B. L. GATES.

CHILD'S COLLAPSIBLE VEHICLE.

APPLICATION FILED JUNE 28, 1915.

1,190,399.

Patented July 11, 1916.

3 SHEETS—SHEET 1.

Fig. 1.

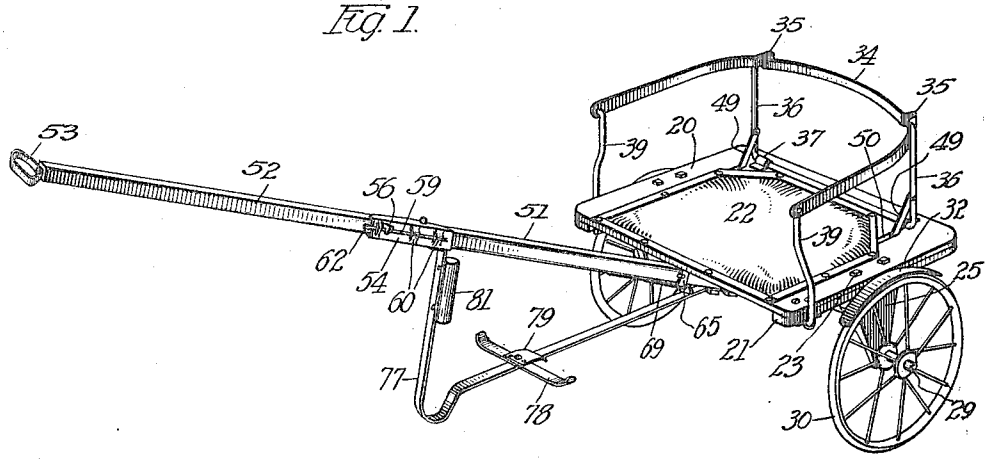
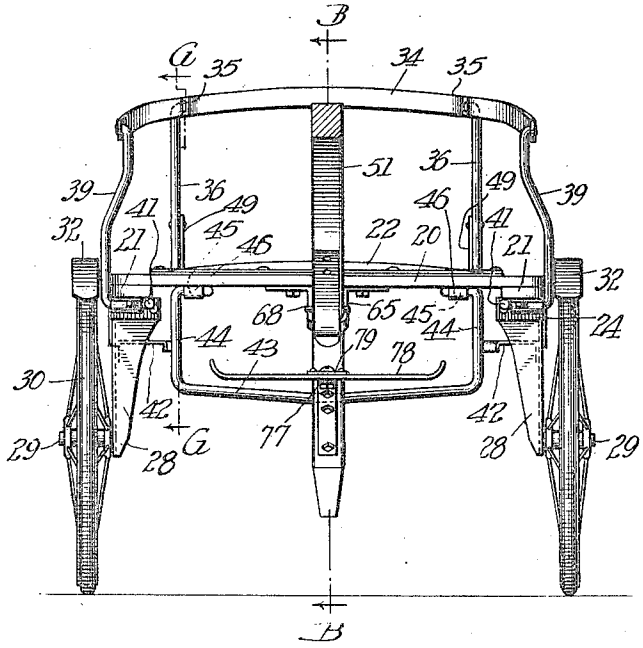


Fig. 2.



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3 SHEETS—SHEET 2.

Fig. 3.

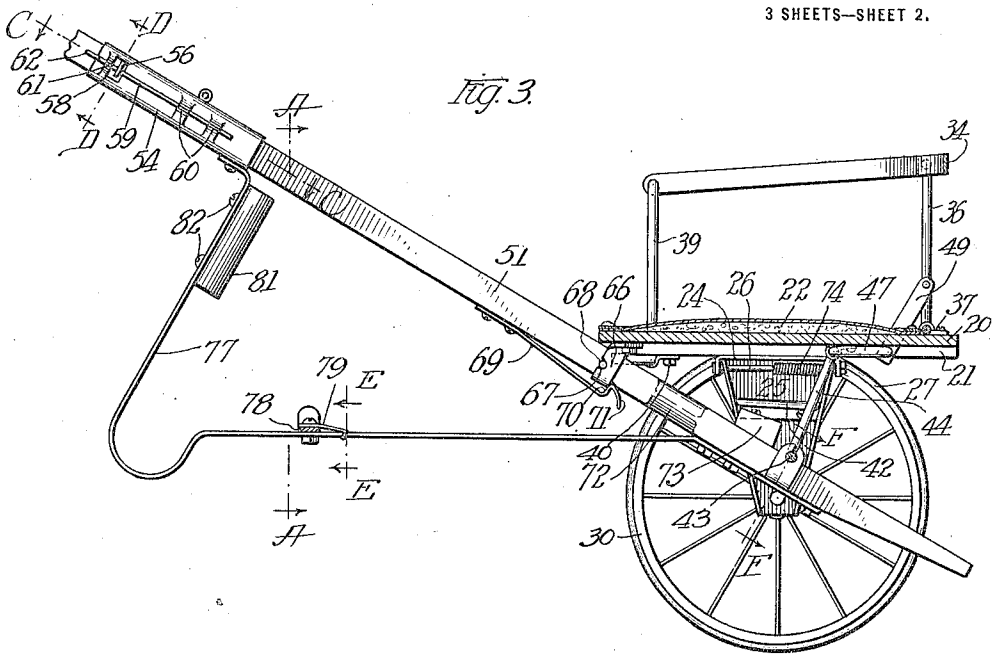


Fig. 4.

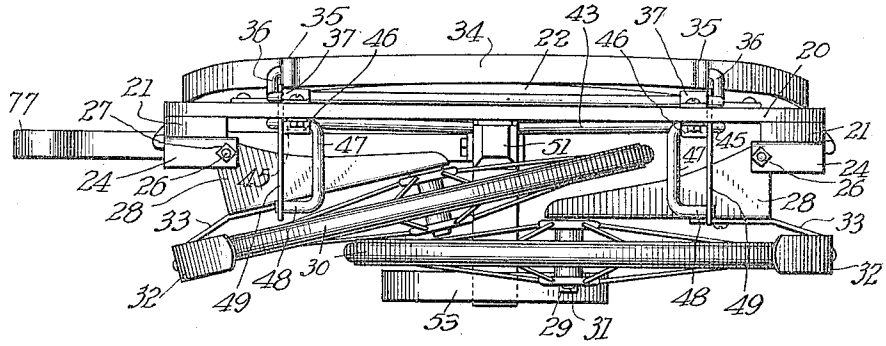
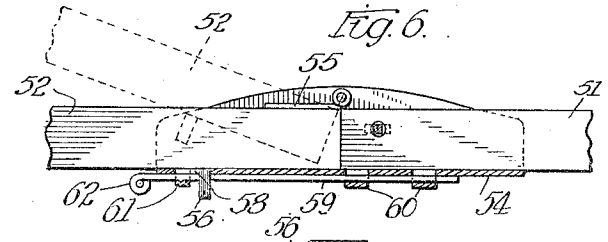


Fig. 6.



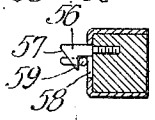


Fig. 7.

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3 SHEETS—SHEET 3.

Fig. 5.

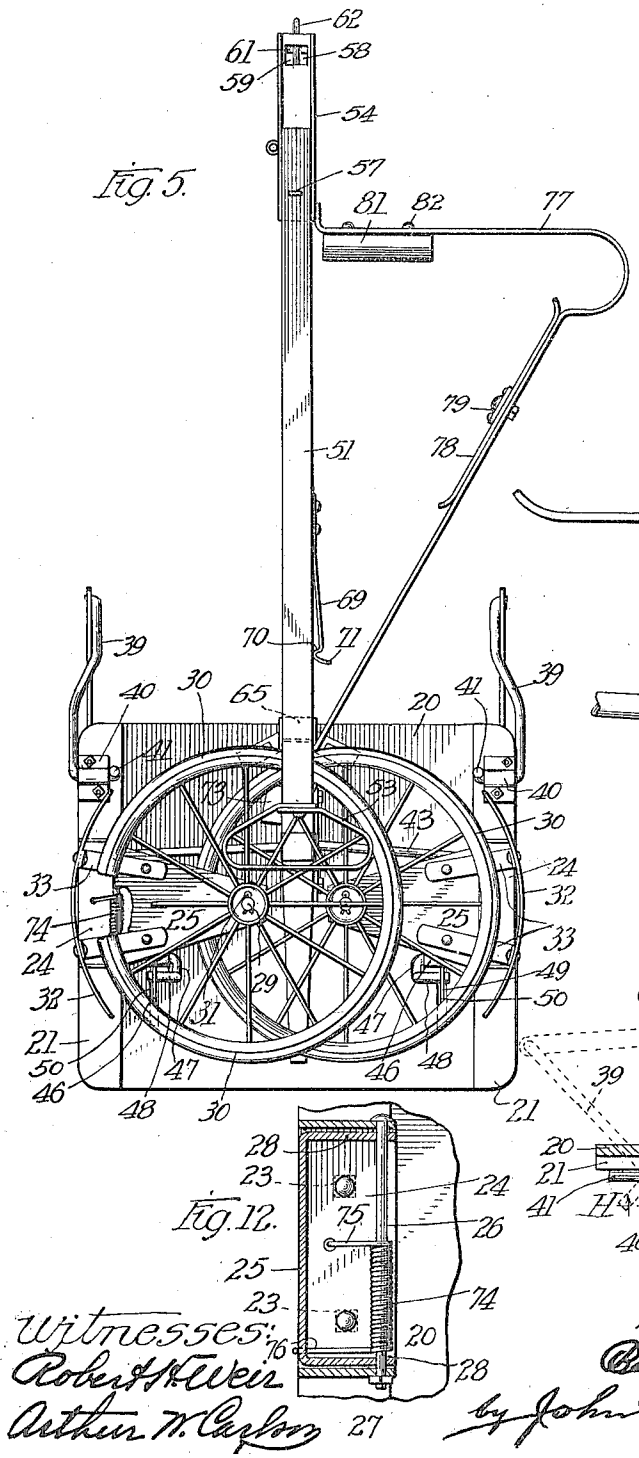


Fig. 11.

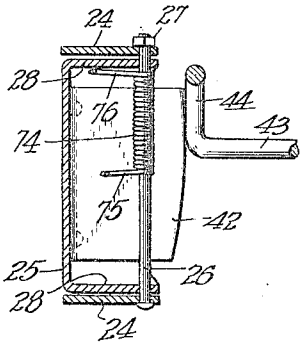


Fig. 8.

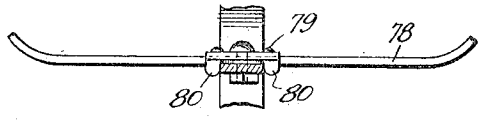


Fig. 9.

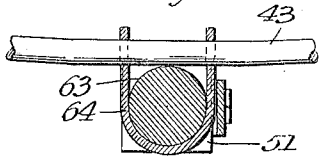


Fig. 10.

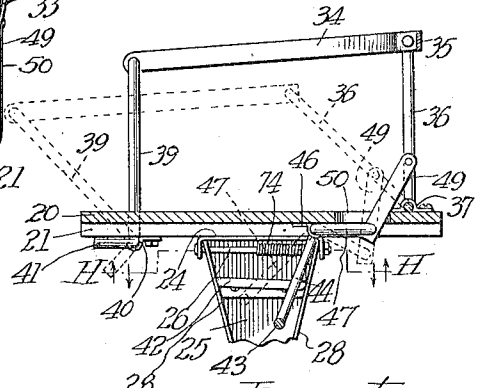


Fig. 12.

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UNITED STATES PATENT OFFICE.

BENJIMAN L. GATES, OF CHICAGO, ILLINOIS, ASSIGNOR TO RHINEHARDT H. BROWN, OF CHICAGO, ILLINOIS.

CHILD'S COLLAPSIBLE VEHICLE.

1,190,399. Specification of Letters Patent. Patented July 11, 1916.

Application filed June 28, 1915. Serial No. 36,612.

To all whom it may concern:

Be it known that I, BENJIMAN L. GATES, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Children's Collapsible Vehicles, of which the following is a full, clear, and exact specification.

My invention is concerned with collapsible children's vehicles, and more especially with collapsible sulkies, and is designed to provide a device of the class described in which all the collapsed parts may be erected by a thrust movement upon the handle while the sulky is on the floor, thus avoiding the necessity of stooping over during that operation. To make the collapsing of the same possible with little manipulation, I arrange the wheel frames to fold automatically by spring action.

My invention is further concerned with certain novel combinations and constructions in such devices, all as will be fully described and particularly pointed out in the claims.

To illustrate my invention, I annex hereto three sheets of drawings, in which the same reference characters are used to designate identical parts in all the figures, of which,—

Figure 1 is a perspective view of a sulky embodying my invention, shown as in its erected position; Fig. 2 is a front elevation of the same on a slightly enlarged scale, as seen in section on the line A—A of Fig. 3; Fig. 3 is a substantially central longitudinal vertical section, as seen on the line B—B of Fig. 2; Fig. 4 is a rear elevation of the same on a still larger scale, with the parts shown in their collapsed position. Fig. 5 is an inverted plan view of the sulky, on the same scale as Figs. 2 and 3, with the parts collapsed; Figs. 6, 7, 8 and 9 are details, on an enlarged scale, in section on the lines C—C, D—D, E—E and F—F, respectively, of Fig. 3; Fig. 10 is a view in section on the line G—G of Fig. 2; and Figs. 11 and 12 are detail views in section, as seen looking down and upwardly, respectively, on the line H—H of Fig. 10.

In my prior application No. 721,552, filed September 21, 1912, and allowed November 29, 1913, I have described and claimed a similar sulky, in which the back-rest element and the arm supports are automatically folded by separate springs, which have to be released separately from the wheel-frame springs, thus requiring two separate manipulations, both in collapsing and erecting the vehicle. In my present invention, I have connected up the wheel frames with the back-rest and arm supports so that a single lock may control all of them, and but a single movement is required either in collapsing or erecting it.

In the description of the invention, for convenience, I will assume that the main frame 20 is always stationary, and that the other parts mentioned move relatively thereto in the collapsing and erecting movements. In my present embodiment of the invention, which is designed to be extremely simple, the main frame 20 forms the basis of the seat, and is preferably formed of a generally rectangular board reinforced along its side edges by wooden strips 21 secured on the under side thereof. A cushion 22, of any desired construction, may be secured on the top of the main or seat frame. Secured centrally on the under side of the bars 21, as by nuts and bolts 23, are the bearing brackets 24 for the wheel frames 25, which brackets preferably take the form of shallow channels formed of sheet-metal with downwardly projecting flanges having apertures therethrough to receive the horizontal bearing rods 26, which are secured in place by any suitable means, such as forming a head on one end and threading the other, and holding them in place by nuts 27. The wheel frames 25 are formed of sheet-metal, of a generally triangular shape, and have flanges 28 turned up along the converging edges thereof and perforated to form bearings by which the wheel frames are pivoted on the bearing rod 26. The lower ends of the wheel frames have the axle studs 29 projecting outwardly therefrom, and wheels 30, of the customary construction, are journaled thereon and secured in place by any desired means, such as cotter pins 31. The wheel frames may also be employed to support the mud guards 32, which may be made of strips of sheet-metal riveted to the angular supporting bars 33, which in turn are riveted to the outer sides of the wheel frames.

The back-rest frame is preferably formed

of the sheet-metal bar 34, which is substantially U-shaped, and is provided at two points equidistant from the ends thereof with two sharp, salient loops 35 provided so that the inwardly turned ends of the U-shaped bail 36 may be passed through apertures in the loops to form pivotal connections between the bail 36 and the back-rest. The horizontal portion of the bail is pivoted on the main or seat frame by strap-loops 37 secured to the top of said frame. The part of the bar 34 between the loops, together with the bail 36, in effect forms the back-rest frame, while the sides thereof in advance of the loop form the arm rests, which are supported at their forward ends by the rods 39 having their upper ends pivoted thereto, and their lower, horizontal inturned ends pivotally mounted in the bearing plates 40 secured on the under side of the bars 21, as best seen in Fig. 5. Beyond the bearings 40, the rods have their ends 41 turned at right angles to the bearing portions, and coöperating with the under side of the bars 21 when the backrest frame is erected, to prevent its movement back beyond its vertical position.

The wheel frames 25 are provided on their inner faces, as best seen in Figs. 10 and 11, with cam plates 42, which are conveniently formed of sheet-metal, with their outer edges turned down so as to be riveted to the wheel frames, and their inner edges turned down to form an additional bearing surface for the cams. The angles of these two cams vary, as is customary in this class of devices, so that one wheel frame will fold in advance of the other to prevent interference. Coöperating with these cams 42 is the erecting frame 43, which preferably takes the general form of a shallow U-shaped bail with the sides 44 thereof coöperating with the cam plates 42, while portions 45 turned off at right angles thereto coöperate with the bearing straps 46, by which the erecting frame is pivoted to the under side of the main frame. Turned at right angles to the bearing portions 45 are the comparatively short portions 47, which, as best seen in Fig. 10, engage the bottom of the main or seat frame when the sulky is erected and limit the movement of the erecting frame toward its erecting position. Beyond these portions 47 are outwardly turned ends 48, which enter suitable apertures in the connecting links 49, passing upwardly through slots 50 in the seat-frame, and pivotally connected at their upper ends to the vertical portions of the bail 36. With the connections described, it will be seen that as the erecting frame 43 is moved to erecting position, the back-rest frame will at the same time be moved to operative position; and when the movement of the erecting frame is reversed, the back-rest frame will be collapsed on the main frame, as seen in Fig. 4. To swing this erecting frame to and from its erecting position, I provide a sliding member 51, which preferably takes the form of a square wooden bar, to the upper end of which is pivoted the tongue 52, which tongue may be provided with the handle 53 at its outer end. As a convenient form of pivotal connection between these two parts, by which they may be locked in their extended or operative position, I employ the structure best shown in Figs. 3, 6 and 7, where it will be seen that I secure to the upper end of the member 51 the sheet-metal channel 54, which has the hinge member 55 secured to the lower end of the handle 52 pivoted at the center of its upper portion. To lock the parts in their extended position, I secure in the side of the handle 52 which engages the bottom of the channel 54, the hook 56 having the cam surface 57, which passes through the aperture 58 formed in the bottom of the channel 54 and forces to one side the spring rod 59, the lower end of which is secured, as by the struck-up loops 60, to the outer side of the bottom of the channel 54, and has its outer end guided in the struck-up loop 61. By these connections the handle is secured automatically when it is thrown into its extended position, and can be quickly released to allow it to be folded back by pressing the loop 62 formed on the free end of the rod 59 to one side to disengage the rod from the hook 56.

The member 51 is connected by a swiveling joint to the middle of the bail constituting the erecting frame 43 by having a rounded portion 63 thereof, best seen in Fig. 5, journaled in the U-shaped yoke 64 formed of sheet-metal and having apertures therein above the member 51, through which the horizontal portion of the bail 43 passes. The yoke 64 can turn on the bail 43, and the member 51 can turn at right angles thereto in the yoke 64. Owing to its pivotal connection with the erecting frame, the member 51 must move through varying angles with reference to the main frame, and to permit this movement, the guide 65, which is preferably formed of a sheet-metal strap, has the bottom face thereof set at the extreme angle which the member 51 can assume relative to the main frame 20. The vertical sides 66 thereof are provided with recesses 67 intended to receive pins 68 projecting from opposite sides of the member 51, and preferably formed by passing a rod of proper length through said member. To lock the member 51, and thus hold the parts in their erected position, I secured on the under side of the member 51, the spring-metal strap 69, which has a hook 70 adapted to engage the lower edge of the guide bearing 65, and also provided with the cam end 71 adapted to ride over said bearing as

the member 51 is thrust downward during the erecting movement. The parts are shown in their locked position in Fig. 3, and it will be obvious that to release the same, all that is necessary is to take hold of the cam end 71 of the spring latch 69 and spring it out far enough to disengage it from the bearing 65, when the member 51 can be withdrawn to collapse the back-rest frame and permit of the collapsing of the wheel frames. When the parts are in their collapsed position, as shown in Figs. 4 and 5, the member 51 is turned on its axis at right angles to the position it assumes when the parts are erected, and, to permit of this turning movement, a portion 72 of the member 51 is rounded off, and this portion 72 is within the bearing 65 in this position. As the sides 44 of the erecting frame 43 lie substantially parallel to the member 51 when the parts are in their collapsed position, it forms a sort of a toggle joint that would make it difficult to shove the erecting frame toward its erecting position with the parts occupying the above-described relationship, and, to overcome this difficulty, I secure on one side of the member 51 a cam block 73, the side of which lies against the bottom of the main or seat frame 20 when the parts are in their collapsed position, as seen in Fig. 5. The first movement in erecting the sulky after the handle 52 has been extended is to turn the handle at right angles to its collapsed position, and the cam 73 during this movement, reacting against the bottom of the main or seat frame, serves to swing the sliding member 51 sufficiently to break, as it were, the toggle joint and permit of the sliding member being readily thrust rearward to the erecting position, during which movement the wheel frames and the back-rest frame will be erected by the connections heretofore described.

To collapse the wheel frames when the erecting frame has been moved to collapsing position by pulling outward on the handle, the rods 26 have wrapped around them the strong, helical, torsion springs 74, one end 75 of which engages and presses against the under side of the bearing plate 24, while the other end 76 engages the recesses in and presses against the top of the wheel frames 25, so that the wheel frames are folded up automatically as soon as they are released by the movement of the erecting frame.

To support the sulky when the handle is dropped, I provide the standard 77, which is preferably formed of a metal strap bent in the generally angular shape shown in Fig. 3, having its forward end bolted to the channel 54 and the inclosed end of the sliding member 51, while its other end extends along the bottom of said member 51 from the rounded portion 72 past the rounded portion 63, and is securely fastened to said member by any desired means. To furnish a foot rest for the occupant, I pivot on the proper portion of the standard 77 the bar 78, preferably having its ends slightly upturned, and I secure to the center of said bar the spring-metal plate 79, which has downwardly turned lugs 80 formed at one end at a sufficient distance apart to coöperate with the bar forming the standard 77 to lock the foot rest in operative position. When the parts are collapsed, the plate 79 may be sprung up enough to release the lugs 80 from engagement with the sides of the standard bar, so that the foot rest can be swung into a position parallel to the standard. As a convenient means of carrying the sulky in its collapsed position, I secure on the vertical portion of the standard adjacent the member 51, the wooden handle 81, by any suitable means, such as screws 82.

The operation of my improved sulky will be apparent from the foregoing description, and it will be seen that when the parts are in their collapsed position, they can be readily carried by the handle 81, and occupy little space. When it is desired to use the same, the spring catch 59 is operated to release the handle 52, which is swung and caught automatically in its extended position. The back of the main or seat frame is placed on the floor or sidewalk, and the handle is swung on its axis through an angle of ninety degrees, breaking the toggle before noted, after which a sharp downward thrust of the handle completes the erecting operation. If the foot rest has been swung to a position parallel with the standard, it is swung at right angles thereto, and the sulky is ready for use. In collapsing the same, the motions are reversed.

While I have shown and described my invention as embodied in the form which I at present consider best adapted to carry out its purposes, it will be understood that it is capable of modifications, and that I do not desire to be limited in the interpretation of the following claims except as may be necessitated by the state of the prior art.

What I claim as new, and desire to secure by Letters Patent of the United States, is:

1. In a device of the class described, the combination with a main frame, of wheel frames pivoted thereto, a back-rest frame pivoted to the main frame, a tongue connected to the main frame, means for collapsing the wheel frames and the back-rest frame, an angular standard connected to the lower portion of the tongue, and a handle secured to the normally vertical portion of said standard.

2. In a device of the class described, the combination with a tongue member, of an angular metallic standard secured thereto, a foot-rest bar pivoted thereto, and a spring-metal plate secured to the foot-rest bar and

having lugs coöperating with the standard to hold the foot-rest bar in operative position.

3. In a device of the class described, the combination with a lower tongue member, of an outer tongue member hinged thereto, a channel secured to the lower tongue member having an aperture in its bottom, a hook carried by the outer tongue member passed through the aperture when the tongue is extended, and a spring latch member secured on the bottom of the channel and adapted to engage the hook and to be sprung out of engagement therewith.

4. In a device of the class described, the combination with a main frame, of a member angular in cross section sliding thereon, a guide therefor having the same angular cross section, a recess in the guide, a projection on the member adapted to enter the recess, and a spring tongue carried by the member and adapted to engage the far side of the guide when the projection enters the recess.

5. In a device of the class described, the combination with a main frame, of a flat metal strip curved in a general U-shape having two sharp salient loops formed therein extending outwardly therefrom, a pair of supporting rods pivoted to the main frame and the ends of the metal strip, and a pair of parallel supporting rods pivoted to the main frame and the salient loops.

6. In a device of the class described, the combination with a main frame, of a pair of wheel frames pivoted thereto, a back-rest frame pivoted to the top of the main frame, an erecting frame pivoted to the main frame, connections between the erecting frame and the wheel frames to cause the erection of the latter and to permit their collapse as the erecting frame is moved, springs interposed between the main frame and the wheel frames tending to collapse the latter, and connections between the erecting frame and the back-rest frame to collapse the latter as the wheel frames are permitted to collapse.

7. In a device of the class described, the combination with a main frame, of a pair of wheel frames pivoted thereto, a back-rest frame pivoted to the top of the main frame, an erecting frame pivoted to the main frame, connections between the erecting frame and the wheel frames to cause the erection of the latter and to permit of their collapse as the erecting frame is moved, springs interposed between the main frame and the wheel frames tending to collapse the latter, arms on the erecting frame, and links connecting the ends of said arms and the back-rest frame to collapse the latter as the wheel frames are permitted to collapse.

8. In a device of the class described, the combination with a main frame, of a pair of wheel frames pivoted thereto, a back-rest frame pivoted to the top of the main frame, an erecting frame pivoted to the main frame, connections between the erecting frame and the wheel frames to cause the erection of the latter and to permit of their collapse as the erecting frame is moved, springs interposed between the main frame and the wheel frames tending to collapse the latter, arms on the erecting frame having extensions engaging the main frame to limit the erecting movement, and links connecting the ends of said arms and the back-rest frame to collapse the latter as the wheel frames are permitted to collapse.

9. In a device of the class described, the combination with a main frame, of wheel frames pivoted thereto, an erecting frame pivoted on the main frame, a rotating and sliding bar pivotally connected to the erecting frame, said erecting frame extending substantially parallel to the bar when the vehicle is collapsed, and a cam lug carried by the bar and engaging the main frame to decrease the angle between the erecting frame and the bar as the latter is turned preparatory to erection.

10. In a device of the class described, the combination with a main frame, of wheel frames pivoted thereto, a back-supporting frame pivoted above the main frame, an erecting frame coöperating with the wheel frames and the back-supporting frame, a tongue, and connections between the tongue and erecting frame so that a longitudinal thrust on the tongue will erect the wheel frames and the back-supporting frame.

11. In a device of the class described, the combination with a main frame, of wheel frames pivoted thereto, a back-supporting frame pivoted above the main frame, an erecting frame coöperating with the wheel frames and the back-supporting frame, a tongue, a sliding member associated with the tongue, a lock for the sliding member, and connections between the sliding member and erecting frame so that a longitudinal thrust on the tongue will erect the wheel frames and back-supporting frame and lock them in erected position.

12. In a device of the class described, the combination with a main frame, of wheel frames pivoted thereto, a back-supporting frame pivoted above the main frame, an erecting frame coöperating with the wheel frames and the back-supporting frame, a tongue, connections between the tongue and erecting frame so that a longitudinal thrust on the tongue will erect the wheel frames and back-supporting frame, and springs interposed between the main frame and wheel frames to collapse the latter when the tongue is moved back to its collapsed position.

13. In a collapsible vehicle, the combina-

tion with a main frame, of a pair of wheel frames pivoted to the under side thereof and adapted to be moved from collapsed to erected position, and vice versa, a back supporting frame pivoted to the upper side and rear of the main frame, locking means for holding said frames locked in their erected position, and springs for throwing them from their erected to their collapsed position when said frames are unlocked.

14. In a collapsible sulky, the combination with a main frame, of a pair of wheel frames pivoted to the under side thereof, a pair of side frames pivoted to the upper portion of the main frame, said pivoted frames being adapted to be moved from erected to collapsed position, and vice versa, locking means for holding said movable frames in their erected position, and springs for throwing said movable frames to their collapsed position when they are unlocked.

15. In a collapsible vehicle, the combination with a main frame, of a pair of wheel frames pivoted thereto, cams secured to the wheel frames, an erecting frame pivoted to the main frame and adapted to coöperate with the cams to move the wheel frames to their erected position or to be moved out of engagement therewith, a member sliding on the main frame and connected to the erecting frame to move the same, a back supporting member foldable down on the main frame when the vehicle is collapsed, connections between the back supporting member and the sliding member, and a tongue connected to said sliding member so that by pressing on the tongue the wheel frames and back supporting member may be erected.

16. In a collapsible vehicle, the combination with a main frame, of a pair of wheel frames pivoted thereto, cams secured to the wheel frames, an erecting frame pivoted to the main frame and adapted to coöperate with the cams to move the wheel frames to their erected position or to be moved out of engagement therewith, a member sliding on the main frame and connected to the erecting frame to move the same, a pair of side frames pivoted to the upper portion of the main frame and foldable down on said main frame when the vehicle is collapsed, connections between the side frames and the sliding member, and a tongue connected to the sliding member so that by pressing on the tongue the wheel frames and the side frames may be erected.

In witness whereof, I have hereunto set my hand and affixed my seal, this 19th day of June, A. D. 1915.

BENJIMAN L. GATES. [L. S.]

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."