Jan. 7, 1930. G. M. TURNER 1,742,738

TIERING MEANS FOR ELEVATING TRUCKS

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FIG. 1

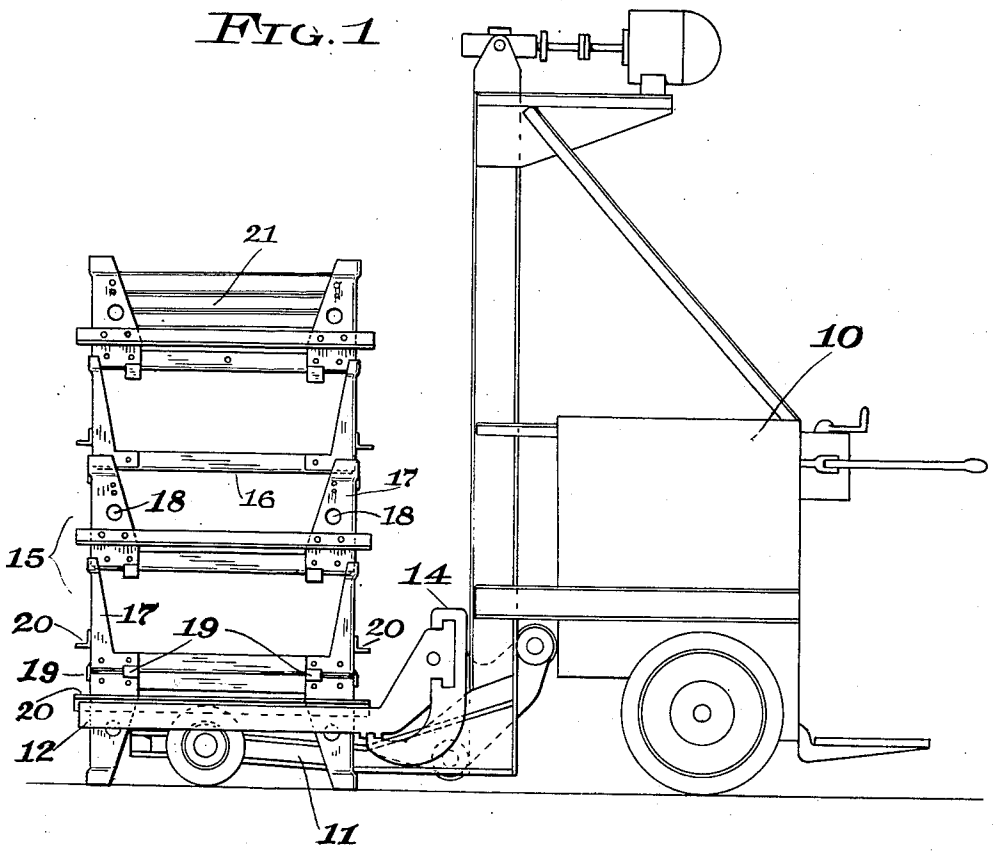
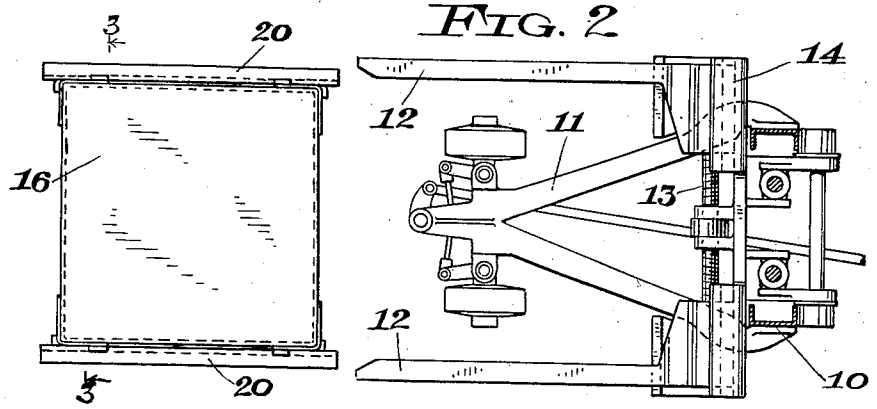


FIG. 2



WITNESSES
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FIG. 3

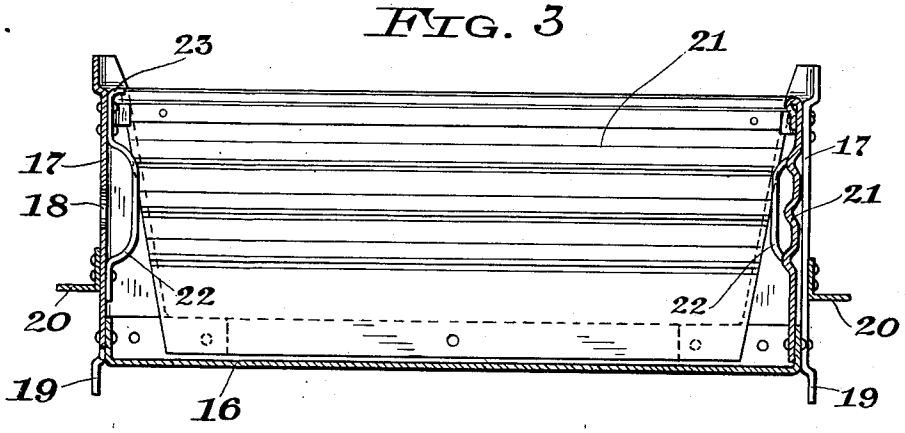


FIG. 4

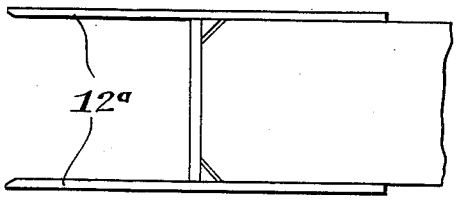


FIG. 8

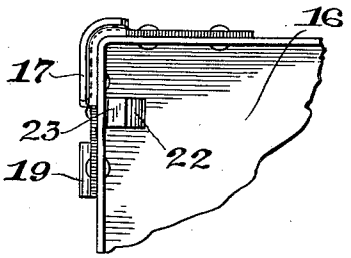


FIG. 5

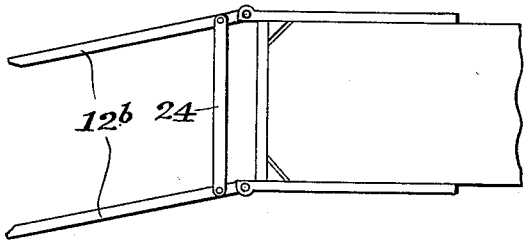


FIG. 6

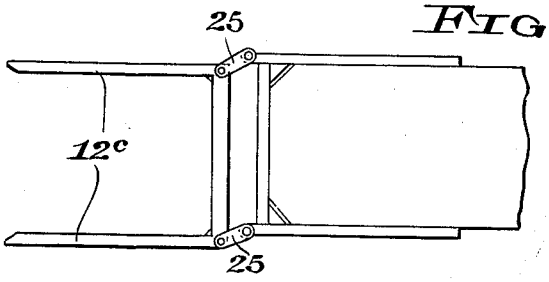
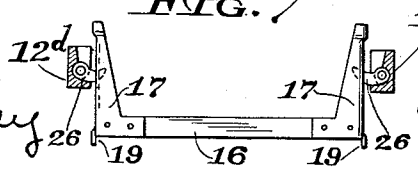


FIG. 7



WITNESSES

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UNITED STATES PATENT OFFICE

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TIERING MEANS FOR ELEVATING TRUCKS

Application filed October 27, 1923. Serial No. 671,206.

This invention has for its object to provide a power lift truck capable of stacking material-supporting skid platforms or containers, said truck and the skid platforms or containers being capable of engagement whether the container to be engaged is at the bottom of the stack or in any other location in the stack, whereby all of the stack or any part thereof may be moved at a time without the necessity for placing spacing means between the containers to admit the lifting arms of the truck.

Power lift industrial trucks now in use have been designed to engage material containers by passing their lifting arms or truck platforms beneath such containers, thus necessitating the containers when stacked being alternated with skid platforms to afford the spacing necessary to admit the arms or truck platform between them. It is a purpose of this invention to avoid this waste of space by permitting the containers to be stacked one directly upon another and adapted to be engaged by the lifting arms of the truck fitting on opposite sides thereof instead of beneath them.

Another object of the invention is to provide a skid platform which, when inverted, will constitute a container.

Another object of the invention is to provide for interlocking the units of a stack of containers.

Another object is to provide container units adapted for engagement by the lifting arms of the truck when the latter fit either on the opposite sides or the opposite ends of said units.

Another object of the invention is to perfect details of construction of the container units to adapt them for the purposes intended as herein pointed out.

With the above and other objects in view the invention consists in the tiering means for elevating trucks as herein claimed and all equivalents.

Referring to the accompanying drawings in which like characters of reference indicate similar parts in different views,

Fig. 1 is a side elevation of a tiering truck and a stack of container units constructed in accordance with this invention;

Fig. 2 is a plan view showing the truck lifting arms about to engage one of the material containing units;

Fig. 3 is a sectional view of one of the material containing units equipped with side plates to constitute a tote-box;

Figs. 4, 5, and 6 are plan views showing modifications of the lifting arms designed for attachment to the ordinary truck platform;

Fig. 7 is a detail view of a modification wherein the engagement is effected by hooks on the lifting arms engaging openings in the material-containing units, and

Fig. 8 is a detail view of one corner of one of the units.

In these drawings, 10 indicates a power lift truck having the usual projecting wheel frame 11 capable of passing beneath the load and provided with the motor elevated lifting arms 12 in lieu of the usual load platform. The lifting arms 12 may be fixed in their relation to each other or suitable adjustment may be provided whereby they may be moved toward or away from each other as by means of a right and left hand screw 13 causing them to slide in horizontal ways in the elevating frame 14.

Each of the skid platforms or material-containers 15 consists of a rectangular sheet metal plate 16 with its edges turned in the same direction to form a surrounding flange. At each corner an angularly bent sheet metal leg member 17 is secured to the flange, preferably by riveting, so that when the legs are lowermost the unit constitutes a skid platform to rest on the floor and support material or a stack of units with sufficient floor clearance to admit the wheel frame 11 of the truck. Each leg member preferably is wider at what will be designated the side of the unit than at the end of the unit and is provided with an opening 18 for engagement with the chain hooks of an elevating crane when the latter is available. The end of each leg member is offset outwardly from both of the planes thereof to adapt them to receive the corners of the adjacent unit to form a stack of interlocked units. For interlocking units when

placed with their plates 16 together, as at the bottom of the stack in Fig. 1, each leg member at its broader face has an outwardly offset projection 19 to engage the corresponding unoffset portions of the leg members of the adjacent unit. This arrangement is accomplished by placing a second unit crosswise of the first unit and, while the succeeding units are shown as alternated in their positions, they may all be arranged in the same direction if desired.

Each unit at its opposite sides is provided with engaging flanges 20 which are preferably formed of angle iron strips riveted to the leg members with their ends projecting beyond the leg members, as shown, thus affording engagement shoulders for the lifting arms 12 of the power lift truck whether said arms embrace the sides or the ends of the unit.

It will thus be seen that when units are stacked the power lift truck may be run beneath the stack with its lifting arms 12 embracing the sides of the lowermost unit so as to engage the flanges 20 thereof when elevated and thus lift the entire stack to transport it or replace it as desired or it may advance with the lifting arms at any desired higher elevation in order to engage the flanges 20 either at the sides or the ends of any of the upper units to separate the stack when elevated, thus making it possible to lift and transport the entire stack or any portion thereof. As each unit above the base unit may contain a load, it is obvious that the stack or tier is without waste space and consequently a greater quantity of material may be stacked in a given amount of floor space.

When desired, the units may be converted into tote-boxes by providing them with side and end panels 21 riveted or otherwise secured in place so that they may better contain the articles that are too small to store in the units with open sides and ends. To prevent the contents of the unit interfering with the engagement of hooks through the openings 18, such openings are preferably guarded by means of bent metal guard strips 22 riveted to the leg members and, if desired, the ends of these strips may be bent over to form stops 23 at the level of the top of the inverted unit and thus increase the bearing surface to support the unit which rests thereon.

It is obvious that the lifting arms of the power lift truck may be rigidly fixed at the proper distance apart to receive the units between them and to engage with the flanges 20 or their protruding ends and such a construction is shown in Fig. 4, where the arms 12^a are illustrated as constituting an attachment for the ordinary truck lifting platform. Likewise, as shown in Fig. 5, the arms 12^b may be pivotally mounted and kept parallel by means of a connecting link 24 which will permit of an angular relation between the truck and the stack. Furthermore, as shown in Fig. 6, the arms 12^c may be rigid with respect to each other but yieldably connected with the truck platform as by means of the parallel links 25, thus permitting of lateral offset between the truck and the stack.

In lieu of the shoulders or flanges 20, the arms 12^d of the power lift truck may be provided with pivoted hook members 26 for engaging the openings 18.

It will be understood that, in the use of power lifting trucks and material-containing units adapted for outside engagement as distinguished from bottom engagement, stacks may be formed without waste of space permitting a greater quantity of material to be stored in the stack and without sacrificing any of the advantages as to ability to separate the stack at any point for removing any or all of the units.

Also it will be recognized that an advantage is gained in utilizing the same unit construction for skid platforms, open material-containers and tote-boxes.

Another advantage is gained in the interlocking arrangement provided whether the units are placed back to back or foot to back.

What I claim as new and desire to secure by Letters Patent is:

1. A material-containing unit for tiering storage comprising a rectangular plate, angular leg members secured thereto at its corners and forming offset feet for receiving between them and supporting the plate of a similar unit whereby the units may be stacked in interlocked relation, and lifting-truck-engaging flanges on the sides of the unit.

2. A material-containing unit for tiering storage comprising a rectangular plate, angular leg members secured thereto at its corners and forming offset feet for receiving between them and supporting the plate of a similar unit whereby the units may be stacked in interlocked relation, and lifting-truck-engaging flanges on the sides of the unit projecting beyond the ends thereof.

3. A material-containing unit for tiering storage comprising a rectangular plate, angular leg members secured thereto at its corners and forming offset feet for receiving between them and supporting the plate of a similar unit whereby the units may be stacked in interlocked relation, lifting-truck-engaging flanges on the sides of the unit, offset lugs on the leg members projecting beyond the plate to form interlocking connection with a similar unit when said units are arranged with their plates together.

4. A material-containing unit for tiering storage comprising a rectangular sheet metal plate with its edges bent normal to the plane thereof to form a flange, angular sheet metal leg members secured to the flange at the corners of the plate and having their ends offset to engage the plate of a similar unit, there

being openings in the leg members to afford engagement for lifting truck-engaging means, a guard covering said openings on the interior of the unit, and sheet metal panels for closing the sides and ends of the unit.

5. A material containing unit for tiering storage comprising a rectangular plate, angular leg members secured thereto at its corners and having offset feet for receiving between them and engaging with the corners of the plate of a similar unit whereby the units may be stacked in interlocked relation, lugs on the leg members projecting beyond the plate at two opposite edges thereof to form interlocking connection with the leg members of a similar unit when said units are arranged with their plates together.

6. A material containing unit for tiering storage comprising a rectangular sheet metal plate with its edges bent normal to the plane thereof to form a flange, angular leg members secured to the flange at the corners of the plate with their ends offset to form shouldered feet to engage the corners of the plate of a similar unit, and sheet metal panels for closing the sides and ends of the unit.

7. A material containing unit for tiering storage comprising a rectangular sheet metal plate, angular leg members secured to the corners of the plate and projecting therefrom for supporting the plate above the floor, the free ends of said leg members being offset to form shouldered feet to engage the corners of a plate of a similar unit when stacked in the same relation, said plate being free to fit against the plate of a similar unit when stacked with their legs extending in opposite directions.

In testimony whereof I affix my signature.

GILES M. TURNER.