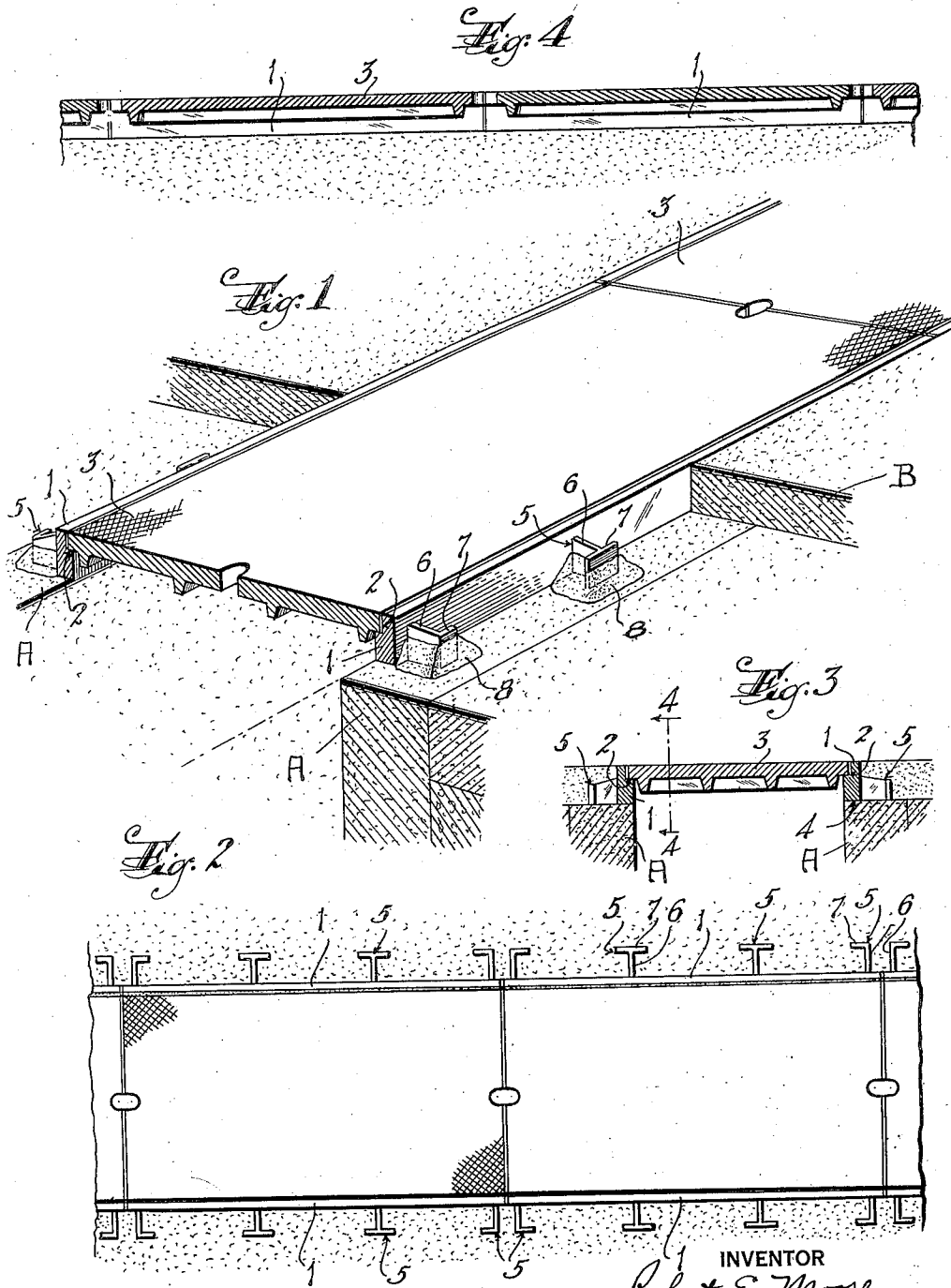


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METAL FRAME AND COVER

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METAL FRAME AND COVER

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2 Claims. (Cl. 94—34)

This invention relates particularly to metal frames and covers for openings or trenches in the ground, concrete floors of buildings, roadways and the like. In the construction of buildings and roadways, it is frequently necessary to lay pipes, wire conduits, and the like beneath the surface of a building floor or under a roadway; large openings or trenches are provided for the pipes, wires, etc., having metal frames or linings at their top edges and covers or gratings removably set in rabbets or seats in said frames at approximately the surface of the floor or roadway to close the openings and permit easy access to the pipes or wires for inspection, replacement or repair.

These frames or linings generally have been formed of a plurality of sections partially set and bonded into the concrete of the floors or roadways, and great difficulty has been experienced in setting and maintaining all of the sections with their upper edges or cover seats in the same horizontal plane so as to provide firm, stable supports for the covers. When any of the frame sections are out of plane, the covers are unevenly supported so as to wobble or tilt, with consequent danger of breaking or cracking of the covers as well as noise and undue wear of the covers and frame from frequent jars and abrasion one upon the other. It is desirable that such frames and covers be made of cast iron due to simplicity of casting and the resistance of cast iron to corrosion and denting or bending, but cast iron is brittle and will break under slight blows when unstably supported and therefore cast iron frames have been made heavy and bulky and difficult to handle and set in concrete, and due to large horizontal surfaces on the frames, it has been difficult to firmly tamp concrete under the frames to provide solid, stable, supports therefor.

Also, many known frames require the use of bonding elements, such as metal rods, which are bolted or similarly attached to the frame sections to bond the sections into the concrete. Such structures are insecure and sometimes loosen from the concrete or the frame sections so as to destroy their usefulness.

My invention contemplates a cast iron or other metal frame of the general character described including sections which shall embody novel and improved features of construction to eliminate or overcome the objectionable features in construction and difficulties incident to use of known frames, and which shall be easy to set and maintain with their cover seats in a common plane, shall have integral anchors for bonding and lock-

ing the sections in the concrete so that the frame cannot settle, shall have small bottom surface areas to permit easy tamping of concrete beneath the section to provide a solid support therefor, and shall be relatively light in weight and of small bulk.

Other objects are to provide such a sectional frame the sections of which shall be capable of supporting themselves in upright position on a foundation during setting of the frame; to provide a frame of this character wherein the integral anchors shall also serve as props to hold the sections in upright position during setting; to provide such a frame the sections of which shall have a low center of gravity to overcome tendency to tilting of said sections out of a predetermined vertical plane; and to obtain other advantages and results as will be brought out by the following description.

Referring to the accompanying drawing in which corresponding and like parts are designated throughout the several views by the same reference characters,

Figure 1 is a fragmentary perspective vertical sectional view through a trench frame and cover embodying my invention.

Figure 2 is a top plan view of the trench frame and cover before the top layer of concrete has been laid.

Figure 3 is a transverse vertical sectional view through the trench frame and cover after the top layer of concrete has been laid, and

Figure 4 is a vertical longitudinal sectional view through the trench frame and cover on the line 4—4 of Figure 3.

Specifically describing the illustrated embodiment of the invention, the frame includes a plurality of cast metal sections 1, preferably formed of cast iron. These sections are shown as comprising elongated plates approximately rectangular in cross section and of substantially uniform thickness throughout. The top edges of the plates are provided with rabbeted cover seats 2 to accommodate cast metal covers 3, while the bottom edges 4 of the plates are approximately flat and at right angles to the sides of the plate.

On the rear surfaces of the plates are a plurality of integral anchors 5 each of which is shown as comprising a web 6 extending transversely across the rear face of the plate in angular relation thereto and a flange 7 disposed in angular relation to the web or in spaced and opposed relation to the plate. The anchors intermediate the ends of the plate may be approximately T-shaped while the anchors at the ex-

5 tremities of the plates are preferably approximately L-shaped with the flanges 7 extending toward the center of the plate. The bottom edges of the anchors are disposed in the same plane with the bottom edges 4 of the plate, while the top edges of the anchors preferably terminate short of the top edges of the plate as clearly shown in Figures 1 and 3, whereby the bulk of the weight of the plates is adjacent the bottom edge thereof so that the center of gravity of the plates is low to ensure stability of the plates when set on their lower edges. Preferably the webs 6 and flanges 7 are thin or narrow and approximately uniformly rectangular in cross section.

10 15 In installing a frame and cover in accordance with the invention, a foundation or wall A at the sides of the opening or trench with which the frame is to be used, is constructed in the usual manner. The frame sections 1 are set edgewise upon this foundation with their cover seats 2 in approximate alinement after which the covers 3 are set in the seats as shown in Figure 1. The frame and covers are then tested to ascertain whether the cover seats are all in the same plane so as to provide stable supports for the covers; in other words, the frame and covers are tested to see that the covers do not tilt or wobble at any point. Small quantities of concrete or grouting 8 are then tamped under and around the anchors to hold the frame sections in place, and the concrete is allowed to set or harden. The frame and covers may then again be tested for plane, that is, to see that the covers are stable on the frames, and if there is any instability the frame and covers can be adjusted. After the frames and the covers have been properly set, a top layer or backing of concrete B is poured over the foundation into contact with the rear faces of the frame sections and around the anchors so as to embed the latter in the concrete. When this backing B of concrete hardens, the frame sections are firmly held in their proper positions against settling and other displacement. The anchors will effectually resist any twisting or bending strains on the frame sections, due to their secure bond with the concrete, and also the anchors will reenforce the frame sections against blows, for example vehicle wheels passing over the frame and covers.

50 Moreover, the plates 1, anchors 5 and the concrete form in effect an integral structure, and the anchors being firmly embedded in the concrete backing, positively prevent movement of the plates in all directions relative to the backing. Accordingly loosening of the plates as the result of settling of the foundation or concrete backing is prevented and integrity of the structure preserved; and this is especially important in obviating rattling of the plates, resisting blows and shocks incident for example, to the passing of heavy vehicles over the frames and covers, and avoiding possibility of the concrete settling away from the plates or vice versa in such a manner

as to form depressions or projections at the points between the plates and the concrete.

It will be observed that during the setting of the frame sections, said sections will be self-supporting on the foundation A due to the anchors and bottom edges of the sections being in the same plane so that the anchors serve as props for the sections. The stability of the sections is further increased by the low center of gravity of the sections which is secured by the anchors at the lower edges of the sections. Also, due to the small surface area of the bottom edges of the sections, the concrete can be easily tamped under the sections should such be desirable so that a solid support for the sections is ensured without voids or air openings in the concrete beneath the sections which frequently occur with known types of sections having large bottom surfaces beneath which it is difficult to thoroughly tamp the concrete. The frame sections can be accurately adjusted to stably support the covers before the final layer of concrete is poured, so that there is little possibility after the frame sections have been set that a complete breaking away of the concrete to readjust the frame sections or grinding of the cover seats to prevent wobbling of the covers will be necessary, as is frequently the case with known frames and covers of this general character. The frame sections are relatively light in weight and easy to handle, and there is no danger of the frame sections becoming separated or pulled away from their anchors as sometimes happens with certain known types of frames.

Having thus described my invention, what I claim is:

1. The combination of a foundation, a frame comprising a plurality of cast metal sections approximately rectangular and uniform in cross section throughout and set edgewise on said foundation, said sections having alined cover seats on their top edges and integral anchors spaced longitudinally of and projecting laterally from their rear faces, each anchor including a web extending transversely across the rear face of the respective section and projecting angularly therefrom and a flange projecting angularly from the web in spaced opposed relation to said section, a backing for said frame consisting of a body of concrete on said foundation in contact with the rear surfaces of said sections and embedding said anchors to hold said sections in position, and a cover in said cover seats.

2. The combination set forth in claim 1 wherein said anchors are thin and approximately uniformly rectangular in cross section throughout, and the bottom edges of said sections and said webs and flanges are substantially in the same plane and the top edges of said webs and flanges terminate short of the top edges of the respective said sections.

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