

No. 618,032.

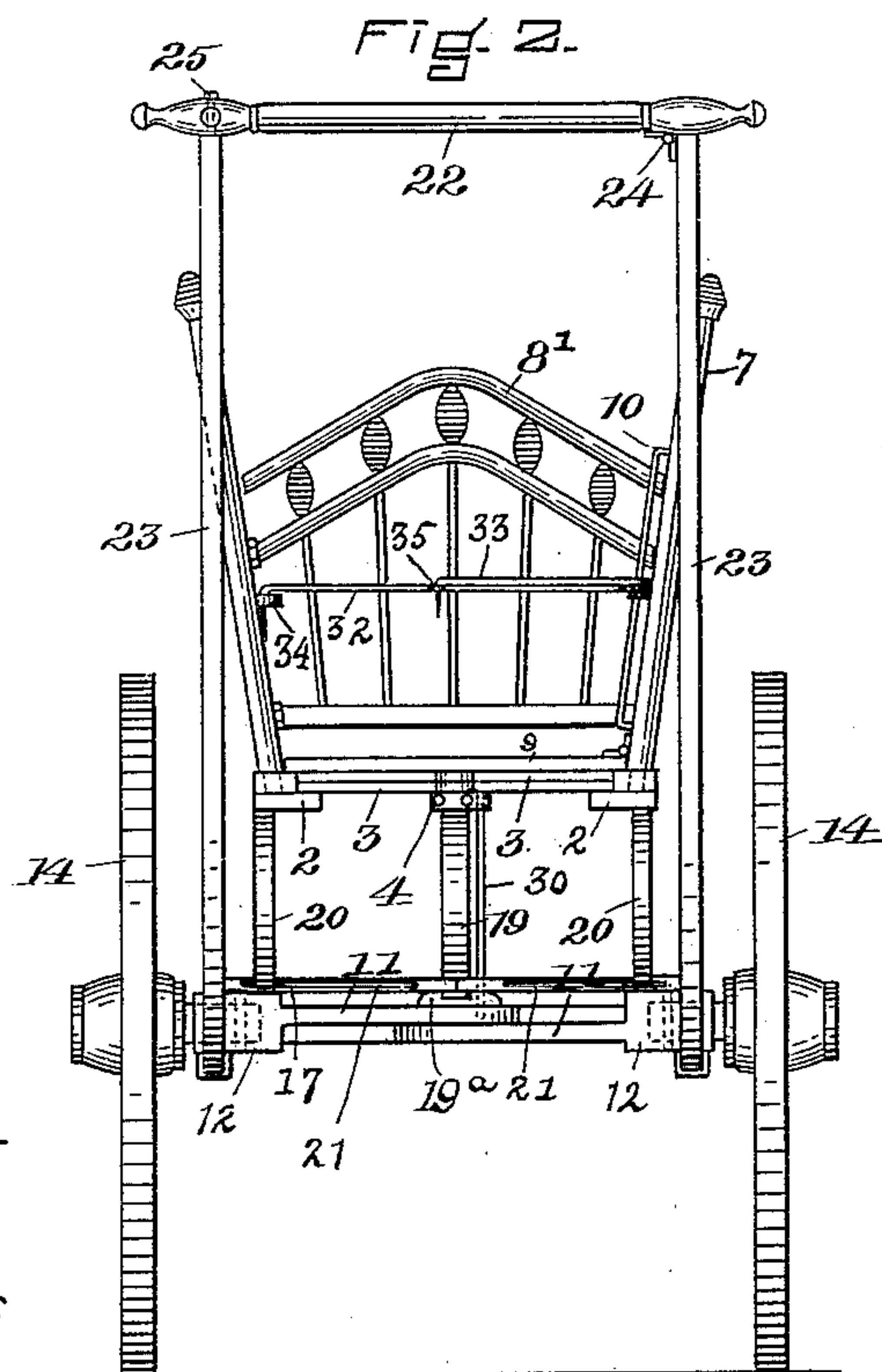
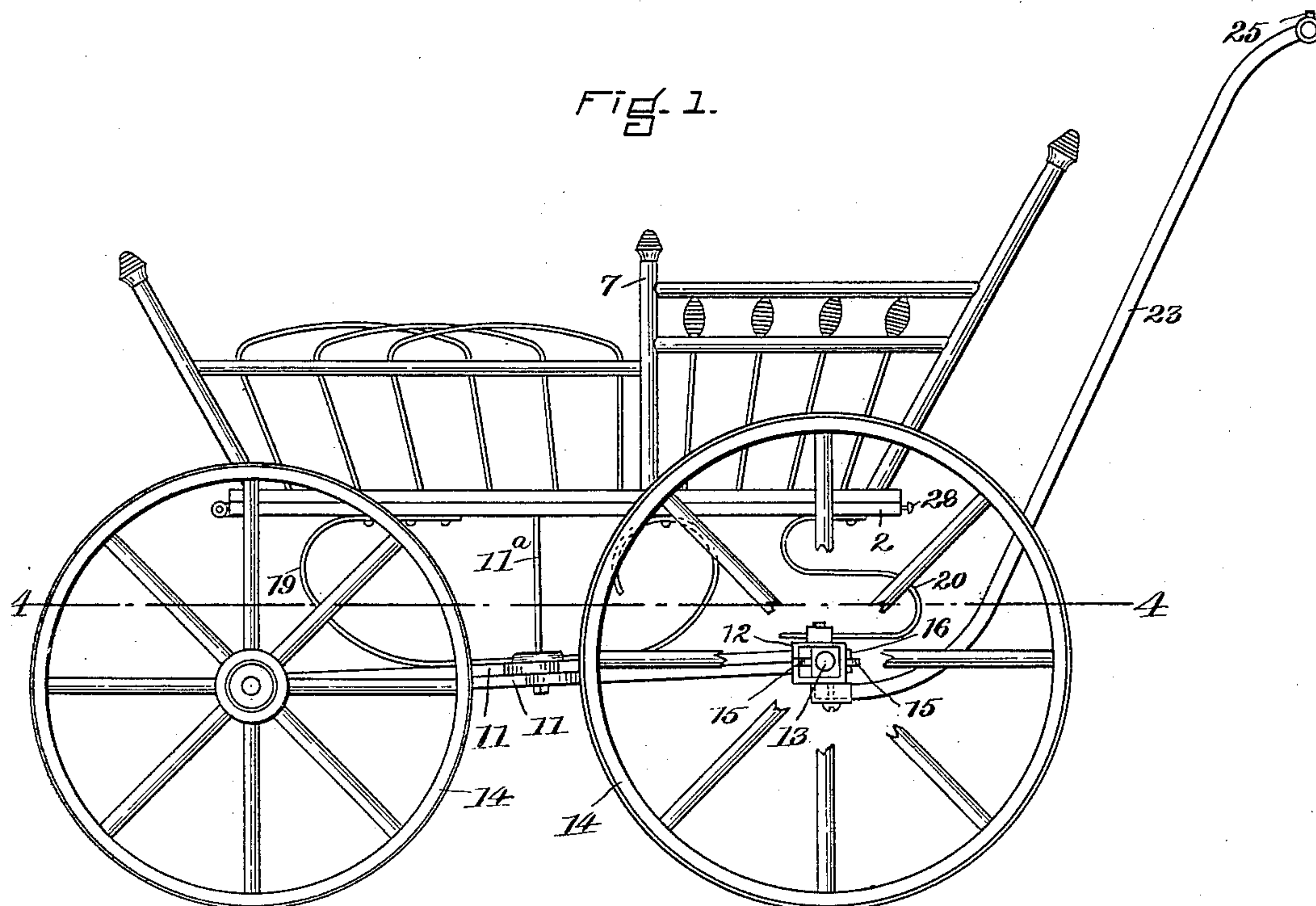
Patented Jan. 17, 1899.

L. A. & B. A. GREYER.
FOLDING CARRIAGE.

(Application filed Mar. 5, 1898.)

(No Model.)

2 Sheets—Sheet 1.



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2 Sheets—Sheet 2.

Fig. 3.

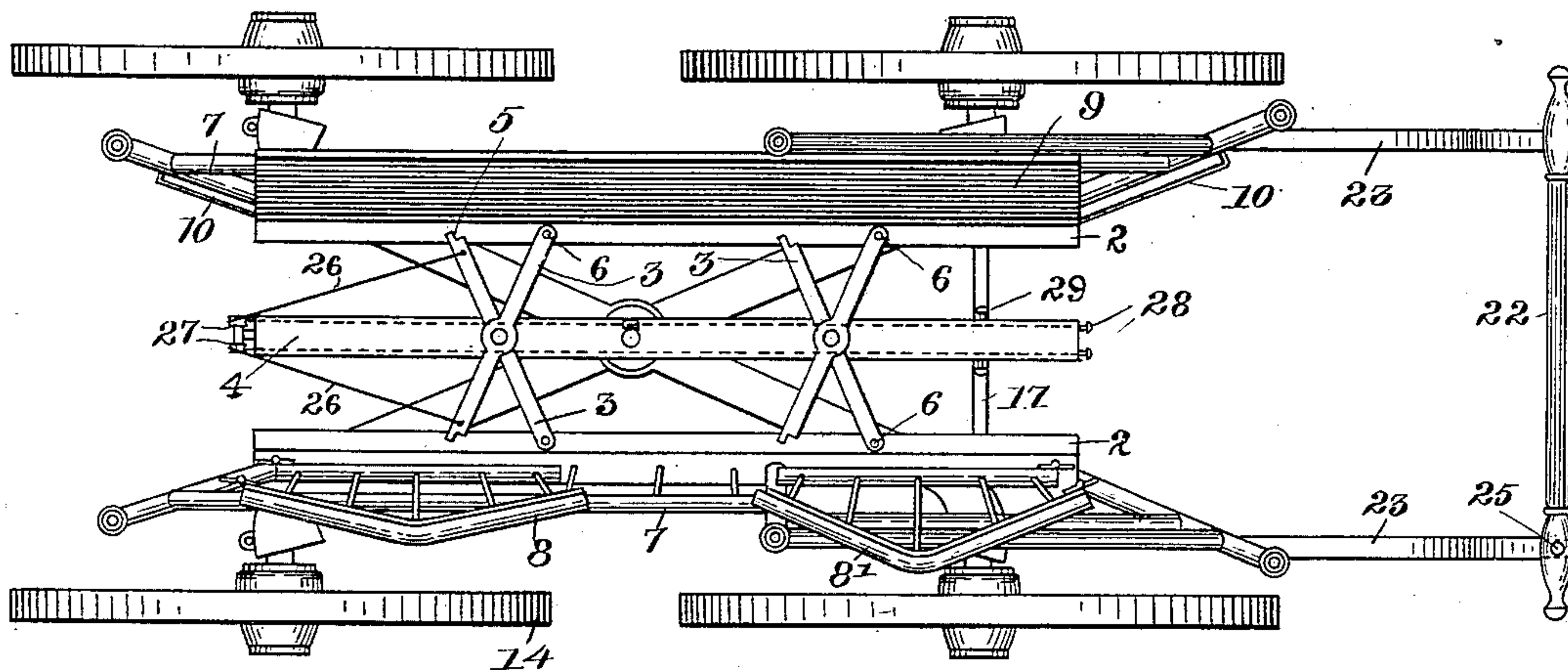


Fig. 4.

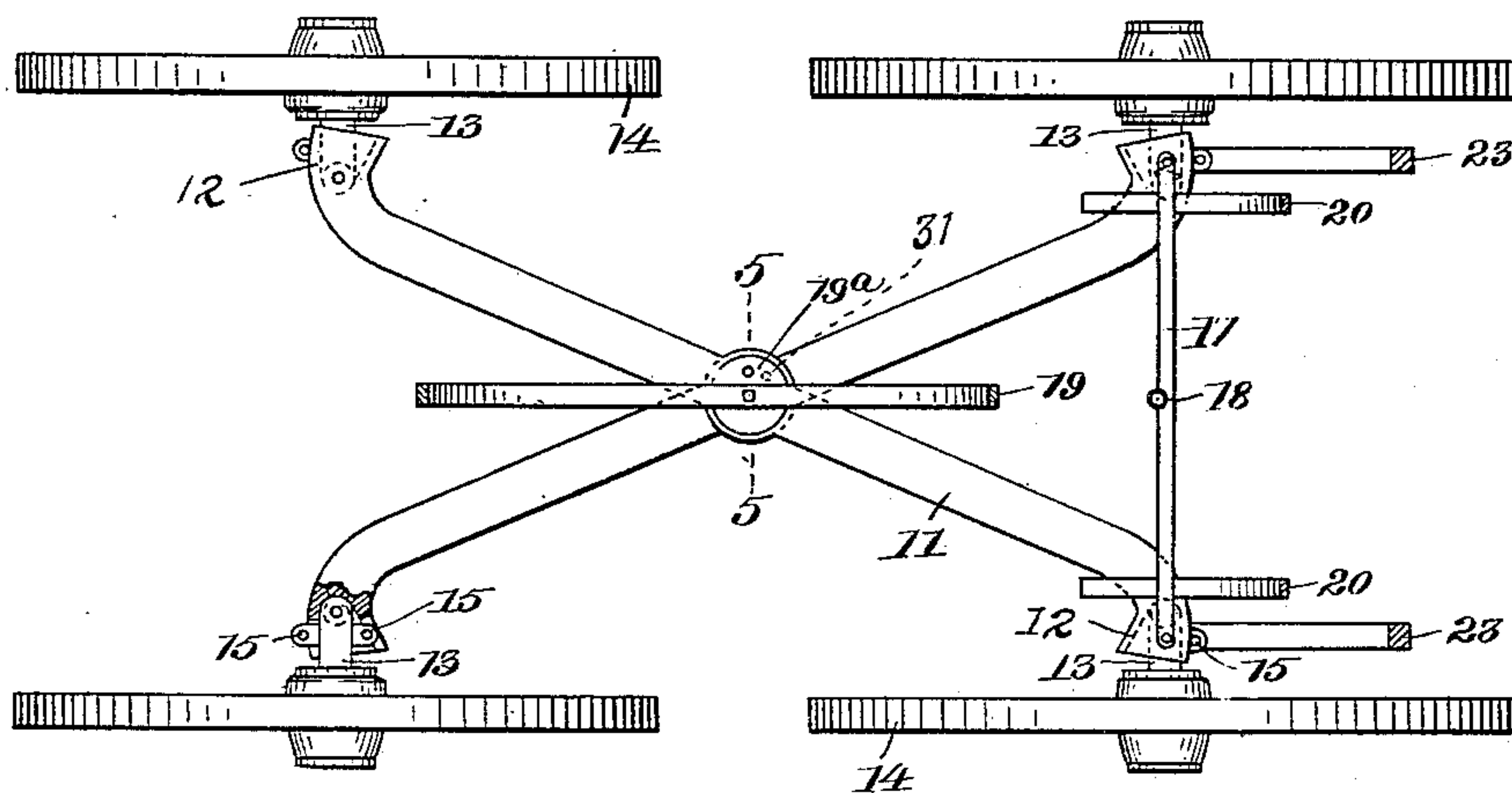
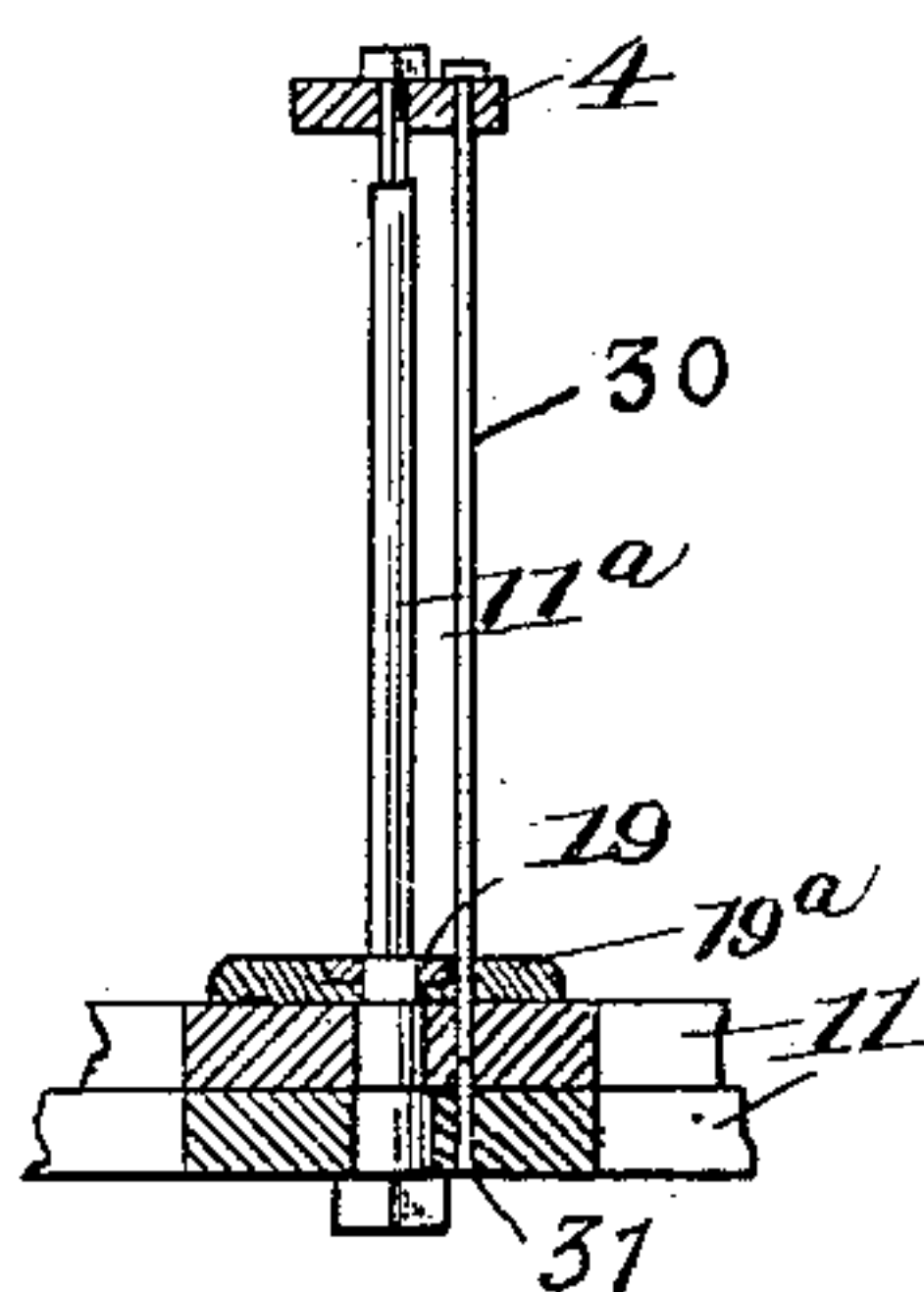


Fig. 5.



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UNITED STATES PATENT OFFICE.

LOUIS A. GREYER AND BERTHA A. GREYER, OF BOSTON, MASSACHUSETTS.

FOLDING CARRIAGE.

SPECIFICATION forming part of Letters Patent No. 618,032, dated January 17, 1899.

Application filed March 5, 1898. Serial No. 672,640. (No model.)

To all whom it may concern:

Be it known that we, LOUIS A. GREYER and BERTHA A. GREYER, citizens of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Folding Carriages, of which the following is a specification.

Our invention relates to folding carriages, and is more especially intended to provide a carriage for children which shall be capable of being readily folded laterally and made to occupy much less space than the usual form of carriage and which shall at the same time be of simple and durable construction and practically as strong and rigid when extended as the ordinary carriage of this class.

A preferred form of our invention is shown in the accompanying drawings, in which—
Figure 1 is a side elevation of the carriage with a portion of one of its wheels broken away. Fig. 2 is a rear elevation of the same as it appears when extended. Fig. 3 is a plan view of the carriage, the body portion being shown partly folded. Fig. 4 is a plan view of the running-gear extended, taken on the line of section 4 4 in Fig. 1. Fig. 5 is an enlarged section on the line 5 5 in Fig. 4.

The body portion of our carriage and its running-gear are so constructed and combined that they may be folded and extended one at a time independently of each other, simplicity being thereby gained and the operations of folding and extending the carriage being made much easier to perform.

The body portion comprises two side bars 2, which carry the sides, ends, and bottom of the carriage-body and to each of which are pivoted two cross-bars 3. These bars 3 are pivoted to each other in pairs, as shown, and to a central longitudinal bar 4, which is supported on the running-gear, as hereinafter described. The bars 3 are preferably made of such length that when the carriage is extended they will reach entirely across the bottom of the body portion, their free ends being notched, as at 5, to receive the pivots 6, by which said bars are secured to the side bars 2. By virtue of the construction just described each pair of bars 3 when extended forms practically one solid bar, and thus gives great rigidity to the carriage-body.

The sides 7 of the carriage are rigidly supported upon the side bars 2, and the front and rear ends 8 and 8' and the bottom 9 are hinged to the parts 7 and 2 in such a manner that the former may be swung flatly against the sides 7 when the carriage is to be folded. We prefer to hinge both of the ends 8 and 8' to one of the sides 7 and the bottom 9 to the opposite side bar 2, as thereby said bottom and ends may each be made integral and each may be folded without interfering with the folding of either of the others. When the carriage is extended, the ends 8 8' may be kept from swinging too far outward by means of stops 10, against which they may be held by means of hooks or by the carriage-cushions (not shown) when put in place.

The running-gear of our carriage comprises two bars 11, each of which extends between diagonally opposite wheels, said bars being thus made to cross each other, they being pivoted together at their point of crossing by a vertical bolt 11^a. To each of the ends of the bars 11 is pivoted a short axle 13, on which a wheel 14 is mounted, these parts being so constructed that the axles 13 will have a limited amount of lateral play. We prefer to accomplish this by providing on each end of the bars 11 an axle-box 12, within which the corresponding axle 13 is pivoted to swing horizontally and by the side walls of which its motion is limited. Thus when the carriage is extended the wheels may be set parallel to each other by swinging the axles 13 over to the outer sides of the boxes 12, and when the carriage is folded the axles may be swung to the other extremity of the boxes 12, which should have such dimensions that when this is done the wheels will again be made parallel with each other. By this arrangement the carriage is made capable of being propelled with equal ease whether folded or extended. The axles 13 must be locked in their extreme positions in order to keep the wheels steady, and for this purpose we provide said axles with perforated ears 15, one on each side thereof, and cut corresponding slots in the sides of the boxes 12, so that in each of the extreme positions of the axles one of said ears will project through the corresponding slot, where it may be locked in place by means of a pin 16, Fig. 1, passed through the perforation in

said ear. Other means for limiting the swing of the axles 13 and for locking them in place may be employed, if preferred.

In order to hold the bars 11 rigidly spread 5 when the carriage is extended, the rear end of the running-gear is provided with a pivoted folding brace 17, having a knuckle-joint 18 at the point where it folds in order to hold it in its straightened position. This brace should 10 be pivoted to the axle-boxes 12 in order that it may not interfere with the folding together of the cross-bars 11, and each of its arms is provided with a long horizontal slot 21, for a purpose hereinafter set forth.

15 We prefer to support the body of our carriage on the running-gear by means of a central spring 19, of any desired pattern, secured at its top to the bottom of the bar 4 and supported by the bars 11 at their intersection, the 20 pivot-bolt 11^a passing through said spring and holding it in place. A suitable seat for the bottom of the spring 19 may consist of a perforated casting 19^a, grooved on its top face to receive the spring and resting on the top bar 25 11, the bars 11 being enlarged at their point of crossing, as shown, to afford an ample bearing for said spring-seat. In the construction shown the bolt 11^a is squared at its upper end and passes through the bar 4 with sufficient 30 looseness to permit said bar to play up and down thereon to a limited extent. We also employ two additional springs 20 to assist in supporting the rear of the carriage, where the weight of the occupant is felt the most. 35 These springs 20 are rigidly secured at their upper ends to the side-bars 2, while their lower ends pass through the slots 21 in the brace 17 and are thus supported and confined by said brace. These slots 21 provide for the 40 relative longitudinal and lateral motions of the springs 20 and the arms of the brace 17, which occur when either portion of the carriage is folded or extended, and thus it is made possible to fold the body portion and 45 the running-gear independently of each other, as above stated.

In order to prevent the body portion of the carriage from turning on the bolt 11^a with respect to the running-gear, a locking device, 50 such as shown in Fig. 5, may be employed, consisting of a headed pin 30, passed loosely through the bar 4 at its upper end and through a hole in the spring-seat 19^a at its lower end and into one of two perforations 31, 55 formed in the bars 11, according to whether the parts are to be locked in their folded or in their extended position.

The push-bar 22 of the carriage is carried, as usual, by two supports 23, which should 60 be secured at their lower ends to the under side of the rear axle-boxes 12. Provision is made for the folding together of these two supports, as by hinging the push-bar to one of them, as at 24, and perforating said bar at 65 its free end in such manner that it may be sprung on or off the end of the corresponding support, which is formed to fit said perfora-

tion, where it may be detachably held by means of a pin 25.

The operation of folding and extending our 70 carriage as above constructed will be sufficiently obvious without further explanation. In order to provide for readily and conveniently starting the parts of the body portion from their extended position, the cross-bars 75 3 being then on a dead-center with respect to lateral pressure, we prefer to attach chains 26 to the free ends of the bars 3, which chains are carried around small pulleys 27, mounted on the front end of the bar 4, and are then 80 carried back under said bar to the rear end of the carriage, where their free ends may be hung upon hooks 28 or 29, according to whether the carriage is folded or extended. 85 When the carriage is to be folded, the free ends of the bars 3 may be started forward by pulling upon these chains, whereupon the sides of the body portion of the carriage may readily be pressed together. Similar means 90 may be used, if desired, to assist in the folding of the brace 17 and the running-gear.

In Fig. 2 is shown a double locking-brace, which may be used to give rigidity to the sides 95 of the carriage when it is either folded or extended, consisting of two rods 32 and 33 of unequal length independently hinged on a common pivot to one of the sides 7 and each provided with a hook at its free end. The longer rod 32 is of such length that when the carriage is extended it may be hooked into an 100 eye 34 on the opposite side 7, the shorter rod 33 being at the same time hooked into and supported by an eye 35, formed on the rod 32. When the carriage is folded, the shorter rod 33 is hooked into the eye 34, the rod 32 hav- 105 ing previously been folded inward back of the bottom 9.

It will be seen that our carriage may be constructed with but few more parts than a carriage of the usual non-folding type and that 110 when extended it will have practically all the rigidity thereof and will not differ materially therefrom in its appearance so far as its parts are visible from the exterior. The pivoted bars, which constitute for the most part the 115 folding portions of our carriage, may conveniently be stamped from sheet metal, as in this way they may be made cheaply and may be given great strength.

It will be apparent that the details of the 120 construction which we have shown and described may be considerably varied without departing from our invention.

We claim as our invention—

1. In a folding carriage, a folding running- 125 gear comprising cross-bars pivoted to each other and each provided at each of its ends with an axle-box, an axle pivoted in each of said boxes to swing horizontally therein, and means for locking each axle at the extreme 130 positions of its movement, for the purpose set forth.

2. In a folding carriage, a folding body portion comprising two side bars, two pairs of

cross-bars pivoted thereto and to each other, and a central bar to which each pair of cross-bars is pivoted at their point of intersection, said cross-bars being of such length as to reach entirely across the bottom portion of the carriage when extended, as set forth.

3. In a folding carriage, a folding body portion comprising two side bars, two pairs of cross-bars pivoted thereto and to each other, and a central bar to which said cross-bars are pivoted at their points of intersection, in combination with means for moving the free ends of said cross-bars simultaneously in a longitudinal direction, for the purpose set forth.

4. In a folding carriage, the combination with a folding running-gear of an independently-folding body portion, comprising a central, longitudinal bar supported on said running-gear, cross-bars pivoted to said central bar, and two side bars pivoted to said cross-bars and carrying the sides, ends and bottom of the carriage-body, substantially as and for the purpose set forth.

5. In a folding carriage, the combination with a folding running-gear of an independently-folding body portion, comprising two side bars to which the sides, ends and bottom of the carriage-body are secured, and provided with means whereby they may be folded together or extended, said side bars being supported at their ends on springs the lower ends of which are held in slotted guides secured to said running-gear, for the purpose set forth.

6. In a folding carriage, the combination with a folding body portion of an independently-folding running-gear, comprising two crossed bars pivoted to each other and provided at each of their ends with an axle pivoted directly thereto, substantially as described.

7. In a folding carriage, the combination

with a folding body portion of an independently-folding running-gear comprising two crossed bars pivoted to each other as described and carrying wheels on their free ends, said body portion being supported on the running-gear by means of a central spring and two side springs, the latter being supported in slotted guides secured to the rear ends of the said crossed bars, as described.

8. In a folding carriage, the combination with a body portion having two side bars arranged to be folded together or extended as desired, of a folding running-gear comprising two cross-bars pivoted to each other as described, and having a horizontally-slotted, folding brace pivoted to the rear ends thereof, and springs rigidly attached to said side bars and supported at their lower ends within the slots in said folding brace, for the purpose set forth.

9. In a folding carriage, the combination with the folding body portion thereof of a double locking-brace comprising two rods of unequal length independently hinged at a common point, each of said rods having a hook at its free end, and the longer rod being provided with an eye into which the shorter rod may be hooked, for the purpose set forth.

10. In a folding carriage, a folding running-gear, a body portion arranged to be folded or extended independently of said running-gear and pivoted thereto by means of a single pivot-bolt, and means for locking said body portion to said running-gear, as set forth.

In testimony whereof we have hereunto subscribed our names this 3d day of March, A. D. 1898.

LOUIS A. GREYER.
BERTHA A. GREYER.

Witnesses:

ROBERT LEHMAN,
E. D. CHADWICK.