

C. H. SMITH.
 CHILD'S FOLDING CARRIAGE.
 APPLICATION FILED JAN. 27, 1908.

924,008.

Patented June 8, 1909.
 6 SHEETS—SHEET 1.

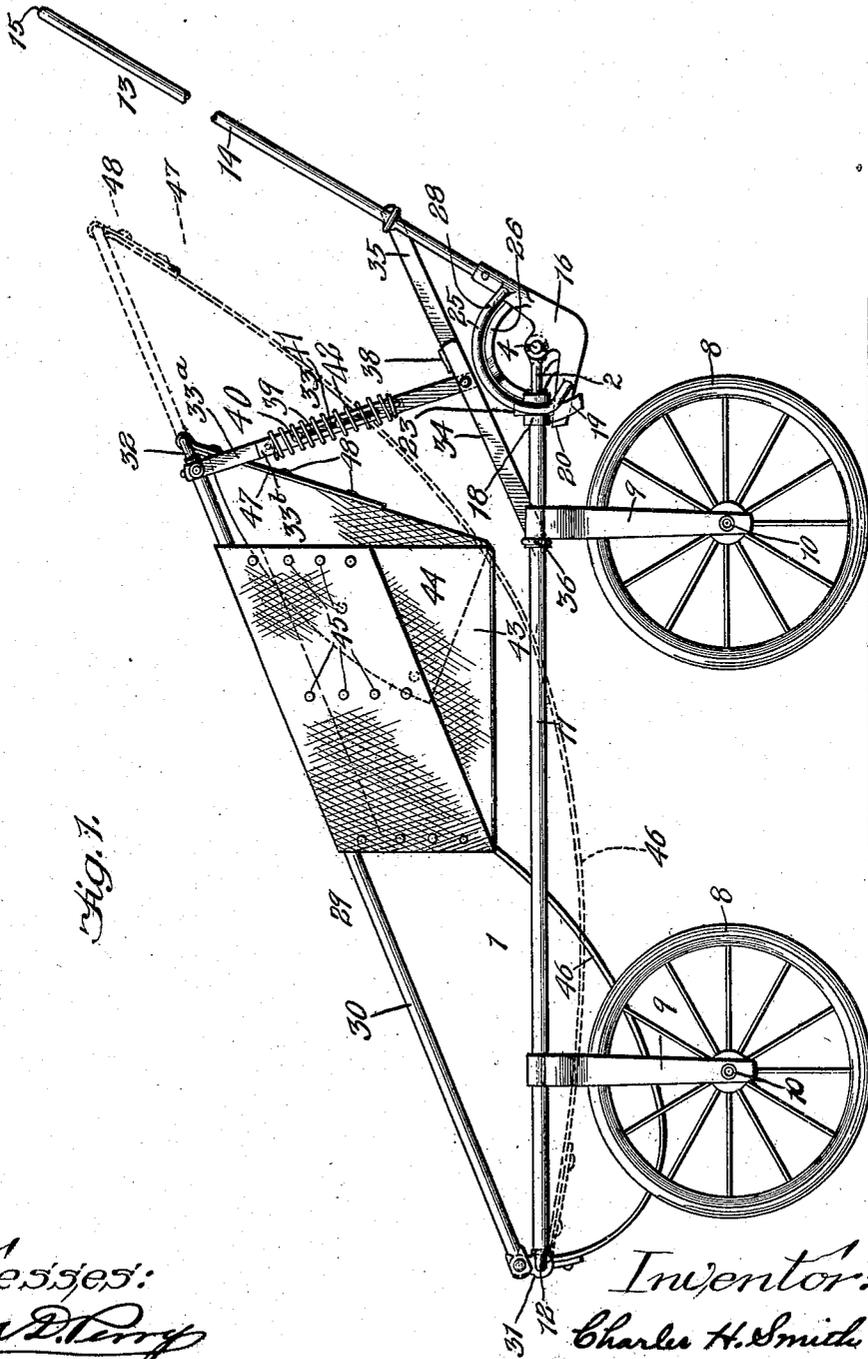


Fig. 1.

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Inventor:
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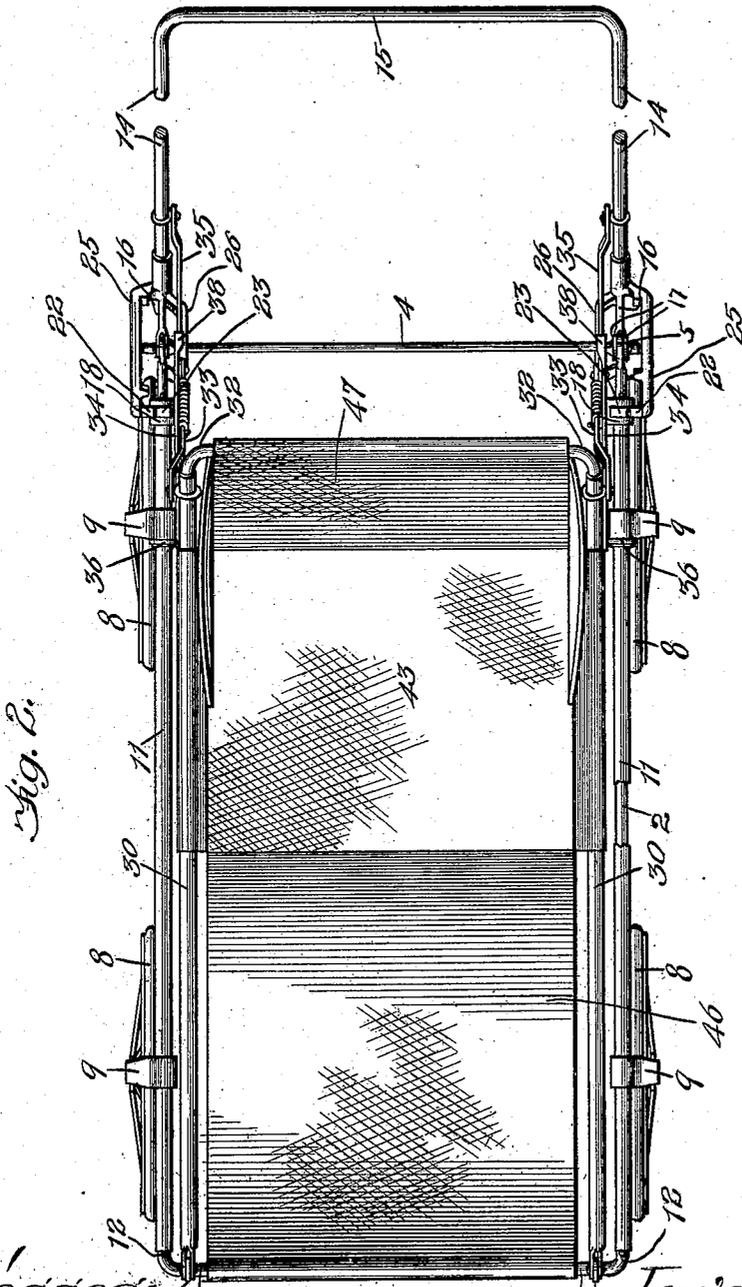


Fig. 2.

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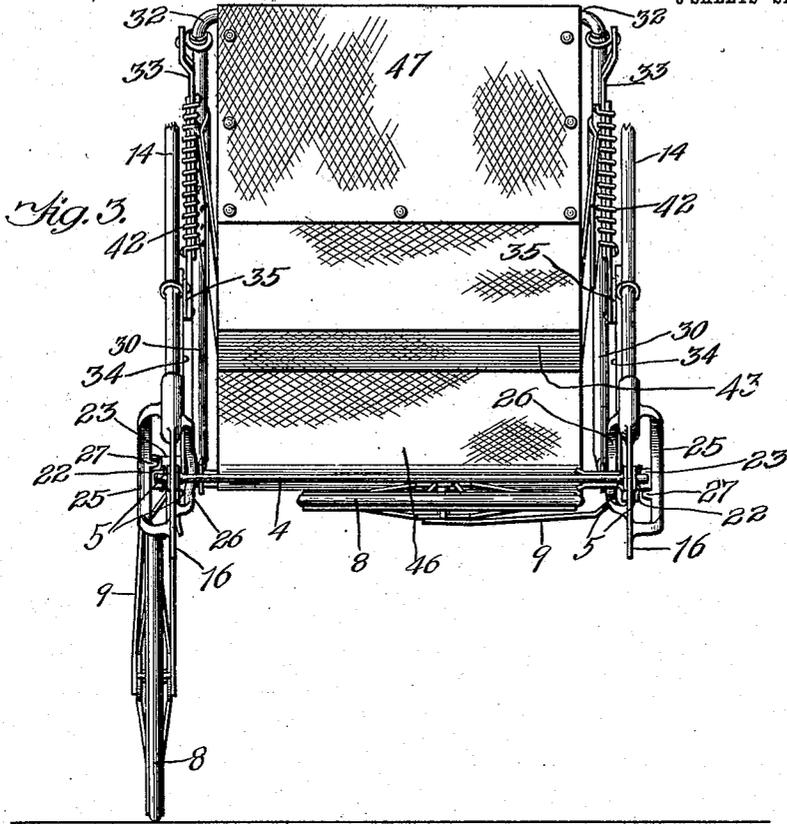
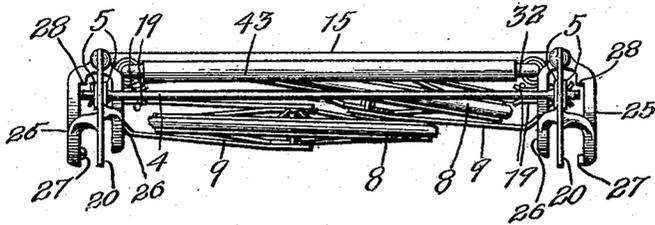


Fig. 4.



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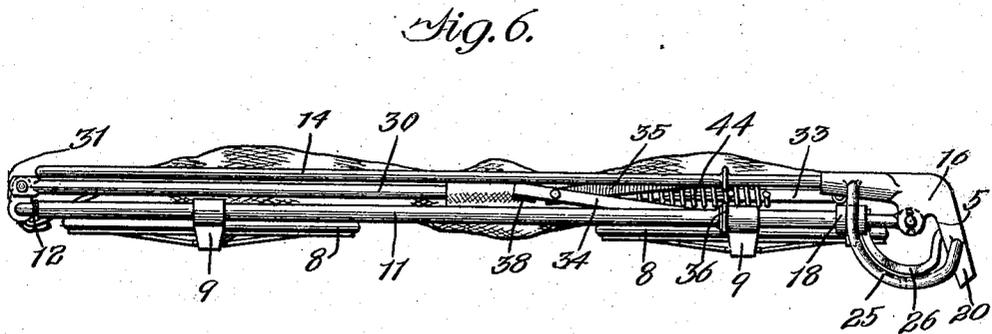
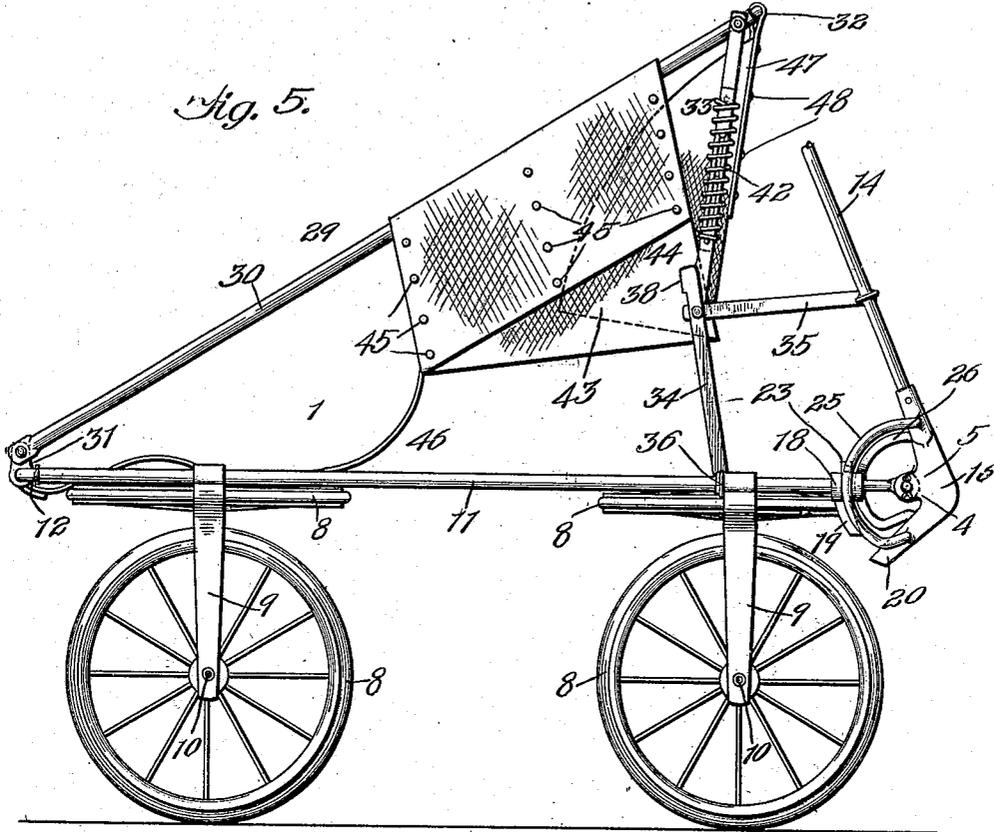
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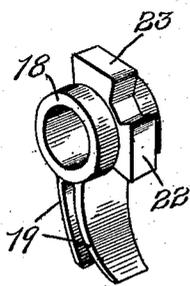
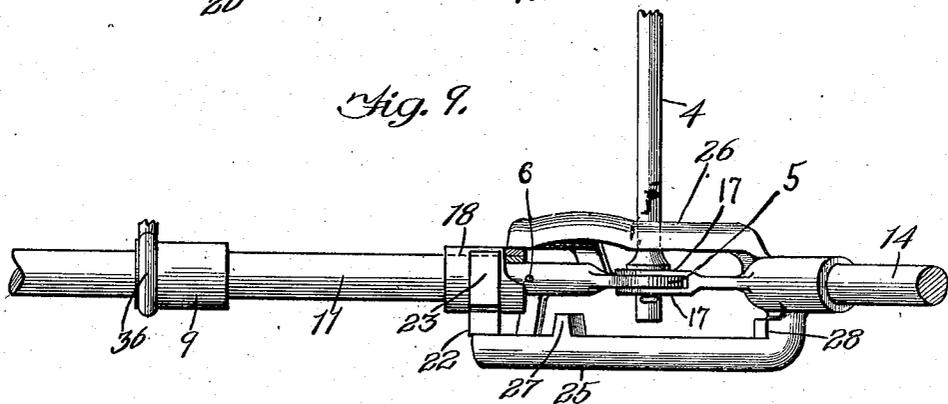
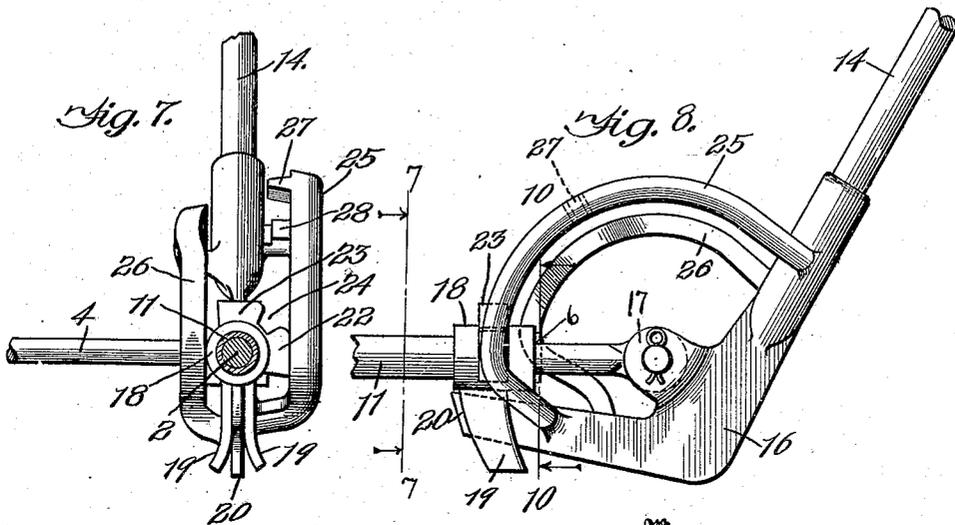


Fig. 13.

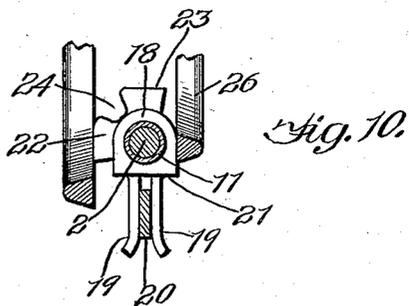


Fig. 10.

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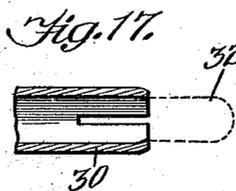
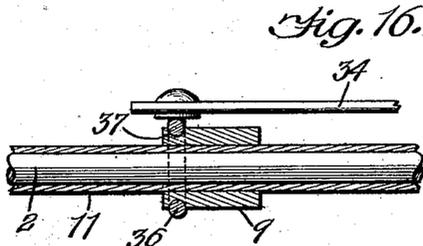
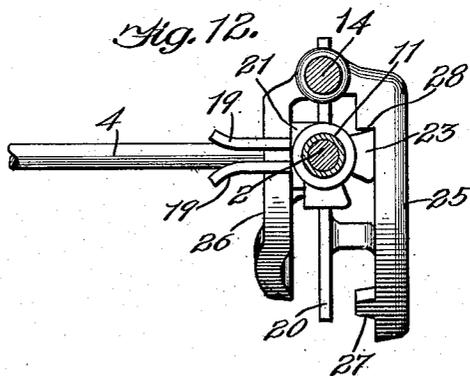
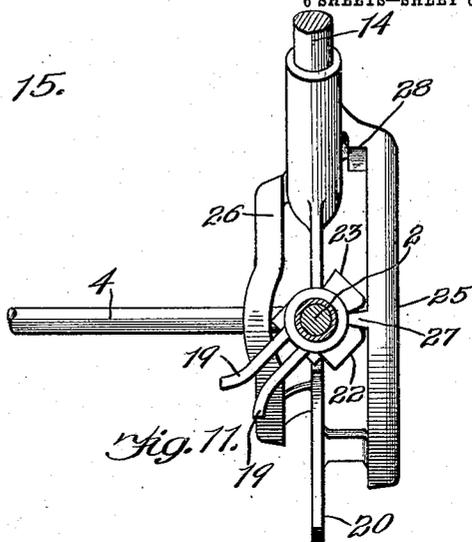
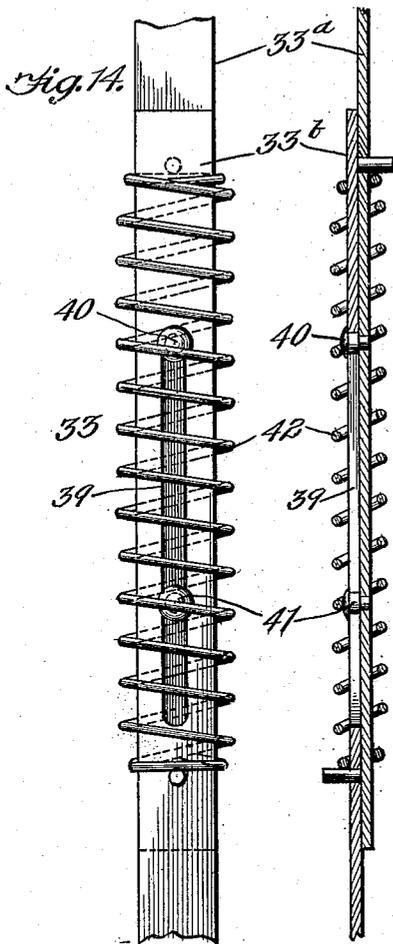
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6 SHEETS—SHEET 6.



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UNITED STATES PATENT OFFICE.

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CHILD'S FOLDING CARRIAGE.

No. 924,008.

Specification of Letters Patent.

Patented June 8, 1909.

Application filed January 27, 1908. Serial No. 412,703.

To all whom it may concern:

Be it known that I, CHARLES H. SMITH, a citizen of the United States, residing at Rockford, in the county of Winnebago and State of Illinois, have invented certain new and useful Improvements in Folding Children's Carriages, of which the following is a specification.

This invention relates to children's carriages or go-carts adapted to be folded into small compass.

The principal object of my invention is to provide an operating connection between the handle and the wheels which shall work smoothly and positively; which shall at all times hold the wheels against chance movement, whether in the folded, unfolded or intermediate positions; and which shall be strong, simple, and not liable to get out of order.

Another object of the invention is so to arrange the parts that the carriage may be folded to occupy a smaller space than has been heretofore possible.

A further object is to lock the parts against accidental unfolding movement when folded, in order that the cart may be carried in any position without the possibility of its partially unfolding.

The invention also relates to the other improvements in children's carriages hereinafter set forth.

In the accompanying drawings, Figure 1 is a side elevation of a carriage embodying the features of my invention. Fig. 2 is a top plan view of said carriage. Fig. 3 is a rear view of the carriage showing the same in partially folded condition. Fig. 4 is a rear view of the carriage when fully folded, the seat not being shown. Fig. 5 is a side elevation of the carriage when in the condition shown in Fig. 3. Fig. 6 is a side elevation of the carriage when completely folded. Fig. 7 is a detail view of one of the operating connections between the wheels and the handle, the view being taken in the plane of line 7 7 of Fig. 8 and showing the parts in the positions assumed when the wheels are in the operative position. Fig. 8 is a side elevation of the parts shown in Fig. 7. Fig. 9 is a top plan view of the parts shown in Figs. 7 and 8. Fig. 10 is a sectional view taken substantially on line 10 10 of Fig. 8. Fig. 11 is a view similar to that of Fig. 7 but showing the parts

in the positions assumed when the wheels are partially folded. Fig. 12 is a similar view showing the parts in the positions they assume when the wheels are completely folded. Fig. 13 is a detail perspective view of a portion of said operating connection. Fig. 14 is an enlarged detail view of the means for yieldingly supporting the seat. Fig. 15 is a sectional view of said means. Fig. 16 illustrates a part of the connection between the rear end of the seat frame and the carriage bed. Fig. 17 is a detail view of a means for frictionally locking in place the extensible rear bar of the seat frame.

The embodiment selected for illustration comprises a bed or base frame 1 formed, in this instance, by bending a rod to provide two side bars 2 and a front bar 3 (Fig. 2), the rear ends of the side bars 2 being rigidly connected together by a bar 4. The connection between each side bar 2 and the rear bar 4 may be formed by a perforated ear 5 on the side bar fitting over the rear bar 4, (Fig. 9).

The wheels 8 are rotatably mounted without forks 9. I preferably mount the wheels upon fixed axles 10 each consisting of a tube passing through openings in the arms of the fork, the ends of the tube being expanded to secure it in place. The forks 9 at each side of the bed 1 are rigidly fixed to a sleeve 11 which is rotatably mounted on the side bar 2. The sleeve 11 may be held against movement lengthwise of the side bar in any suitable way. The rear end of said sleeve may abut against a stop pin 6, as shown in Figs. 8 and 9, and the other end may extend to the front bar 3 or a stop pin 12 (Fig. 2).

The wheels 8 are swung into and out of operative position by means of the handle 13 and mechanism connecting the handle with the sleeves 11. The handle consists, in this instance, of a bar bent into U-form to provide the side arms 14 and the end bar 15, said handle being pivotally mounted upon the rear bar 4. As herein shown, the lower ends of the side arms 14 are rigidly secured to a member 16 comprising two perforated lugs 17 rotatably mounted upon the rear bar 4 (Fig. 9) at opposite sides of the ear 5.

The operating connection between each of the wheel-carrying sleeves 11 and the handle 13 comprises a member illustrated in Fig. 13. Said member consists of a hub 18 rigidly secured to the sleeve 11 and provided at one

side with two locking fingers 19 adapted to lie at opposite sides of a locking projection 20 fixed with relation to the handle. One end of the hub 18 is provided with a flat surface or locking lug 21 as shown in Fig. 10. Upon the periphery of the hub 18 are two locking or guide lugs 22 and 23 having flattened ends and providing a notch 24 between them. Fixed with relation to the handle 13 are two guide arms 25 and 26 (Figs. 7 to 12) curved upon the arcs of circles concentric with the pivotal axis of the handle. The arm 25 is located outside of the vertical plane of the wheel-carrying sleeve 11 and extends into position to contact with the square ends of the lugs 22 and 23. The operating portion of the arm 25 has a plane surface as indicated in Figs. 7 and 9. Upon the arm 25 and at about the middle thereof is located a spur 27 adapted to enter the notch 24. Upon the end of the arm 25 nearest to the handle 13 is a locking shoulder 28. The arm 26 lies inside the vertical plane of the sleeve 11 in position to move past the rear end of the hub 18 and at times to slide in contact with the flat portion 21 of said hub. The arms 25 and 26 extend parallel with one another save that opposite the spur 27 the arm 26 is bent outwardly as indicated in Figs. 7 and 9. Their function is to hold between them the parts 21, 22 and 23, and thus lock the wheels against swinging movement except when the spur 27 engages in the notch 24, as will appear more clearly hereinafter.

The parts 16, 17, 25, 26 and 27 may be an integral casting.

Leaving out of consideration for the present, the seat-supporting frame and related parts, the action of the wheel-operating devices is as follows: Assuming the carriage to be in the position indicated in Fig. 1, the operator grasps the front bar 3 and the end bar 15, lifts the carriage off the floor, and folds the bed 1 and the handle together. This movement withdraws the locking projection 20 from between the fingers 19, but such withdrawal does not permit the wheels 8 to swing freely, uncontrolled by the operator, for the lug 22 is in contact with the arm 25 and one side of the lug 21 lies against the arm 26 (Fig. 7). As the folding movement continues, the spur 27 enters the notch 24 as shown in Fig. 11, and, pressing against the lug 22, tilts the sleeve 11 to throw the lug 23 into contact with the arm 25, and the flat portion 21 of the hub 18 into contact with the arm 26. The lugs 22 23 turn when opposite the outward bend in the arm 26. The parts are machined to slide freely upon one another, and the adjacent corners of the lugs 22 23 are rounded, in order to allow said lugs to turn. The wheels have now been rotated through 90° and are held in their new position by reason of the members 21 and 23 lying in contact with the arms 25 and 26. At

the end of the folding movement, the lug 23 abuts against the stop shoulder 28, as shown in Fig. 12, thus further assisting to prevent swinging movement of the wheels. The unfolding operation is merely a reversal of the operation outlined above. The wheel-carrying sleeve 11 continues to be locked in its folded position until the spur 27 engages the lug 23, when said sleeve is rotated to place the wheels in operative position. After the wheels have reached a vertical position, the locking projection 20 enters between the fingers 19 and securely locks the wheels in such position. The operation of the parts at the opposite side of the carriage is the same as that just described, save that in the particular construction herein shown the sleeve 11 does not begin its folding movement until the wheels at the opposite side of the carriage are completely folded. In Fig. 3, the wheels at the left-hand side of the carriage are about to begin their folding movement. As shown in said view the spur 27 upon the left-hand operating device is located nearer the handle 13 than the spur 27 upon the opposite side of the carriage in order to delay the folding movement of the left-hand wheels, as just described. When the carriage is being unfolded the wheels shown at the left hand side of Fig. 3 are unfolded in advance of the right-hand wheels.

The seat is supported upon a seat frame 29 which in this instance consists of two tubes 30 pivotally connected at their forward ends to lugs 31 fixed upon the front bar 3. The rear ends of the tubes 30 are joined by a bar 32, the ends of which are bent at right angles with the body of the bar to enter said tubes, thus providing means for lengthening the seat frame by extending the bar 32. If desired, the bar 32 may be locked in place in any suitable manner. For example, the upper ends of the tubes 30 may be split and slightly compressed so as frictionally to clamp the angular portions of the bar 32 (Fig. 17). As will be understood the spring clamping pressure thus provided is sufficient only to prevent accidental movement of the bar 32.

The seat frame 29 is supported at its rear end by two members 33, one at each side of said seat frame. The upper ends of said members are pivotally connected with said seat frame and the lower ends thereof are similarly connected with the ends of two links 34 and 35. The link 34 is pivoted to the bed 1 in any suitable way, as, for example, by attaching said link to a ring 36 rotatably mounted in a groove 37 formed in the hub of the rear wheel-fork (Fig. 16). One end of the link 35 is pivotally connected in any suitable way with the adjacent side arm 14 of the handle. One end of the link 34 is extended past the point of pivotal connection of the members 33, 34, and 35, and is

provided with a lug 38 adapted to overlie the link 35 for limiting pivotal movement between the links 34 and 35 in one direction and thus support the seat frame 29. The parts are so arranged that the lug 38 engages the link 35 when the links 34 and 35 are in alinement, or flexed downwardly a trifle. Said links thereby constitute a lock to prevent folding movement between the bed 1 and the handle 13 until the rear end of the seat frame 29 has been lifted by the operator a slight distance to flex the links 34 and 35 upwardly. It will be understood that such upward flexing movement of the links 34 and 35 need be only enough to carry the pivotal joint between said links off "dead center."

Preferably, the seat frame 29 is yieldingly supported. This result may be obtained in various ways, as, for example, by forming each member 33 of two overlapping bars 33^a and 33^b (Figs. 14 and 15). The bar 33^b has an elongated opening 39 therein through which extend headed rivets 40 and 41 fixed in the bar 33^a. The stud 40 limits movement between the parts in one direction. Movement in the opposite direction is yieldingly resisted by a coiled spring 42 secured at one end to the bar 33^a and at its opposite end to the bar 33^b.

Any common or suitable form of seat may be employed, but the construction preferably is as illustrated in Fig. 1. The seat proper 43 is supported from the seat frame 29 by the flexible sides 44 of cloth or other suitable material, said sides being looped over the side bars 30 and the free ends detachably secured to the sides in any suitable way, as by means of stud and socket fasteners 45. A plurality of such fasteners may be provided at different heights to afford an adjustment of the height of the seat. A flexible extension 46 connects the front end of the seat 43 with the front bar 3. The back 47 is of cloth or other suitable material looped over the bar 32 and secured in place by stud and socket fasteners 48. A number of such fasteners is employed in order to permit of adjusting the length of said back. When it is desired to change the seat into reclining position, the sides 44 and the back 47 are lengthened and the bar 32 extended, as indicated by dotted lines in Fig. 1.

When the cart is to be folded, the operator lifts the bar 32 sufficiently to carry the links 34 and 35 out of alinement, and then grasping the end bar 15 of the handle and the front bar 3 of the bed, he brings said bars together, as shown in Fig. 6, at the same time lifting the carriage clear of the floor. The seat frame 30 folds against the bed 1 as the links 33, 34 and 35 fold together as indicated in Figs. 5 and 6. The wheels 8 are positively held in operative position by the arms 25 and 26 until the spur 27 at the right-hand

side of Fig. 3 engages the lug 22, whereupon the wheels at the right-hand side of the carriage are folded into horizontal position. Just as the right-hand wheels reach the folded position, the spur 27 at the left-hand side of the carriage engages the lug 22 at that side of the carriage and throws the left-hand wheels into folded position. The wheels are held in folded position by the engagement of the lugs 21 and 23 with the arms 25 and 26 and the locking shoulder 28. By reference to Fig. 6 it will be seen that when the carriage is folded, the act of raising the handle 13 tends to unflex the links 34 35 and raise the pivotal joint between said links. But said joint cannot rise without swinging on the axis (36) of the link 34, and such pivotal movement is impossible because said joint is connected with the link 33 and because the latter cannot shorten sufficiently to permit the links 34 35 to come into alinement. The handle 13 therefore cannot be unfolded without first slightly raising the rear end of the seat frame 29 to permit the joint between the links 34 35 to move upward and rearward below the link 33. It will thus be seen that the cart may be held by practically any part thereof and carried in any position without accidental unfolding of any portion of the carriage.

While I have hereinbefore described the present embodiment of my invention with some particularity, I recognize the fact that various changes may be made in the construction and arrangement of the parts herein shown, therefore, no undue limitation should be understood from the foregoing detailed description.

I claim as my invention:

1. A folding go-cart comprising wheels; a member fixed with relation to said wheels; a pivoted member; and two arms fixed to said pivoted member and lying at opposite sides of the member fixed to said wheels, said last mentioned member and said arms being adapted to control the movement of said wheels.
2. A folding go-cart comprising wheels; a handle; two lugs fixed with relation to said wheels; a spur fixed with relation to said handle and adapted to engage said lugs; and means arranged to cooperate with said lugs, said means and said lugs constituting a wheel-locking means.
3. A folding go-cart comprising wheels; a pivoted handle; a spur fixed with relation to said handle; two locking lugs fixed with relation to said wheels and arranged to be engaged by said spur; means arranged to cooperate with said lugs; a third locking member fixed with relation to said wheels; and means arranged to cooperate with said third locking member.
4. A go-cart comprising wheels; a device fixed with relation to said wheels; a pivoted

member; and two curved arms fixed to said pivoted member and lying at opposite sides of said device, one of said arms being adapted to operate said device to fold and unfold the wheels.

5 5. A go-cart comprising wheels; three lugs fixed with relation to said wheels; a pivoted handle; two arms fixed to said handle and curved on the arcs of circles concentric with the pivot for said handle, said arms lying at opposite sides of said lugs; and a spur fixed to one of said arms and arranged to engage two of said lugs, the other arm being adapted to engage the third lug, said lugs being adapted to slide in contact with said arms for locking said wheels against movement.

10 6. A wheel-operating member for folding go-carts consisting of a pivot lug and two curved arms, one of said arms having a spur thereon.

15 7. A wheel-operating member for folding go-carts consisting of a casting comprising a pivot lug, a part to receive the handle, a locking projection, and two curved arms, one of said arms having a spur thereon.

20 8. A folding go-cart comprising a bed; a seat frame supported at its forward end upon said bed; a handle pivoted to said bed; two pairs of pivotally connected links, said links joining said handle and said bed; and means at the rear end of said seat frame and at each side thereof for yieldingly supporting said seat frame, said means comprising two overlapping bars, one of said bars being attached to the adjacent pair of links, means for limiting relative movement between said bars, and a spring resisting relative movement between said bars in one direction.

25 9. A folding go-cart comprising a bed; a handle pivoted to said bed; a seat frame attached at its forward end to said bed frame; two links connected together, one of said links being pivoted to said bed and the other to said handle, said links being in substantial alinement when the handle is in operative position; and means for limiting the pivotal movement of said links in one direc-

tion, the rear end of said seat frame being supported on said links.

30 10. A folding go-cart comprising a bed; a handle pivoted to said bed; a seat frame attached at its forward end to said bed frame; two links connected together, one of said links being pivoted to said bed and the other to said handle, said links being in substantial alinement when the handle is in operative position; a stop lug on one of said links adapted to engage the other link; and a link connecting the rear end of the seat frame with the pivotal joint of said first mentioned links.

35 11. A wheel-operating device for folding go-carts comprising two curved arms spaced apart and fixed with relation to each other, one of said arms having a spur thereon.

40 12. A wheel-operating device for folding go-carts comprising two curved arms spaced apart and fixed with relation to each other, said arms being curved on the arcs of concentric circles of different radii, one of said arms having an operating means thereon.

45 13. In a wheel-operating mechanism for folding go-carts, the combination of a pivotally mounted member comprising two curved arms spaced apart and curved on the arcs of concentric circles of different radii, a pivotally mounted member having two locking lugs adapted to slide in contact with the curved arm of larger radius and a locking lug adapted to slide in contact with the other curved arm, a spur on the arm of larger radius adapted to engage the two first mentioned lugs, the other arm being bent outwardly opposite said spur, and a locking shoulder being provided near one end of the arm of larger radius, two locking fingers on the second mentioned pivotally mounted member, and a projection on the first mentioned pivotally mounted member adapted to lie between said fingers.

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