Jan. 9, 1962 C. LAKE 3,016,150

SHELVING WITH SLIDING SHELVES

Filed Aug. 13, 1959 2 Sheets-Sheet 1

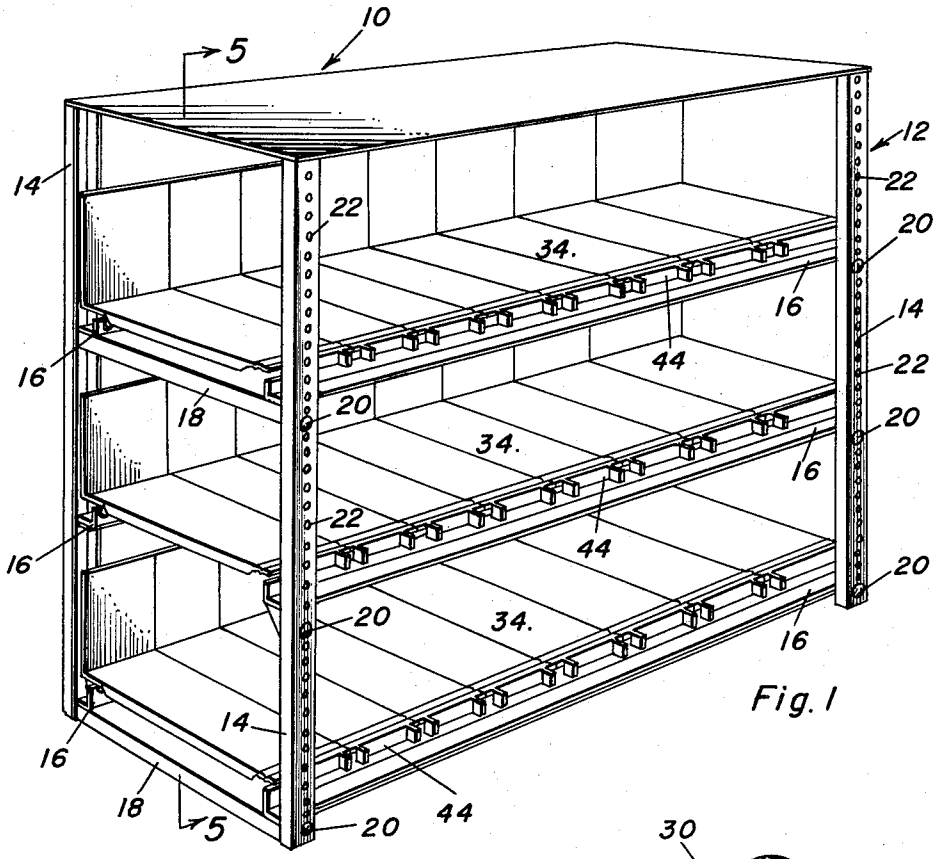


Fig. 1

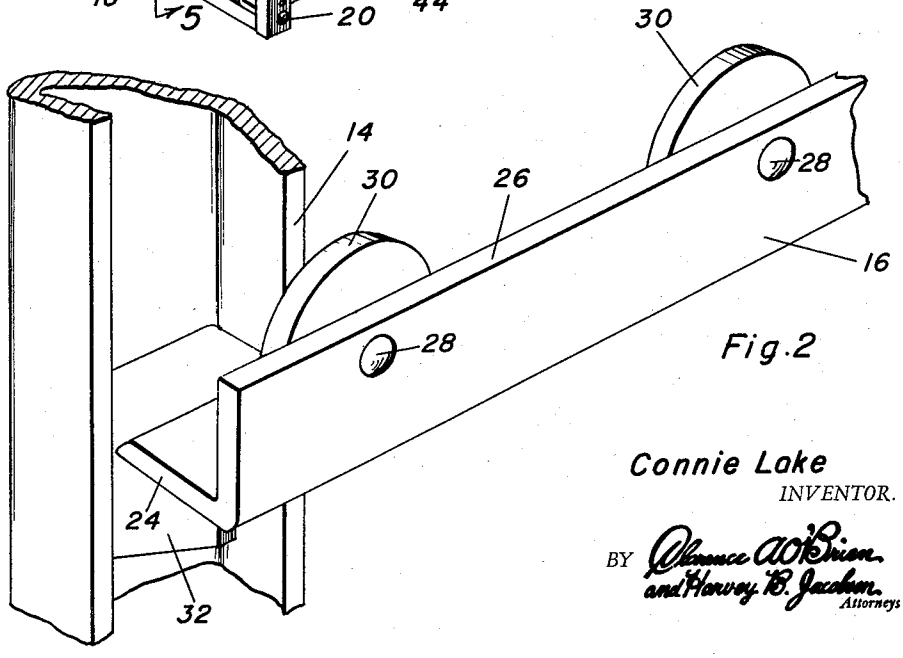


Fig. 2

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SHELVING WITH SLIDING SHELVES

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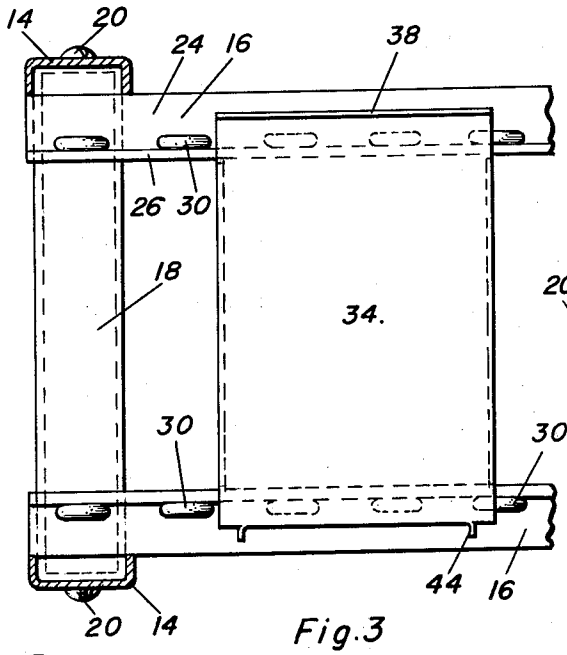


Fig.3

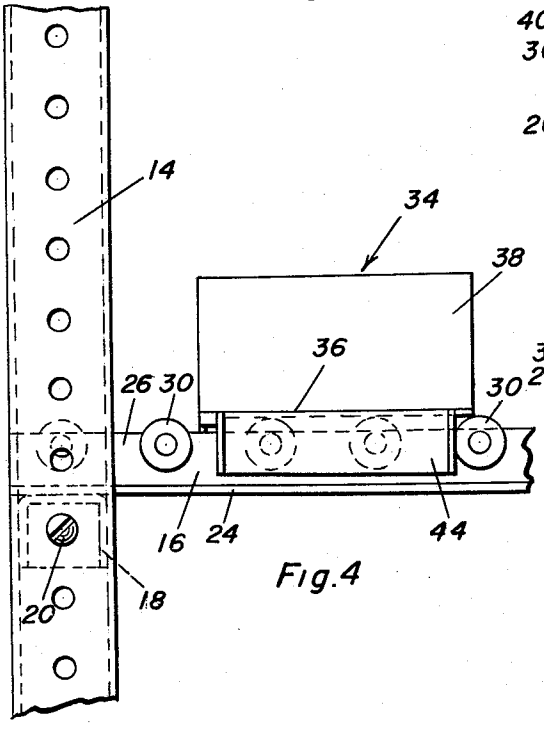


Fig.4

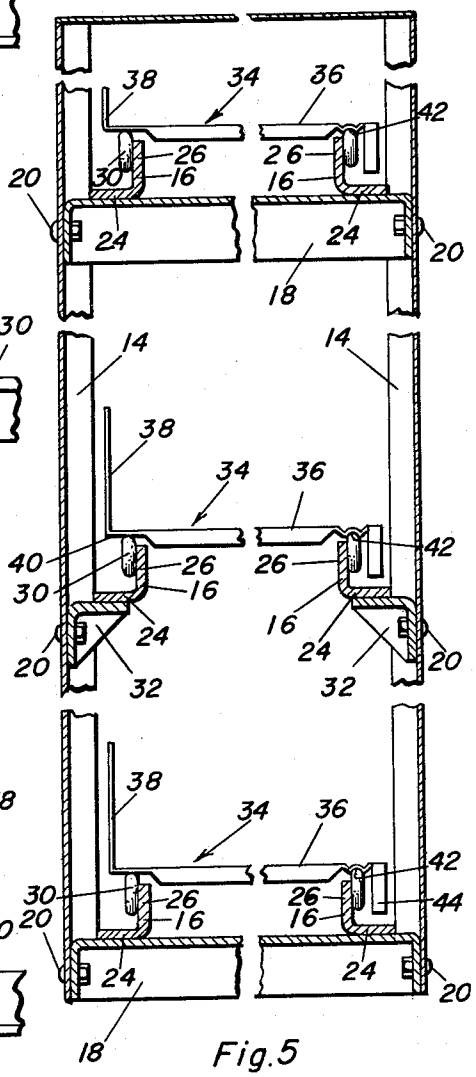


Fig.5

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SHELVING WITH SLIDING SHELVES

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This invention comprises a novel and useful shelving with sliding shelves and more particularly relates to shelving which is adapted to utilize to a better advantage or to a greater percentage the available volume or space in shelving and bin storage units. More specifically, it is an object to effect the foregoing purpose by a construction enabling individual shelves or storage bins to be removed from the shelving and replaced between two adjacent bins by moving or adjusting the shelves or bins, relative to the space from which the one bin was removed and the space where it is to be replaced, longitudinally of the shelving in order to fill in the space where the one bin was removed and to provide a space wherein the same removed bin may be placed in its new position.

Many supply houses or jobbers utilize the bin storage technique for storing the large number of relatively small parts which they are sometimes required to stock. Since the supply houses and jobbers are subject to having to fill comparatively large orders of any item they may stock, many are the times when a large number of their bins must lay idle and empty after having filled a large order until the exhausted items have been replenished.

Inasmuch as the better businessmen of today deem it wise to maintain a more or less running inventory of the items they are required to stock, the removal of part bins ear-marked for a certain item from one place and the replacement of those bins in another part of the room together with the placement of other parts bins in the space vacated by the first bins is not advisable since this would tend to maintain a parts department in constant turmoil inasmuch as it would be almost impossible for a parts clerk to know at all times even the general area in which he might find the desired bin.

This invention embraces the concept of parts bins that may be easily moved longitudinally of the shelving on which they rest so that a long horizontal row of bins may be moved toward the space of one or two empty bins upon the removal of the same in order to maintain the parts bins in horizontal order while the two removed bins may be placed at the opposite end of the row moved to provide extra space in which to store a new shipment of parts located in that position if the extra bins are needed. Thus, a greater number of the bins may be maintained in use resulting in the storage of the desired quantity of moving stock in a smaller volume or area.

A main object of this invention is to provide shelving having shelves or storage bins which are movable longitudinally of the shelving so as to utilize a greater percentage of the available space in shelving and bin storage units.

A further object of the invention, in accordance with the preceding object, is to provide bins or shelves which may be readily removed from the shelving so as to facilitate the relocation of one or more bins in the shelving.

A still further object of this invention is to provide a means whereby each shelf or storage bin may be moved longitudinally of the shelving but will be guided and restrained against movement laterally of the shelving.

Still another object is to provide shelving for sliding shelves or bins which may be adjusted to support horizontal rows of sliding shelving at adjusted vertical positions.

Yet another object is to provide shelving sections for the support of sliding shelves or bins which may be longitudinally aligned and connected together so as to provide one continuous horizontal row of shelving on which individual shelves or bins thereon may travel from one shelving section to another.

A final object to be specifically enumerated herein is to provide a shelving with sliding shelves or bins which will be of simple design, of sturdy construction and conform to conventional forms of manufacture so as to provide a device that will be durable and economically feasible.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIGURE 1 is a perspective view of the invention showing the shelving supporting three horizontal rows of sliding shelves or bins;

FIGURE 2 is an enlarged fragmentary perspective view of one of the supporting standards and the support element secured thereto which has rollers on which the shelves or bins are supported journalled therein;

FIGURE 3 is an enlarged fragmentary horizontal sectional view taken substantially upon a plane passing through the shelving immediately above one of the sliding shelves or bins with parts of the shelving being broken away;

FIGURE 4 is an enlarged fragmentary side elevational view of a portion of the shelving showing a sliding shelf or bin positioned therein, parts of the shelving being broken away; and

FIGURE 5 is an enlarged vertical fragmentary sectional view taken substantially upon the plane indicated by the section line 5—5 of FIGURE 1.

Referring now more specifically to the drawings the numeral 10 generally designates the shelving comprising the present invention which includes a framework generally designated by the reference numeral 12 comprising pairs of upstanding standards 14 between which standards of each pair are secured a plurality of the support elements 16. The latter are in horizontal alignment with the corresponding support elements 16 secured between the other pair of standards 14, the pairs of support standards 14 being interconnected at the opposite ends of the shelving 10 by means of cross supports 18 which are secured between and vertically positioned with respect to the corresponding standards 14 of each pair of standards, by means of suitable fasteners 20. Each of the standards 14 is provided with a plurality of longitudinally spaced apertures 22, of which selected aligned pairs may be utilized to support opposite ends of the cross supports 18.

With attention now directed more particularly to FIGURES 2 and 5, it will be seen that each of the support elements 16 comprises an L-shaped member having a horizontal leg 24 and a vertical leg 26. Journalled for rotation about axes extending horizontally of each of the support elements 16 by means of suitable axle pins 28 secured through the vertical legs 26 are a plurality of rollers 30 whose purpose is to be hereinafter set forth.

With attention directed more particularly to FIGURE 5 of the drawings, it will be seen that each of the support elements 16 is supported by either one of the cross supports 18 or an L-shaped supporting member 32 which is in turn secured to the corresponding standard by means of fasteners 20 secured through a selected aperture 22. The supporting elements 16 may be secured to either the

cross supports 18 or the support members 32 in any convenient manner and it will be noted that the cross supports 18 are disposed at the uppermost and lowermost portions of the frame 12 so as to provide support between each pair of standards supporting the elements 16 and that the support members 32 are utilized to support the support elements 16 disposed between the upper and lowermost support elements 16 so as to enable large objects to be supported thereby without interference with one of the cross supports 18. Further, the utilization of the support members 32 intermediate the upper and lowermost support elements 16 will enable the intermediate support elements 16 to be adjusted vertically without also necessitating the similar adjustment of a cross support 18.

With attention now directed more particularly to FIGURES 4 and 5, it will be noted that there is supported by corresponding pairs of support elements 16 a plurality of shelves or bins generally referred to by the reference numeral 34. Each of the bins 34 may be constructed as an open top receptacle or as a flat shelf having a supporting surface 36 with a rear wall 38 as is shown in the drawings.

Each of the shelves 34 is provided with a smooth undersurface as at 40 and a concave recess or groove 42 extending in the direction of the travel of the shelf which is of the same configuration in cross-section as the cross-section of the roller 30 so as to receive therein the adjacent portion of the periphery of the roller 32 during the movement of the bins 34 longitudinally of the frame 12.

With attention now directed more particularly to FIGURES 3 and 4 of the drawings, it will be noted that the rollers 30 are spaced longitudinally along the supporting elements 16 sufficiently close together to insure that at least two rollers 30 will be supporting each end of the bins 34.

It can therefore be readily seen that the positioning of the periphery of the rollers 30 within the recess 42 will guide the bins 34 during their longitudinal movement of the frame 12 against lateral movement relative to the supporting elements 16.

Conveniently, as can best be seen by FIGURES 1 and 5, the forward edge of each of the bins 34 may be provided with suitable brackets 44 for securing to that portion of the bin 34 suitable index tabs (not shown) which designate the proper article for that bin.

It is to be understood that each shelving section 10 may be longitudinally aligned with other shelving sections and secured thereto so as to enable the bins 34 of one shelving section to travel from one section to the other on longitudinally aligned supporting members 16. Each shelving section 10 may be secured to the adjoining shelving sections in any convenient manner.

With attention directed more particularly to FIGURE 3 of the drawings it will be noted that each of the supporting members 16 extends to the remote ends of the standards 14 which is supported thereby and that the depth of the shelving is less than the distance between the standards supporting the two support elements 16 on which the shelving 34 is supported. It can therefore be seen that each of these shelving sections 10 is constructed in such a manner to enable a bin 34 thereon to be moved over the rollers 30 and to a position supported by the adjacent shelving section 10.

In operation, assuming that there has been provided a plurality of shelving sections 10 which are longitudinally aligned and secured together, various parts may be placed on each of the bins or shelves 34 in horizontal order on each of the reaches of bins. Should the quantity of one of the items normally stocked require the use of several of the bins 34, the filling of a large order of these items might possibly remove all of the items from two or more parts bins. At this time should there be received a replacement shipment for another item being stocked and there not be sufficient space in the bins designated for the newly arrived items, the bins having been vacated by the first items may be removed and the bin 34 between that position and that the position needing additional bins may be moved longitudinally of the shelving 10 to fill the space vacated by the removed bins while simultaneously providing additional space where it is desired into which the extra bins 34 may be placed in order to provide sufficient bin storage room for the newly arrived shipment.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. A sliding shelf construction comprising a framework, vertically spaced pairs of elongated, parallel and horizontal support elements secured to said framework, a plurality of aligned support rollers rotatably journaled in each of said support elements about horizontal axes extending transversely thereof, a plurality of shelves, each of said shelves having lower surfaces engaging the rollers of one pair of elements wherein said shelves are supported for longitudinal movement therealong, said rollers comprising the sole contact between said shelves and said framework, means on each shelf for guiding the latter against movement laterally of said elements during movement therealong, said guiding means comprising at least one downwardly opening groove formed across the lower surface of each of said shelves extending in the direction of its travel in which the rollers of at least one of said support elements are received, said framework and said support elements being free of portions disposed in close vertical overlying relation to said shelves, whereby a selected one of said shelves may be readily lifted vertically from engagement with the corresponding rollers, said framework on at least one side being open between adjacent vertically spaced support elements an amount sufficient to enable shelves lifted from engagement with said rollers to be withdrawn laterally through said one side of said framework.

2. The combination of claim 1 wherein said framework comprises a plurality of vertically disposed interconnected standards, means for vertically adjusting said elements on said standards.

3. The combination of claim 2 wherein each support element is supported by a pair of standards, each of said shelves being less in depth than the distance between pairs of standards.

4. A sliding shelf construction comprising a framework, vertically spaced pairs of elongated, parallel and horizontal support elements secured to said framework, a plurality of support rollers rotatably journaled in each of said support elements about horizontal axes extending transversely thereof, a plurality of shelves, each of said shelves having lower surfaces engaging the rollers of one pair of elements wherein said shelves are supported for longitudinal movement therealong, said rollers comprising the sole contact between said shelves and said framework, means on each shelf for guiding the latter against movement laterally of said elements during movement therealong, said guiding means comprising at least one downwardly opening groove formed across the lower surface of each of said shelves extending in the direction of its travel in which the rollers of at least one of said support elements are received, said framework comprising a plurality of vertically disposed interconnected standards, means for vertically adjusting said elements on said standards, each support element being supported by a pair of upstanding standards, each of said shelves being less in depth than the distance between pairs of standards, means

on each shelf for guiding the latter against movement laterally of said elements during movement therealong, said framework and said support elements being free of portions disposed in close vertical overlying relation to said shelves, whereby a selected one of said shelves may be readily lifted vertically from engagement with the corresponding rollers, said framework on at least one side being open between adjacent vertically spaced support elements an amount sufficient to enable shelves lifted from engagement with said rollers to be withdrawn laterally through said one side of said framework.

5. The combination of claim 1 wherein said framework comprises a plurality of vertically disposed interconnected standards, means for vertically adjusting said elements on said standards, said elements extending between the remote surfaces of the corresponding standards.

6. The combination of claim 1 wherein said groove is formed by a series of reversely curving bends in said shelf.

7. The combination of claim 6 wherein the upper surface of each of said shelves is free of portions of said bends projecting thereabove.

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