March 15, 1960 R. J. SHELLEY 2,928,639

ELEVATOR

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Fig. 1

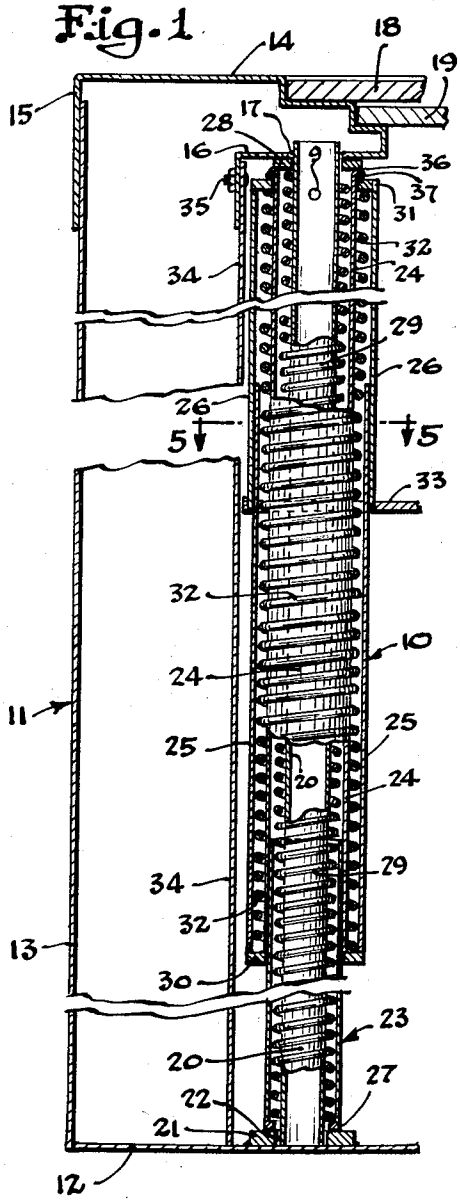



Fig. 2

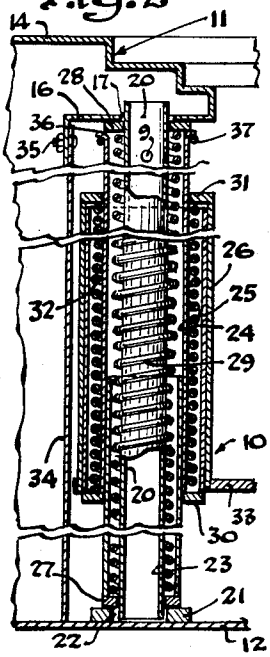



Fig. 4

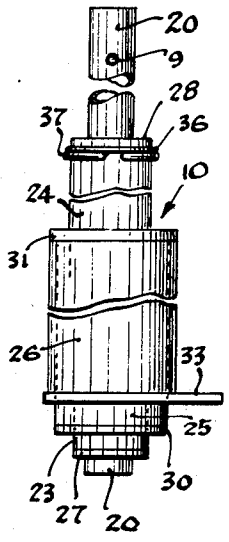



Fig. 3

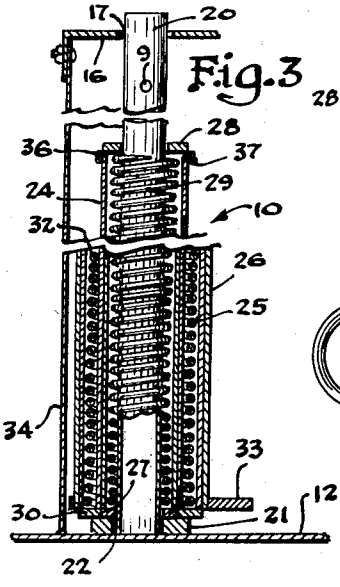



Fig. 3A

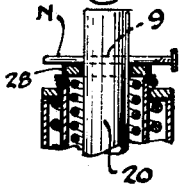



Fig. 6

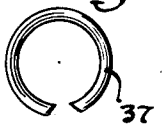
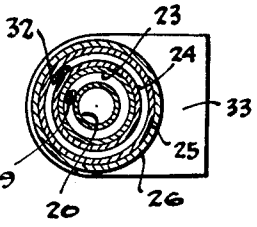



Fig. 5




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Fig. 7

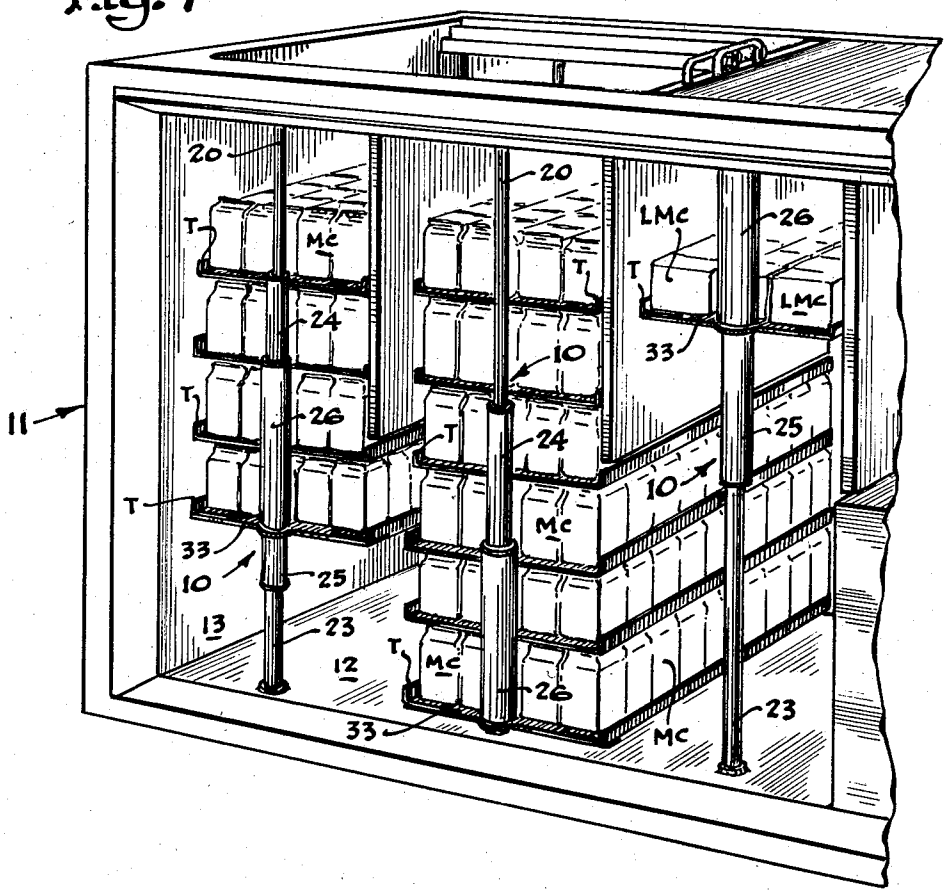



Fig. 8A

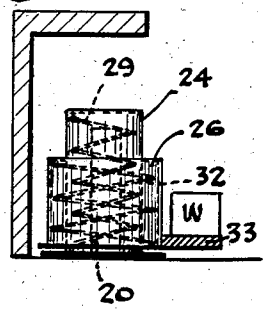



Fig. 8B

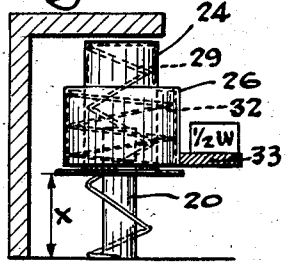
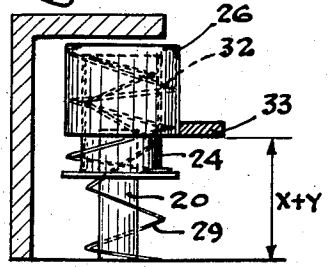



Fig. 8C




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Fig. 9

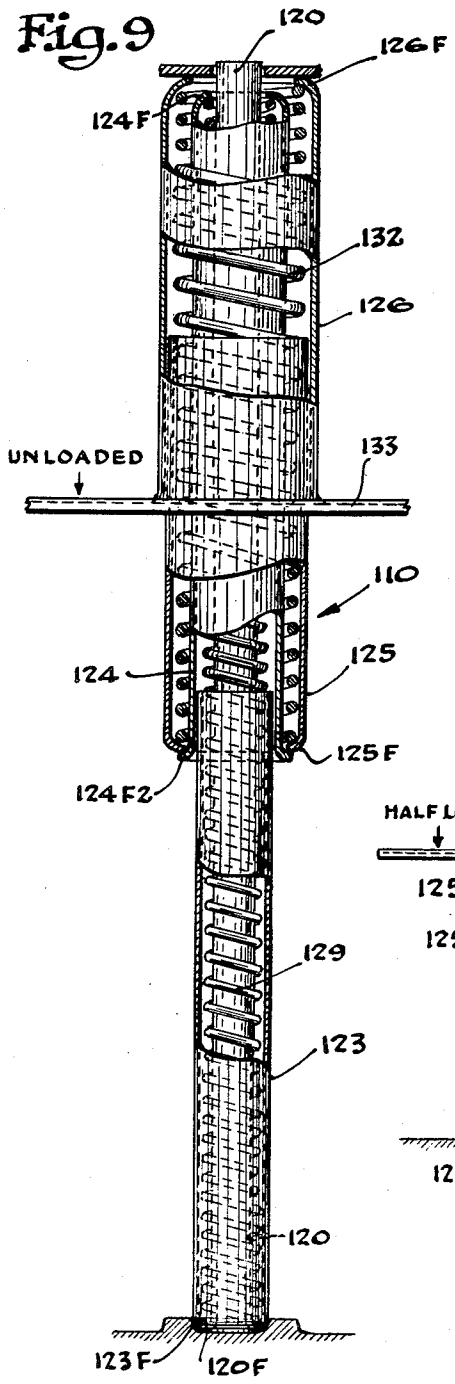



Fig. 10

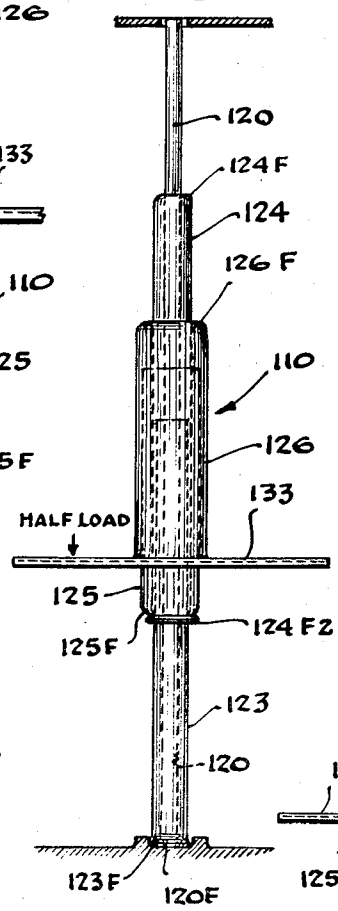
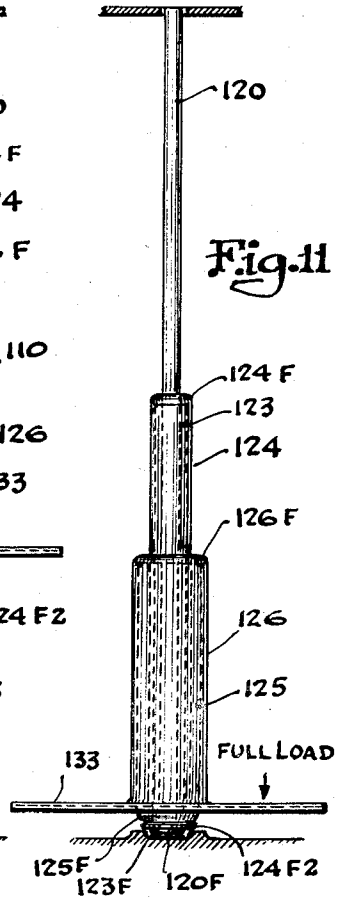



Fig. 11




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United States Patent Office 2,928,639 Patented Mar. 15, 1960



2,928,639

# ELEVATOR

Robert J. Shelley, Miami, Fla.

Application October 21, 1958, Serial No. 768,658

8 Claims. (Cl. 248—204)

This invention relates to elevator mechanism particularly of a kind adapted to automatically raise a shelf supporting member progressively from a lower depth as articles on the shelf are removed. This application is a continuation-in-part of my application Serial No. 651,838, filed April 10, 1957, now abandoned.

In my earlier U.S. Patent Nos. 2,525,243 and 2,709,561 I have disclosed tray or shelf elevators for storage cabinets such as coolers wherein milk containers and the like are adapted to be stored. In accordance with the desire for large capacity, these cabinets are conventionally of substantial depth such that it is almost impractical for a person to have easy access to the lowest group of containers in the cabinet. In my prior patents identified above, I have arranged in the cabinet a spring actuated tray or shelf supporting mechanism which is effective gradually to raise the shelf or tray on which the articles are supported as the articles are gradually removed from the cabinet, this being due to the concomitant gradual expansion of the spring means. There are numerous commercial and industrial analogies of cabinets of this kind, such as in a dish cabinet installation where it is advantageous to be able to afford means which continuously elevate stacked trays or dishes, and so on.

In accordance with the present invention I have found that I can greatly improve the utility of elevator mechanism of the general kind disclosed in my aforesaid patents by having resort to an arrangement of concentric springs and nested tubes of predetermined dimension whereby I am able to bring the shelf or tray supporting means much closer to the top of the cabinet whereby the last group of articles supported thereby within the cabinet are readily accessible from the top of the cabinet, and the accomplishment of this is the primary object of the present invention. Specifically it is the object of the present invention to dispose within a storage cabinet or the like, wherein trays or shelves are to be arranged in vertical tiers, elevator mechanism comprising an inner guide disposed upright, an inner sleeve or tube of predetermined dimension disposed in concentric space relation about the guide with a coil spring arranged between the guide and this inner tube, and an outer tube or sleeve of predetermined dimension disposed and spaced in concentric relation about the inner sleeve with a second coil spring arranged between the inner and outer tubes. The dimensioning of the parts will be explained in detail hereinafter, and the two tubes are arranged to move axially relative one to another and relative to the main inner support or guide mentioned above. Moreover the outer sleeve carries a shelf or tray supporting lug, and as articles such as milk containers are added in increasing numbers incidental to filling the cabinet the springs are compressed as the sleeves gradually move downward lengthwise of the inner guide, and the converse relation prevails in the opposite direction as the articles are removed from the cabinet.

Other and further objects of the present invention will be apparent from the following description and claims



and are illustrated in the accompanying drawings which, by way of illustration, show a preferred embodiment of the present invention and the principle thereof and what is now considered to be the best mode contemplated for applying that principle. Other embodiments of the invention embodying the same or equivalent principle may be used and structural changes may be made as desired by those skilled in the art without departing from the present invention and the purview of the appended claims.

In the drawings:

Fig. 1 is a fragmentary vertical sectional view illustrating the elevating mechanism of the present invention mounted in a cabinet;

Fig. 2 is a fragmentary sectional view similar to Fig. 1, but showing the position of the parts in adjusted or compressed position;

Fig. 3 is a view similar to Fig. 2, but showing the parts in a further adjusted position;

Fig. 3A is a fragmentary detail view illustrating a removal situation of an elevator from within a cabinet;

Fig. 4 is a side elevational view of one of the elevating units;

Fig. 5 is a sectional view taken on the line 5—5 of Fig. 1;

Fig. 6 is a plan view of the split ring;

Fig. 7 is a perspective view looking into the interior of a cabinet constructed in accordance with the present invention and illustrating a typical distribution therein of mechanism of the kind illustrated in Fig. 1;

Figs. 8A, 8B and 8C are diagrammatic views illustrating the operating principles of the invention and facilitating an appreciation thereof; and

Figs. 9, 10 and 11 are views showing another embodiment of the invention in different state of actuation.

Referring in detail to the drawings, the numeral **10** in Figs. 1 and 7 designates in its entirety an elevating unit or mechanism which is adapted to be mounted in a cabinet such as the cabinet **11**, and the cabinet **11** includes the usual bottom wall **12**, upstanding end wall **13**, and top **14**, and the top **14** may be provided with a depending flange **15**, Fig. 1, insulation being provided where necessary. The top **14** may have a member **16** secured thereto or formed integral therewith, Figs. 1 and 2, and the member **16** is provided with a recess or opening **17** for a purpose to be later described. The top **14** may provide a support for the usual sliding lids **18** and **19**. It will be recognized from Fig. 7 that the cabinet **11** is quite deep and is of the type to receive a large supply of milk containers MC arranged at various levels therein. The present invention is concerned in particular with making easily available, within easy arm's reach from the top of the cabinet, the last of the containers such as identified at LMC in Fig. 7 which otherwise ordinarily would be rather far down in the cabinet and difficult to grasp. This is the primary desired end achieved under the present invention, and the present invention using a dual spring assembly also makes possible the supporting of substantial weights of articles.

In achieving the desired end explained above, the elevating unit **10** includes a first upright tube **20** or inner stabilizing and guide member which has its lower end projecting into an opening or recess **22** in a lug **21**, secured as by welding to the bottom wall **12**, although various arrangements can be resorted to for anchoring and securing the guide **20** in a stationary upright position within the cabinet. The upper end of the tube **20** is advantageously received in the recessed portion **17** of the member **16**.

There is further provided a second guide member in the form of a tube indicated by the numeral **23**, and the elevator unit further includes a third tube **24** which constitutes an inner sleeve movable axially of the guide **20**

as an important member, a fourth tube **25** constituting another guide, and a fifth tube or outer sleeve **26** movable axially of the guide **20** as an important member, all concentrically nested one outward of the other in that order.

A washer **27** is secured to the lower end of the tube **23**, and the washer **27** surrounds the lower portion of the first tube **20** and is also secured as a spring stop to the tube **20**, to integrate these two guide members in spaced relation. There is further provided a second spring stop or washer **28** which surrounds loosely the upper portion of the inner guide **20**, Figs. 1, 2 and 3. A coil spring **29** is disposed concentrically about the tube **20**, and this spring is interposed normally (when unloaded) in an expanded state between the pair of stops **27** and **28** for a purpose to be later described.

Secured to the lower ends of the tubes **24** and **25** in any suitable manner, as for example by welding, is a third spring stop or washer **30**, which joins these two members, and a fourth such washer **31** is secured to the upper end of the tube **26**. A coil spring **32** is interposed normally in expanded state between the washers **30** and **31** in the manner that the spring is interposed between its washers, and it will be recognized that these washers constitute abutments or stops for confining their respective springs.

Extending outwardly from the lower edge of the tube **26** and secured thereto in any suitable manner, is a shelf or tray support member **33**, and the support member **33** provides a support for a tray or shelf T, Fig. 7, which is to have articles thereon in the manner illustrated for sake of more understanding in Fig. 7. Thus, due to the provision of the previously described spring arrangement and telescoping tubes, it will be seen that when articles such as MC, Fig. 7, are removed from the trays T on the support members **33**, the support members **33** will move upwardly due to the force of the spring assembly so that the next successive articles will be brought within convenient reach of the user of the cabnet.

The numeral **34** designates a portion of a wall of the cabinet or tank which may be secured to the member **16** in any suitable manner, as for example by means of securing elements **35**.

The upper edge of the tube **24** flares outwardly as at **36** as a mode of convenient connection, and a split ring **37** is arranged in engagement with the flaring portion **36** as shown in Fig. 4.

From the foregoing, it is apparent that there has been provided an elevating mechanism which is an improvement over the device shown and described in my prior Patents Nos. 2,525,243 and 2,709,561 as will be explained in principle below. The elevating mechanism of the present invention is adapted to be mounted in a suitable cabinet such as the cabinet **11**. In use, the support members **33** are adapted to support a tray which may have any type of articles thereon such as containers of beverages. Then, as the containers are removed from the shelf or tray on the support members **33** within a cabinet as **11**, it will be seen that the resiliency of the pair of coil springs **29** and **32** will gradually cause the support members **33** and trays to move upwardly so that a person can more easily gain access to the articles in the cabinet, particularly the last ones. When the trays have sufficient weight or articles thereon, the parts are moved to the position shown in Fig. 3, or to the position shown for the medial group of containers in Fig. 7. Thus, when a tray has sufficient weight thereon, the support member **33** will be moved downwardly, and this will concomitantly cause the washer or stop **31** on the outermost sleeve **26** to compress the coil spring **32** as this outermost sleeve or tube **26** moves downwardly relative to the guide **20** and relative to the opposite end of the inner sleeve **24** which carries the stop or washer **30**. It will be recognized that this downward movement of the tube **26** will result in compression of the coil spring **29** when sufficient weight is on the support member **33**, since, as will be recognized from Figs. 1, 2 and 3, and the state of the springs, the washer or stop **28** must be secured to the third tube or inner sleeve **24**.

As articles are removed from the trays, the pair of coil springs **29** and **32** will be able to expand to move the parts from the position shown in Fig. 3 to the position shown in Fig. 2 and finally back to the position shown in Fig. 1. Thus, it will be seen that with the trays full of containers of beverage or other material, the support members **33** will be in a lowered position as shown in Fig. 3. Then, as the uppermost containers or articles are removed, it will be seen that the weight on the support members **33** will be decreased whereby the pair of springs **29** and **32** can successively move the parts from the position shown in Fig. 3 to the position shown in Fig. 2 and then to the position shown in Fig. 1, whereby the user will be able to easily gain access to the articles since they will be gradually moved to a raised position as the material or articles are removed from the cabinet. The snap ring **37** is arranged in engagement with the outwardly flaring portion **36** of the tube **24**, and this arrangement, or its equivalent, prevents the outer sleeve **26** from over-riding and hence "hanging up" on the upper end of the inner sleeve **24**, when the trays are not loaded, or lightly loaded as with the right-hand trays in Fig. 7, which would prevent the desired downward movement of the outer sleeve when the mechanism is more fully loaded.

The parts can be made of any suitable material and in different shapes or sizes. The washer **30** or equivalent stop may be secured to the lower ends of the tubes **24** and **25** in any suitable manner. For example, this washer may be brazed in place, and this washer serves to connect the tubes **24** and **25** together, the latter in reality constituting a guide for the outer sleeve **26** just as the tube **23** is a guide for the inner sleeve **24**.

Thus, it will be seen that the present invention constitutes an improvement over the elevator construction shown and described in my prior patents, and the elevator of the present invention can be used in any suitable apparatus, as for example, in a milk and beverage cooler. The elevator will serve to raise the platform or tray that holds the articles to within a very close distance from the top such as 7½ inches of the top instead of 13½ as did the original elevator.

This primary principle of the present invention can be best appreciated by having reference to Figs. 8A, 8B and 8C which are diagrammatic illustrations. Thus, in Fig. 8A it is assumed that a full weight W is supported on the supporting member **33** which is carried by the outer sleeve **26**, and in this state the sleeves **26** and **24** have been moved downwardly within the cabinet substantially to the full depth, and the springs **29** and **32** are fully loaded. Assuming that one-half the weight W is removed, Fig. 8B, support **33** can be assumed to be located upwardly from the bottom of the cabinet a distance X which could be mid-way of the depth of the cabinet. When all of the weight is or about to be removed, Fig. 8C, the support **33** is at its maximum elevated position at a distance $X+Y$ above the bottom of the cabinet which would be the position at which the last of the articles within the cabinet are located for removal. On the other hand, were there to be but a single spring and sleeve as **24**, the last of the articles to be removed from the cabnet would be at the position X, Fig. 8B, representing a location difficult to reach within the cabinet **11**. Thus, the arrangement of the present invention elevates the last of the articles to a greater height of Y in excess of X.

Thus, there is provided a means for automatically raising racks, trays or shelves, so that any type of material can be automatically raised such as cups, glasses, dishes or food containers, packaged foods or the like, and this level is automatically maintained as each supported item is removed from within the cooler, refrigerator, cabinet

or whatever installation embodies the vertically oriented elevator mechanism of the present invention. The flaring portion 36 provides a support for the split ring 37 which helps, as mentioned, to retain the parts in their proper assembled position. After the support member 33 moves downwardly a predetermined distance to compress the coil spring 32, then the coil spring 29 will be compressed so as to permit the support member 33 to assume difference elevations in the cabinet.

In use, when sufficient weight is supported on the member 33, the tube or outer sleeve 26 will be moved downwardly to thereby move the washer 21 downwardly so as to start to compress the coil spring 32 between the stops 30 and 31 so that the parts will move from the position shown in Fig. 1 to the position shown in Fig. 2. When the tube 26 moves downwardly, this will cause the guide member 25 to start to move downwardly and will cause downward movement of the inner sleeve 24, since the washer 30 connects the tubes 25 and 24 together. As the tube 24 moves downwardly, it moves the washer 28 downwardly to thereby compress the coil spring 29 between the stops 27 and 28. As weight is removed from the member 33, the reverse will take place.

The member 16 has the lids slidably mounted thereon, and the hole or recess 17 permits the elevators to be removed or inserted, without removing the entire top of the cooler, simply by reaching inside the cabinet and pressing down on the sleeves sufficiently to expose the opening 9 in the guide 20 so that a pin or nail N, Fig. 3A, can be inserted through the hole 9 in the upper part of tube 20 which removes the pressure that holds the assembly in place, whereby the entire elevator can be simply raised up enough to clear the lug at the bottom and then swung out.

The elevator mechanism shown in Figs. 1, 2 and 3 is simply one half of the operative arrangement within an area of a cabinet, there being two of these assemblies connected by a tray that supports the weight of the contents. In other words, and referring to Fig. 7, there are three more elevator assemblies (not shown) within the cabinet 11 at the far or back side thereof supporting the opposite ends of the trays T.

An improved, and therefore preferred construction, is illustrated in Figs. 9, 10, and 11 in the drawings, and in this connection it should be pointed out that Fig. 9 shows the unloaded state of the mechanism within the cabinet, Fig. 10 shows the state of the device approximately in half-load condition, and Fig. 11 illustrates the disposition of parts under the full load state. In order to simplify recognition of related parts, a "100" series of references characters will be used in Figs. 9, 10, and 11 in respect to reference characters used to identify related parts in Fig. 1 embodiment of the invention. Thus, the improved construction is illustrated at 110 in Fig. 9 and comprises an elongated inner guide tube or standard 120 having an out-turned stop flange 120F at its lower end adapted to be engaged by an in-turned flange 123F formed at the bottom end of a tubular guide 123. Both these flanges are integral parts of the related tubes and are formed by corresponding swaging or turning operations performed on the parts 120 and 123. Such is also true of the flanges to be mentioned hereinafter.

The tube 123 is substantially shorter than the tube 120 and is arranged in concentric spaced relation about the latter with the flange 123F engaging the upper side of flange 120F when the mechanism is disposed operatively within a cabinet or the like with the lower end of the tube 120 disposed in an appropriate mounting socket at the base of the cabinet. Arranged in the space between the tube 120 and the tube 123 is an elongated coil spring 129. In its fully expanded state, this spring projects slightly above the upper end of the tube 120, but even under no-load conditions in the cabinet is under slight tension between the flange 123F and an in-turned stop flange 124F formed at the top of an inner movable sleeve 124. The sleeve 124 is approximately the length of the guide 123 (see Fig. 11), and the sleeve 124 is disposed concentrically of the guide 123 and is dimensioned such that in the assembly the two are substantially in sliding contact as shown in Fig. 9.

Another or outer coil spring 132 is arranged concentrically about the outside of the inner sleeve 124, and this spring is substantially shorter than the inner coil spring. An outer guide tube 125 is arranged concentrically about the spring 132 and is substantially shorter than the spring 132. The guide 125 is formed at its lower end with an in-turned flange 125F which abuts the upper side of an out-turned stop formed on the lower end of sleeve 124. The coil spring 132 is disposed in the space between the guide 125 and the sleeve 124, and the lower end of this spring engages the inner or upper side of the flange 125F. In this way, the lower end of the spring 132 engages a movable part of the elevator mechanism which engages a fixed part of the sleeve 124.

An outer sleeve 126 is arranged concentric about the guide 125, and these two respectively have their lower and upper end portions in nested engagement as shown in Fig. 9 so that the sleeve 126 will slide vertically on and relative to the guide 125. The sleeve 126 is approximately the same length as the guide 125. A tray or shelf supporting member 133 is welded to the sleeve 124 preferably at the lower end thereof, and this support serves the purpose of the support 33 described above. At its upper end, the outer sleeve 126 is formed with a rounded in-turned stop flange 126F, and the upper end of spring 132 engages the inside surface of the flange 126F.

The upper end of the guide 120 can be projected into an opening in the top of the cabinet or otherwise stabilized, and the tube 120 includes a nail or pin receiving opening to facilitate withdrawal of the mechanism of the cabinet when desired and in the manner described above. However, in the operative state of the device as shown in Fig. 9, spring 129 is effective on the flange 124F of sleeve 124 to apply an upward lifting or holding force thereto, and this is transmitted to the outer concentric parts by the engaged flanges 124F2 and 125F.

The rates of the springs are such that both remain stationary until the weight of the second tier of containers in the cabinet causes downward compression of the outer spring 132 slightly ahead of the inner spring 129, causing the upper end of sleeve 126 to move downward away from the top of the cabinet and downward relative to sleeve 124 through a short separate stroke. This enables the least possible distance to be maintained between the top of the cabinet and the articles on support 133. Thus, in order to prevent the first tier of containers from moving the springs down, the latter are made long enough and of such strength as to support the weight of one tier before there is any appreciable movement and action. Subsequently, as each tier of milk cartons or the like is added, the outer spring is selected to compress approximately one inch to two inches of movement of the inner spring, and in this way both springs bottom at approximately the same time.

It will also be observed that the diameter of the externally convex rounded in-turned flange 126F at the upper end of the sleeve 126 is such as to nicely clear the corresponding externally convex rounded flange 124F at the upper end of the inner sleeve 124, and this clearance is such that the inner circumference or diameter of flange 126F embraces, with but a small spacing, the outer circumference of the inner sleeve 124 during relative movement between the sleeves 124 and 126. Even if there were some engagement due to canting, the flange 126F would easily slide off the rounded outer surface of flange 124F. In this way, assurance is had that the outer sleeve will not overhang the inner sleeve and become locked up in a manner of speaking.

Accordingly, when there is sufficient weight on the support 133, the outer sleeve first moves downwardly ex-

posing more and more of the upper end of the inner sleeve 124, the outer spring 132 compressing more and more between the stops 126F and 125F which are now moving closer together. The flange or stop 126F slides past the flange or stop 124F with no encumbrance, and eventually as more and more weight is added the inner sleeve 124 is pulled down against the action of the spring 129 due to the increased load and the engagement between the flanges 125F and 124F2. Hence, the inner spring starts to compress as the loading force is applied thereto by the flange 124F, and the inner sleeve starts to move down with the outer sleeve as more and more weight is added, the parts passing through the intermediate load stage shown in Fig. 10 to the fully loaded state shown in Fig. 11.

Hence, while I have illustrated and described preferred embodiments of my invention, it is to be understood that these are capable of variation and modification, and I therefore do not wish to be limited to the precise details set forth, but desire to avail myself of such changes and alterations as fall within the purview of the following claims.

I claim:

1. In a storage cabinet or the like for confining articles in vertical tiers or stacks on shelves in the area between the top and bottom of the cabinet: shelf supporting and elevating mechanism comprising, a main inner vertically disposed guide member, an inner coil spring concentrically surrounding said guide member and being axially compressible relative thereto, an inner sleeve freely surrounding said spring and being freely movable axially relative to said guide member toward one end thereof, said inner sleeve including a part fixed thereto in engagement with said spring for applying compressive forces on the spring upon axial movement of said sleeve toward said one end of said guide member, an outer spring concentrically surrounding said sleeve, said outer spring being supported by said sleeve to be compressible relative thereto, an outer sleeve surrounding said outer spring and being movable axially relatively to said inner sleeve and relative to said guide member toward said one end of said guide member, said outer sleeve having a part engaged with said outer spring to apply compressive forces thereto upon axial movement of said outer sleeve as aforesaid.

2. In an elevator mechanism of the kind described, a first tube, a second tube aligned axially with and surrounding in spaced relation a portion of said first tube and being shorter than the first tube, a third tube aligned axially with and surrounding in spaced relation a portion of the first tube and also surrounding in engaged relationship a portion of said second tube so as to be guided thereby, a stop adjacent one end of and carried by said third tube, another stop adjacent the end of the third tube having the first-named stop, a coil spring surrounding the first tube in the space that lies between the first tube and the second and third tubes spaced therefrom, said spring being in contact with said stops and compressible upon axial movement of the first stop toward said outer stop, said third tube being shorter than the first tube, a fourth tube surrounding in spaced relationship a portion of the third tube, a fifth tube surrounding in spaced relationship a portion of said third tube and surrounding in engaged relationship a portion of said fourth tube so as to be guided thereby, a stop adjacent the end of the fourth tube which lies opposite the end of the fifth tube having the third-named stop aforesaid, and a second coil spring arranged between said last-named stops and in contact therewith so as to be compressible upon movement of the stop on said fifth tube toward the abutment on said fourth tube.

3. In a shelf elevator mechanism of the kind described an inner elongated guide member, a pair of hollow elongated tubular members arranged in spaced concentric relation, the outer of said tubular members being axially movable relative to and being shorter than the inner tubular member, said inner guide member being longer than said tubular members, said inner tubular member being disposed in concentric spaced relationship about said inner guide member and being axially movable relative thereto, an inner coil spring disposed in the space between said inner guide member and said inner tubular member, one end of said inner coil spring abutting a fixed stop adjacent the corresponding end of said inner guide member and the opposite end of said inner coil spring being in contact with a stop member movable with said inner tubular member so that the spring will undergo compression upon axial movement of said inner tubular member toward said corresponding end of said inner guide member, an outer coil spring disposed in the space between said tubular members, one end of said outer coil spring engaging stop member movable with the inner tubular member and the other end of said outer coil spring engaging a stop member movable with said outer tubular member so that the second-named spring will undergo compression upon movement of the outer tubular member toward the stop member on said inner tubular member, and shelf supporting means carried by said outer tubular member.

4. Elevator mechanism according to claim 3 wherein the inner guide member is provided with an opening near one end thereof for receiving a pin.

5. Elevator mechanism according to claim 3 wherein the inner tubular member at one end is provided with means for preventing over-riding of the outer tubular member relative thereto.

6. In a storage cabinet or the like for confining articles in vertical tiers or stacks on a shelf: at least a pair of spaced apart shelf supporting and elevator mechanisms and each comprising: an inner elongated guide member supported upright within the cabinet and being removably mounted therein, a pair of hollow elongated tubular members arranged in spaced concentric relation, the outer of said tubular members being axially movable relative to and being shorter than the inner tubular member, said inner guide member being longer than said tubular members, said inner tubular member being disposed in concentric spaced relationship about said inner guide member and being axially movable relative thereto, an inner coil spring disposed in the space between said inner guide member and said inner tubular member, one end of said inner coil spring abutting a fixed stop adjacent the corresponding end of said inner guide member and the opposite end of said inner coil spring being in contact with a stop member movable with said inner tubular member so that the spring will undergo compression upon axial movement of said inner tubular member toward said corresponding end of said inner guide member, an outer coil spring disposed in the space between said tubular members, one end of said outer coil spring engaging stop member movable with the inner tubular member and the other end of said outer coil spring engaging a stop member movable with said outer tubular member so that the second-named spring undergoes compression upon movement of the outer tubular member toward the stop member on said inner tubular member, and shelf supporting means carried by said outer tubular member.

7. Elevator mechanism comprising: an inner guide disposable in an upright position, an inner coil spring concentrically surrounding said guide, an inner sleeve concentrically surrounding said spring and having a part fixed thereto engaging one end of said spring, said sleeve being shorter than said spring, an outer coil spring concentrically surrounding said sleeve, said outer spring being shorter than the inner spring and having one end engaged with a movable part of the mechanism which in turn engages a part of said sleeve spaced from the first-named part of said sleeve, and an outer sleeve in engagement with the end of the second spring opposite said

one end thereof, said outer sleeve having a shelf-supporting member affixed thereto.

8. Elevator mechanism according to claim 7 wherein the inner sleeve has a rounded in-turned flange at one end engaging said one end of the inner coil spring and having an out-turned flange at its opposite end, a tubular guide surrounding said outer coil spring and having an in-turned flange at one end engaging said out-turned flange, said outer coil spring having an end engaging the



in-turned flange of said tubular guide, and wherein said outer sleeve has a rounded in-turned flange at one end engaging the other end of said outer coil spring, and said in-turned flange of said outer sleeve having a diameter which clears the external surfaces of said inner sleeve.

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