

July 23, 1940.

C. K. ERNST

2,208,968

HOIST

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2 Sheets-Sheet 1

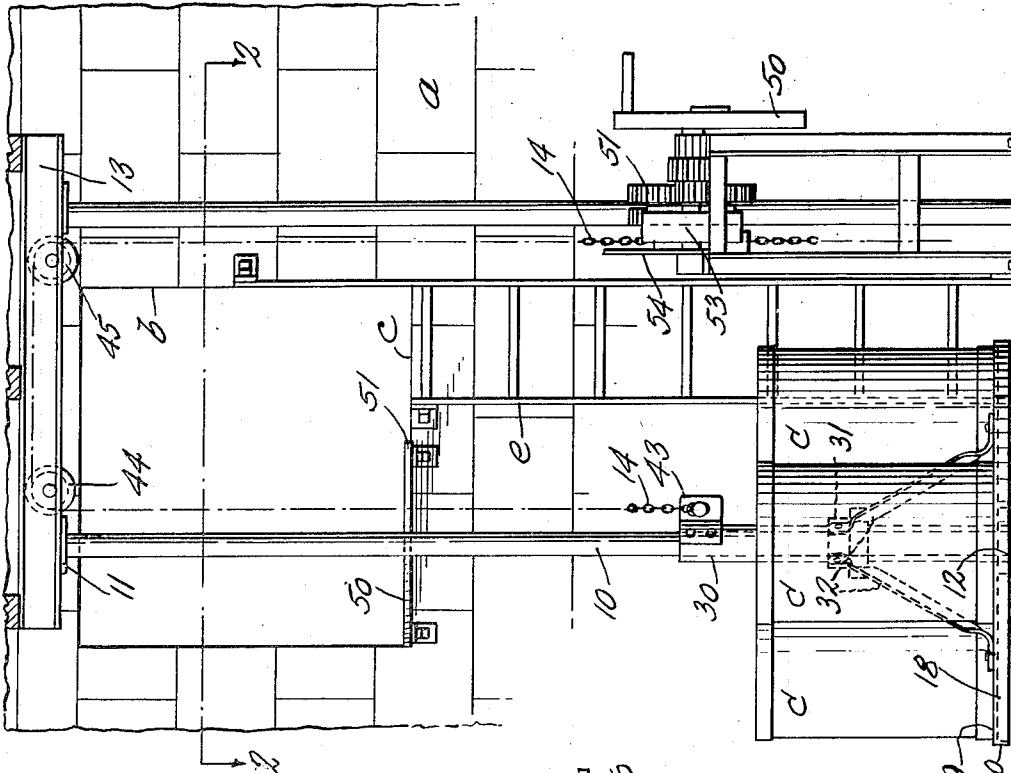
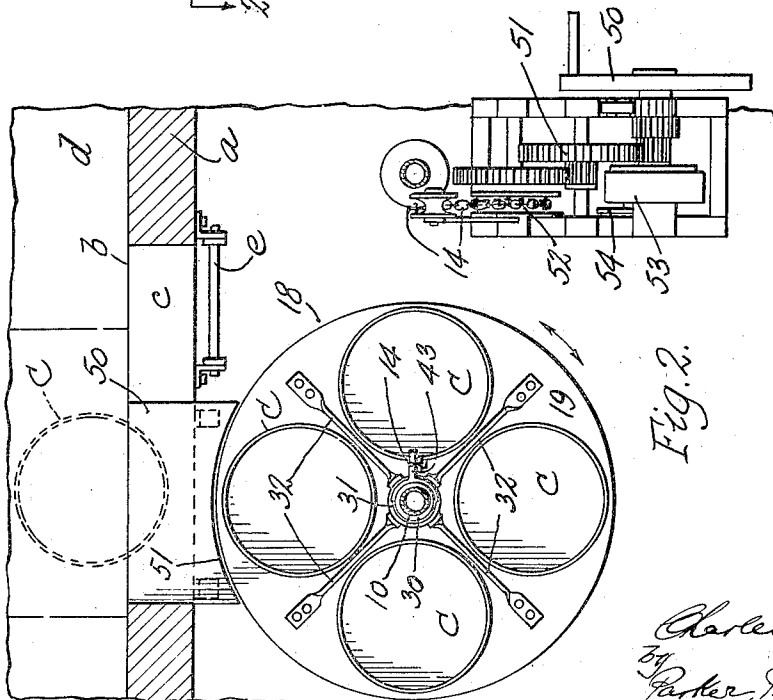


Fig. 1.

Fig. 2.

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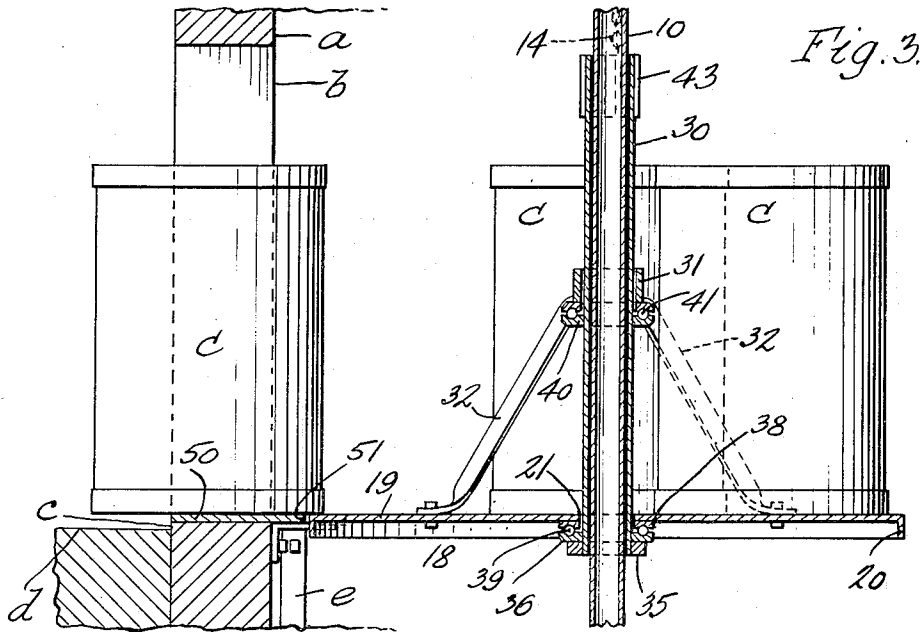
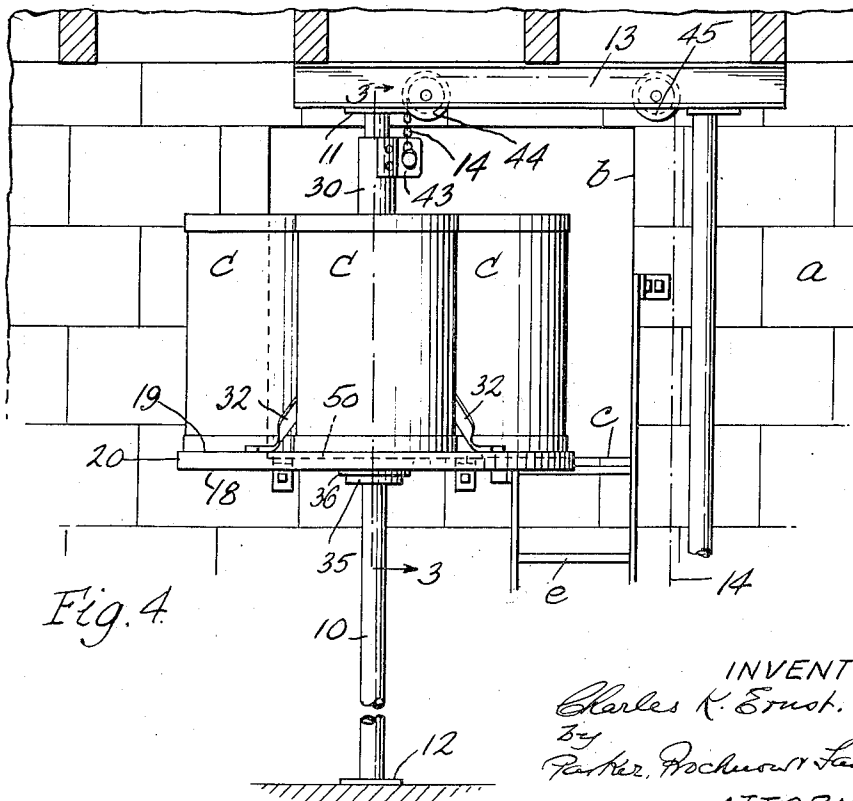
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UNITED STATES PATENT OFFICE

2,208,968

HOIST

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11 Claims. (Cl. 187—3)

This invention relates to improvements in hoists or mechanisms, of that type which may be installed in basements for the purpose, among other uses, of elevating filled ash and garbage cans and other containers or objects from the basement floor to a window or sidewalk opening or the like place where the load is to be removed and for returning or delivering emptied cans, containers or other objects to the floor.

Many types and constructions of hoists or mechanisms have been proposed, or are in use for such purpose. Such hoists usually have a platform movable by suitable lifting or power means relatively to its supporting means, but it often happens that, owing to restricted or confined space or other reasons, the individual cans or objects comprising the load can only be placed on or removed from the platform from a more or less limited position, thus making it awkward and inconvenient to obtain maximum use and expeditious operation of the hoist. Likewise when a load of several cans or objects are delivered by the hoist to a window or opening it is awkward and difficult to remove these cans or objects, since some of them are remote from the operator at the outside of the window. The operator may, for example, have to stand on a sidewalk, and if the window or opening is of restricted size, it is difficult to reach in to manipulate and remove the cans or objects from the far side of the platform.

Some objects of the present invention are to provide a novel and improved hoist, of simple, rugged compact and relatively inexpensive construction with which each one a plurality of cans, containers or objects constituting a load on the hoist platform may be successively or selectively positioned at a point close to a window or opening for easy removal therefrom with maximum accessibility and minimum effort and without first shifting the desired can or object on or relatively to the platform in attaining this end; and also to provide a hoist upon which a plurality of cans or objects may be successively placed in different relative positions on the hoist platform from a restricted loading point or limited space on the floor or other inside place, or from the sidewalk or other place outside.

Other objects are to construct a hoist which may be installed close to a wall or in a restricted or confined area and upon which the cans or articles may be loaded (or removed) one after another and distributed over the area of the hoist platform while operating from a place remote from the wall, or at the open or exposed side of

the confined space, and without having to roll or shift the cans or articles over the platform to distribute them upon the same; also to this end to provide a hoist having a platform movable lengthwise along and rotatably mounted with reference to its support or column and in which the rotary movement of the platform is about the axis of its support and may be effected at or at any point between the ends of its travel; also to support the platform in a simple and novel way to facilitate its movement lengthwise of and its rotary movement relatively to or about its support, and also to construct a hoist having a platform which is well sustained against tipping or binding due to any unbalanced disposition of the load thereon, and in which the sustaining or bracing means also constitutes means to facilitate the symmetrical spacing of the articles about the center of the hoist or platform so that the load is uniformly distributed thereon.

Other objects and advantages of this invention will be apparent from the following disclosure of an embodiment thereof, and its novel features will be pointed out in connection with the appended claims.

In the drawings:

Fig. 1 is an elevation of an embodiment of my improved hoist, showing the platform thereof in its lower position, the hoist being installed in the basement of a building.

Fig. 2 is a horizontal section thereof, on line 2—2, Fig. 1.

Fig. 3 is a fragmentary, vertical transverse central section through the platform and adjacent parts of the hoist.

Fig. 4 is a fragmentary view, similar to Fig. 1, showing the platform in an elevated position.

In its general organization, my improved hoist comprises a stationary upright column or standard, and a substantially horizontal platform movable up and down relatively to the column or standard. The column extends through a hole in the platform and the latter is arranged to rotate about the column, and means are provided for supporting and for raising and lowering the platform relatively to the column.

Since the hoist under consideration is particularly adapted for use in the basements of apartment and other houses, stores or buildings, I have illustrated the same in the embodiment shown as being installed in a basement wherein a vertical, cylindrical column 10 has its lower flange or end 12 secured to the floor and its upper flange or end 11 secured to or adjacent the ceiling, as

for example to an I-beam or structural member 13 which, as shown, can be additionally employed for the purpose of supporting and guiding a chain or cable 14 used for raising and lowering the hoist platform. This platform, indicated at 18, is disposed horizontally and may be formed of a substantially circular metal plate 19 having a marginal depending flange 20. The platform, however, may be of any other shape and constructed of other materials.

As shown, the upright column 10 extends centrally through the platform in a hole 21 therein so that the platform may be moved up and down with reference to the column from a position close to the floor, as shown in Fig. 1, to an elevated position at or opposite the place where it is desired to remove articles from the platform, or upon which articles may be placed to be lowered to the floor level.

In the arrangement illustrated, the column 10 is installed near a side wall *a* of a basement, and in which a window or opening *b* is formed at a distance from the floor. The lower edge or sill *c* of the window *b* may advantageously be disposed approximately at the level of a side walk or the like *d*, where, for example, it may be desired to discharge cans or containers *C* of ashes, garbage, or the like, or other articles, after loading them upon the platform 18 from the floor and elevating the platform so that the horizontal, upper surface of the plate 19 thereof is positioned substantially in the plane of the window ledge *c*.

If desired, a ladder *e* may be mounted against the wall *a*, as an added convenience, to enable a person to ascend from the floor to the window *b* and pass therethrough so as to manipulate and remove the cans *C* from the hoist to the sidewalk *d* after it has been raised, as described, and to then return to the basement through the window after the load has been discharged, to lower the platform.

In order to easily and smoothly support and guide the platform 18 in its movements up and down the column 10, suitable means are provided which, in the embodiment illustrated, comprises a suitable member arranged to slide upon the column, such for example as a tubular sleeve or member 30, see particularly Fig. 3, the internal diameter of which is such that, while free sliding movements of the same are permitted upon the column 10, lateral movement thereof is substantially prevented. The upper end of the sleeve 30 extends some distance above the platform, as shown in the drawings, while its lower end may be positioned in operative relation to and near the platform. In the arrangement shown, the lower end of the sleeve 30 passes through the hole 21 in the platform to a point somewhat below the latter.

Any suitable means may be provided for affording an operative connection between the sleeve 30 and the platform 18 so that the latter may move with the sleeve up and down the column 10, and may also be rotated relatively to the sleeve and column. For this purpose, I provide suitable anti-friction bearing and supporting means between the sleeve 30 and the platform. These means may be arranged in any suitable manner. For example, as shown particularly in Fig. 3, I secure to the lower end of the sleeve 30 an annular ring or part 35 which forms an annular shoulder upon which the lower ring or plate 36 of a ball bearing may engage. The upper ring or race 38 of the ball bearing is secured to the underface of the plate 19 of the platform so as

to extend axially about the sleeve 30. By this arrangement, the balls 39 of the anti-friction bearing supporting structure rotatably supports the platform 18 so that it may be easily and smoothly turned or rotated relatively to the column 10 and to the sleeve 30.

By the arrangement described, the platform is supported by means of a ball bearing structure upon the lower end of the sleeve 30, which takes the weight of the platform and its load.

I may, when found desirable, provide additional supporting means for the platform 18, such means further acting to brace and stiffen the platform against tipping and lateral strains. I show in the drawings, for this purpose, an annular ring or member 31, rotatably surrounding the sleeve 30 at a distance above the platform 18, and to this member I secure the upper ends of a plurality of radially extending, diagonal spaced braces 32. The lower ends of these braces 32 are fastened to the top face of the platform at a distance from its axis. By the provision of the braces 32 connected to the annular member or ring 31 and the platform 18, the platform has adequate support and is prevented from tilting while in use, even should an unbalanced load be disposed on the platform.

It will be obvious that in any position of the platform, the ring 31 can turn freely about the sleeve 30 and through its connection with the platform by the braces 32, a strong well braced structure is provided.

If desired, the ring or annular member 31 may be supported upon an anti-friction or ball bearing similar to the structure 38 and having its lower ring or race 40 rigidly secured to the sleeve 30 and its upper ring or race rigidly secured to the underside of the member 31 so as to rotate therewith upon the balls 41 of the bearing. This bearing may be of any other suitable form, or it may be entirely omitted.

In the arrangement shown in the drawings, one end of the chain or cable 14 for raising and lowering the hoist may be secured by any suitable way to the sleeve 30, such as by a bracket or lateral member 43 rigidly fastened to and extending laterally from the upper end of the sleeve 30. In this way, the chain or cable 14 may extend upwardly along the side of the column in spaced parallel relation thereto, as indicated in Fig. 1.

The chain or cable 14 passes, near the upper end of the column 10, over a pulley 44 rotatably mounted upon the beam 13 adjacent the column 10, then horizontally along the beam and over a second, similarly mounted pulley 45, and thence downwardly to an operating mechanism of any suitable sort by which power may be applied to the chain for operating the platform 18.

The power applying mechanism shown in the drawings is of a well known type, and since it forms no part of the invention, per se, it need not be described in detail. This mechanism is such that the hoist platform may be actuated by hand to raise and lower the same between the floor and the window and may be locked to hold the platform in raised position or in any intermediate position, if desired.

The mechanism shown includes a hand crank or wheel 50 and suitable gearing 51 disposed between the wheel 50 and a sprocket or drum 52 over which the chain 14 passes to move the chain in one direction or another by appropriate manipulation of the hand wheel. Locking means 53 under the control of a hand lever 54 is provided

for securing the chain against movement to hold the platform in any position into which it is moved.

It will be noted that since the chain 14 is connected to the bracket 43 at one side of the column 10, the sleeve 30 is substantially prevented from turning about the column 10, since the pull of the chain in a vertical line directly over its connection with the bracket 43 is such that the sleeve 30 will be maintained in approximately the same relative position on the column 10 at all times.

However, by the provision of one or both ball bearing supports between the sleeve and the platform, the latter may be easily and freely turned upon and relatively to the sleeve 30 and column 10.

Assuming the platform 18 to be in the lower position shown in Fig. 1, and part of its periphery close to the wall *a* and therefore, relatively less accessible than that portion of the platform which is diametrically opposed to that part near the wall, a can or container C, for example, may be placed upon the platform at the side thereof remote from the wall, where ample room is available for doing this in an easy and convenient way. After a can has been so placed, a slight push will enable the platform to be rotated so as to bring another part of the platform in position to receive another container. This procedure may be repeated until the platform is fully loaded, whereupon the power mechanism may be manipulated to raise the platform to the window ledge *c* and then the power mechanism can be locked to hold the platform in this position. The operator may now ascend the ladder *e* and pass through the window to the sidewalk outside, where it will be seen that the can or retainer C which is on the platform nearest the window can be easily reached and removed through the window. The platform may now be easily rotated so as to bring the next container, or any desired container, close to the window for removal, and this procedure may be continued until all of the cans or containers are removed. Obviously the reverse procedure may be carried out when returning the empty cans C to the basement by passing each can successively into the window and placing it on the platform, and turning the platform alternately with the placing of the cans thereon until all are in position. The operator may now pass in through the window, descend the ladder and operate the power mechanism to lower the platform to the floor, where the cans may be removed.

It will be noted that the braces 32, as shown particularly in Fig. 2, are so disposed as to divide the platform into a plurality of areas of similar size, each of which areas, in this case, are such as to conveniently accommodate an ash can C. By this arrangement, the braces define like areas so that no trouble is encountered in placing the cans or articles in proper position on the platform. Also by arranging the braces in this way, the articles or containers constituting a load may be symmetrically disposed about the axis of the platform and column, thus assuring a substantially uniform distribution of the load.

To facilitate the passage of the cans, containers, or other articles in either direction through the window *b*, I may provide a horizontal plate or inwardly extending member 50, which I secure upon the ledge *c* of the window *b*, so that its inner edge 51 may overhang the wall *a* and extend close to the adjacent peripheral portion of

the platform 18. In the arrangement shown, since the platform 18 is of circular form, the edge 51 of the plate 50 is preferably formed of approximately corresponding curvature, so that when the platform 18 is moved into the plane of the plate 50, the top surface of the platform 18 and corresponding face of the plate 51 form a substantially continuous surface over which the cans or articles may be moved from the platform out through the window, or vice versa. The provision of a plate similar to the plate 50 has a particular advantage when, due to inside obstructions or other reasons, it is found to be desirable to place the platform 18 at a short distance from the wall *a*.

I claim as my invention:

1. In a hoist, a stationary upright column, a tubular supporting member slidably engaging about said column for up and down movements thereon, a horizontal platform having a hole at its axis through which said column extends, means for raising and lowering said tubular member on said column, and means for rotatably supporting said platform on said tubular member for horizontal rotation about the axis of said platform and relatively to said column.

2. In a hoist, a stationary upright column, a sleeve slidably embracing said column, a horizontal platform having a hole through which said column and said sleeve extend, means for raising and lowering said sleeve and said platform together relatively to said column, and a ball bearing operatively disposed between said platform and said sleeve for enabling said platform to be rotated relatively to said column.

3. In a hoist, a stationary, upright column, a horizontal platform having a central hole through which said column extends, means for raising and lowering said platform relatively to said column, equally spaced radially disposed members defining like areas on said platform within which articles may be symmetrically placed to form a load which is uniformly disposed about the axes of said column and platform, and means for rotatably supporting said platform relatively to said column, so that said platform may be turned to successively load said articles thereon from a position at one side of said platform when in its lower position, and to successively bring said articles one after another to a predetermined unloading position when said platform is raised.

4. In a hoist, a stationary upright column, a tubular supporting member slidably engaging about said column for up and down movements thereon, a horizontal platform having a hole through which said column extends, a ball bearing disposed between said platform and the lower portion of said tubular member, a ring surrounding said member at a distance above said platform, a second ball bearing disposed between said ring and said member, and radial braces extending between said ring and said platform, whereby said platform may be rotated about said member and said column and reinforced against stresses from loads upon said platform.

5. Hoisting mechanism including a stationary upright column, a substantially horizontal ledge for loading and unloading laterally disposed at a distance above the lower end of said column, a horizontal platform having a central hole through which said column extends, means for shifting said platform in opposite directions lengthwise of said column whereby it may be positioned in the plane of said ledge, and means for rotatably supporting said platform relatively to said column,

whereby said platform may be turned to bring different portions thereof next to said ledge for loading and unloading.

6. In a hoist, an upright column, a member 5 slidably mounted on the exterior of said column for elevation and descent thereon, an approximately horizontal platform mounted on said member for elevation and descent therewith and rotatable on said member about an upright axis 10 passing approximately centrally of the platform, and means connected to said member for causing its elevation and descent on said column.

7. In a hoist, a stationary, upright column, a horizontal platform having a hole vertically 15 therethrough at approximately its center, through which said column extends, a member slidable vertically on the exterior of and guided by said column and mounting said platform for rotation about the upright axis of said column, and means 20 for raising and lowering said member and through it said platform, whereby said platform in all positions in its elevation and descent will be in approximately concentric relation to said column, and may be rotated about said column as an axis 25 to position any peripheral zone of the platform in any unloading position about said column.

8. In a hoist, a stationary, upright column, a horizontal platform having a hole vertically 30 therethrough at approximately its center, through which said column extends, a member slidable vertically on the exterior of and guided by said column and mounting said platform for rotation about the upright axis of said column, means for raising and lowering said member and through 35 it said platform, whereby said platform in all positions in its elevation and descent will be in approximately concentric relation to said column, and may be rotated about said column as an axis 40 to position any peripheral zone of the platform in any unloading position about said column, and upstanding elements disposed on said platform, approximately radially of said axis and approxi- 45 mately equally spaced horizontally about said platform, for defining platform areas of approximately equal size so that when articles of equal weight, to be elevated or lowered, are placed in

all of said areas, the load on the platform will be uniformly distributed about said axis.

9. In a hoist, an upright, stationary column, a member surrounding and slidably fitting said column and guided thereby in vertical move- 5 ments, a horizontal platform disposed symmetrically about said column and mounted on said member for rotation about the upright axis of said column, and means for elevating and lower- 10 ing said member on said column.

10. In a hoist, an upright, stationary column, a sleeve fitted over and engaging the exterior of said column and slidable vertically thereon, a horizontal platform having an approximately 15 central hole from face to face thereof and through which said sleeve extends, and rotatably supported by the lower end of said sleeve for rotation about the upright axis of said sleeve, a collar rotatably fitting said sleeve at a point 20 above said platform and straps connecting said collar to said platform at a substantial distance outwardly from said sleeve, whereby tilting of said platform on said sleeve by loads unequally 25 placed on said platform will be resisted, and means for elevating and lowering said sleeve and through it said platform.

11. In a hoist, an upright, stationary column, a sleeve fitted over and engaging the exterior of said column and slidable vertically thereon, a horizontal platform having an approximately 30 central hole from face to face thereof and through which said sleeve extends, and rotatably supported by the lower end of said sleeve for rotation about the upright axis of said sleeve, a collar rotatably fitting said sleeve at a point above said platform, 35 and straps connecting said collar to said platform at a substantial distance outwardly from said sleeve, whereby tilting of said platform on said sleeve by loads unequally placed on said platform will be resisted, means on said sleeve 40 for resisting movement of said collar downwardly thereon when said platform is loaded, and means for elevating and lowering said sleeve and through it said platform.

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