

March 27, 1934.

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1,953,005

CELLULAR RETAINING WALL

Filed Oct. 8, 1932

3 Sheets-Sheet 1

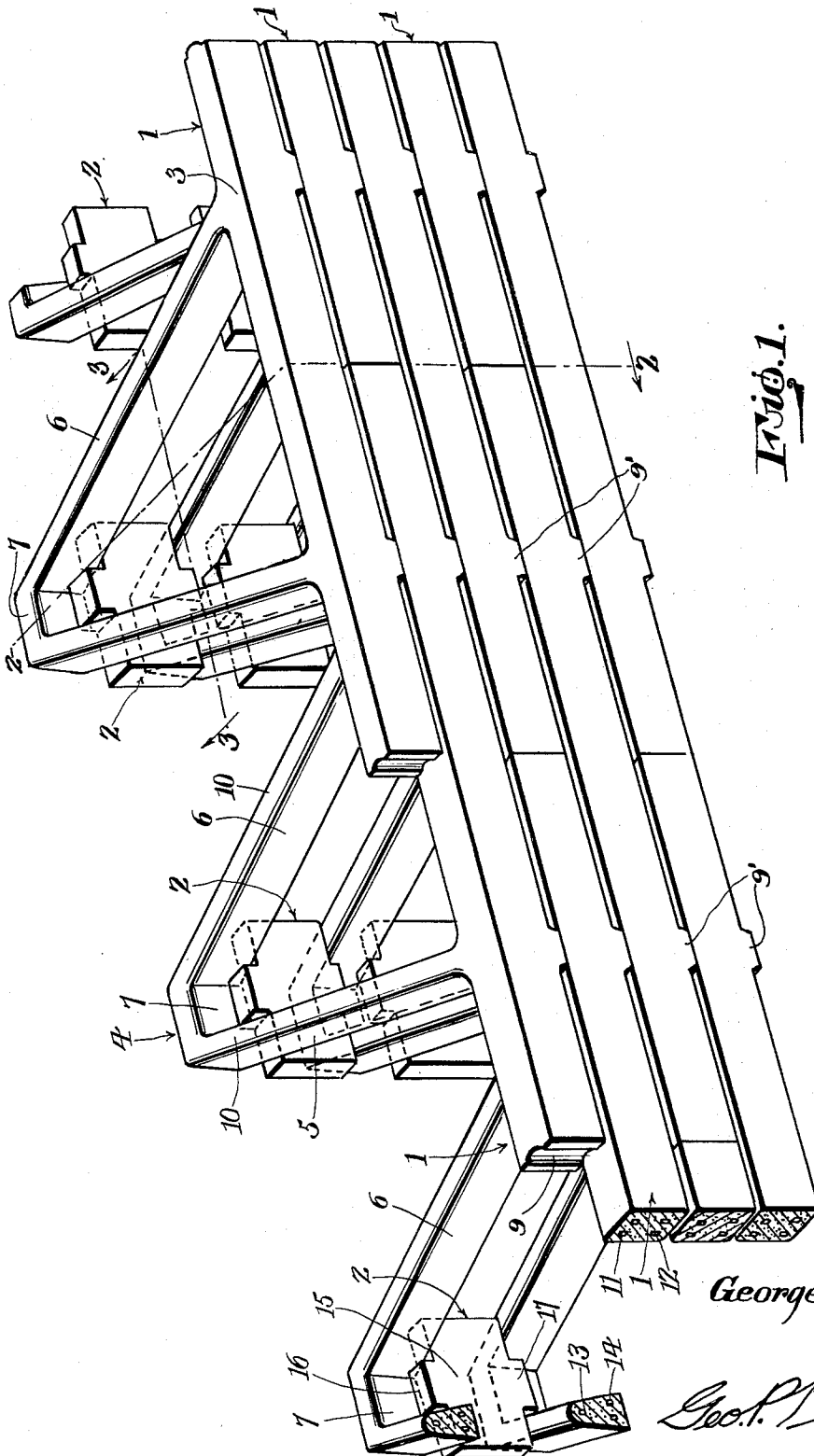


Fig. 1.

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3 Sheets-Sheet 2

Fig. 2.

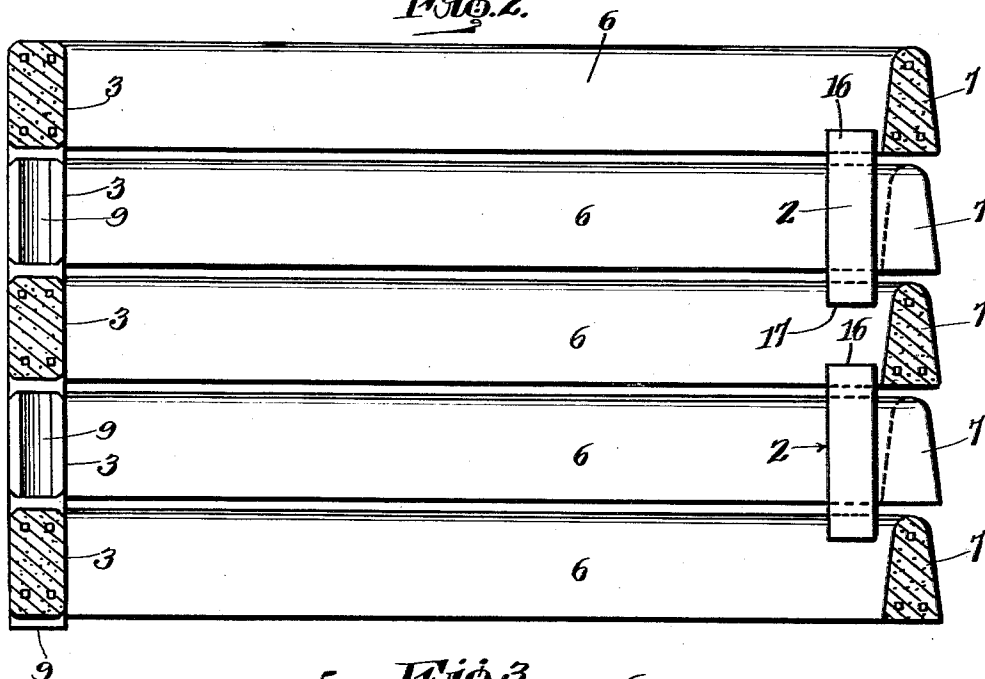
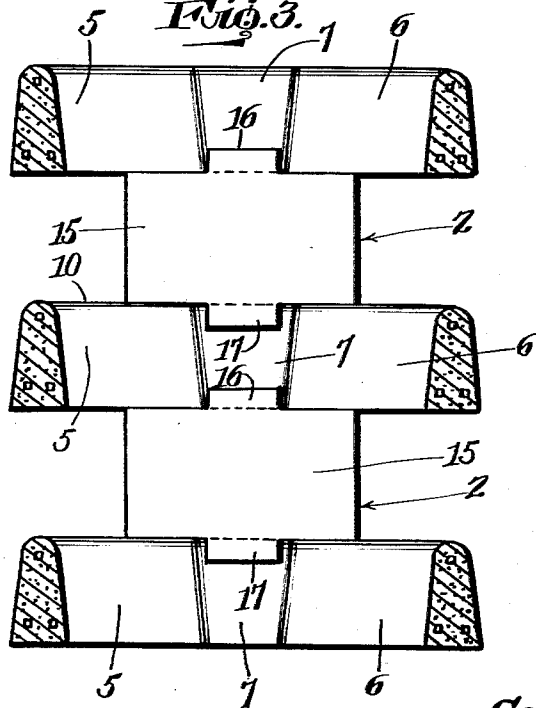


Fig. 3.



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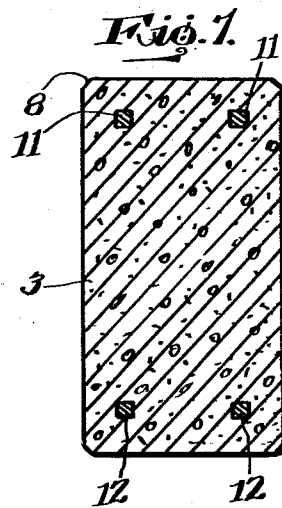
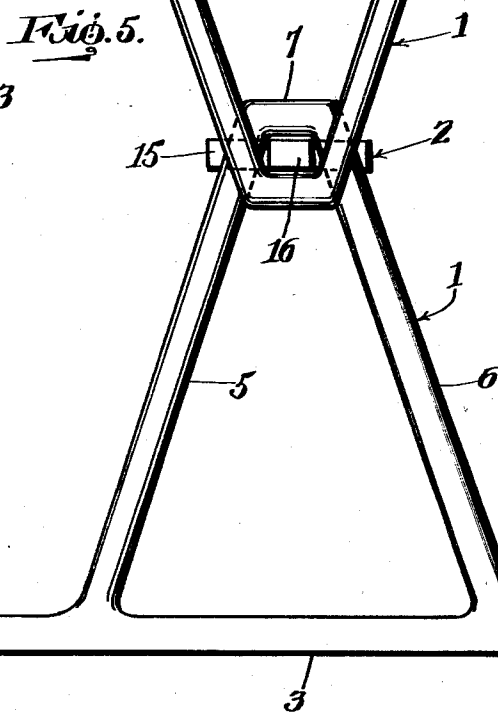
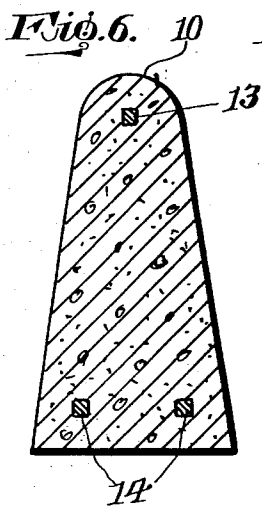
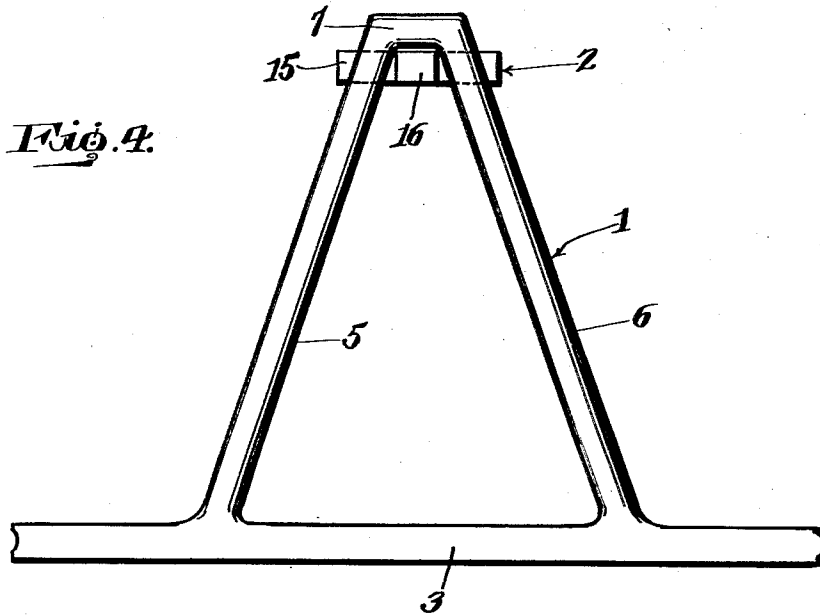
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3 Sheets-Sheet 3



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CELLULAR RETAINING WALL

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17 Claims. (Cl. 61—47)

This invention relates to a cellular retaining wall designed primarily for use in connection with hills and embankments of railways, but it is to be understood that a cellular wall, in accordance with this invention, is designed for any purpose for which the same is found to be applicable.

One of the objects of the invention is to provide a cellular retaining wall including superposed courses of skeleton cribbing units of any suitable shape and held in place by means of filling the cells thereof with earth or other material and with each unit so shaped and formed as to carry its own internal pressure.

Another object of the invention is to provide a cellular retaining wall including superposed courses of skeleton cribbing units of any suitable shape and held in place by means of filling the cells thereof with earth or other material, and with each unit having a three point suspension, thus conforming to uneven settlement of the wall without undue stress or strain on the units.

Another object of the invention is to provide a cellular retaining wall including superposed courses of skeleton cribbing units of any suitable shape and held in place by means of filling the cells thereof with earth or other material, and with each unit having bearing feet located at quarter points at the front thereof, thus permitting vertical loading of the units, one upon the other, when placed in a wall with broken or staggered end joints.

Another object of the invention is to provide a cellular retaining wall including superposed courses of skeleton cribbing units of any suitable contour and held in place by filling the cells thereof with earth or other material, and with each unit including a front or stretcher portion and a rear header or holding portion for and integral with said front portion.

A further object of the invention is to provide a cellular retaining wall including superposed courses of skeleton cribbing units of any suitable shape and held in place by filling the cells thereof with earth or other material, and with each unit including a front or stretcher portion and a rear header or holding portion for and integral with said front portion at quarter points of the latter, so as to permit minimum volume and strength in said front or stretcher portion.

A further object of the invention is to provide a cellular retaining wall including courses of skeleton independent units whereby one unit in connection with a half unit are employed in starting and finishing a course, and which eliminates the difficulty experienced with a series of separate

headers and separate stretchers, in that each unit, in accordance with this invention, carries its own internal pressure and prevents the danger of failure at the intersecting point of the separate headers and separate stretchers.

A further object of the invention is to provide a skeleton cribbing unit including a front or stretcher portion and a rearwardly extending holding or header portion for extension back into the fill and integral with the front or stretcher portion at quarter points, and inasmuch as the earth pressure is applied uniformly throughout the back surface of the front or stretcher portion the unit may be made of minimum size, because if the points of joinder were at the ends of the front portion or stretcher, the latter would have to be much stronger to withstand the internal pressure.

A further object of the invention is to provide, a cellular retaining wall including superposed courses of skeleton cribbing units of any suitable contour and combined spacing and anchoring elements for the units, each element being common to a pair of superposed units and with the wall held in place by filling the cells thereof with earth or other material; each unit including a front or stretcher portion and a rearwardly extending header or holder portion integral with the stretcher portion, and each element opposing the forward face of the rear ends of a pair of superposed header or holding portions and bearing against the upper face of the lower and the lower face of the upper one of such pair of header or holding portions for spacing and anchoring such portions in superposed relation.

A further object of the invention is to provide, a cellular retaining wall for the purpose referred to, including superposed courses of skeleton cribbing units, and each unit including a front or stretcher portion and a rear header or holding portion integral with, extending rearwardly from, arranged adjacent the ends of and of less width than the said front or stretcher portion.

A further object of the invention is to provide a cellular retaining wall including superposed courses of skeleton cribbing units and superposed courses of combined spacing and anchoring units interposed between and extending into the units of the courses, and with each unit and each element being strong, durable, thoroughly efficient for the purpose intended therefor, and comparatively inexpensive to manufacture.

To the above ends essentially, and to others which may hereinafter appear, the invention consists of such parts, and such combination of

parts which fall within the scope of the invention as claimed.

In the drawings:

Figure 1 is a fragmentary view in perspective of the cellular retaining wall.

Figure 2 is a section on line 2—2 Figure 1.

Figure 3 is a section on line 3—3 Figure 1.

Figure 4 is a top plan view illustrating a cribbing unit and combined spacing and anchoring elements in assembled position.

Figure 5 is a fragmentary view in top plan illustrating a modified arrangement of cribbing units.

Figure 6 is a cross section of one of the sides of the holding portion of the cribbing unit.

Figure 7 is a cross section of the front or stretcher portion of the cribbing unit.

With reference to Figure 1, the cellular wall includes sets of superposed cribbing units and sets of superposed combined spacing and anchoring elements to provide superposed courses of cribbing units and superposed courses of spaced combined spacing and anchoring elements for the cribbing elements. The units of one set are staggered with respect to the units of an adjacent set. The cribbing units of each of the sets are of like construction and generally indicated at 1. The combined spacing and anchoring elements of each set are of like construction and generally indicated at 2. Each set of the combined spacing and anchoring elements is arranged within the rear of and inter engaging with and space the units of a set of units in superposed relation at the rear of the latter. Each of the units of each set has the front thereof provided with spaced depending feet, to be hereinafter referred to, for spacing the unit of a set and the units of an upper course from the units of a lower course.

Each unit 1 is of skeleton form and includes a front or stretcher portion 3 of the desired length and of rectangular form in vertical section, and a rear header or holding portion 4 of less width than the length of the stretcher portion 3. The header portion 4 can be of any suitable form but of a width less than the length of the stretcher portion 3 and has its forward end integral with the inner face of the latter at spaced points adjacent the ends of stretcher portion 3. By way of example, the header or holding portion 4 is shown of V-shaped contour formed of a pair of oppositely inclined sides 5, 6 connected together by a rectangular rear end 7 whereby the rear end of the header portion is truncated. The forward ends of the sides 5, 6 are integral with and at quarter points of the rear face of stretcher portion 3. In vertical section, the header portion 4 is of tapered contour. The stretcher portion 3 has beveled corners 8, a vertical groove 9 at each end, and a pair of spaced feet 9' depending from its lower face. The feet 9' are shown, by way of example, as positioned at quarter points of the lower face of stretcher portion 3. The header portion 4 has its top rounded throughout.

The unit is formed from a body of concrete. The stretcher portion 3 has embedded therein and lengthwise thereof upper and lower pairs of spaced metallic reinforcements 11, 12 respectively. The header portion 4 has embedded therein an upper lengthwise extending metallic reinforcement 13 and a pair of lower spaced metallic reinforcements 14. Each of the reinforcements referred to is of square cross section and

the reinforcements are suitably interlocked within the concrete body.

Each combined spacing and anchoring element 2 comprises a rectangular body 15 standing on its lower lengthwise edge and formed with oppositely extending vertically disposed lugs 16, 17 at the center of the top and bottom of said body. The height of each lug is materially less than that of the body 15 but corresponds in width to that of the latter. The lugs are flush with the front and rear faces of body 15.

When superposed courses of the wall are provided by the units, the units of one set are staggered with respect to the units of an adjacent set. The ends of the units of each course abut whereby the grooves 9 in such ends will register to provide a circular pocket for the reception of a binding medium if it be desired.

When the wall is set up, each set of combined spacing and anchoring elements coacts with a set of units for maintaining the units of the set in superposed spaced relation at the rear thereof and for anchoring the units of the set to prevent the outward shifting of one relative to the other.

The feet 9' of the units of each set coact with the combined spacing and anchoring elements associated with the units of the set to provide a three-point suspension for the upper units.

When the wall is set up from pairs of oppositely extending units, a set of combined spacing and anchoring elements is common to the sets of each pair, and in this connection attention is directed to Figure 5.

When building the wall, one unit is all that is needed with the exception of a half unit used in the starting and finishing of the wall. This eliminates the difficulty experienced with series of headers and stretchers in that each unit carries its own internal pressure and prevents the danger of failure at the intersecting points of independent headers and stretchers.

What I claim is:—

1. A cellular wall construction including superposed courses of cell forming independent cribbing units held in place by a filling within the cells thereof, each of said units being in the form of an integral frame like structure having a front portion and a rear holding portion for and integral with the rear face of said front portion, said holding portion being integral with the front portion at the quarter points of the length of the said rear face.

2. A cellular wall including superposed courses of independent cribbing units and held in place by a filling within the cells thereof, the units of an upper course being staggered with respect to those of a lower course, each of said units being of skeleton form and comprising a front portion having a rear face for application thereto uniformly of the pressure of the filling, and a rearwardly extending open holding portion integral at spaced points with said rear face adjacent the ends of the latter.

3. A cellular wall construction including superposed courses of cell forming cribbing units and superposed courses of spaced combined spacing and anchoring elements and with the wall held in place by a filling within the cells thereof, each of said elements being common to the rear of a pair of superposed units, each unit including a solid front portion having depending spacers therefor and an open rearwardly extending holding portion for and integral with the front portion and each of said elements coacting with the spacers in a front portion, opposing the forward

face of the rear end of a pair of superposed holding portions and bearing against the upper face of the lower one and the lower face of the upper one of such pair of holding portions for spacing and anchoring the latter in superposed relation.

4. A cellular wall including superposed courses of cell forming independent cribbing units held in place by a filling within the cells thereof, the units of an upper course being staggered with respect to those of a lower course, each of said units being in the form of an integral frame like structure comprising a front portion having a rear face for application thereto uniformly of the pressure of the filling and a rearwardly extending open holding portion integral at spaced points with said rear face adjacent the ends of the latter, and the holding portion of each unit being disposed with respect to the rear of the front portion of the unit at two spaced points and adjacent the ends of said front portion.

5. A cellular wall including superposed courses of cell forming independent cribbing units held in place by a filling within the cells thereof, the units of an upper course being staggered with respect to those of a lower course, each of said units being in the form of an integral frame like structure comprising a front portion having a rear face for application thereto uniformly throughout the pressure of the filling and a rearwardly extending open holding portion integral at spaced points with said rear face adjacent the ends of the latter, and said front portion having spaced feet depending from its lower face.

6. A cellular wall including superposed courses of independent skeleton cribbing units, each formed of a stretcher portion and a header portion integral with the latter, said stretcher portion having spaced depending spacer feet, and combined spacing and anchoring elements for said units and each coacting with the feet of each unit to provide a three-point suspension for the unit, said elements extending between the said units and opposing the rear ends of the header portions.

7. In a cellular wall construction, superposed skeleton cribbing units, each including a front portion, a pair of side portions and a rear portion, said portions being integral with each other, superposed combined spacing and anchoring elements arranged within the spaces between the side portions of said units, opposing the forward faces of said rear portions and extending between the side portions of superposed units for anchoring the latter together and for maintaining the side portions of an upper unit in superposed spaced relation with respect to the side portions of a lower unit, and said front portions having spaced means coacting with said elements to provide a three-point suspension for each of said units.

8. In a cellular wall construction, superposed skeleton cribbing units, each including a front portion, a pair of side portions and a rear portion, said portions being integral with each other, superposed combined spacing and anchoring elements arranged within the spaces between the side portions of said units, opposing the forward faces of said rear portions and extending between the side portions of superposed units for anchoring the latter together and for maintaining the side portions of an upper unit in superposed spaced relation with respect to the side portions of a lower unit, said front portions having spaced means coacting with said elements to provide a three-point suspension for each of said units, said

front portions being of greater length than said rear portions, and said side portions being oppositely outwardly inclined from said rear portions to said front portions.

9. In a cellular wall construction, superposed skeleton cribbing units, each including a front portion, a pair of side portions and a rear portion, said portions being integral with each other, superposed combined spacing and anchoring elements arranged within the spaces between the side portions of said units, opposing the forward faces of said rear portions and extending between the side portions of superposed units for anchoring the latter together and for maintaining the side portions of an upper unit in superposed spaced relation with respect to the side portions of a lower unit, said front portions being of greater length than said rear portions, and said side portions being oppositely outwardly inclined from said rear portions to said front portions and merging into the latter inwardly adjacent the ends thereof.

10. In a cellular wall construction, superposed skeleton cribbing units, each including a front portion, a pair of side portions and a rear portion, said portions being integral with each other, superposed combined spacing and anchoring elements arranged within the spaces between the side portions of said units, opposing the forward faces of said rear portions and extending between the side portions of superposed units for anchoring the latter together and for maintaining the side portions of an upper unit in superposed spaced relation with respect to the side portions of a lower unit, said front portions having spaced means coacting with said elements to provide a three-point suspension for each of said units, said front portions being of greater length than said rear portions, and said side portions being oppositely outwardly inclined from said rear portions to said front portions and merging into the latter inwardly adjacent the ends thereof.

11. In cellular wall construction, sets of superposed cribbing units, each unit including a solid front portion provided with depending spaces and a rearwardly extending open holding portion formed of a pair of sides and a rear end, said sides being integral with the rear face of the front portions, said front portions of said sets being arranged in superposed courses, the front portions of one set being staggered with respect to the front portions of adjacent sets whereby the holding portions of such set will be spaced from each other, and a set of combined spacing and anchoring elements for the holding portions and units of each set, each element of each of said sets of elements being common to a pair of units of a set and coacting with the depending spacers on the front portions of the units of a set.

12. In cellular wall construction, a one-piece cribbing unit consisting of a front portion and a holding portion, said front portion being solid, said holding portion being open and of a width less than the length of the front portion, the forward part of said holding portion merging into the rear face of the front portion at two spaced points spaced from the ends of said face, said holding portion being flush with the top and bottom faces of said front portion.

13. In cellular wall construction, a one-piece cribbing unit consisting of a front portion and a holding portion, said stretcher portion being solid, said holding portion being open and of a width less than the length of the front portion, the forward part of said holding portion merging

ing into the rear face of the front portion at two spaced points spaced from the ends of said face and gradually increasing in width from its rear end to its points of mergence into said front portion, said holding portion being flush with the top and bottom faces of said front portion.

14. A unit for cellular wall construction comprising a one-piece body formed of a front portion and a hollow holding portion of V-shaped contour integral at its forward end, at two spaced points with and extending rearwardly from the rear face of said front portion, the said spaced points being located adjacent the ends of said rear face, said holding portion extending lengthwise throughout in a direction at right angles to the direction in which said holding portion extends.

15. In cellular wall construction, sidewise arranged sets of superposed cell forming cribbing units, each unit of a set being an integral independent concrete structure formed of a front portion and a hollow holding portion of V-shaped contour integral at its forward end at two spaced points with and extending rearwardly from the rear face of said front portion, said holding portion gradually increasing in width from front to rear, the front portion of each unit of each set extending lengthwise throughout in a direction at right angles to the direction in which the holding portion of the set extends and having its lower face provided with depending spaced feet to provide spacers, and a set of combined spacing and anchoring elements for each set of units and coacting with the spaced feet of the latter, the elements of each set being arranged within

the rear of and extending between the units of a set.

16. A cellular wall construction comprising sets of superposed skeleton cribbing units, each unit of a set being an integral independent structure and consisting of a front portion, a rear portion and a pair of side portions merging into said rear portion and into the inner face of the front portion adjacent the ends of the latter, the end terminal parts of the front portion of the units of one set extending between an end terminal part of the units of a pair of adjacent sets, and the side portions of the units of one set being spaced from the side portions of the units of a pair of adjacent sets.

17. A cellular wall construction comprising sets of superposed cribbing units, each formed of a one-piece body having an oblong header portion and a hollow holding portion of V-shaped contour integral at two spaced points at one end thereof with and extending at an angle to a side face of said header portion, the said spaced points being located adjacent the ends of said face, the header portions of the units of each set having depending means for spacing said portions in superposed relation with respect to each other, and a set of superposed combined spacing and anchoring elements for and arranged within and extending across the holding portions of the units of each of said sets of units, each of the elements of each set of elements being interposed between and seating against the opposed edges of the sides and opposing the other ends of a pair of holding portions of the units of each set of units.

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40	115
45	120
50	125
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