

Nov. 10, 1953

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2,658,647

COLLAPSIBLE DUMPING BOX

Filed Aug. 6, 1948

3 Sheets-Sheet 1

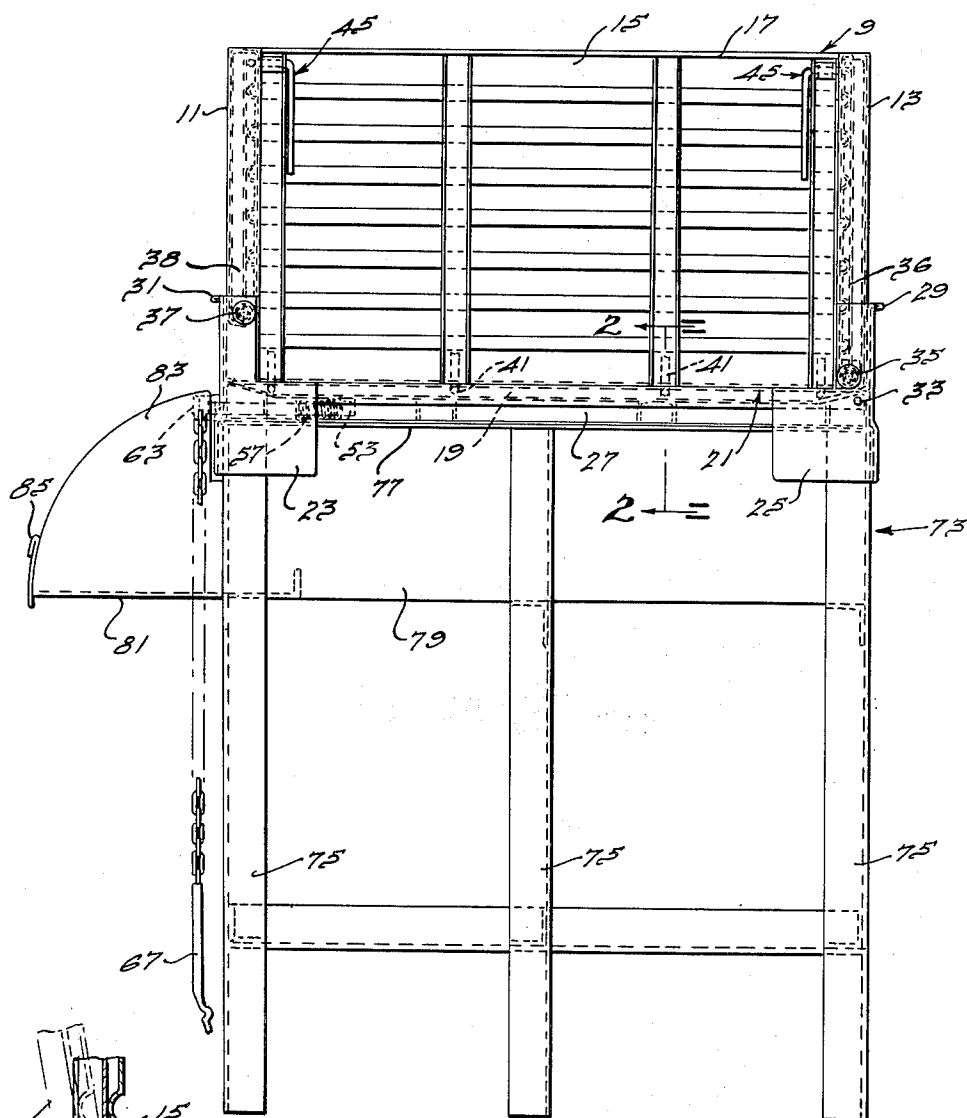


FIG. 1.

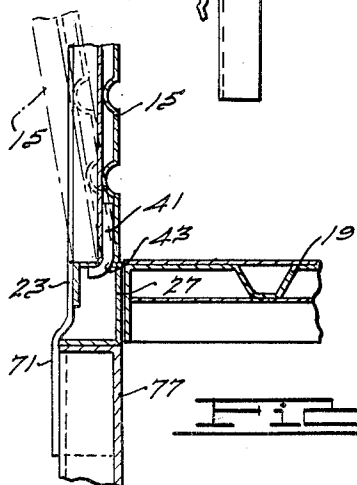


FIG. 2.

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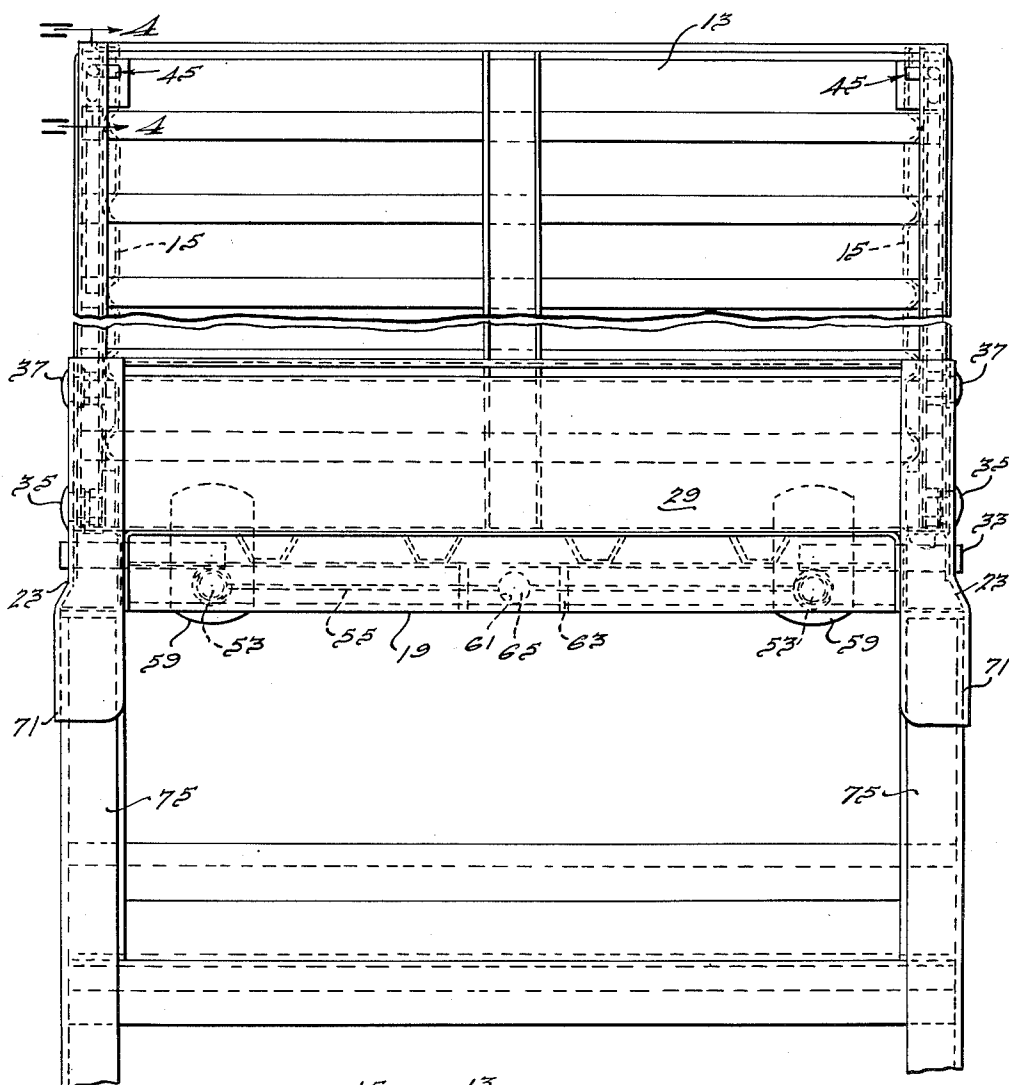
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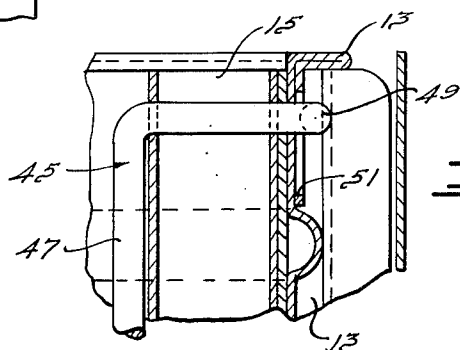
COLLAPSIBLE DUMPING BOX

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File 3.



Fi. 4.

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3 Sheets-Sheet 3

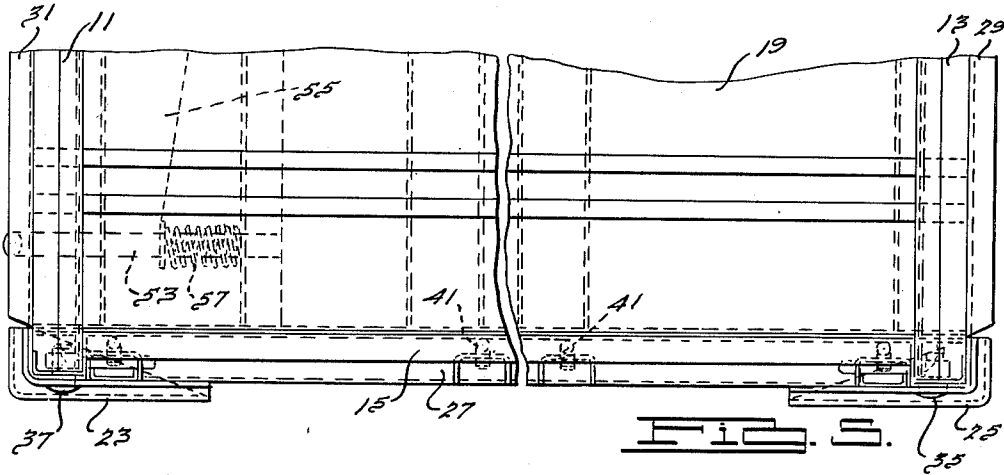
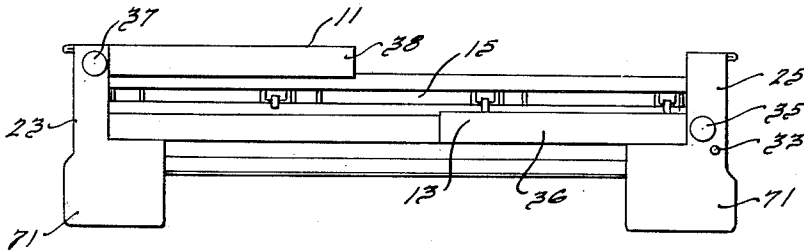


FIG. 6.

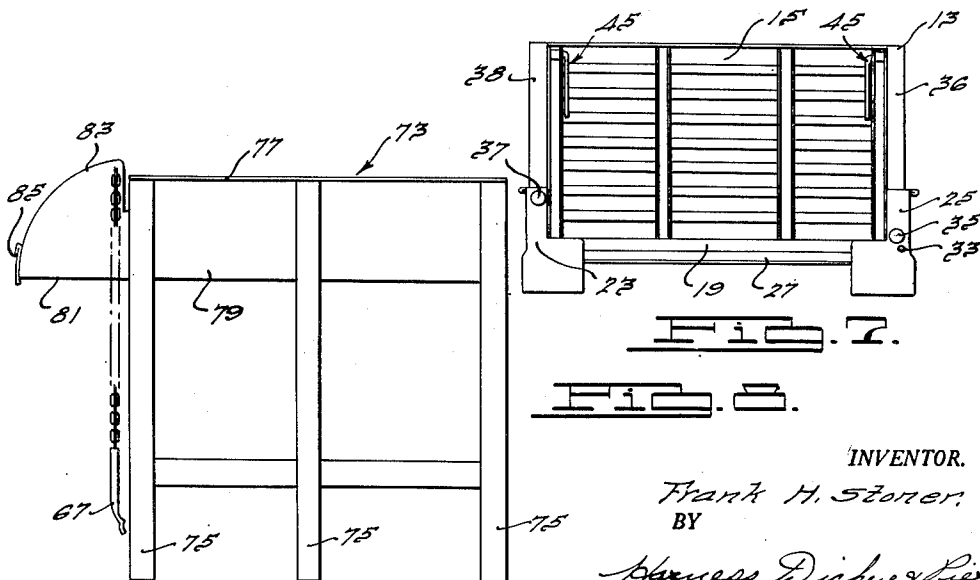


FIG. 7.

FIG. 8.

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2,658,647

COLLAPSIBLE DUMPING BOX

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Application August 6, 1948, Serial No. 42,918

4 Claims. (Cl. 222-185)

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This invention relates to a collapsible dumping box structure and to a combination collapsible dumping box structure and supporting stand therefor, and is an improvement over the co-pending patent applications of Brouwer D. McIntyre, et al., Serial No. 11,536, filed February 27, 1948, entitled Dumping Box, now Patent No. 2,596,908, dated May 13, 1952, and Frank H. Stoner, Serial No. 697,176, filed September 16, 1946, entitled Collapsible Box, now abandoned.

The aforementioned co-pending patent application of Brouwer D. McIntyre et al., illustrates a dumping box of the type having a bottom closure pivotally connected with the box portion adjacent the rear wall thereof for swinging movement toward and away from the box and incorporates a latch mechanism for holding the bottom closure in its upwardly swung closed position. The latch mechanism is releasable to permit the bottom closure to swing downwardly to an open dumping position. A supporting structure is also illustrated in this co-pending application for supporting the box portion on a supporting surface whereby to permit the entrance of the fork of a lift truck between a supporting surface and the bottom closure so that the bottom closure can be swung into its upwardly swung closed position by means of a lift truck or platform. The aforementioned patent application of Frank H. Stoner illustrates a collapsible box having removable side walls and inwardly foldable end walls so that the side walls can be stored between the collapsed end walls.

It can be readily appreciated that a dumping box structure is particularly advantageous and useful in supplying a large number of articles in convenient access, such as on the assembly line, or the like, i. e. a dumping box of the aforementioned type positions the articles for easy access by the user and eliminates the necessity of the user having to reach into the box in order to remove articles therefrom. Likewise, it can be readily appreciated that a collapsible box is advantageous in that it can be collapsed into a relatively small space for storing, shipping or the like, when it is not actually filled with material, or in use. The collapsible, self-contained dumping box of this invention combines the advantages of both a dumping box and a collapsible box and therefore provides the ultimate in material handling equipment of this type, in that the dumping box can be collapsed into a relatively small space so as not to take up much room when it is not in use.

The principal object of this invention is to

provide a dumping box of the aforementioned general type, in which the walls of the box may be collapsed into a relatively small space, thereby permitting the dumping box, when not in use, to be stored in a minimum of space.

Other objects of this invention are, to provide an improved structure for supporting the box above a supporting surface so that the fork of a lift truck may be inserted between the box and supporting surface from any side thereof, in order to lift the box and may also be inserted between a supporting surface and the bottom closure of the box, when the latter is in its downwardly swung open position, so as to swing the closure to its upwardly swung closed position; to provide an improved supporting structure of the aforementioned type, which includes corner posts of a size and shape which will permit a plurality of dumping boxes to be stacked one on top of the other when the box is in either its collapsed or erect position; to provide supporting structure of the aforementioned type, which collapsibly supports the walls of the box, pivotally supports one end of the bottom closure and carries keeper means for releasably retaining the bottom in its closed position; to provide a collapsible dumping box of the aforementioned type, in which the walls are releasably interconnected so as to provide a box which is exceptionally strong and durable, while at the same time collapsible and relatively light in weight; to provide a supporting stand, upon which the collapsible dumping box may be supported, which is constructed so as to provide a ledge or shelf upon which material may be dumped from the box, as well as means which will co-operate with the bottom closure of the box, when the latter is in its downwardly swung open position, to provide a laterally enclosed chute which will direct the material from the box onto the stand ledge without any of the material spilling.

Other objects of this invention will become apparent from the following detailed description, taken in conjunction with the accompanying drawings, in which

Figure 1 is a side elevational view of the collapsible dumping box mounted on the supporting stand;

Fig. 2 is an enlarged sectional view of the structure illustrated in Fig. 1, taken along the line 2-2 thereof;

Fig. 3 is a fragmentary rear elevational view of the structure illustrated in Fig. 1;

Fig. 4 is an enlarged sectional view of the

structure illustrated in Fig. 3, taken along the line 4—4 thereof;

Fig. 5 is a fragmentary top plan view of the dumping box illustrated in Fig. 1;

Fig. 6 is a side elevational view of the dumping box in its collapsed position;

Fig. 7 is a side elevational view of the dumping box in its erected position; and

Fig. 8 is a side elevational view of the supporting stand.

Referring now to the drawings, it will be seen that the collapsible dumping box is indicated at 9, and includes front and rear walls 11 and 13 respectively, and side walls 15, all of which are preferably formed of corrugated sheet metal having a beaded upper edge 17. A bottom closure 19 is provided for the box. A supporting structure 21 supports the box in an elevated position above a supporting stand or other supporting surface and comprises front corner posts 23 and rear corner posts 25, which are interconnected by generally inverted channel shaped longitudinal members 27. The corner posts are generally L-shaped and extend both above and below the bottom of the box 9. The rear corner posts 25 are interconnected by means of a transverse vertical member 29, while the front corner posts are interconnected by means of a transverse vertical member 31. The bottom closure 19 is pivotally connected to the supporting structure 21, by means of pivot pins 33, supported in the corner posts 25 and the longitudinal members 27, adjacent the rear wall 13 of the box. The bottom closure can thus move between the longitudinal members 27 from its open to closed position and vice versa, and the longitudinal members aid in providing a laterally enclosed chute with said bottom when the latter is open, as will hereinafter appear.

The rear wall 13 is pivotally connected to the supporting structure rear legs 25, above the bottom closure pivot pins 33, by any suitable means, such as bolts 35, which extend through the legs 25 and inturred side flanges 36 on the wall 13. The front wall 11 of the box is pivotally connected to the supporting structure front legs 23 by means of bolts 37 which extend through legs 23 and inturred side flanges 38 on wall 11. It will be noted that the pivot bolts 37 for the front wall 11 are located further above the bottom of the box than the rear wall pivot bolts 35, for reasons which will hereinafter appear. The side walls 15 of the box are detachably or collapsibly connected to the supporting structure 21 by means of a plurality of longitudinally spaced, depending hook like members 41, which are detachably received in openings 43 in the supporting structure longitudinal side members 27, as can be best seen in Fig. 2. The hook like members 41 secure the side walls to the supporting structure 21 against accidental displacement but permit the side walls to be removed from the supporting structure when it is desired to collapse the box, as will be hereinafter described.

In order that the box 9 may be substantially rigid when erected, means are provided for releasably interlocking the adjacent upper corners of the box walls. Any suitable locking means may be employed but for purposes of illustration, and as can be best seen in Fig. 4, the side walls 15 carry locking elements 45 at each end thereof. Each locking element 45 includes a handle portion 47 and a transversely extending locking portion 49 which extends through a slot 51 in either the front or rear wall 11 or 13, adjacent thereto. The locking elements may be turned so that the

locking portions thereof either engage the adjacent wall and rigidly interconnect the side walls with the front or rear walls, or are in alignment with the slots 51 in the front and rear walls so that they can be pulled outwardly therethrough, in order to disconnect the upper ends of the side walls from the front and rear walls.

In order to releasably retain the bottom closure 19 in its upwardly swung closed position, suitable latch means are provided. The latch means may be of any suitable type but are preferably of the type illustrated and described in the aforementioned copending application of Brouwer D. McIntyre et al. The latch mechanism includes a pair of laterally spaced plungers 53, slidably supported in and extending through apertures in a cross member of the bottom closure, a connector plate 55 which ties the two plungers together for co-ordinated movement, and a coil spring 57 on each plunger between the back face of the connector plate and the front face of an adjacent bottom closure cross member. The coil springs normally urge the plungers forwardly and the forward movement of the plungers is limited by the engagement of the connector plate with the bottom closure. The outer ends of the plungers are adapted, when the bottom is in its closed position, to be received in and project through apertures in keeper plates 59 which are welded or otherwise suitably secured to the supporting structure front transverse member 31. Thus, even though the front box wall is collapsed the latch mechanism can engage the keepers so that the bottom will be releasably held in its closed position.

An aperture 61 is provided in the front cross member of the bottom closure and a guard or bracket 63, including front and side walls, is welded over the aperture. A pin 65 projects through the aperture 61 and into the confines of the guard 63, and the inner or back end of the pin 65 is connected to the connector plate 55. Therefore, by inserting a tool 67 into the space between the rear wall of the guard 63 and the outer end of the pin 65, the pin can be moved rearwardly and will move the plungers rearwardly against the action of the coil spring 57, thus withdrawing the forward end of the plungers from the keeper plates 59 and permitting the bottom closure to drop down into its open or dumping position. When the bottom closure is raised to its upper closed position, the outer ends of the plungers will cam over the lower ends of the keeper plates 59 and will be forced rearwardly against the action of the springs 57 until they come into alignment with the apertures in the plates. The springs 57 will then force the forward ends of the plungers through the keeper apertures so as to releasably latch the bottom closure in its upwardly swung closed position.

When it is desired to collapse the box for storage, shipping or other similar purposes, the locking elements 45, carried by the side walls 15 at the upper end thereof, are disengaged from the front and rear walls 11 and 13. The side walls 15 are then removed from the supporting structure 21 by lifting them angularly upwardly and disengaging the hook like members 41 from the supporting structure longitudinal members 27. The rear wall 13 is then folded inwardly until it lies flat upon the bottom closure 19. The side walls 15 are then placed flat on top of the inwardly folded rear wall and the front wall 11 is folded inwardly on top of the side walls. The box is then in the collapsed position

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illustrated in Fig. 6, wherein an exceptionally compact collapsed box is illustrated in which the turned flanges 38 on the opposite sides of the front wall 11 and the supporting structure 21 will prevent the sidewalls from becoming disengaged from the remainder of the box structure. Thus, by pivoting the front wall 41 farther above the box bottom than the rear wall 13, the side walls may be placed between the folded front and rear walls and the front wall will lie substantially flat and parallel to the bottom.

It should at this time be noted that the L-shaped corner posts 23 and 25 of the supporting structure have their lower edges bent outwardly as indicated at 71, by an amount such that the lower ends 71 of the posts may be fitted over the upper ends of like posts on other boxes, as well as over the upper corners of the walls of an adjacent like box, when the latter are in their erected position. Thus, a plurality of erected or collapsed boxes may be stacked one on top of the other and the boxes will be firmly retained in their stacked arrangement by the interfitting connection between the bottoms of the corner posts of one box and the tops of the corner posts or wall corners of an adjacent box.

It will also be appreciated that the corner posts support the box and bottom closure far enough above a supporting surface so that the fork of a lift truck may be inserted between the supporting surface and the bottom closure from all four sides of the box, in order to lift and move the latter. Likewise when the bottom closure has been dropped to its downwardly swung open position, the fork of a lift truck may be inserted between the rear corner posts 25 in order to engage the bottom closure and swing it to its upwardly swung closed position, prior to lifting of the box by the fork of the truck.

The supporting stand 73, which is illustrated in the drawings, includes legs 75 and spaced longitudinally extending top frame members 77. The longitudinal frame members 77 are formed with depending side plate portions 79, for reasons which will hereinafter appear. A ledge or shelf 81 projects forwardly of the leg structure 75 below the top of the supporting stand and substantially in line with the bottom edges of the depending plate portions 79. The ledge 81 is provided with opposed side walls 83 and a front end wall 85. The stand 73 is dimensioned so that the dumping box may be positioned thereon with enlarged portions 71 of the corner posts 23 and 25 fitting over and engaging the front and rear corners of the stand frame members 77, above the four corner legs 75. When the dumping box is so positioned on the supporting stand, the dumping box longitudinal members 27 will engage or be disposed just above the top surface of the supporting stand longitudinal members 77, as can be clearly seen in Fig. 2. Therefore, when the bottom closure 19 is released and swings downwardly to its dumping position, the dumping box longitudinal members 27 and the supporting stand longitudinal members 77 form, with the bottom closure, a laterally enclosed chute which is open at the front end thereof so that the material within the dumping box will slide along the inclined bottom closure and onto the ledge 81 between the side walls 83 and the front end wall 85 thereof, without any spilling of the material occurring. The material is then in a position for ready access by a user.

It will thus be appreciated that the collapsible dumping box structure of this invention is rela-

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tively simple in construction and provides a dumping box which can be collapsed and stored or shipped without taking up a large amount of space. It will likewise be appreciated that the novel supporting structure of the dumping box of this invention collapsibly supports the walls while at the same time supporting the bottom for pivotal movement and the latch keepers, so that all of the improved features of this box are obtained in a simple and efficient manner so as to provide the consumer with the ultimate in material handling equipment of this type.

What is claimed is:

1. A collapsible dumping box structure, including a box having opposed side walls and front and rear walls, a bottom closure for said box, structure for supporting said box above a supporting surface including post like members adjacent each corner of the box, longitudinal members connecting the adjacent front and rear posts, and a transverse member extending between and connected to said front post members, means pivotally connecting said bottom closure to said supporting structure adjacent the rear wall of said box, so that said bottom closure can swing toward and away from said box between said longitudinal members, means pivotally connecting said front and rear walls to said supporting structure, cooperating means on said side walls and supporting structure longitudinal members removably engageable to detachably connect said box side walls to said supporting structure longitudinal members and latching means, part of which is located on said supporting structure and part on said bottom closure for releasably retaining said bottom in its upwardly swung position as a closure for said box, said latching means being operable to release said bottom for downward swinging movement.

2. A self contained collapsible dumping box structure including a box having opposed collapsible walls, a bottom closure for said box, structure for supporting said box above a supporting surface including corner posts of such a size and shape as to fit over and nest with either the upper corners of the walls of a like box structure or the upper portions of the corner posts of a like box structure, so that one box structure may be stacked upon another whether said box structures are collapsed or erected, means pivotally connecting said bottom closure to said supporting structure adjacent the rear wall of said box so that said bottom closure can swing toward and away from said box, means collapsibly connecting said walls to said supporting structure, and latching means, part of which is located on said supporting structure and part on said bottom closure for releasably retaining said bottom in its upwardly swung position as a closure for said box, said latching means being operable to release said bottom for downward swinging movement.

3. A self contained collapsible dumping box structure including a box having opposed side walls and front and rear walls, a bottom closure for said box, structure for supporting said box above a supporting surface, means pivotally connecting said bottom closure to said supporting structure adjacent the rear wall of said box so that said bottom closure can swing toward and away from said box, means pivotally connecting said front and rear walls to said supporting structure so that said walls may be folded inwardly when it is desired to collapse said box, one of said walls being pivoted to said supporting

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structure further above the bottom of said box than the other of said walls, means detachably connecting said side walls to said supporting structure, whereby said side walls may be detached from said supporting structure and placed between the inwardly folded front and rear walls when said box is collapsed, and latching means, a part of which is located on said supporting structure and part on said bottom closure for releasably retaining said bottom in its upwardly swung position as a closure for said box, said means being operable to release said latching bottom for downward swinging movement.

4. A collapsible dumping box structure including a box having opposed side walls and front and rear walls, a bottom closure for said box, structure for supporting said box above a supporting surface, means pivotally connecting said bottom closure to said supporting structure adjacent the rear wall of said box so that said bottom closure can swing toward and away from said box, said supporting structure including post like members adjacent each corner of said box and longitudinal members connecting the adjacent front and rear posts and disposed adjacent the said bottom closure so that said bottom closure moves between said longitudinal frame members and so that said longitudinal frame members will cooperate with said bottom closure to aid in the provision of a laterally enclosed chute when said bottom closure is in its open position, means pivotally connecting said front

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and rear walls to said supporting structure and means detachably connecting said box side walls to said supporting structure longitudinal members.

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References Cited in the file of this patent

UNITED STATES PATENTS

	Number	Name	Date
10	909,615	Le Bauve	Jan. 12, 1909
	1,038,923	Mathy	Sept. 17, 1912
	1,619,784	Counts	Mar. 1, 1927
	1,626,369	Williamson	Apr. 26, 1927
	1,793,362	Graves	Feb. 17, 1931
15	1,881,822	McKelligon	Oct. 11, 1932
	2,221,504	Beasey et al.	Nov. 12, 1940
	2,440,056	McIntyre et al.	Apr. 20, 1948
	2,457,841	Smith et al.	Jan. 4, 1949
20	2,596,908	McIntyre et al.	May 13, 1952

FOREIGN PATENTS

	Number	Country	Date
	19,534	Great Britain	Sept. 10, 1904
	272,697	Italy	Mar. 18, 1930

OTHER REFERENCES

Page 7 of catalogue of the Turner System of Material Handling, issued by the Factory Service Co., 4615 North 21st Street, Milwaukee 9, Wisconsin, stamped Feb. 26, 1948. Copy in Division 52, U. S. Patent Office.