

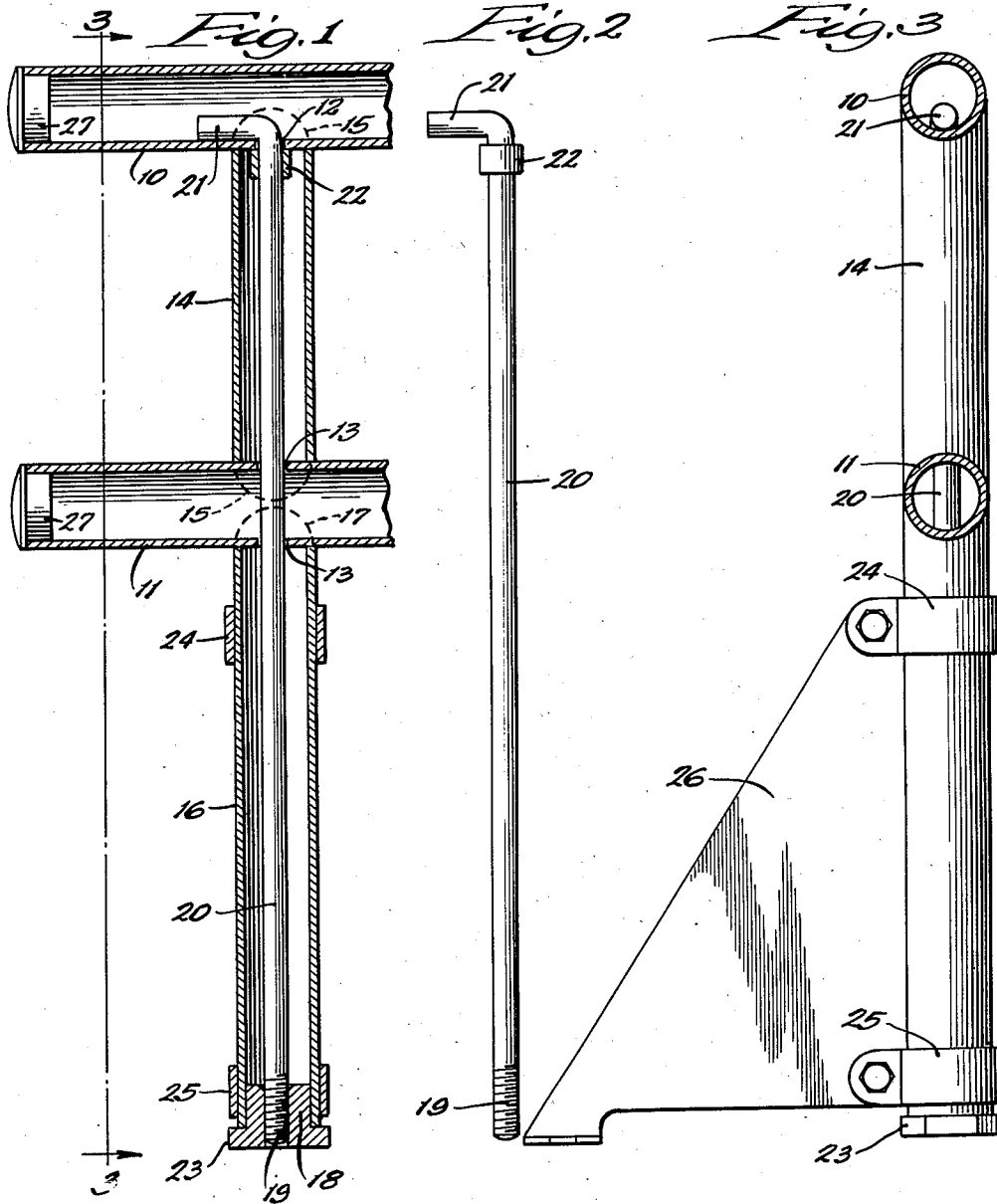
June 12, 1951

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2,557,002

RAILING STRUCTURE

Filed Oct. 2, 1946



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UNITED STATES PATENT OFFICE

2,557,002

RAILING STRUCTURE

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Application October 2, 1946, Serial No. 700,613

2 Claims. (Cl. 256—65)

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This invention relates to a railing structure and the like. The invention is particularly useful in connection with a railing or guard for placement about chain conveyors or the like and for forming enclosures about areas.

An object of the invention is to provide a railing structure formed of simple parts which may be readily assembled into a sturdy integrated railing frame. A further object is to provide means for assembling tubing which may be shipped in compact form to a place where the railing is to be erected, the assembly means permitting the parts to be brought together quickly into a sturdy finished frame. Yet another object is to provide a railing structure equipped with simple tie members permitting ready disassembly or assembly of the structure. Other specific objects and advantages will appear as the specification proceeds.

The invention is illustrated, in a preferred embodiment, by the accompanying drawings, in which—

Figure 1 is a vertical sectional view of apparatus embodying my invention; Fig. 2, a side view in elevation of a tie member or tie rod which may be employed to unite the frame parts; and Fig. 3, a transverse sectional view, the section being taken as indicated at line 3—3 of Fig. 1.

In the illustration given, 10 designates an upper horizontal tubular member, and 11 a lower horizontal tubular member. The members 10 and 11 are designed to become the railing of the finished structure, and it will be understood that the railing may be formed of one, two or more horizontal members.

The tube 10 is provided with an opening 12 in its lower side, and the tube 11 is provided with a pair of aligned openings 13. It will be understood that the members 10 and 11 may be connected to adjacent tubes in the same plane so as to form a continuous rail or guard about any desired area.

Between the tubes 10 and 11, I provide a vertical tubular member 14. The member 14 is cut away at its top along an arcuate path to provide a recess receiving the upper tube 10. If the upper tube 10 is circular, the recess preferably is formed in an arc conforming to the outside curvature of the member 10. Similarly, the vertical member 14 has a cutaway portion, as indicated by dotted lines 15, at its lower side so as to encompass almost half of the tubular member 11.

Below the tubular member 11 is a vertical tube 16 having its top portion cut away along the

line 17 to provide a recess receiving tube 11. If horizontal tube 11 is substantially circular in cross section, the notch 17 is preferably arcuate so as to conform to the curvature of the tube 11. The lower end of the vertical member 16 is provided with a nut 18 having internal threads receiving the threaded end 19 of the tie member or tie rod 20.

The upper end of the tie rod 20 is preferably turned to form a locking head 21, as shown more clearly in Fig. 1, and secured to the rod 20 below the bend is a ferrule 22. The ferrule 22 prevents the head 21 from extending upwardly into the tube 10 and thus maintains the lower threaded end 19 in fixed position while nut 18 is being turned to tighten the rod within the frame work. The nut 18 is preferably provided with a hexagonal or multi-sided head 23 so that the head may be effectively turned in the tightening operation.

If the railing is joined to form a circular or rectangular frame, it is found that no additional support is necessary. However, if a complete frame of this sort is not assembled, it may be desirable to have supports extend along the frame, and one example of such a support is shown best in Fig. 3. The support comprises a pair of sleeve members 24 and 25 receiving the tube 16 and the ends of the sleeves 24 and 25 are bolted to a laterally-extending wing 26.

In the operation of the structure, the rod 20 is first inserted in position, as shown in Fig. 1, and is free of the nut 18. The vertical tube 14 is next placed in position by sliding it over the rod 20. The horizontal tube 11 is next placed in position by passing the rod 20 through the openings 13. Finally, the tube 16 is slipped into position over rod 20, as indicated in Fig. 1. The nut 18 is next placed in position and rotated so as to draw the rod 20 downwardly. It will be noted that the flanges 23 of the nut 18 engage the lower end of the tube 16, and the rotation of the nut 18 brings about a clamping action, drawing rod 20 tightly in a downward direction. The rod 20 thus becomes a means for integrating the various tubes into a compact rigid framework. If the support is to be employed along with the railing, the sleeves 24 and 25 are inserted about the tubing 16 before the nut 18 is placed in position and drawn tight.

The method of assembly described permits a railing to be assembled quickly and extending over long areas. Where the tubes 10 and 11 are connected with other tubes of a continuous railing, a simple friction insert ring may be employed, or any other suitable means for securing

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the two rails together may be employed. If the rails should terminate, the ends of the tubes may be closed by suitable friction caps 27. It will be understood that many variations may be made in the type of structure employed. The tubes may be square or rectangular in cross section rather than circular and the parts illustrated may be of different configurations.

The structure is extremely simple in character, permitting ready assembly and also ready disassembly. When the parts are drawn together under the pressure exerted upon rod 21, it is found that the arcuate notches in the vertical tubes closely conform to the circular contours of the horizontal tubes 10 and 11 so that the resulting frame has the appearance of an integral structure and its rigidity is comparable to that of an integral structure. At the same time, upon the unscrewing of nut 18, all of the parts may be disassembled and packed for shipment in compact relation. The vertical members 14 and 16, together with the horizontal tube 11, may be readily drawn off the rod 20, and the rod 20 may, by turning the same, be withdrawn from the upper horizontal tube 10.

While in the foregoing specification, I have set forth a specific structure in great detail as illustrating one embodiment of the invention, it will be understood that such details may be varied widely by those skilled in the art without departing from the spirit of my invention.

I claim:

1. In a railing structure, a plurality of substantially horizontal tubes, a plurality of substantially vertical tubes, said vertical tubes being aligned and where meeting said horizontal tubes being provided with a recess receiving the latter tubes, said horizontal tubes being provided with openings aligned with said vertical tubes, a rigid rod extending through said openings and having a turned locking end engaging the inner bottom wall of the topmost horizontal tube, a ferrule fixed to said rod at a spaced point below the

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turned end thereof and engageable with the outer wall of said uppermost horizontal tube to prevent upward movement of said rod, said rod having a threaded lower end, and a nut receiving the lower threaded end of said rod and abutting the lower end of the vertical tube.

2. In a railing structure, a plurality of substantially horizontal tubes, a plurality of substantially vertical tubes, said vertical tubes being aligned and where meeting said horizontal tubes being provided with a recess snugly receiving the latter tubes, said horizontal tubes being provided with openings aligned with said vertical tubes, and a rod extending through said openings and having a lower threaded end, the upper end of said rod being turned laterally and engaging the inner wall of the topmost horizontal tube, a ferrule fixed to said rod at a spaced distance below the turned end of the rod and engageable with the outer wall of said uppermost horizontal tube to prevent upward movement of said rod, and a nut equipped with a threaded shank received within the lowermost vertical tube and having a laterally extending flange receiving the bottom edge of the lowermost tube.

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