Oct. 29, 1929. C. GILMAN 1,733,790

CONCRETE CRIBBING

Filed March 16, 1925 2 Sheets-Sheet 1

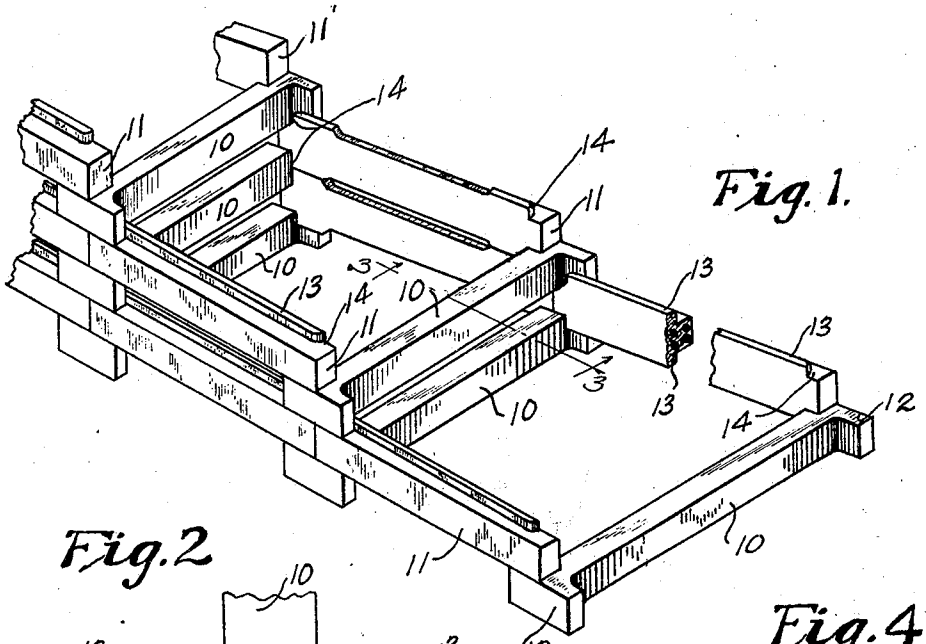


Fig. 1.

Fig. 2

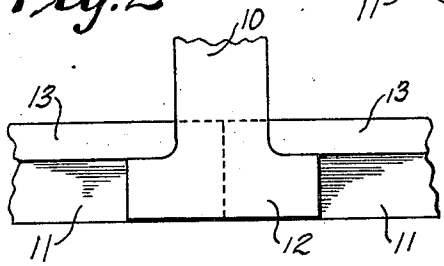


Fig. 4

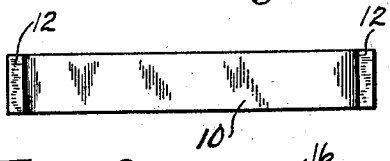


Fig. 6.

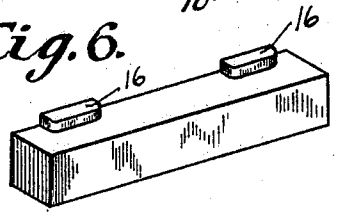


Fig. 3

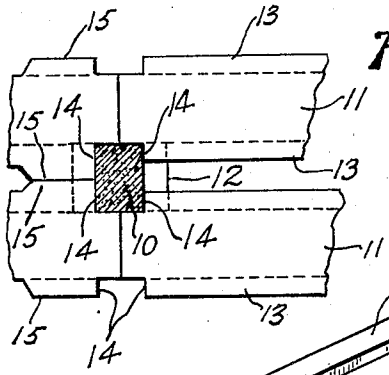
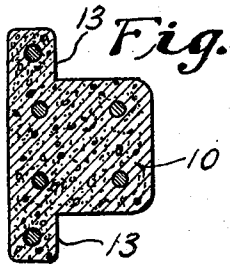


Fig. 5

Fig. 7



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CONCRETE CRIBBING

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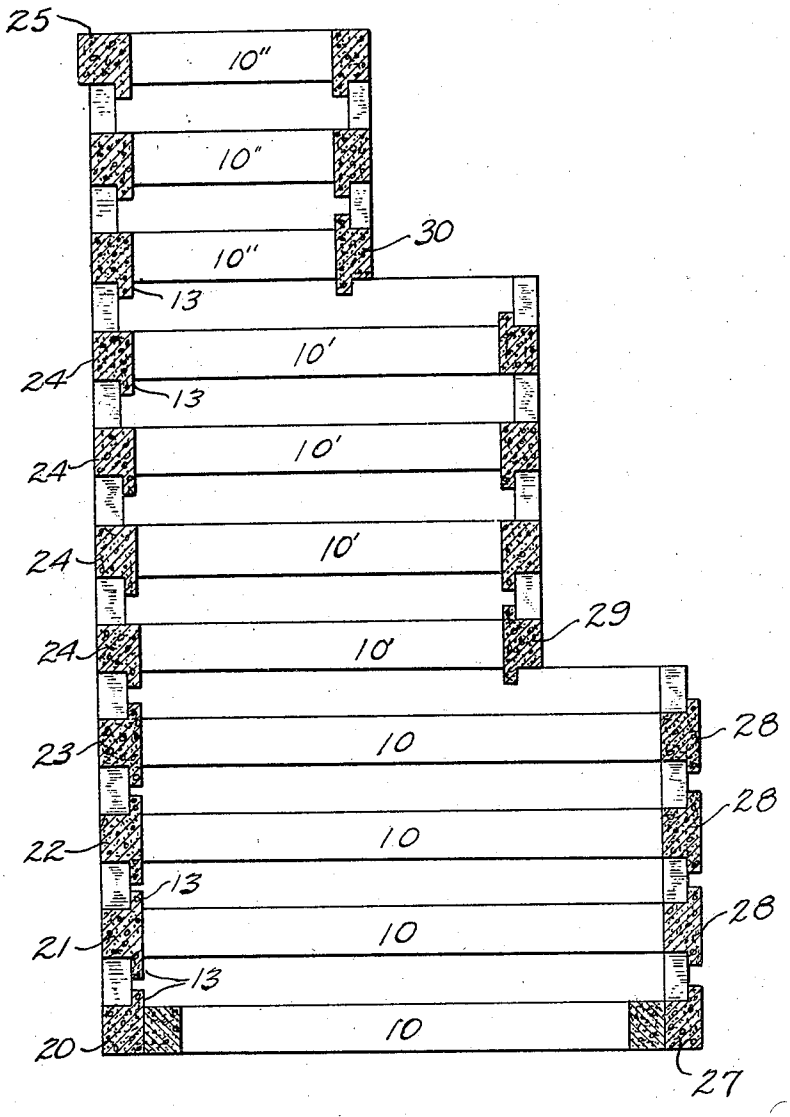


Fig. 8

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UNITED STATES PATENT OFFICE

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CONCRETE CRIBBING

Application filed March 16, 1925. Serial No. 15,743.

The present invention relates to improvements in reinforced concrete cribbing, and is more particularly directed toward the provision of a cribbing which may be constructed out of a number of reinforced concrete units of predetermined size adapted to be interfitted so that a retaining wall, embankment, or the like may be constructed.

Walls and embankments of the type contemplated by the present invention are particularly useful in building up temporary or permanent structures in places where there is limited area for working. They provide effectively for draining the filling materials so as to prevent the accumulation of water. The concrete units are not permanently and inseparably fastened together, and the salvage value of the wall is practically 100%. These walls may be erected in sections or cells as convenient and may be taken down and stored, or rebuilt in different locations as described.

The present invention contemplates the provision of concrete units so designed that a high and substantial wall may be constructed with its outer face vertical, without any batter, if desired; one wherein the headers, or cross members are flush with the longitudinal members, and one wherein these longitudinal members, known as stretchers, are provided with suitably disposed means for retaining the filling material and interlocking them with the headers.

Other objects of the invention are the provision of a wall in which different types of stretchers may be used in the different parts of the wall, according to the character of fill, or as other conditions dictate, and in which shorter headers may be used in the upper part of the fill than would be required in the lower part. By properly combining these features in a wall, the wall may be more economically constructed than were it necessary to build the entire wall out of uniform headers and stretchers (designed for the heaviest loads). Other and further objects of the invention will appear as the description proceeds.

The accompanying drawings show, for purposes of illustration, one of the many forms in which the present invention may be embodied together with modifications of certain parts, it being understood that the drawings are illustrative of the invention which is not limited thereto.

In these drawings:

Fig. 1 is a perspective view showing a concrete cribbing utilizing units contemplated by the present invention;

Fig. 2 is a horizontal plan view showing one form of joint formed by the improved units, it being assumed that the upper course of stretchers has not yet been laid;

Fig. 3 is a cross section taken on line 3—3 of Fig. 1, through a header between opposite courses of stretchers and shows how the header is supported on adjacent stretchers and how the next course of stretchers is supported on the header. In said figure an additional stretcher is shown in place, which is absent from Fig. 1.

Fig. 4 is a side elevational view of one form of improved header;

Fig. 5 is a perspective view of one form of improved stretcher;

Fig. 6 is an elevational view illustrating a modified form of stretcher;

Figure 7 is a cross sectional view through the stretcher shown in Figures 1 to 3, and illustrating an arrangement of reinforcing rods; and

Fig. 8 is a sectional view through a retaining wall built up using different forms of stretchers and headers contemplated by the present invention.

Figure 1 shows one form of cribbing built up in accordance with the present invention. As here shown a plurality of headers 10 are horizontally arranged and extend across the wall or cribbing, while a plurality of stretchers 11 are also horizontally arranged and extend lengthwise of the wall as indicated; the headers are in vertical tiers regularly spaced along the cribbing while the stretchers are in vertical tiers at both the front and rear sides of the wall. There may be any number of tiers of stretchers to make up the length of wall desired. These stretchers and headers may be laid on one another alternately, as indicated, and the wall extending vertically

and horizontally as appears in the drawings.

These headers, as indicated in Figures 1, 2, 3, 4 and 7 are composed of properly reinforced blocks of predetermined size and rectangular cross-section and provided with T-shaped heads 12. The headers may have any desired and convenient length, and are preferably made with identical ends so that the header may be symmetrical and placed in a wall or cribbing more easily.

The stretchers 11, as indicated in Figures 1, 2 and 3 are made of properly reinforced concrete blocks of the proper length and cross-section to sustain the load imposed upon them. These stretchers, as here shown, are of rectangular cross-section at their ends, and are provided with longitudinally extending lugs 13, integral with the body of the block. These lugs are carried along the adjacent longitudinal edges of the stretchers and are preferably less than one-half the depth of the headers. Their ends are spaced sufficiently from the ends of the stretchers so that the body of the header 10 may be placed between the ends 14 of adjacent lugs as appears in Figures 1, 2 and 3.

From the foregoing it will be apparent that the stretchers, at the front and/or back of the wall, are supported at their ends on the headers. A cell or section of cribbing may be built up without the use of metallic pins or other fastening devices, by alternately arranging the headers and stretchers. The stretchers may readily have a large bearing surface on the headers. The lugs are placed on the back of the stretchers so that they assume a part of the load and materially strengthen the stretchers. They make it unnecessary to use fillers, and are so arranged on the stretchers that they will come behind the head of the T of the headers (both above and below as indicated in Figure 3). The ends of the stretchers will be close together, and additional bearing surface may be provided, if desired, by making the lugs somewhat deeper near the ends so that they will meet as indicated at 15.

The interlocking of the headers and stretchers makes it impossible for the filling material to force the headers or stretchers out of place, yet the cribbing may be assembled or torn down very easily. The cribbing may be built to the desired height and length and later extended or raised or lowered as desired.

The stretchers and headers are so proportioned that the stretchers are out of contact with one another (except possibly at their ends). The longitudinal lugs 13 are spaced sufficiently to permit drainage of the filling material, without permitting the escape of the filling material. A small amount of loose filling material may pass out through these spaces, but it will be caught on the shelf formed by the body of the stretchers and will naturally slope up (at about 1½ to 1) toward the stretcher next above and prevent further escape of filling material. The filling material will, of course, settle in the cribbing, and the settled material has little tendency to escape. If there is a batter to the cribbing, there will be less tendency for the loose material to escape through the spaces between the stretchers, and therefore, these spaces may be made wider by using narrower lugs than would be the case on a vertical wall. On the other hand, if the lugs are made of sufficient width so that the material does not escape from the vertical cribbing, it will certainly take care of the cribbing built up with a batter.

As shown in Figure 5, and the upper part of Figure 1 the stretcher 11′ is provided with only one lug 13 instead of two as used in the form of stretcher shown in Figures 2 and 3. In Figure 6 short lugs 16, 16 are carried near the ends of the stretcher. These short lugs may be placed on one side of a stretcher or on both sides as desired, and may be of a size to provide additional bearing surface. They serve to interlock the headers and stretchers, without adding materially to the weight of the unit. Such stretcher units are particularly useful where the tendency of filling material to escape is low.

In Figure 8 a cribbing utilizing various forms of units contemplated by the present invention, is shown in cross-section. Here the front or left side of the cribbing is smooth and vertical and the rear or right hand side of the cribbing is set back in steps. In this cribbing the lower front stretcher 20 is of type illustrated in Figure 5, being smooth on its lower side and having an upper rib 13. It is also made much broader to provide increased bearing surface against the soil. The front stretchers 21, 22, 23 which make up the lower front of the cribbing may be like those illustrated in Figures 1, 2, and 3 of the drawings, while the remainder of the front stretchers 24 may be similar to the stretcher 11′ of Figure 5, with the stretcher inverted so as to bring the lug 13 to the bottom side of the stretcher, if desired. The top front stretcher 25 is made somewhat wider than the other stretchers so as to provide a coping to finish off the top of the wall.

The back side of the cribbing may also use various forms of units, arranged in various manners. The single or double lugged stretchers may be arranged with the lugs inside the T heads of the headers or on the outside as shown at 27 and 28. These lower stretchers may have their lugs on the outside as they are frequently placed where they are held against firm earth or old fill. Shorter headers 10′ and 10″ may be used toward the top of the cribbing, as clearly appears from the drawings, and the stretchers interlock

with them in the same manner. In this case, it is preferable to provide the first stretcher used with a shorter header with lugs on top and bottom, as indicated by the stretchers 29 and 30.

While the present drawings show the cribbing arranged for building long straight embankments, it is of course obvious that the parts may be readily shaped and proportioned to build curved embankments or to make offsets or corners as desired. Of course, other shapes of header may be used to give the enlarged bearing surface and provide for interlocking with the stretcher, and other forms of stretchers may be employed. The cribbing may be laid so that the front face is vertical or at a batter as desired.

What is claimed is:

1. In a reinforced concrete cribbing, two parallel stretchers of T-shaped cross-section similarly disposed and spaced one above the other, the heads of the T's being spaced apart to provide drainage, the lower stretcher providing a shelf to hold loose filling material and cause it to slope up to the upper stretcher, the ends of the stretcher being rectangular, and a header spacing the stretchers and having a T-shaped end on which the ends of adjacent stretchers rest and the ends of the heads of the T's of the stretchers being interlocked behind the heads of the T of the header.

2. In reinforced concrete cribbing, a horizontal header having a T-shaped front end with the ends of the T placed horizontal and four horizontal stretchers arranged in pairs, each pair extending at right angles to the header, at least two of the stretchers being interlocked with the T-shaped head, two of the stretchers being supported by the header, and the other two stretchers supporting the header.

3. In a reinforced concrete cribbing, two parallel stretchers spaced one above the other, the side of each of the stretchers adjacent the other stretcher having a longitudinally extending integral lug spaced from the adjacent stretcher to prevent the escape of filling materials, the lugs throughout the major portion of their length, being of a depth such as to leave a space between lugs of vertically adjacent stretchers except at the ends of the stretchers where said adjacent lugs meet and thereby afford additional bearing surfaces.

4. A reinforced concrete cribbing comprising a plurality of horizontally disposed reenforced concrete headers arranged across the cribbing and a plurality of horizontally disposed reenforced concrete stretchers arranged lengthwise of the cribbing, the end of the headers having enlarged bearing surfaces providing vertical shoulders, said surfaces affording a support for said stretchers, and the stretcher which is supported by a given header having vertically enlarged portions which engage behind one of the shoulders of said header and form an interlock therewith, and permit said headers to terminate flush with said stretchers.

5. In a reinforced concrete cribbing, parallel stretchers of T-shaped cross section similarly disposed and spaced one above the other, the heads of the T's being spaced apart to provide drainage and disposed with the bodies of the T's exterior of the cribbing so as to provide shelves to hold loose filling material and cause it to slope up to the stretcher next above.

6. A reinforced cribbing comprising a plurality of T-shaped horizontally disposed reinforced concrete headers arranged across the cribbing and a plurality of horizontally disposed reinforced concrete stretchers arranged lengthwise of the cribbing, said headers terminating flush with said stretchers, thereby permitting the face of said cribbing to be smooth, each header having a flat surface supporting thereon abutting stretchers, said stretchers having lugs interlocking behind the T-shaped ends of the headers whereby longitudinal movement of such stretchers is prevented by said headers in contact therewith.

In testimony whereof I have affixed my signature to this specification.

CHARLES GILMAN.