May 24, 1932. M. B. SCHILLER 1,859,894

KNOCKDOWN STRUCTURAL ELEVATOR TOWER

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FIG. 1.

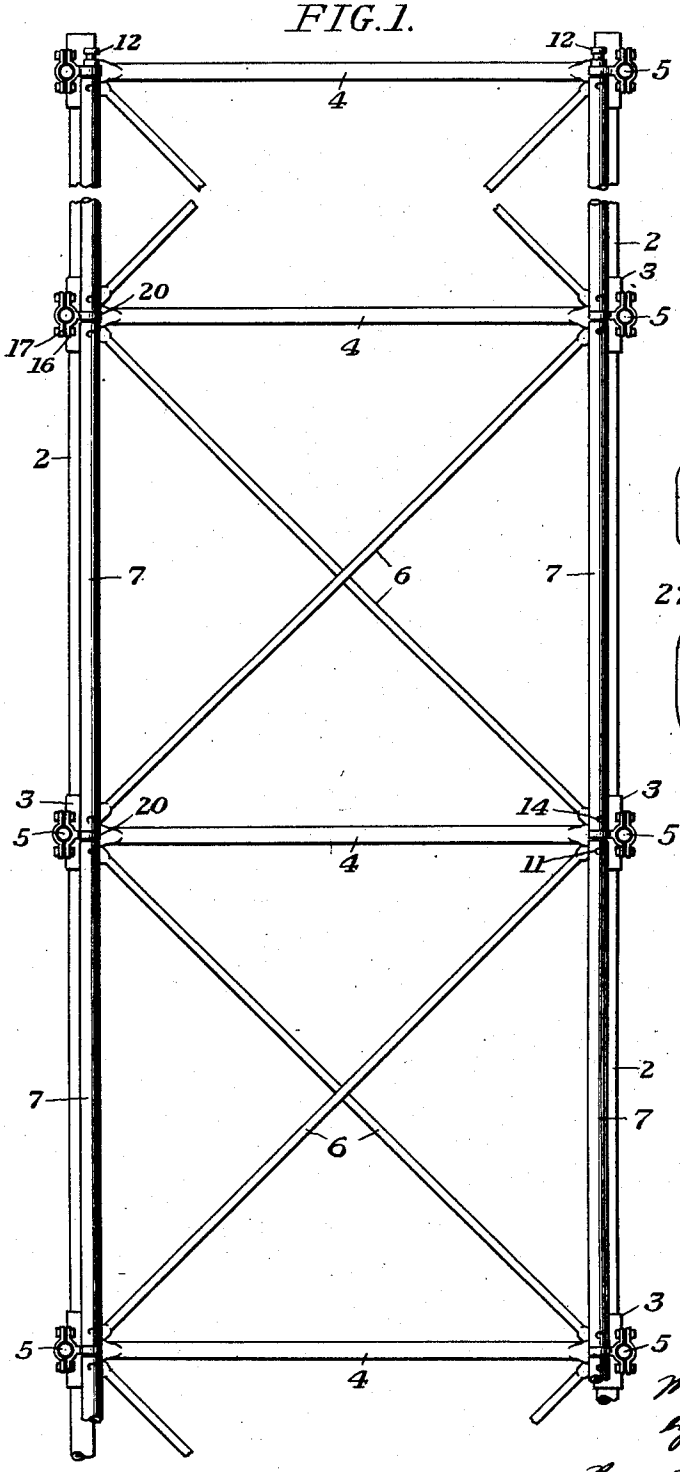


FIG. 4.

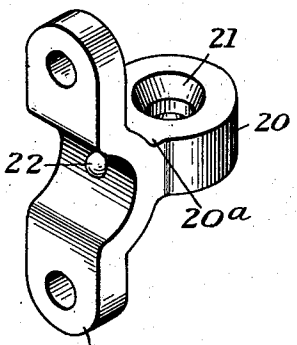


FIG. 5.

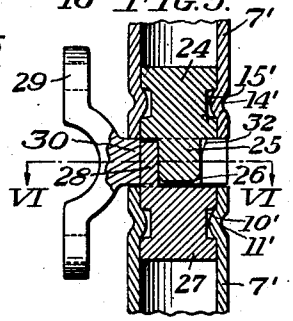
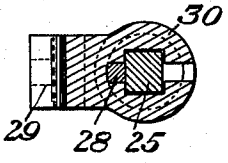


FIG. 6.



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FIG. 3.

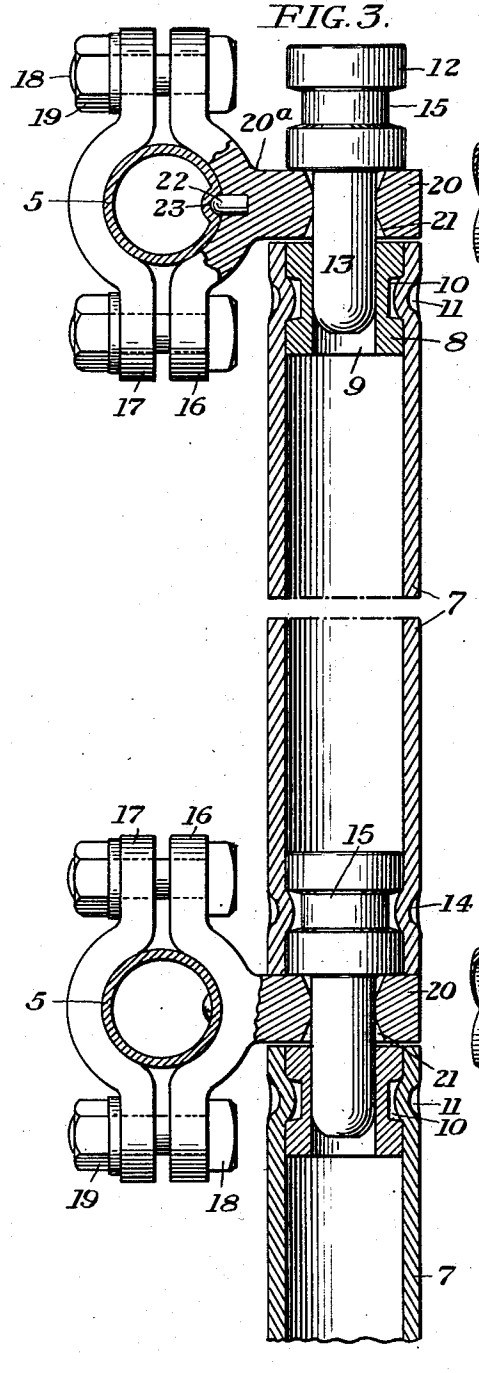
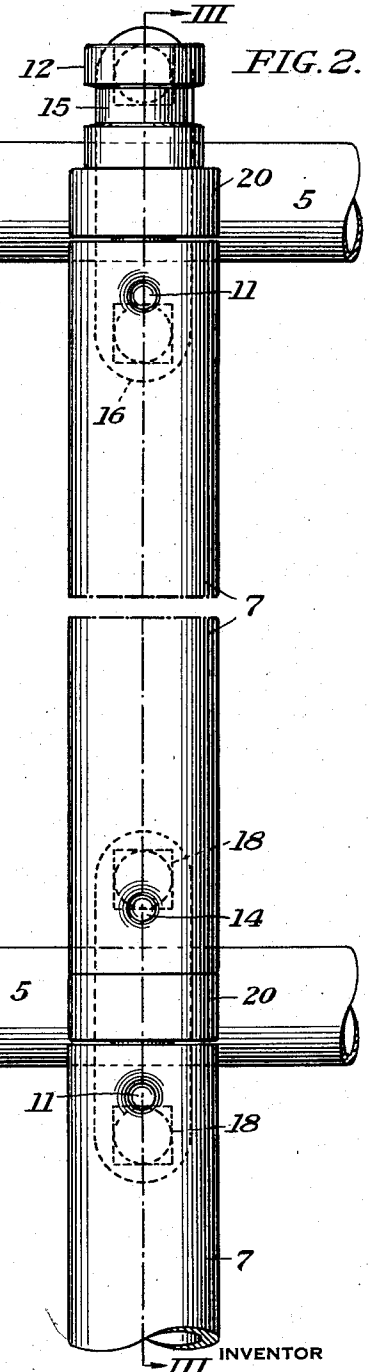


FIG. 2.



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Patented May 24, 1932 1,859,894

UNITED STATES PATENT OFFICE

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KNOCKDOWN STRUCTURAL ELEVATOR TOWER

Application filed April 19, 1930. Serial No. 445,622.

This invention relates to knock-down structural elevator towers, especially those of tubular construction and of the general type disclosed in Schiller and Haller Patent No. 1,676,161, and more particularly to an elevator guide for use in such towers.

These knock-down towers are commonly used by contractors during the erection of buildings and comprise a frame-work made up in sections within which is an elevator or platform on which materials are conveyed from the ground to the floors of the building under construction. The elevator is guided in the frame-work by means of guides positioned along at least two sides of the tower. The guides, for the purpose of convenience, must also be in sections, the sections corresponding generally to the height of the sections of the tower. While the sections do not have to present as smooth and unbroken a surface as the guides used for commercial elevators, the surface must be fairly smooth and continuous and fairly alined in order to be satisfactory.

According to the present invention there is provided in a sectional elevator tower a sectional elevator guide which can be erected as the tower is built up, or which can be erected after the tower has otherwise been entirely completed, wherein the sections are firmly retained in place and in alinement, which can be erected after the tower has been built without the use of tools, and which can be taken down upon removal of the tower, without the use of tools.

The invention which possesses many advantages over the constructions now commonly employed in structures of this kind may readily be understood by reference to the accompanying drawings in which

Figure 1 represents a vertical section through a portion of a structural tower showing the guides in elevation positioned within the tower;

Figure 2 is a front elevation of the guide, Figure 2 being shown on a scale larger than Fig. 1;

Figure 3 is a transverse vertical section in substantially the plane of line III—III of Fig. 2;

Figure 4 is a detail perspective view of one of the eye members constituting a part of the guide;

Figure 5 is a detail view, principally in vertical section, of a modified form of connection between guide sections;

Figure 6 is a transverse section on line VI—VI of Fig. 5.

In the drawings, Figure 1 shows a portion of a sectional knock-down tower of the general type disclosd in the said Schiller and Haller patent, this tower having sectional corner posts 2 with connections at 3, cross girts 4 at one side of the tower, and cross girts 5 at right angles to the girts 4. The tower also has diagonal braces 6.

The elevator guides are designated generally as 7, and comprise, in the preferred embodiment of the invention, lengths of tubes. Secured into the top of each tube, as shown in Fig. 3, is a collar 8 having a central opening 9, the top of the collar terminating flush with the top of the tube. While the collars may be welded, bolted, or otherwise retained in place, I have found that a satisfactory method of retaining the collars in place is to provide each collar with an annular groove 10. The tube 7 is punched in at intervals around the collar, these indentations being designated 11. They serve to hold the collar against endwise movement, and are also sufficiently tight to prevent the rotation of the collars, although this is not material.

At the opposite end of each length of tubing 7 is a plug member 12 generally similar to the plug 8, but instead of having a central opening 9 it is provided with a pin or extension 13 which, however, is in longitudinal alinement with the opening 9. The plug 12 carrying the pin 13 is retained in place the same as the plug 8, the metal of the tube 7 being indented at 14, the plug 12 having an annular recess 15 to permit of such indentation.

Carried on each of the cross girts 5 is a clamp comprised of two parts 16 and 17, these parts being connected together by the bolts 18 on which are the clamping nuts 19. The member 16 is provided with a horizontal extension 20 in which is an eye or opening 21.

The central part of the opening 21 is preferably substantially the same as the diameter of the pin 13, while the opening is tapered in at least one direction from the center, although for certain construction projects or for certain types of labor, the opening 21 should be tapered in both directions from the center, as shown in Fig. 3. The double taper makes it easier, in some cases, to assemble the lengths of guides, but permits more play at these connections.

Each of the members 16 is preferably provided with a small extension 22 on the inner face thereof, this projection being received in a corresponding depression 23 in the cross girts 5. The depression 23 is located in the middle of the cross girt, and by reason of the interfitting projection and socket 23 the clamps can be quickly and accurately positioned on the girts both with respect to the center of the girt and with respect to the radius of the girt. Because the girts 5 have flattened ends it is of course necessary that the clamps be applied in such position that when the cross girt is in place on the tower the eye or extension 20 will be in a horizontal plane. The interfitting projection and socket also serve to hold the clamp positively against movement along the girts or against rotation on the girts so that the clamps are not maintained in position by friction only.

The clamps can be applied to the cross girts in the factory in which the towers are fabricated, or can be applied thereto by the contractor erecting the elevator before the tower is put up. Because of the interfitting projection and socket on the clamp and girt, it is assured that the clamps will be in the proper position when the girt is secured in place on the tower structure.

After the tower has been erected the elevator guide can be secured in place merely by raising the respective sections 7 to the proper position, slipping the pin 13 on the lower end of each section through the hole in the eye 20 beneath it. The pin 13 is of such length as to extend well into the opening 9 of the section beneath it. The flaring of the openings 21 permits the tube sections 7 to be inclined or tipped in making the insertion and allows the tube sections 7 to be tipped or inclined in removing the same.

It will be noted by reference to Figs. 2 and 3 that the tubes are slightly shorter than the distance between the successive eyes 20, whereby sufficient clearance is provided to permit the tubes to be inclined upon being installed or removed from the tower.

In the particular arrangement shown in Figs. 2 and 3, th pin on the bottom of one tube not only serves to hold the bottom of that tube in position, but also serves to hold the top of the tube beneath it in proper alinement. The eye 20 in addition to holding the tube sections in alinement also substantially fills the gap between the adjacent tube ends and forms a part of the guide surface.

In Figs. 5 and 6 there is illustrated a modified form of connection between guide sections. In these figures, the parts corresponding to the same parts in the first form are given the same numeral with a prime affixed thereto. In the lower end of each section 7′ is secured a plug member 24 by means of indentations 14′ cooperating with an annular groove 15′. The plug member 24 is provided with a pin or extension 25 which is square in cross section. The lower corners of the projection 25 may be rounded or bevelled as shown at 26 in Fig. 5. In the upper end of each section 7′ is secured a plug member 27 which is secured in position by indentations 11′ cooperating with an annular groove 10′. The plug member 27 is provided with a lug or extension 28 which has one face forming substantially a continuation of the periphery of the plug member 27, and is correspondingly rounded. The other three faces are squared as shown in Fig. 6. A clamp member 29 is provided with a horizontal extension 30 which is slotted in the manner indicated in Fig. 6. This slot has in different portions thereof different widths, the smaller width fitting the lug 28 and the larger width fitting the extension 25. It will be obvious that a clamp member 29 may be assembled with a cooperating clamp member such as shown at 17 in Fig. 3 in constructing a tower of the type above referred to.

In assembling the sections 7′ the lug 28 slides in the slot in the extension 30. The pin 25 is then inserted in the larger portion of this slot to lock the lower section 7′ in position. The pin 25 accordingly serves not only to hold the bottom of the guide section in position, but also serves to lock in proper alinement the top of the guide section beneath it. In order to permit tipping or tilting of a tube section 7′ during insertion of the pin 25, the central opening in the extension 30 may be tapered outwardly toward its upper end as is shown at 32 in Fig. 5. This, together with the tapering or bevelling of the lower edges of the pin 25, facilitates assembling of a plug 24 and a plug 27 with a clamp member 29.

From the foregoing it will be seen that the invention provides an elevator guide for knock-down towers of this type, which guide can be installed as the tower is erected, or installed after the tower is completed. The clamps 16—17 being secured to the cross girts before the tower is erected, it will be seen that the elevator guides can be installed upon erection of the tower without the use of tools and also be taken down without the use of tools. At the same time the sections of the guide are positioned in proper alinement, and they cannot become detached accidentally.

Although I have shown the guide sections herein as being circular in cross section, I may, in connection with certain types of elevators, provide guide sections having a different cross section, such as a channel member or a guide section having a square cross section. In any case, the horizontal extension 20 must conform in shape to the contour of the guide section. The elevator is thereby permitted to slide readily from one guide section to another.

At the top of the tower the uppermost sections can be retained in place by a pin which is in all respects similar to the pin plug used in the bottom end of each of the tube sections.

The eye members on the cross girts are reversible so that in erecting the tower the cross girts can be used on either side of the tower, and the only care that need be exercised in the erection of the tower is that the eyes shall project inwardly instead of outwardly. This reversible feature is of advantage because it simplifies the erection of the towers by having the girts interchangeable.

While I have described one present preferred embodiment of my invention, it will be understood that the invention is not limited to the particular form herein disclosed, but may be otherwise embodied, and various modifications and arrangements may be made therein.

I claim:

1. In a knock-down tower of the class described, a tubular elevator guide comprising a plurality of tube sections having projections at one end thereof, and eye members secured to the tower into which the projections extend.

2. In a knock-down tower of the class described, a tubular elevator guide comprising a plurality of tube sections having projections at one end thereof, and eye members secured to the tower into which the projections extend, said eye members being of substantially the same diameter as the tubular guide sections and providing a guide surface between adjacent tube ends.

3. In a tower of the class described having cross girts, elevator guide members carried on the cross girts and having a substantially circular eye portion, and tubular guide sections between the girts and having projections which engage in the eye portions of said guide members, the diameter of the eye members being substantially the same as the diameter of the tubular guide sections.

4. The combination with a tower of the class described having cross girts thereon, of a sectional elevator guide, and retaining means secured to the cross girts having an eye thereon, the outer surface of the eye projecting between sections of the guide and being substantially flush with the surface of the guide.

5. In a knock-down tower of the class described having horizontal girts thereon, clamps carried on some of the girts, said clamps having an eye portion thereon, and means for securing the clamps to the girts, the axis of the eye being in a vertical plane, and an elevator guide section having a portion thereon engaging the eye.

6. The combination with a knock-down tower of the class described having cross girts thereon and having sectional elevator guides therein having portions thereon for engagement in a retaining element, of means secured to some of the girts for retaining the guides in position, said means comprising retaining elements attached to some of the girts, said elements having a horizontal extension thereon in which is a vertical opening which tapers inwardly from one face thereof and into which said portions of the guides project.

7. The combination with an elevator tower having sectional elevator guides and having cross girts, of guide retaining eye members, means for clamping the eye members to the girts, and an interfitting projection and socket engagement between the eye member and the girt for positioning the eye member on the girt and holding the eye member against displacement both around and along the girt.

8. In a knock-down tower structure of the class described, a sectional tubular elevator guide comprising a plurality of tube sections, a socket member in one end of each tube section and a pin member in the other end of each tube section adapted to cooperate with the socket member of an adjacent tube section, and eye members secured to the tower interposed between the adjacent ends of the tube sections and through which the pin of one tube section extends into the socket of the next adjacent tube section.

9. In a knock-down tower structure of the class described, a sectional tubular elevator guide comprising a plurality of tube sections, a socket member in one end of each tube section and a pin member in the other end of each tube section adapted to cooperate with the socket member of an adjacent tube section, and eye members secured to the tower interposed between the adjacent ends of the tube sections and through which the pin of one tube section extends into the socket of the next adjacent tube section, said eye members having the exterior thereof substantially flush with the exterior of the tube sections.

10. In a knock-down tower structure of the class described, a sectional tubular elevator guide comprising a pluraliy of tube sections, a socket member in one end of each tube section and a pin member in the other end of each tube section adapted to cooperate with the socket member of an adjacent tube section, and eye members secured to the tower interposed between the adjacent ends of the tube sections and through which the pin of

one tube section extends into the socket of the next adjacent tube section, said eye members having the exterior thereof substantially flush with the exterior of the tube sections, each of the eye members having an opening therethrough which decreases in diameter from the outer faces of the eye toward the center.

11. The combination with a knock-down tower of the class described having crossed girts thereon and having sectional elevator guides therein, of means secured to some of the girts for retaining the guides in position, said means comprising clamp elements attached to some of the girts, said elements having a horizontal extension thereon in which is an opening which tapers inwardly from one side thereof.

12. In a knock-down tower of the class described, an elevator guide comprising a plurality of guide sections each having a projection at one end thereof, and an eye-member cooperating with each projection, said eye-members being secured to the tower to connect the guide sections to the tower.

13. In a knock-down tower of the class described, an elevator guide comprising a plurality of guide sections each having a projection at one end thereof, and an eye-member cooperating with each projection, said eye-members being secured to the tower and being of substantially the same cross section as the guide sections and providing a guide surface between adjacent ends thereof.

In testimony whereof I have hereunto set my hand.

MORGAN B. SCHILLER.