

Nov. 25, 1952

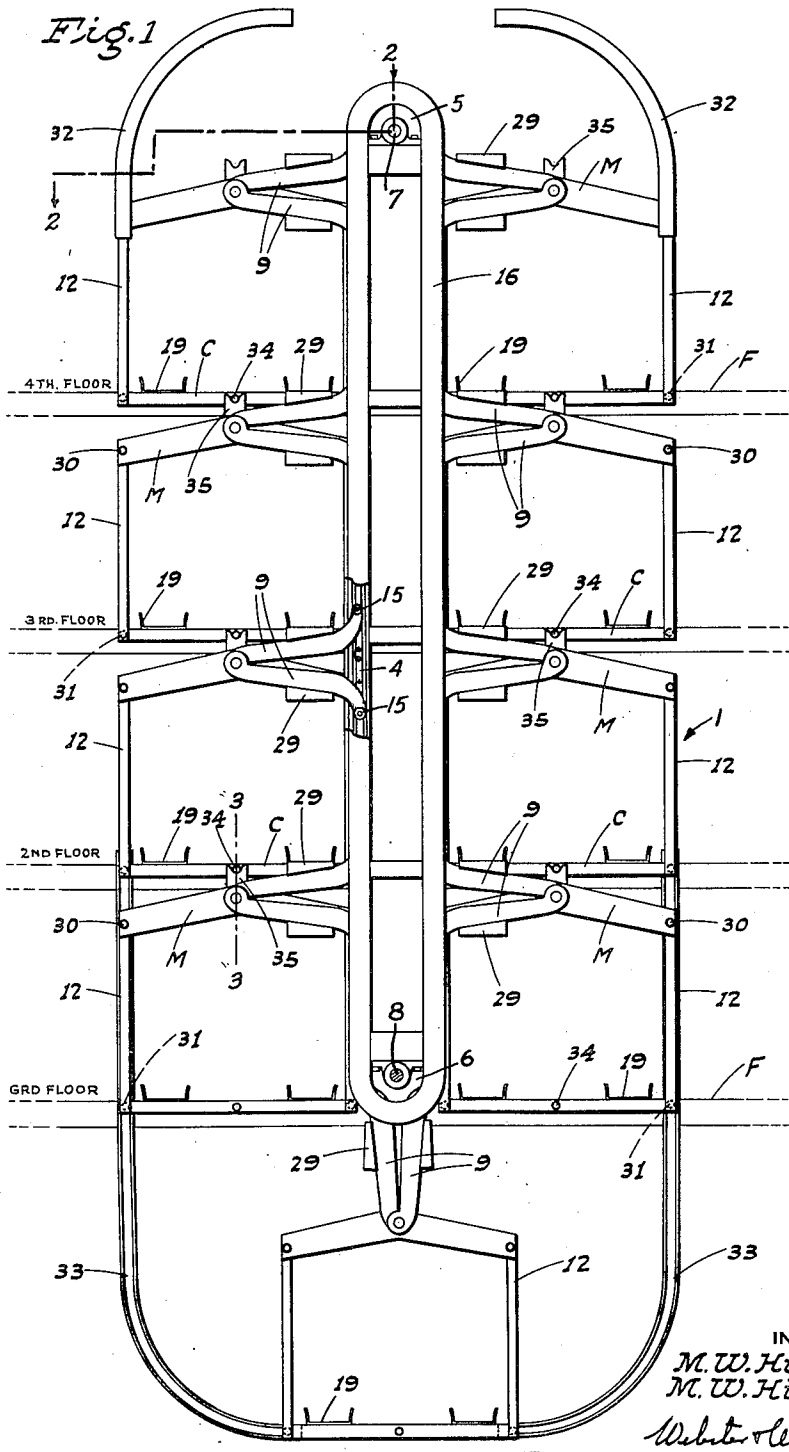
M. W. HILD, SR., ET AL

2,619,239

ELEVATOR

Filed July 14, 1947

2 SHEETS—SHEET 1



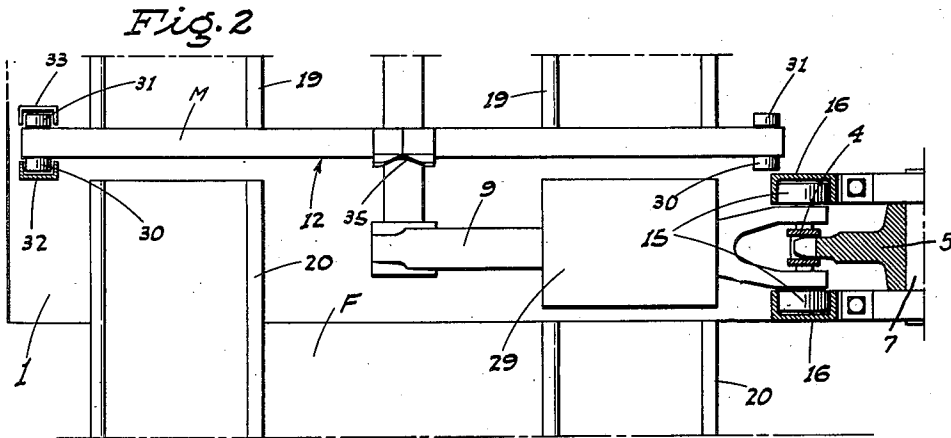
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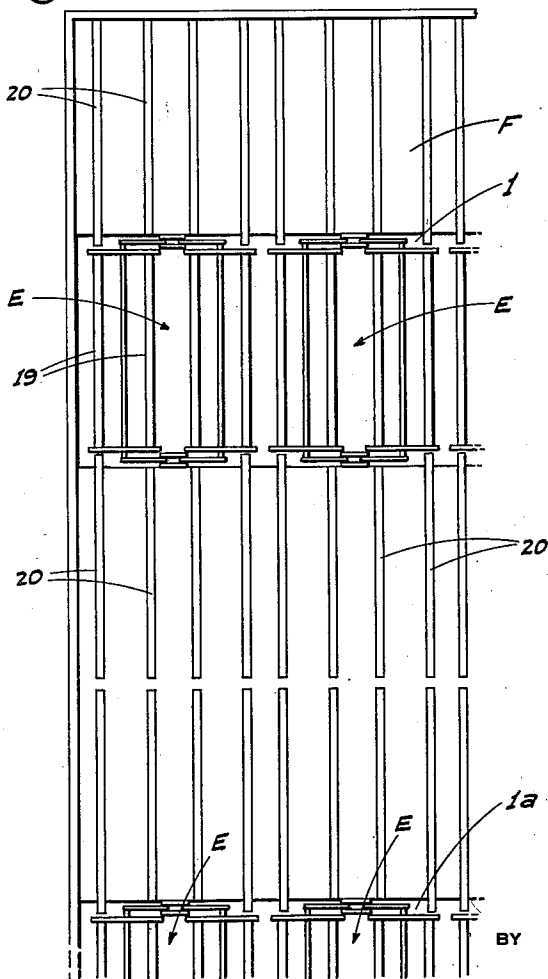
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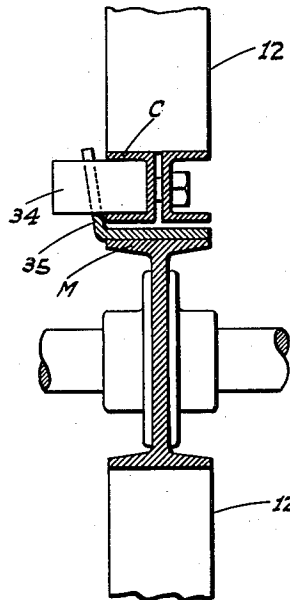
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*Fig. 4*



*Fig. 3*



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# UNITED STATES PATENT OFFICE

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## ELEVATOR

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3 Claims. (Cl. 214-16.1)

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This invention is directed to, and it is an object to provide, a novel elevator for a storage building which includes a plurality of floor levels.

Another object of the invention is to provide an elevator which is especially designed for the transport of automobiles between the ground floor and upper floor levels in an automobile storage building which includes a number of stories; the elevator being operative to carry automobiles between such floor levels in an expeditious and convenient manner.

A further object of this invention is to provide an elevator, as above, which includes a driven, upstanding endless chain assembly having a plurality of automobile supporting cages or carriers mounted thereon in predetermined symmetrical spaced relation.

An additional object of the invention is to provide an elevator, as in the preceding paragraph, in which the carriers are pivotally suspended from the endless chain assembly whereby the carriers remain horizontal throughout their path of movement, there being novel means included in the elevator to stabilize the carriers and prevent swinging thereof when in operation.

It is also an object to provide an automobile elevator which has substantial capacity so that a number of automobiles may be stored or removed from storage within a relatively short time, as is desirable in the handling of the trade at peak business hours.

A further object is to provide a storage system, including a number of the elevators, which will enable the maximum storage space in the building to be utilized, without ever having to move any stored car in order to get at another one for removal from storage.

A further object of the invention is to provide a practical elevator which will be exceedingly effective for the purpose for which it is designed.

These objects are accomplished by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claims.

In the drawings:

Fig. 1 is a side elevation of the elevator assembly.

Fig. 2 is a fragmentary enlarged sectional plan on line 2-2 of Fig. 1.

Fig. 3 is a fragmentary enlarged cross section on line 3-3 of Fig. 1.

Fig. 4 is a fragmentary diagrammatic floor plan illustrating a car storage system utilizing a number of elevator units.

Referring more particularly to the characters

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of reference on the drawings, the improved elevator which is particularly for automobile storage buildings, is housed within an elevator shaft indicated generally at 1.

The vehicle supporting cages or carriers 12 are swingably supported by suspension arms 9, the inner ends of which are connected to endless driving chains 4, and carry rollers 15 guided in the endless channels 18 which are symmetrical to the chains.

The chains are mounted on top and bottom sprockets 5 and 6 respectively, mounted on shafts 7 and 8 respectively, one shaft being driven in any suitable manner. The shafts are horizontal and parallel and are journaled in fixed relation to the building within the elevator shaft.

The suspension arms and carriers are spaced, when on the vertical runs of the chains, so that the upper suspension arm on one carrier is but slightly below the plane of the wheel engaging tracks 19 of the carrier immediately above, as shown in Fig. 1.

To provide the necessary bridge for the car wheels between the end of the laterally innermost track 19 and the corresponding edge of the elevator pit or well, pads 29, registering with such tracks, are fixed on or formed with the arms 9. Since there is nothing in the way between the laterally outermost track 19 and the edge of the pit, the corresponding floor wheel guiding channels 20 may be extended horizontally over the pit to a point adjacent the ends of the carrier, as shown in Fig. 2.

A stabilizing arrangement is provided in the following manner:

Rollers 30 project outwardly or away from each other from the end members of the carriers at the top and sides thereof, while similar rollers 31 project inwardly, or in facing relation to each other, from the lower end of the end members of the carriers at the sides thereof as shown in Fig. 1.

The laterally outermost rollers 30 ride in fixed guide tracks 32 only during arcuate movement of the carriers about the top sprockets of the endless chains, while rollers 31 ride in fixed guide tracks 33 only during the arcuate movement of the carriers about the lower sprockets of the endless chains.

During the movement of the carriers on the straightaway portions of their travel, either up or down, adjacent carriers are held in locked relation with each other by means of a central roller or heavy dowel pin 34 on the bottom end cross member C of each carrier which is engaged

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by a crotch or cradle plate 35 mounted on the top end cross member M of the carrier immediately below, as shown in Figs. 1 and 3. This engagement becomes effective, with upward movement of the carriers, as soon as a carrier completes the turn about the lower sprockets and before said carrier and the one immediately above has become disengaged from the adjacent guide track 33. Automatic disengagement of the rollers and cradles takes place as soon as a carrier starts about the top sprockets. The same action, of course, takes place with the downward travel of the carriers.

The elevator assembly in Fig. 1 is adapted for four-floor and basement storage, and in Fig. 4 we illustrate a fragmentary plan of one floor employing a number of elevator assemblies. Each pit or well 1 is of sufficient extent to contain a number of elevator units E in close side by side relation, with the storage tracks or channels 20 for a single car only alined with the tracks 19 of each carrier mounted on the floor F to the sides of the pit. Another pit 1a paralleling the pit 1 contains other elevator units similarly arranged, said pit 1a being spaced from the pit 1 sufficient to give space on the floor for two cars between the adjacent edges of the pits, or for a single car from each carrier in the pit 1a. By reason of this arrangement, cars may be stored or parked so as to utilize all available space on the floor without having to maneuver or disturb any car so stored in order to park or remove any other car.

Also in case of need the elevator carriages themselves may be utilized as storage spaces as long as one carrier in each elevator unit is left unoccupied for use in transferring any stored car from the corresponding storage space on any floor to street level.

From the foregoing description it will be readily seen that there has been produced such a device as substantially fulfills the objects of the invention as set forth therein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations from such detail may be resorted to as do not form a departure from the spirit of the invention, as defined by the appended claims.

Having thus described the invention, the following is claimed as new and useful and upon which Letters Patent is desired:

1. A car elevator comprising an endless driven chain assembly having vertical runs, a plurality of car carriers disposed laterally out from the chain assembly in evenly spaced relation, each carrier having car-wheel supporting tracks extending parallel to the axes of the chain assembly, suspension arms secured to and projecting

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outwardly from the chain assembly, means pivotally suspending the carriers from the outer end of the arms above the tracks, a pit in which the elevator runs having openings at different floor levels; the vertical spacing between adjacent carriers being such that the tracks of one carrier are above but close to the adjacent suspension arms of the carrier immediately below, and wheel engaging pads on the arms alining with the laterally innermost track of said one carrier and bridging the gap between said track and the adjacent edge of the pit.

2. A car elevator comprising an endless driven chain assembly, a plurality of load carriers, means swingably suspending the carriers from the chain assembly laterally out from the vertical runs of the latter, an arcuate roller guide above the chain assembly, an arcuate roller guide below the chain assembly, the space between the guides being free, projecting rollers on each side of each carrier facing outwardly with respect to the carrier, said rollers being adapted to engage the arcuate guide at one end of the chain assembly, other rollers on the sides of the carrier facing inwardly relative to the carrier, such other rollers being adapted to engage the other guide, and means on the carriers effective to interlock the carriers against relative swinging movement when the carriers move in the free space between the two guides.

3. A structure as in claim 2 in which the last named means includes a notch cradle on the top of each carrier and a dowel pin on the bottom of each carrier, the pin on one carrier being engageable with the notch in the cradle on the carrier below when the carriers are in vertical alinement.

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