Nov. 18, 1930. W. R. HERBY ET AL 1,782,121

BUILDING STRUCTURE

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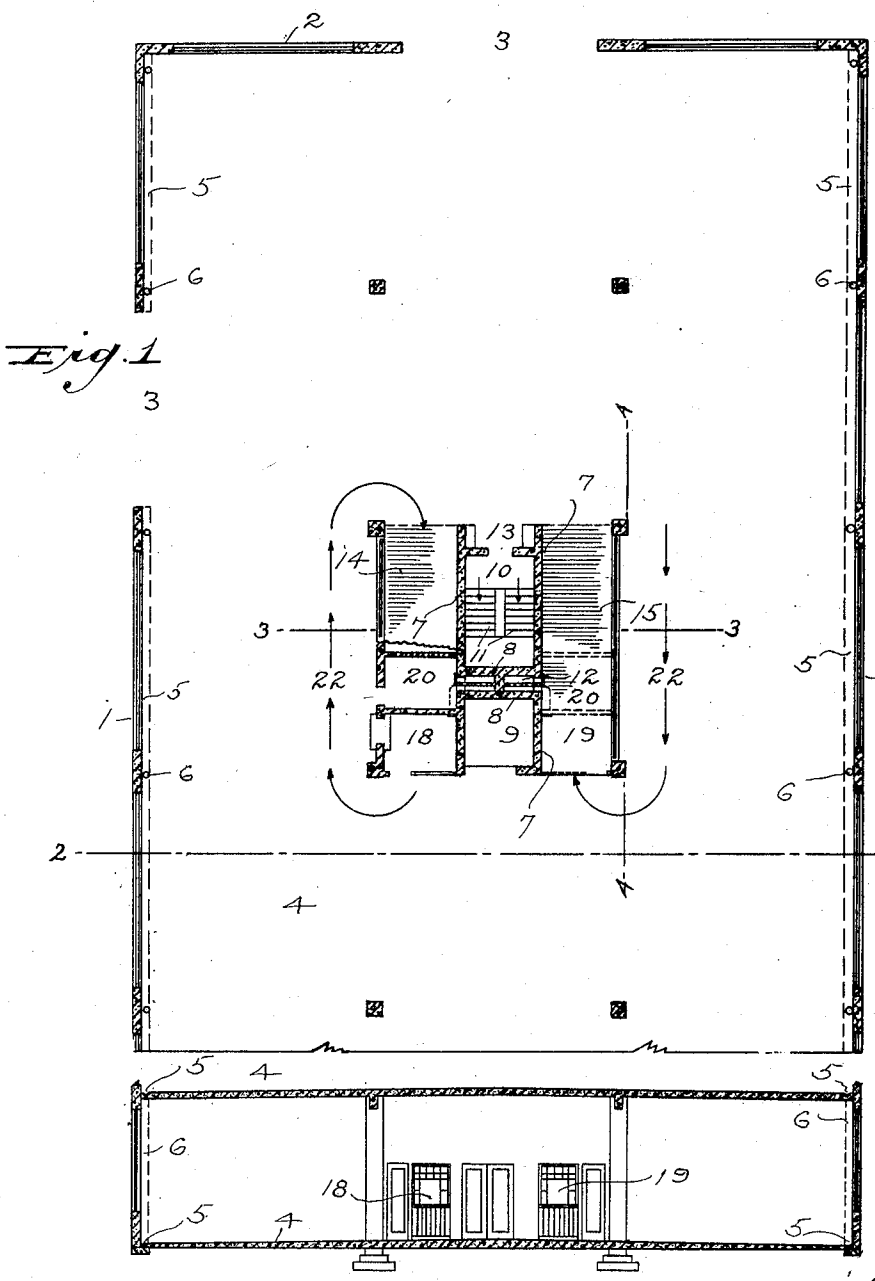


Fig. 1

Fig. 2

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Fig. 3

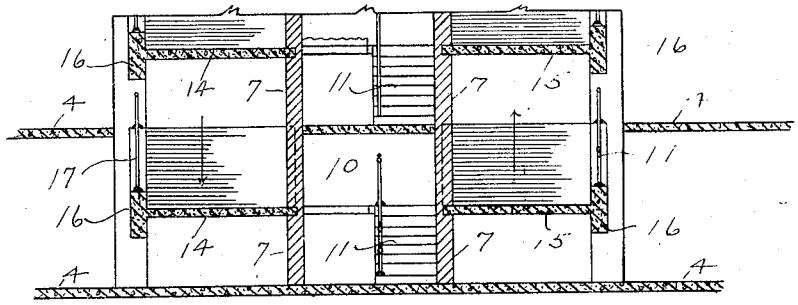
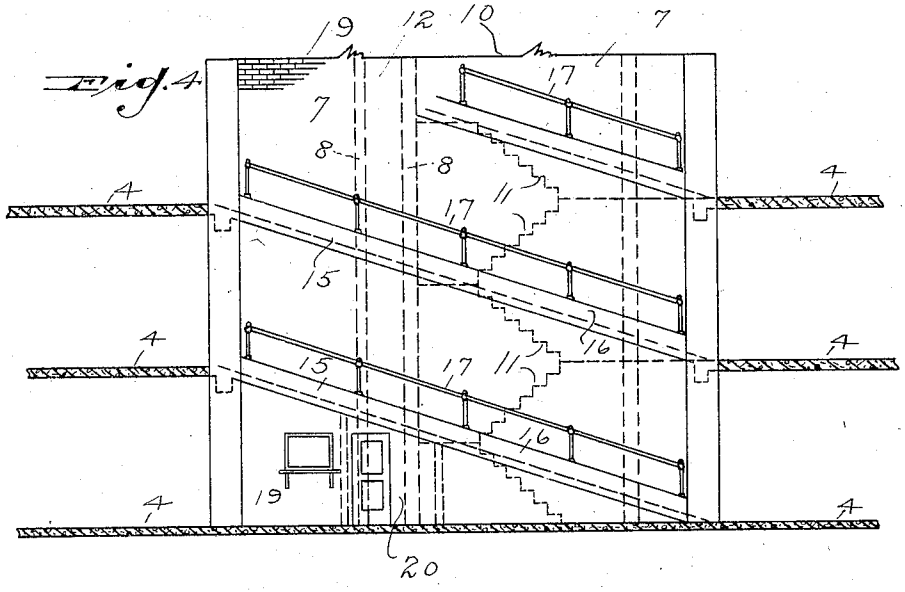


Fig. 4



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UNITED STATES PATENT OFFICE

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BUILDING STRUCTURE

Application filed April 25, 1927. Serial No. 186,289.

Our invention relates to building constructions, and more particularly, to a warehouse or storage building having inclined ramps upon which vehicles may travel from one floor to another. The construction is primarily designed for automobile garage purposes. One of the primary objects of the present invention is to provide an arrangement of ramps which will afford maximum economy of floor space and facilitate the safe and rapid travel of vehicles from floor to floor.

The building codes in various vicinities, structural requirements, and conditions of usage necessitate provision of certain features common to all structures of this character regardless of their size or individual floor plans, such as enclosed elevator shafts and stair walls, enclosed ventilator shafts, toilets, waiting rooms for customers and business offices.

One of the objects of the present invention is to provide a structural unit which will contain in minimum space these essential features in a convenient and practical relation, and to utilize the walls of the elevator shaft and stair well for the further purpose of supporting the vehicle ramps. The structural unit as herein described, which embodies all of these essential and necessary features in a compact form, is capable of incorporation in any storage building regardless of the dimensions or floor plan arrangement or relative location of the unit within the structure.

A further object of the invention is to minimize building costs, afford increased convenience and safety, and standardize construction.

A further object of the invention is to provide improved floor drainage and utilize the floor inclination to facilitate locating stored vehicles and keeping them from accidental displacement.

With the above primary and other incidental objects in view, as will more fully appear in the specification, the invention consists of the features of construction, the parts and combinations thereof, and the mode of operation, or their equivalents, as hereinafter described and set forth in the claims.

In the accompanying drawings, wherein there is shown the preferred, but obviously not necessarily, the only form of embodiment of the invention, Fig. 1 is a plan view of a vehicle storage building or garage in which the present invention has been embodied. Fig. 2 is a transverse sectional view on line 2—2 of Fig. 1. Fig. 3 is a detail sectional view through the structural unit of the building on line 3—3 of Fig. 1. Fig. 4 is a side elevation of the structural unit on line 4—4 of Fig. 1.

Like parts are indicated by similar characters of reference throughout the several views.

Because of lack of parking space for vehicles many storage buildings or community garage buildings are being constructed, having inclined runways or ramps, up and down which vehicles may be driven from one floor to another. There are six features common to all such structures, to wit, the vehicle ramp, an elevator for passengers or merchandise, a stair, ventilating shafts, toilets, a waiting room and business offices. Frequently these several features are distributed or scattered through the structure without relation to each other. The present arrangement and plan of such buildings consolidates these various common features into a compact structural unit capable of being embodied in building structures of various dimensions, floor arrangements and designs. This consolidation and rearrangement of such common features into a unitary association economizes floor space and materially reduces building costs, reduces fire hazards and increases safety. It also enables the standardization of such vehicle storage or garage building and affords a strong, sturdy and durable construction.

Referring to the accompanying drawings, Fig. 1 shows the first floor plan of a typical garage or vehicle storage building in which the structural unit, including the vehicle ramps has been centrally located. It will be understood that this ramp unit may be variously located in different buildings. The floor plans for floors other than the first or ground floor are identical with that shown in Fig. 1 except that no provision is made for toilet and

business offices and waiting room, as these are necessarily required only on the first or ground floor. The unit is common to a number of floors extending therethrough from the ground floor upwardly.

The building may be of any suitable character of which 1—1 are the side walls and 2 the end wall. These have been illustrated as of concrete and sash wall construction, although this per se forms no part of the present invention. Entrance and exit doors 3—3 are provided at any convenient location. The floors 4 of the building are preferably medially crowned and slope at a very slight inclination toward the walls. Adjacent to the walls are formed drain gutters 5 in the floors, having downdrains or outlets 6 leading to a sewer or waste connection. This outwardly inclined floor surface serves to drain all water and oil away from the central portion of the floor and out of the usual path of travel of vehicles. One of the difficulties of a community or public garage is that of keeping the floor surfaces clean. To sweep the floors raises quantities of dust which settle on the stored vehicles, displeasing their owners and necessitating frequent washing. For this reason it is found most desirable to flush the floors instead of sweeping. However, if the floors sloped inwardly to a central drain, or to spaced drains as is usual, it would be necessary for incoming and outgoing vehicles to drive through the flush water, thus splashing not only the traveling cars, but also those in storage, and carrying dirty water to the clean portions of the floor. This difficulty is overcome by reversing the usual direction of inclination of the floor and draining the flush water toward the wall leaving the central portion of the floor, over which incoming and outgoing vehicles must pass, drained and free from water. There is also a further advantage in such outward inclination of the floors. Although the inclination of the floors is very slight, it is sufficient to enable vehicles to be backed easily into stalls or storage positions adjacent to the walls either under power or by pushing them by hand. Such outward inclination of the floor has a further advantage of keeping the vehicles in their stored position preventing them from rolling or coasting out of position in the event the emergency brake has not been set. While this slight outward inclination of the storage floor in itself seems to be but a small feature it has been found, however, to be advantageous in the quick placing of cars in storage, and quite effective in preventing accidents due to accidental rolling or "coasting" of cars from their storage position whereby they may project somewhat beyond their neighboring cars, and so possibly obstruct runways and aisles.

The ramp unit comprises an upright column extending through the superposed floors of the building. It includes spaced parallel fire walls 7—7, affording an intermediate space which is divided by cross partitions 8—8 to form an elevator shaft 9, a stair well 10, in which stairs 11 leading from floor to floor are located and ventilator shaft 12. There is also provided within the space between the fire walls 7—7 an area 13 which may be utilized either for a storage closet or provided with seats as a waiting alcove. The particular sequence of these areas, to wit, the elevator shaft, the stair well, the ventilator shaft, and the area 13 is unimportant and they may be variously disposed relative to each other.

Located contiguous to the parallel walls 7—7 are inclined ramps 14 and 15. These ramps are arranged in two vertical series. One series of ramps is employed for downwardly traveling vehicles and the other for incoming or upwardly traveling cars. The ramps extend in upwardly inclined positions from one floor to the other. The ramps between succeeding floors are disposed in parallel relation and in a vertical succession. The ramps 14 and 15 are of cantilever style being embedded in or structurally secured at one side to the vertical spaced supporting walls 7—7 , while their opposite sides extend free. These walls are thus made to perform a double function. These fire walls 7—7 confine the elevator shaft and stair well, as well as the ventilator shaft and also serve as supporting walls for the cantilever vehicle ramps 14 and 15.

While one side of each ramp is secured or supported upon one of the supporting walls 7, the opposite side of the ramp is formed into a diagonal beam or girder 16 extending from one floor to the other. This diagonal beam or girder 16 forms a curb along the side of the ramp and supports a railing 17. Thus the outer sides of the ramps are open to admit light and air throughout the full length of the ramps.

Below the lowermost ramp of each series, that is, the ramp leading from the ground floor to the second floor, is a space which has been divided into an office space 18, and a toilet 20, beneath one ramp. A corresponding space beneath the other ramp affords an employee's locker room or storage room 19 and a second toilet 20. Thus all of the features necessary to a structure of this character are confined within this unit column in intimate association with each other, thereby forming a standardized compact unit, applicable to building structures generally.

The course of vehicles in traveling from floor to floor up and down the ramps 14 and 15 is indicated by arrows on Fig. 1. After traversing the length of the inclined ramp from one floor to another, such traveling vehicle then reverses its direction of travel alongside the unit as indicated by arrows at

22 to the opposite end of the succeeding ramp which is traversed and the return course repeated. This system is followed whether the travel of the vehicle is upward or downward.

By providing separate ramps for travel in opposite directions and keeping the course of travel of oppositely moving vehicles over the ramps entirely separated, accidents and collisions are entirely avoided. It will be noted that there is no intersection of the courses of upwardly traveling and downwardly traveling vehicles. The ramps themselves are separated by the intervening shafts and stair well. The return courses for upwardly and downwardly traveling vehicles in passing from the outlet of one ramp to the inlet of another is separated by the width of the entire unit. Not only is there no conflict between the upwardly and downwardly traveling vehicles but the course of travel is confined to a comparatively small area, leaving a maximum area of floor space available for vehicle storage purposes. It has been found quite practical in actual building construction to confine the unit structure herein described, including the respective ramps and interposed elevator shaft and stair well within an area of twenty-six feet square.

While the structure is primarily intended for vehicle storage purposes it will be obvious that a building equipped with the type of unit herein described may be employed for various other purposes wherein it may be desired to drive vehicles from one floor to another for loading or unloading purposes, or such structure may be employed in factory buildings for conveying material trucks, hand cars, and automatic conveyors, from floor to floor. For this reason the structure is not limited to garage storage buildings alone, but such use has been shown and described for illustrating purposes, the unit being obviously capable of installation in other types of structures.

From the above description it will be apparent that there is thus provided a construction of the character described possessing the particular features of advantage before enumerated as desirable but which obviously is susceptible of modification in its form, proportions, and arrangement of parts, without departing from the principle involved or sacrificing any of its advantages.

While in order to comply with the statute the invention is described in language more or less specific as to structural features, it is to be understood that the invention is not limited to the specific details shown, but that the means and construction herein disclosed comprise the preferred form of several modes of putting the invention into effect, and the invention is therefore claimed in any of its forms or modifications within the legitimate and valid scope of the appended claims.

Having thus described our invention, we claim:

1. In a building structure including superposed floors located at full story intervals, a hollow vertical column having therewithin means of access to the several floors, and two series of inclined cantilever ramps, each leading from one floor to another, one series located on each side of the hollow vertical column and supported thereby at their adjacent margins, the outer margins of the ramps being located in spaced relation with the walls of the building to permit travel of vehicles beside each series of ramps from the outlet of one ramp to the inlet of the next ramp of the respective series.

2. In a building structure including superposed floors located at full story intervals, a structural unit including two series of inclined ramps each leading from one floor to the other, one series of ramps being for incoming vehicles and the other series for outgoing vehicles, two series of passage ways located on the different floors parallel with and on opposite sides of the two series of inclined ramps, one series of passage ways being for incoming vehicles and the other for outgoing vehicles, said passage ways on each floor leading in reverse direction relative to the direction of the ramps from the outlet of one ramp to the inlet of another ramp of the associated series of ramps, the courses of travel of incoming and outgoing vehicles being entirely separate and non-intersecting.

In testimony whereof, we have hereunto set our hands this 21st day of April A. D. 1927.

WILBUR R. HERBY.
RAYMOND J. UNGER.