June 22, 1954 L. CLARKE 2,681,562

CONCRETE WALL

Filed June 7, 1951

Fig. 1.

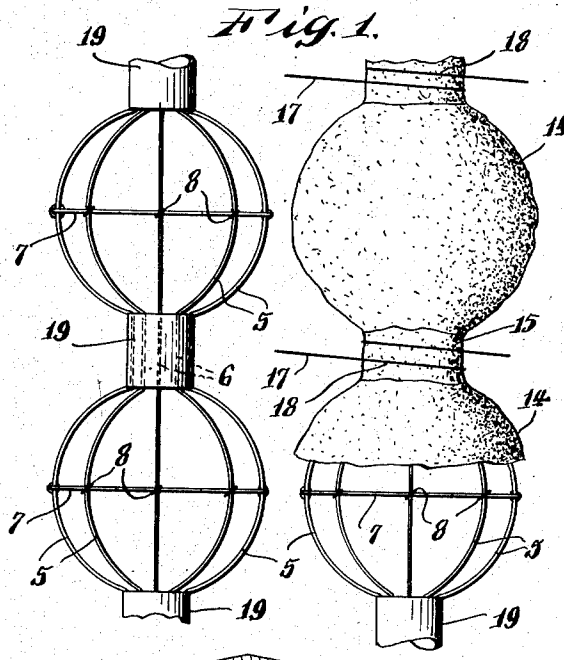


Fig. 2.

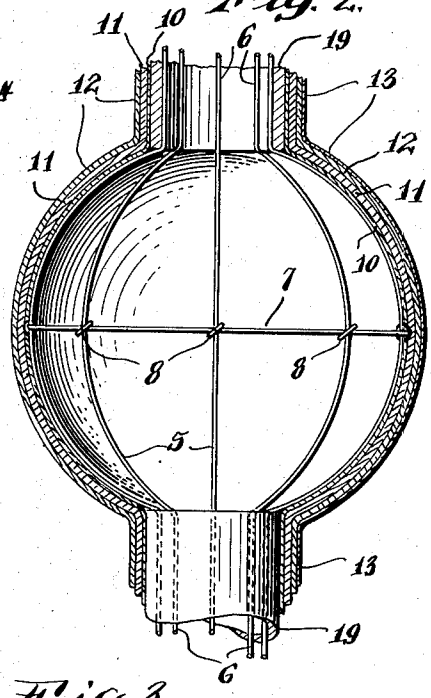


Fig. 3.

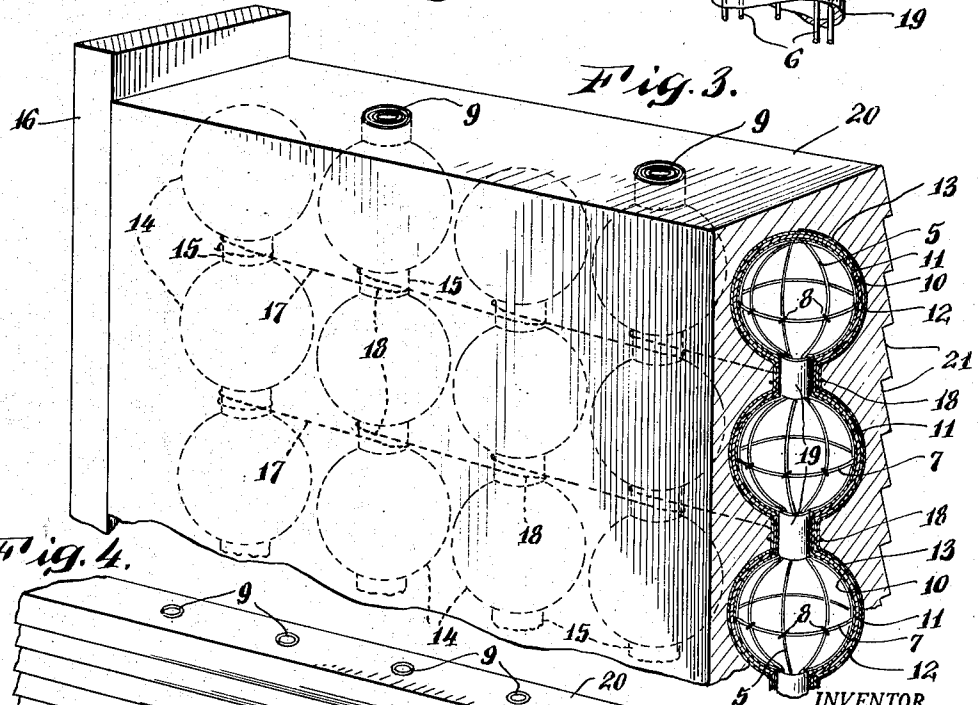
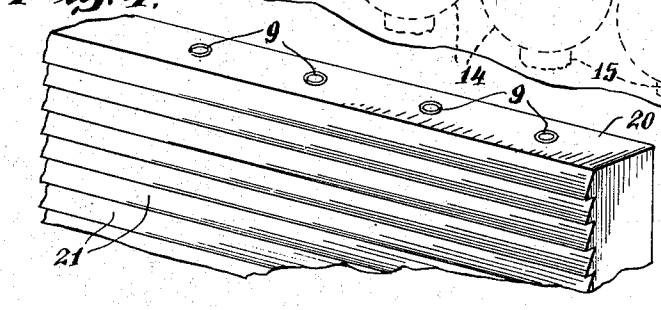


Fig. 4.



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CONCRETE WALL

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4 Claims. (Cl. 72—48)

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My invention relates to concrete walls having circulating air passages therein which passages may be used for the installation of utility-conduits through the walls.

It is an object of the invention to provide this type of concrete wall which is light in weight, strong and inexpensive.

It is another object of the invention to form the circulating air passages by a row of spaced hollow columns, each column comprising spherical members connected by straight tubular portions whereby the spherical members form reinforcing arches in the concrete.

It is a further object of the invention to waterproof and insulate the concrete wall by applying waterproofing material on the hollow columns and applying a metal foil on the surfaces of the columns facing the portion of the wall forming the exterior of a building.

Other objects and advantages of the invention will be described hereinafter.

In the drawing accompanying and forming a part of this application, Figure 1 is a fragmentary view of a frame structure of the circulating air passages.

Figure 2 is a sectional view of a spherical member showing the frame structure and enveloping coverings thereof.

Figure 3 is a perspective view of a concrete wall constructed in accordance with this invention and partly in section to show the structure of a circulating air passage column.

Figure 4 is a perspective view of the exterior face of the wall forming an exterior wall of a building.

In carrying out this invention, circulating air passages are first formed by shaping a plurality of equidistantly spaced wire strands into aligned curved portions 5 and alternate straight portions 6 connecting said curved portions whereby a wire frame column is formed having spaced spherical members connected by tubular portions. The spherical members are reinforced and retained in spherical form by wire strands 7 encircling the center of the curved portions 5 and extending transversely of the longitudinal axis of the column. The wire strands 7 are secured to the portions 5 in any suitable manner, such as wire ties twisted around adjoining sections of the portions 5 and wire strands 7, as shown at 8. In the present illustration of the invention, the frame of each column is formed by four strands of wire, each strand being initially bent to U-shape, subsequently the opposite sections of the leg portions of the U-shaped

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strand is formed into the curved portions 5 and straight portions 6, and finally the opposite ends of the strand are united together in any suitable manner, such as by welding. In a predetermined number of columns, the opposite ends of the strands are extended to form straight portions 6 and provide passage for utility conduits, such as electric, water and gas conduits, as shown at 9 in Figure 3. Each column is of a length substantially equal to the height of the wall to be constructed.

Each column frame is covered to form hollow spherical bodies and tubular connecting portions. This is accomplished by first wrapping a layer of fibrous material, such as cloth or paper, over the wire frame portions 5 and 6, as indicated at 10 in Figures 2 and 3. Secondly, the fibrous layer is covered by a thin coating of plaster, which may be sprayed onto the fibrous layer, as indicated at 11. After the plaster has set, the third step consists of applying over the set plaster a layer of waterproofing material, such as tar, as indicated at 12. The layer of waterproofing material may be applied by dipping the column into a bath of said material. In cases where the wall to be formed is utilized as the exterior wall of a building, the fourth step in covering the wire frame portions would be to apply a metal foil 13 on the vertical half of the waterproofed portions 5, 6 facing the exterior face of said wall, as shown in Figure 2, for the purpose of providing an insulation against penetration of extreme temperatures.

A column constructed in this manner will be light in weight and easy to handle, and would consist of aligned hollow spherical members 14 connected in fluid communication with each other by tubular portions 15.

In constructing a wall, each completely covered column is positioned in a suitable form or frame consisting of end and side walls, an end wall of which is shown at 16 in Figure 3. The columns are positioned in the form in a single row with the columns spaced from each other, as shown in Figure 1, and retained in such position by ties in the form of wire strands 17 having portions coiled around the covered tubular connecting portions 15, as shown at 18. The ends of the tie wires 17 are secured in any suitable manner as by securing said ends to the tubular connecting portions of the end columns of the row of columns.

The tubular connecting portions 15 may be reinforced by tubular members 19 of suitable material, such as cardboard wrapped around the

wire portions 6 prior to the application of the layers 10 to 13, inclusive.

The columns are tied together before they are placed in the form or the columns are tied together while they are in the form with one side wall of the form removed.

After the columns are tied together, concrete is poured into the fully assembled form around said columns and allowed to set, as shown at 20 in Figures 3 and 4. After the concrete is thoroughly set, the form is removed.

In constructing the exterior walls of a building, one side wall of the form is arranged with horizontal grooves of angular shape in cross-section to form a clapboard effect on the exterior face of said concrete walls, as shown at 21 in Figures 3 and 4.

In the present illustration of the invention, the spherical portions 14 are ten inches in diameter and the wall is twelve inches thick. The columns are positioned midway of the outer surfaces of the wall so that there is one inch of concrete on the opposite faces of the spherical portions 14.

The walls are constructed directly on the foundation of the building.

Having thus described my invention, I claim:

1. In a concrete wall, a row of hollow columns, each column comprising spherical members and tubular portions spacing and connecting the members in fluid communication with each other and the columns being spaced apart, each column comprising a plurality of wire strands

spaced apart and each strand having curved portions connected by straight portions and extending longitudinally of the column, a layer of fibrous material covering the wire strands, and a coating of plaster applied over the fibrous layer, and concrete enclosing the columns, the spherical members forming reinforcing arches and increasing the air space in the concrete.

2. In a concrete wall as claimed in claim 1, a circular strand of wire encircling and secured to the curved portions of the column wire strands and extending transversely of the longitudinal axis of the column.

3. In a concrete wall as claimed in claim 2, a tubular member engaged around the straight portions of the wire strands below the fibrous layer and the coating of plaster.

4. In a concrete wall as claimed in claim 3, tie wires having portions coiled around the coating of plaster covering the tubular members and extending transversely of the columns.

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