Oct. 8, 1957 R. G. STROHMAIER 2,809,047

FOLDING CARRIER DEVICE

Filed Sept. 7, 1954 2 Sheets-Sheet 1

Fig. 1.

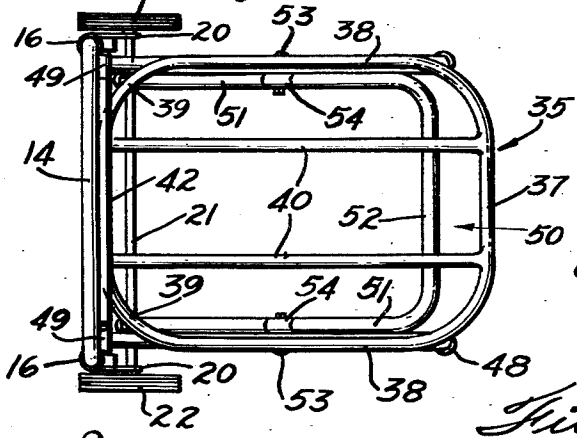


Fig. 4.

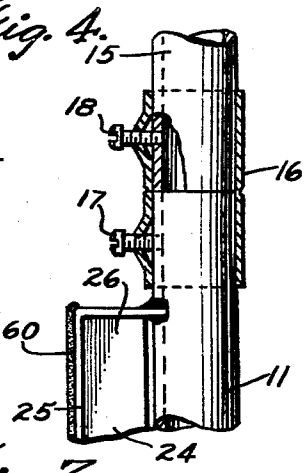


Fig. 2.

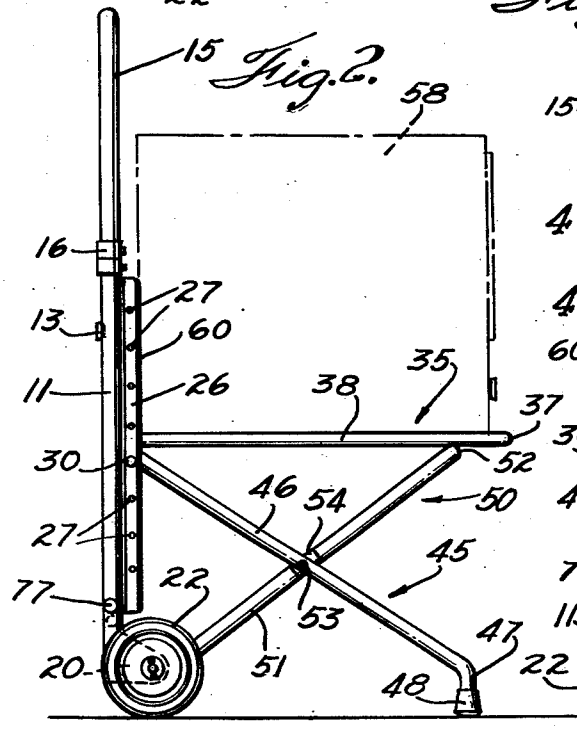
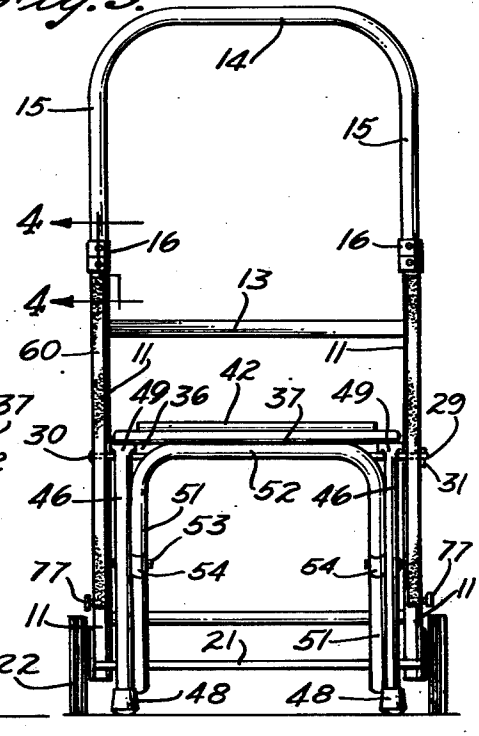


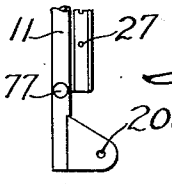
Fig. 3.



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Fig. 10.



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Oct. 8, 1957 R. G. STROHMAIER 2,809,047

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Filed Sept. 7, 1954 2 Sheets-Sheet 2

Fig. 5.

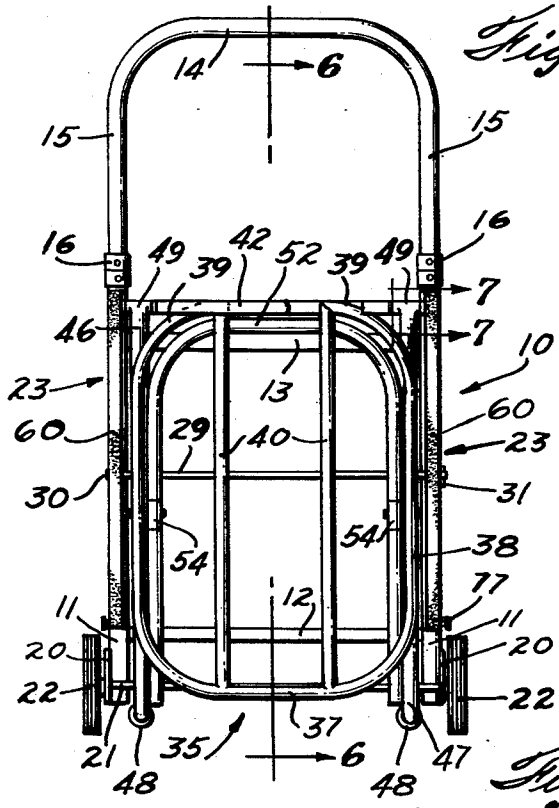


Fig. 6.

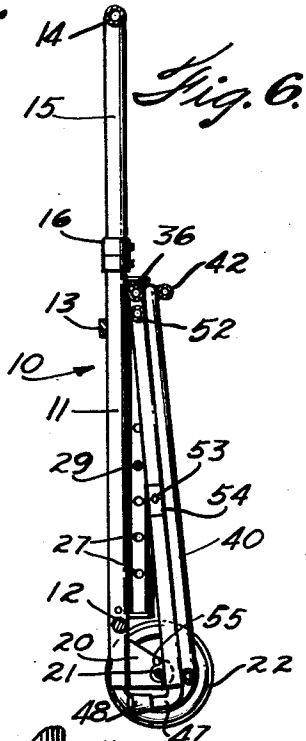


Fig. 7.

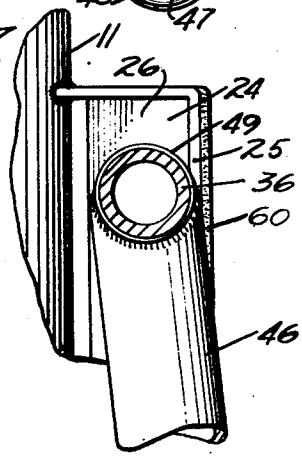


Fig. 9.

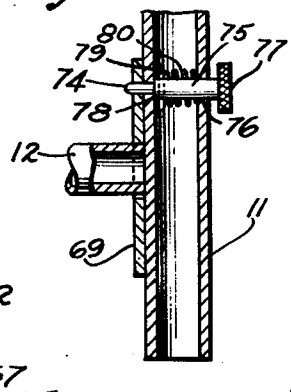
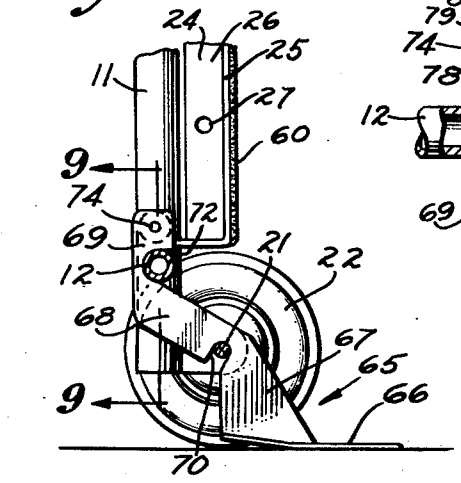


Fig. 8.



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2,809,047

FOLDING CARRIER DEVICE

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Application September 7, 1954, Serial No. 454,271

11 Claims. (Cl. 280—36)

This invention relates generally to handcarts for moving various, relatively heavy articles about, and relates more particularly to folding carts of this character.

While the present device is useful for moving a wide variety of articles, one use is in moving table model television sets, console types of television and radio sets, and the like, as when such sets are taken to a service shop for servicing and repair.

An object of the invention is to provide a handcart with which handling and moving relatively heavy or cumbersome articles is facilitated.

Still another object of the invention is to provide a device of this character wherewith fragile articles, or articles with fragile parts, may be safely handled and moved about.

A further object of the invention is to provide a device of this character wherein the article supporting portion of said device is adjustable for height.

A still further object of the invention is to provide a device of this character which may be readily used on stairways.

Another object of the invention is to provide a device of this character that may be readily folded into a flat compact shape so as to be readily stored in a small space.

Still another object of the invention is to provide a device of this character that is readily convertible for use when folded to move articles about.

A further object of the invention is to provide a device of this character that is simple and sturdy in construction.

A still further object of the invention is to provide a device of this character that is easy to handle.

Another object of the invention is to provide a device of this character that is relatively inexpensive to manufacture.

With these and other objects in view, as will appear hereinafter, the invention consists of certain novel features of construction, combination and arrangement of parts, and the characteristics and the advantages of the invention are further sufficiently referred to in connection with the following detailed description of the accompanying drawings which show one embodiment of said invention and for illustrative purposes only. After considering the illustrated example, skilled persons will understand that many variations may be made without departing from the principles disclosed; and it is contemplated the employment of any constructions, arrangements, and modes of operation that are properly within the scope of the appended claims.

Referring to the drawings:

Fig. 1 is a top plan view of the device in the unfolded position;

Fig. 2 is a side view of the same, showing in broken lines an article positioned on the article supporting portion;

Fig. 3 is a rear view of the device in the unfolded position;

Fig. 4 is an enlarged section taken on line 4—4 of Fig. 3;

Fig. 5 is a front view of the device in the folded position;

Fig. 6 is a sectional view of the same taken on line 6—6 of Fig. 5;

Fig. 7 is an enlarged sectional view taken on line 7—7 of Fig. 5;

Fig. 8 is an enlarged fragmentary view showing the supporting blade in position whereby the device may be used in the folded position;

Fig. 9 is a sectional view taken on line 9—9 of Fig. 8; and

Fig. 10 is an enlarged side view of one of the frame plates.

Referring more particularly to the drawings, the device is shown as comprising a main frame, indicated generally at **10** having a pair of parallel tubular side members **11**, there being a cross member **12** of tubular material adjacent the lower end of the frame and interconnecting said members **11**. Adjacent the top of the members **11** is a second cross member **13** which may be of any suitable shape but is shown as a piece of bar material. It is to be noted that the member **11** may be also of bar material of any other suitable material, said parts **12** and **13** being for reinforcing purposes. The upper ends of the members **11** carry a handle of generally U-shape which is also formed of tubular material. The handle comprises a transverse member **14** which closes the U and parallel arms **15** which are spaced apart the same distance as the spacing of the members **11**. The handle is connected to the members **11** by means of collars **16** which are provided with a pair of screws **17** and **18**. The lower portion of each collar is received on the upper end of the respective members **11** and the collars are secured thereto by means of the screws **17**. The free end portions of the arms **15** of the handle are received in the upper portions of the collars **16** and are secured therein by means of the screws **18**.

Adjacent the lower ends of the frame members **11** are plates **20** which are secured to said members **11** by any suitable means such as welding, or the like, and which extend forwardly of said members. Aligned holes **20a** are provided in said plates for reception of a shaft **21** having end portions which project outwardly of said plates and on which are operably secured wheels **22** whereby the device may be rolled from place to place.

On the front side of each member **11** is a guide **23** formed of an angle iron. Each guide is provided with an end portion at each end which is turned toward the respective member **11** and secured thereto by means of welding or other suitable means. Thus is formed a channel **24** facing inwardly with respect to the frame **10**, one side **25** of the channel being spaced forwardly of the respective members **11** and forming the front wall of the channel. The other side **26** of the angle member forms the outer wall of the channel and the member **11** forms the rear. The guides extend from a point adjacent the upper ends of the members **11** to a point adjacent the lower ends and the sides **26** are provided with longitudinally spaced openings **27**. Respective openings in the sides **26** are aligned for reception of a bar **29** which extends across the frame **10**. The bar has a head **30** at one end and is secured in position by a cotter pin **31** secured at said other end in the well known manner.

A weight supporting frame, which may be termed the platform, is indicated generally at **35** and comprises a transverse tubular member **36** having the ends thereof received in the respective channels **24** so that said ends are slidable in said channels. A generally O-shaped member, including a forward transverse portion **37**, side portions **38** and inturned rear end portions **39** form the outside portion of the platform or frame **35**, the end portions **39** being disposed above the member **36** and secured thereto by any suitable means such as welding,

for example. Within the O are a plurality of members 40 which extend from front to rear of the frame 35, said members 40 having their forward ends secured to the part 37 of the O-shaped member and their rear ends secured to the respective ends of the parts 39. The members 40 may be secured to the respective parts of the O-shaped member by welding or other suitable means. On top of the end portions 39 is a transverse member 42 which is secured to the ends 39 by welding or other suitable means. It is to be noted that the transverse member 42 does not extend into the channels 24 but serves as a stop to limit rearward movement of articles placed on the platform 35.

There are a pair of forwardly extending legs, indicated generally at 45, each leg being formed of tubular material, or any other suitable material. Each leg includes a main portion 46 terminating at the forward end in a downwardly turned end portion 47 which may be provided with a rubber tip 48 of well known type, said tip having a socket in which the lower free end of the part 47 is received. The opposite end of the main portion 46 of each leg is provided with a transversely extending bearing 49 in which adjacent portions of the transverse member 36 is rotatably received.

A U-shaped platform support, indicated generally at 50, is provided and includes the side arms 51, spaced apart in parallel relationship relative to each other, and a front transverse part 52 connecting the arms 51 together. The arms 51 are pivotally connected, intermediate the ends thereof, to the portions 46 of the legs by means of bolts 53. It has been found effective to a better pivotal action between the legs and members 51 to provide a sleeve 54 on one of the pivoted parts. As shown, the sleeves are disposed on the arms 51 and have openings for reception of the bolts 53. The sleeves are positioned at the pivotal points to slightly space the adjacent parts from each other so that they do not rub on each other when the device is folded or unfolded. Adjacent the free end of each arm 51 is a clamp member 55 for clamping said end to the rod or axle 21. The clamps may be secured to the members 51 by means of bolts, not shown, welding, or any other suitable means.

When the device is unfolded the platform or frame 35 is positioned horizontally and is supported at the forward end by the transverse portion 52 of the frame 50, the members 40 resting on said portion 52. At the rear the platform is supported by the adjusting rod 29 which may be located in any desired aligned set of holes in the sides 26 to thereby position the platform in vertically adjusted positions. Figs. 1, 2 and 3 show the device in the unfolded position and in Fig. 2 a table model television set is indicated at 58 resting on the platform 35. When the device is to be moved about, it is tilted rearwardly slightly and moved about on the wheels 22 which are rotatable on the shaft 21.

To fold the device, the member 42 or member 36 may be grasped and pulled upwardly in the channels 24, it being noted that the member 36 is also rotatable in said channels as well as slidable. Upward movement of the member 36 in the channels causes the legs to be drawn toward the main frame 10 and the supporting frame 50 to be pivotally swung upwardly. When in the folded position the parts of the device assume the position as shown in Figs. 5 and 6.

In order to protect articles placed on the platform from being scratched, the forward face of each of the parts 25 may be covered with felt 60. If desired, the side of the member 42 facing the forward end of the frame 35 may also be provided with felt, not shown. This member 42 prevents articles sliding rearwardly from the frame or platform 35, particularly where the article supported on the platform is narrower than the space between the members 11.

Should it be decided to use the device in the folded position, a blade arrangement indicated generally at 65 is provided for detachable attachment. This device includes a forwardly projecting blade 66 adapted to extend across the front portion of the device for insertion under and lifting up of articles such as crates or the like. At each side of the blade 66 is an upturned part 67 from which is a rearwardly and upwardly inclined portion 68 terminating in an upstanding end portion 69. Adjacent the junction of the part 67 and portion 68 and opening downwardly is a notch 70 for reception of the shaft 21. The upstanding end portions are provided with forwardly facing notches 72 for reception of the transverse member 12 of the frame 10. Upwardly of the notch 72 is an opening in each upstanding member 69 for reception of a locking pin 74 of a releasable latching device. Each latching device includes a plunger 75 extending through an opening 76 in the respective member 11, the outer end of said plunger being provided with a knurled knob 77, the opposite end of said plunger carrying the pin 74 which is of reduced diameter with respect to the plunger 75 so as to provide a shoulder 78 which limits inward movement of the plunger. The plunger is also provided with a pin 79 extending transversely thereof adjacent the inner end. A spring 80 reacts between the pin 79 and the opposite wall of the member 11 to urge the plunger 75 inwardly. In order to release the blade device 65, the knurled knobs 77 are pulled outwardly to release said blade device by withdrawing the pins 74 from the openings provided therefor in the upstanding parts 69. In attaching the blade device it is also necessary to withdraw the pins 74 to place the device 65 in position, as shown in Fig. 8, and releasing the plungers 75 will permit the springs 80 to move the pins 74 into their respective openings in the parts 69.

I claim:

1. In a folding structure of the class described: a main frame comprising a relatively long frame structure, including a pair of side members and an inverted U-shaped top section, the transverse part closing one end of the U being a handle from which the parallel side arms depend and means releasably securing said arms to said side members; forwardly projecting plates at the lower ends of said side members, said plates having aligned openings therein; a shaft extending through said openings and projecting outwardly of the plates; wheels rotatably mounted on the end portions of said shaft at the outer sides of said plates; a guide on each side member of the main frame, each guide being located at the forward side of its respective side member and extending a substantial distance along said member, each guide defining an inwardly facing channel and having a plurality of longitudinally spaced openings therein, said respective openings in said guides being aligned; an article supporting frame having a transverse member from which the frame extends forwardly of the main frame, the ends of said transverse member being slidably and rotatably received in the channels of said guides; a stop member secured to the article supporting frame above and substantially parallel to said transverse member, said stop being shorter than said transverse member; means for adjustably positioning the article supporting frame for height, said means including a rod receivable in said aligned openings in the guides for limiting downward movement of the transverse member of said article supporting frame; a pair of legs having aligned openings intermediate the ends thereof, each leg being pivotally mounted on said transverse member and extending forwardly thereof, each leg including a downwardly extending end portion; a bracing frame of generally U-shape; means securing the ends of the arms of the U-shaped bracing frame to the shaft so that said bracing frame may swing on the axis of said shaft, the free end of said bracing frame supporting the free end of the article supporting frame when the device is unfolded; sleeves on said arms of the bracing frame intermediate the ends thereof, there being aligned openings through said arms and sleeves; and means received in said openings

and the openings in said legs for pivotally connecting said arms to the respective legs.

2. In a folding structure of the class described: a main frame comprising a relatively long inverted U-shaped frame structure, the transverse part closing the upper end of the U being a handle from which the parallel side members depend; forwardly projecting plates at the lower ends of said side arms, said plates having aligned openings therein; a shaft extending through said openings and projecting outwardly of the plates; wheels rotatably mounted on the end portions of said shaft at the outer sides of said plates; a guide on each side member of the main frame, each guide being located at the forward side of its respective frame side member and extending a substantial distance along said member, each guide defining an inwardly facing channel and having a plurality of longitudinally spaced openings therein, said respective openings in said guides being aligned; an article supporting frame having a transverse member from which the article supporting frame extends, the ends of said transverse member being slidably and rotatably received in the channels of said guides; a stop member secured to the article supporting frame above and substantially parallel to said transverse member, said stop being shorter than said transverse member; means for adjustably positioning said transverse member for height, said means including a rod receivable in said aligned openings in the guides for limiting downward movement of said transverse member; a pair of legs, each leg having one end pivotally mounted on said transverse member, each leg including an angularly extending free end portion forming a foot; a bracing frame of generally U-shape; means securing the free ends of the side arms of the U-shaped bracing frame to the shaft so that said bracing frame may swing on the axis of said shaft; and means pivotally connecting said side arms of the bracing frame to the respective legs intermediate their respective ends.

3. In a folding structure of the class described: a main frame comprising a relatively long inverted U-shaped frame structure closed at the top and having depending side members, forwardly projecting plates at the free ends of said depending side members of said frame, said plates having aligned openings therein; a shaft extending through said openings; wheels rotatably mounted on said shaft at the outer sides of said plates; a guide on each side member of the main frame extending a substantial distance along said member, each guide defining an inwardly facing longitudinally extending channel, one side of which is formed by the adjacent portion of the respective side member; an article supporting frame having a transverse member from which the article supporting frame extends, the ends of said transverse member being operably received in the channels of said guides; means for adjustably limiting downward movement of the transverse member in said guides; a pair of legs, each leg having one end pivotally mounted on said transverse member; a bracing frame of generally U-shape; means securing the free ends of the arms of the U-shaped bracing frame to the shaft so that said bracing frame may swing on the axis of said shaft; and means pivotally connecting said arms to the respective legs, said bracing frame and legs folding under the article supporting frame when the transverse member thereof is moved upwardly in said guides from a lower position.

4. In a folding structure of the class described: a main frame comprising a relatively long U-shaped frame structure; a transverse shaft; means securing said shaft to the side members of said U-shaped frame adjacent the free ends of said members; wheels operably mounted on said shaft; guides on said side members, said guides defining channels facing each other; an article supporting frame having a transverse member from which said article supporting frame extends, the ends of said transverse member being slidably and rotatably received in the channels of said guides; a pair of legs, each leg being pivotally mounted on said transverse member; a bracing frame of generally U-shape; means securing the ends of the arms of the U-shaped bracing frame to the shaft so that said bracing frame may swing on the axis of said shaft; and means pivotally connecting said arms of the bracing frame to the respective legs, and when the device is in the unfolded position, the transverse member is positioned in the guides toward the wheel carrying end of the main frame, the free ends of the legs being in the supporting position and the supporting frame being positioned so that the free end thereof supports the free end of the article supporting frame.

5. In a folding structure of the class described: a main frame comprising a relatively long frame structure having longitudinally extending side members and a handle adjacent the upper end; a shaft; means securing said shaft to said frame structure adjacent the lower end thereof; wheels operably mounted on said shaft; substantially vertical guides on said frame structure and at the lower end thereof; an article supporting frame having a member slidably and rotatably mounted in said guides and movable between an upper and a lower position; a pair of legs, each leg being pivoted on said member of the article supporting frame; a bracing frame; means pivotally securing one end of the bracing frame on said shaft so that said bracing frame may swing on the axis of said shaft; and means pivotally connecting said bracing frame to the legs intermediate the ends of the latter, said bracing frame being positioned to support the free end of the article supporting frame when said member of the article supporting frame is in its lower position, the legs then supporting said bracing frame.

6. In a folding structure of the class described: a main frame comprising a relatively long U-shaped frame structure, the transverse part closing one end of the U being a handle from which the parallel side members of said U depend; a transverse bar adjacent the lower end of said frame; forwardly projecting plates at the lower ends of said side members, said plates being below said bar and having aligned openings therein; a shaft extending through said openings and projecting outwardly of the plates; wheels rotatably mounted on the end portions of said shaft at the outer sides of said plates; a guide on each side member of the main frame, each guide extending a substantial distance along its respective frame member; an article supporting frame having a transverse member from which the article supporting frame extends, the ends of said transverse member being slidably and rotatably connected to said guides, said transverse member being movable between an upper and a lower position; a pair of legs, each leg having one end pivotally mounted on said transverse member; a bracing frame; means securing one end of said bracing frame to the shaft so that said bracing frame may swing on the axis of said shaft; means pivotally connecting said bracing frame intermediate the ends thereof to the respective legs intermediate the ends of the latter, said main frame, legs, bracing frame and article supporting frame being folded relatively flat; a transverse blade; upstanding members at the ends of said blade and toward the rear thereof, said upstanding members having notches in front and rear edges, the rear notches being adapted to receive the shaft and the front notches being adapted to receive said transverse bar of the main frame; and means for releasably securing the blade in position on said shaft and bar.

7. In a folding structure of the class described: a main frame comprising a relatively long frame structure having longitudinally extending side members and a handle adjacent the upper end; a shaft; means securing said shaft to said frame structure adjacent the lower end thereof; wheels operably mounted on said shaft; substantially vertical guides attached to the sides of said frame structure and at the lower end thereof; an article supporting frame having a member slidably and rotatably mounted

in said guides and movable between an upper and a lower position; a pair of legs, each leg being pivoted on said member of the article supporting frame; a bracing frame; means pivotally securing one end of the bracing frame on said shaft so that said bracing frame may swing on the axis of said shaft; and means pivotally connecting said bracing frame to the legs intermediate the ends of the latter, said bracing frame being positioned to support the free end of the article supporting frame when said member of the article supporting frame is in its lower position, the legs then supporting said bracing frame, the main frame, legs, article supporting frame and bracing frame being moved into the folded position when said member of the article supporting frame is moved to the upper position thereof.

8. In a folding structure of the class described: a main frame comprising a relatively long frame structure; wheels operably mounted adjacent one end of said shaft; guides on said frame structure and at the lower end thereof, said guides extending longitudinally of said frame structure; an article supporting frame operably connected to said guides and movable between an upper and a lower position; a pair of legs, each leg being pivoted relative to the article supporting frame; a bracing frame; means pivotally securing one end of the bracing frame adjacent the lower end of said main frame; and means pivotally connecting said bracing frame to the legs intermediate the ends of the latter, said bracing frame being positioned to support the free end of the article supporting frame when said member of the article supporting frame is in its lower position, the legs then positioned to support said bracing frame.

9. In a folding structure of the class described: a relatively long main frame structure; wheels operably mounted adjacent the lower end of said frame; substantially vertical guides attached to said frame structure at the sides thereof and at the lower end thereof; an article supporting frame having one end operably connected to said

guides, said end being movable between an upper and a lower position; a bracing frame; means pivotally securing one end of the bracing frame to said main frame adjacent the lower end of the latter; a plurality of legs pivoted to said article supporting frame and to said bracing frame, said bracing frame being positioned to support the free end of the article supporting frame when said end of the article supporting frame is in its lower position, the legs then supporting said bracing frame.

10. In a folding structure of the class described: a relatively long main frame structure; wheels operably mounted to said main frame structure adjacent the lower end thereof; guides extending longitudinally of said main frame; an article supporting frame having one end operably connected to said guides and movable between an upper and a lower position; a pair of legs, each leg being pivoted on the article supporting frame adjacent said one end thereof; a bracing frame; means pivotally securing one end of the bracing frame on said shaft so that said bracing frame may swing on the axis of said shaft; and means pivotally connecting said bracing frame to the legs, said bracing frame being positioned to support the free end of the article supporting frame when said one end of the article supporting frame is in its lower position, the legs then supporting said bracing frame, said frames and legs being drawn into the folded position when said one end of said article supporting frame is moved to the upper position thereof.

11. The invention defined by claim 10 wherein portions of said wheels extend rearwardly of said main frame structure.

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