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P. H. DENNEN

COLLAPSIBLE BABY CARRIAGE

Filed April 1, 1922

2 Sheets-Sheet 2

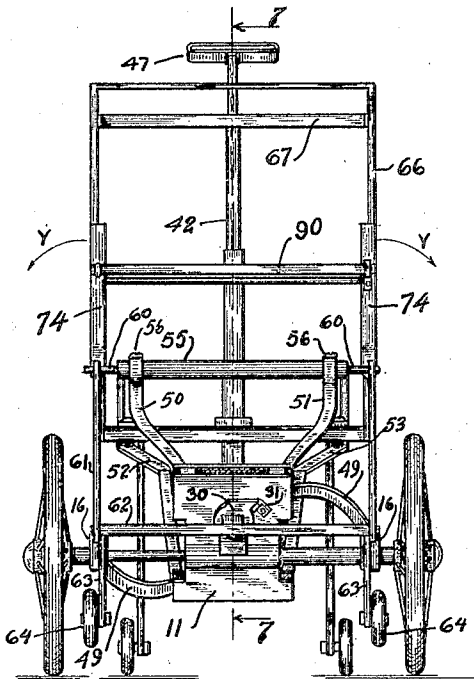


Fig. 2.

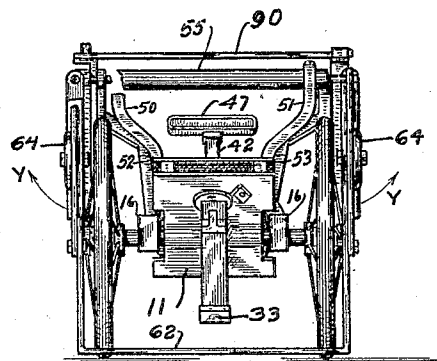


Fig. 3.

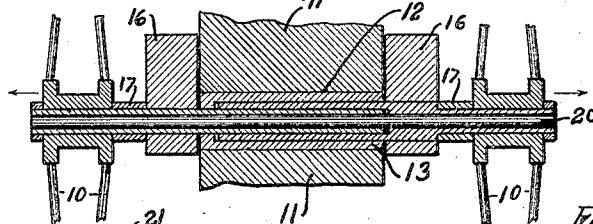
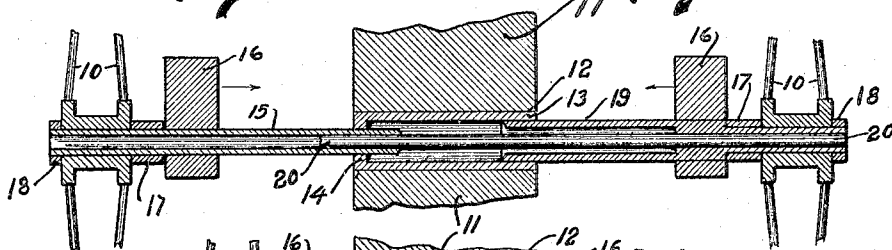


Fig. 4.

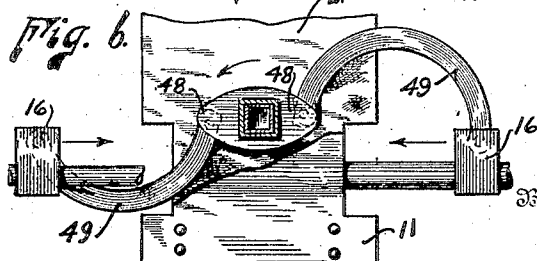


Fig. 6.

Fig. 5.

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By

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UNITED STATES PATENT OFFICE.

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COLLAPSIBLE BABY CARRIAGE.

Application filed April 1, 1922. Serial No. 548,609.

To all whom it may concern:

Be it known that I, PHILIP H. DENNEN, a citizen of the United States, residing at the city and county of Denver and State of Colorado, have invented certain new and useful Improvements in Collapsible Baby Carriages; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this specification.

This invention has for its object the production of a baby carriage that can be conveniently folded into a compact parcel that can be readily carried in the hand and transported on the street car.

I am aware that many different kinds of collapsible baby carriages have been patented and offered for sale, and I will not attempt to review the prior art, but will merely describe my invention, and for this purpose I shall have reference to the accompanying drawings which show the framework only and in which

Fig. 1 shows a perspective view of my improved carriage in the position which the parts occupy when the carriage is in condition for use; several elements which have nothing to do with my invention being omitted for the sake of clearness;

Fig. 2 shows a front elevation of the carriage shown in Fig. 1;

Fig. 3 shows a front elevation of the carriage in collapsed position;

Fig. 4 is a longitudinal section of the axle and shows the relationship of the parts when the parts are in extended position;

Fig. 5 is a section on the same plane as Fig. 4 and shows the parts in collapsed position.

Fig. 6 is a section taken on line 6—6 Fig. 7 and shows the mechanism by means of which the axle is extended and collapsed;

Fig. 7 is a longitudinal section of the handle taken on a vertical plane 7—7 Fig. 2;

Fig. 8 is a side elevation of a portion of the handle looking in the direction of the arrow 8 Fig. 7;

Fig. 9 is a top plan view of a portion of

the carriage looking in the direction of arrow 9 Fig. 1;

Fig. 10 is a detail showing the method of securing the lost motion connection between the back and the bevel gear;

Fig. 11 shows a rear elevation of the gear illustrated in Fig. 10;

Fig. 12 shows a front elevation of a portion of the back shown in Fig. 11;

Fig. 13 is a section, on a somewhat enlarged scale, taken on line 13—13, Fig. 8.

The same reference numerals will be used to designate the same or similar parts throughout the several views.

Numerals 10 represent the main supporting wheels which are rotatably mounted on the ends of the collapsible shaft, the construction of which is shown in Figs. 4 and 5, and which I will now describe.

A plate 11 has an opening 12 extending from one edge to the other and within this opening I rigidly secure a tubular member 13 which is provided at one end with an inwardly projecting flange 14. A tubular member 15 has one end thereof slidable in the opening in flange 14 and has rigidly secured thereto near the outer end thereof a block 16; a ferrule 17 surrounds a portion of the outer end of pipe 15 and has its inner end abutting the block 16 while the outer end thereof serves as a stop for the wheel 10 which is held in place by any suitable means such as a washer or nut. Slidable within the tubular member 13 is a second pipe 19 whose outer diameter is of such size that it will freely slide in the opening in member 13. Near the outer end of shaft 19 the opening therein is reduced in diameter so as to be substantially equal to the inside diameter of member 15. Beyond the block 16 the outer diameter of shaft 19 is also reduced to substantially the same diameter as the outside diameter of shaft 15 and a tubular ferrule 17 placed thereon to serve as an inside stop for wheel 10. A round rod 20 is secured within the opening in the outer end of shaft 19 and extends for some distance into shaft 15. The rod 20 is of such length that when the axle is collapsed in the manner shown in Fig. 5, it will extend almost or entirely through the same and the parts must be so proportioned that the rod will be within the opening in

shaft 15 when the shaft is extended as shown in Fig. 4. In order to extend and collapse the axle at will, I provide the following means:

I take two plates 11 and 21 and space them apart in parallel relation by means of short brackets 22 (Fig. 7). Substantially central of these plates I provide a bushing 23 which has circular portions 24 and 25 which are journaled in cooperative round holes in members 11 and 21. To the upper end of member 23 I secure a collar 26 which prevents it from moving downwardly with respect to plate 21 and to the lower end I secure another collar 27 which cooperates with plate 11 to prevent upward movement. The part 23 will therefore be rotatably but non-slidably mounted in the plates 11 and 21. Member 23 has a tubular extension 28 which serves to hold in place a locking member, 29, the function and operation of which will be hereinafter described. Member 27 has secured thereto, or formed integral therewith, a stop 30 (Fig. 2) which cooperates with a stop 31 on plate 11 and limits the rotary movement of member 23. A square opening extends axially through member 23 and within this opening there is slidably mounted a tubular member 32 of rectangular shape which has its lower end closed by a cap 33 and its upper end is crimped as indicated at 34. Telescopically connected to member 32 is a second tubular member 35 which has its lower end 36 expanded to fit the inside of member 32. The shoulders formed by the crimped portion 34 and the expanded portion 36 form stops which positively prevent the two members from being separated by a longitudinal pull. Secured to the outside of member 32 near its upper end is a spring locking member 37 whose free end is bent at right angles to form a hook 38 which projects through an opening in the crimped portion 34 and engages with a registering opening in the side of the cooperating member 35. The member 38 has its inner end beveled as indicated by 39 and the cooperating hole in member 35 has its upper side beveled as indicated by 40 and the lower edge of expanded portion 36 has a beveled portion 41 which engages with the bevel 39 to move the stop 38 outwardly for the purpose of permitting telescoping of the parts. The handle is made up of as many separate telescoping members as may be necessary to secure the desired length, all of which are constructed and connected in the manner just described, except the end member 42 which is provided with a plunger bar 43 which is held in its upper or retracted position by means of a spring 44 which normally holds the plunger in the dotted line position in which the lower end with its bevel 45 lies above hole 46. To the upper end of the end member 42 a hand grip 47 is

connected. When it is desired to collapse the handle, the operator presses the projecting upper end of bar 43 which then moves downwardly and permits the beveled end 45 to press outwardly the locking member 38. Member 42 will then slide downwardly and its lower end will unlock the locking means between the next two members until finally the beveled portion 41 of flange 36 unlocks the locking member 29 and permits tubular member 32 to slide in member 23. The lower ends of springs 37 engage the crimped end of the tube below and act as stops. In the manner above described, the handle may be telescoped and extended. Secured to member 23, or formed integral therewith, is a pair of arms 48 to the ends of which I pivotally secure curved links 49, the outer ends of which are secured to the blocks 16 in the manner shown in Fig. 6. When the axle is in its extended position (Figs. 1, 2, 4 and 6) the arms 48 occupy the position shown in Fig. 6 and stop 30 engages stop 31 (Fig. 2). When it is desired to collapse the axle, the handle is rotated in the direction of the arrow in Fig. 6 for substantially 180 degrees which will bring the axle parts into the position shown in Fig. 5.

To the structure described above I secure the framework of the carriage by means of supporting bars, or braces, 50, 51, 52 and 53. Braces 50 and 51 and 52 and 53 form pairs which are identical except that one is a right and the other a left. The lower ends of the braces are secured to plate 21 by means of screws 54 in the manner shown in Fig. 7. The upper ends of bars 50 and 51 are bent around the ends of a tubular member 55 and either welded thereto or held in place by screws 56, and the upper ends of braces 52 and 53 are similarly secured to the ends of member 57 (Fig. 9). Side bars 58 and 59 join the ends of members 57 and 60 and form a rectangular frame which serves as a means for supporting the upholstery of the seat (not shown).

Extending through tubular member 55 is a rod 60, to the ends of which I secure bars 61 which extend downwardly and have pivoted to their lower ends a U-shaped foot rest 62. The sides of the foot rest are made in the shape of bell crank levers and have downwardly extending arms 63, to the ends of which I secure suitable wheels 64. Bars 61 are held in adjusted position by any suitable means, such as a set screw 155 passing through the tubular member 55 and engaging the rod 61, and the foot rest 62 is also secured to the ends of bars 61 by means which permit them to be rigidly clamped thereto.

The ends of member 57 are provided with bearings 65 of reduced diameter, upon which is oscillatingly mounted the U-shaped strap

66 which forms the framework for the back. Near the top of the U a transverse rod 67 is provided for a brace. Rotatably mounted on the outer ends of bearings 65 are beveled gears 68 whose rear surfaces are each provided with an arcuate slot 69 which cooperate with pins 70 on the lower ends of member 66 for the purpose of forming a lost motion connection between the two, the purpose of which will hereinafter appear. Members 58 and 59 are each provided with bracket members 71 and 72, which serve as bearings for a rotatable shaft 73 to which the U-shaped side members 74 are connected.

Secured non-rotatably to the rear end of each shaft 73 is a bevel gear 75 which meshes with gear 68. Near the rear end of each shaft 73 is a rectangular portion 76, and slidable on each shaft is a bushing 77 which is also rectangular and adapted to telescopically cooperate with the rectangular parts 76 to hold the shaft against rotation. A collar 78 is rigidly secured to each shaft 73 and serves as an abutment for a spring 79 whose function it is to impart to members 77 a tendency to telescope with members 76. A bar 80 connects members 77 and has secured substantially centrally thereof a rod 81 which has a rotatable connection therewith. Rod 81 passes through a hole in rod 57 and is provided with a pin 82 which can pass from one side of rod 57 to the other through a suitable slot 83. A handle 84 permits the rod 81 to be rotated and moved backwards and forwards. When the pin 82 is so placed that it engages in slot 83, the springs 79 will force members 77 rearwardly and onto members 76 and serve to prevent rotation of shafts 73. When pin 82 is in front of bar 57, shafts 73 are unlocked.

With the arrangement described above it is apparent that when the back member 66 is rotated backwardly in the direction of the arrow X in Fig. 1, pin 70 will engage the end of slot 69 and cause gear 68 to rotate, which in turn will rotate gears 75 and move the sides 74 downwardly in the direction of arrows Y.

The function of the lost motion connection between the back member 66 and the gear 68 is to permit the back to be adjusted through a corresponding number of degrees while the sides 74 remain in their upright position. Straps 85 are pivoted to the sides of member 66 and have notches 86 which engage pins 87 and serve to hold the back in adjusted position.

A light framework 88 is pivoted at its upper end to the seat member and is provided with wheels 89 which serve to hold the carriage against tipping rearwardly. A removable strap member 90 is adapted to be secured to the seat in the manner shown in Fig. 3 for the purpose of functioning as a

handle for carrying the collapsed carriage, or to the front of sides 74 (Fig. 2) for the purpose of preventing the child from falling forward.

When it is desired to change the carriage from the position shown in Fig. 1 to the collapsed condition shown in Fig. 3, it is accomplished as follows: Handle 84 (Fig. 9) is grasped and members 77 moved forwardly sufficiently to release shafts 73. Straps 85 are then disconnected from pins 87. The sides and back are now ready to be folded downwardly, but before this can be accomplished the wheels will have to be moved out of the way by collapsing the axle to the position shown in Fig. 5; this is accomplished by rotating the handle in a counterclockwise direction, or in the direction of the arrow in Fig. 6; this draws the axle members inwardly in a manner that is obvious from the drawing. When the wheels have been moved to the position shown in Fig. 3, the handle is then collapsed by pressing plunger 43 and unlocking the upper lock 37. The handle can then be telescoped in the manner explained above. When the handle and axle have been collapsed, the back and sides may then be turned downwardly in the direction indicated by arrows X and Y. The parts will then be in the position shown in Fig. 3, and the carriage can be grasped by handle 90 and carried in one hand. When the carriage is to be used, back 66 and sides 74 are first rotated to upright position. The handle is then extended, after which it is rotated to extend the axle to its full length.

Having now described my invention, what I claim is:

1. In a device of the class described, in combination, an axle, a handle secured thereto, and means whereby the axle may be extended and collapsed by a rotary movement of said handle.

2. In a collapsible baby carriage, in combination, an extensible and collapsible axle, an extensible and collapsible handle rotatably attached thereto, and means whereby said axle may be extended or collapsed when the handle is rotated about its longitudinal axis.

3. In a collapsible baby carriage, in combination, an extensible and collapsible axle, an extensible and collapsible handle rotatably attached thereto, means whereby said axle may be extended or collapsed when the handle is rotated about its longitudinal axis, and a framework comprising a seat, sides and back attached to said axle, said sides and back being movable with respect to the seat.

4. In a collapsible baby carriage, in combination, an axle comprising a tubular supporting member, a pair of tubes telescopically connected therewith, said tubes being

adapted to telescope with each other, whereby the axle may be extended or collapsed, a handle rotatably connected with said axle, and means whereby the rotation of the handle will extend or collapse said axle.

5. In a collapsible baby carriage, in combination, an axle comprising a tubular supporting member, a pair of tubes telescopically connected therewith, said tubes being adapted to telescope with each other, whereby the axle may be extended or collapsed, a rod extending entirely through both of said tubes when the axle is collapsed, and means comprising a handle rotatably connected with said axle whereby said axle may be extended or collapsed.

6. In a collapsible baby carriage, in combination, an axle comprising a tubular supporting member, a pair of tubes telescopically connected therewith, said tubes being adapted to telescope with each other, whereby the axle may be extended or collapsed, a rod extending entirely through both of said tubes when the axle is collapsed, and means comprising a collapsible and extensible handle rotatably connected with said axle whereby said axle may be extended or collapsed.

7. In a collapsible baby carriage, in combination, an axle comprising a tubular supporting member, a pair of tubes telescopically connected therewith, said tubes being adapted to telescope with each other, whereby the axle may be extended or collapsed, a rod extending entirely through both of said tubes when the axle is collapsed, and means for collapsing and extending the axle, comprising a handle rotatably connected with said axle and provided with means whereby a rotation thereof extends or collapses said axle.

8. In combination, an extensible and collapsible axle, a handle rotatably connected thereto and provided with means for extending or collapsing it at will, a framework comprising a seat, rigidly secured to the axle structure, a pair of sides hingedly secured to said seat, and means for locking said sides in a plurality of different positions.

9. In combination, an extensible and collapsible axle, a handle rotatably connected thereto and provided with means for extending or collapsing it at will, a framework comprising a seat rigidly secured to said axle structure, a pair of sides hingedly secured to said seat, means for locking said sides in a plurality of different positions, and a back member hingedly connected to said framework.

10. In combination, an extensible and collapsible axle, a handle rotatably connected thereto and provided with means for extending or collapsing it at will, a framework comprising a seat rigidly secured to

said axle structure, a pair of sides hingedly secured to said seat, a back member hingedly connected thereto, means whereby the movement of said back member about its pivot will impart a corresponding movement to the sides, means for securely locking said sides in upright position, means comprising a lost motion connection for permitting said back member to be moved to a limited extent without moving said sides, and means for retaining said back in adjusted position.

11. In combination, an extensible and collapsible axle, a handle rotatably connected thereto and provided with means for extending or collapsing it at will, a framework comprising a seat rigidly secured to said axle structure, a pair of sides hingedly secured to said seat, a back member hingedly connected thereto, a pair of bevel gears connecting each side to said back, whereby the movement of said back member about its pivot will impart a corresponding movement to said sides, means to lock said sides in upright position, a lost motion connection between said back and said gears whereby the back may be adjusted without rotating the gears, and means for locking the back in adjusted position.

12. In a collapsible baby carriage, in combination, a pair of spaced plates, a tubular member secured to one of said plates, a pair of tubes telescopically connected to said tubular member and adapted to telescope with each other, a member rotatably mounted between said plates, a pair of opposed arms secured thereto, a connecting rod between the end of said arms and each of said telescoping tubes, whereby a rotation of said arms will reciprocate said tubes, and a handle slidably connected with said rotatable member.

13. In a collapsible baby carriage, in combination, a pair of spaced plates, a tubular member secured to one of said plates, a pair of tubes telescopically connected to said tubular member and adapted to telescope with each other, a member rotatably mounted between said plates, a pair of opposed arms secured thereto, a connecting rod between the end of said arms and each of said telescoping tubes, whereby a rotation of said arms will reciprocate said tubes, and a collapsible handle slidably connected with said rotatable member.

14. In a collapsible baby carriage, in combination, a pair of spaced plates, a tubular member secured to one of said plates, a pair of tubes telescopically connected to said tubular member and adapted to telescope with each other, a member rotatably mounted between said plates, a pair of opposed arms secured thereto, a connecting rod between the end of said arms and each of said telescoping tubes, whereby a rotation of

said arms will reciprocate said tubes, and a collapsible handle slidably connected with said rotatable member, said handle comprising a plurality of tubular members telescopically connected, and provided with means to hold them locked in extended position.

15. In a collapsible baby carriage, in combination, a pair of spaced plates, a tubular member secured to one of said plates, a pair of tubes telescopically connected to said tubular member and adapted to telescope with each other, a member rotatably mounted between said plates, a pair of opposed arms secured thereto, a connecting rod be-

tween the end of said arms and each of said telescoping tubes, whereby a rotation of said arms will reciprocate said tubes, and a collapsible handle slidably connected with said rotatable member, said handle comprising a plurality of tubular members telescopically connected, means to hold them locked in extended position, and manually operated means to unlock said locking means to permit the handle to be collapsed.

In testimony whereof I affix my signature.

PHILIP H. DENNEN.