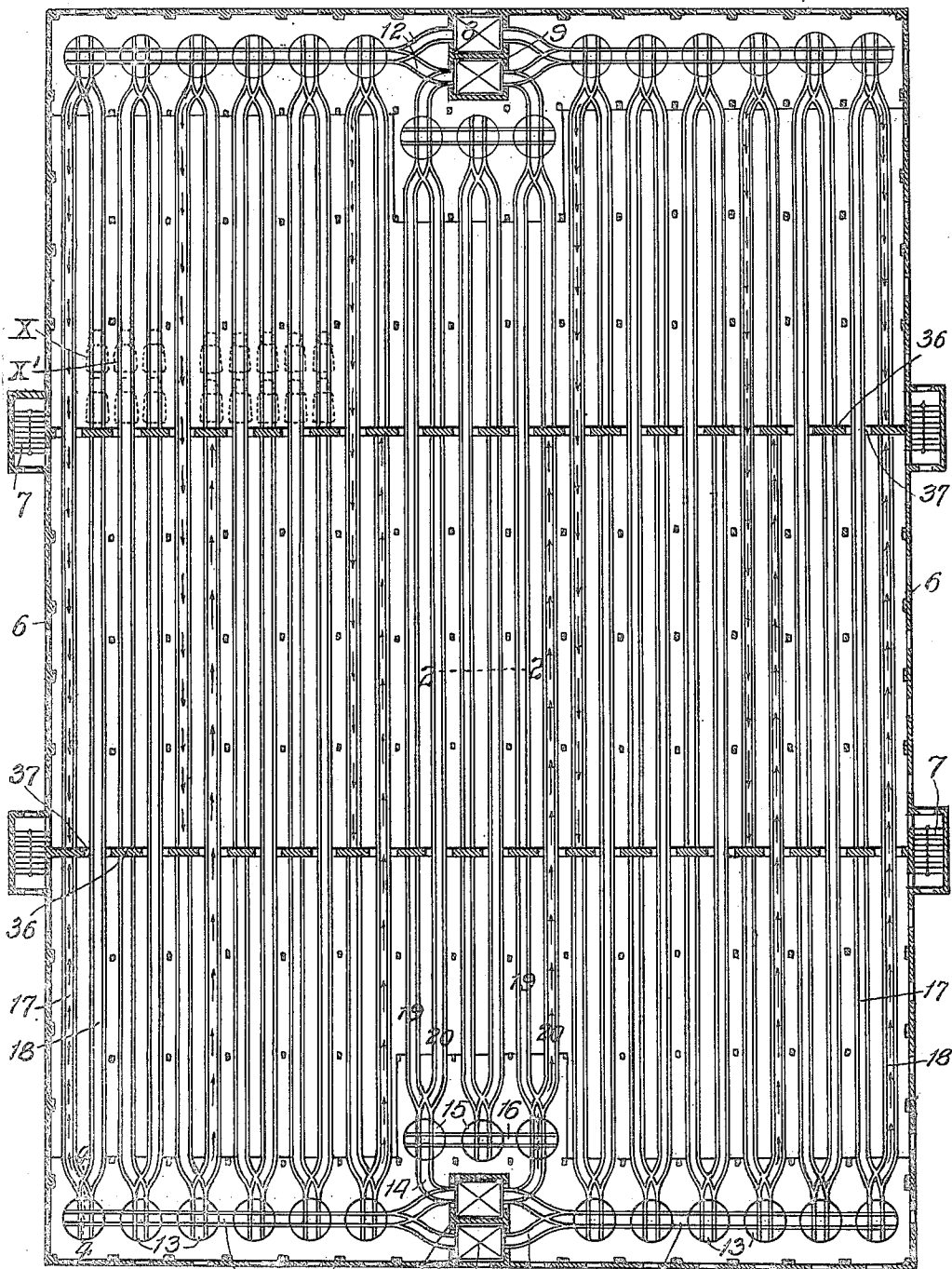


D. H. BURNHAM.
 BUILDING CONSTRUCTION.
 APPLICATION FILED MAY 8, 1918.

1,404,926.

Patented Jan. 31, 1922.

2 SHEETS—SHEET 1.



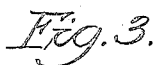
Witness:
 John Enders

Fig. 1.

Inventor:
 Daniel H. Burnham
 by *Frederick L. ...*
 his Atty.

1,404,926.

2 SHEETS—SHEET 2.



Inventor:
Daniel H. Burnham
By Fred Gerlach
his Atty.

UNITED STATES PATENT OFFICE.

DANIEL H. BURNHAM, OF EVANSTON, ILLINOIS.

BUILDING CONSTRUCTION.

1,404,926.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, DANIEL H. BURNHAM, a citizen of the United States, and a resident of Evanston, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Building Construction, of which the following is a full, clear, and exact description.

The invention relates to buildings and more particularly to buildings that are specially designed for the storage of automobiles. In buildings for this purpose, it is desirable to provide a plan by which the maximum number of vehicles may be stored in a given space, and which facilitates the removal of the vehicles when desired. Another desideratum is to construct a building capable of sustaining the maximum load with a given quantity of building material or a building in which all of the material, such as reinforced concrete, is distributed to derive the maximum supporting efficiency.

One object of the invention is to provide an improved building, which is so constructed that the load of the vehicles will be sustained in substantial entirety by beams and girders or a skeletonized structure. In other words, a construction in which the load is imposed directly upon the beams and girders, as distinguished from a floor, and in which the floor, if desired, may consist of a thin sheathing just sufficient to serve as a closure and fire retardant but insufficient to perform any active function in sustaining the load.

A further object of the invention is to provide an improved construction and arrangement which permits the maximum number of automobiles to be stored in a building and by which the removal of the cars may be facilitated.

The invention consists in the several novel features hereinafter set forth and more particularly defined by claims at the conclusion hereof.

In the drawings: Fig. 1 is a plan of one floor of a building embodying the invention. Fig. 2 is a detail section crosswise of the tracks. Fig. 3 is a section of the floor lengthwise of the tracks. Fig. 4 is a section on line 4-4 of Fig. 1. Fig. 5 is a plan of a portion at the end of a floor.

The invention is shown as applied to a building having outer walls 6 and of any suitable construction, stairways 7, and a

pair of elevator shafts 8, disposed centrally at each end of the building. These elevators are adapted to bring the vehicles to any floor of the building. The elevator shafts are surrounded by a suitable fire-proof wall 9, and have openings therein so that a vehicle may be driven off either elevator to either end thereof, and from these openings lead grooved tracks 12 for a vehicle of the standard tread, which merge into a cross-track 11 parallel to the ends of the building and which extend between a series of turn-tables 13. There is one pair of tracks 12 merging into a cross-track 10 and a series of turn-tables 13 adjacent each end of each pair of elevators, so that from either of the elevators a vehicle may be driven transversely of the building. A track 14 leads from the inner elevator of each pair to one of a series of turn-tables 15 which are disposed inwardly of the elevators so that the space at that point can be utilized and to provide access to all of the space extending longitudinally between the elevators at one end of the building and those at the other. A cross-track 16 connects the turn-tables 15. The tracks 12, 10, 14 and 16 are formed by grooves properly spaced apart to receive the wheels of the vehicle and to confine them to the track. The turn-tables 13 and 15 are provided with crossed tracks similarly formed by grooves. Between each pair of turn-tables, there is formed a pair of tracks 17 and 18 which merge at their ends where they connect with the turn-tables, so that from one turn-table a vehicle may be driven into either of the longitudinal tracks or so that the vehicle may be driven from either of the longitudinal tracks onto the turn table. Longitudinal tracks 19 and 20 extend between the turn-tables 15 and each pair of these tracks merge at either end so that a vehicle may be driven from either turn-table onto either of the longitudinal tracks or from either of said tracks onto a turn table.

The invention is embodied in a reinforced concrete structure comprising columns 22, reinforced concrete beams or girders 23, 24, extending continuously and longitudinally of the building. In the end portions of the building where the turn-tables and merging track terminals are located, a reinforced flat slab 25 of concrete is formed of sufficient strength to sustain the load and is extended

to include and support the merging track terminals and the tracks between the turn-
tables, because in these places beams or girders alone would be insufficient to support all
5 portions of the merging tracks. The longitudinal area between these thick-end portions 25 consists entirely of the continuous longitudinal beams 24 in which are formed grooves 26 to form the tracks and the cross-
10 beams or girders 24 which are supported by the columns. The columns contain suitable column reinforcement 27. The beams 24 contain the bottom reinforcing rods 28 and the column-head reinforcement 29.
15 The beams 23 contain the continuous bottom reinforcement 30, the top rods 21, extending beyond the point of counterflexure and the rods 32 to take the shearing stresses of the beam between the columns. This exemplifies a construction in which the tracks are
20 formed in concrete girders which are supported entirely by beams, so that concrete slabs and reinforcement are dispensed with.

In practice, it is sometimes desirable to
25 provide a closure between the beams and for this purpose a thin sheathing 33 may be laid between the girders and on the beams. This may consist of wooden strips or expanded metal lath covered with concrete.

30 The supporting slabs 25 at the ends of the building are extended, as at 35, to include the area in which the merging tracks communicating with the turn tables 14 are located.

35 In practice, the tracks next to the sides of the building are kept clear and used as aisles for the removal of vehicles and such intermediate tracks as may be found necessary or desirable may also be used as aisles and
40 kept clear of vehicles, as indicated in Fig. 1. If desired, fire-walls 36, provided with doors 37, may be provided to divide the space into separate rooms.

Any number of floors may be provided of
45 the same construction.

In use, the vehicles may be driven from one of the elevators into one of the cross tracks 10 and thence to the turn-table connecting with the longitudinal track on
50 which it is desired to place or store the vehicle. This may be continued until all of the longitudinal tracks, except those reserved for aisles, have been filled. For the purpose of moving vehicles transversely
55 from one of the longitudinal tracks to an aisle, a hoist 40 is provided which is mounted on a carriage 41 which is adapted to travel on a transverse I-beam 42, there being one of such beams and a carriage hoist for
60 each transverse row of vehicles which the building is adapted to contain. For example, if it should be desired to remove the car marked "X" without moving the cars ahead or behind it, the hoist will be applied
65 to this car so as to lift it out of the tracks

and then the carriage 41 can be pushed to a point over the outermost track, which is used as an aisle, and then the vehicle can be lowered into the aisle track and driven onto a turn table, thence into a cross-track 10 to one of the elevators. If it should be desired
70 to remove a car on one of the tracks which is not immediately adjacent one of the aisle tracks, for example the car "X"; the car "X" may be first lifted onto the aisle track
75 and then moved longitudinally to clear the way for the transverse removal of the car "X" into the aisle track and after removal of that car, the car "X" may be put back in its place.

The invention exemplifies a building which is particularly adapted for the storage of vehicles and in which the entire load is supported mainly in or on the tracks formed
85 on or by reinforced concrete beams in such a manner that concrete supporting slabs between the beams are dispensed with. Also one in which the maximum number of vehicles may be stored and in which provision is made for facilitating the removal of
90 the vehicles.

The invention is not to be understood as restricted to the details set forth, since these may be modified within the scope of the appended claims, without departing from the
95 spirit and scope of the invention.

Having thus described the invention, what I claim as new and desire to secure by Letters Patent, is:

1. In a building for the storage of vehicles, 100 the combination of a supporting structure provided with elevated, reinforced beams and a series of longitudinal tracks on said beams, a series of turn-tables at one end of the tracks, the adjoining pairs of tracks having
105 merging terminals communicating with one terminal, a cross-track for delivering vehicles to the turn-tables, and means for delivering vehicles to the cross-track.

2. In a building for the storage of vehicles, 110 the combination of a supporting structure provided with a series of longitudinal tracks, a series of turn-tables at one end of the tracks, adjoining pairs of tracks having
115 merging terminals communicating with one turn table, a cross track for delivering vehicles to the turn tables, a plurality of elevators and merging tracks between the elevators and the cross track for delivering a vehicle from either of the elevators to or
120 from the cross-track.

3. In a building of the character described, the combination of a continuous floor slab of reinforced concrete, a turn-table in said slab, parallel storage tracks connected with
125 said turn-table and reinforced concrete beams adapted to support the tracks without an intermediate slab, said beams extending away from the slab.

4. In a building of the character described, 130

the combination of a continuous floor slab of reinforced concrete extending across each end of a building, a turn-table in each slab, parallel tracks connected with said turn-
5 tables and reinforced concrete beams adapted to support the tracks without an intermediate slab extending between the slabs.

10 5. In a building of the character described, the combination of elevators at the ends of the building, cross-tracks connecting with the elevators respectively, turn-tables connecting with the cross-tracks, a series of parallel girders, tracks on said girders and extending between the ends of the building and
15 connecting with the turn-tables and additional turn-tables disposed inwardly of the elevators and longitudinal tracks connecting with said latter turn tables, said girders be-

ing adapted to support the loaded tracks without supporting slabs therebetween. 20

6. In a building of the character described, the combination of elevators at the ends of the building, cross-tracks connecting with the elevators respectively, turn-tables connecting with the cross-tracks, a series of parallel girders, tracks on said girders and extending between the ends of the building and connecting with the turn tables, and additional turn-tables disposed inwardly of the elevators and longitudinal track having
25 merging terminals connecting with said latter turn-tables, said girders being adapted to support the loaded tracks without supporting slabs therebetween. 30

DANIEL H. BURNHAM.