Sept. 15, 1931. G. I. CHITTENDEN 1,823,816

WHEELBARROW

Filed March 26, 1930 3 Sheets-Sheet 1

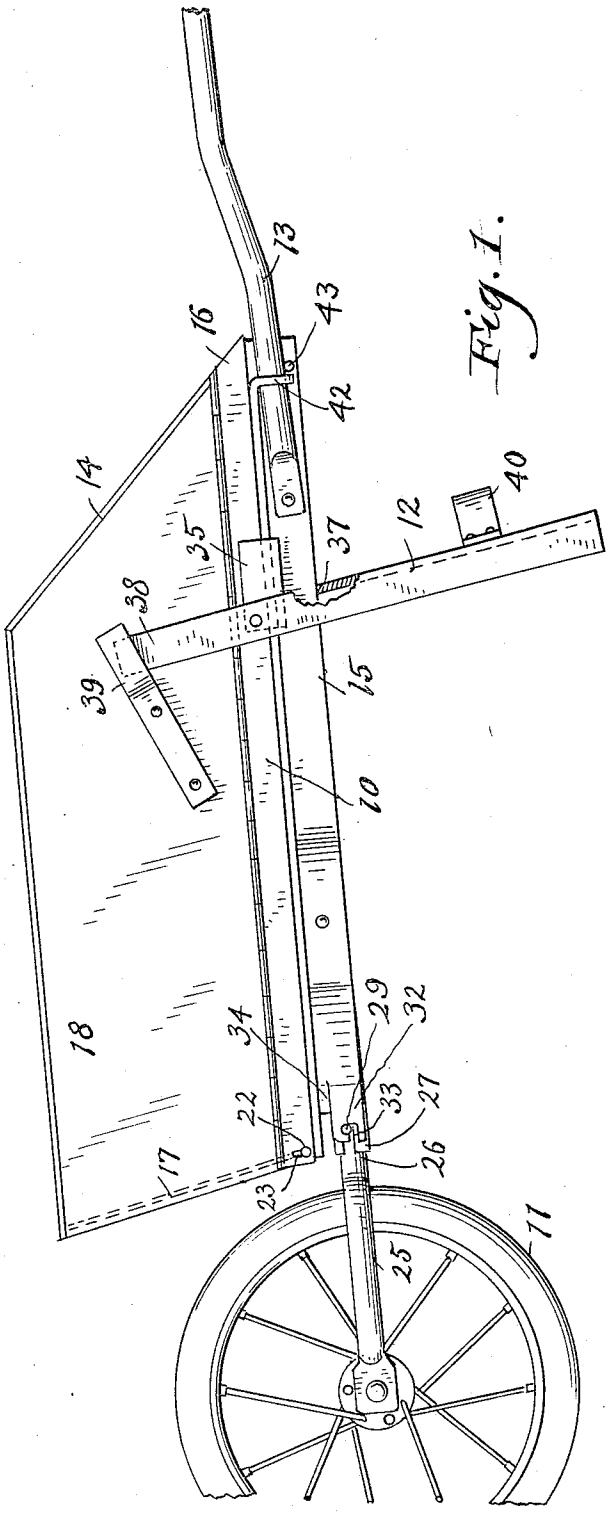


Fig. 1.

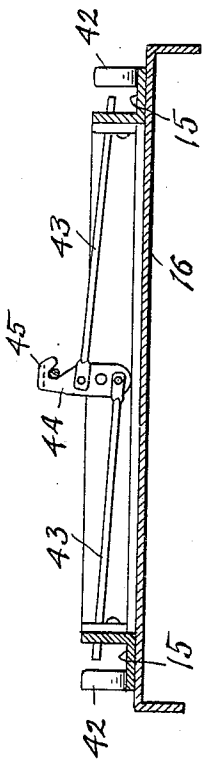


Fig. 6.

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Fig. 2.

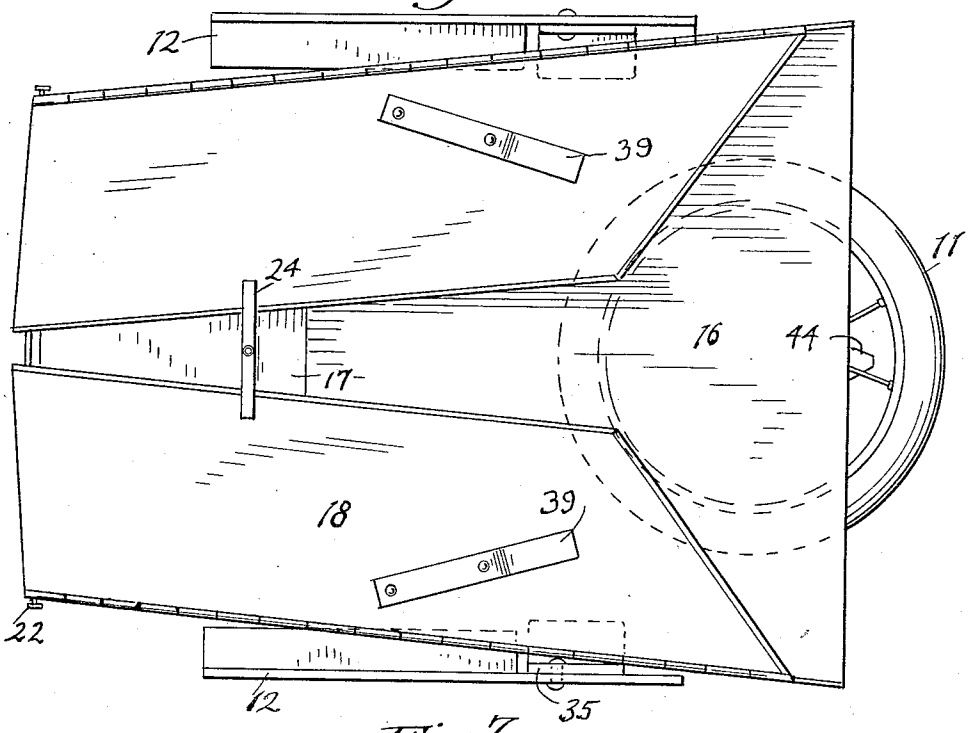


Fig. 7.

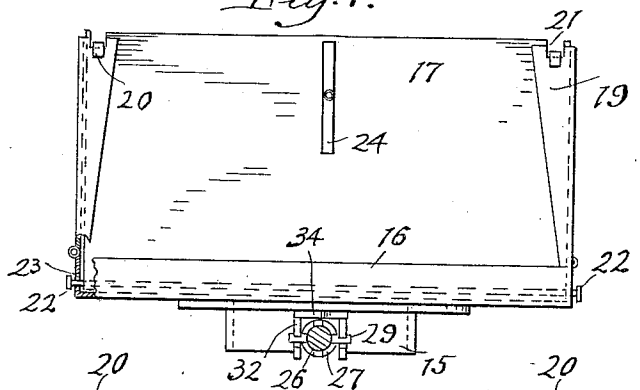
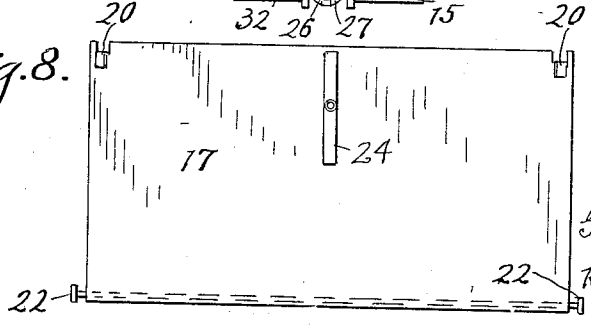


Fig. 8.



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Fig. 3.

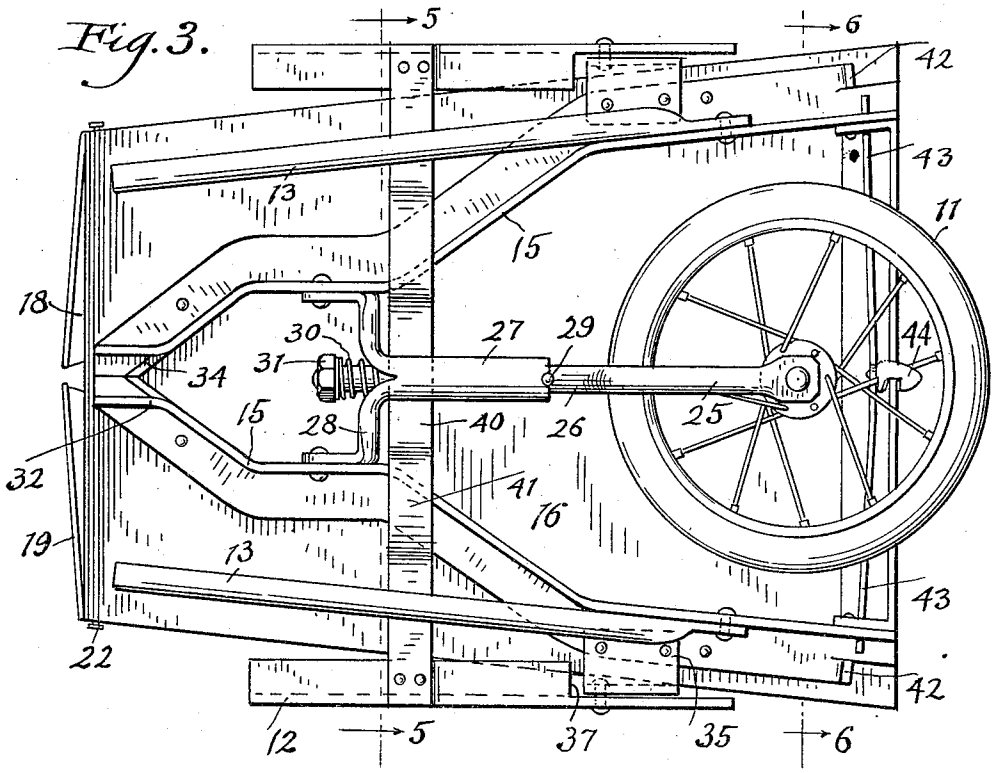
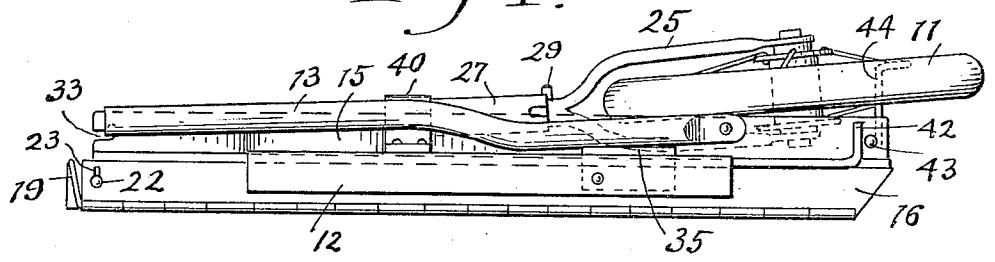


Fig. 4.



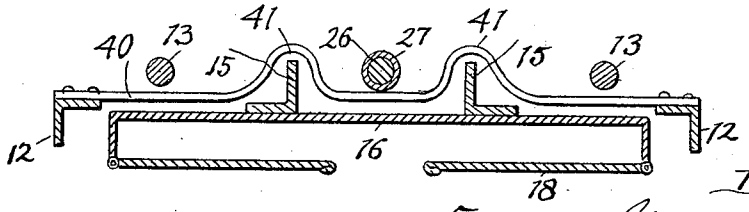


Fig. 5.

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Patented Sept. 15, 1931 1,823,816

UNITED STATES PATENT OFFICE

GEORGE I. CHITTENDEN, OF LAKEWOOD, OHIO

WHEELBARROW

Application filed March 26, 1930. Serial No. 438,971.

This invention relates generally to collapsible or folding structure, and more particularly to an improved form of folding wheelbarrow.

The irregular shape, and peculiar arrangement of the parts, of wheelbarrows are characteristics not conducive to a folding construction for these devices, and accordingly the folding wheelbarrows which have heretofore been proposed have generally been constructed with the parts thereof arranged to permit the wheel to be dismounted when the device is to be folded. A folding construction which necessitates mounting and dismounting the wheel is an unsatisfactory arrangement because these operations require time, he exercise of skill, and the use of tools. Folding wheelbarrow structures have also been proposed with complicated arrangements of hooks, braces or sliding parts arranged to hold the legs and handles in their load carrying positions, and to permit the folding of these members. These complex arrangements are likewise undesirable because of the increased manufacturing cost, and because of the difficulty in setting up or folding the device, and furthermore, in use are unsatisfactory because they lack rigidity.

It is therefore an object of this invention to provide an improved form of folding wheelbarrow having no loose parts, and which can be quickly and easily set up or compactly folded without the need of tools.

Another object of this invention is to provide a folding wheelbarrow having novel wheel mounting means whereby the wheel may be moved from a load carrying position to a folded position without being disconnected; and in which locking means is provided for releasably retaining the wheel in the load carrying position; and in which means is provided for transmitting the load from the body structure to the wheel mounting means independently of said locking means.

Another object of this invention is to provide a wheelbarrow having an improved form of folding leg construction.

Still another object of this invention is to provide a wheelbarrow having a novel arrangement of folding end and side boards.

A further object of this invention is to provide a folding wheelbarrow having novel means for retaining the handles in the load carrying position.

The invention may be further briefly summarized as consisting in certain novel combinations and arrangements of parts hereinafter described and particularly set out in the appended claims.

In the accompanying sheets of drawings,

Figure 1 is a side elevational view showing the folding wheelbarrow of my invention in the assembled condition.

Fig. 2 is a top plan view of my wheelbarrow in the folded condition.

Fig. 3 is a bottom plan view of the device in the folded condition.

Fig. 4 is a side elevational view of the device as shown in Fig. 3.

Fig. 5 is a transverse sectional view taken on line 5—5 of Fig. 3.

Fig. 6 is a transverse sectional view taken on line 6—6 of Fig. 3.

Fig. 7 is a front elevational view of the device with the wheel removed, and

Fig. 8 is a detached detail view of the front board.

In the drawings illustrating my invention I have shown a wheelbarrow composed of parts permanently connected together and so constructed and arranged as to permit the device to be compactly folded for storage or shipment. This wheelbarrow comprises a body structure 10 adapted to be supported at one end by the wheel 11 and at its opposite end by means of the legs 12 and handles 13.

The body structure may be of any desirable shape or form but, as herein illustrated, this structure comprises a box 14 to which longitudinally extending frame members 15 are secured. The box is constructed with a substantially pan-shaped bottom 16 to which the end board 17 and the side boards 18 are hinged. At their forward ends the side boards are provided with inwardly projecting extensions 19 which form abutments against which the end board 17 is adapted to rest. For retaining the end and side boards

in upright or assembled relation, I provide these members with suitable cooperating locking means. This locking means, as herein illustrated, may comprise hook-like projections 20 located near the upper edge and adjacent the ends of the front board 17 for releasable engagement in locking recesses 21 provided adjacent the tops of the abutments 19. To provide for movement of the end board relative to the abutments so that the projections 20 may be brought into cooperating relation with the recesses, I provide a floating pin 22 at the hinge connection between the lower edge of this board and the bottom 16. The ends of this hinge pin project laterally through slots 23 provided at the edges of the bottom so that the end board will have a limited up and down movement relative to the abutments, but of sufficient extent to permit the lugs 20 to be moved into and disengaged from the locking recesses of the abutments.

As shown in Fig. 2, the end and side boards can be swung inwardly to folded positions substantially parallel with the bottom of the box. In moving the boards to their folded positions, the end board is folded inwardly first, after which the side boards are folded inwardly over the end board. A latch 24 is pivoted on the end board and is so located on this member that it will be exposed between the edges of the side boards when the latter have been folded over the end board. When turned upon its pivot, this latch will engage the side boards and will retain all of the boards in their folded positions.

The wheel 11, which I have provided for supporting one end of the body structure, is mounted in a wheel fork 25 arranged to extend forwardly of the box to provide clearance for the wheel. This fork is constructed with a shaft portion 26 which is rotatably mounted in the tubular member 27. This tubular member is provided at one end with oppositely extending integral arms 28 which are pivoted to the frame members 15, and at its opposite, or free end, with opposed recesses in which the locking pin 29, carried by the wheel fork, engages. For yieldingly holding the pin 29 in engagement with the recesses in the tubular member I provide a coiled spring 30 which surrounds the shaft 26 and is compressed between the pivoted end portion of the tubular member and the nut 31 secured on the shaft. The pivotal connection of the tubular member with the frame members of the body structure permit the wheel mounting to be swung from its forward load-carrying position to a rearwardly extending folded position adjacent the bottom of the box, while the rotatable mounting of the wheel fork in the pivoted tubular member, permits the wheel to be turned from its load-carrying position with its plane substantially vertical, to a position with its plane horizontal or substantially parallel with the bottom of the box. The pin 29 engaging in the recesses of the tubular member, retains the wheel in the horizontal plane so that it will lie close to the bottom of the box while in the folded position.

When the wheel and the tubular member 27 are in the forwardly extending load-carrying position, this tubular member is received in the space provided between end portions of the frame members 15. These end portions are arranged to form a retaining means for holding the tubular member in axial alignment with the body of the wheelbarrow. In forming this retaining means angularly disposed flange portions of the frame members are cut for a portion of their length and are bent to provide the spaced abutments 32 between which the tubular member 27 is received. For retaining the wheel mounting means in its forwardly extending position, I provide locking recesses 33, in the ends of these abutments, in which the pin 29 releasably engages. It will be noted that the inner end portions of these locking recesses are angularly disposed upwardly with respect to their outer end portions so that the locking pin 29, which engages therein, will prevent movement of the wheel fork axially of the body structure. With this arrangement the weight of the body structure retains the pin 29 in engagement with the locking recesses so that the wheelbarrow can be safely moved in the backward direction without danger of releasing the wheel from the locked position. When the wheel and wheel mounting means is in this forwardly extending load-carrying position, the tubular member 27 bears against the abutment 34 formed by the meeting end portions of the frame members 15. The engagement of the tubular member with this abutment provides for the transfer of the load to the wheel mounting means independently of the locking pin 29.

At a suitable intermediate location on the body structure, I provide appropriate mounting means, such as the clips 35, to which the legs 12 are pivotally attached. In constructing these legs I prefer to use material having angularly disposed webs or flanges such as angle iron stock, so that by cutting out one of these flanges for a portion of the length of the leg, the remaining flange provides a flat portion which can be conveniently attached to the clip 35, and the cut-out flange provides the laterally extending shoulder portion 37. This shoulder portion engages under the body structure when the legs are in the load-supporting position so that the load is transmitted to the legs substantially independently of their pivotal connection with the clips 35. The legs are extended above their pivot points to provide end portions 38 which are adapted to engage under the lugs 39 secured

to the side boards for retaining these boards in an upright position. Near their lower ends the legs are preferably connected together by means of a horizontally extending brace 40. This brace is provided with bends 41 spaced apart a distance corresponding with the spacing of the frame members 15 so that when the legs are swung upon their pivots to a folded position adjacent the body structure, these bends will receive the frame members and permit the legs to lie close to the bottom of the box.

The handles 13, which I provide for supporting the rear end of the wheelbarrow, are pivotally connected to the body structure at a location rearwardly of the pivotal connection for the legs. The pivotal connection permits the handles to be swung from the rearwardly extending load carrying position shown in Fig. 1, to a folded position close to the bottom of the box as shown in Figs. 3 and 4. When in the load carrying position, the inner ends of the handles lie close to the depending webs of the frame members to which they are pivoted, and the handles are held against lateral movement in one direction by these webs. For retaining the handles against lateral movement in the opposite direction, I provide lugs 42 formed by bending portions of the frame members downwardly on the sides of the handles opposite the web to which they are pivoted. For retaining the handles in their load-carrying position between the depending portions of the frame members, I provide laterally movable latch pins 43 which extend under the handles to prevent them from dropping downwardly away from the bottom of the box.

For actuating the movable latch pins 43 simultaneously, I provide a pivoted actuating member 44 which, as shown in Fig. 6, is located substantially on the longitudinal axis of the body structure. The inner ends of the latch pins are eccentrically pivoted to the actuating member so that rotation of this member retracts or extends the latch pins, as may be desired. The lower end of this actuating member is constructed in the form of a hook 45 which engages a spoke of the wheel 11 for retaining the wheel in the folded position. This member thus serves as a means for actuating the latch pins 43, and also as a latch means for retaining the wheel in folded position.

While I have shown the frame members 15 as being continuous, it may be desirable to make the bottom 16 sufficiently rigid to permit intermediate portions of these frame members to be cut out so as to reduce the weight of the structure.

It will now be readily seen that I have provided a folding wheelbarrow construction in which all of the parts are permanently secured together for movement to their respective positions without being disconnected from each other. With the exception of the wheel tire all of the parts are made of metal so as to provide a strong and durable construction. The arrangement of parts which I have provided permits the device to be quickly and easily reduced to a compactly folded condition for storage or shipment, or to an assembled or set up condition to form a rigid and serviceable wheelbarrow. The operations of folding and assembling the device do not require tools of any kind, and furthermore require only ordinary skill and but slight exertion.

While I have shown and described the device of my invention in a detailed manner, it should be understood however that I do not intend to limit myself to these precise details of construction, but regard my invention as including such changes and modifications as do not involve a departure from the spirit of the invention and the scope of the appended claims.

Having thus described my invention, I claim:

1. In a folding wheelbarrow the combination of a body structure, oppositely curved metal frame elements secured to the bottom of said body with their forward end portions spaced relatively close together, handles for supporting one end of said body structure, a wheel for supporting the other end of said body structure, and movable wheel mounting means whereby said wheel may be swung from a load carrying position to a folded position adjacent the bottom of the body structure, said mounting means including a member pivoted to said forward end portions, and a wheel fork rotatable relative to said member.

2. In a folding wheelbarrow the combination of a body, handles for supporting one end of said body, a wheel for supporting the other end of said body, and wheel mounting means including a tubular member extending longitudinally of said body and having a locking recess in its forwardly extending end, a wheel fork rotatable in said tubular member whereby said wheel may be moved from a load carrying position to a folded position, means on said fork engageable with a locking recess provided on said body for holding said wheel in the load carrying position and engageable with the locking recess of said tubular member for holding said wheel in the folded position, and spring means for urging said means into selective engagement with said locking recesses.

3. In a folding wheelbarrow the combination of a body, handles for supporting one end of said body, a wheel for supporting the other end of said body, and wheel mounting means including a tubular member extending longitudinally of said body and having a locking recess in its forwardly extending end,

a wheel fork rotatable in said tubular member whereby said wheel may be moved from a load carrying position to a folded position, and means on said fork engageable with a locking recess provided on said body for holding said wheel in the load carrying position and engageable with the locking recess of said tubular member for holding said wheel in the folded position.

4. In a folding wheelbarrow the combination of a body structure, handles for supporting one end of said body structure, a wheel for supporting the other end of said body structure, movable mounting means whereby said wheel may be selectively positioned with respect to said body structure, cooperating locking means provided on said body structure and on said mounting means for retaining the wheel in the load carrying position, and an abutment on said body structure engageable with said mounting means whereby the load is transmitted to said wheel independently of said locking means.

5. In a folding wheelbarrow the combination of a body, members secured to the bottom of said body, handles pivoted to said members for movement from a load carrying position to a folded position, means for preventing lateral movement of the handles while the same are in the load carrying position, said means comprising portions of said members depending on opposite sides of said handles, and latch mechanism for retaining said handles in the load carrying position.

6. In a folding wheelbarrow the combination of a body structure, handles pivoted on said body for movement from a load carrying position to a folded position, laterally movable locking pins engaging said handles intermediate their pivots and their free ends for retaining said handles in the load carrying position, and means for simultaneously actuating said locking pins.

7. In a folding wheelbarrow the combination of a body structure, a wheel supportingly connected to said body structure for movement from a load carrying position to a folded position, handles pivoted on said body structure for movement from a load carrying position to a folded position, locking means for retaining said handles in the load carrying position, and means for actuating said locking means, said actuating means also serving as a latch for retaining said wheel in the folded position.

8. In a folding wheelbarrow the combination of a body structure having a bottom portion, an end board hinged to said bottom portion, side boards hinged to said bottom portion, inwardly extending forwardly inclined abutment means at the forward ends of said side boards adapted to be engaged by said end board, and locking elements carried by said end board and engageable with said side boards for retaining all of the boards in their upright position.

9. In a folding wheelbarrow the combination of a body structure having a bottom portion, side boards hinged to said bottom portion and having inwardly extending abutment means at their forward ends, said abutment means being provided with locking recesses, and an end board having locking means thereon engageable in said recesses for holding said end board against said abutment means.

10. In a folding wheelbarrow the combination of a body structure having a bottom portion, side boards hinged to said bottom portion and having inwardly extending abutment means at their forward ends, an end board adapted to bear against said abutment means, said end board and said abutment means being provided with cooperating locking means, and a floating hinge connection between said bottom portion and said end board whereby the latter may be moved for engaging and disengaging said cooperating locking means.

In testimony whereof, I hereunto affix my signature.

GEORGE I. CHITTENDEN.