Aug. 8, 1961 E. W. RICH 2,995,384

TRICYCLE WITH STEERABLE REAR WHEELS

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Fig.1

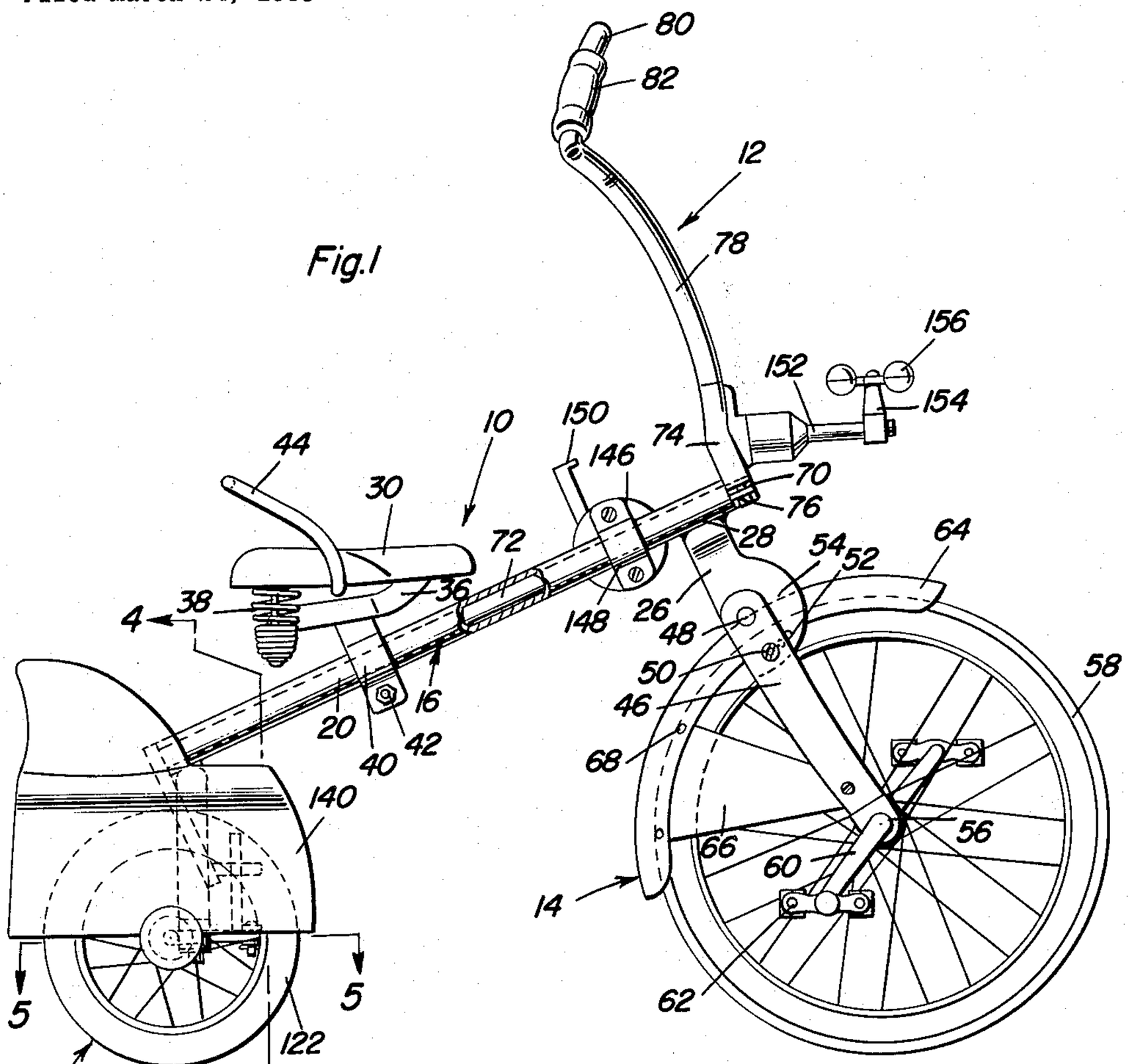

Fig.5

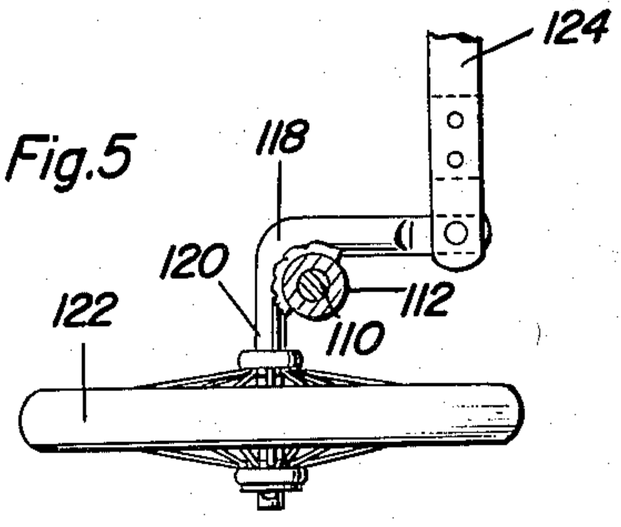

Fig.6

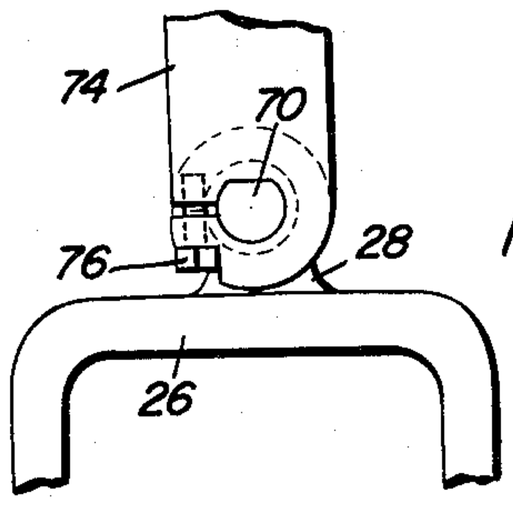

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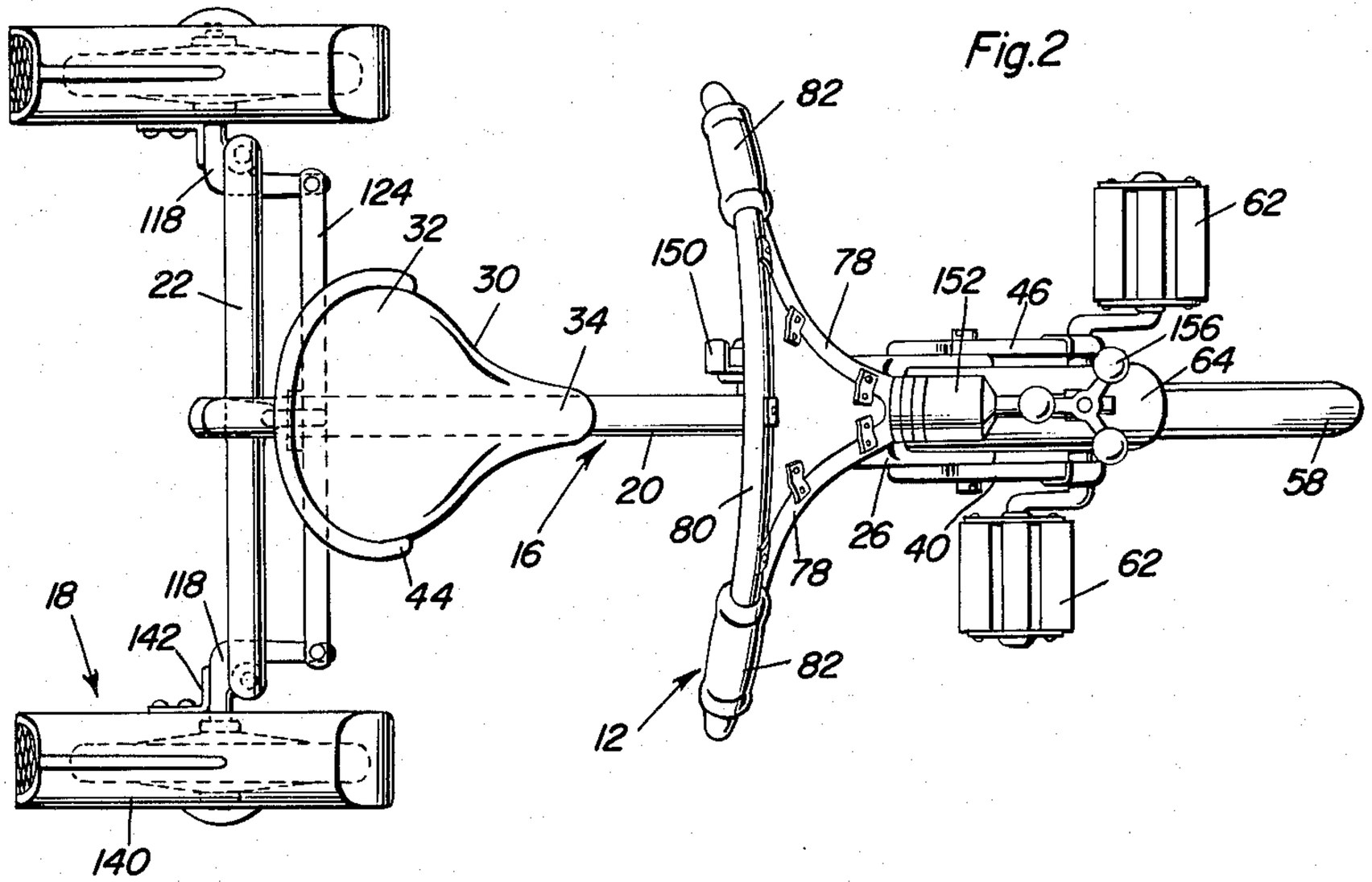
Fig.2



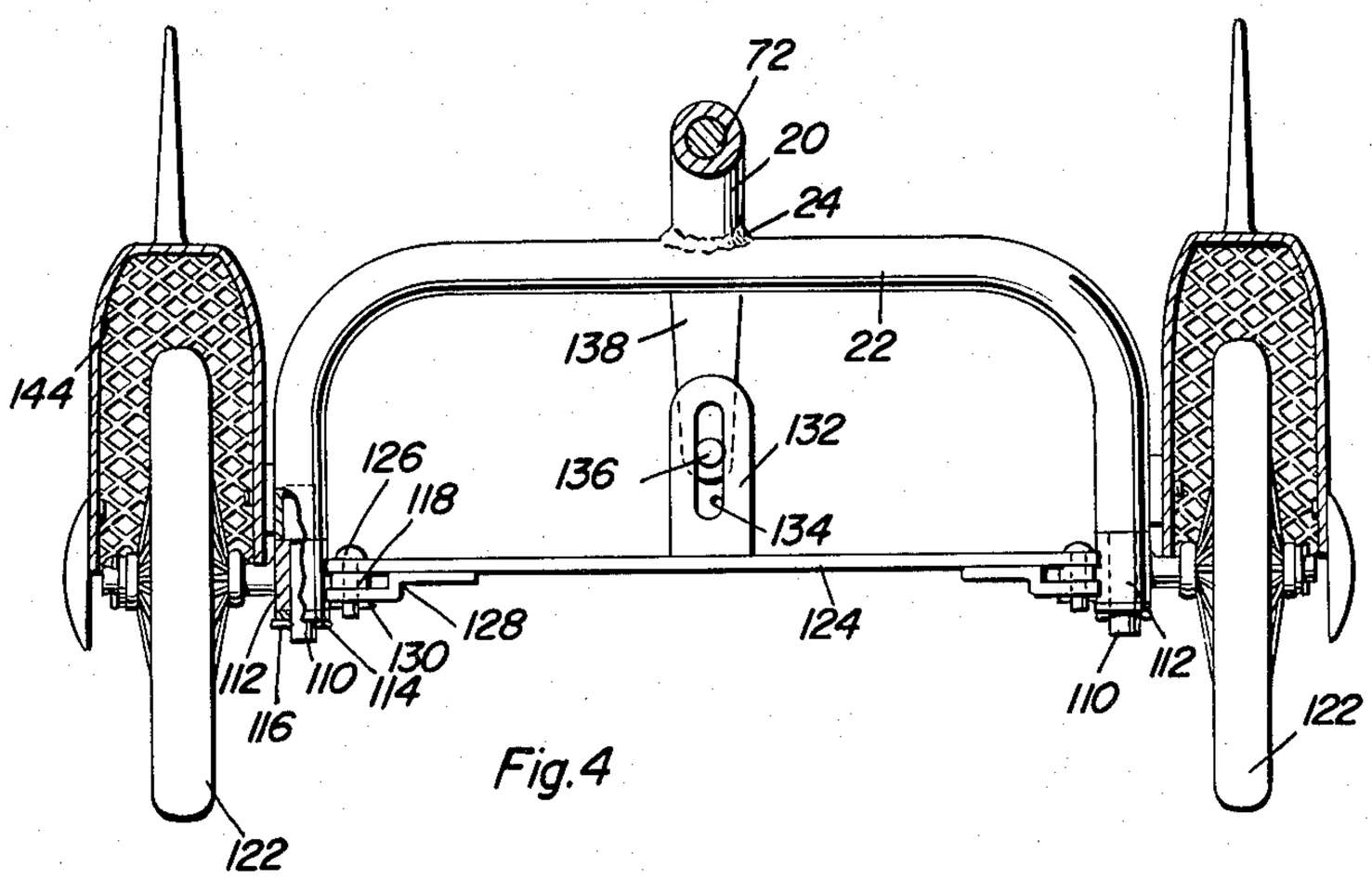


Fig.4

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TRICYCLE WITH STEERABLE REAR WHEELS

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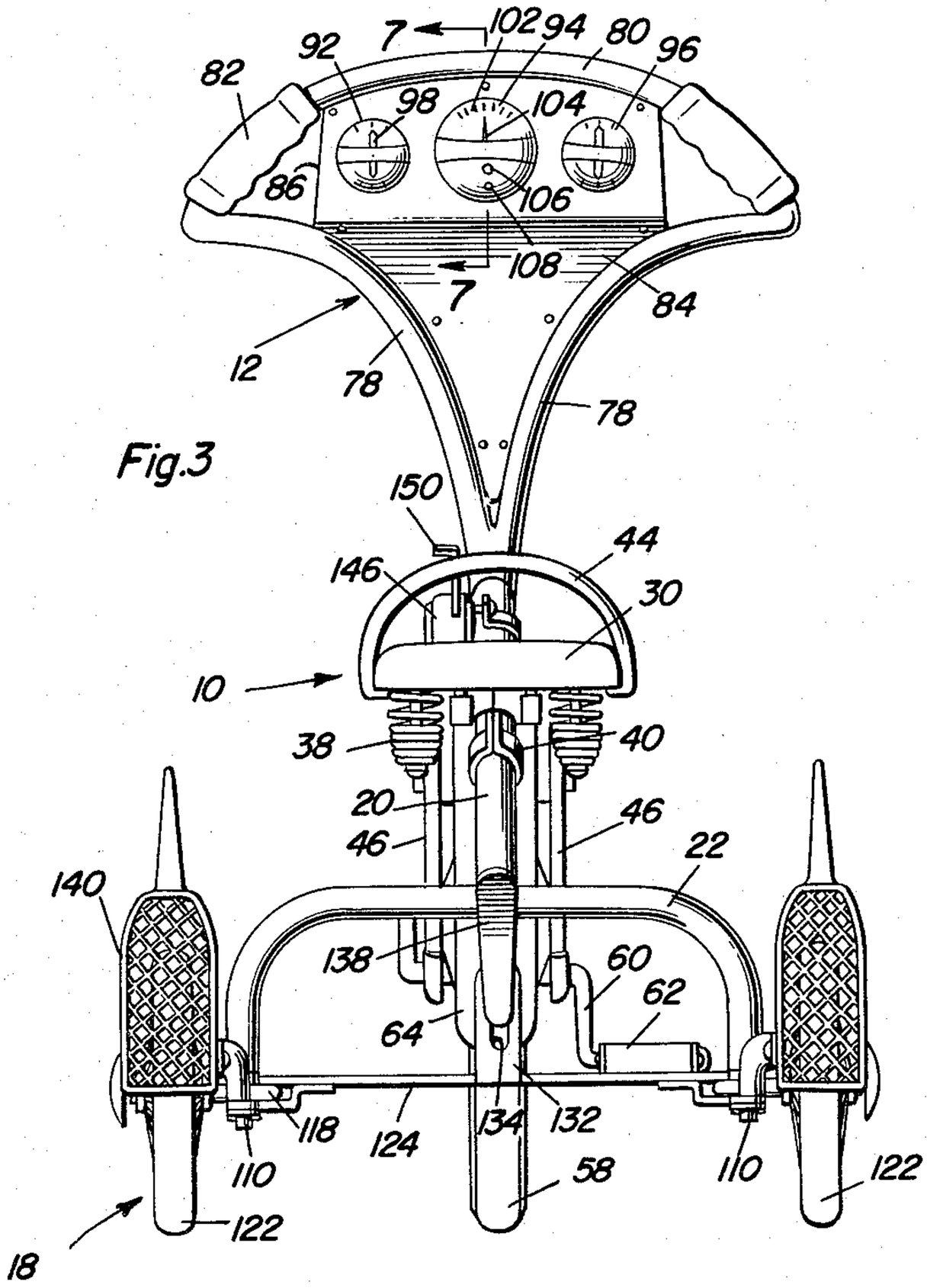

Fig.3

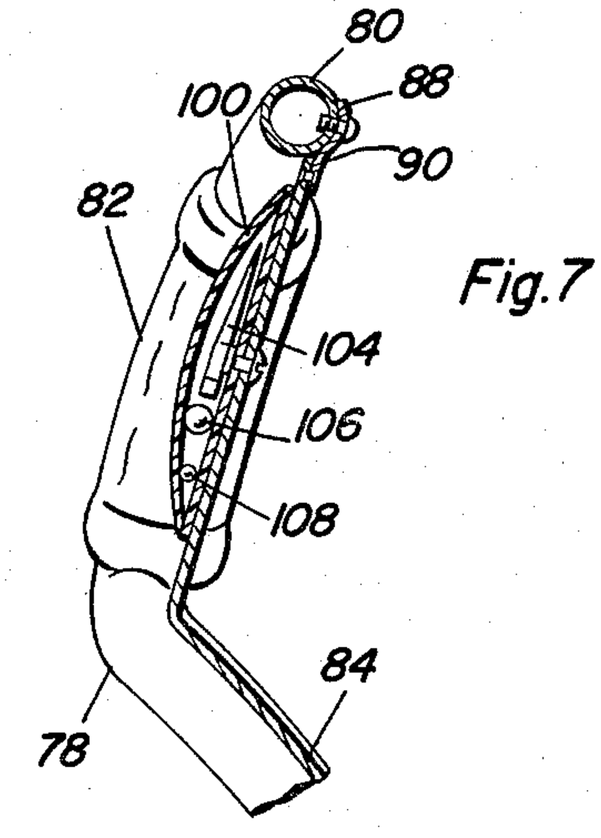

Fig.7

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TRICYCLE WITH STEERABLE REAR WHEELS

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5 Claims. (Cl. 280—269)

The present invention generally relates to a wheeled toy and more particularly to an occupant propelled vehicle of the velocipede or tricycle type in that there are three supporting wheels and the vehicle is driven by offset pedals on the forward wheel.

The primary object of the present invention is to provide a wheeled toy generally in the form of a tricycle in which the two rear wheels are pivotal about a vertical axis or kingpin for controlling the direction of movement of the vehicle with the front wheel being rotatable but non-pivotal in relation to the main frame of the vehicle.

A further object of the present invention is to provide a wheeled toy in the form of a tricycle in which the steering control is provided by a handle bar assembly which pivots about an inclined longitudinal axis with the main frame member of the wheeled toy receiving a steering rod for steering control of the rear wheels.

Another object of the present invention is to provide a wheeled toy in accordance with the preceding objects in which the handle bar assembly is generally disposed in a vertical plane with the same being swingable about a generally longitudinal axis together with a device for indicating the degree of bank or tilt of the handle bar assembly thus indicating the degree of turning of the rear wheels.

A still further object of the present invention is to provide a wheeled toy in which the seat and front powered wheels maintain a constant relationship with each other thereby providing a direct thrust on the pedals without the necessity of flexing the legs sideways as occurs in a conventional tricycle in which the front wheel is steerable.

Yet another feature of the present invention is to provide a wheeled toy that is much more stable than conventional tricycles which have the front wheel pivotal about an inclined vertical axis which enters a camber factor into the steering of the vehicle which quite often results in overturning of a conventional tricycle with the present invention differing from the conventional tricycle and overcoming this problem by providing rear steerable wheels.

Still another important object of the present invention is the provision of a wheeled toy which is ultra-modern in construction and appearance, safe in operation, long lasting and dependable, adjustable for different size children by varying the seat position longitudinally of the frame, adjustable as to orientation of the front fork, constructed to simulate an aircraft such as a jet plane, easy to propel and relatively inexpensive to manufacture.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIGURE 1 is a side elevation of the wheeled toy with a portion of the frame broken away showing the steering rod;

FIGURE 2 is a top plan view of the construction of FIGURE 1;

FIGURE 3 is a rear view of the wheeled toy;

FIGURE 4 is a transverse, vertical sectional view taken substantially upon a plane passing along section line 4—4 of FIGURE 1 illustrating the mechanism for providing steering control for the rear wheels;

FIGURE 5 is a detailed sectional view taken substantially upon a plane passing along section line 5—5 of

FIGURE 1 illustrating further structural details of the steering mechanism for the rear wheels;

FIGURE 6 is a partial front view of the steering rod, handle bar assembly and front wheel bracket; and

FIGURE 7 is a detailed sectional view taken substantially upon a plane passing along section line 7—7 of FIGURE 3 illustrating further structural details of the handle bar assembly and the simulated instrument panel mounted thereon.

Referring now specifically to the drawings, the numeral **10** generally designates the wheeled vehicle of the present invention which includes a generally vertically disposed handle bar member generally designated by the numeral **12**, a front wheel assembly generally designated by the numeral **14**, a frame assembly generally designated by the numeral **16** and a rear or steerable wheel assembly generally designated by the numeral **18**.

The frame **16** includes an elongated tubular member **20** which is disposed longitudinally and which is upwardly inclined from front to rear. At the rear end of the tubular member **20** there is provided an inverted U-shaped frame member **22** secured to the tubular member **20** as by welding or the like designated by the numeral **24**. At the forward end of the tubular member **20**, there is provided an inverted U-shaped bracket **26** secured to the undersurface of the tubular member **20** as by welding **28** or the like.

Mounted on the tubular member **20** is a seat **30** having a generally oval shaped main portion **32** and a forwardly projecting narrow portion **34** which is substantially conventional in shape. The seat **30** is provided with the usual supporting frame **36** and resilient supporting springs **38**. The supporting frame **36** is provided with a depending clamp **40** in the form of a split clamp which is mounted on the tubular member **20** and clamped thereon in longitudinally adjusted position by a clamp bolt **42**. Secured to the seat by any suitable means and extending upwardly above and arcuately around the back edge of the seat is a curved rod **44** which generally follows the contour of the oval shaped portion **32** but is disposed above the surface of the seat thus forming generally a back rest and stop for a person disposed on the seat so that forward thrust may be provided by the person sitting on the seat **30** without the person sliding rearwardly off of the seat. As the seat **30** is longitudinally adjustable on the tubular member **20**, the wheeled toy may be used by children having different length legs or as a child gets older, the seat may be moved farther rearwardly on the tubular member **20**.

Pivotally attached to and extending downwardly from each leg of the U-shaped bracket is a support arm **46** secured to the bracket **26** by pivot pin or bolt **48**. In spaced relation to the pin **48** is an anchor bolt **50** which will engage one of a series of arcuately arranged apertures **52** in the bottom edge of the legs of the U-shaped bracket **26** which are enlarged as designated by the numeral **54**. The lower end of the members **46** journal the front axle assembly **56** carrying the front wheel and tire **58** thereon with the axle also having crank arms **60** attached thereto with pedals **62** being rotatable on the outer end thereof whereby pressure exerted on the pedals **62** will cause rotation of the front wheel **58** in a conventional manner. The front wheel **68** is provided with the usual arcuate fender **64** which is generally U-shaped in cross-section and which is supported by supporting shields **66** attached to the members **46** and to the fender **64** by suitable fasteners **68**. Thus, the front wheel assembly **14** will not pivot about any axis but will be rotatable when the pedals **62** are driven. The adjustment provided by the bolt **50** and apertures **52** permits the wheel **58** to be lowered in relation to the frame **16** thereby permitting the tubular member **20** to be inclined at different angles. This also orientates the pedals so that substantially a straight forward thrust may be provided and due to the

rigidity between the tubular member **20**, the bracket **26**, the members **46** and the wheel axle, the line of thrust exerted on the pedals **62** will always be longitudinal and will remain the same since the wheel **58** does not pivot about a generally vertical axis as in conventional tricycles.

The handle bar assembly is attached to the forward reduced end **70** of an elongated steering control rod **72** rotatably received in the tubular member **20**. The handle bar assembly **12** includes a depending member **74** clamped onto the flattened reduced end **72** by a split clamp with a clamp bolt **76** therefor. Extending upwardly from the member **74** is a pair of outwardly and arcuately curved members **78** which are interconnected by a top arcuately curved member **80** with the arcuate member **80** having a pair of hand grips **82** thereon.

The area of the handle bar assembly defined by the curved rod **78** and the rod **80** is filled in by a piece of high impact plastic **84** which is curved to conform to the curvature of the arcuate members **78** and curves in the manner illustrated in FIGURES 1 and 7. The side edges of the member **84** which are defined by the numeral **86** are spaced from the hand grips **82** to permit free access to the hand grips **82**.

The portion of the plate **84** lying generally in the same plane has the arcuate member **80** secured thereto by brackets **88** and fasteners **90**. Mounted on this portion of the member **84** are three meters or dials designated by the numerals **92**, **94** and **96**. In each of the dials or meters **92** and **96**, the needles **98** are heavier on the bottom side and are pivoted so that they will be activated when the handle bar assembly is pivoted about the steering rod **72**. Each of the dials or meters is provided with an arcuate plastic cover **100** and the center meter **94** is provided with an angle of bank graduations **102** at the upper edge thereof and the needle **104** is weighted at its bottom for indicating the angle of inclination of the handle bar assembly. Below the center area of the meter **94**, there is provided a red bead **106** and a smaller spherical ball bearing member **108** which are freely rotatable under the cover **100** and since they are of different diameters they travel in different radii and being of different weight will seldom line up thus simulating a radar screen which is activated by the tilting of the handle bar assembly.

Now referring particularly to FIGURES 4 and 5, the steering wheel assembly **18** includes a depending kingpin **110** extending downwardly from the lower end of each depending leg of the inverted U-shaped frame member **22**. Each kingpin **110** receives a sleeve **112** rotatably thereon and the sleeve **112** is held in position by a washer **114** and a transverse pin **116**. Rigidly affixed to the sleeve **112** is a generally L-shaped wheel support member **118** having one leg **120** forming an axle for a rear wheel **122**. The other end of the L-shaped support member **118** is connected to an elongated tie bar or rod **124** by virtue of a vertical pin **126** which extends through the end of the tie bar **124** and through the end of the support member **118** and also through a bracket member **128** attached to the tie bar **124** and underlying the flattened end of the L-shaped support member **118**. The pin **126** is held in position by a transverse retainer pin such as a cotter pin designated by the numeral **130**.

Intermediate the ends of the tie bar **124**, there is an upstanding vertically elongated lug **132** having an elongated slot **134** formed therein. The slot **134** receives a forwardly prejecting pin **136** carried by an offset support arm **138** rigidly affixed to the rear end of the steering rod **72**. Thus, rotation of the steering rod **72** about its longitudinal axis will cause arcuate swinging movement of the arm **138** in an axis perpendicular thereto and will cause the pin **136** to swing about the center of rotation of the steering rod **72**. It is noted that the pin **136** is not perpendicular to the arm **138**. Rather, the pin **136** is perpendicular to the lug **132** for maintaining a perpendicular relation to the lug **132** for operation of the same so that the lug

132 will be caused to move laterally and slightly longitudinally as the L-shaped support members **118** pivot about the vertical axes defined by the pins **110**.

The L-shaped support member **118** also supports a pair of rear wheel enclosures or fenders **140** by brackets **142** and the rear wheel enclosures or fenders **140** may simulate an appearance the aft section of a jet plane including an open exhaust section **144** at the rear end thereof. Provided on the tubular member **20** adjacent the forward end thereof is a suitable bell or other noise maker **146** supported by a clamp **148** and having an operating handle **150** extending vertically thereabove whereby depression of the operating handle **150** will cause operation of the noise producing mechanism **146** which may be in the form of a bell, siren or the like. Extending forwardly from the handle bar assembly adjacent the element **74** is a support arm **152** having an upstanding support member **154** mounted thereon together with a rotatable member **156** generally in the configuration of an anemometer for determining wind velocity. The entire construction may be attractively colored and will generally carry out the aeronautical motive.

The adjustment of the front fork enables the frame to be used as a chassis for a small sidewalk car when the fork is extended. This enables the driving pedal arrangement to be used in this type of car thereby eliminating the use of chain and sprocket drives along with brackets and chain guards for retaining the cost at a minimum. Since the front wheel does not turn for steering control from side to side, a relatively small body may be placed around the front wheel which may be styled as a rocket or aircraft.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly, all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. A wheeled toy comprising an elongated frame member, a front wheel disposed at the forward end of the frame member, means mounting the front wheel for rotation about a horizontal axis and rigid in relation to a vertical axis, a pair of rear wheels, means supporting each of the rear wheels on the rear end of the frame member for rotation of each of the rear wheels about a horizontal axis and pivotal movement of each of the rear wheels about a vertical axis for steering the vehicle, a handle bar assembly mounted at the forward end of the frame member and connected with the rear wheels for steering control of the same, a seat on the frame member, and pedals attached to the front wheel for propelling the vehicle whereby the rear wheels may be steered for controlling the path of movement of the vehicle, said frame member being tubular and said handle bar assembly including an elongated steering rod rotatable in said frame member, said steering rod having an offset arm on the rear end thereof and a handle bar connected to the front end, said rear wheels being supported on vertical kingpins supported from the frame member, each rear wheel having an offset steering arm, said arms being interconnected by a tie bar, and means interconnecting the offset arm on the steering rod and the tie bar for transmitting the rotational movement of the steering rod about its longitudinal axis to lateral transverse movement of the tie bar for pivoting both of the rear wheels in the same direction at the same time.

2. The structure as defined in claim 1 wherein said handle bar extends substantially in a vertical plane and includes generally two hand grips disposed in a vertical plane for rotation about the axis of the steering rod, said handle bar including a bank angle indicator mounted thereon for indicating the degree of tilt of the handle bar

for indicating the degree of pivotal movement of the rear wheels.

3. The structure as defined in claim 1 wherein said frame member is inclined downwardly towards the rear wheels, means securing the seat to said inclined frame member in longitudinally adjusted relation whereby the distance from the seat to the pedals may be varied for orientating the seat in the desired spaced relation to the pedals for optimum exertion of pressure on the pedals by the occupant of the seat.

4. The structure as defined in claim 1 together with an enclosure for the upper portion of each rear wheel, means supporting the enclosure for pivotal movement about said vertical axis with the respective rear wheels.

5. A wheeled toy comprising an elongated frame member, a front wheel disposed at the forward end of the frame member, means mounting the front wheel for rotation about a horizontal axis and rigid in relation to a vertical axis, a pair of rear wheels, means supporting each of the rear wheels on the rear end of the frame member for rotation of each of the rear wheels about a horizontal axis and pivotal movement of each of the rear wheels about a vertical axis for steering the vehicle, a handle bar assembly mounted at the forward end of the frame member and connected with the rear wheels for steering control of the same, a seat on the frame member, and pedals attached to the front wheel for propelling the vehicle whereby the rear wheels may be steered for controlling the path of movement of the vehicle, said means for supporting the front wheel from the frame member including a rigid depending bracket, and a pair of arms pivotally attached to the bracket and straddling the wheel and connected to the front axle, said arms being adjustable angularly in relation to the bracket, and means for locking the arms in angular adjusted position thereby changing the elevation of the front end of the frame member and changing the entire silhouette thereof.

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