A. E. McGILL.

FOLDING GO-CART.

APPLICATION FILED MAR. 8, 1909.

1,094,455.

Patented Apr. 28, 1914.

6 SHEETS—SHEET 1.

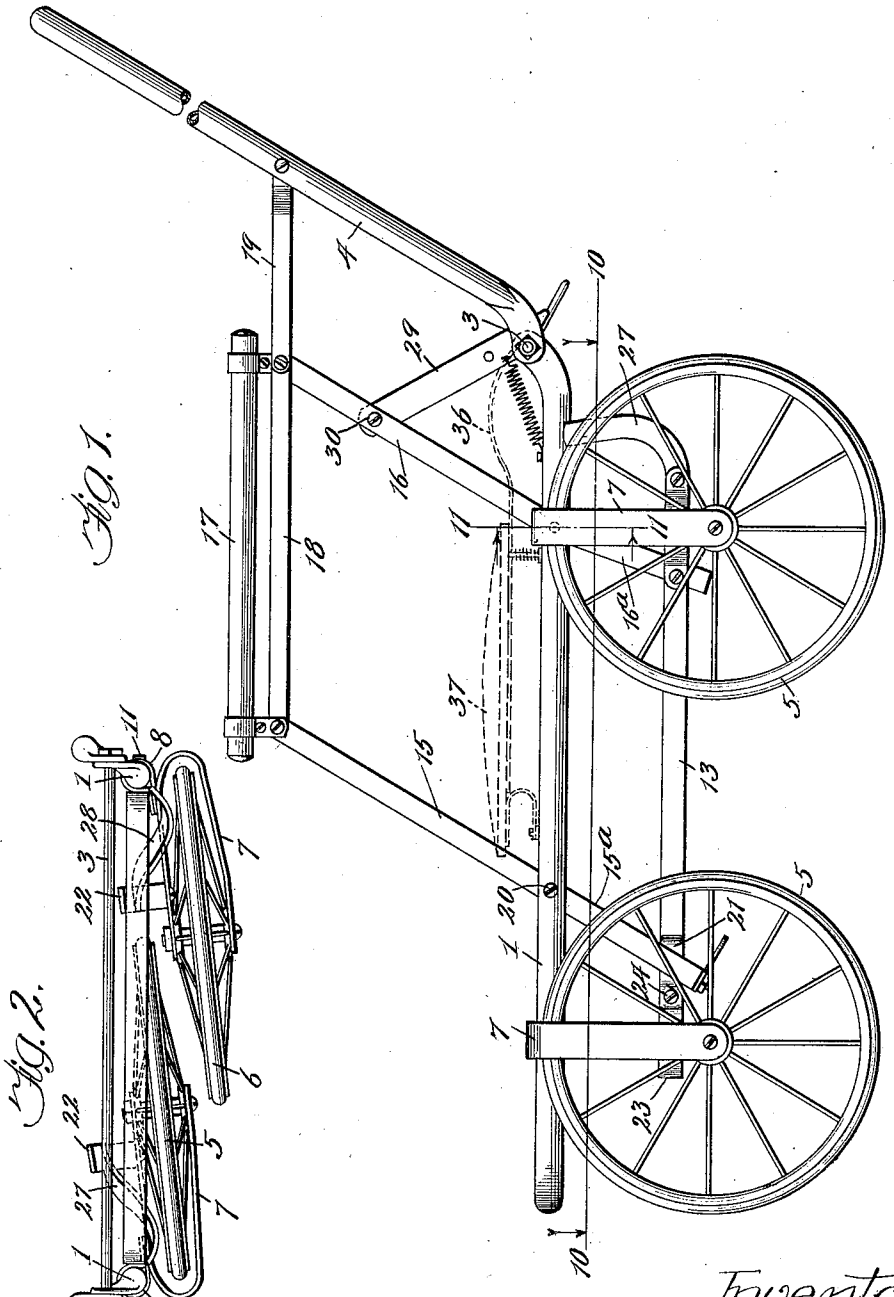

Fig. 1.

Fig. 2.

Witnesses:

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J. A. Jochum, Jr.

Inventor:

A. E. McGill

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6 SHEETS—SHEET 2.

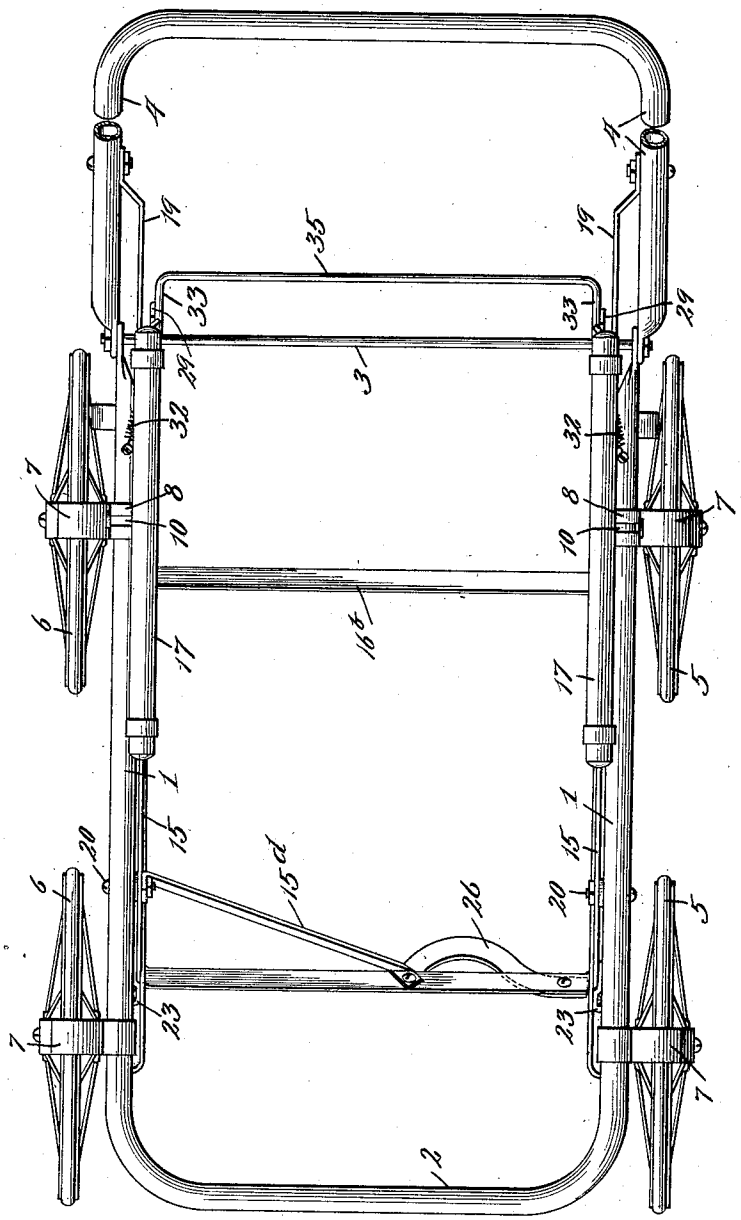

Fig. 3.

Witnesses:
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6 SHEETS—SHEET 3.

Fig. 4.

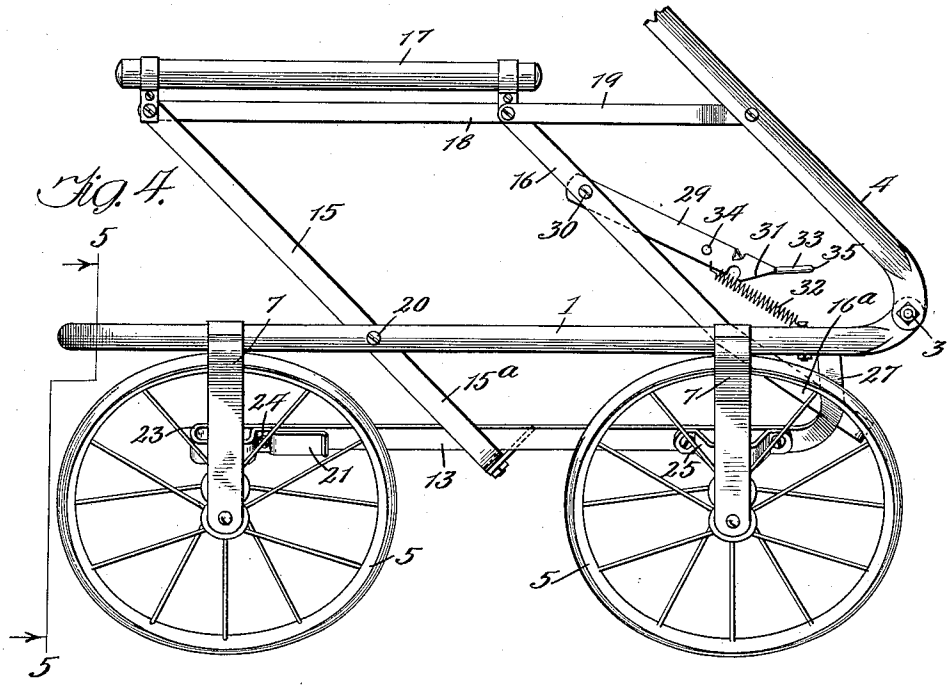
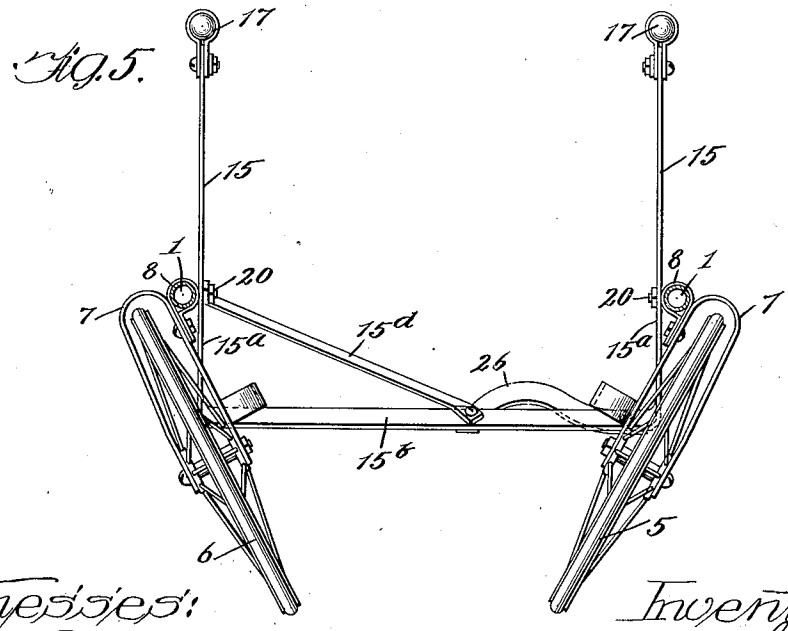


Fig. 5.



Witnesses:

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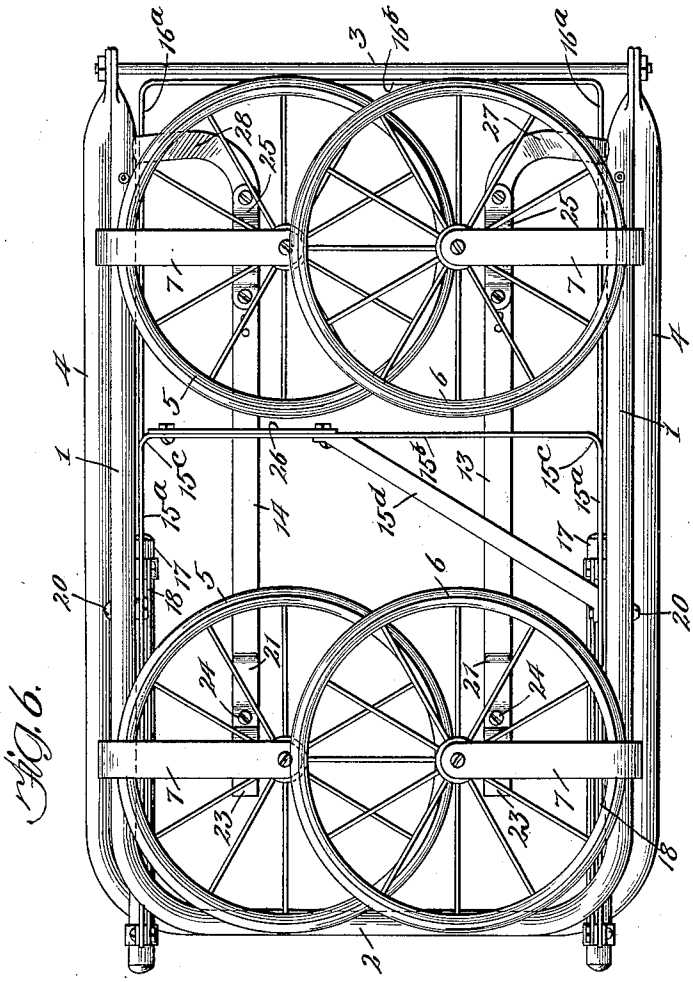

Fig. 6.

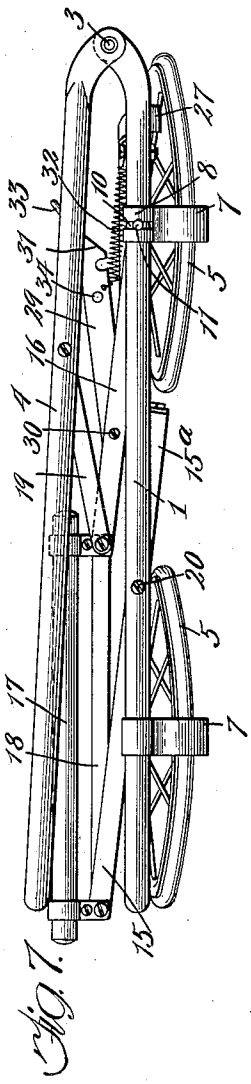

Fig. 7.

Witnesses:

Inventor:

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6 SHEETS—SHEET 5.

Fig. 8.

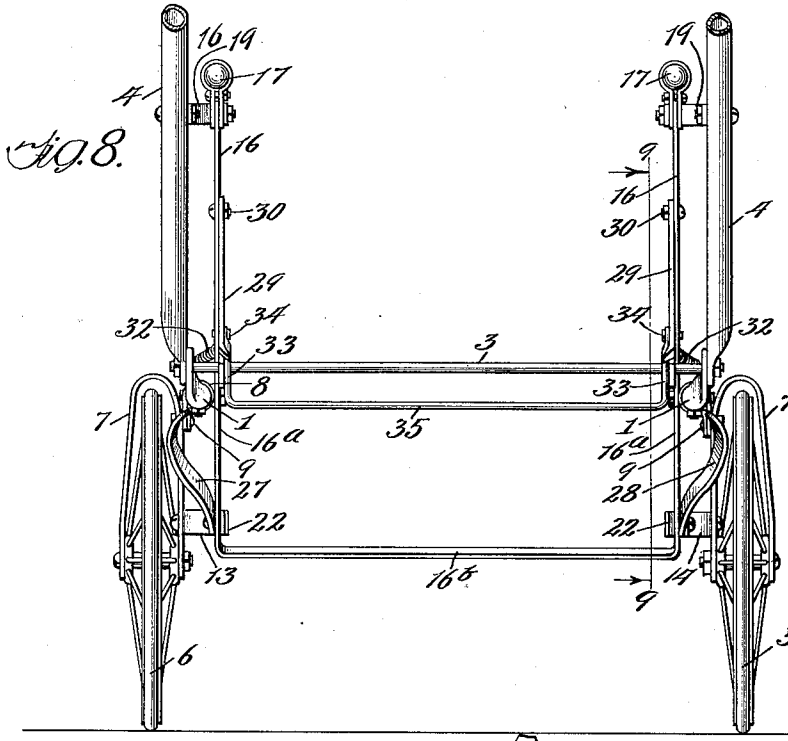
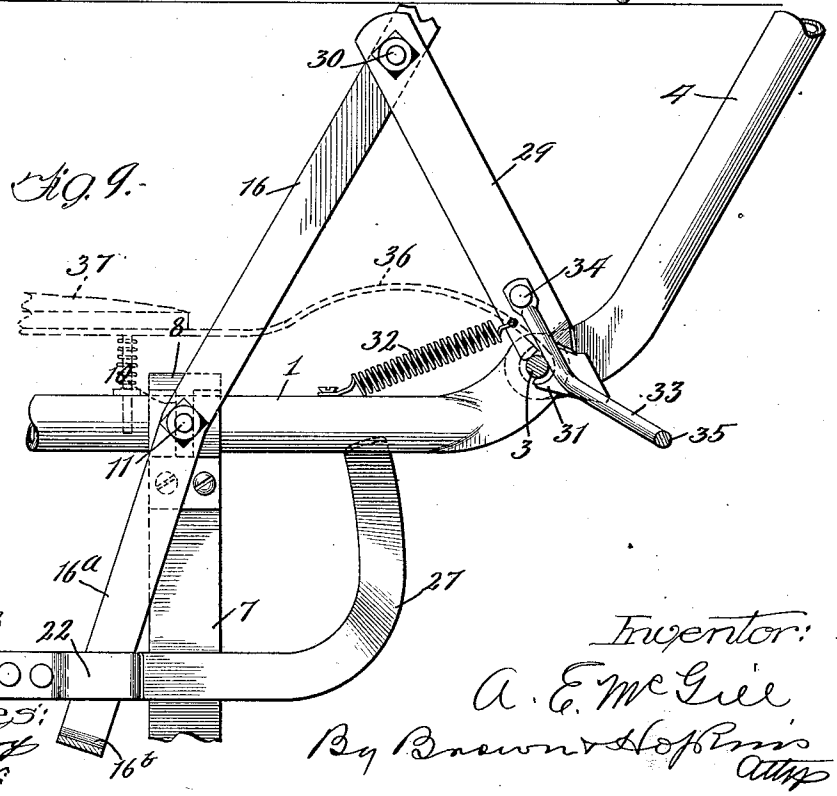


Fig. 9.



Witnesses:

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6 SHEETS—SHEET 6.

Fig. 10.

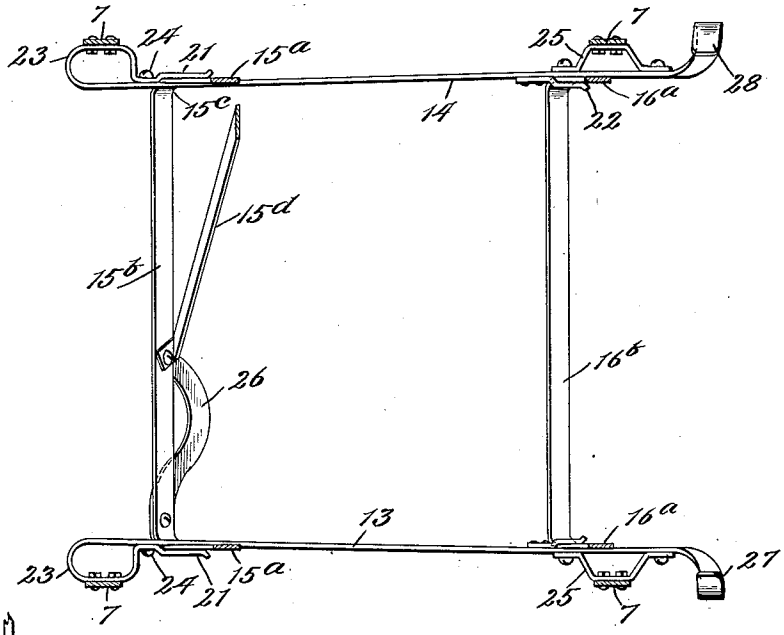


Fig. 11.

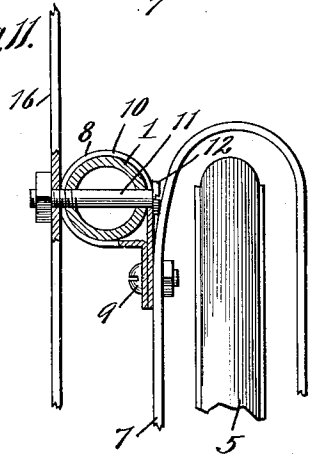


Fig. 12.

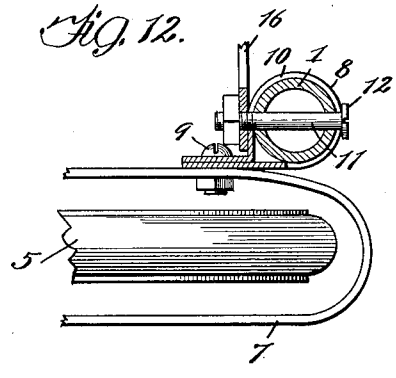
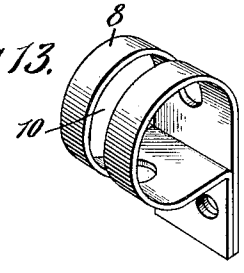


Fig. 13.



Witnesses:

B. D. Perry

J. H. Jochum, Jr.

Inventor:

A. E. McGill,

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Attys

UNITED STATES PATENT OFFICE.

ALBERT E. McGILL, OF CHICAGO, ILLINOIS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO WILLIAM S. FERRIS, OF ELKHART, INDIANA, AND ALEXANDER B. LEITH, OF CHICAGO, ILLINOIS, TRUSTEES.

FOLDING GO-CART.

1,094,455. Specification of Letters Patent. **Patented Apr. 28, 1914.**

Application filed March 8, 1909. Serial No. 481,991.

To all whom it may concern:

Be it known that I, ALBERT E. McGILL, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Folding Go-Carts, of which the following is a full, clear, and exact specification.

This invention relates to that type of folding go-carts in which the wheels fold under the running gear frame while the handle folds downwardly upon the top thereof, or over the same, substantially lengthwise thereof, and this folding action of the wheels is caused by the folding operation of the handle, and the invention has for its primary object to provide improved and efficient means whereby the folding operation of the handle will not only thus automatically fold the wheels, but will cause the wheels to fold in pairs sequentially.

A further object of the invention is to provide improved and efficient means whereby the unfolding action of the handle and wheels will eventuate in the automatic locking of the wheels in their operative position.

With a view to the attainment of these ends and the accomplishment of certain other objects which will hereinafter appear, the invention consists in the features of novelty hereinafter described with reference to the accompanying drawings, and particularly pointed out in the claims.

In the said drawings—Figure 1 is a side elevation of a go-cart constructed according to this invention. Fig. 2 is a rear end elevation thereof in its folded condition. Fig. 3 is a plan view unfolded. Fig. 4 is a side elevation of a cart partially folded. Fig. 5 is a transverse section thereof on the line 5—5 Fig. 4, also showing it partially folded. Fig. 6 is a bottom view of the cart completely folded. Fig. 7 is a side elevation thereof. Fig. 8 is a rear elevation of the cart in its working or unfolded condition, showing the handle bars broken away. Fig. 9 is an enlarged sectional view of the rear end of the cart showing the lock for the handle, taken on line 9—9 of Fig. 8. Fig. 10 is a detail plan section taken on the line 10—10 of Fig. 1, the wheels being omitted. Fig. 11 is an enlarged detail sectional view taken on the line 11—11 of Fig. 1. Fig. 12 is a similar view showing the wheel in its folded position. Fig. 13 is a detail perspective view of a clip hereinafter described.

In all of the views excepting Fig. 1 the seat and its supports are entirely omitted, and in this figure the seat is shown merely in dotted lines. The seat, however, and its supporting means, constitute no part of the present invention, and a seat of any desired construction and supported either directly upon the running gear frame or upon other parts of the structure may be employed without departing from the spirit of the present invention.

In this exemplification of the invention, the running gear frame is shown as being composed of a trilateral member having side bars 1 and a cross bar 2 connecting the side bars together and formed integrally therewith. The rear ends of the side bars 1 are connected together and suitably braced by a cross-rod 3, which also serves as a means of pivotally connecting the side bars 4 of the handle and the running gear frame. The wheels are mounted in two pairs 5, 6, one pair on each side of the running gear frame, and each wheel, as usual, is suitably journaled in a bracket or wheel support, which in this example of the invention is in the form of a fork 7, rotatably connected to the side bar 1 in any suitable way. An efficient and inexpensive method for accomplishing this consists in encircling the side bar 1 with a clip or collar 8, which has its extremities flattened and brought together against the outer face of the fork 7 and secured thereto by one or more bolts or rivets 9, thus giving the wheel rotatable support upon the running gear frame. In order that the collar or clip 8 may be held against longitudinal motion on the bar 1, it is provided with a slot 10, in which engages a bolt 11 passing transversely through the bar 1 and the slot 10. One end of this bolt is provided with a head 12, which prevents the bolt from pulling out and keeps the end thereof projecting through the slot 10, so that it will constitute a stop for limiting the outward or unfolding action of the wheel when the end of the slot comes against this projecting end of the bolt, as shown in Fig. 11. These wheel brackets or supports 7 are connected together in pairs by any suitable means, but preferably by means of

longitudinal bars 13, 14 respectively, which are secured to the inner branches of the forks so that when a wheel on one side is folded or unfolded, the other wheel on the same side will make a like movement. The means for thus folding or unfolding the wheels automatically by the action of the handle 4 will now be described.

On each side of the running gear frame are mounted two deflectable uprights or standards 15, 16, which are connected together at their upper ends by a horizontal arm 17, and which arm and standards constitute a part of a folding seat structure capable of being folded from the upright position shown in Fig. 1 to a position in close proximity and substantially lengthwise of the running gear frame, as shown in Fig. 7. For the sake of strength, the arm 17, which ordinarily constitutes the arm rest for the child, is supplemented by a reinforcing bar 18, connecting the ends of the uprights 15, 16 pivotally together on each side of the cart, and each of these bars 18 is pivotally connected to one of the handle bars 4 by a link 19, so that when the handle is folded or unfolded, the uprights 15, 16 will be deflected from their substantially upright position to a position lengthwise of the running gear frame, and will carry with them the arm 17 and bar 18, and maintain the substantially parallel relation of the arm 17 to the running gear frame.

The uprights 15, 16 may be pivotally mounted in any suitable way, but they are preferably pivoted directly to the bars 1. The bolts 11 are utilized as the pivots of the rear pair of uprights 16, and the forward pair may be pivoted by means of bolts or pins 20. In both instances, the uprights are arranged between the side bars 1, but each pair of uprights is provided with a bail-like downward extension, one of which is arranged between the connecting bars 13, 14, while the other is arranged outside of and embracing them. This bail-like extension of the forward pair of uprights 15 comprises downwardly extending arms 15^a and a cross-brace 15^b, which latter is situated below the connecting bars 13, 14, while the arms 15^a are arranged outside of and embrace them. The bail-like extension of the uprights 16 comprises two downwardly extending arms 16^a and a cross-brace 16^b, the arm 16^a being situated between the connecting bars 13, 14 when the cart is in its unfolded condition. By this means it will be seen that the two bail-like extensions of the uprights 15, 16 constitute both braces and locks for securely holding the wheel supports in their upright or working position, the arms 15^a and the cross-brace 15^b serving to hold the supports against outward movement while inward movement is prevented by the arms 16^a and cross-brace 16^b.

In the preferred construction of the invention, however, in which these connecting bars 13, 14 are made of thin stock, it is preferable to give them a more direct and positive connection with the bail-like extensions and braces, and to that end each cross-brace at each end is provided with a clip for embracing the arms of the bail-like extension at that end. As better shown in Fig. 10, the arms 15 engage between the connecting bars 13, 14 and the clips 21 and one of these clips 21 is arranged on the outer side of each connecting bar, while the arms 16^a at the rear end engage between the inner face of each connecting bar and a clip 22 secured thereto. Inasmuch as the arms 15^a and 16^a are between the bars 1 of the running gear frame and the inner branches of the forks 7 fall into vertical planes outside of the side bars 1 when in their standing position, it is desirable to set the connecting bars 13, 14 inwardly from these forks in position to be conveniently engaged by the arms 15^a, 16^a. As an efficient means of accomplishing this, the connecting bars 13, 14 at their forward ends are provided with return bends or loops 23, which extend outwardly to meet so as to be secured to the forks or supports 7, and the extreme ends of the bar being brought back against the main body of the bar and secured by rivet 24, may be utilized for forming the clip 21. These bars 13, 14 at their rear ends are secured to the wheel supports 7 by brackets 25. It will also be seen that with this construction and arrangement of the bail-like extensions formed on or secured to the uprights 15, 16 and their described relation to the connecting bars 13, 14, the folding action of the handle results in bringing the brace 15^b upwardly against the under edges of the connecting bars 13, 14 and crowds these bars inwardly, thereby folding the wheels in pairs toward one another as the brace 16^b and arm 16^a recede from their position between the bars 13, 14, the point of conjunction between the arms 15^a and their brace 15^b being sufficiently rounded, as shown at 15^c, to start the inward movement of the bars 13, 14 at the initial engagement. In order, however, that the pair of wheels on one side may fold at a greater rate of speed than those on the other, so as to avoid clashing with the latter and thereby interfering with their folding action, the brace 15^b is provided with a cam 26 in the form of a C-shaped plate secured thereto near one end thereof in position to engage the bar 13 as the uprights 15 are moved forwardly and downwardly. This, of course, hastens the action of the wheels controlled by the bar 13, inasmuch as the other pair of wheels are dependent for their folding action merely upon the brace 15^b engaging the bar 14. As the uprights 15

approach the horizontal, completing the folding action of the wheels, the arms 16[a] rise out of the way of the wheels and moving bars connected therewith, and in order that they may be completely out of interfering position, they are preferably set at a slight angle to the uprights 16, as better shown in Fig. 1, so that they will be nearer the horizontal when the uprights 16 are at the limit of their downward movement. When the handle is again raised, the wheels are automatically unfolded by the action of the rear one of the bail-like extensions, or at least by their arms 16[a] which come into engagement with cam like projections 27, 28 on the rear extremities of the bars 13, 14 respectively, and which cam like extensions curve upwardly to points contiguous to the side bars 1 of the running gear frame in position to be engaged by the arms 16[a] as these make their initial downward movement. The cam like extension 28 also serves the further purpose of preventing premature folding of the pair of wheels controlled by the connecting bar 14, so as to avoid the possibility of these wheels accidentally closing or folding in advance of the pair controlled by the cam 26. When the cart is fully folded, the handle being on top, the cross-bar 15[b] rests under the connecting bar 14 and the cross-brace 16[b] and the arm 16[a] at one end thereof rests above the cam like extension 28. In unfolding the cart, this arm 16[a] follows closely the contour of cam 28, while the cross-brace 15[b] follows the bottom edge of the connecting bar 14, or, in other words, the contour of the cam 28 is such as to remain in contact, or substantially in contact, with the arm 16[a], while the brace 15[b] remains in contact with the bar 14 during the unfolding movement, as well as during the folding movement, and consequently, the pair of wheels on this side is positively controlled in its folding and unfolding action. The pair of wheels on the opposite side connected to the connecting bar 13 is likewise controlled by the cams 26, 27, but so far as any premature folding action of the wheels on this side is concerned, the shape of the cam 27 is not material, as its purpose is primarily for causing the wheels to open, and not for limiting their folding movement, but the shape of the cam 27 must of course be such that it will not open the wheels connected to the bar 13 faster than the wheels are opened on the opposite side by the cam 28.

The bars when in their unfolded or working position may be securely locked in place by any suitable means, many forms of which lock are well known in the art. In this exemplification of the invention, the object is accomplished by two latch bars 29, pivoted at 30 to the uprights or standards 16 respectively, and having hooks 31 near their lower ends adapted to engage over the cross-rod 3, as the handle 4 is erected, the locking action of the latch being induced by springs 32 or other suitable means attached to the latch bars 29 and the side bars 1 of the frame. The release of the latch bars is accomplished by a treadle consisting of two levers 33 pivoted at their upper ends to the latch bars 29, as shown at 34, and connected together at their lower ends by a rod 35 accessible to the toe of the operator, the levers 33 taking their fulcrum upon the rod 3, so that pressure upon the bar 35 causes the latch bars 29 to lift out of engagement with the rod 3. As the latch bars move forward with the treadle 33, 35 the cross bar 35 runs on one or more extensions 36, which are carried rearwardly from some part of the seat 37 or its support, thereby causing the latch bars to be guided into locking position when the handle is returned.

The forward cross-brace 15[b] may, if desired, be reinforced by a supplementary brace 15[d] secured at one end thereto and at the other end to the pivot corresponding to the pivot 20 on that side of the cart.

In order that the invention may be understood by those skilled in the art, the details of an exemplification thereof have been thus specifically described, but

What I claim is:

1. In a folding go-cart the combination of a running gear frame, wheel supports pivoted to fold under the frame crosswise thereof, means connecting the wheel supports together in pairs, a cross-brace pivotally supported and adapted to swing downwardly below the plane of the running gear frame between the said connecting means, a second cross-brace pivotally supported and adapted to swing downwardly from the plane of the running gear frame, comprising supporting arms and a cross-brace embracing the said connecting means, and a cam secured to the last said cross-brace for engaging the said connecting means on one side and causing the wheels on that side to fold in advance of those on the other side.

2. In a folding go-cart the combination of a running gear frame, wheel supports pivotally mounted to fold transversely thereof, connecting bars securing said supports together in pairs, said connecting bars at one end being provided with return bends or loops secured to said wheel supports and having extremities constituting clips, and downwardly swinging arms adapted to engage between said clips and connecting bars for holding said connecting bars in place.

3. In a folding go-cart the combination of a running gear frame, wheel supports rotatably mounted to fold transversely thereof, connecting bars securing said wheel supports together in pairs, having upwardly extending cam-shaped extremities at their

rear ends, and a folding seat structure mounted above the running gear frame and having downwardly projecting bail-like extensions adapted to respectively engage between and outside of said connecting bars, one of said bail-like extensions being adapted to embrace and engage under said connecting bars for folding the same inwardly and the other of said extensions being adapted to engage said cam-like extensions for causing the wheel supports to unfold.

4. In a folding go-cart the combination of a running gear frame, wheel supports adapted to fold transversely thereof, connecting bars securing the said wheel supports together in pairs, the connecting bar of each pair of said wheel supports being provided with an upwardly extending cam-like projection, a folding seat structure, a folding handle connected therewith for causing the seat structure to fold and unfold, downwardly extending arms connected to the seat structure and arranged to engage with said cam-like extensions respectively, a bail-like extension embracing said connecting bars operatively connected with the said seat structure and adapted to swing downwardly below the running gear frame, and a cam carried by said bail-like extension for engaging one of said connecting bars and causing the wheel supports controlled by that one to fold faster than the other pair of wheel supports, the aforesaid cam being so formed with relation to the said bail-like extension and its movement that the said downwardly swinging arms will remain substantially in contact with said cam-like extension during the folding movement of the wheels on that side induced by the upwardly swinging action of said bail-like extension.

5. In a folding go-cart the combination of a running gear frame, wheel supports rotatably mounted to fold transversely thereof, means connecting said wheel supports together in pairs, each of said means comprising a single bar having one end looped backwardly upon itself with its extremity free to form a clip and the opposite end curved upwardly to form a cam, a pair of downwardly swinging arms adapted to engage between said bars for holding the bars apart and to engage with said cams for unfolding the wheels, and a downwardly swinging bail-like element embracing said bars and adapted to engage between the same and said clips for locking the bars in position when moving downwardly and to engage with the under sides of the bars for causing the wheels to fold when moving upwardly.

6. In a folding go-cart the combination of a running gear frame, wheel supports, slotted clips or collars securing said wheel supports rotatably to the frame, and pins passing through the frame and slots of said collars for limiting the movement of the collars.

7. In a folding go-cart the combination of a running gear frame, a wheel support, a slotted collar rotatably securing the wheel support to the running gear frame, and a pin projecting from the running gear frame into the slot of the collar and forming a stop for limiting the rotary movement of the collar on the frame.

8. In a folding go-cart, the combination of a running gear frame, a wheel support, a divided clip embracing the running gear frame and adapted for movement about the frame for rotatably securing the wheel support thereto, said clip having its ends secured to the support, and means for limiting the movement of the clip.

9. In a folding go cart, the combination of a running gear frame, wheel supports pivoted to fold under the frame crosswise thereof, means connecting the wheel supports together in pairs, a pair of braces pivoted to the frame to swing downwardly below the plane of the frame, one of said braces embracing the said connecting means and adapted to swing the supports inwardly toward the frame, and means whereby the other brace will retard the inward swinging movement of the wheel supports and will operate to cause an unfolding movement of the supports.

10. In a folding go cart, the combination of a running gear frame, wheel supports pivoted to fold under the frame crosswise thereof, means connecting the wheel supports together in pairs, a pair of braces pivoted to the frame to swing downwardly below the plane of the frame, one of said braces embracing the said connecting means and adapted to swing the supports inwardly toward the frame, means whereby the other brace will retard the inward swinging movement of the wheel supports and will operate to cause an unfolding movement of the supports, and means connecting said braces for operation in unison.

11. In a folding go cart, the combination of a running gear frame, wheel supports pivoted to fold under the frame crosswise thereof, means connecting the wheel supports together in pairs, a pair of braces pivoted to the frame to swing downwardly below the plane of the frame, one of said braces embracing the said connecting means and adapted to swing the supports inwardly toward the frame, means whereby the other brace will retard the inward swinging movement of the wheel supports and will operate to cause an unfolding movement of the supports, a foldable handle, and means whereby the folding and unfolding movements of the handle will simultaneously actuate said braces.

12. In a folding go cart, the combination

of a running gear frame, wheel supports pivoted to fold under the frame crosswise thereof, means connecting the wheel supports together in pairs, a pair of braces pivoted to the frame to swing downwardly below the plane of the frame, one of said braces embracing the said connecting means and adapted to swing the supports inwardly toward the frame, and a cam carried by the said connecting means and with which the other of said braces coöperates to retard the folding movement of the wheel supports and for effecting an unfolding movement of the supports.

13. In a folding go cart, the combination of a running gear frame, wheel supports pivoted to fold under the frame crosswise thereof, bars connecting the wheel supports together in pairs on opposite sides of the frame, said bars being spaced below the running gear frame, the rear extremities of the bars being upturned toward the frame, a pair of braces pivoted to the frame to swing downwardly below the plane of the frame, one of said braces embracing the connecting bars and adapted to swing the supports inwardly toward the frame, the other of the braces coöperating with the upturned portion of the bars to retard the inward movement of the supports and for unfolding the supports.

14. In a folding go cart, the combination of a running gear frame, wheel supports pivoted to fold under the frame crosswise thereof, bars connecting the wheel supports together in pairs on opposite sides of the frame, said bars being spaced below the running gear frame, the rear extremities of the bars being deflected upwardly toward the frame and shaped to form inwardly projecting cams, a pair of braces pivoted to the frame to swing downwardly below the plane of the frame, one of said braces embracing the connecting bars and adapted to swing the supports inwardly toward the frame, the other of the braces coöperating with the said cams to swing the wheel supports outwardly and to retard the inward folding movement of the supports.

15. In a folding go cart, the combination of a running gear frame, wheel supports pivoted to fold under the frame crosswise thereof, bars connecting the wheel supports together in pairs on opposite sides of the frame, said bars being spaced below the running gear frame, the rear extremities of the bars being deflected upwardly toward the frame and shaped to form inwardly projecting cams, a pair of braces pivoted to the frame to swing downwardly below the plane of the frame, one of said braces embracing the connecting bars and adapted to swing the supports inwardly toward the frame, the other of the braces coöperating with the said cams to swing the wheel supports outwardly and to retard the inward folding movement of the supports, the ends of the deflected portions of the bars coöperating with the frame to initiate the unfolding movement of the supports.

16. In a folding go-cart, the combination of a running gear frame, wheel supports pivoted to fold under the frame crosswise, rods connecting the wheel supports on corresponding sides in pairs, arms pivoted on said running gear frame adapted to swing downwardly below said frame adjacent said connecting rods, and a cross member connecting the ends of said pivoted arms and having a cam intermediate its ends adapted to coöperate with one of said wheel support connecting rods to fold that pair of wheel supports slightly in advance of the other pair.

17. In a folding go-cart, the combination of a running gear frame, wheel supports pivoted to fold under the frame crosswise, rods connecting the wheel supports on corresponding sides in pairs, arms pivoted on said running gear frame adapted to swing downwardly below said frame adjacent said connecting rods, a cross member connecting the ends of said pivoted arms and having a cam intermediate its ends adapted to coöperate with one of said wheel support connecting rods to fold that pair of wheel supports slightly in advance of the other pair, and means for actuating said pivoted arms.

18. In a folding go-cart, the combination of a running gear frame, wheel supports pivoted to fold under the frame crosswise, rods connecting the wheel supports on corresponding sides in pairs, arms pivoted on said running gear frame adapted to swing downwardly below said frame adjacent said connecting rods, a cross member connecting the ends of said pivoted arms and having a cam intermediate its ends adapted to coöperate with one of said wheel support connecting rods to fold that pair of wheel supports slightly in advance of the other pair, a handle pivoted on said running gear frame and adapted to fold thereupon, extensions on said pivoted arms above said running gear frame, and means connecting said extensions to said handle whereby the movement of the handle will operate said pivoted arms.

19. In a folding go-cart, the combination of a running gear frame having side members, a pair of wheel supports pivoted to each side member to fold up under said frame crosswise thereof, means connecting the wheel supports of each pair so that they will fold in unison, an arm pivoted on each side member of said running gear frame and adapted to swing downwardly therebelow, a cross member connecting the ends of said arms to operate in unison and having a cam portion intermediate its ends and between said pivoted arms, said cross member and its cam portion being adapted to coöperate with

the wheel support connecting means for causing one pair of wheel supports to fold slightly in advance of the other pair.

20. In a folding go-cart, the combination of a running gear frame, supporting wheel frames pivoted to said running gear frame and adapted to fold under the frame crosswise thereof, a pair of pivoted arms adapted to swing downwardly below said running gear frame for bracing said supporting wheel frames, a cross brace connected between the ends of said pivoted arms and having a cam portion intermediate its ends, and means on one of said supporting wheel frames coöperating with said cam portion for causing said supporting wheel frame to fold slightly in advance of the other supporting wheel frame.

21. In a folding go-cart, the combination of a running gear frame, supporting wheel frames pivoted to said running gear frame and adapted to fold under the frame crosswise thereof, a pair of pivoted arms adapted to swing downwardly below said running gear frame for bracing said supporting wheel frames, a cross brace connected between the ends of said pivoted arms and having a cam portion intermediate its ends, extensions on said arms above said running gear frame, a handle pivoted on said running gear frame and adapted to fold thereupon, and links connecting said handle and said extensions to communicate the movement of said handle to said pivoted arms.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 2nd day of March A. D. 1909.

ALBERT E. McGILL.

Witnesses:
J. H. JOCHUM, Jr.,
CHARLES H. SEEM.