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[54] PREFABRICATED DRAIN APPARATUS

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[52] **U.S. Cl.** **210/164,** 210/477

[51] **Int. Cl.** **B01d 35/02**

[58] **Field of Search** 210/163, 164, 474, 477

[56] **References Cited**

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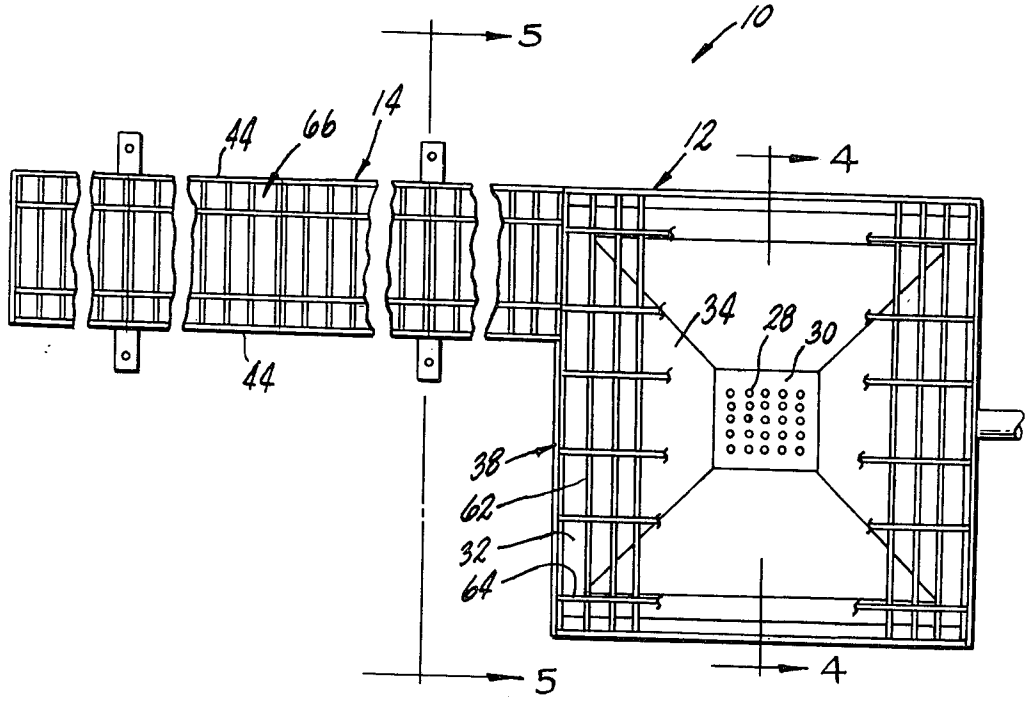
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[57] **ABSTRACT**

Apparatus for use in constructing a drainage system for paved surfaces such as are found in automobile service stations and the like. The apparatus includes sheet metal sections which can be assembled at the site of use to serve as forms for an indefinite length about which concrete can be poured and which then remain as integral parts of a trench drain and sump assembly.

7 Claims, 5 Drawing Figures



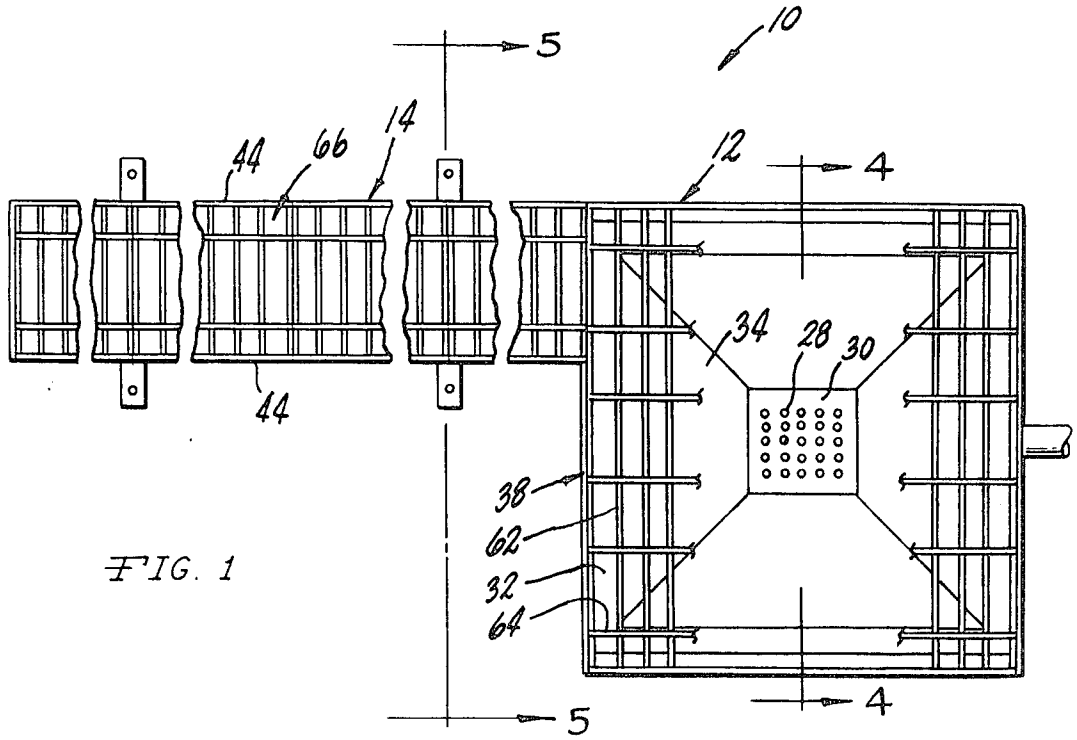


FIG. 1

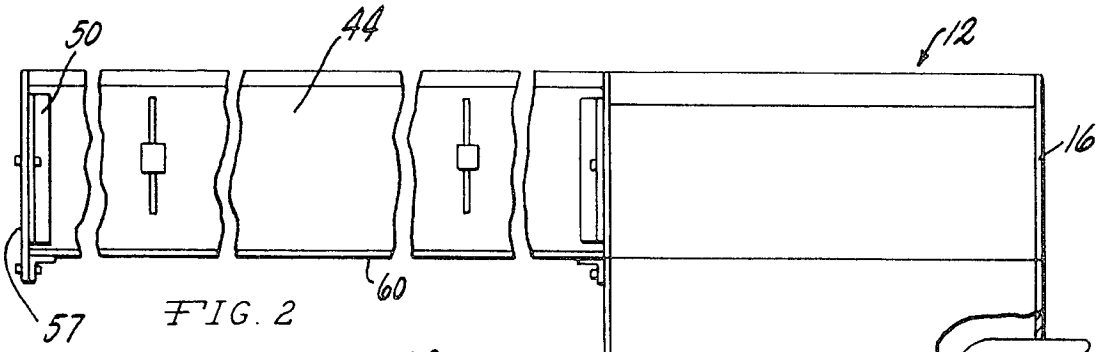


FIG. 2

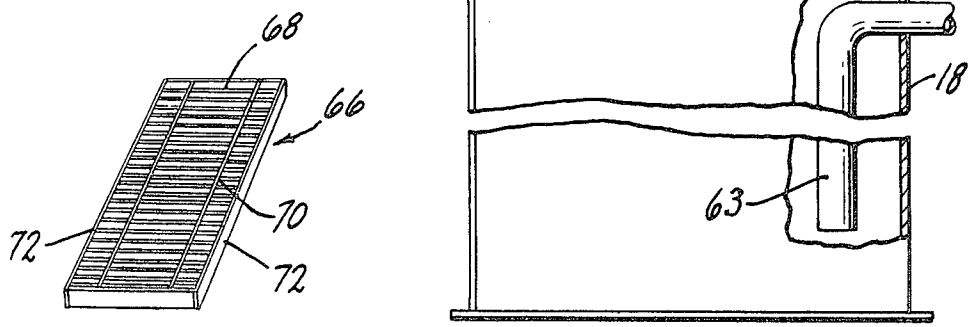


FIG. 3

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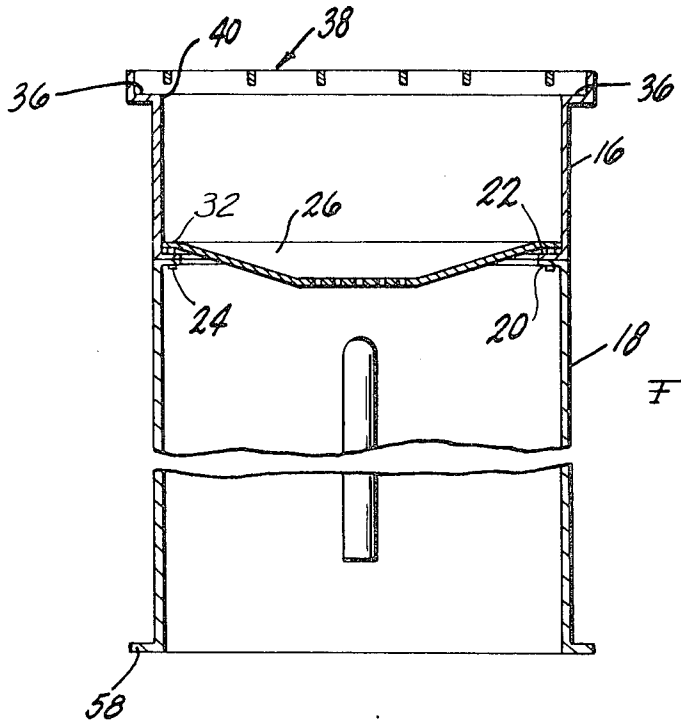


FIG. 4

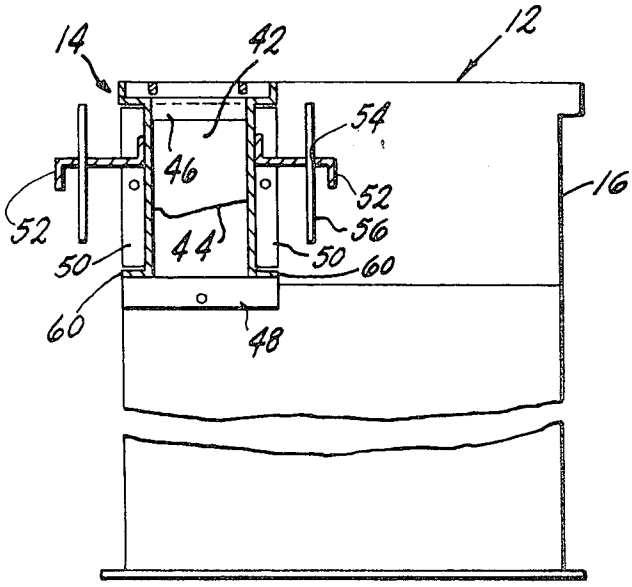


FIG. 5

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PREFABRICATED DRAIN APPARATUS

BACKGROUND OF THE INVENTION

The present invention relates to improvements in trench drain and sump assemblies essentially adapted for use in construction of drainage systems for large paved surfaces on which vehicles travel or are serviced.

In the past, it was the conventional procedure when paving automobile service station driveways or areas, initially to construct and to install at the site wooden forms to define the trench drain and sump and to insert angle iron after which the concrete would be poured. This practice was expensive, involving carpentry trades, and was time consuming, and left much to be desired in the finished drainage system. To overcome the problems inherent in the earlier conventional procedures, new methods have been provided wherein preformed trench drains and sumps have been made of metal which have been installed in place, prior to the pouring of concrete, and the need for construction and use of wooden forms has been eliminated.

SUMMARY OF THE INVENTION

The present invention is directed to improvements in prefabricated drain apparatus of the character required for carrying out the latest methods of forming drainage systems.

According to one form of the present invention, a trench drain and sump assembly is provided which comprises a sump frame, including top and bottom sheet metal sections. The bottom section has an inwardly extending flange around its upper periphery and the top section has an inwardly extending flange around its lower periphery which is seated on and fastened to the flange of the bottom section. A sheet metal strainer is removably supported on the fastened flanges. The top section has shoulders on opposite sides adjacent to its upper periphery, and a grating is seated on the shoulders and extends over the opening of the top section. A trench frame is provided which includes side sheet metal sections secured in spaced-apart relation by transverse frame members connected to the ends of the side sections. The side sections provide shoulders adjacent to their upper edges, and a plurality of aligned gratings are seated on the shoulders and extend over the opening between the side sections. The top section of the sump frame includes an opening in one side, and one end of one of the frame sections is connected to the top section with its open end in registry with the opening in the one side of the sump frame.

It is one of the objects of the present invention to provide improved prefabricated drain apparatus which can be assembled at the site of its intended use to serve as forms about which concrete can be poured, and which then remain in place as integral parts of the drain system.

Other objects of this invention will appear in the following description and appended claims, reference being had to the accompanying drawings forming a part of this specification wherein like reference characters designate corresponding parts in the several views.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a fragmentary top plan view of a trench drain and sump assembly embodying the present invention;

FIG. **2** is a side elevational view of the embodiment of the invention illustrated in FIG. **1**;

FIG. **3** is a perspective view of a grating such as is shown in the trench frame of the illustrated embodiment;

FIG. **4** is a vertical section taken on the line **4—4** of FIG. **1**; and

FIG. **5** is a vertical section taken on the line **5—5** of FIG. **1**.

DESCRIPTION OF THE PREFERRED EMBODIMENT.

Before explaining the present invention in detail, it is to be understood that the invention is not limited in its application to the details of construction and arrangement of parts illustrated in the accompanying drawings, since the invention is capable of other embodiments and of being practiced or carried out in various ways. Also, it is to be understood that the phraseology or terminology employed herein is for the purpose of description and not of limitation.

Referring now to the drawings, the invention will be described in greater detail. The trench drain and sump assembly **10** includes the sump frame **12**, the trench frame **14** and the parts to be described which are associated with each of these frames. The sump frame **12** has a top sheet metal section **16** and a bottom sheet metal section **18**. As best seen in FIG. **4**, the bottom section **18** has an inwardly extending flange **20** around its upper periphery and the top section **16** has an inwardly projecting flange **22** around its lower periphery which is seated on and fastened to the flange **20**. Conventional bolts **24** or the like can be used for securing the two sections **16** and **18** together. The fastened flanges **20** and **22** provide a seat for a sheet metal strainer **26** which is removably supported thereon. The strainer **26** is preferably formed from a single sheet of metal and is provided with a plurality of apertures **28** in the centrally apertured portion **30**. The sheet metal strainer is a one piece stamping having peripheral portions **32** which are supported on the fastened flanges **20** and **22**, and an intermediate portion **34** sloping downwardly from the peripheral portions **32** to the central portion **30**.

The top section **16** also defines shoulders **36** on opposite sides adjacent to its periphery. A grating **38** is seated on the shoulders **36** and extend over the opening **30** of the top section **16**. The top section **16** also has in one side wall an opening **42**, FIG. **5**, for registry with the open end of the adjacent trench section **14**.

Each trench drain **14** includes a pair of spaced side sheet metal sections **44** which are secured in the spaced apart relation by transverse upper and lower angle irons or frame members **46** and **48**. The top and bottom frame members **46** and **48** are secured to the side sections at the ends thereof, and also secured to the side sections at the ends are the vertical frame members **50**. By virtue of the locations of the frame members **46**, **48** and **50**, a series of trench frames can be secured in alignment in end to end relationship. Also, one end of the trench frame **14** can be secured to the side of the sump frame with its open end in registry with the opening **42** of the sump frame **12**.

Rigidly secured to the outer surfaces of the side sections **44** are a plurality of anchor brackets **52** which preferably each have a hole **54** therein through which an anchor rod **56** can be passed. Also, an end plate **57** normally will close the end of the outermost trench frame **14**.

During installation of the drainage system for a concrete poured surface, excavation will initially be conducted at the location for the sump, and trenches will be arranged leading to the sump. The sump frame and the trench frames will then be inserted in place prior to pouring the concrete. For this purpose, the anchor rods **56** will be used to aid in securing each trench frame **14** in place so that it will not be displaced by the concrete which will be poured approximately 4 inches deep measured from the top edge of the trench frame. Concrete also will be poured into the opening between the side sections **44** to provide a lower concrete surface for the trench drain, which surface will be sloped to drain water to the sump. Concrete will be poured in a similar fashion around the exterior walls of the sump frame, but preferably the bottom surface will be left unpaved to accommodate some drainage from the sump. Normally, local construction codes will govern considerations such as this.

To assure that the sump frame and the trench frame remain properly located in the excavation prior to pouring of the concrete, it preferred that laterally extending flanges **58** be provided at the lower periphery of the bottom section **18** and that laterally extending flanges **60** be provided along the bottom edges of the side sections **44**. Also, to provide additional drainage from the sump frame **12**, one or more drain outlet

conduits **63** can be provided which can discharge to a sewer or other suitable outlet. For this purpose a suitable hole or holes will be cut in the side wall or walls of the bottom section **18**.

Positioned over the sump is the grating **38** which preferably is formed of a plurality of parallel bearing bars **62** and a plurality of cross bars **64** which are welded into the bearing bars **62** so as to be flush with the upper surfaces thereof.

Similarly, the trench frames **14** are provided with a plurality of aligned gratings **66** which have a plurality of load bearing vertical bars **68** held in parallel spaced relationship by the cross bars **70** and by the strapping bars **72**. The latter are also welded into the upper edges of the load bearing bars **68** so as to be flush with the upper surfaces thereof. In the illustrated embodiment, each trench frame is provided with two aligned gratings **66** to provide a limited amount of flexibility of the gratings relative to the trench frames **14** so that the gratings will always be flush with the poured concrete surface.

From the foregoing description it will be understood that a trench drain and sump assembly has been provided which can be prefabricated and shipped to the site of intended use where it can be easily assembled and thereafter will act as a form for pouring concrete after which it will be an integral part of the drain system. The component parts of the sump frame and the trench frame are sheet metal stampings which can readily be fabricated at relatively low costs and which can be shipped conveniently to the site of intended use. The gratings are constructed so as to provide maximum strength to withstand vehicles driving on their upper surfaces and also to assure minimum weight relative to their load carrying capacity.

It is claimed:

1. A trench drain and sump assembly comprising a sump frame including top and bottom sheet metal sections, said bottom section having an inwardly extending flange around its upper periphery and said top section having an inwardly extending flange around its lower periphery which is seated on and fastened to the flange of the bottom section, a sheet metal strainer removably supported on the fastened flanges, said top section defining shoulders on opposite sides adjacent to its upper periphery, a grating seated on said shoulders and extending over the opening of the top section, and a trench frame including side sheet metal sections secured in spaced-apart relation by transverse frame members connected to the ends of the side sections, said side sections defining shoulders adjacent to their upper edges, and a plurality of aligned gratings seated on the last-named shoulders and extending over the opening between said side sections, said top section of the sump frame including an opening in one side, and one end of one frame section is connected to the top section in registry with said opening in one side.

2. The trench drain and sump assembly that is defined in claim **1**, wherein said bottom section has a flange extending laterally from its lower periphery, and said side sections have flanges extending laterally from their lower edges.

3. The trench drain and sump assembly that is defined in claim **1**, wherein anchor brackets are rigidly secured to the outer surfaces of said side sections and extend laterally therefrom.

4. The trench drain and sump assembly that is defined in claim **1**, wherein the aligned gratings seated in said trench frame are two in number and when in their aligned positions their combined lengths equal the length of the trench frame.

5. The trench drain and sump assembly that is defined in claim **4**, wherein said aligned gratings include a plurality of bearing bars banded in parallel spaced relation having their ends seated on the shoulders of the side sections and a pair of cross bars welded to each of said bearing bars adjacent to the top surfaces thereof.

6. In a trench drain and sump assembly, a trench drain that has an open end, a sump frame including top and bottom sheet metal sections, said bottom section having an inwardly extending flange around its upper periphery and said top section having an inwardly extending flange around its lower periphery which is seated on and fastened to the flange of the bottom section, a sheet metal strainer removably supported on the fastened flanges, said top section defining shoulders on opposite sides adjacent to its upper periphery, a grating seated on said shoulders and extending over the opening of the top section, and said top section of the sump frame including in one side thereof above said strainer an opening in registry with the open end of said trench drain.

7. The combination that is defined in claim **6**, wherein said sheet metal strainer is a one-piece stamping having peripheral portions supported on the fastened flanges, a central apertured portion, and intermediate inclined portions sloping downwardly from the peripheral portions to the central portion.

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