May 24, 1927. 1,629,787

A. S. HACKETT

BRIDGE APPROACH

Filed May 7, 1926 5 Sheets-Sheet 1

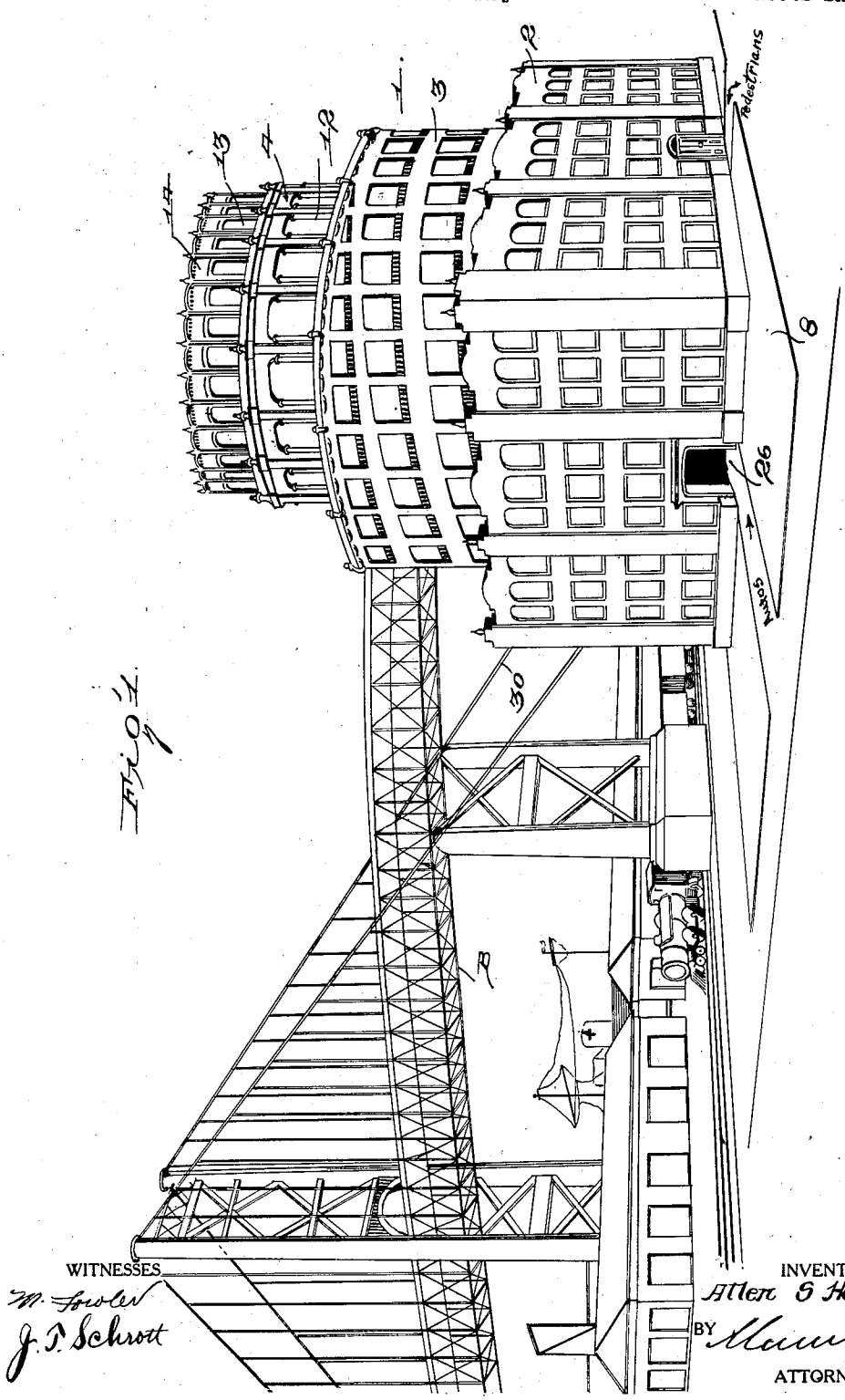


Fig. 1.

WITNESSES

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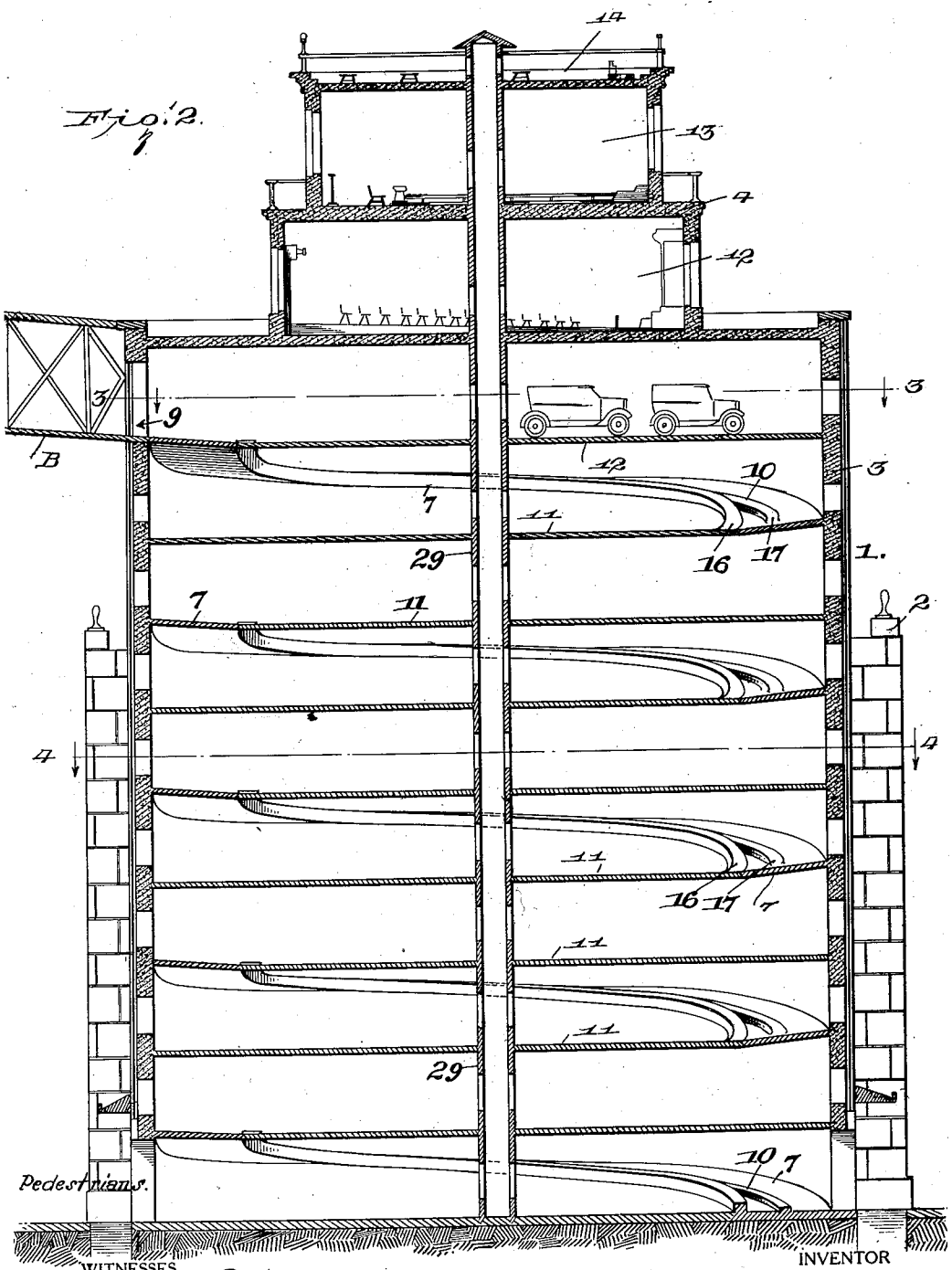
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Fig. 2.



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BRIDGE APPROACH

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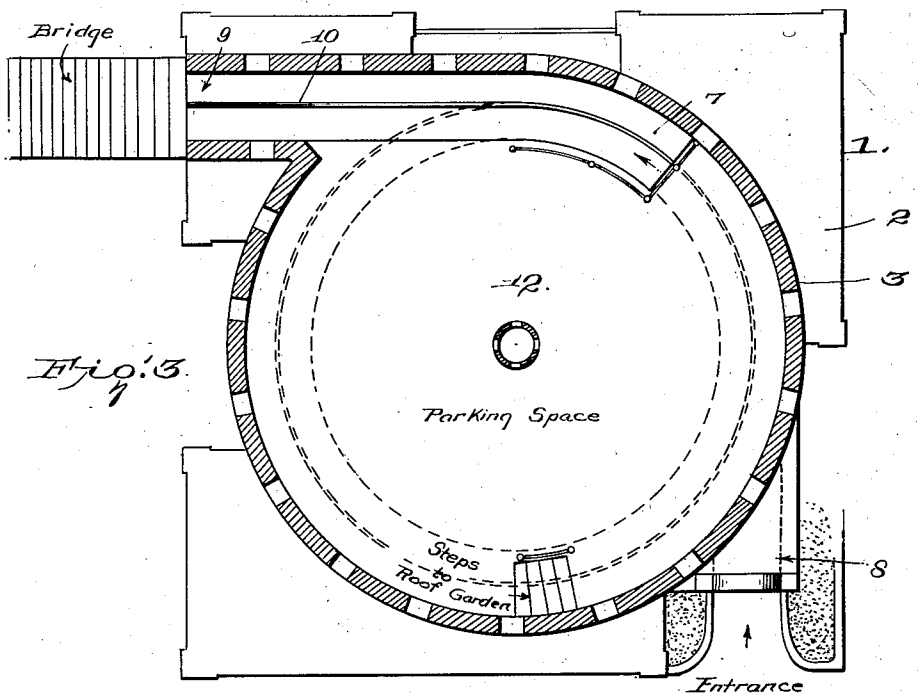


Fig. 3.

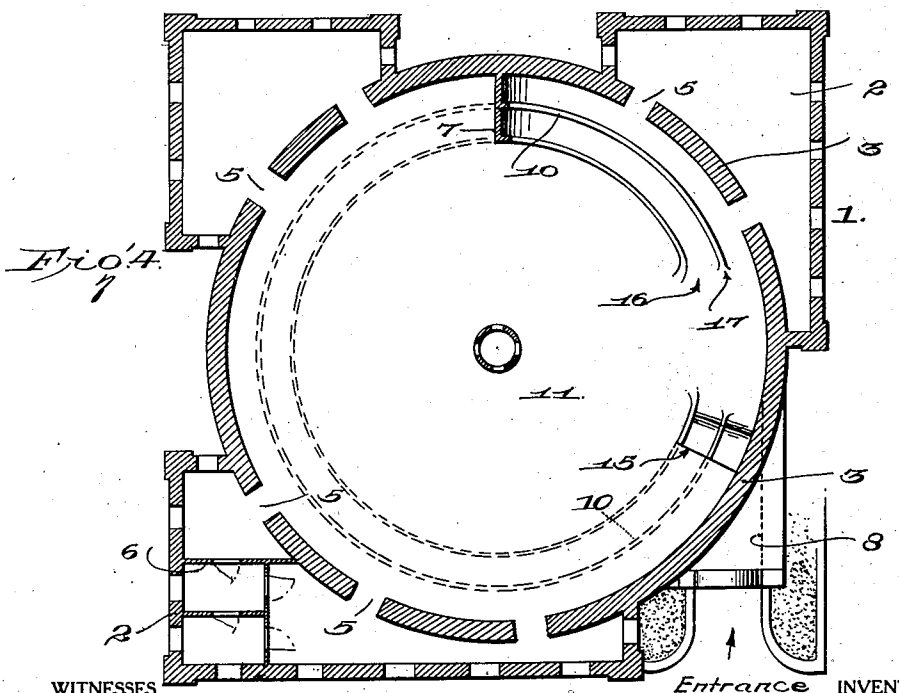


Fig. 4.

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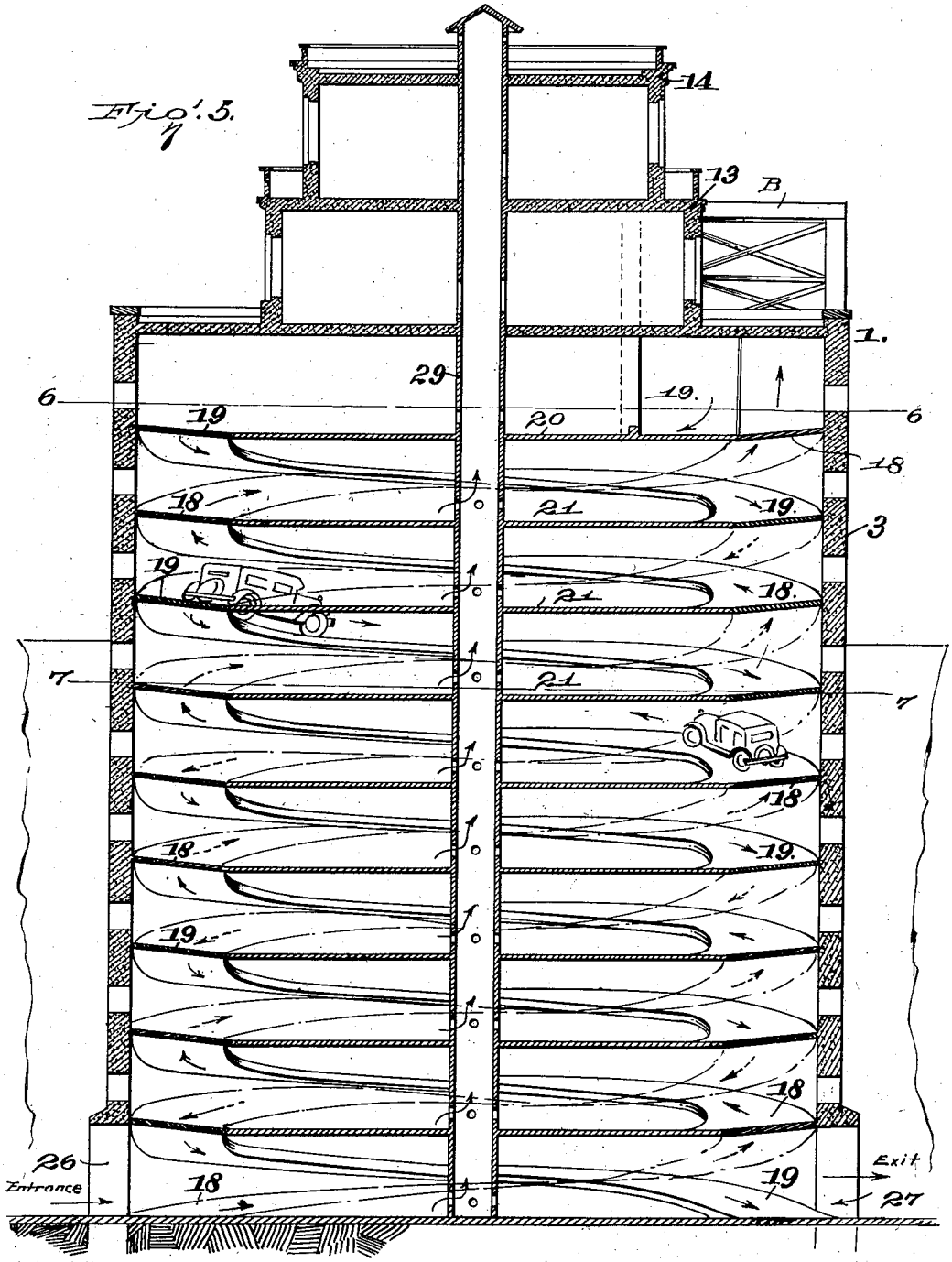
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BRIDGE APPROACH

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Fig. 5.



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BRIDGE APPROACH

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Fig. 6.

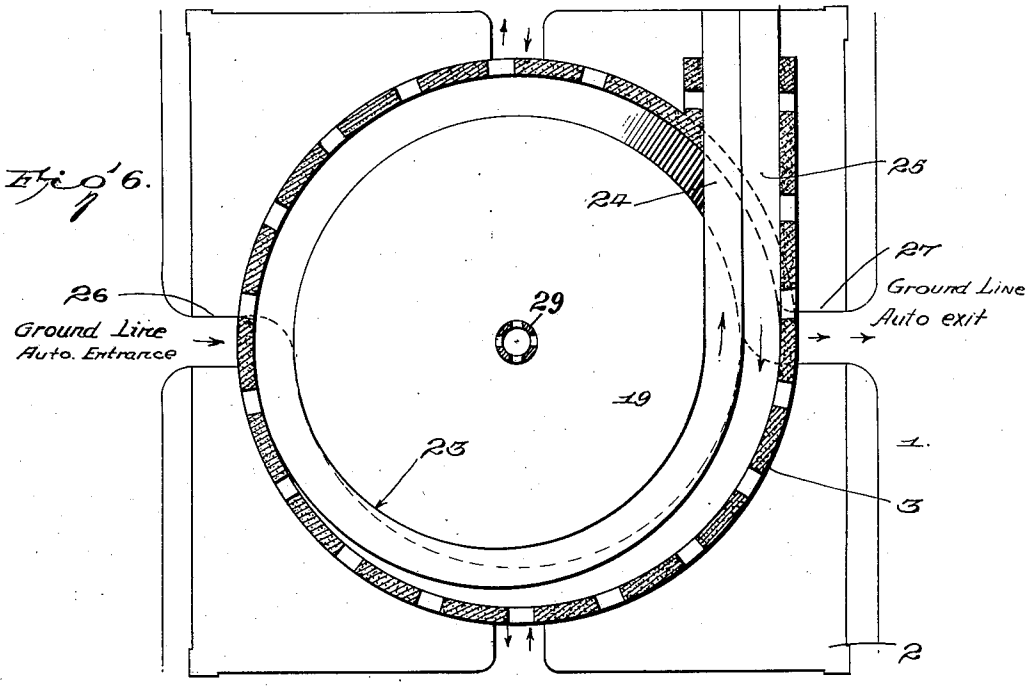
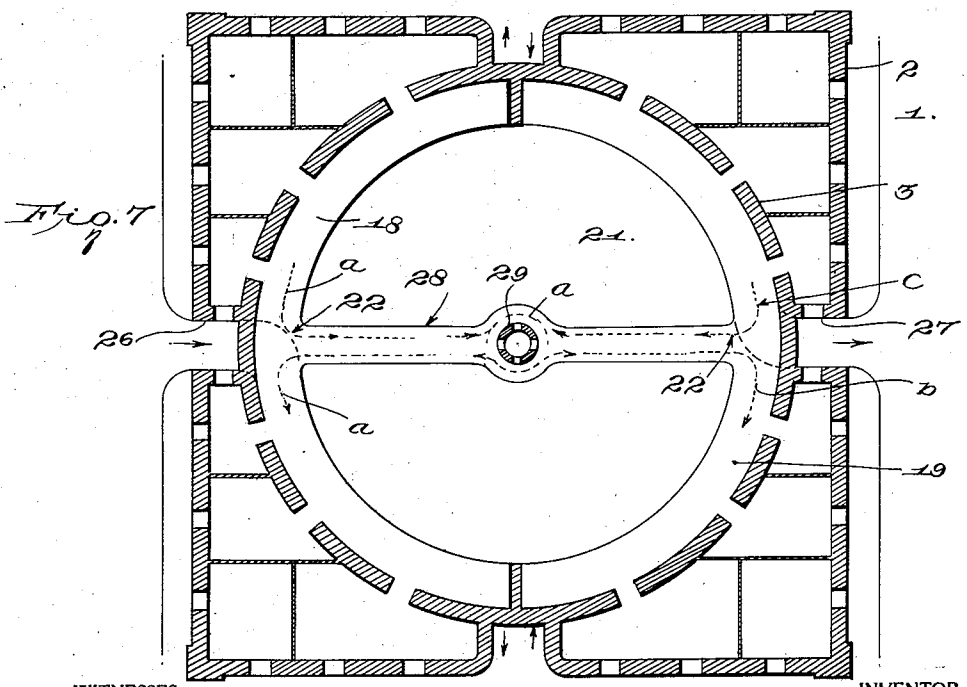


Fig. 7



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UNITED STATES PATENT OFFICE.

ALLEN S. HACKETT, OF NEW ORLEANS, LOUISIANA.

BRIDGE APPROACH.

Application filed May 7, 1926. Serial No. 107,458.

This invention relates to improvements in approaches to bridges, and the separate floors of a building construction, one of the principal objects being to combine with a building of any suitable number of stories designed for occupancy, a spiral ramp of either single or double character, said ramp being arranged within the building or buildings and so associated with transversely extending floors that the interior of said building or buildings may be additionally employed for storage purposes.

Other objects and advantages appear in the following specification, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view illustrating the general arrangement of the foregoing building at one approach of a bridge,

Figure 2 is a central vertical section of the building or approach, illustrating a spiral ramp of single nature,

Figure 3 is a cross section taken substantially on the line 3—3 of Figure 2,

Figure 4 is a cross section taken substantially on the line 4—4 of Figure 2,

Figure 5 is a vertical section illustrating the use of a ramp of double nature,

Figure 6 is a horizontal section taken substantially on the line 6—6 of Figure 5, showing the arrangement of superimposed spiral ingress and egress ramps,

Figure 7 is a section taken on the line 7—7 of Figure 5.

The problem of constructing the approaches to a bridge presents numerous difficulties to be overcome, and the difficulties increase with the density of population on the site of the approaches, land values, etc. It is generally the case that the approaches to a bridge must extend for quite a distance in order that the grade may not be prohibitively great. It is one of the purposes of the invention to greatly condense the approaches to the bridge, and rather than to make the condensed approaches unsightly, it is proposed to combine them within buildings of attractive architectural design having accommodations for offices, the storage of motor vehicles, for the assembly and amusement of people, etc.

In Figure 1 the bride B is regarded as having an approach at each end, but it may be supposed that each end of the bridge is approximately the same height above the ground level and the approaches are therefore alike. In view of this circumstance the illustration and description of the single approach shown will suffice for both.

The approach is generally designated 1. It comprises the building which is composed of the outer structure 2, the central structure 3 and the superstructure 4. The outer building structure extends to a height of four stories, but the number of stories will obviously vary with the height of the bridge above ground level.

In Figure 4 the central structure 3 is shown to have a plurality of openings 5 communicating with the outer structure 2 which bears the relationship of wings to said central structure. The purpose of the openings is to provide for the entrance and exit of persons or motor vehicles. In the first instance the various floors may be subdivided by partitions providing offices or the like. In the second instance, portions of the wings may be used for the storage of automobiles. For example, the office in the lower left corner of Figure 4 is partitioned for business purposes, a space being reserved for the parking of the automobile or automobiles of the occupants of the office.

A circular arrangement of the central section 3 is not necessarily adhered to because it may be made oval, and of other shapes. The interior of the central structure contains a spiral ramp 7 (Figs. 2, 3 and 4) which begins at the street level, as at 8 and ends at the bridge floor level, as at 9. The spiral ramp is arranged around the interior wall of the central structure, and in order that it may be employed for traffic going in both directions the ramp is centrally divided by a low wall 10 as plainly shown in Figures 2 and 3. The ramp is known as of single nature to distinguish from the modified form of ramp in Figures 5, 6 and 7.

Extending across the central structure 3 in superimposed parallel relationship is a number of floors 11 (Fig. 2) which floors are intended to be used for storage purposes. These occupy the center of the structure 3 which would otherwise be empty due to the confinement of the spiral ramp to the wall of the structure. The uppermost and last floor 12 is especially used as a parking space for the automobiles of persons visiting the superstructure 4. This superstructure, as shown in Figure 2, may include an auditorium 12, a recreation hall 13 and a roof garden 14. Obviously the superstructure

may be devoted to purposes other than those mentioned.

Upon reference to Figure 4 it is seen that the floor 11 extends completely across the space inside of the central structure 3, there being a necessary break in the continuity of the floor as at 15 where the continuing spiral ramp 7 passes to the level of the floor beneath. In order that motor vehicles may run in upon the floor 11 (the same is true of any of the floors) the ramp has a suitably formed approach 16 which includes a break 17 in the low wall 10. The outer track of the ramp is supposedly confined to ascending traffic, while the inner track is confined to descending traffic. The arrangement of the approach 16 and 17 (Fig. 4) permits traffic from either track or lane to enter upon the floor 11.

Reference is next had to Figures 5, 6 and 7. The arrangement here shown is a modification in so far as the motor vehicle runway is concerned. It is now made in the form of a double spiral ramp, one component 18 of which is devoted to ascending traffic, the other component 19 being devoted to descending traffic. The arrangement may be compared with a double pitch screw, each thread of which is independent of the other. By comparison of Figure 5 with Figure 6 the individuality of the two lanes is readily traced. The spiral ramps must obviously be separated vertically a sufficient distance to give clearance for the highest motor vehicle and lowest likely to be transported thereover. One lane or spiral ramp may be said to be superimposed upon the other, and the particular arrangement has been hereinbefore designated as of double nature. The superimposed spiral ramps probably will not have to be as wide as the single ramp 7 (Fig. 2) because the necessity of provision for two lines of traffic in the same plane is avoided.

As in the first form of the invention the central structure has transverse floors 20 and 21, the first agreeing with the parking floor or space 12 in Figure 2 the latter with the other ordinary floors 11. Arrangements for the ingress and egress of traffic from the two spiral ramps upon the various floors is made as before for instance as illustrated at 22 in Figure 7.

In Figure 6 it is noted that the ascending spiral ramp 18 circles about the inner wall of the structure 3 and that the descending ramp 19 falls directly therebeneath until the top of the structure is approached. In order that one ramp may not conflict with the other at the entrance to the bridge, the descending ramp is given a somewhat quicker turn as at 23 so that the tangential entrance portion 24 may lay beside the corresponding exit portion 25 of the ascending spiral. A similar arrangement may be adopted at the street level of the structure, but it is preferable to locate the entrance 26 to the ascending ramp substantially 180° from the exit 27 of the descending ramp 19, it being understood that the arrangement of the various entrances and exits may be varied as practice may require.

The mode of use is readily understood. It is intended that the specific structure 1 shall be part of the bridge B itself. To that end it seems desirable that there should be some harmony of design between the bridge and building structures so that the specific building or approach may be more closely identified with the bridge. It has already been stated that the approach is condensed into a relatively small space by arranging it in spiral formation. The spiral approach or ramp is built in as part of the central structure 3 of the building 1.

The outer structure or wings 2 of the building are to be devoted to office, storage and other purposes, as can also the various floors 11 and 12 (Fig. 2) and 20 and 21 (Fig. 5). A great deal of space that would otherwise be wasted is thus put to good and valuable use, it being an expressed purpose of the invention to combine the building and its function with the spiral approaches or ramps and their functions and to make of the combination an important contribution to the particular art involved.

Specific reference is purposely avoided herein to the mode of construction of the building and ramps because the modes of construction are so many and varied that the description of one might be construed as a limitation. The manner and material of construction are left for practice to decide.

Both modifications are essentially the same, the distinction between the arrangement in Figs. 2 and 6 being that in the first case the spiral ramp 7 is of single formation (like a single pitch screw) while the second arrangement is double (like a double pitch screw). In the latter case the ascending and descending spiral ramps 18 and 19 are quite independent of each other, but in the first case the spiral ramp 7 has a central dividing low wall 10 which separates the two lanes of ascending and descending traffic.

Reference is made to Figure 7. It is to be observed that the ascending and descending ramps 18 and 19 meet the level floor 21 at approximately diametrically opposite points previously referred to as at 22. The dotted arrows *a* indicate how ascending traffic may be diverted from the ramp 18 in the event it be desired to stop at the floor 21. The floor may be marked off to define a cross lane 28 which meets and passes around the ventilating shaft 29 as shown.

These arrows also show how traffic should pass around the shaft in order to again reach the ascending ramp. Inasmuch as the lane

connects with the descending ramp 19 at the second point 22, traffic may pass across and down as at the arrow *b*. Decending traffic may be diverted from the ramp 19 as shown at the arrow *c*.

In conclusion it is desired to describe another function of the building structure 1. The bridge B is of the type having back stay cables 30. Inasmuch as the structure is built at the end of the bridge the foundations of such structure can be effectively utilized as an achorage for said stay cables. These are therefore brought down in the manner generally suggested in Figure 1, and incorporated in the building foundations so as to hold them firmly in place.

While the construction and arrangement of the improved approach to bridges (or the floors of a building structure when no bridge is present) is that of a generally preferred form, obviously modifications and changes may be made without departing from the spirit of the invention or the scope of the claims.

I claim:—

1. An approach for a bridge having the floor ending abruptly at an altitude above ground level, a building erected at ground level extending upward across the end of the bridge, said building having a relatively large opening at which the bridge floor communicates with the interior of the building and having a pair of openings at ground level being diametrically opposite each other, a continuous spiral ramp located within the building and communicating at the lower end with one of said ground level openings, a second continuous spiral ramp having its convolutions interposed between those of the first mentioned ramp and communicating at its lower end with the other ground level opening, and tangential portions extending from the opposite and upper ends of said ramps being disposed side by side and communicating with said relatively large bridge opening.

2. A bridge having the floor ending abruptly at an altitude above ground level; in combination, a combined bridge terminal and building comprising a building structure erected at ground level extending upward across the end of the bridge floor said building structure having a relatively large opening at the bridge floor and a pair of openings at ground level, continuous spiral ramp within the building communicating with one of the ground level openings at one end, a second continuous spiral ramp having its convolutions interposed between those of the first mentioned ramp communicating at one end with said other ground level openings, one of said spiral ramps being given a somewhat quicker turn at the upper end, and runway portions extending from the upper ends of said spiral ramps being disposed side by side and communicating with the bridge opening.

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