(No Model.) 2 Sheets—Sheet 1.

F. HEPPNER.

FOLDING CARRIAGE.

No. 571,228 Patented Nov. 10, 1896.

Fig. 1.

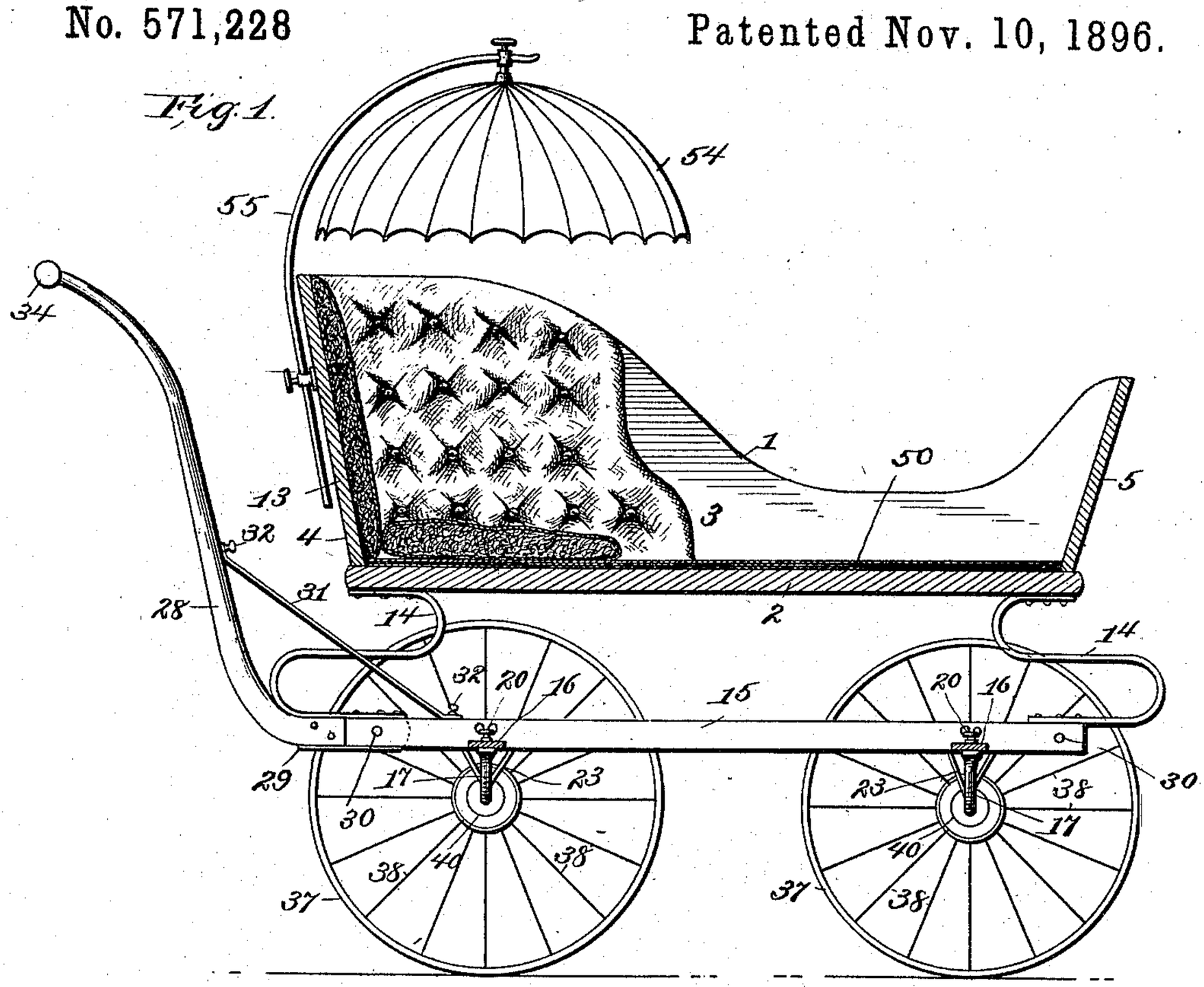
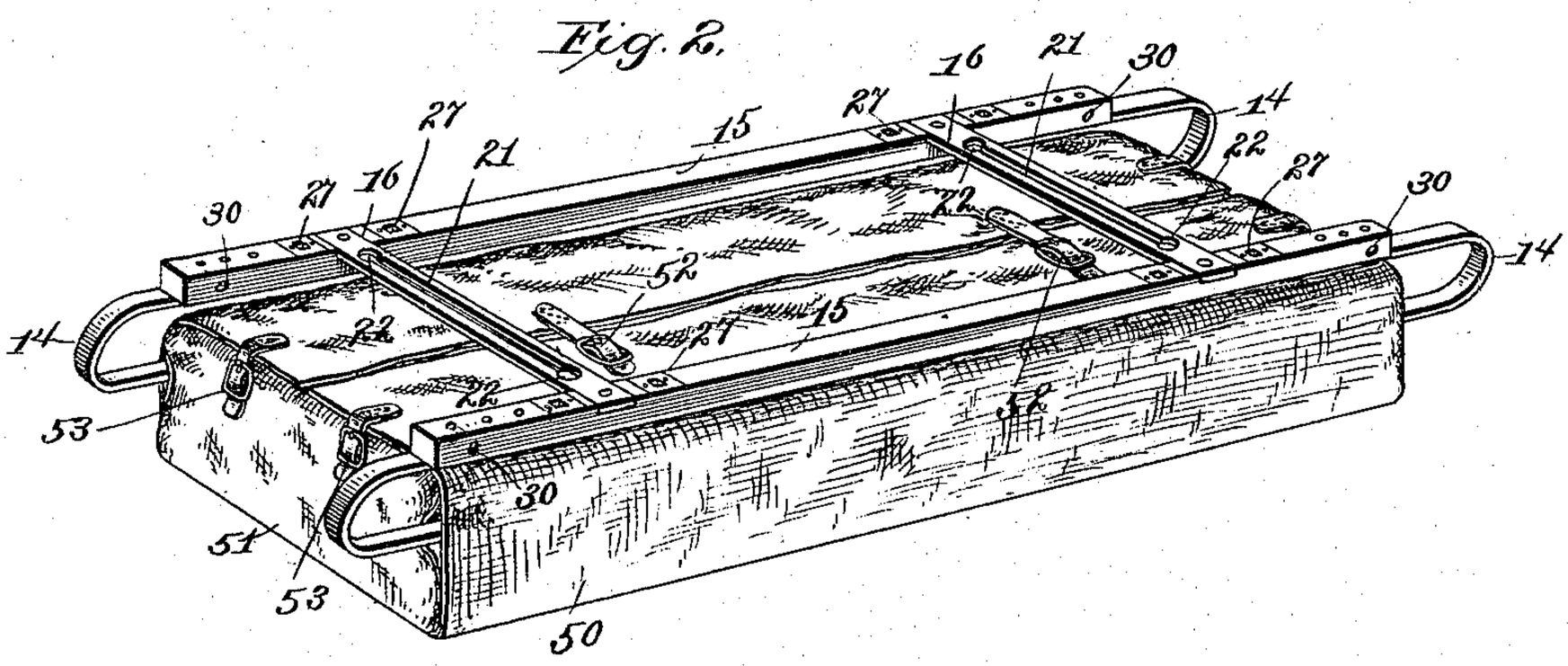


Fig. 2.



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(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

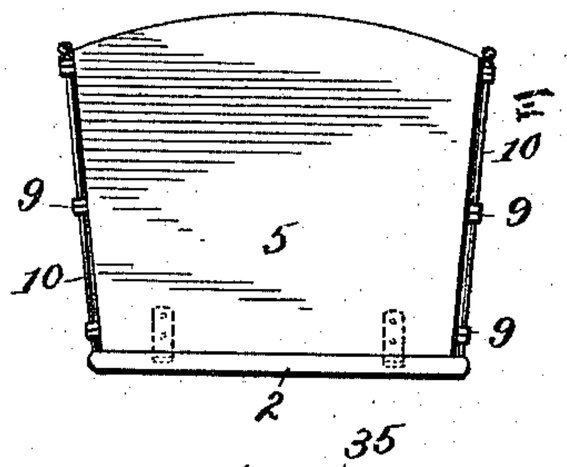


Fig. 4.

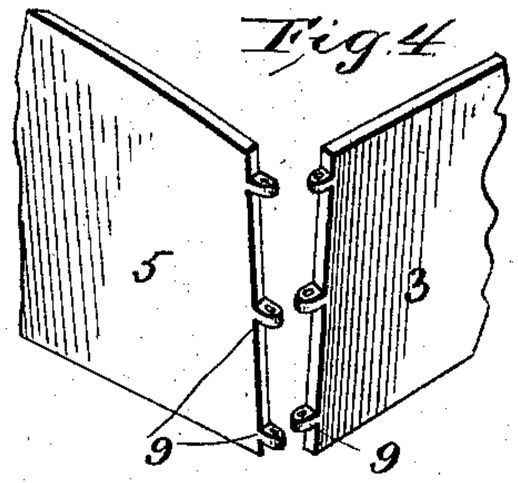


Fig. 5.

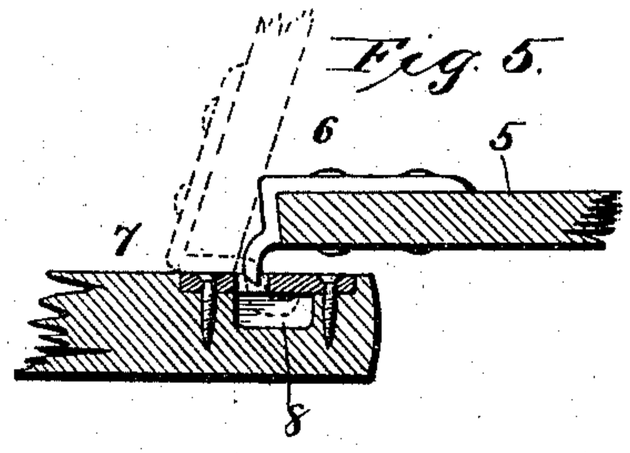


Fig. 6.

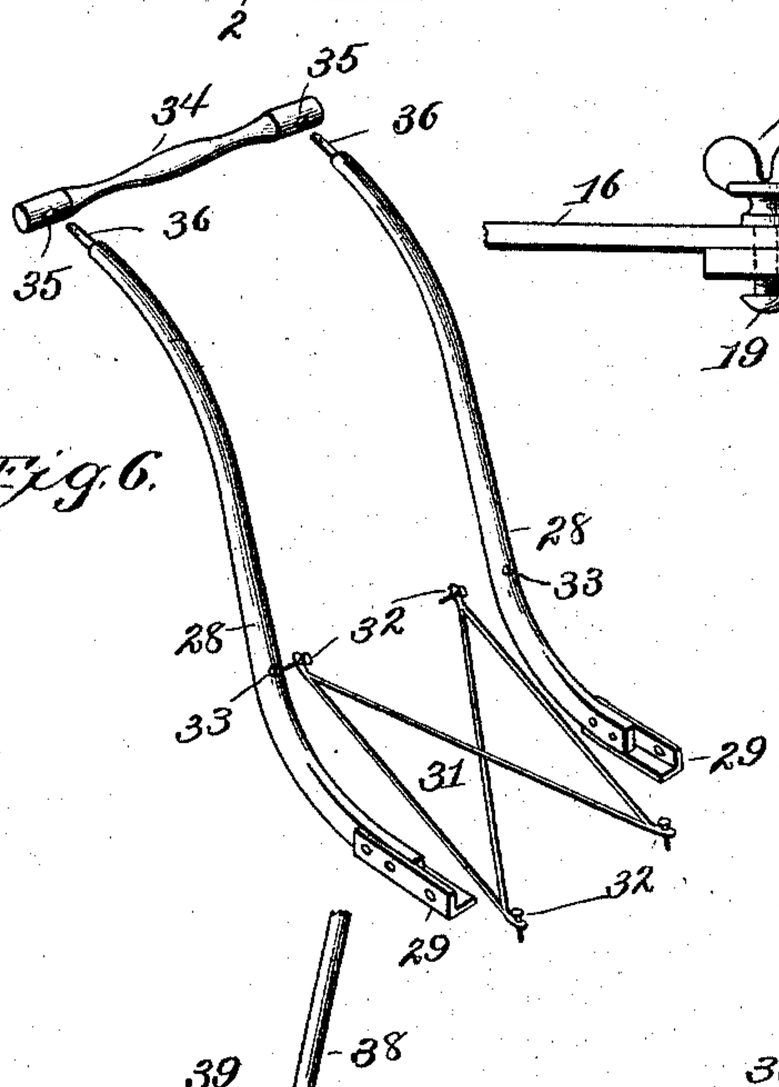


Fig. 7.

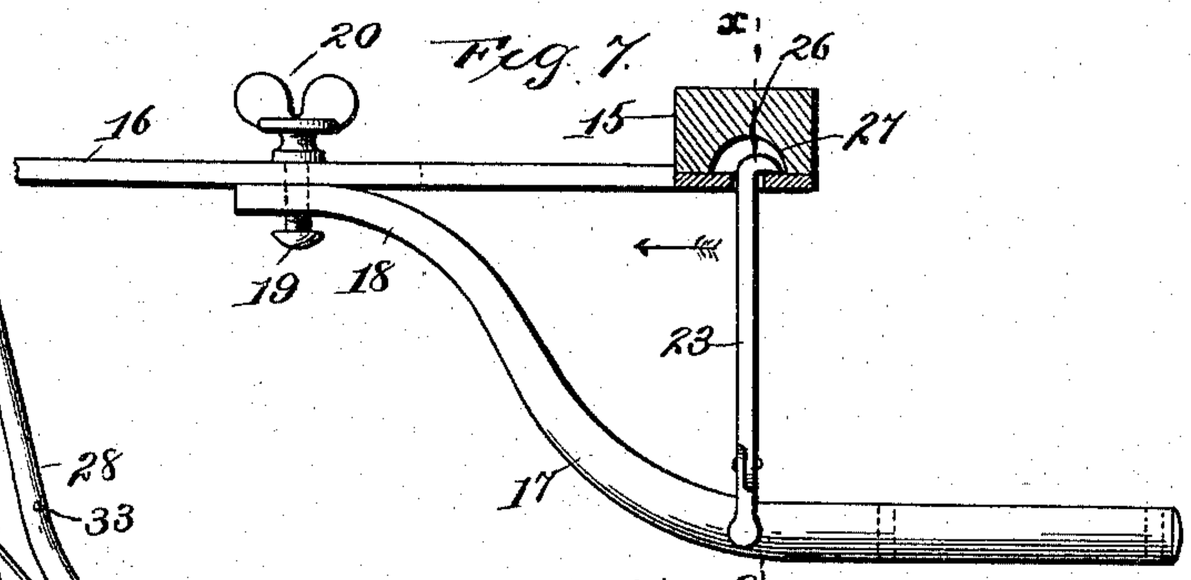


Fig. 8.

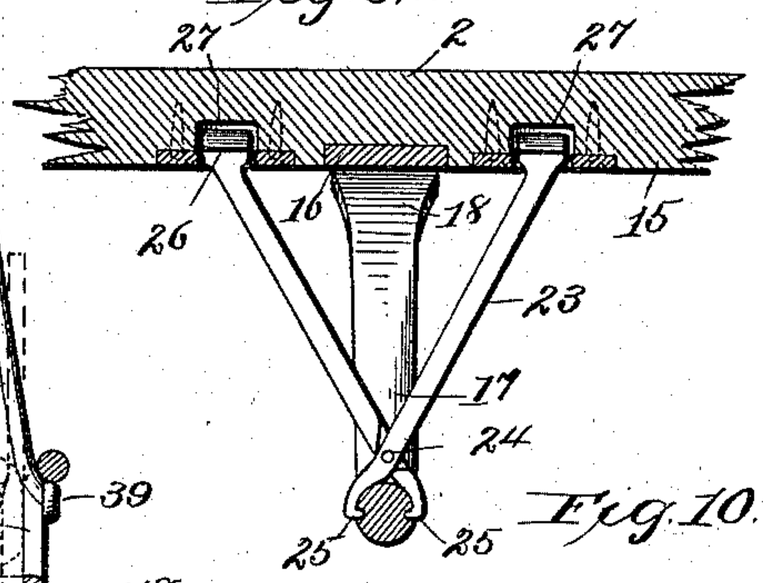


Fig. 9.

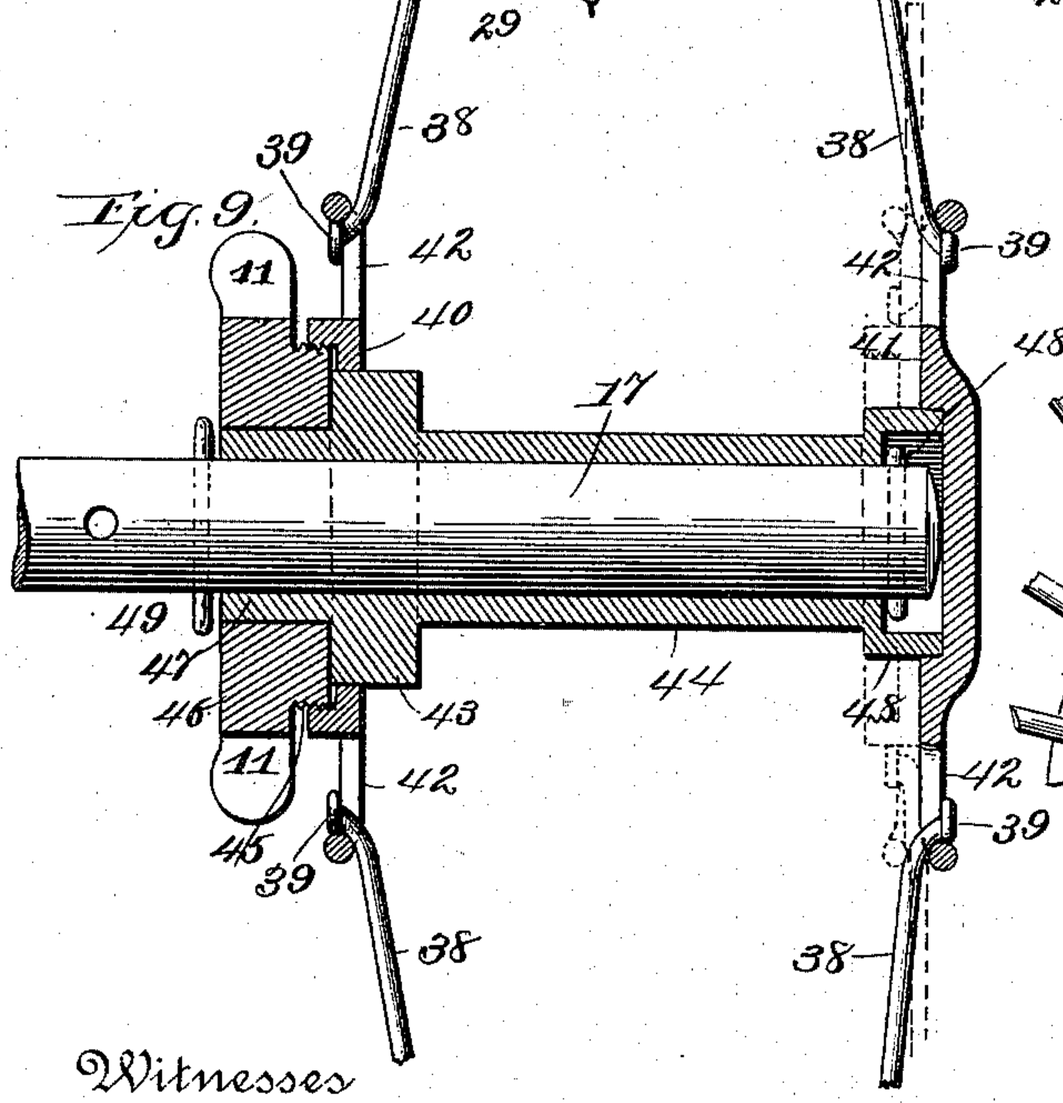
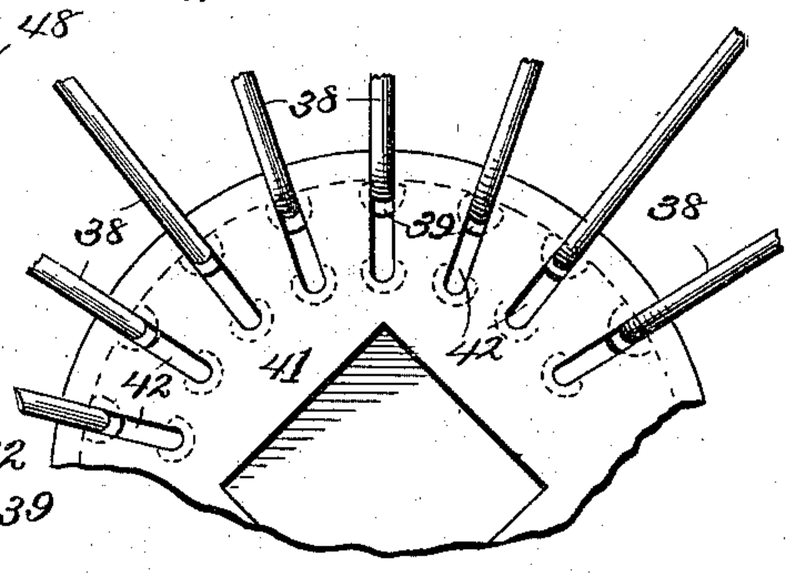


Fig. 10.



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UNITED STATES PATENT OFFICE.

FREDERICK HEPPNER, OF NEW YORK, N. Y.

FOLDING CARRIAGE.

SPECIFICATION forming part of Letters Patent No. 571,228, dated November 10, 1896.

Application filed June 1, 1896. Serial No. 593,720. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK HEPPNER, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Collapsible and Folding Carriages, of which the following is a specification.

My invention relates to a new and useful improvement in collapsible carriages, and has for its object to provide a device of this description which, when in use, will have the general appearance of an ordinary carriage and differ therefrom in no essential feature, and yet when occasion requires may be folded into a small compass for transportation or storing A further object is to effect this change in a quick and simple manner.

With these ends in view my invention consists in the details of construction and combination of elements hereinafter set forth, and then specifically designated by the claims.

In order that those skilled in the art to which this invention appertains may understand how to make and use the same, I will describe its construction and operation in detail, referring to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a central longitudinal section of a carriage embodying my improvement when the several parts thereof have been placed into position to produce the ordinary carriage. Fig. 2 represents the general appearance of my improvement when folded for transportation or storing; Fig. 3, an end view of the body; Fig. 4, a detail perspective showing the method of securing the foot-board and sides of the body together; Fig. 5, an enlarged detail section showing the method of securing the foot-board to the bottom of the body; Fig. 6, a detail perspective of the handles. Fig. 7 is a detail elevation of one of the detachable axles, showing the method of securing it to one of the side-bars and the metallic cross-bar; Fig. 8, a similar section at the line $x\,x$ of Fig. 7 looking in the direction of the arrow; Fig. 9, a detail section of the hub of one of the wheels, illustrating the method of securing the same upon its axle; and Fig. 10, a side view of a portion of this hub.

Referring to these drawings in detail, 1 represents the body of the carriage, which is composed of a bottom board 2, sides 3, head 4, and foot-board 5. These parts may be of such shape as to produce any desired design or carriage when properly secured together, and the sides, and head and foot boards are attached to the bottom by a series of hooks 6, which are secured thereto in any convenient manner, the noses of which are adapted to enter the slots in the plates 7, said plates being attached to the foot-board, as clearly shown in Fig. 5, where one of these hooks and plates is illustrated in the manner of their initial engagement, it being of course understood that suitable recesses 8 are formed beneath the plates to receive the hooks when passed through the slots.

A number of lugs 9 project from the ends of each of the sides, head-board and foot-board, and when these parts are brought together the lugs are so positioned as to come in line with each other, when they are secured by the passage of the pins 10. These lugs may be formed with the several parts from which they project, and when the body of the carriage is made of cane or other suitable material the lugs may be formed by the proper interweaving of said cane. Thus to form the body from the several parts the sides are first attached to the bottom by bringing first one side and then the other into substantially the same horizontal plane with the bottom, engaging the hooks 6 with the plates 7, and swinging said sides upward and inward until the lower edges abut against the bottom, which will prevent further inward movement, and when the head and foot-boards have been similarly attached the several parts are secured rigidly together by the passage of the pins 10 through the holes in the lugs 9, as before described.

To the bottom of the body are attached in the usual manner the springs 14, the lower ends of which are also attached to the side-bars 15, which form a part of the truck-frame, and these bars are secured together parallel with each other by the metallic cross-bars 16. Thus the bottom of the body and the truck-frame are inseparable, and when the carriage is folded the several parts thereof fall within the dimension of this bottom and frame, as clearly shown in Fig. 2.

Four axles 17 are provided and are arranged

to be attached to or detached from the truck-frame by each having an upwardly-curved extension 18, through the upper end of which passes the bolts 19, having threaded on its end a thumb-nut 20. Slots 21 are formed in the cross-bars 16, and having enlargements 22, so that the nuts 20 may be passed through said enlargements, and when the axles are drawn inward the bolts 19 will pass into the slots 21, when they may be clamped by tightening said nuts, thereby securing the upper ends of the axles, the lower portions of which are rigidly connected to the side-bars 15 by the brackets 23, each of said brackets being composed of two levers pivoted together at 24 and terminating in jaws 25, adapted for engagement with suitable notches formed in each of the axles. The upper ends of the levers which compose the tongs terminate in hooks 26, arranged to engage with the plates 27, secured upon the side-bars by passing through suitable slots therein, recesses 27 being formed in said bars back of the plates to permit the entrance of the hooks.

To secure the axles to the truck-frame, the operation is to first engage the jaws 25 of one of the brackets with its axle, and then pass the hooks 26 into engagement with the plates 27 by turning them sufficiently sidewise, and then moving them inward to the perpendicular, and finally clamping the upper end of said axle to the cross-bar 16, as before described. Each axle having thus been secured to the truck-frame it will be seen that they will be firmly held in place until again detached by the reversed operation. The handles 28 are secured to this truck-frame by the angle-irons 29, which are permanently attached thereto and adapted to fit upon the ends of the side-bars 15, and there held by the passage of suitable pins 30; and in order that these handles may both be rendered rigid as respects to sidewise strain, and also securely held in their proper relative position to the truck-frame, I arrange a truss 31, which consists of two parallel wires and two wires running diagonally, which connect these parallel wires, and at their meeting-points are arranged the screws 32, which pass through suitable holes in suitable wires, two of which are adapted to be screwed into the holes 33 and the remaining two into holes formed in the side-bars, and for convenience these screws are so arranged as to remain with the truss-frame when the latter is removed from the handles. A handle-bar 34 is provided with threaded holes 35, by means of which the handles are attached thereto by screwing the threaded tips 36 within said holes, and this is done previous to the attachment of the handles to the truck-frame.

Each of the wheels consists of a rim 37, having the spokes 38 attached thereto in the ordinary manner, and these spokes have formed upon their inner ends heads 39, for the purpose next explained. 40 and 41 are disks having radial holes 42 formed therein, through which the inner ends of the spokes pass and are prevented from withdrawal by the heads 39. The disk 40 has a square opening through its center adapted to fit snugly upon the squared portion of the hub 44, and is also provided with an annular recess facing outward, which is threaded for the reception of the threads 45 of the nut 46, and said nut is provided with ears 11. The hub 44 is of tubular shape and adapted to fit over one of the axles 17, and is also provided with a tubular extension 47, upon which the nut 46 turns. The outer end of the hub is enlarged, as at 48, the perimeter of which enlargement is squared, the interior being circular. The disk 41 is provided with a squared recess adapted to fit over the end of the enlargement 48, and when so fitted the wheel is securely held to the hub by turning up the nut 46, which draws the plate 40 away from the plate 41, thereby drawing tension upon the spokes.

Each of the tubular hubs is held in place upon the axles by the pins 48 and 49. Thus when a wheel is to be secured to one of said hubs the disks 40 and 41 are passed over said hub, the enlargement 48 being of less diameter than the squared portion 43, thereby permitting the disk 40 to pass the enlargement 48 without hindrance, and when these disks are in proper place upon the squared portions of the hub they are there secured by the engagement of the threads of the nut 46 with the threads in the disk 40, as before described. The removal of the wheels from the axles is very simple, and requires but little time, in that it is only necessary to back off the nut 46, when the disks 40 and 41 will be free to be disengaged from the hub, and may be brought into contact with each other, thus reducing the thickness of the wheel, and this is permitted by the slots 42, in which the inner ends of the spoke slide, when the relation of the disk is changed.

The rear wheels of the carriage are preferably made somewhat larger in diameter than the front wheels, which permits the smaller to lie within the larger, and the diameters of the latter are such that they may lie upon the bottom board 2 of the body without extending beyond the edges thereof when the carriage is collapsed; and in collapsing the carriage the several parts thereof are so folded and arranged that all the loose members may be packed into the space between the bottom of the carriage and the truck-frame, and when thus packed they are covered with the canvas strips 50 and 51, there being two of the former secured to the inner surface of the bottom near the side edges thereof and two of the latter likewise secured near the ends of said bottom when the carriage is formed for use. These strips of canvas lie upon the bottom thereof, and there serve for a covering for the floor of the carriage, or may be concealed by suitable strips of carpeting superimposed

thereon, and when the carriage is collapsed any surface of the bottom of the body becomes the outer surface of the package.

The side strips 50 are drawn upward around the several parts contained within the package and passed beneath the side-bars 15, when their meeting edges are secured together by the strips and buckles 52, the end strips having previously been folded over the package and afterward secured in place by the strips and buckles 53, all of which is clearly shown in Fig. 2. When thus folded and secured, the package becomes a solid piece of package that can be safely shipped by railway or carried in the hand by means of straps and handles. (Not shown.)

In collapsing the carriage the operation is as follows: The parasol 54, which is of any ordinary construction and supported by the curved rod 55, is taken out. The pins 10, each made of wood or other suitable material, are withdrawn from the lugs 9, when the head and foot boards and sides of the body may be removed from the bottom by the disengagement of the hooks 6 from their plates, the seat of course having previously been removed and folded. The handles are next detached by removing the truss-frame 31 and the pins 30, and these handles may be disconnected from the handle-bar by unscrewing, as before described. The removal of the axles from the truck-frame is accomplished by unscrewing the thumb-nuts 20 and moving them toward the central enlargement 22 in the metallic cross-bars, then passing the thumb-nuts through these enlargements and pressing the wheel downward to disengage the hooks 26 of the brackets from their respective plates, after which these brackets are disengaged from the axles by their jaws being swung upon the pivot-points 24, as before described; and, finally, the four wheels are each removed from the axles, leaving the hubs and nuts 46 thereon, and by bringing the disks 40 and 41 in contact with each other these wheels are then ready for placing upon the bottom board of the body, after which all the detached parts are placed upon this board and covered and secured in place by means of the canvas strips, as herein before set forth.

I am aware that various designs may be produced and slight modifications might be made in the construction here shown and described without departing from the spirit of my invention; and I therefore do not wish to be limited to these details of construction, one modification of which might be in the substitution of hooks 26 for holding the brackets 23 to the side-bars 15.

Having thus fully described my invention, what I claim as new and useful is—

1. In a collapsible carriage, a body composed of a bottom having a head and foot board, and two sides adapted to be attached to or detached from said bottom, a truck-frame consisting of two side-bars and two metallic cross-bars, springs for connecting said truck-frame to the body, four axles adapted to be attached to and detached from the truck-frame, collapsible wheels arranged to be journaled upon said axles, and a pair of handles adapted for securement to the truck-frame before arranged, substantially as and for the purposes set forth.

2. In a collapsible carriage, the combination of a body composed of a bottom, a head and foot board, and two sides, each arranged for attachment to said bottom by means of hooks, a truck-frame, springs secured to said frame, and to which the bottom of the body is also secured, four axles, brackets, and screws for securing said axles to the truck-frame, tubular hubs journaled upon said axles, collapsible wheels adapted to be attached to and removed from said hubs, and handles arranged for attachment to and detachment from the truck-frame, substantially as and for the purposes set forth.

3. In combination with a running-gear of a carriage of the character described, a body consisting of a bottom supported by said running-gear by means of suitable springs, a head and foot board having hooks arranged upon their lower edges for engagement with suitable plates secured upon the bottom, two sides, each having similar hooks for engagement with like plates upon said bottom, lugs projecting from the meeting edges of the head and foot board and sides, pins for passing through suitable holes in said lugs, whereby the several parts are secured in position, substantially as and for the purposes set forth.

4. In combination with a running-gear of a carriage of the character described, a bottom board 2, supported by suitable springs carried by said running-gear, strips of fabric secured to said bottom, a head and foot board, each having hooks for engagement with suitable plates, secured upon the bottom, two side boards also having hooks for engagement with the plates upon the bottom, lugs projecting from the meeting edges of these last-named parts, pins for passage through suitable holes in said lugs, whereby the parts are secured in position, substantially as and for the purposes set forth.

5. In combination with a body of a carriage of the character described, the side-bars 15, springs 14, supported by said side-bars, and each in turn supporting said body, cross-bars 16, having slots and central openings therethrough, axles 17, bolts 19, carried by said axles, and adapted to pass through said slots, thumb-nuts for securing said bolts within said slots, brackets 23, each consisting of levers pivoted together and terminating in jaws, means for attaching said brackets to the side-bars, tubular hubs journaled upon said axles, wheels consisting of rims, spokes, and the disks 40 and 41, each of said disks adapted to fit upon the squared portions of said hubs, and nuts 46, for engagement with

suitable threads upon the disk 40, substantially as and for the purposes set forth.

6. In combination with a body of a carriage of the character described, the side-bars 15, springs 14, supported by said side-bars, and each in turn supporting said body, cross-bars 16, having slots and central openings therethrough, axles 17, bolts 19, carried by said axles and adapted to pass through said slots, thumb-nuts for securing said bolts within said slots, brackets 23, each consisting of levers pivoted together and terminating in jaws, and means for attaching said brackets to the side-bars, substantially as and for the purposes set forth.

7. In combination with the truck-frame of a carriage of the character described, four axles having upwardly-curved extensions 18, said extensions being provided with bolts 19, thumb-nuts 20, run upon said bolts, brackets 23, each composed of two levers terminating in jaws for engagement with said axles, hooks formed with said levers, adapted to engage suitable plates secured upon the side-bars of the truck-frame, and collapsible wheels adapted to be journaled upon said axles, substantially as and for the purposes set forth.

8. A collapsible wheel consisting of a tubular hub adapted to be journaled upon a suitable axle, said hub having squared enlargements formed thereon, disks 40, and 41, each adapted to engage with the squared enlargements, and having radial slots formed therein, spokes having heads upon their inner ends for engagement with said slots, a rim to which the outer ends of the spokes are attached, a nose 46, having threads formed thereon for engagement with suitable threads formed upon the disk 40, whereby the wheel may be attached to or detached from the hub without removing the latter from its axle, as specified.

9. In a collapsible carriage the combination of a body, composed of a bottom, a head and foot board and two sides, each attached to said bottom by means of hooks, a truck-frame, springs secured to said frame, supporting the body, four axles, brackets, and screws for securing said axles to the truck-frame, tubular hubs journaled on the axles, collapsible wheels adapted to be attached to and removed from said hubs, handles arranged to be attached to and detached from the truck-frame, a handle-bar removable from said handles and a truss consisting of two wires running diagonally connecting the parallel wires, said truss being adapted to brace the handles as and for the purpose described.

In testimony whereof I have hereunto affixed my signature in the presence of two subscribing witnesses.

FREDERICK HEPPNER.

Witnesses:
S. S. WILLIAMSON,
R. M. PIERCE.