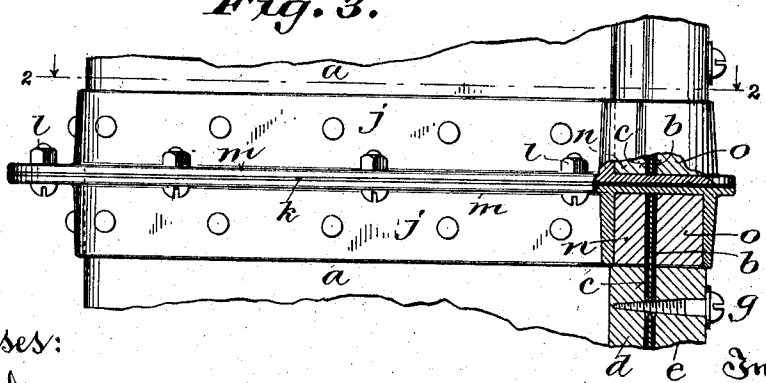
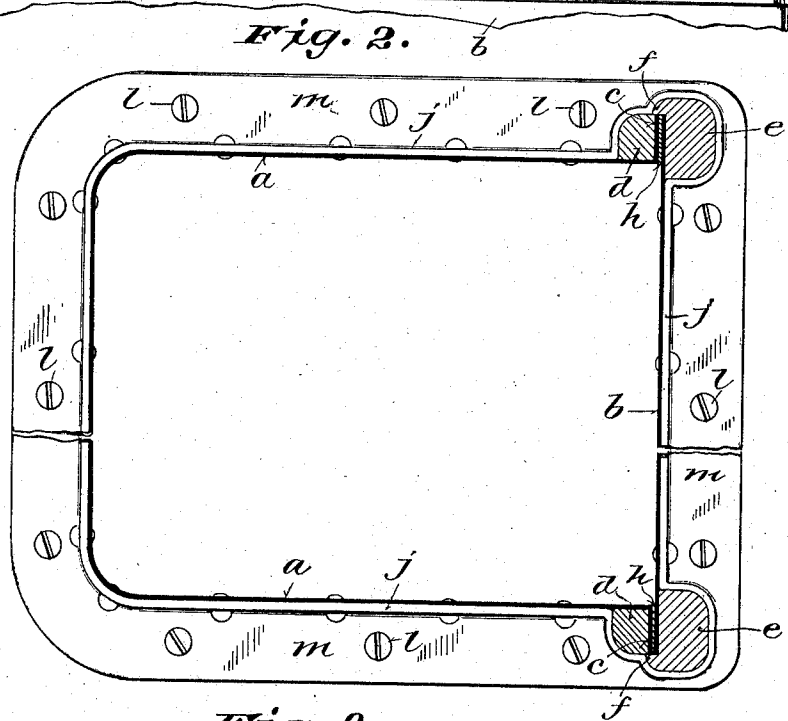
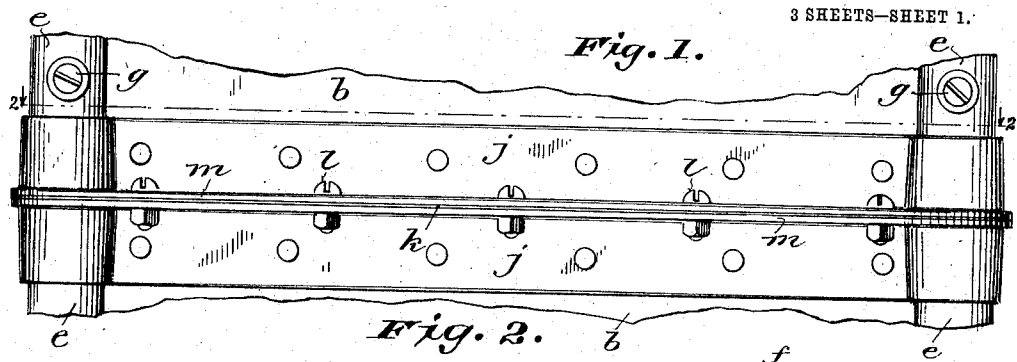


W. D. GRAY.
TUBULAR STRUCTURE.
APPLICATION FILED MAR. 30, 1908.

1,015,312.

Patented Jan. 23, 1912.

3 SHEETS—SHEET 1.

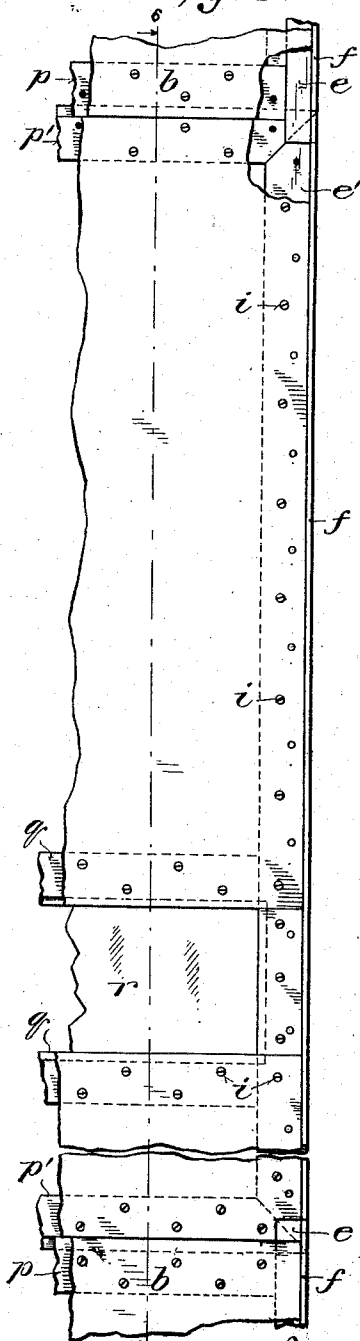
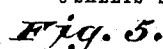
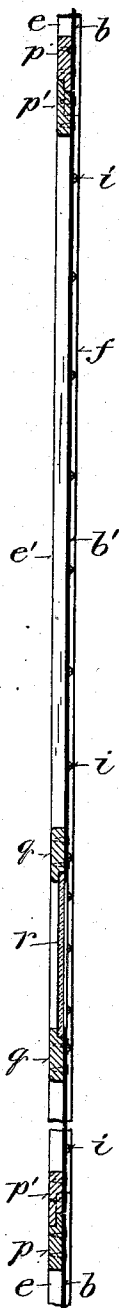
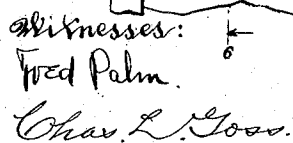


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3 SHEETS—SHEET 2.



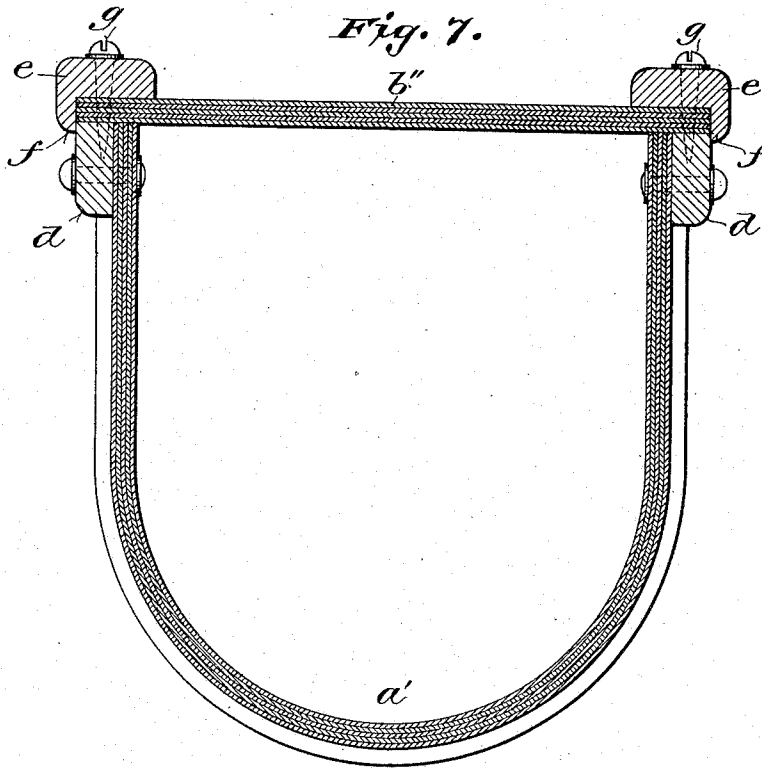
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

WILLIAM D. GRAY, OF MILWAUKEE, WISCONSIN.

TUBULAR STRUCTURE.

1,015,312.

Specification of Letters Patent.

Patented Jan. 23, 1912.

Application filed March 30, 1908. Serial No. 423,988.

To all whom it may concern:

Be it known that I, WILLIAM D. GRAY, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Tubular Structures, of which the following is a specification, reference being had to the accompanying drawing, forming a part thereof.

This invention relates to tubular structures for elevator legs, conveyers, spouts and the like. Its main objects are to produce light, strong and durable tubular structures of this class, which can be economically built in sections or lengths if desired and easily erected or installed, and which will have tight joints and will not twist or warp out of shape; to provide for easy access to the interior of such structures for repairs or inspection; and generally to improve the construction and increase the serviceability of devices of this class.

It consists in certain novel features of construction and in the peculiar arrangement and combinations of parts as hereinafter particularly described and pointed out in the claims.

In the accompanying drawing like characters designate the same parts in the several figures.

Figure 1 is an elevation of the front or outer side, as viewed from the right with reference to Figs. 2 and 3, of a portion of the ends of adjoining sections or lengths of an elevator leg embodying the invention; Fig. 2 is a cross section on the line 2 2, Figs. 1 and 3; Fig. 3 is a side elevation as viewed from the left with reference to Fig. 1; Figs. 4, 5 and 6 are views on a reduced scale of a portion of a cover section with a removable length, for an elevator leg or tubular structure of the kind shown in Figs. 1, 2 and 3, Fig. 4 being an outside elevation, Fig. 5 an inside elevation, and Fig. 6 a longitudinal section on the line 6 6, Figs. 4 and 5; and Fig. 7 is a cross section showing a modification of a tubular structure for conveyer cases.

Referring to Figs. 1 to 6 inclusive, showing a tubular structure specially designed for elevator legs which may be made to facilitate manufacture and erection in lengths of any desired dimensions and coupled together end to end. Each length is composed of a U-shaped section *a*, and a cover section *b*, of sheet metal, as shown, or of other suit-

able material. When made of sheet metal the U-shaped body sections are formed with outturned flanges *c* along their longitudinal edges, and the cover sections *b* are made to overlap these flanges, as shown in Fig. 2. In the angles formed by the outturned flanges *c* and the sides of each section *a*, are fitted longitudinal reinforcing strips *d*, which may be made of wood. Over the edges of each cover section *b* are fitted angular reinforcing strips *e*, which may also be made of wood and have lips or flanges *f* extending over and beyond the edges of the section *b*. The strips *e* with the cover section *b* are fastened to the strips *d* over the outturned flanges *c* of section *a*, by screws *g* passing through the strips *e* and registering holes in the sheet metal sections into the strips *d*, as shown in Fig. 3. The lips or flanges *f* of the strips *e* projecting over the edges of section *b* and of the flanges *c*, cover the joints between them, giving a finished appearance to the structure as well as reinforcing and strengthening it. To further insure perfectly tight joints, thin strips or layers *h* of suitable packing material may be interposed between section *b* and the opposing flanges *c* of section *a*, as shown in Fig. 2. The sheet metal sections *a* and *b* may be secured on the inside to the strips *d* and *e* independently of the screws *g*, which connect and bind the sections together by screws *i*, as shown in Fig. 5.

When the structure is made according to the preferable and usual practice, in lengths, flanged metal coupling rings *j* are riveted or otherwise fastened to the ends of the lengths, and are secured together with interposed gaskets *k*, by bolts *l* passing through registering holes in the flanges *m*. Each ring *j* is formed adjacent to the joints between the sections *a* and *b*, with recesses corresponding in cross section and in line with the clamping and reinforcing strips *d* and *e*, and these recesses are filled, as shown in Fig. 3, with plugs *n* and *o* of wood or other suitable material, against which said strips *d* and *e* abut endwise and between which the outwardly projecting lapped edges of the section extend at adjoining ends of the lengths. The coupling rings are thus made to correspond in design or external contour with the tubular structure, and the construction and assemblage of the parts of the structure are facilitated. The separate lengths may be made to correspond with the dis-

tance between floors of mills or buildings in which they are to be set up, and may be finished in a shop or factory ready for coupling together end to end in the mill or other building where they are to be used.

For elevator legs or similar structures where it is necessary or desirable to provide for easy access to the interior, the cover section is made in separate lengths, which are provided at their ends with interfitting rabbeted cross strips p p' , one of the lengths b' being removable with the cross strips p' and the longitudinal strips e' which are attached thereto and constitute a frame therefor. The strips e' like the strips e , have marginal lips or flanges f , which are adapted to cover and close the joints between the removable length or cover b' and the sides of the tubular structure formed by the section a . The permanent side strips e project, as shown in Figs. 4 and 5, beyond the cross strips p , and the corners of the removable length or cover b' and the mitered corners of its frame composed of the strips e' and p' , are cut away or recessed on the back or inner side, to receive the projecting ends of the strips e , which thus assist to hold the cover in place and close the joints between the rabbeted cross strips p and p' at their ends. Sight openings are formed in the removable lengths or covers b' , and these openings are bordered by grooved cross strips q , in which a glass or transparent panel r is fitted, the side strips e' being correspondingly grooved to receive the ends of the panel, as shown in Figs. 4, 5 and 6.

Referring to Fig. 7, showing a modification of the structure designed for use as a case or box for a spiral conveyer, the U-shaped body section a' and the cover section b'' are shown as made up of several layers of wood or other material glued or cemented together, according to the usual practice in making laminated wood structures. In this form of the structure the outturned flanges along the edges of the body section are omitted, and the reinforcing strips d riveted or otherwise secured to said section, bear directly against the overhanging or overlapping portions of the section b'' . The angular reinforcing strips e , which are secured by screws g to the strips d , have lips or flanges f which overlap the edges of section b'' and cover the joints between them and the strips d .

In both forms of the structure herein shown and described, the longitudinal strips d and e serve not only to stiffen and strengthen the edges of the sections to which they are attached and to prevent warping and twisting of the structure, but also serve to clamp or bind the edges of the sections together and to cover and close the joints between them.

Various modifications in details of construction and arrangement of parts other than those herein specifically mentioned may be made without departing from the principle and scope of the invention.

I claim:

1. A tubular structure for elevator legs and the like, composed of a U-shaped section having reinforcing strips applied to its longitudinal edges on the outer side thereof, and a cover section having angular reinforcing strips applied to its longitudinal edges on the outer side thereof and secured to the other strips and binding the sections together, the angular strips overlapping the other strips and covering the joints between the adjoining sections, substantially as described.

2. A tubular structure for elevator legs and the like, composed of a U-shaped section flanged outwardly along its longitudinal edges, a cover section fitted to the open side of the first section and lapping its outturned flanges, and longitudinal strips secured to each other with the flanges of the U-shaped section and the edges of the cover section clamped between them, one of each pair of strips having a lip or flange fitting over and covering the intermediate edges of the sections and the joint between them, and the other strip of each pair fitting into the external angle between one side and the adjoining flange of the U-shaped section, substantially as described.

3. A tubular structure for elevator legs and the like, made in lengths each composed of sections having outwardly projecting longitudinal lapped edges and provided with external strips which are secured together and form closed joints between the sections, and flanged rings fastened to ends of the lengths for connecting them end to end and formed with recesses into which the lapped edges of the sections extend at adjoining ends of the lengths, substantially as described.

4. A tubular structure for elevator legs and the like, made in lengths each composed of sections provided along their longitudinal edges with external strips which are secured together in pairs and form closed joints between the sections, and flanged rings attached to ends of the lengths for coupling them together end to end and having recesses adjacent to the joints between the sections and corresponding in cross section with said strips, substantially as described.

5. A tubular structure for elevator legs and the like, made in lengths each composed of a U-shaped section having outturned flanges along its edges and of a cover section fitted flatwise against said flanges, reinforcing and clamping strips secured together in pairs over the adjoining edges of the sections and covering the joints between them,

flanged coupling rings attached to adjoining ends of the lengths and recessed to receive the projecting edges of the sections and plugs inserted in the recesses in said rings and corresponding in cross section with said reinforcing and clamping strips against which they abut endwise, substantially as described.

6. A tubular structure for elevator legs and the like composed of sections provided along their longitudinal edges with reinforcing strips arranged in pairs and covering the joints between the sections, one of the sections being made in separate lengths and provided at the ends with interfitting rabbeted cross strips and one of said lengths being removable with the longitudinal and cross strips which constitute a frame therefor, substantially as described.

7. A tubular structure for elevator legs

and the like, composed of sections provided along their longitudinal edges with reinforcing strips arranged in pairs and covering the joints between the sections, one of the sections being made in separate lengths having interfitting rabbeted cross strips at the ends, and one of said lengths being removable and having longitudinal strips with lips or flanges overhanging its opposite edges and adapted to cover the joints between the removable length and the sides of the tubular structure, substantially as described.

In witness whereof I hereto affix my signature in presence of two witnesses.

WILLIAM D. GRAY.

Witnesses:

CHAS. L. GOSS,
ALICE E. GOSS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."