

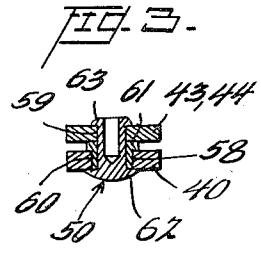
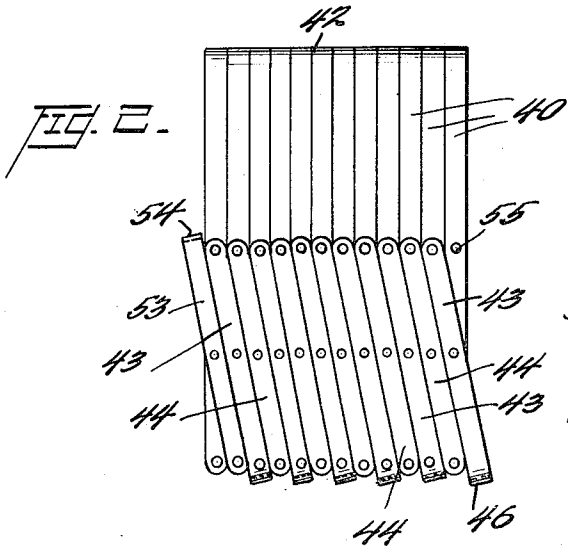
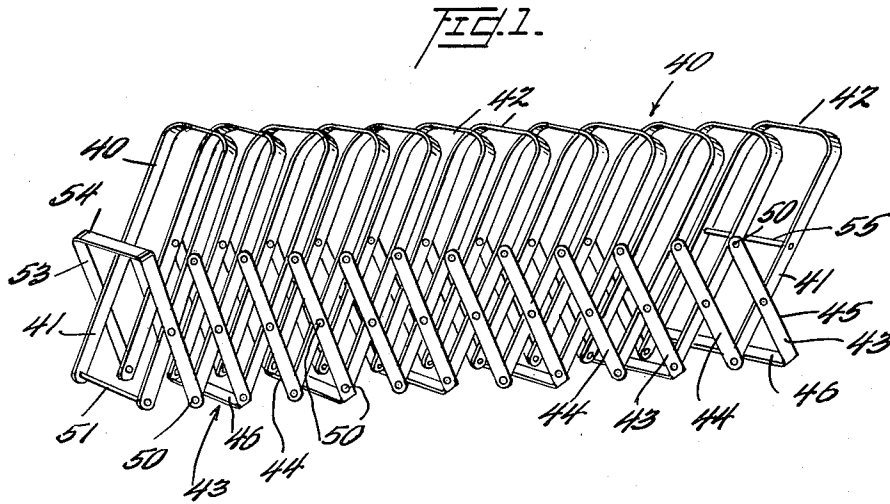
Sept. 25, 1951

L. W. EVANS  
COLLATOR RACK

2,568,996

Filed Oct. 7, 1946

3 Sheets-Sheet 1



Inventor

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By

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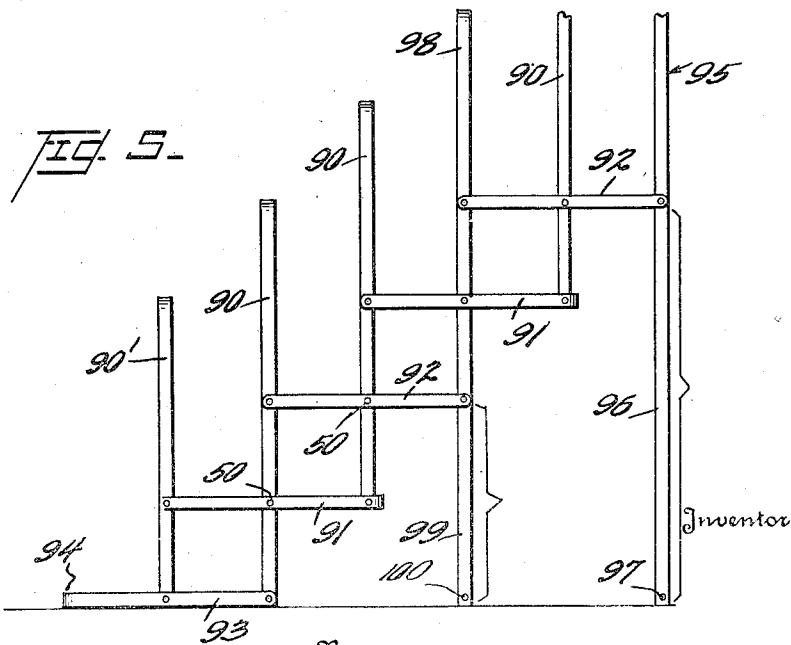
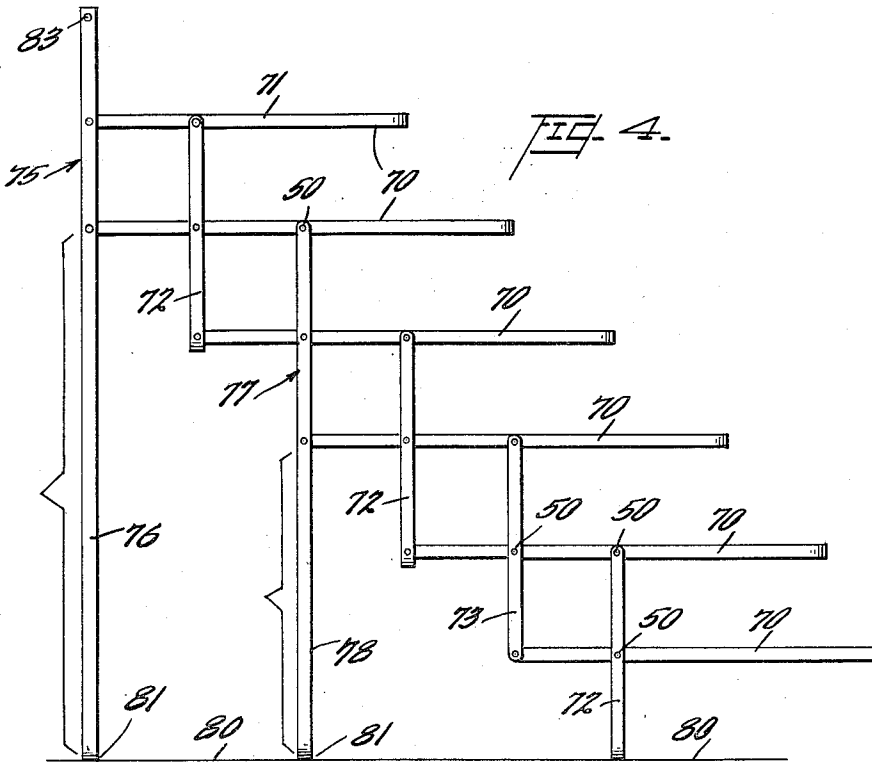
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3 Sheets-Sheet 2



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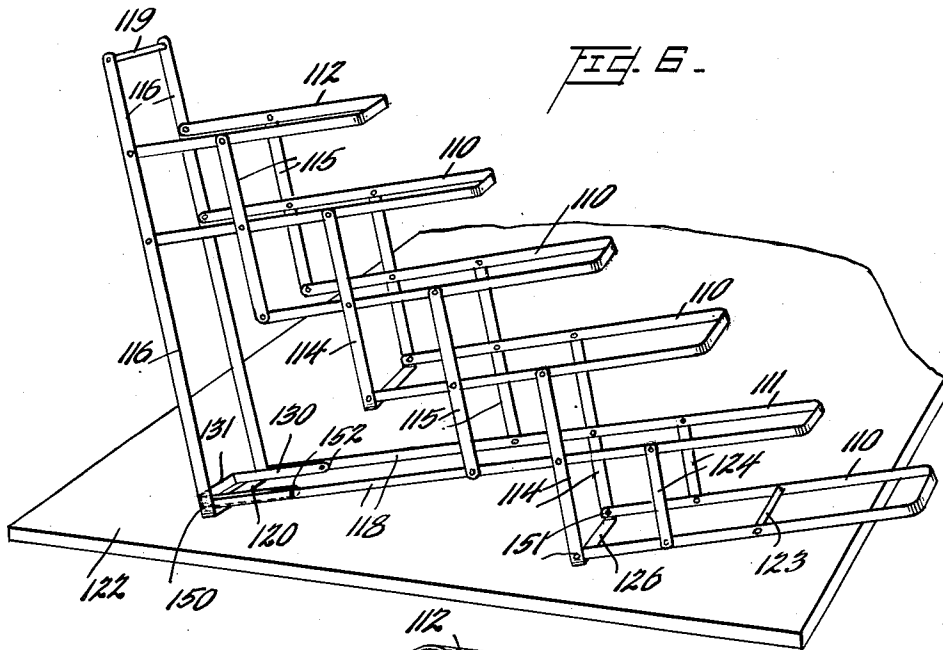


FIG. 7

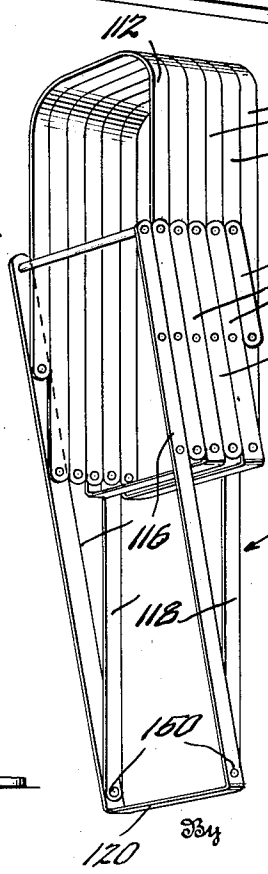
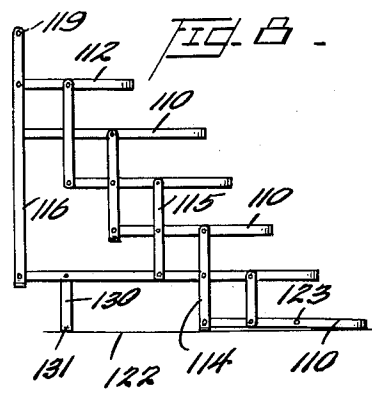
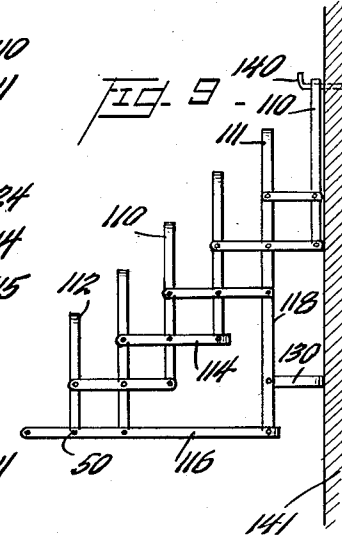


FIG. 8



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# UNITED STATES PATENT OFFICE

2,568,996

## COLLATOR RACK

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Application October 7, 1946, Serial No. 701,805

10 Claims. (Cl. 211-10)

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This invention relates to adjustable and collapsible racks and more particularly to racks of this description which are well adapted for holding sheet material, especially paper sheets or cards for sorting, gathering, collating, or like purposes.

This application is a continuation-in-part of my copending application Serial No. 501,716, filed September 9, 1943, now abandoned.

The general object of the invention is to provide a novel and improved rack of the class described, which is of sturdy and durable construction, comparatively simple and inexpensive to manufacture, and adapted for a wide variety of uses in filing, printing, binding, and general office procedures.

In its preferred embodiments the invention contemplates the provision of an extensible, collapsible, and adjustable rack embodying a lazy-tong structure and having a plurality of horizontal, vertical, or inclined partitions, leaves, or shelves which present a series of compartments in which papers or cards to be filed, sorted or collated may be received. The lazy-tong structure may be completely collapsed for shipment or storage, or it may be partly folded or collapsed for adjustment of size for the reception of contents of different grades and quantities. Also in some cases the rack may be partially folded together upon the papers or other articles in the compartments when they are to be stored or temporarily disposed within a filing cabinet, desk, or the like. In all of the embodiments of the invention the lazy-tong structure is fundamental, and in all cases the basic partition or leaf elements of this structure comprise U-shaped members or "wickets" of bowed or arched construction which extend upon the outward portion of the rack some distance beyond the points of pivotal connection with the other lazy-tong elements. The last named lazy-tong elements which perform a connecting function may or may not be of similar U-shaped configuration, depending upon the particular adaptation chosen.

It is within the purview of the invention to provide various means for pivotally connecting the lazy-tong elements, means for holding them in adjusted positions, and means for affording supplemental support for the rack when it is disposed in vertical, horizontal, or tilted positions.

Other objects and features of novelty will be apparent from the following specification when read in connection with the accompanying

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drawings in which certain embodiments of the invention are illustrated by way of example.

In the drawings,

Figure 1 is a view in perspective of a rack embodying the principles of the invention;

Figure 2 is a view in side elevation of the rack shown in Figure 1, but in collapsed condition;

Figure 3 is a transverse sectional view through one of the joints of the rack;

Figure 4 is a view in side elevation of another embodiment of the invention in which certain of the link or connecting elements forming parts of the lazy-tong structure, are extended to provide legs for supporting the rack so that the partitions or shelves are disposed horizontally for the reception of papers or the like;

Figure 5 is a view in side elevation of a modification in which others of the lazy-tong elements are extended to provide legs for supporting the rack for the reception of papers in vertical position;

Figure 6 is a perspective view of a further modification in which certain of the oppositely inclined lazy-tong elements are extended until they meet and are pivotally connected to provide a collapsible self-supporting rack with slightly tilted shelves or partitions;

Figure 7 is a view in perspective of a rack similar to the one shown in Figure 6, in collapsed condition;

Figure 8 is a view in side elevation of the rack shown in Figure 6 with the supplemental pivoted leg let down for support in true horizontal position; and

Figure 9 is a view in side elevation of the rack shown in Figures 6 and 8 adapted for suspension from a wall with the partitions in vertical position.

In Figures 1 and 2 of the drawings there is illustrated an embodiment of the invention which is of sturdy construction and which is completely self-supporting, thus dispensing with the need for supplemental separable cross connectors or latches. This rack is comprised essentially of the upwardly extended inverted U-shaped wicket elements 40 which are preferably made of narrow strip metal or equivalent material. These U-shaped wickets comprise partition members and include the side portions 41 and the top cross connecting portions 42. The cooperating elements which are pivotally connected with the basic partition-forming elements 40, to form the lazy-tong structure, comprise the alternate inverted U-shaped elements 43 and the pairs of oppositely disposed links 44. Of course all of

the cooperating elements could be formed as inverted U-shaped wickets with the side portions 45 and the bowed cross portions 46, but it is not necessary to cross-connect the rack at each lower point of pivotal connection; therefore, the alternately provided simple link elements 44 may be used.

As clearly disclosed in the drawings the link or connecting members 43 and 44 are considerably shorter than the partition forming members 40. The members 43 and 44, except at the extreme ends of the rack, are provided with openings at their upper, lower, and intermediate points. The members 40 are provided with openings at their lower ends upon each side thereof and are provided with openings spaced from the lower ends a distance substantially equal to the lengths of the connecting members 43 and 44. Other openings are provided in the side portions 41 of the members 40 to coincide with the intermediate openings in the members 43 and 44. At all points where these openings in the members 40 and in the members 43 and 44 register, they are pivotally connected as by means of the rivets 50.

At the forward end of the rack the foremost extended U-shaped wicket member 40 is provided at its lower end with a transverse rod 51 which connects the lower ends of its side portions 41. At this same end of the device the connecting link portion is comprised by an inverted U-shaped wicket member 53 having a top cross piece 54.

At the rear end of the rack the lower end of the last connecting element 43 is not provided with openings for pivotal connection, and the rearmost partition forming U-shaped member 40 is provided with a cross rod 55 at its intermediate point corresponding with the upper pivot points of the great majority of the lazy-tong forming elements. With the minor exceptions of the cross rods 51 and 55, which might well be omitted in many cases, the only cross-connections of the double lazy-tong rack are the cross portions 42, 46, and 54 of the standardized U-shaped wicket elements.

When this rack is collapsed it assumes the condition shown in Figure 2 of the drawings in which all of the inverted U-shaped wicket partition elements 40 are brought together into contact and the alternate link connecting members 43, 44, and 53 are also brought into close juxtaposition. Thus the rack may be compressed into a compact collapsed form for shipment or storage.

When in its open usable position as shown in Figure 1, the rack is maintained by the frictional contact of the many points of pivotal connection of the lazy-tong structures. One of these points is shown in detail in Figure 3 of the drawings. Certain of the members, for example the members 40, are provided with somewhat larger openings 58 than the corresponding openings 59 in the other elements 43, 44. A shouldered bushing 60 extends into the opening 58 and has a flange 61 interposed between the two lazy-tong elements. The central opening of the bushing 60 is of the same diameter as the opening 59 in the other elements and a rivet 50 passes through these registered openings. The rivet is provided with a preformed head 62 at one end and is spun or peened over as at 63 at its other end to securely hold the elements together at these pivot points. This pivotal arrangement provides sufficient friction to maintain the rack in any

open, closed, or intermediate position to which it may be adjusted, without the necessity of providing latches or other separable devices.

In Figure 4 of the drawings the basic lazy-tong structure with the partition elements extended outwardly in one direction is retained, however with the rack tilted from the position shown in Figure 1 to provide an inclined lazy-tong structure in which the shelves or partitions are horizontally disposed, the rack being maintained in such position by the extension of certain of the connecting link members to form elongated legs.

In this embodiment the principal partition members 70 corresponding to the U-shaped members 40 in Figure 1, are also of U-shaped construction and are extended to about twice the length of the lazy-tong portion thereof. The uppermost partition member 71 is somewhat shorter than the member 70 since it need not be extended beyond its first pivotal connection with the rearmost connecting element. As in the embodiment shown in Figure 1, the complementary lazy-tong-forming connecting elements 72 and 73 are U-shaped and of simple strap construction similar to the elements 43 and 44 in Figure 1. The foremost connecting link 72 rests upon the supporting surface and is of the short length corresponding to the extent of the lazy-tong connection. However, the rearmost connecting member 75 of the lazy-tong arrangement is extended vertically downwardly as at 76 to reach the supporting surface. Similarly an intermediate link 77 is extended as at 78 to rest upon the supporting surface 80. Both of these elongated elements 75 and 77 are of U-shaped configuration having a lower bowed construction 81, the side arms of the element 77 being pivotally connected to one of the partitions 70 in the usual way. The rearmost U-shaped supporting element 75 has its side arms preferably connected by a cross bar 83.

This form of rack is well adapted for filing, collating, or the display of merchandise in a horizontal position and may be collapsed to a smaller compass just as in the other cases.

A modification of the arrangement shown in Figure 4 is suggested in Figure 5 of the drawings. In this construction the compartments are vertically arranged with the inverted U-shaped elements 90 disposed in vertical position and connected in lazy-tong fashion by means of the links 91 and 92, the elements 91 being U-shaped to provide substantial cross-connection of the sides of the rack and the elements 92 being simple strip or link elements comparable to the partitions 44 in Figure 1. The lowermost cross connecting element which rests upon the supporting surface is a U-shaped member 93 having its cross bar 94 extending outwardly of the device. The first vertical U-shaped member corresponding to those designated 90 is indicated at 90' and is shorter than the elements 90 by the distance between two adjacent pivotal points 58. The rearmost U-shaped member of the device is designated 95 and is extended downwardly as at 96 to provide an elongated supporting leg for the rack, the side bars of the extension 96 being connected by a cross rod 97. Similarly, an intermediate one of the U-shaped partition members designated 98 is extended downwardly as at 99 and provided with a cross rod 100.

A very convenient rack of the same general features which characterize the present invention is shown in Figure 6 of the drawings. This

embodiment exhibits certain features which are employed in both of the embodiments illustrated in Figures 4 and 5, and the arrangement is such that the shelves or leaves of the device are disposed in generally horizontal position but slightly tilted for better display or retention of the sheets or other articles supported. In this embodiment the U-shaped partition or shelf elements are indicated at 110 with certain modifications of individual elements shown at 111 and 112. Alternating U-shaped and straight link-like connecting elements complete the lazy-tong structure, these connecting elements being indicated at 114 and 115 respectively, a modification of one of the connecting elements being designated 116.

The uppermost partition or shelf member 112 is somewhat shorter than the general run of partitions 110 and the next to the lowermost partition element differs from the standardized elements 110 by being elongated as at 118 rearwardly of the lazy-tong portion. The rearmost U-shaped connecting member 116 has its side arms joined at the top by the cross bar 119 and is provided with an integral cross portion 120 at the bottom, which rests upon the supporting surface 122. The rearwardly projecting ends 118 of the partition element 111 are pivotally connected to the side arms of the extended member 116 as at 150.

The lowermost shelf or partition member is provided with an intermediate cross bar 123 and is connected with the next higher partition member 111 by means of the short links 124. The rear end of the side arms of the lowermost member 110 are pivotally connected as at 151 with the lower side wall portions of the lowermost connecting member 114, and the cross bar 126 of this U-shaped connecting member 114 is adapted also to rest upon the surface 122.

In this way the shelf members 110, 111, and 112 are disposed in slightly inclined positions for better handling and display of the contents.

In Figure 7 of the drawings the rack, similar in most respects to the one shown in Figure 6 is shown in collapsed position in which the partitions 110, 111, and 112 are brought together into contact and the connecting members which go to complete the lazy-tong structure are also brought into contact. It will be seen that extensions 118 of the legs of the second shelf 111 converge toward the extended connecting link member 116 and intersect at the pivotal connecting points 150.

In Figure 8 of the drawings there is illustrated an alternative position for the rack shown in Figure 6. In this case the shelves are horizontally disposed, the rear portion of the rack being elevated by means of the supplemental leg comprising the pivotally supported U-shaped member 130, the arms of which are pivoted as at 152 to points along the extension 118 of the shelf 111 selected so that when the leg 130 is swung to idle position, as indicated in Figure 6, the rear portion 131 thereof will rest upon the cross strap 120 of the leg 116 and be retained in that position. In Figure 8 however, the leg 130 is swung over and downwardly so that its lower cross portion 131 rests upon the supporting surface 122. In this case the lowermost shelf 110 rests substantially upon the surface 122 throughout its length, and all of the shelves are disposed horizontally.

Still another utilization of the rack shown in Figure 6 is indicated in Figure 9 of the drawings. In this connection the rack is swung through an angle of 90° from the position shown in Figure 8,

and the lowermost partition 110 forms a loop which can be hung upon a hook such as indicated at 140, whereby the device may be attached to a wall or other vertical surface indicated at 141. In this case the leg 130 assumes the same extended position as shown in Figure 8 but is employed as a brace or abutment for holding the lower portion of the rack away from the wall.

A wide variety of uses of this rack will suggest itself to a printer, book binder, collator, or general office worker. The sheets, cards or other material may be inserted in the pockets or compartments of the rack in sorting or collating, and, if desired, papers or cards to be filed may be clamped within the partitions by a partial collapsing of the rack, whereupon the rack and its contents may be placed in a filing cabinet, desk, or other receptacle.

Various changes and modifications may be made in the embodiments illustrated herein without departing from the scope of the invention as defined by the following claims.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. An extensible and collapsible rack of the class described comprising, in combination, a series of continually parallel, bowed, arched, U-shaped, strap-like, wicket members each having a pair of legs spaced transversely of the rack, and a crossing arch portion extending from one leg to the other at the outward portion of the rack, said wicket members adapted to define between them compartments for the reception of articles when the rack is in an extended position, and means cooperating with said wicket members to provide upon the respective sides of the rack a pair of spaced parallel lazy-tong structures at the inward portion of the rack, said last named means including another series of continually parallel, bowed, arched, U-shaped, strap-like, wicket members, inverted with respect to said first named series and having their legs overlapping the legs of the members of the first named series, and means for frictionally pivotally securing said overlapping legs separately upon both sides of the rack at the plurality of points necessary to afford said lazy-tong structure, said last named means comprising friction hinges, the pintles of which project transversely no further than necessary to connect the overlapping legs on the respective sides of the rack, the intermediate side portions adjacent the lazy-tong pivots thus being free of cross connections, and the arch portions of the two sets of U-shaped wicket members being the sole crossing elements from one side of the rack to the other at least at all points intermediate the longitudinally spaced ends of the rack.

2. A rack of the class described comprising, in combination, a pair of spaced parallel lazy-tong structures each comprising crossing strips pivotally connected for the most part at the three usual points for such lazy-tong structure, the corresponding pairs of opposite strips which extend in the same direction on both of the lazy-tong structures extended outwardly from the lazy-tong pivots and integrally connected across the rack by arch portions to provide a series of wicket-like partition members forming pockets or compartments between successive wicket members, certain of the other corresponding opposite pairs of strips which extend in the other direction being prolonged to provide legs for sup-

porting the rack in a position in which the lazy-tong structures themselves are inclined at a substantial angle to any surface upon which the rack is supported and the partition members are approximately at right angles to the other set of strips.

3. A rack of the class described comprising, in combination, a pair of spaced parallel lazy-tong structures each comprising crossing strips pivotally connected for the most part at the three usual points for such lazy-tong structure, the corresponding pairs of opposite strips which extend in the same direction on both of the lazy-tong structures extending outwardly from the lazy-tong pivots and integrally connected across the rack by arch portions to provide a series of wicket-like partitions forming pockets or compartments between successive wickets, the other corresponding opposite pairs of strips which form the lazy-tong structures being of substantially equal length and being shorter than the extended partition forming wickets, certain of said wickets also being prolonged in the opposite direction to provide a leg for supporting the rack in a position in which the lazy-tong structures are inclined at a substantial angle with respect to the horizontal while said wickets are disposed in an approximately vertical position.

4. An extensible and collapsible rack of the class described comprising, in combination, a series of continually parallel, bowed, arched, U-shaped, strap-like, wicket members each having a pair of legs spaced transversely of the rack and a crossing arch portion extending from one leg to the other at the outward portion of the rack, and means cooperating with said wicket members to provide upon the respective sides of the rack a pair of spaced parallel lazy-tong structures at the inward portion of the rack, said last named means including another series of continually parallel, bowed, arched, U-shaped, strap-like, wicket members, inverted with respect to said first named series and having their legs overlapping the legs of the members of the first named series, and means for frictionally pivotally securing said overlapping legs separately upon both sides of the rack at the plurality of points necessary to afford said lazy-tong structure, the wickets of one of said series providing parallel partition elements defining between them compartments for the reception of articles when the rack is in an extended position, at least one of said wicket members of one of said series being prolonged well beyond the extent of the others of the same series to provide a leg for supporting the rack in a position in which the lazy-tong structures are inclined at a substantial angle with respect to the horizontal, while the wickets of one of said series occupy parallel planes which do not depart substantially from the horizontal.

5. An extensible and collapsible rack of the class described comprising, in combination, a series of continually parallel, bowed, arched, U-shaped, strap-like, wicket members each having a pair of legs spaced transversely of the rack and a crossing arch portion extending from one leg to the other at the outward portion of the rack, and means cooperating with said wicket members to provide upon the respective sides of the rack a pair of spaced parallel lazy-tong structures at the inward portion of the rack, said last named means including another series of continually parallel, bowed, arched, U-shaped, strap-like, wicket members, inverted with respect

to said first named series and having their legs overlapping the legs of the members of the first named series, and means for frictionally pivotally securing said overlapping legs separately upon both sides of the rack at the plurality of points necessary to afford said lazy-tong structure, the wickets of one of said series providing parallel partition elements defining between them compartments for the reception of articles when the rack is in an extended position, two of said wicket members, including one from each of said series adjacent the respective opposite ends of the rack being prolonged upon the same side of the lazy-tong structures until they meet, and a pivotal connection between said wicket members at their point of intersection, the pivoted prolongations providing prop means for supporting the rack in a position in which the lazy-tong structures are inclined to the horizontal.

6. A rack of the class described comprising, in combination, a pair of spaced parallel lazy-tong structures each composed of crossing strips pivotally connected for the most part at the three usual points for such lazy-tong structure, the corresponding pairs of opposite strips which extend in the same direction on both of the lazy-tong structures extended outwardly from the lazy-tong pivots and integrally connected across the rack by arch portions to form pockets or compartments between successive arches, at least one pair of arch connected strips adjacent one end of the rack being prolonged inwardly from said pivot points and at least one of the pairs of oppositely extending cooperating lazy-tong-forming strips adjacent the other end of the rack being inwardly prolonged until they intersect said first named inwardly prolonged pair and are pivotally connected thereto, the connected prolongations interfering in no way with the collapsing of the rack and providing a bracing support therefor.

7. A rack of the class described comprising, in combination, a pair of spaced parallel lazy-tong structures each composed of crossing strips pivotally connected for the most part at the three usual points for such lazy-tong structure, the corresponding pairs of opposite strips which extend in the same direction on both of the lazy-tong structures extended outwardly from the lazy-tong pivots and integrally connected across the rack by arch portions to form pockets or compartments between successive arches, one pair of arch connected strips namely the second pair from one end of the rack being prolonged inwardly from said pivot points and the pair of oppositely extending cooperating lazy-tong-forming strips at the other end of the rack being inwardly prolonged until they intersect said first named inwardly prolonged pair and are pivotally connected thereto, the connected prolongations interfering in no way with the collapsing of the rack and providing a bracing support for maintaining the rack in a slightly tilted position.

8. A rack of the class described comprising, in combination, a pair of spaced parallel lazy-tong structures each composed of crossing strips pivotally connected for the most part at the three usual points for such lazy-tong structure, the corresponding pairs of opposite strips which extend in the same direction on both of the lazy-tong structures extended outwardly from the lazy-tong pivots and integrally connected across the rack by arch portions to form pockets or compartments between successive arches, one pair of arch connected strips namely the second pair from one end of the rack being prolonged in-

wardly from said pivot points and one of the pairs of oppositely extending cooperating lazy-tong-forming strips at the other end of the rack being inwardly prolonged until they intersect said first named inwardly prolonged pair and are pivotally connected thereto, the connected prolongations interfering in no way with the collapsing of the rack and providing a bracing structure therefor, a leg pivoted to said bracing structure and providing an optionally usable supplemental support or brace for maintaining said rack in upright position.

9. A rack of the class described comprising, in combination, a pair of spaced parallel lazy-tong structures each composed of crossing strips pivotally connected for the most part at the three usual points for such lazy-tong structure, the corresponding pairs of opposite strips which extend in the same direction on both of the lazy-tong structures extended outwardly from the lazy-tong pivots and integrally connected across the rack by arch portions to form pockets or compartments between successive arches, one pair of arch connected strips namely the second pair from one end of the rack being prolonged inwardly from said pivot points and one of the pairs of oppositely extending cooperating lazy-tong-forming strips at the other end of the rack being inwardly prolonged until they intersect said first named inwardly prolonged pair and are pivotally connected thereto, the connected prolongations interfering in no way with the collapsing of the rack and providing a bracing structure therefor, a U-shaped, bail-like leg pivoted to said first named pairs of prolongations and providing an optionally usable supplemental support or brace for maintaining said rack in upright position.

gations interfering in no way with the collapsing of the rack and providing a bracing structure therefor, a U-shaped, bail-like leg pivoted to said first named pairs of prolongations and providing an optionally usable supplemental support or brace for maintaining said rack in upright position.

10. The rack as set forth in claim 9 in which there is provided a cross-connection joining the intersections of the said prolongations on the respective sides of the rack, the points of pivotal connections of said bail-like leg with one of said pairs of prolongations being spaced from said cross-connection a distance less than the length of said leg, whereby said cross-connection serves as a retaining rest for said leg when the latter is not in use.

LUTHER W. EVANS.

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