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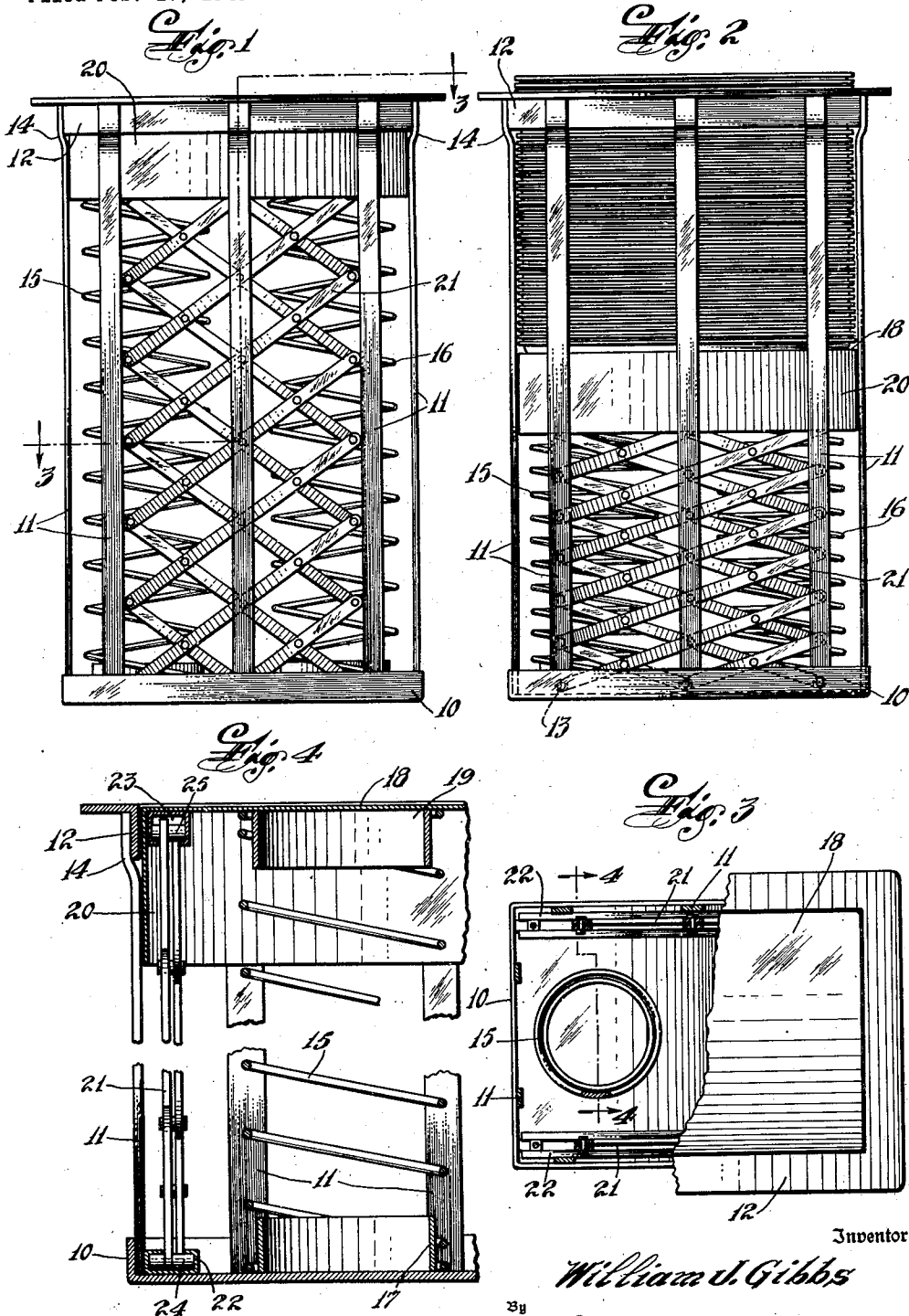
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APPARATUS FOR STORING STACKED ARTICLES

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2 Sheets-Sheet 1



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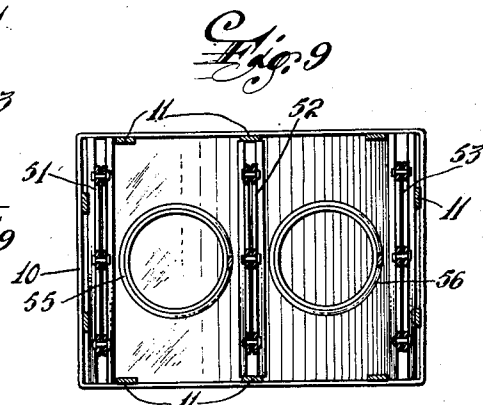
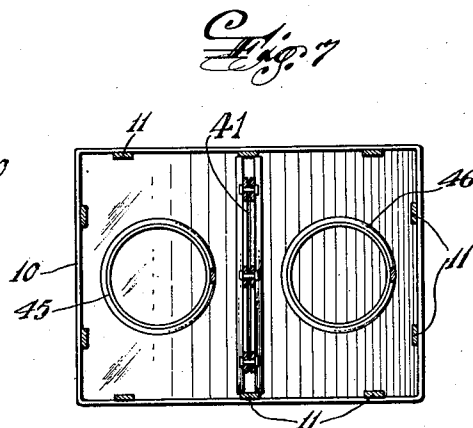
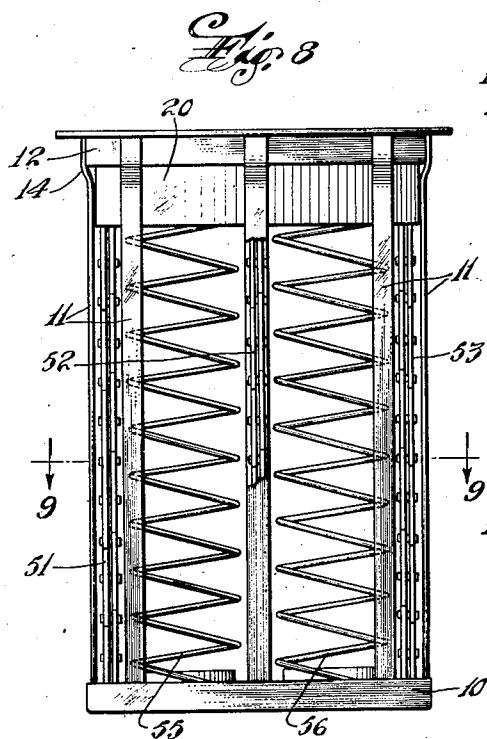
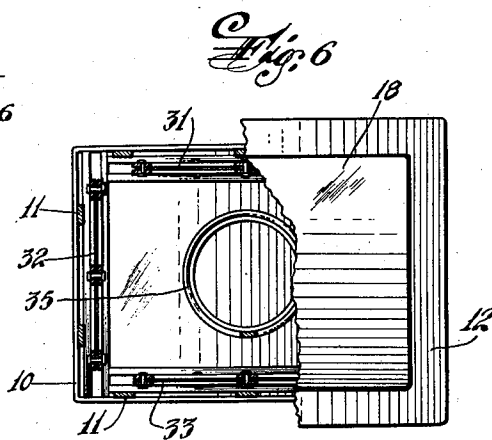
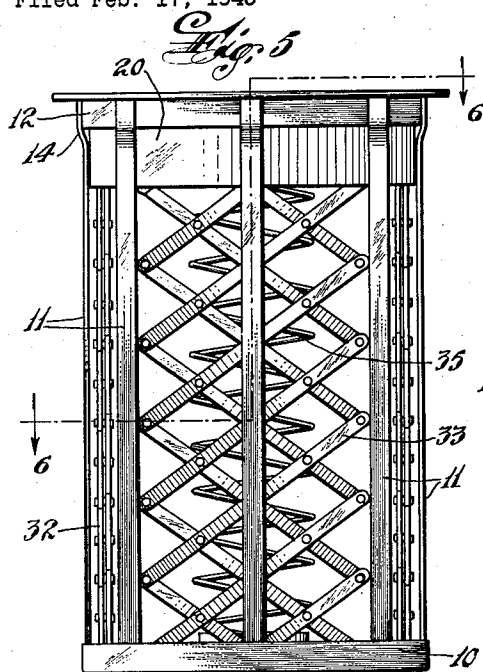
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APPARATUS FOR STORING STACKED ARTICLES

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2 Sheets-Sheet 2



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APPARATUS FOR STORING STACKED ARTICLES

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10 Claims. (Cl. 312-71)

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This invention relates to devices for holding and feeding stacked articles and preferably those of uniform size and weight. More particularly, it relates to devices for holding and dispensing stacked articles such as trays; the device can be applied to stacked plates, saucers, bowls or any other uniform article capable of being stacked. The present structures relate to improvements in devices for holding and feeding stacked articles of the type shown and described in my Patents 2,226,308, issued December 24, 1940, and 2,251,876, issued August 5, 1941.

One of the objects of the invention, among others, is the provision of improved devices for holding and feeding stacked articles so that the uppermost unit of a stack of articles is always presented for removal from the device at a predetermined level with the underlying units guided in a protected position for automatic upward feeding upon the removal of the uppermost article or articles. Further objects are the provision of a device having improved means for guiding and supporting the stacked articles in their automatic feeding and holding movement within the device; a device that is simple and easy of design; that is economical to manufacture and durable in operation. Other objects will become apparent from the detailed description of the drawing.

In carrying out the objects of the invention there is provided a device for holding and feeding stacked articles, having a vertical housing, which may be open or closed, and may have a top and base portion. A carrier for the stacked articles is reciprocally mounted within the housing motivated by calibrated compression spring means disposed between said carrier and base portion with said spring means being calibrated and adapted to expand and raise stacked articles on the carrier a given distance for each given decrement in the weight of the load whereby said stacked articles are presented with the uppermost unit of the stack at a predetermined level with respect to the upper end of the housing. Extensible and retractable means are connected with the base portion and carrier to guide and support the carrier in its vertical motion within the housing. In carrying out the invention one compression spring or a plurality of springs may be used with a single or plurality of extensible and retractable means as conditions and requirements may dictate for any specific device desired. The device may be arranged for individual use or it can be employed in single or multiple arrangements in apertured horizontal supports, such as counters or cabinets or the like. The invention

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will be better understood from the following detailed description having reference to the accompanying drawings wherein like reference numerals have been used to represent like parts throughout the several views, and in which:

Figure 1 is a view in elevation showing one embodiment of the invention without stacked articles thereon.

Figure 2 is a view in elevation showing the embodiment of Figure 1 with stacked articles thereon.

Figure 3 is a part sectional view and a part plan view taken on the line 3-3 of Figure 1.

Figure 4 is a sectional view taken on the line 4-4 of Figure 3.

Figure 5 is a view in elevation showing another embodiment of the invention.

Figure 6 is a part sectional view and part top plan view taken on the line 6-6 of Figure 5.

Figure 7 is a sectional view showing another form the invention can assume.

Figure 8 is a view in elevation showing still another embodiment of the invention.

Figure 9 is a sectional view taken on the line 9-9 of Figure 8.

Referring to the drawings, an embodiment of the invention illustrated in Figures 1 to 4, comprises a unitary cage structure forming a housing consisting of a base 10, spaced vertical guide rods 11 and a rectangular member 12 attached to the guide rods 11 forming a top portion. The housing, including the base portion and top portion may be made of any material desirable but is preferably made as light as possible so a light metal such as aluminum or magnesium is employed. The guide rods 11 are attached rigidly to the base portion by any suitable means such as riveting, as shown at 13 in Figure 2, but may be by any well known attaching method such as nut and bolt if it is desired to make the rods detachable from the base portion. The top portion of the rods 11 is flared out at 14 to form a socket to receive the member 12 therein and the rods 11 and top portion 12 may be attached by any means such as riveting or welding.

A pair of calibrated compression springs 15 and 16 have their lower ends held in place by projecting collars or members secured to the base portion 10, one of which is shown at 17 in Figure 4. A carrier 18 for the stacked articles is reciprocable within the housing and has projecting flange portions on which the upper ends of the springs 15 and 16 are held in place, one of which is shown at 19 in Figure 4. The carrier preferably consists of an integral casting providing a

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flat top disc-like load carrying portion and an integral depending annular flange 20 of substantial length and which has a loose fit within the housing member so the carrier has free vertical movement out of contact with the rods 11.

The structure as described up to now is substantially the same as that disclosed in Patents 2,226,308 and 2,251,876 which structures have operated with much success and advantage for their intended purposes. Applicant has found it advantageous, in some instances, to provide a guide and support means for the stacked article carrier that will allow reciprocal movement of the carrier free from any bearing surfaces.

According to this invention the extensible and retractable guide and support means employed are shown in Figures 1 to 4 at 21 as pivotally connected metallic strip members forming a lazy-tong arrangement. At the bottom, the free ends of two of the lowermost strip members of each lazy-tong are slidably supported in the base 10 of the housing by a series of socket portions 22 extending along the base 10 (Fig. 3), one of which is also shown at 22 in Figure 4, into which fit bearing portions 24 on the ends of two of the lowermost metallic strips of the extensible and retractable member 21. The outward movement of the bearing portions 24 in socket portions 22 may be limited by engagement with the base portion 10. Likewise, the carrier 18 has a series of socket portions, one of which is shown at 23 in Figure 4, into which fit bearing portions 25 on the ends of two of the uppermost metallic strips which form the opposite end of the extensible and retractable members 21. The outward movement of the bearing portions 25 in socket portions 23 may be limited by engagement thereof with the flange 20. It can be seen that bearing portions 25 are thus pivotally and slidably mounted in the sockets 23 and the bearing portion 24 are pivotally and slidably mounted in the sockets 22. The other pair of uppermost and lowermost strip members of each lazy-tong are pivotally connected to each other. The bottoms of the extensible members are not movable vertically since the base portion 10 is not vertically movable. The carrier 18 is vertically movable, hence the socket 23 and bearing portion 25 move therewith and extend or retract the member 21 depending upon which direction the carrier 18 moves.

The series of members making up the extensible and retractable member pivot to extend as shown in Figure 1 and Figure 2 shows the position taken by the member 21 when the carrier is loaded and the member retracted. As the extensible and retractable member becomes extended, its width is diminished while its width increases as it is retracted. The extensible and retractable member is so proportioned that it will be fully contained within the housing member when fully compressed. The members 21 shown in Figure 4 respond instantly to the force of the springs or weight placed on the carrier to aid in guiding and supporting the carrier in its vertical movement within the housing. The members 21 must possess sufficient rigidity to serve their function as a guide and support means and must still be flexible. The members 21 are adjusted as to the force needed to expand or contract the members by the rigidity of the pivotal points, connecting each of the metallic strip members making up the lazy-tong arrangement.

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The lazy-tong extensible and retractable member 21 is thus free to expand or contract by the separate metallic strip members making up the member, each pivoting about the metallic strip member to which it is connected in a manner well known for the lazy-tong. With the lazy-tong arrangement there are no bearing surfaces for the carrier 18 in its vertical movement in the housing hence there is no possibility of any binding with the housing in the vertical movement of the carrier. The extensible and retractable members 21 act to support the carrier in a level plane in its vertical movement within the housing and in this way guide the movement of the carrier out of contact with the housing even though there be a component of force on the carrier.

The springs 15 and 16 are of such stock and design as to provide for full compression of the springs without causing the springs to bulge intermediate their ends. The springs employed are calibrated for articles of a given weight so that, with a stacked load of articles on the carrier, the uppermost unit of the stock will always be presented for removal from the stack at a predetermined level with regard to the upper end of the housing.

It is thought that operation of the device will have become apparent from the foregoing description but it may be mentioned that the loading of the device is accomplished by placing the stacked articles directly on the carrier or on top of other stacked articles already on the carrier. The springs are compressed in accordance with the load on the carrier and to such an extent that the uppermost article of the stack presents itself for removal at a position at the top of the device. With the removal of an article or articles from the top of the stack, the springs automatically expand to raise the stack a given distance for each decrement in the weight of the load. The entire assembly provides a novel unitary storage and dispensing structure accommodating in protected manner a maximum number of articles in a minimum of space, thus avoiding breakage and alleviating the necessity of a user stooping or reaching upward over shelves and the like. For cleaning, the device may be subjected to ordinary washing in any known manner.

The invention is shown taking a different form in Figures 5 and 6 from that shown in Figures 1 to 4. In Figures 5 and 6, the housing and carrier are the same structure as shown in Figures 1 to 4. Instead of just two extensible and contractable members as shown in Figures 1 to 4, the present modification provides four; three being shown at 31, 32, and 33. One lazy-tong is located at each side of the housing and all the lazy-tongs surround a single spring means 35. Where a single spring means is employed, additional supporting means for the carrier is provided by the four extensible and contractable members.

Figure 7 shows another modification of the device where two springs 45 and 46 are employed but with only a single extensible and retractable member 41 located between the two spring members 45 and 46.

Still another modification carrying out the principles of the invention, is shown in Figures 8 and 9 wherein two compression springs 55 and 56 are employed, along with three extensible and retractable members 51, 52 and 53, with one of the extensible and retractable members 52

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being between the two spring members 55 and 56 while the other two extensible and retractable members 51 and 53 are on the other sides of the springs 55 and 56 and all three extensible and retractable members are in parallel relationship to each other.

While the invention has been described in connection with specific embodiments, it is to be understood that the words which have been used are words of description rather than of limitation, and that practice of the invention within the scope of the appended claims may be resorted to without departing from the true scope of the invention in all of its aspects.

I claim:

1. A device for feeding and holding stacked articles, comprising a housing having a base portion and a top portion, a carrier for stacked articles reciprocable within the housing, the top portion of said housing being provided with an opening coextensive with said carrier to permit articles to be placed on the carrier, helical compression spring means disposed between said carrier and base portion to motivate said carrier and its load of stacked articles, and extensible and retractable means connected with the base portion and carrier, said last mentioned means being a lazy-tong, said lazy-tong including separate pairs of links at the top and bottom of the lazy-tong which are slidably connected to said base portion and carrier and movable outwardly thereon during the contraction of said lazy-tong, said spring means being calibrated to support said carrier in various positions wherein the outer face of the outermost article of a stack of uniform articles on the carrier will be disposed at a predetermined level.

2. A device for feeding and holding stacked articles, comprising a housing having a base portion and a top portion, a carrier for stacked articles reciprocable within the housing, the top portion of said housing being provided with an opening coextensive with said carrier to permit articles to be placed on the carrier, calibrated compression spring means disposed between said carrier and base portion to raise and lower said carrier at a uniform predetermined distance of travel corresponding with the weight of each increment and decrement added to and removed from the articles supported by the carrier to maintain the uppermost article supported by said carrier at a constant predetermined level, and a plurality of extensible and retractable lazy-tongs connected with the base portion and carrier and arranged in substantially parallel relationship for maintaining said carrier free from tilting.

3. A device for feeding and holding stacked articles, comprising a housing having a base portion and a top portion, a carrier for stacked articles reciprocable within the housing, the top portion of said housing being provided with an opening coextensive with said carrier to permit articles to be placed on the carrier, a plurality of helical compression springs disposed between said carrier and base portion to motivate said carrier and its load of stacked articles, and extensible and retractable means connected with the base portion and carrier, said last mentioned means being a lazy-tong slidably connected to said base portion and carrier, said compression springs being calibrated to collectively support said carrier in various positions wherein the outer face of the outermost article of a stack of uniform articles on the carrier will be disposed at a predetermined level.

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4. A device for feeding and holding stacked articles, comprising a housing having a base portion and a top portion, a carrier for stacked articles reciprocable within the housing, the top portion of said housing being provided with an opening coextensive with said carrier to permit articles to be placed on the carrier, a plurality of calibrated compression springs disposed between said carrier and base portion to motivate said carrier and its load of stacked articles and a plurality of extensible and retractable means connected with the base portion and carrier and arranged in substantially parallel relationship, each of said last mentioned means being a lazy-tong.

5. A device for feeding and holding stacked articles, comprising a housing of substantially rectangular cross section having a base portion and a top portion, a carrier for stacked articles reciprocable within the housing, the top portion of said housing being provided with an opening coextensive with said carrier to permit articles to be placed on the carrier, calibrated compression spring means disposed between said carrier and base portion to freely support said carrier and its load of stacked articles, and retractable and extensible means connected with the base portion and carrier, said extensible and retractable means located within the housing along each side of the housing and surrounding the compression spring means to maintain said carrier level, each of said retractable and extensible means being a lazy-tong.

6. A device for feeding and holding stacked articles, comprising a housing having a base portion and a top portion, a carrier for stacked articles reciprocable within the housing, the top portion of said housing being provided with an opening coextensive with said carrier to permit articles to be placed on the carrier, a plurality of compression spring means disposed between said carrier and base portion to motivate said carrier and its load of stacked articles and a single extensible and retractable means connected with the base portion and carrier and located between the spring members, said last mentioned means being a lazy-tong.

7. A device for feeding and holding stacked articles, comprising a housing having a base portion and a top portion, a carrier for stacked articles reciprocable within the housing, the top portion of said housing being provided with an opening coextensive with said carrier to permit articles to be placed on the carrier, a pair of calibrated compression springs disposed between said carrier and base portion to maintain the top of the stack of articles supported on said carrier at a predetermined constant level, and extensible and retractable means connected with the base portion and carrier located in parallel relationship, with one extensible and retractable means located along two sides of the housing, each of said last mentioned means being a lazy-tong.

8. A device of the character described for feeding and holding stacked articles, comprising a housing having a base portion and a top portion, a carrier for stacked articles reciprocable within the housing, the top portion of said housing being provided with an opening coextensive with said carrier to permit articles to be placed on the carrier, compression spring means disposed between said carrier and base portion to motivate said carrier and its load of stacked articles, said spring means being calibrated and adapted to

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expand and raise stacked articles on the carrier a given distance for each given decrement in the weight of the load whereby said stacked articles are presented with the uppermost unit of the stack at a predetermined level with respect to the upper end of the housing, and extensible and retractable means connected with the base portion and carrier to guide and support the carrier in a level position in its movement within the housing, said last mentioned means being a lazy-tong.

9. A device of the character described for feeding and holding stacked articles, comprising a housing having a base portion and a top portion, a carrier for stacked articles reciprocable within the housing, the top portion of said housing being provided with an opening coextensive with said carrier to permit articles to be placed on the carrier, compression spring means disposed between said carrier and base portion to motivate said carrier and its load of stacked articles, said spring means being calibrated and adapted to expand and raise stacked articles on the carrier a given distance for each given decrement in the weight of the load whereby said stacked articles are presented with the uppermost unit of the stack at a predetermined level with respect to the upper end of the housing, and extensible and retractable means connected with the base portion and carrier to guide and support the carrier in a level position in its movement within the housing, said last mentioned means including a plurality of lazy-tongs, one of said lazy-tongs extending longitudinally of said carrier and being

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located underneath the same, and another of said lazy-tongs extending transversely of said first mentioned lazy-tong and being located underneath said carrier.

10. Apparatus for storing and dispensing material comprising a housing, a carrier mounted for free vertical movement within said housing, said housing having an opening through its upper surface of a size sufficient to allow said carrier to pass therethrough, a plurality of calibrated spring devices for raising and lowering said carrier a distance varying with the weight of each increment and decrement added to and removed from the material supported by said carrier to thereby maintain the top of the material supported on said carrier at a predetermined level and a lazy-tong device connected to said housing and said carrier to maintain said carrier horizontal as it moves in a vertical path of travel within said housing.

WILLIAM J. GIBBS.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
977,305	Heppe	Nov. 29, 1910
1,131,856	O'Donnell	Mar. 16, 1915
1,198,428	Elsas	Sept. 19, 1916
2,034,516	Hunt et al.	Mar. 17, 1936
2,083,843	Hicks	June 15, 1937
2,251,876	Gibbs	Aug. 5, 1941