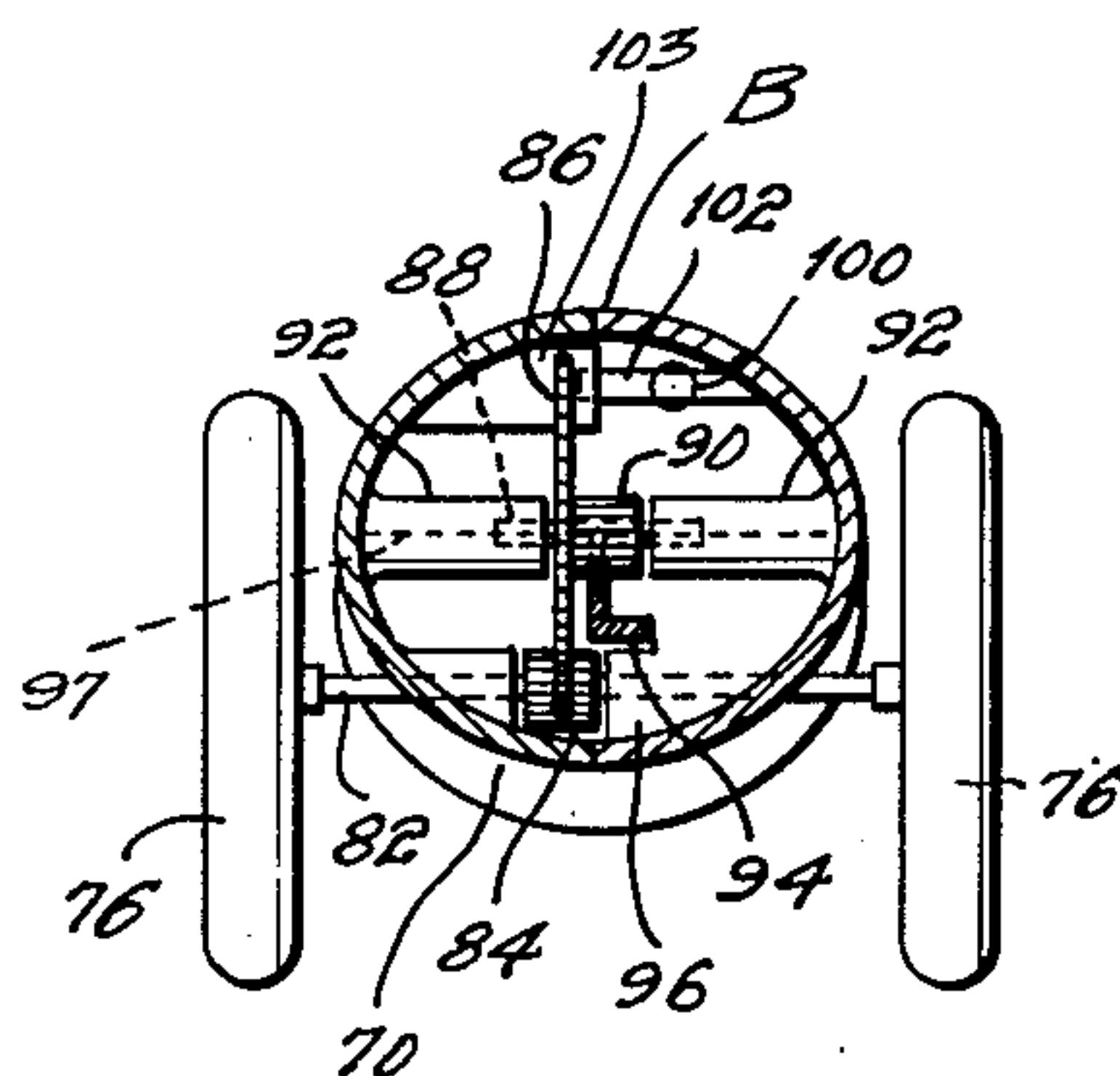


FIG. 8.

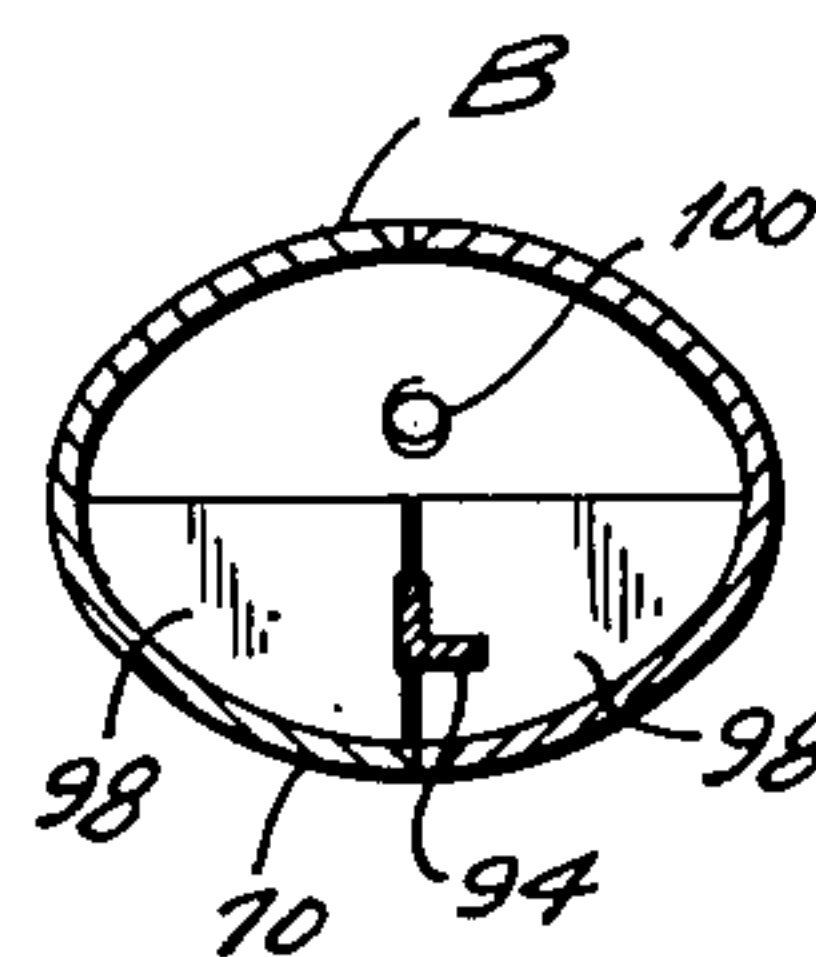
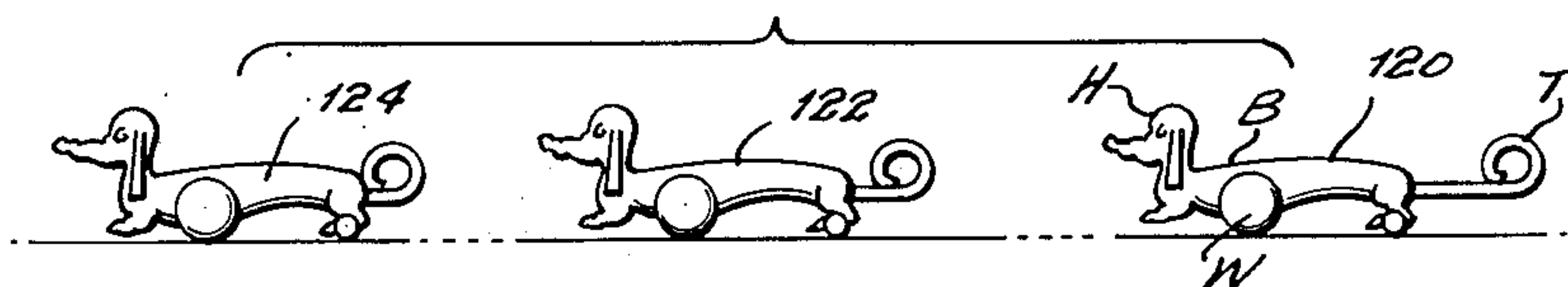


FIG. 9.



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SPRING DRIVEN WHEELED TOY

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Application August 17, 1948, Serial No. 44,728

15 Claims. (Cl. 46—104)

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This invention relates to toys, and more particularly to wheeled toys driven by a spring motor.

The primary object of the invention is to generally improve wheeled toys of the specified character. A more particular object is to provide a comical and amusing animal toy, in which the spring motor of the toy is energized by elongation of the toy, or more specifically, by pulling the tail in a direction away from the head. Still another object is to provide such a toy with a train of step-up gearing including gears which automatically disengage when the toy coasts, and also while the spring is being tensioned, and which automatically re-engage when the spring is released to drive the toy.

Still another object of the invention is to embody the toy in the form of a simulated dog, preferably a dachshund. The toy is disclosed in two forms, in one of which the body is itself telescopic, and is elongated to energize the toy, and in the other of which the tail is slidable in longitudinal direction, and is elongated to energize the toy.

To accomplish the foregoing general objects, and other more specific objects which will hereinafter appear, our invention resides in the wheeled toy and spring motor elements, and their relation one to another, as are hereinafter more particularly described in the following specification. The specification is accompanied by drawings in which:

Fig. 1 is a longitudinal section through one form of toy embodying features of our invention;

Fig. 2 is a transverse section taken approximately in the plane of the line 2—2 of Fig. 1;

Fig. 3 is a transverse section taken approximately in the plane of the line 3—3 of Fig. 1;

Fig. 4 is a transverse section taken approximately in the plane of the line 4—4 of Fig. 1;

Fig. 5 is a schematic illustration of the toy in operation;

Fig. 6 is a longitudinal section through a modified form of the invention;

Fig. 7 is a transverse section taken approximately in the plane of the line 7—7 of Fig. 6;

Fig. 8 is a transverse section taken approximately in the plane of the line 8—8 of Fig. 6; and

Fig. 9 is a schematic illustration of the toy in operation.

Referring to the drawings showing both species of the invention, the toy comprises generically a simulated animal body B, having a head H at

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one end, and a pull or tail T at the other end. The toy further comprises wheels W for propelling the toy, and a spring motor S for driving the wheels W. The toy is so constructed that the tail T may be moved toward or away from the head H, and this movement is employed to energize the spring. In both forms parts of the toy are relatively telescopic, and in both forms the tail is slidably movable longitudinally of the head.

In the species of the invention shown in Figs. 1 through 5, the body B is telescopic, the head H being secured to the forward end of one part, and the tail T being secured to the rear end of the other part, so that movement of the tail away from the head elongates the body portion B, and at the same time energizes the motor. This is shown in Fig. 5, in which the toy runs from right to left, the body being elongated in the right hand position 60, and progressively shortened as the toy runs forward through the positions 62 and 64. It will be understood that a substantial distance is covered by the toy, say, the length of a long room, between the right and lefthand positions 60 and 64 shown in Fig. 5.

A second species of the invention is shown in Figs. 6 through 9 of the drawing. In this case the toy is elongated by pulling the tail out of the body in a direction longitudinal of the body. Again the toy is assumed to run from right to left, it being fully energized in the righthand position 120 and de-energized in the lefthand position 124. The tail is shortened in the positions 122 and 124 as the spring is de-energized. Here again the change between the positions 120 and 124 shown in Fig. 9 would normally occupy a distance corresponding, say, to the length of a room.

Considering the mechanism in greater detail, and reverting to the first form of the invention, the body B is made up of a tubular forward portion 12 molded integrally with the head H and with simulated legs and paws 14. Small idler wheels or rollers 16 are freely rotatably carried on a suitable axle 18. The toy may be made with two wheels 16 disposed on opposite sides of joined simulated legs 14. We have also made the toy in another form, in which there are separate and spaced simulated legs 14, with a single roller therebetween.

The body of the toy includes a second tubular portion 20 which is telescopically received within the tubular portion 12. Simulated rear legs 22, as well as a simulated tail 23, are formed integrally with body portion 20. The tail is prefer-

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ably a closed ring, for strength. The second portion of the body may include guide walls 24 and 26, preferably molded integrally therewith. The forward portion of the body includes a transverse wall 28, also preferably molded integrally therewith. For simplicity of mold design, the forward portion of the body is preferably made of two symmetrical halves divided on a vertical plane, as is indicated at 30 in Fig. 2, and the wall 28 is similarly divided. In the same way, the rear portion of the body is preferably molded of symmetrical halves divided on a vertical plane, and the guide walls 24 and 26 are similarly divided. The halves of the toy are not in all respects symmetrical, for the forward half of the toy may include a spring anchor pin 32 formed on only one side of the toy, as is best shown in Fig. 2, and the rear half of the toy may include a spring anchor pin 34 similarly formed on only one side of the toy.

The motive power is obtained from a pull spring 36 hooked at one end about the pin 32, and hooked at its other end about the pin 34. Thus the spring tends to contract or shorten the body, and is stretched or tensioned when the body is elongated.

The drive mechanism further includes a rack 40, the forward end of which is anchored in anchor wall 28. For this purpose, one end of the rack has a tab or tongue 42 which is bent sidewardly and received in a mating recess in one half of the wall 28. Thus the rack moves with the forward part of the body. The rack is guided by mating slots in the guide walls 24 and 26. The rack is preferably angle-shaped in section, as is best shown in Fig. 3, and gear teeth 44 (Fig. 1) are formed on its lower edge.

The rack is operatively connected to the wheels W by means of a gear train, and the said gear train includes an intermediate shaft 46, the said shaft being received in elongated or slotted bearings 48. These bearings permit a part of the gear train to engage or disengage, and the arrangement is such that when the tail is pulled rearwardly to tension the spring, the gear train is automatically disengaged, and when the tail is released to permit the toy to run forward, the gear train is automatically engaged.

In the specific case here shown, the rack teeth 44 mesh with a pinion 50 on intermediate shaft 46. The said shaft also carries a gear 52 adapted to mesh with a pinion 54 on the axle 56 of the drive wheels 58. The elongated or slotted bearings 48 permit the intermediate gear 52 to move out of or into engagement with the axle pinion 54. The meshed relation between the intermediate pinion 50 and the rack is undisturbed, because the bearings are slotted in a direction parallel to the rack.

It will be evident that when the toy is elongated, the rack pulls the intermediate shaft 46 toward the left, thereby disengaging gear 52 from pinion 54 during the motor tensioning operation. However, when the toy is released and the spring contracts the toy, the motion of the rack relative to the rear half of the toy moves the intermediate shaft 46 toward the right, as viewed in Fig. 1, thereby bringing the gear 52 into driving mesh with the pinion 54.

This gear train arrangement has the additional advantage of providing a free wheeling action for the toy. In other words, if a child pulls or pushes the toy forward, the rotation of the wheels automatically results in disengagement of the gear train. This minimizes resistance to move-

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ment of the toy, and also avoids possibility of injury to the spring motor. The free wheeling feature has the additional advantage that if the room or floor surface is long enough, and the toy is energized and then released, it may continue to coast on its own inertia, instead of coming to an abrupt stop, after the toy has contracted to minimum length.

As to the structural relationship between the two halves of the toy, the body may be made cylindrical, as here shown, in which case relative rotation of the forward and rear halves of the toy is prevented by the rack 40. This is a relatively rigid member, and inasmuch as it is fixedly secured to the forward half of the body, and passes slidably through the rear half of the body, it serves to keep the halves in alignment. Of course, the body may be made non-circular in section, and if made elliptical in section the sectional shape will itself prevent rotation of one half of the body relative to the other.

The maximum elongation of the body shown at 50 in Fig. 5 is limited by the rack 40, the teeth of which terminate as indicated at 66 in Fig. 1. If desired, the rack may be provided with a still more positive stop, as, for example, a tongue 68 bent upwardly and adapted to engage the guide wall 26.

Contraction or shortening of the body may be limited by the rear axle 56, which would encounter the rear edge of the forward half of the body when the body is fully shortened. In the present case it is limited by the anchor wall 28 (Fig. 1) which is engaged by the forward edge of the rear half of the body.

The second species of the invention is shown in Figs. 6 through 9 of the drawing, and referring thereto, the body 70 may be made of molded plastic. Preferably two halves are separated on a vertical parting plane, the said halves being cemented together as before in edge-to-edge relation, with the operating mechanism therebetween. The body comprises simulated forward legs 72 and rear legs 74. In this case the drive wheels 76 are located nearer the forward end of the body, and the additional wheels or rollers 78 are located at the rear legs instead of the front legs. These small wheels or rollers turn idly on a suitable spindle 80.

The drive wheels 76 are carried on an axle 82 having pinion 84. This meshes with an intermediate gear 86 carried on intermediate shaft 88, which also carries a pinion 90. The ends of the intermediate shaft 88 are slidably carried in elongated slots or bearings 92.

Pinion 90 meshes with a gear rack 94 slidably received in guide walls 96, 97, and 98. The bearings and guide walls are all molded integrally with the halves of the toy. As before, the rack is preferably angle-shaped in section or rigidity, this being best shown in Fig. 8, which also shows how a guide wall 98 may be made in two halves, one molded with each side of the toy body, and the said halves coming together in such a way as to receive the rack 94 therebetween. Guide walls 96 and 97 are relatively offset longitudinally of the toy, as shown in Fig. 6.

The rack is normally urged forward by means of a pull spring 100. This is anchored at its forward end on a suitable pin 102, and at its rear end in an apertured lug 104 fashioned as a part of the rack 94. The pin 102 is molded integrally with one side of the body. If desired, it may enter a mating hole in a stud 103 molded

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integrally with the other side of the body (see Fig. 7).

The rack is connected to and operated by the tail. In the present case the tail is preferably molded of plastic, and includes a ring 106, preferably closed at 108 for strength. The forward portion 110 has a slot 112 formed therein for a substantial distance, said slot receiving a rearward extension 114 of the rack. The parts are permanently and rigidly secured together, as by means of pins 116.

It will be evident that when the tail is pulled rearwardly, as shown at 120 in Fig. 9, the spring 100 is tensioned, thereby energizing the toy. During this tensioning operation the rearward movement of the rack moves the intermediate shaft 88 toward the right, thereby disengaging the intermediate gear 86 from the axle pinion 84. This eliminates spinning of the wheels during the winding operation, and makes it possible to wind the toy while holding it firmly down on the floor. When the toy is released it runs rapidly forward. At the same time the tail is drawn into the body, as shown by the successive positions 120, 122, and 124 in Fig. 9. During this forward movement of the rack, the intermediate shaft 88 is moved toward the left, as viewed in Fig. 6, thereby causing intermediate gear 86 to engage the axle pinion 84. However, when the spring runs down, the toy may coast or free wheel under its own inertia, the gear 86 disengaging from the pinion 84.

The maximum rearward movement of the tail may be limited in any desired fashion, and in the present case, the step or abutment 126 between the rack and the tail serves the intended purpose. The maximum forward movement of the tail may be limited by the ring 106 of the tail itself, or by the lug 104 reaching the guide wall 96.

It is believed that the construction and operation, as well as the advantages of our improved wheeled toy, will be apparent from the foregoing detailed description thereof. It will also be apparent that while we have shown and described the toy in several preferred forms, changes may be made, without departing from the spirit of the invention as sought to be defined in the following claims.

We claim:

1. A wheeled toy comprising an elongated body simulating a four legged animal, a head at one end, a rigid tail at the other end, said tail being curled upwardly and around to form a substantial, rigid ring strong enough to facilitate pulling the tail in a direction away from the head, said ring simulating a curled tail on the animal, simulated legs, wheels for propelling said toy, a spring motor for driving said wheels, means so mounting said tail that it is slidably movable longitudinally of the toy toward or away from the head, means to maintain the ring in a vertical plane with the tail curled upwardly, and means responsive to relative movement of the tail and head for energizing the spring motor.

2. A wheeled animal toy comprising a body made up of two telescopic parts, with the head and forelegs secured to the forward end of one of said parts, and the tail and hindlegs secured to the rear end of the other of said parts, wheels for propelling said toy, and motor means comprising a rack, a gear train between said rack and said wheels, said gear train including an intermediate shaft, slotted bearings for said intermediate shaft permitting the gearing at said

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shaft to engage or disengage, and a pull spring for urging said rack in that direction which causes the gearing to engage and which causes the wheels to propel the toy, the aforesaid parts of the motor means being so related and connected to the aforesaid telescopic parts of the toy body that movement of one relative to the other changes the length of the body between the forelegs and the hindlegs, disengages the gearing, and tensions the spring.

3. A wheeled animal toy comprising a simulated animal body made up of two telescopic parts, with the head and forelegs secured to the forward end of one of said parts, and the tail and hindlegs secured to the rear end of the other of said parts, wheels for propelling said toy, and motor means comprising a rack, an intermediate shaft having a pinion meshing with said rack and having a gear, an axle for the wheels, a pinion on said axle for meshing with the aforesaid gear, slotted bearings for said intermediate shaft permitting said gear to engage or disengage said axle pinion, and a pull spring for urging said rack in that direction which causes the gear to engage the axle pinion and causes the wheels to propel the toy forwardly, the aforesaid parts of the motor means being so related and connected to the aforesaid telescopic parts of the toy body that a pull on the tail away from the head elongates the body portion between the forelegs and the hindlegs, disengages the gearing, and tensions the spring.

4. A wheeled animal toy simulating a dachshund having a tubular body portion which may be lengthened or shortened by a telescopic relation of the forward and rear parts of the body, a head at one end, a rigid tail at the other end, wheels for propelling said toy, motor means comprising a rack, a gear train between said rack and said wheels, said gear train including an intermediate shaft, slotted bearings for said intermediate shaft permitting the gearing at said shaft to engage or disengage, and a pull spring for urging said rack in that direction which causes the gearing to engage and which causes the wheels to propel the toy, the aforesaid parts of the motor means being so related and connected to the aforesaid telescopic parts of the toy body that movement of one relative to the other changes the length of the body, moves the rack in that direction which tensions the spring, and disengages the gearing.

5. A wheeled animal toy simulating a dachshund having a tubular body portion which may be lengthened or shortened between the forelegs and the hindlegs by a telescopic relation of the forward and rear parts of the body, a head at one end, a rigid tail at the other end, wheels for propelling said toy, and motor means comprising a rack, an intermediate shaft having a pinion meshing with said rack and having a gear, an axle for the wheels, a pinion on said axle for meshing with the aforesaid gear, slotted bearings for said intermediate shaft permitting said gear to engage or disengage said axle pinion, and a pull spring for urging said rack in that direction which causes the gear to engage the axle pinion and causes the wheels to propel the toy forwardly, the aforesaid parts of the motor means being so related and connected to the aforesaid telescopic parts of the toy body that a pull on the tail away from the head moves the rack in that direction which tensions the spring and disengages the gear from the axle pinion.

6. A wheeled toy comprising an elongated body simulating a four legged animal, the body portion being made up of two telescopic parts, with a head and forelegs secured to the forward end of one of said parts, and a tail and hindlegs secured to the rear end of the other of said parts, wheels for propelling said toy, a spring motor for driving said wheels, and means responsive to elongation of the body portion between the forelegs and the hindlegs to energize the spring.

7. A wheeled toy comprising a long low body simulating a dachshund, a head at one end, a rigid upwardly curled tail of large dimension at the other end, simulated paws, wheels for propelling said toy, a spring motor for driving said wheels, means so mounting said tail that it is slidably movable longitudinally of the toy toward or away from the head, means to keep the tail with its upwardly curled portion in a vertical plane, and means responsive to relative movement of the tail and head for energizing the spring motor, the simulated dachshund being lengthened by outward movement of the large upwardly curled tail part of the body to assume an even longer and more comical appearance.

8. A wheeled toy as defined in claim 1, in which the spring motor comprises a rack having gear teeth on its upper surface, an intermediate shaft disposed transversely across the rack above the rack and having a pinion meshing with said rack and having a gear, said gear being disposed alongside the rack and having a diameter so large that the lower portion thereof comes below the rack, an axle for the wheels disposed transversely across the rack beneath the rack, a pinion on said axle for meshing with the aforesaid gear, slotted bearings for said intermediate shaft permitting said gear to engage or disengage said axle pinion, and resilient means urging said rack in that direction which causes the gear to engage the axle pinion and causes the wheels to propel the toy forwardly, and in which relative movement of the tail and head in desired direction moves the rack in that direction which tensions the resilient means and disengages the gear from the axle pinion.

9. A wheeled toy as defined in claim 1, in which the tail includes a rigid straight portion slidably received in the body, and in which the resilient means of said spring motor is a pull spring having one end connected to the tail and the other end connected to the forward part of the toy, so that a pulling movement of the tail out of the body energizes the spring.

10. A wheeled toy as defined in claim 1, in which the spring motor comprises a rack having gear teeth on its upper surface, an intermediate shaft disposed transversely across the rack above the rack and having a pinion meshing with said rack and having a gear, said gear being disposed alongside the rack and having a diameter so large that the lower portion thereof comes below the rack, an axle for the wheels disposed transversely across the rack beneath the rack, a pinion on said axle for meshing with the aforesaid gear, slotted bearings for said intermediate shaft permitting said gear to engage or disengage said axle pinion, a pull spring for urging said rack in that direction which causes the gear to engage the axle pinion and causes the wheels to propel the toy forwardly, and in which relative movement of the tail and head in desired direction pulls the rack in that direction which tensions the resilient means and disengages the gear from the

11. A wheeled toy as defined in claim 1, in which the spring motor comprises a rack having gear teeth, an intermediate shaft disposed transversely of the rack and having a pinion meshing with said rack and carrying an intermediate gear, said gear being disposed alongside the rack, an axle for the wheels, a pinion on said axle meshing with the aforesaid intermediate gear, slotted bearings for said intermediate shaft permitting said gear to engage or disengage said axle pinion, a pull spring for urging said rack in that direction which causes the gear to engage the axle pinion and causes the wheels to propel the toy forwardly, and in which the forward part of the tail includes a rigid straight portion slidably received in the body, and said straight portion is directly connected to the rack, whereby the tail may be used to pull the rack in that direction which tensions the spring and disengages the gear from the axle pinion.

12. A wheeled toy as defined in claim 1, in which the tail includes a rigid straight portion received in the body, means so mounting said tail that it is slidably movable longitudinally toward or away from the head, and in which said spring motor comprises a rack which is fixedly connected to said tail and which forms an extension thereof within the body, a gear train between said rack and said wheels, said train including an intermediate shaft, slotted bearings for said intermediate shaft permitting the gearing at said shaft to engage or disengage, and a pull spring for urging said rack in that direction which causes the gearing to engage and causes the wheels to propel the toy forwardly, said pull spring having one end connected to the tail and the other end connected to the forward part of the toy, the arrangement being such that a pulling movement of the tail out of the body disengages the gearing and tensions the spring.

13. A wheeled toy as defined in claim 1, in which the body is molded out of a moldable plastic in halves divided on a vertical parting plane and cemented together in edge-to-edge relation, said tail having a rigid straight portion slidably received in the body for movement longitudinally of the toy, the resilient means of said spring motor being a pull spring having one end connected to the tail and having the other end connected to the body of the toy by means of an anchorage extending transversely of the toy, said anchorage comprising a pin molded integrally with one side of the toy and projecting toward the other side of the toy, and a socket molded integrally with the other side of the toy and projecting toward and receiving the end of the pin.

14. A wheeled toy as defined in claim 1, in which the body is molded out of a moldable plastic in halves divided on a vertical parting plane, said halves being cemented together in edge-to-edge relation, means so mounting said tail that it is slidably movable longitudinally toward or away from the head, and in which the spring motor comprises a rack, an intermediate shaft having a pinion meshing with said rack and having a gear alongside the rack, an axle for the wheels, a pinion on said axle meshing with the aforesaid gear, slotted bearings for said intermediate shaft permitting said gear to engage or disengage said axle pinion, said bearings being molded integrally with the sides of the toy and projecting inwardly toward one another to a spacing approximately equal to the axial length of the gear and pinion and receiving the ends of the intermediate shaft, and a pull spring for

urging said rack in that direction which causes the gear to engage the axle pinion and causes the wheels to propel the toy forwardly, and in which movement of the tail away from the head moves the rack in that direction which tensions the spring and disengages the gear from the axle pinion.

15. A wheeled toy as defined in claim 1, in which the body is molded out of a moldable plastic in halves divided on a vertical parting plane, said halves being cemented together in edge-to-edge relation, means so mounting said tail that it is slidably movable longitudinally toward or away from the head, said spring motor comprising a rack, guide walls molded integrally with the sides of the toy and projecting inwardly to a spacing suitably dimensioned to act as a guide for the rack, an intermediate shaft having a pinion meshing with said rack and having a gear alongside the rack, an axle for the wheels, a pinion on said axle for meshing with the aforesaid gear, slotted bearings for said intermediate shaft permitting said gear to engage or disengage said axle pinion, said bearings being molded integrally with the sides of the toy and projecting inwardly toward one another to a spacing approximately equal to the axial length of the gear and pinion and receiving the

ends of the intermediate shaft, a pull spring for urging said rack in that direction which causes the gear to engage the axle pinion and causes the wheels to propel the toy forwardly, one end of said pull spring being connected to the tail, and the other end being connected to the body of the toy by means of an anchorage, said anchorage comprising a pin molded integrally with one side of the toy and projecting toward the other side of the toy, and a socket molded integrally with the other side of the toy and projecting toward and receiving the end of the pin, and in which movement of the tail away from the head moves the rack in that direction which tensions the spring and disengages the gear from the axle pinion.

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