

March 20, 1945.

J. H. WOODBERRY ET AL

2,371,663

CRATE

Filed Jan. 5, 1943

2 Sheets-Sheet 1

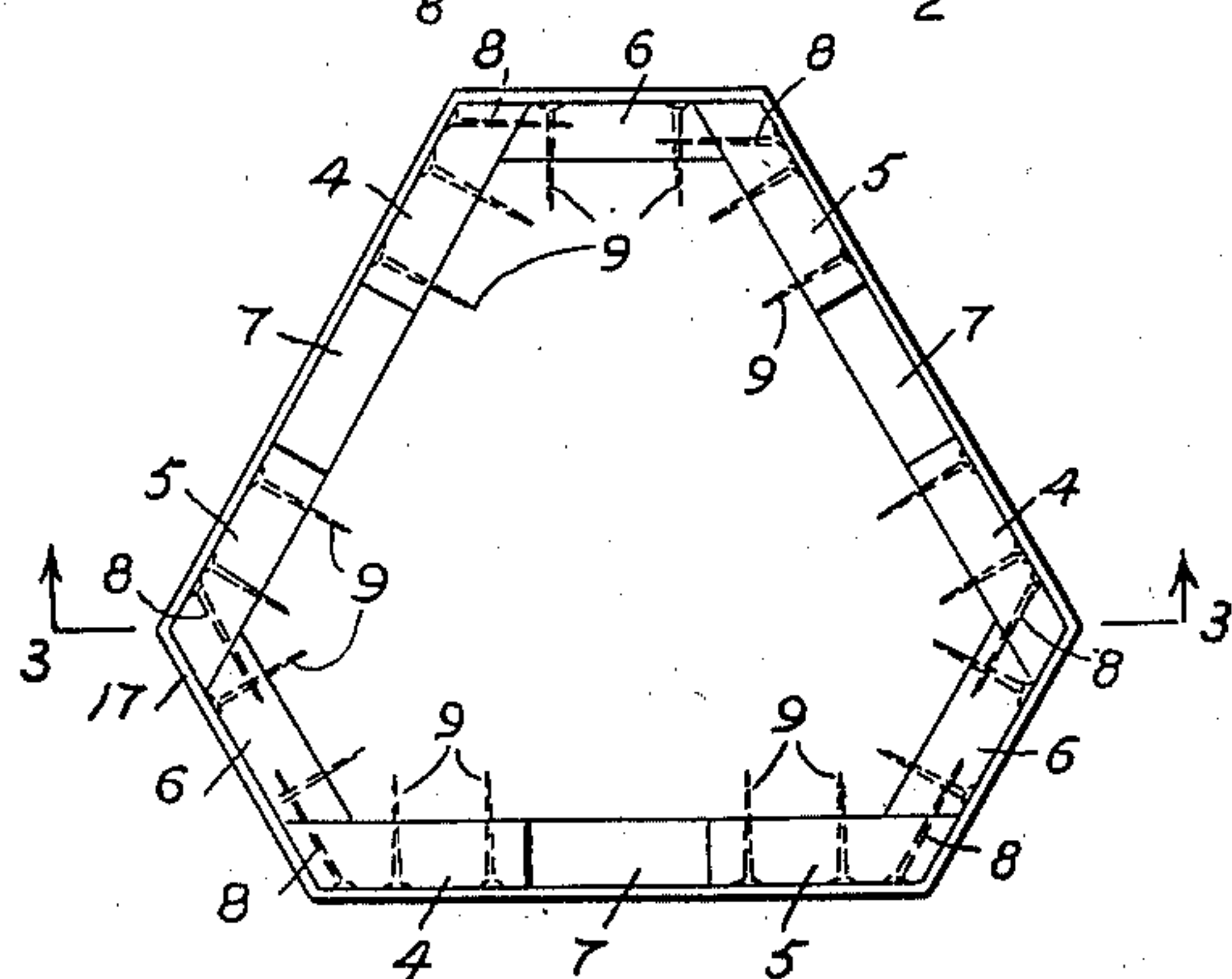
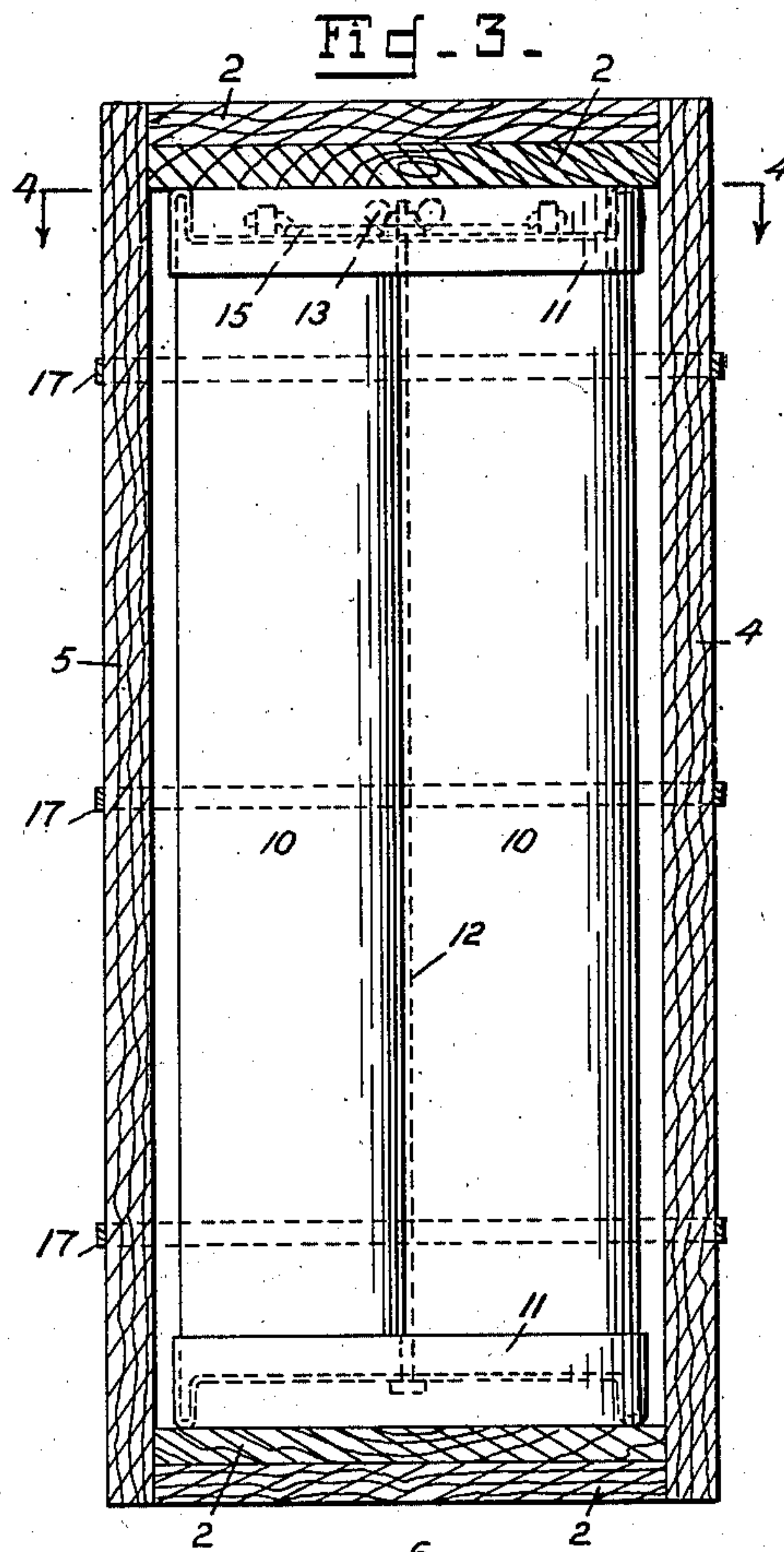
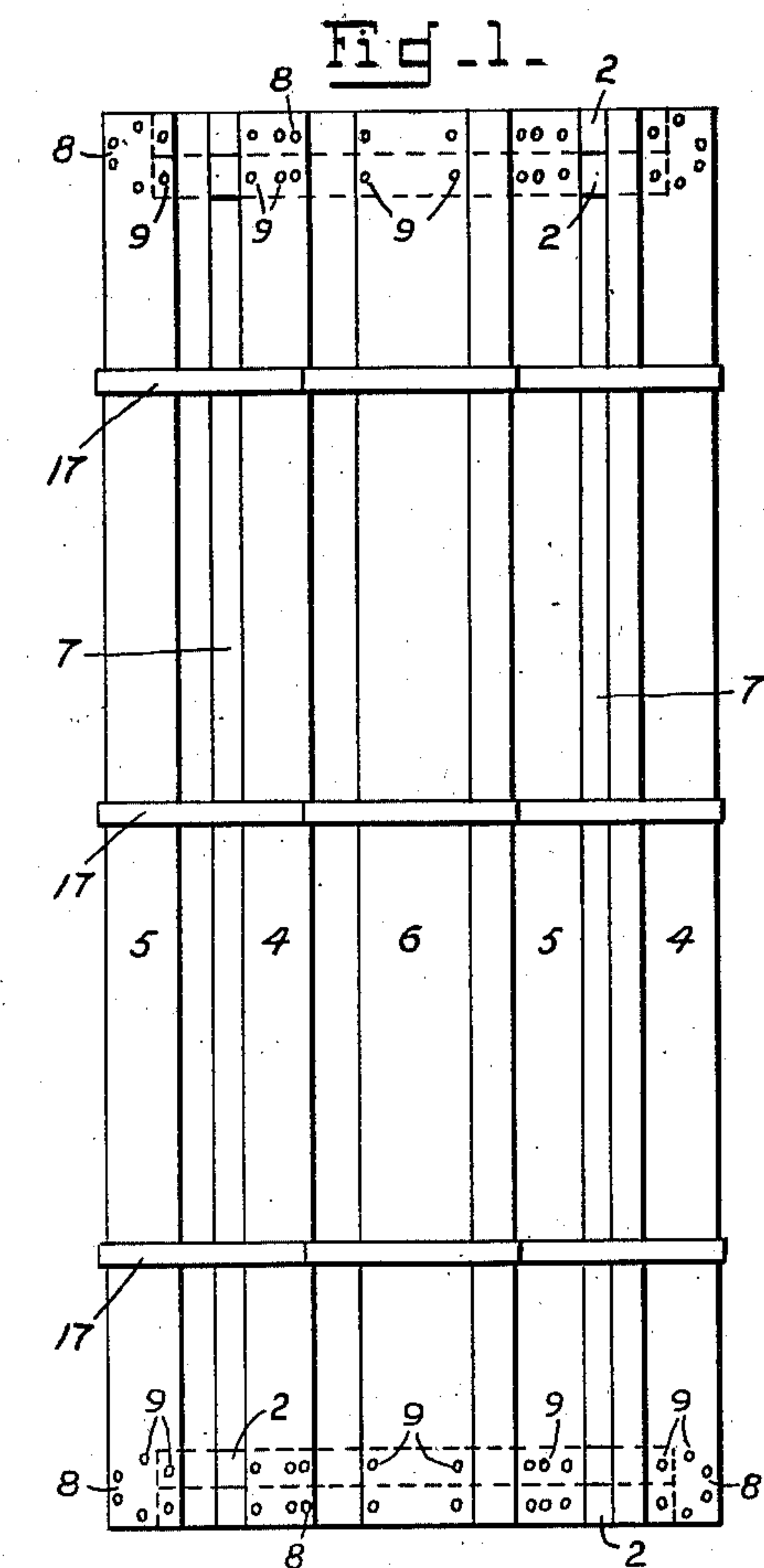
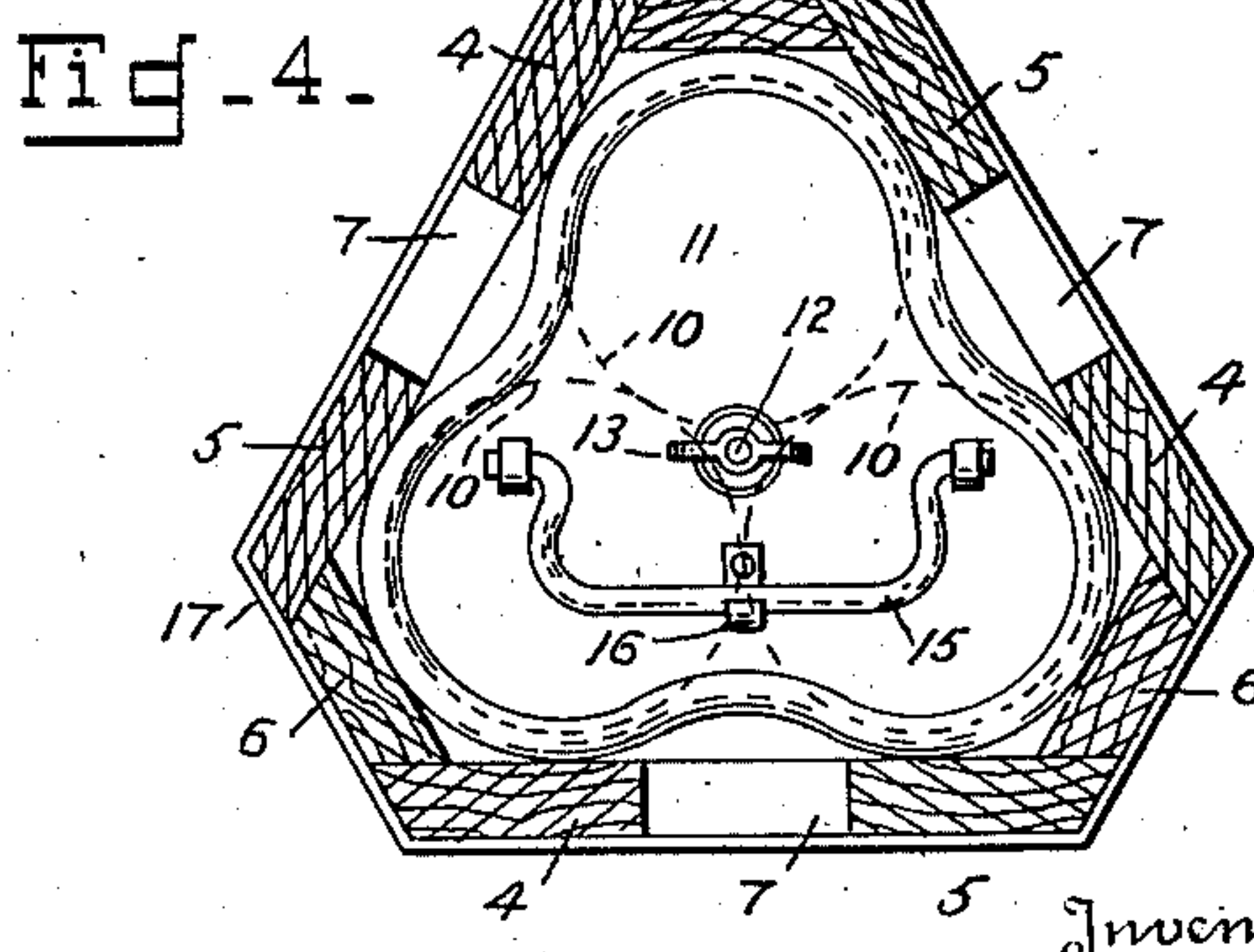


Fig. 2.



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2 Sheets-Sheet 2

Fig. 5.

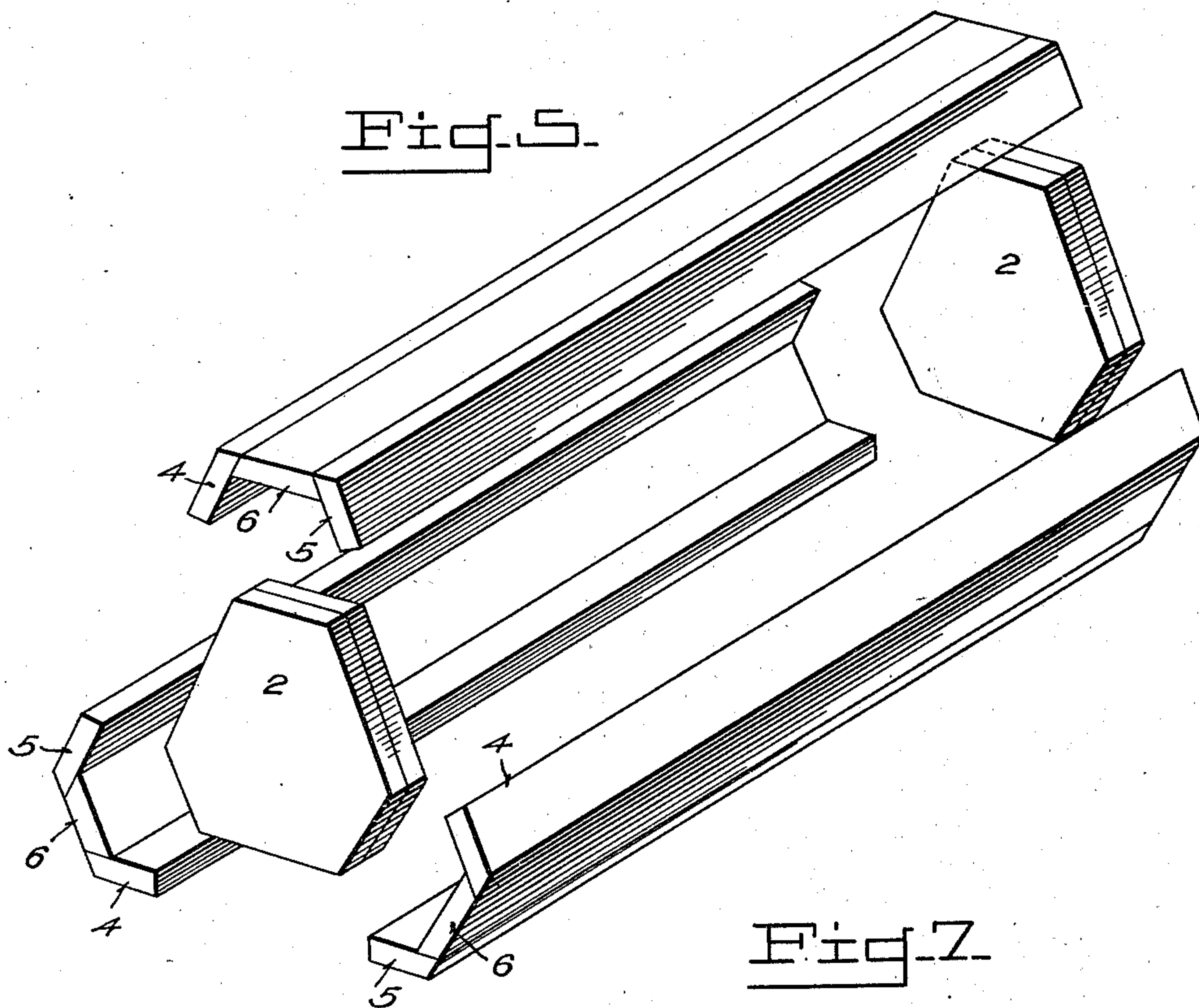


Fig. 6.

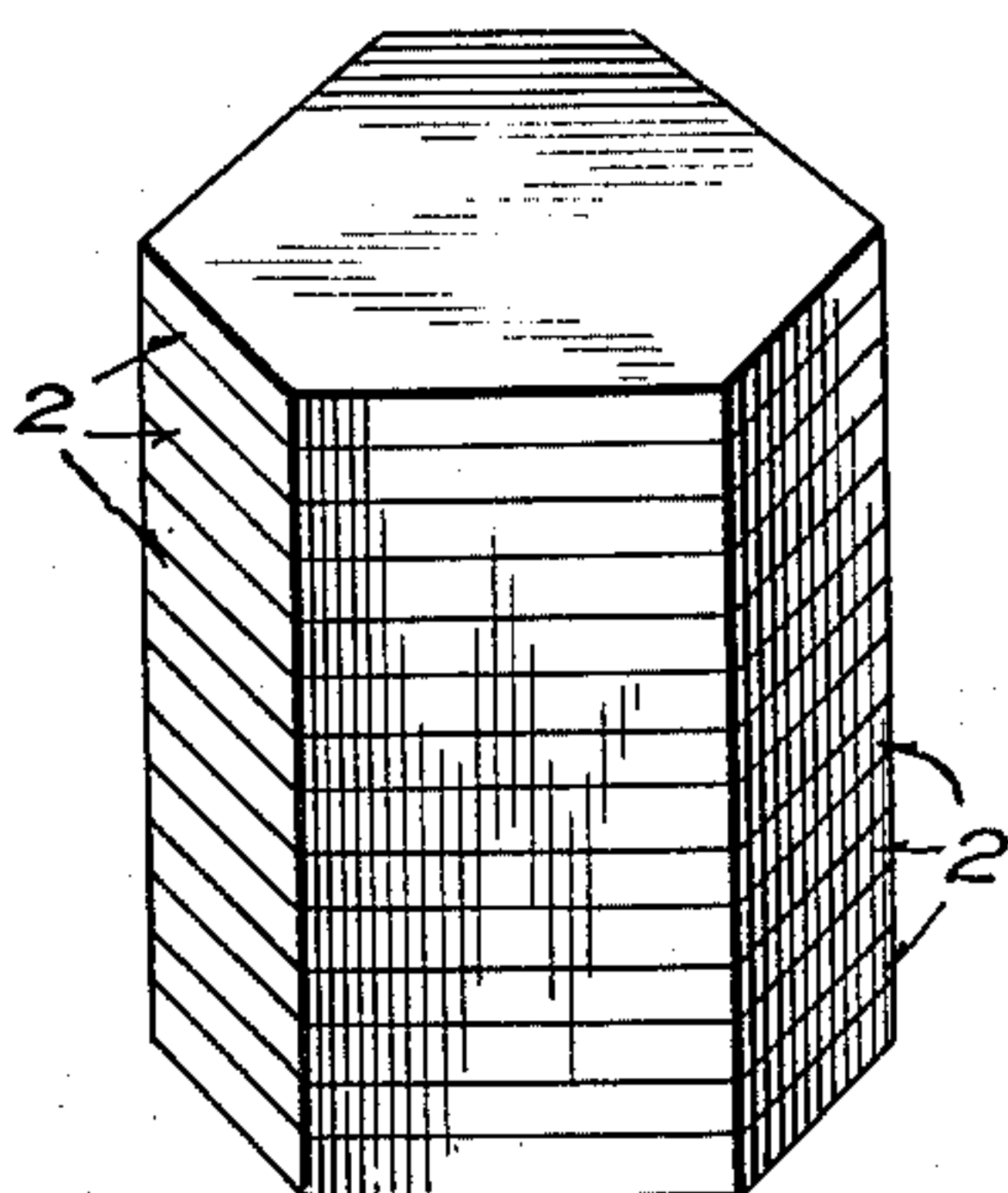
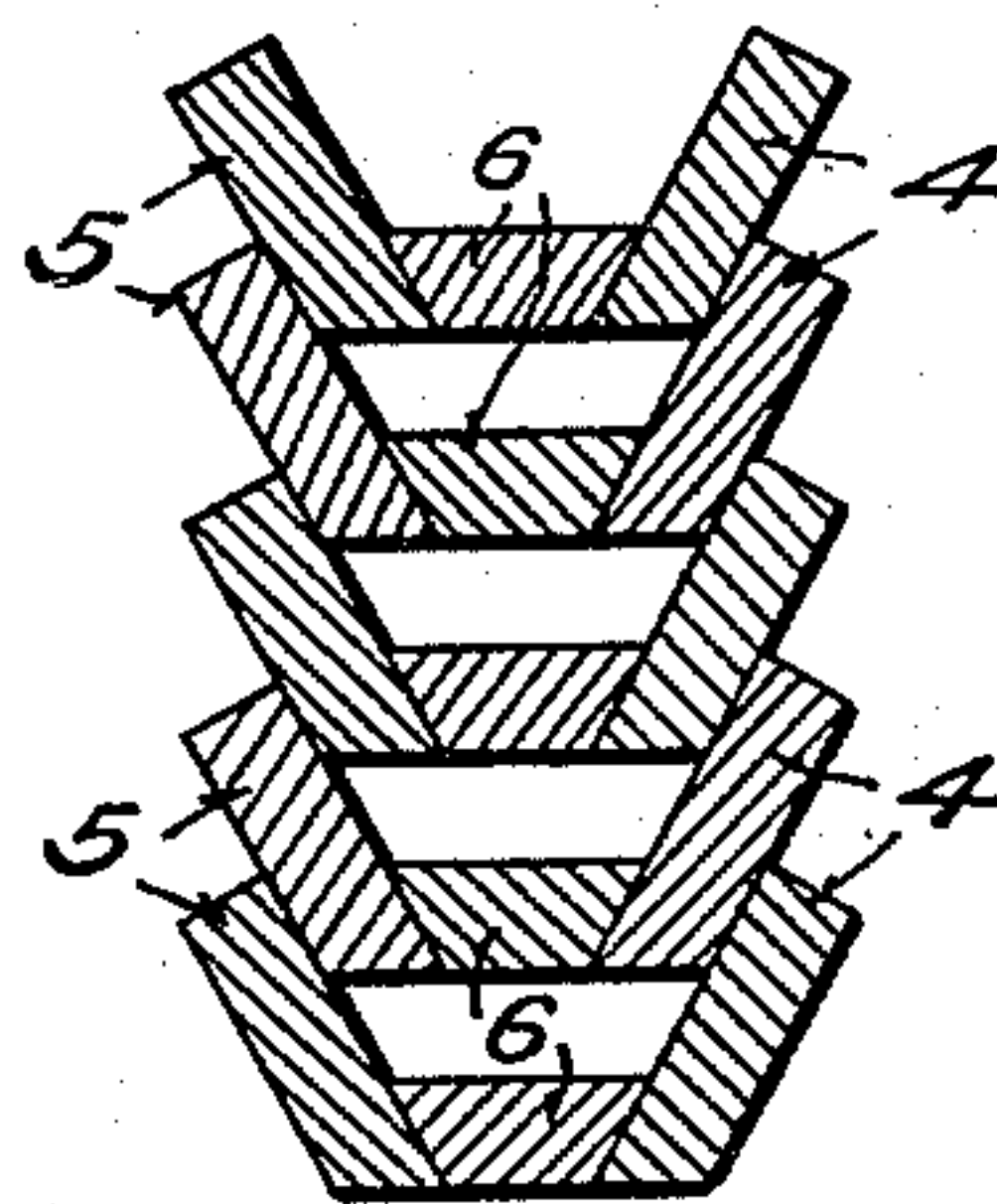


Fig. 7.



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## UNITED STATES PATENT OFFICE

2,371,663

CRATE

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Application January 5, 1943, Serial No. 471,316

4 Claims. (Cl. 217—36)

(Granted under the act of March 3, 1883, as  
amended April 30, 1928; 370 O. G. 757)

The invention described herein may be manufactured and used by or for the Government for governmental purposes without the payment to use of any royalty thereon.

The present invention relates to a crate which is useful in the shipment of various articles.

An object of the invention is the production of a crate particularly useful in the transportation of ammunition of cylindrical form, for example ammunition for artillery, trench mortar ammunition, bombs and the like.

A further object of the invention is to provide a crate highly suitable for use in shipping ammunition which has been enclosed in cylindrical tubes or containers. Such containers are usually grouped or clustered in units of three and held together by two end plates of cloverleaf shape, one end plate being placed at each end of the group. The cloverleaf end plates fit over the ends of the containers, and a bolt which passes from the center of one end plate to the center of the other holds the two end plates and the three containers together as a unit. The crate of the present invention is particularly suitable for use in shipping these clusters.

A further object of the invention is the provision of a crate of the character indicated which can be built up very simply from preformed parts or units, which owing to their shape and nesting possibilities occupy far less space in storage and transportation than the assembled crate or than the component parts of any known crates in a state of disassembly.

Referring to the accompanying drawings illustrating an embodiment of the invention and in which the same reference numeral indicates the same or corresponding parts in the several views,

Fig. 1 is a plan view of the crate in assembled condition, but shown empty to better illustrate its construction.

Fig. 2 is an end view at either end of Fig. 1.

Fig. 3 is a longitudinal section on the line 3—3 of Fig. 2, looking in the direction of the arrows, but including in elevation a group of cylindrical articles held together as a cluster by two cloverleaf end plates and a bolt.

Fig. 4 is a section on the line 4—4 of Fig. 3, and showing in plan one of the cloverleaf end plates which fits over the ends of the three containers in the cluster.

Figure 5 is an exploded view in perspective illustrating the trough-like members separated from the hexagonal end pieces of the crate.

Figure 6 illustrates in perspective how a num-

ber of end pieces of the crate may be stacked in storage or in shipment to points of assembly.

Figure 7 illustrates in cross-section how a number of trough-like members may be stacked in storage or in shipment to points of assembly.

The crate of the present invention comprises four end portions 2 of the same size and shape. These end portions may be made of lumber or of any other suitable material. The thickness of these four end portions may be different, but it is preferred that they all be of the same thickness.

The shape of the ends 2 may be defined in several ways. Referring to Fig. 2, the shape of the ends 2 may be regarded as an equilateral triangle from which the three vertices have been cut off along lines drawn parallel to the side opposite each vertex and equidistant inwardly from each vertex. This results in three blunt corners one hundred and twenty degrees apart. Bearing in mind the thickness of each end portion 2, each of these blunt corners is formed by three surfaces, two of which meet the third at an angle of one hundred and twenty degrees.

The shape of ends 2 may be viewed in another way. It may be considered as a hexagon having substantially equal angles between its sides with three substantially equal sides of one length, three substantially equal sides of a shorter length, and the shorter sides alternating with the other sides around the periphery of the hexagon or end portion.

In assembly of the crate, two contiguous portions 2 are used to form each of the two ends of the crate as may be seen in Figures 1, 3 and 5, and the direction of the grain of the wood in one of the contiguous end portions is preferably placed at an angle of sixty to ninety degrees with the direction of the grain in the other. The two contiguous end portions 2 at each end of the crate are so positioned with reference to each other that the short and long edges on one respectively register with the short and long edges on the other. The two ends so constituted are spaced apart, according to the size of the crate desired, with their hexagonal planes substantially perpendicular to a line joining their centers and with the short and long sides of the hexagon of one end of the crate directly opposite like sides on the other end of the crate. In other words, the blunt corners referred to above are directly opposite each other in the assembly.

Another element of the crate consists of a trough or trough-like member, three of which are present in the assembled crate. Each of the troughs or trough-like members is formed of

wood side boards 4 and 5 and wood bottom board 6, as shown in Figures 2, 4, 5 and 7. Side boards 4 and 5 would meet at an angle of sixty degrees if they were extended to meet. Side boards 4 and 5 of each trough meet bottom board 6 at an angle of one hundred and twenty degrees or thereabouts. The bottom 6 of each trough is bevelled along its two longer edges to fit between the sides 4 and 5 of the trough, and the two sides of the trough are also bevelled along the edge nearer the bottom 6 so as to be flush with the outside of the bottom. Sides 4 and 5 are secured to bottom 6 by nails 8 passing through sides 4 and 5 into bottom 6. It is to be noted that the three troughs are so shaped as to fit over the blunt corners of the end portions 2 of the crate as shown in Figs. 1, 2, 4 and 5. Side walls 4 and 5 and bottom wall 6 of the said troughs function as slats between the two ends of the crate. The troughs may be preformed and thereafter assembled with end portions in building the crates (see Fig. 5). Owing to their shape, the troughs may be nested in storage or shipment, as shown in Fig. 7.

In the assembly of the crate (see Figs. 1 and 5) two pairs of end portions 2 are spaced apart as above described. The bottom 6 of each trough fits over and passes from a shorter side of each hexagonal end to and over the shorter side of the hexagonal end which is spaced therefrom and directly opposite; and each of sides 4 and 5 fits over and passes from a longer side of each hexagonal end to and over the longer side of the hexagonal end directly opposite. The width of sides 4 and 5 is such that when they are joined with the ends of the crate, three spaces 7 (see Figs. 2 and 3) will be provided between them. Sides 4 and 5, i. e., the side walls of the trough, and slats 6, i. e., the bottoms of the troughs are secured by nails 9 to each of the two end portions 2 at each end of the crate.

In Figures 3 and 4 a cluster of three cylindrical containers for artillery ammunition is shown enclosed by the crate. This cluster consists of three cylindrical containers 10, arranged as shown, two cloverleaf end plates 11 which pass over the ends of the containers, and a bolt 12 with wing nut 13. The bolt 12 passes through the two cloverleaf end plates 11, and tightening the wing nut 13 secures the cluster together for handling. A hinged handle 15 is secured to each cloverleaf end plate to facilitate handling of the cluster, and a spring latch 16 is secured to each end plate to hold the handle down when not in use. In crating this cluster of ammunition, the sides 4 and 5 and the bottoms 6 of the above described troughs of the crate fit, as shown in Fig. 4, against the edges of the cloverleaf end plates 11, while the ends of

the crate fit against their tops. Steel bands or straps 17 may be placed around the crate.

We claim:

1. A crate comprising spaced enclosing portions and three spaced trough-like members extending from one of said enclosing portions to the other of said enclosing portions and defining an enclosure therewith, each of said trough-like members consisting of two side walls and a bottom, the said side walls meeting said bottom at an angle of substantially one hundred and twenty degrees.

2. A crate comprising spaced enclosing portions and three spaced trough-like members extending from one of said enclosing portions to the other of said enclosing portions and defining an enclosure therewith, each of said trough-like members consisting of two side walls and a bottom, the said bottom fitting between said side walls and forming an angle of substantially one and twenty degrees with them.

3. A crate comprising two ends each of the shape of a hexagon having substantially equal angles between its sides, three substantially equal sides of one length, and three substantially equal sides of a shorter length, the said shorter sides alternating with the other sides around the periphery of each end, said ends being spaced apart with their polygonal planes substantially perpendicular to a line joining their centers and the said shorter sides of the ends being opposite each other; and three trough-like members, each of which fits over a shorter side of one end and over the two sides adjacent said shorter side and extends to and fits over the opposite shorter side on the other end and over the two sides adjacent said last mentioned shorter side.

4. A crate comprising two ends each of the shape of a hexagon having substantially equal angles between its sides, three substantially equal sides of one length, and three substantially equal sides of a shorter length, the said shorter sides alternating with the other sides around the periphery of each end, the said ends being spaced apart with their polygonal planes substantially perpendicular to a line joining their centers and the said shorter sides of the ends being opposite each other; and three trough-like members, each of which fits over a shorter side of one end portion and over only a part of both of the two sides adjacent said shorter side and extends to and fits over the opposite shorter side on the other end portion and over only a part of both of the two sides adjacent said last mentioned shorter side.

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