

(No Model.)

2 Sheets—Sheet 1.

C. RABITZ.

RECEPTACLE FOR THE PRESERVATION OF GRAIN AND
SUCCULENT MATERIALS.

No. 339,211.

Patented Apr. 6, 1886.

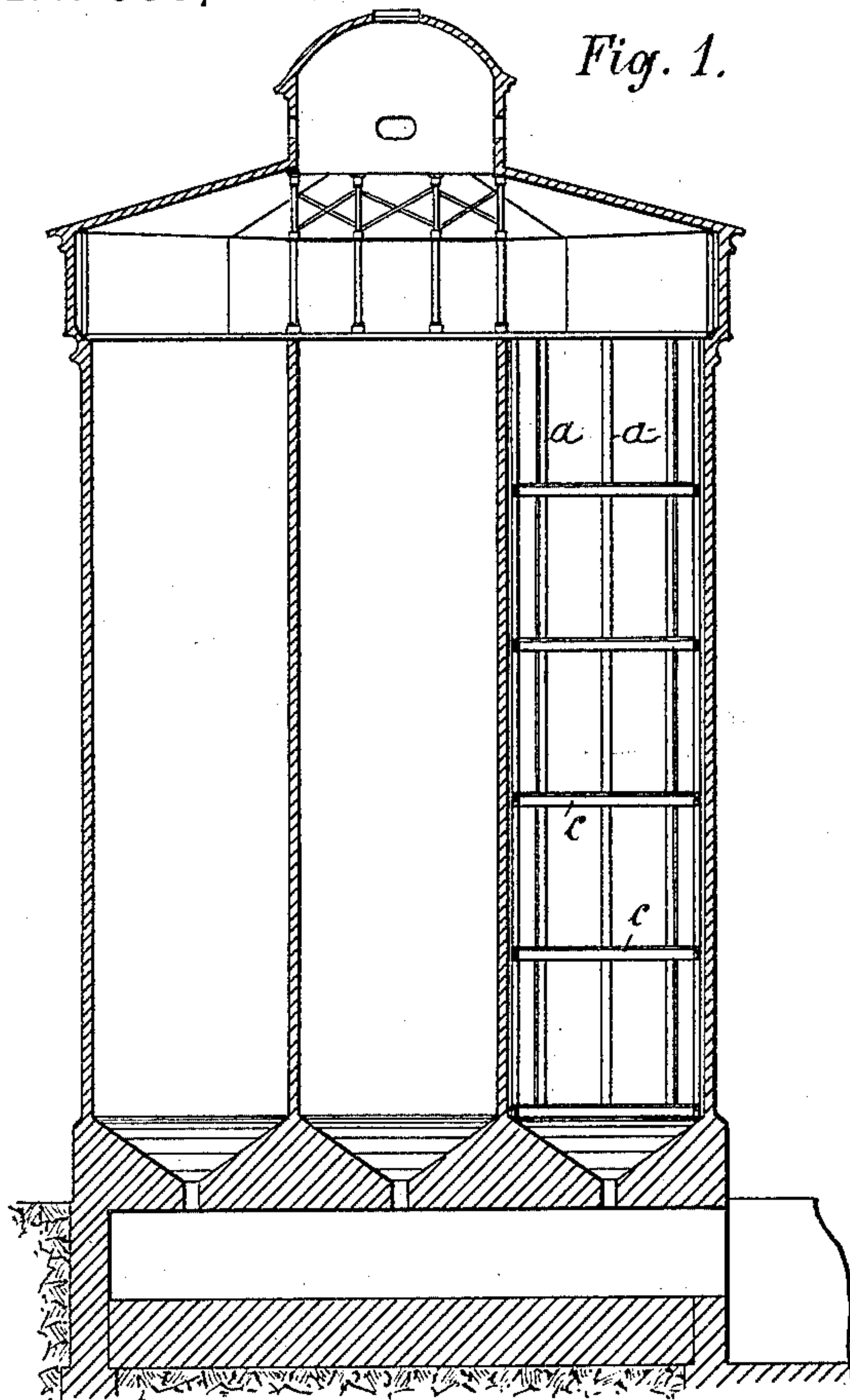


Fig. 1.

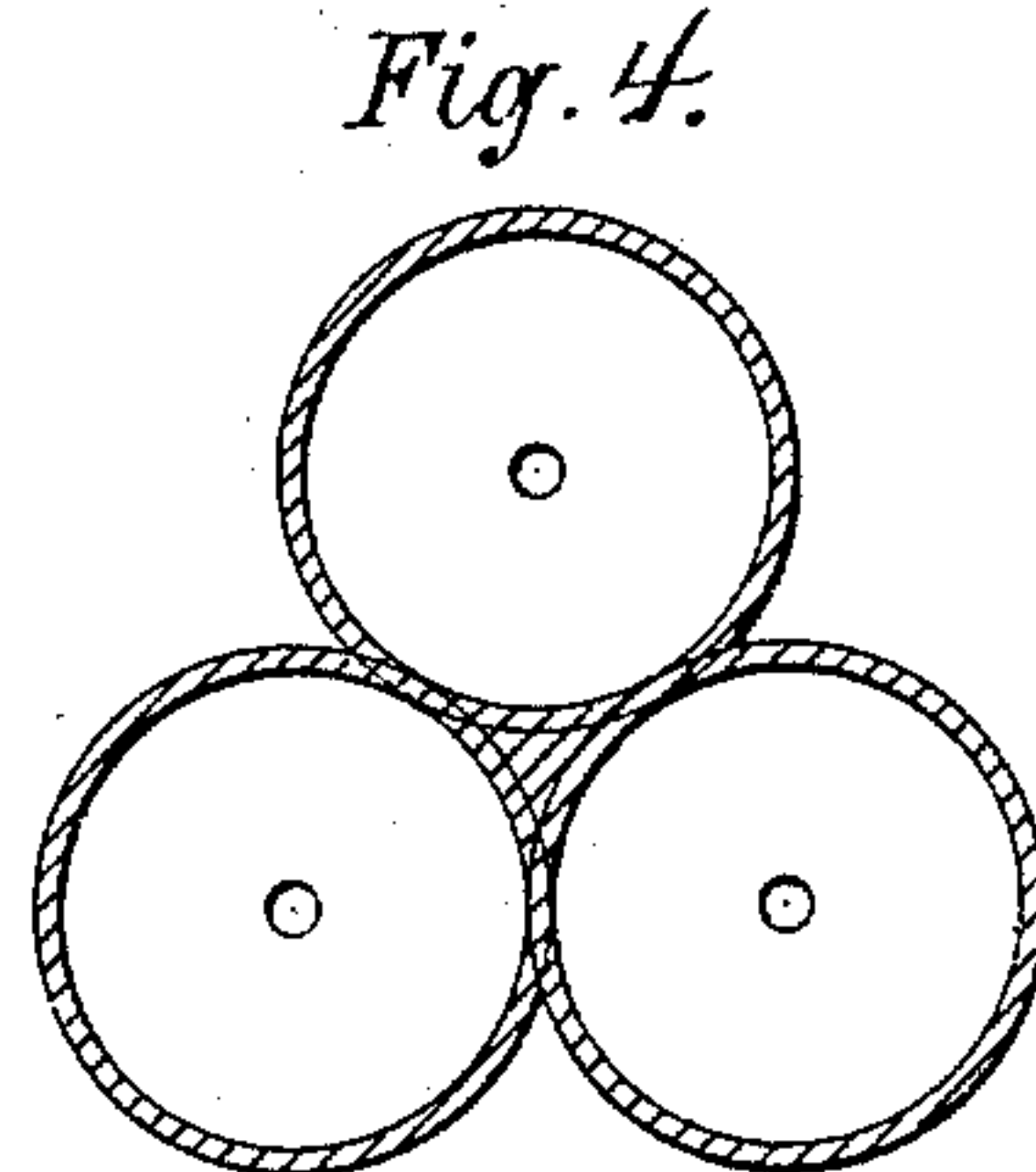


Fig. 4.

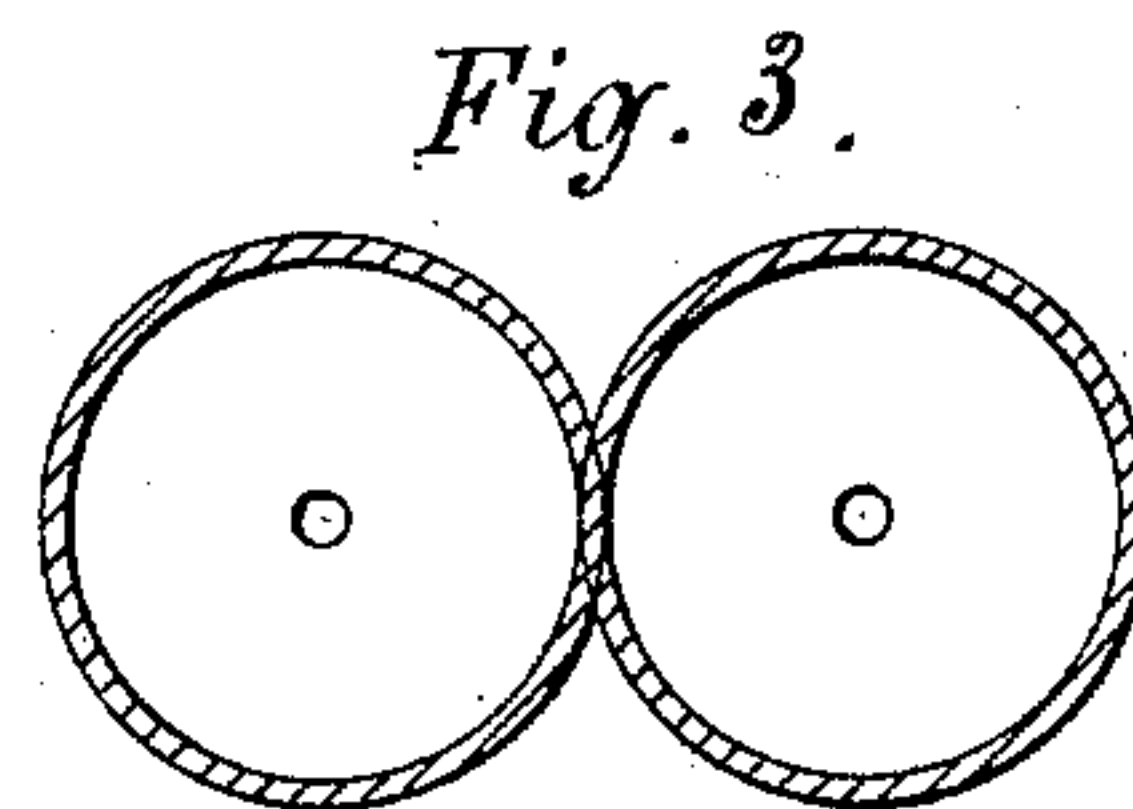


Fig. 3.

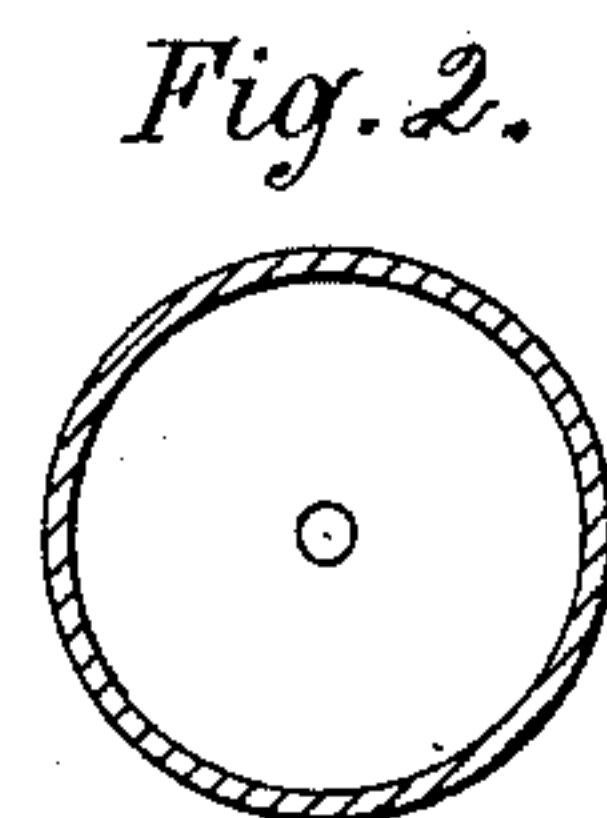


Fig. 2.

Fig. 9.

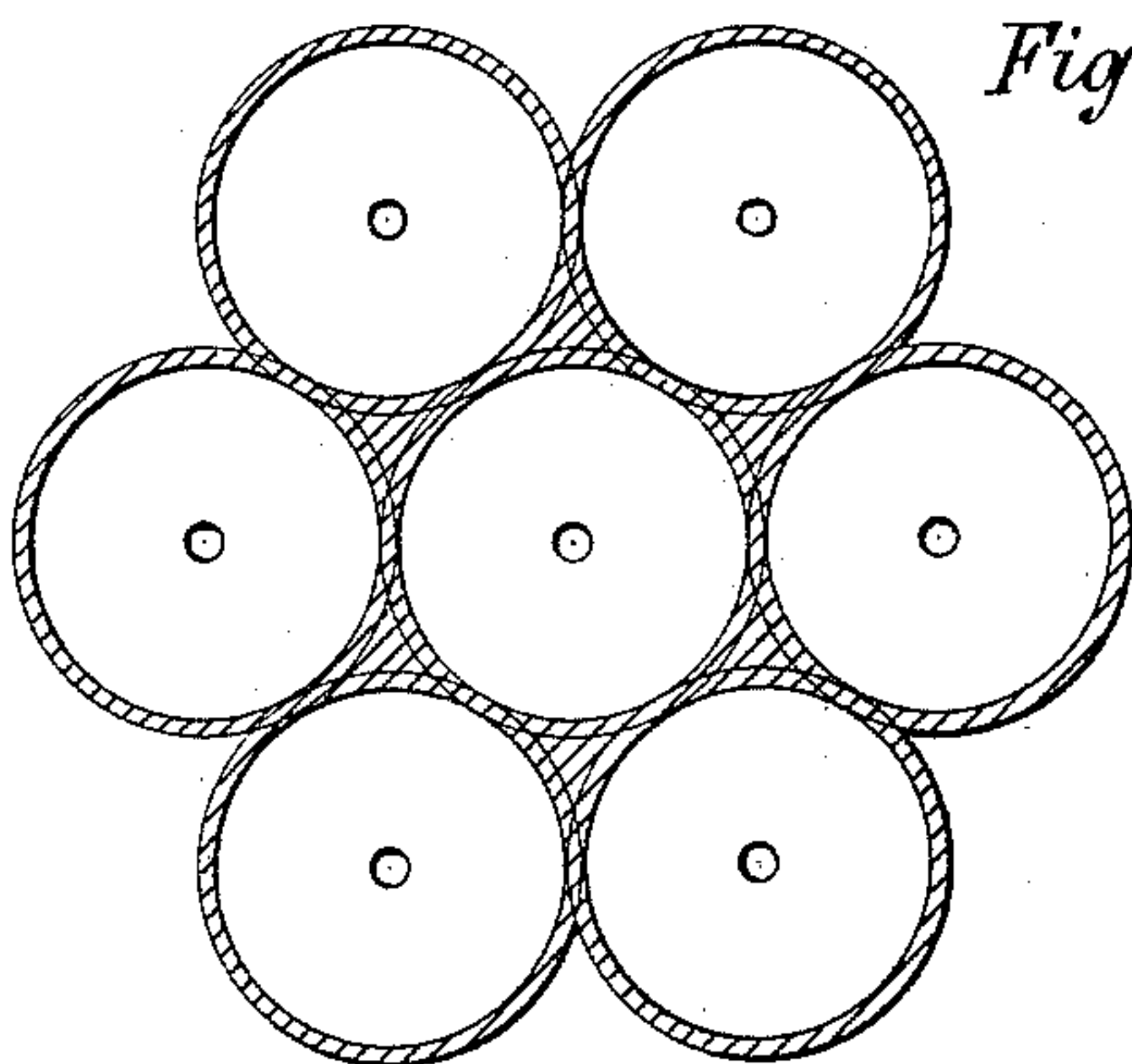
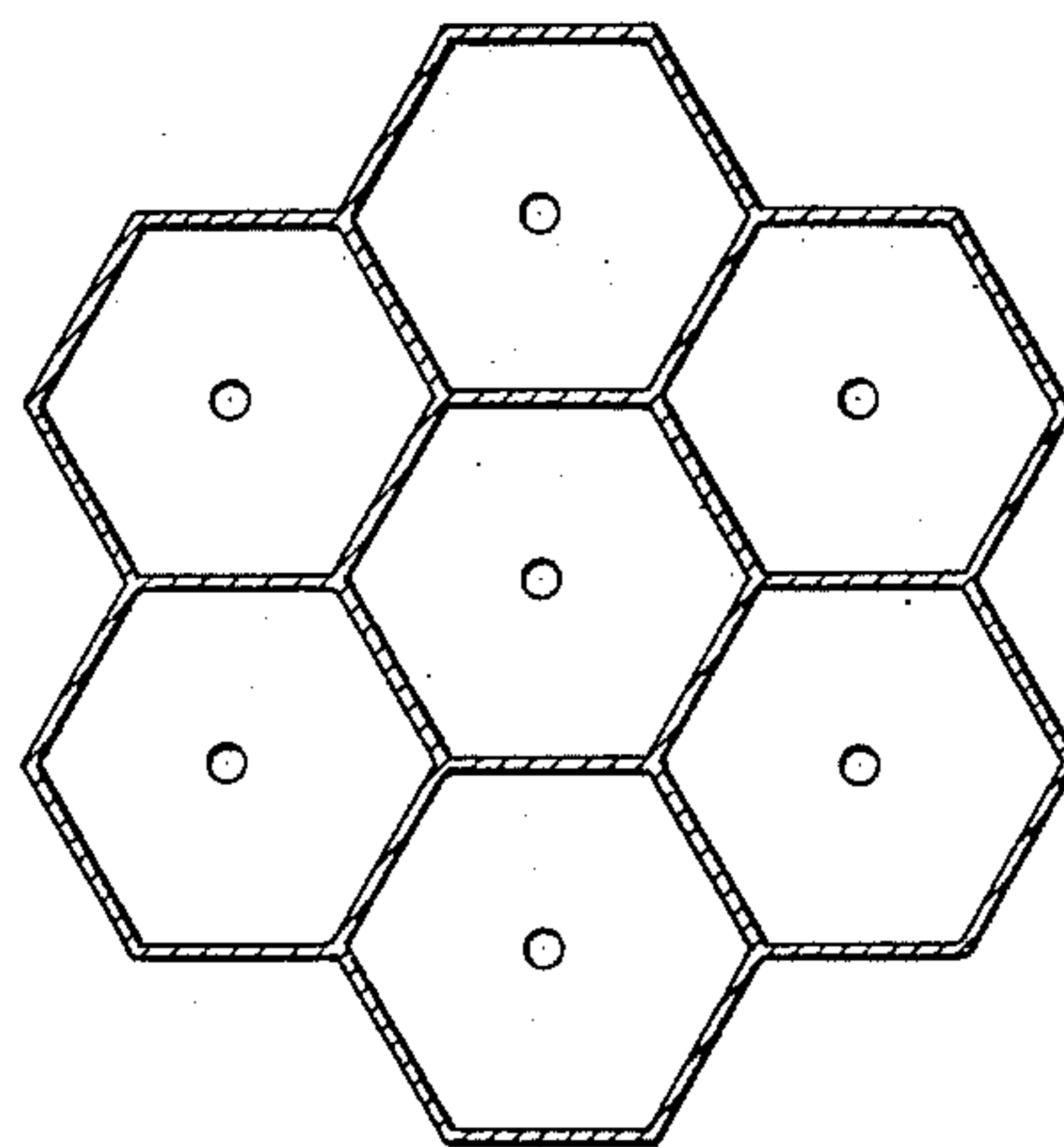


Fig. 5.



Witnesses:-
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Paul M. Knobloch.

Inventor:
Carl Rabitz
per *[Signature]*
his atty.

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2 Sheets—Sheet 2.

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Fig. 6.

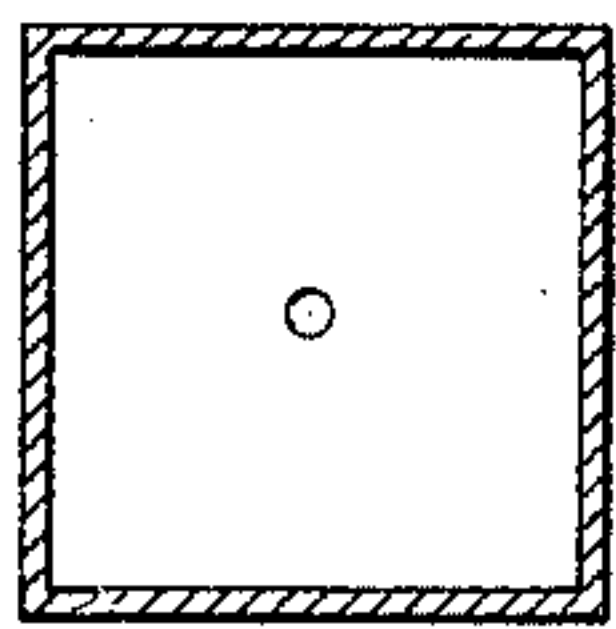


Fig. 7.

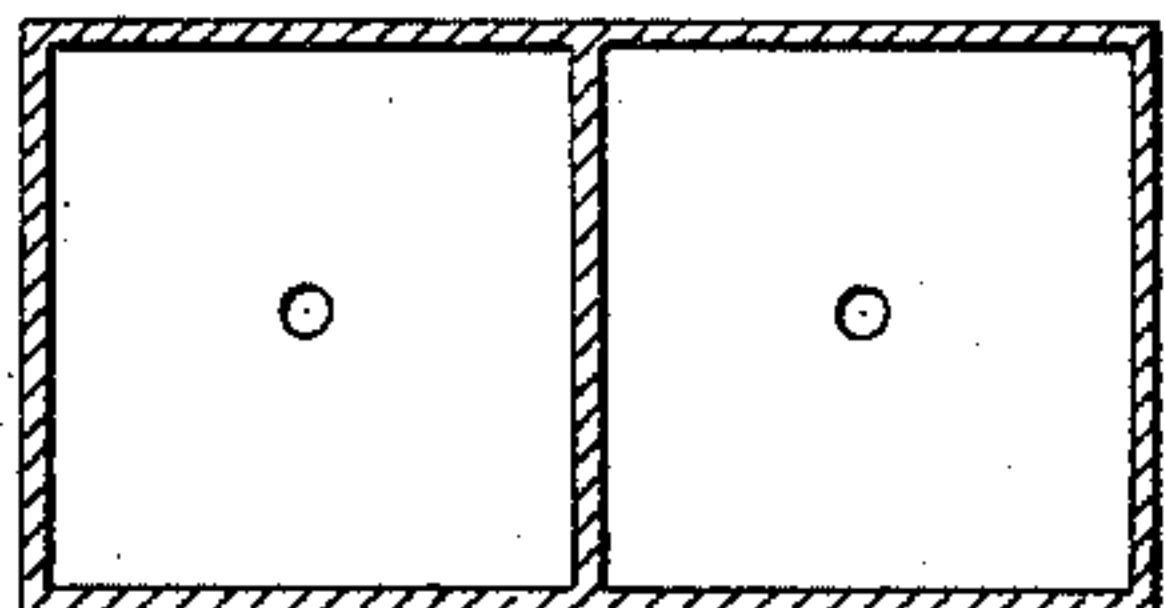


Fig. 8.

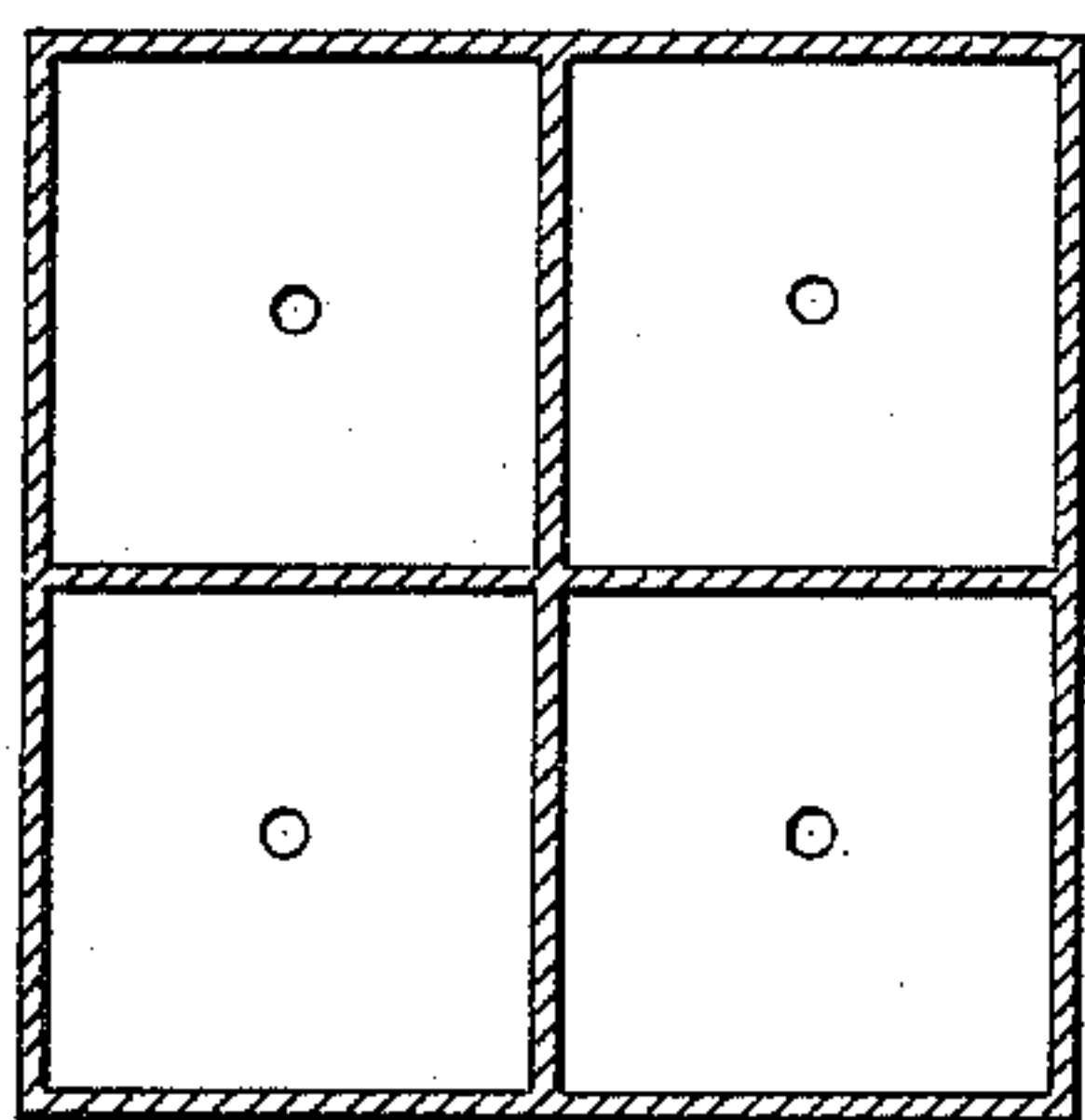


Fig. 10.

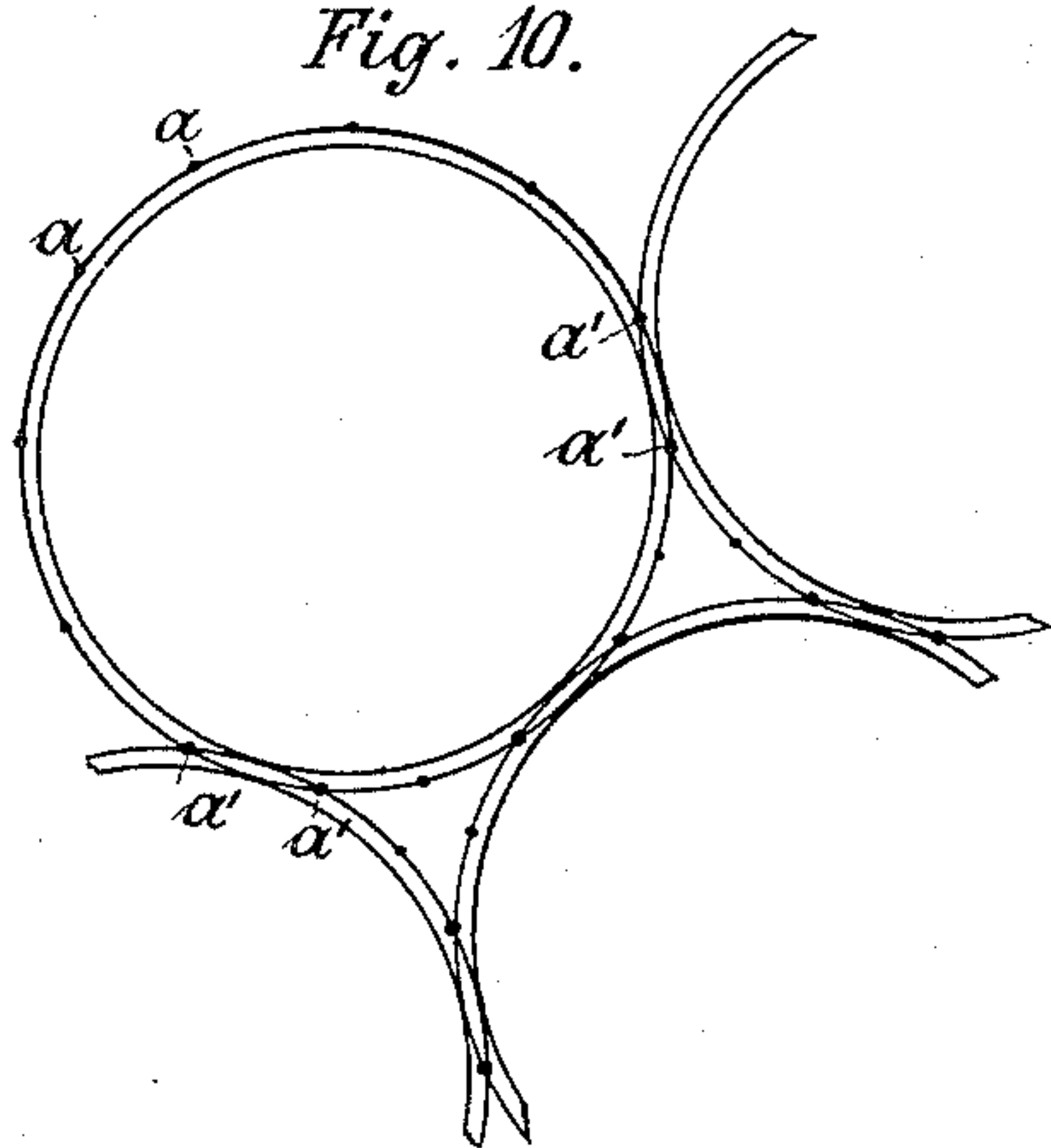


Fig. 14.

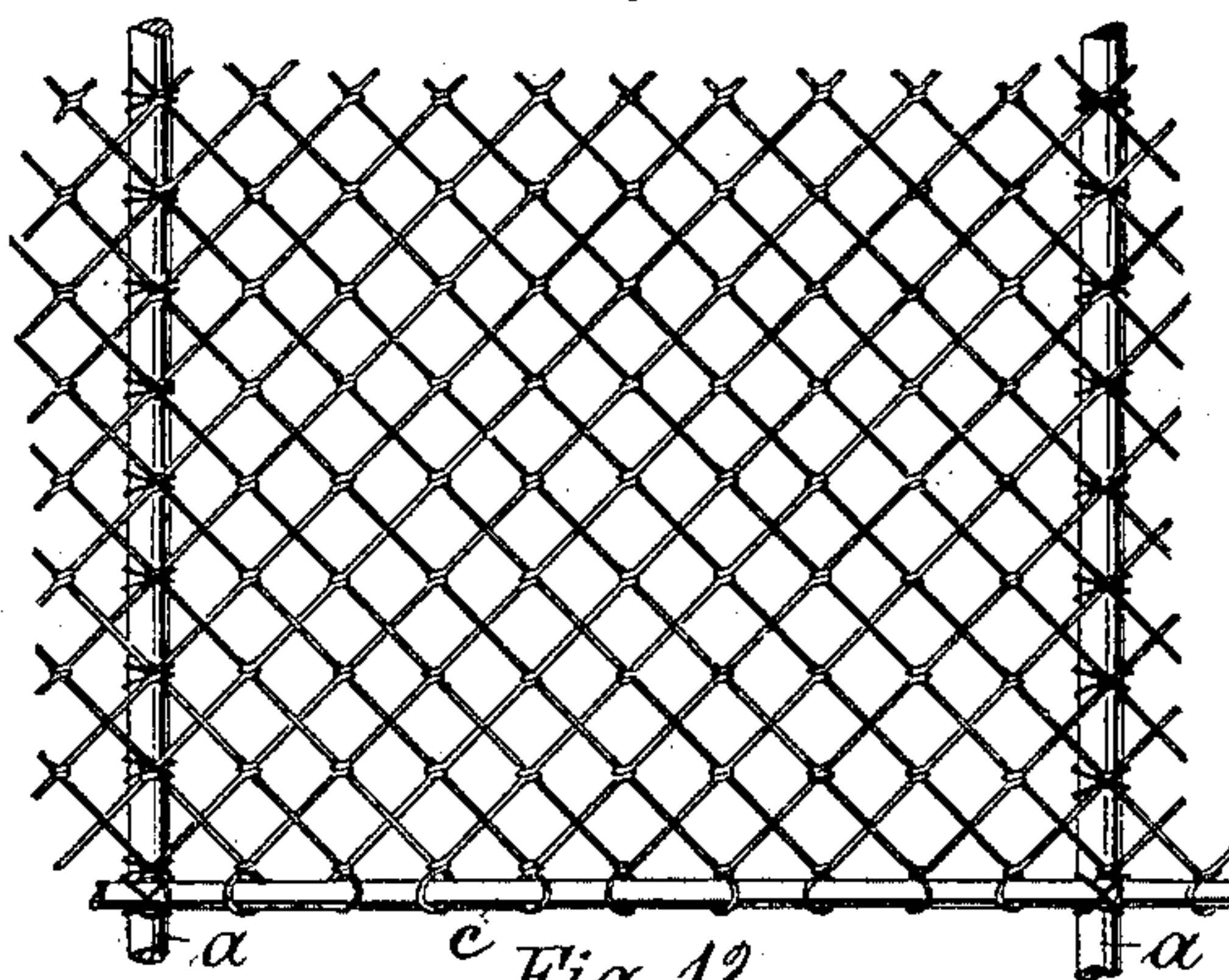


Fig. 12.

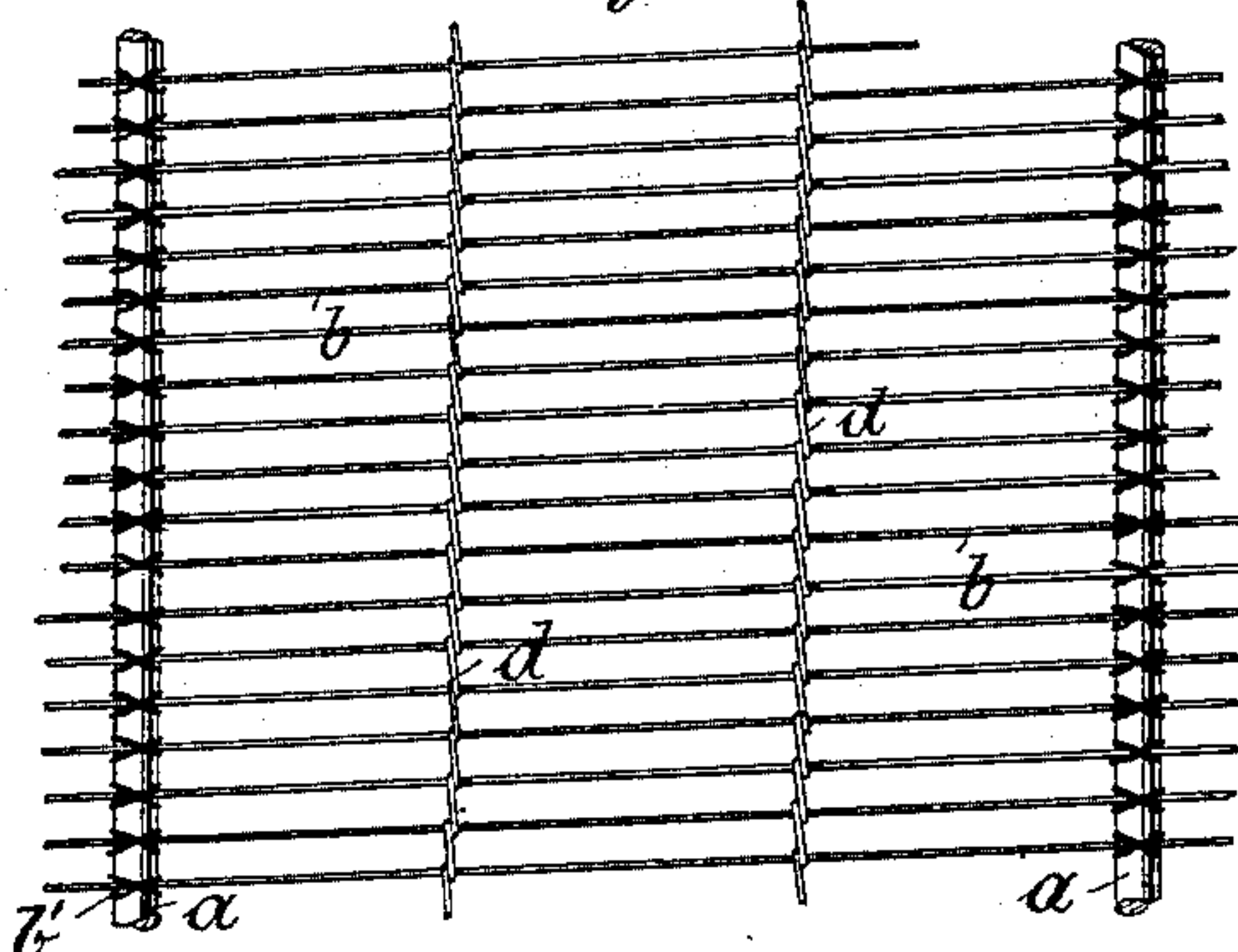


Fig. 13.

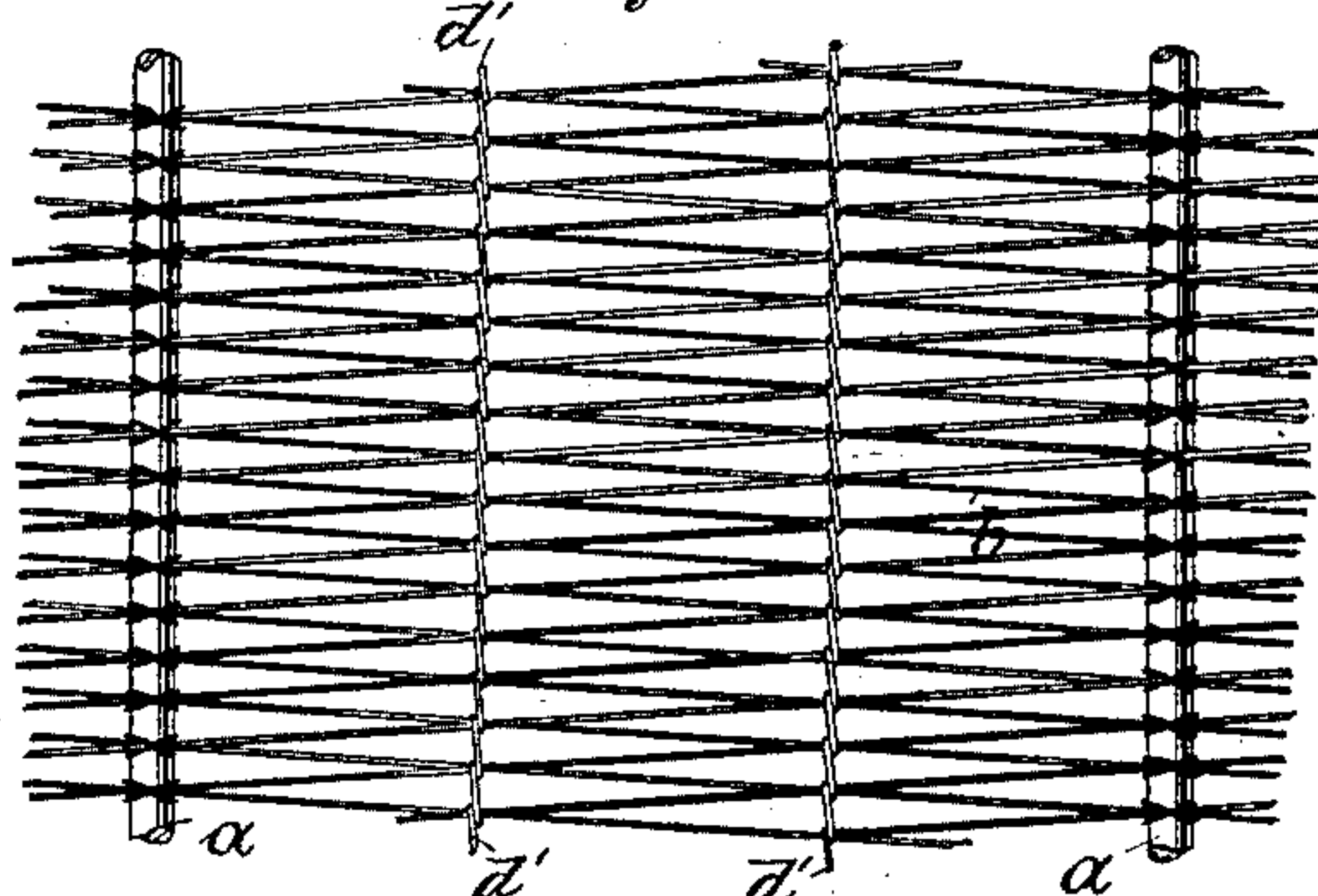
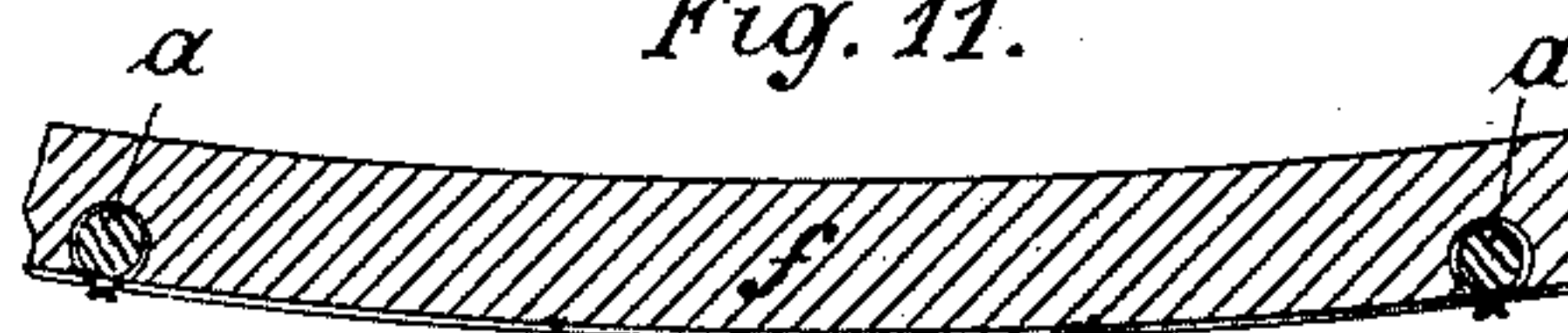


Fig. 11.



Inventor:
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per J. E. Boulton
his atty.

UNITED STATES PATENT OFFICE.

CARL RABITZ, OF BERLIN, GERMANY.

RECEPTACLE FOR THE PRESERVATION OF GRAIN AND SUCCULENT MATERIALS.

SPECIFICATION forming part of Letters Patent No. 339,211, dated April 6, 1886.

Application filed January 9, 1886. Serial No. 188,139. (No model.) Patented in England December 24, 1885, No. 15,882.

To all whom it may concern:

Be it known that I, CARL RABITZ, a subject of the King of Prussia, residing at Berlin, Prussia, German Empire, have invented certain new and useful Improvements in Receptacles Chiefly Designed for the Preservation of Grain and Succulent Materials; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

This invention relates to the construction of silos and analogous receptacles or reservoirs for storing fodder, grain, &c., and also adapted for containing fluids.

The object of this invention is not only to provide a mode of construction by which a tight receptacle or reservoir or silo is obtained, but whereby the structure itself is made much stronger with comparatively thin inclosing-walls.

The invention consists, essentially, in forming the walls of a silo or reservoir by means of a metallic skeleton, as a foundation for the mortar or other substance or compound, or the said mortar or other substance or compound and a lining therefor, substantially as hereinafter fully described.

The invention further consists in the details of construction and in the combination of parts which constitute the structure, substantially as hereinafter fully described.

In the accompanying drawings, forming a part of this specification, and in which like letters of reference indicate like parts, Figure 1 is a vertical section of a group of silos under a common roof. Fig. 2 is a transverse section of a cylindrical silo, or a member of a group of such. Figs. 3, 4, and 5 show by like views convenient modes of grouping cylindrical silos together. Figs. 6, 7, and 8 show by like views a single silo of square form in cross-section and groups of such silos, respectively. Fig. 9 shows, also, by a cross-section a group of silos of hexagonal form in cross-section. Fig. 10 shows by a cross-section the mode of connecting the various groups of silos together. Fig. 11 is a like view of a portion of the

wall of a cylindrical form; and Figs. 12, 13, and 14 show various modes of constructing the skeleton walls, Figs. 10 to 14 being drawn to a larger scale than the other figures.

The skeleton frame for the inclosing-walls of the silo or group of silos is constructed of metal rods and a metallic net-work, to serve as a foundation for the building material employed in the construction of the said walls, this skeleton foundation being so arranged as to offer the necessary or a maximum resistance to the power exerted thereon by the contents of the silo under a most judicious use of materials of which the walls are constructed, so that, for instance, a silo having a diameter of four or five meters and a height of twelve or fifteen meters, may be constructed with an inclosing-wall of a thickness of nine centimeters at the base and five centimeters at top, that will offer the necessary resistance to the pressure exerted thereon. Such ribs, it will readily be understood, may therefore be built at a cost considerably less than would be the case otherwise, or than is the case in such structures when built in the usual manner, and form at the same time structures that will be proof against atmospheric influences, and fluid-tight.

These structures may have any desired form in cross-section—such as cylindrical, square, hexagonal, or other suitable or desired form—and may be arranged and connected in groups, as shown in the drawings.

The skeleton for the inclosing-walls of the silo or group of silos may be constructed in various ways; and it consists, essentially, of a series of vertical metallic rods or bars, *a*, which may be arranged at suitable distances from one another, according to the diameter or capacity of the structure. They may be connected together by metallic bands *c* of proper form at suitable intervals. One of said bands is applied at opposite ends of the series of vertical rods *a*, and any required number of such bands may be applied intermediately of the end bands. This skeleton frame-work is secured to or in the foundation by embedding the ends of the vertical rods *a* therein, and said connecting-bands are secured to the rods by any suitable or desired means, either bolts or rivets, or they may be bound thereto by means of wire.

When a number of silos are grouped together, their contacting faces are formed by a single row of vertical rods, *a*, as shown, for instance, in Fig. 10, at *a' a'*. The skeleton frame, constructed as described, is then bound or surrounded by a wire net-work, which may be formed by spirally winding a single wire, *b*, thereon, as shown in Fig. 12, and tying the wire to the vertical rods by means of wire, as shown at *b'*. To give greater strength to this wire net-work, the convolutions of the wire *b* may be bound together by one or more intermediate wires, *d*, where the vertical rods *a* are at a certain distance from one another. The net-work of wires may also be formed by crossing the spirally-wound wires *b*, as shown in Fig. 13, and binding them together at their points of intersection by wires *d*. Finally, instead of this arrangement, the rods *a* may be covered with a wire-netting, *b*, made by machinery or by hand in the usual manner, as shown in Fig. 14, the object of applying this wire net-work being not only to provide a foundation for holding the building material of which the walls are constructed, but also to impart to the inclosing-walls the necessary power of resistance to the pressure exerted thereon.

It is obvious that by the means described the resisting-power is equally distributed over the entire surface of the inclosing-wall, and is of such a nature as to offer a much greater resistance to lateral pressure than a wall of ordinary construction of equal thickness.

When a woven-wire fabric is employed, I preferably wind the strips onto the framing in spiral convolutions and bind their edges together at suitable intervals by means of wire.

When a number of silos are grouped together, the wire jackets of the frame thereof are interlaced, as shown at *a' a'*, Fig. 10, whereby the entire group of silos are firmly bound to each other from top to bottom.

Instead of the wire netting or jacket, the frame bars or rods *a* may be connected by single boards of metal to produce the skeleton frame, and instead of surrounding the vertical bars by means of the wire or wire-netting this may be applied on the inside of said bars or rods *a*, as will be readily understood.

This skeleton frame, when erected on the foundation, is finally lined with any suitable building material, the said lining, *f*, being preferably about nine centimeters thick from the bottom upward, and gradually diminishing to a thickness of five centimeters at top. It is obvious, however, that I do not wish to

limit myself to the thickness of wall described, as it is obvious that this will vary with the capacity of the silo; but for a silo of the dimensions hereinbefore given it will be found of sufficient thickness.

The lining may consist of a mixture of lime and gypsum, to which may be added sand, glue, or dextrine, hair, iron scraps, iron filings, or short pieces of wire; or it may consist of hydraulic cement or lime, trap-rock, tripolite, mixed with sand, pulverized slags or cinders, or ashes, and the above-described metallic substances; or it may consist of asphaltum, natural or artificial, with the addition of air-slaked lime, hydraulic lime, cement, sand, and pulverized cinders, &c. The skeleton frames may also be lined inside as well as outside with one or more layers of overlapping roofing-tiles properly jointed together, laid in one or the other materials or compositions hereinbefore described, and jointed thereby. Instead of ordinary roofing-tile, this massive or solid lining may be of specially prepared and glazed tiles, and the said tiles may be molded from the materials or compositions hereinbefore described. Finally, this outer and inner lining for the walls may be composed of beton or cement, concrete, or of burned tiles formed with one of the building materials or compounds referred to.

A group of silos may have a common roof, as shown in Fig. 1; and it will readily be understood that the silos constructed as described may be employed for storing other substances than those commonly stored in silos, as well as for storing fluids.

What I claim is—

1. A silo or receiver the walls whereof are formed of a metallic skeleton frame composed of vertical rods or bars *a* and a reticulated connecting-netting secured to the rods or bars, made of wire or metal rods and lined with a suitable material or compound, such as mortar, cement, asphalt, compounds, &c., or with tiles or flags, substantially as described.

2. The grouping of two or more silos by the interlacing of their skeleton walls at the contacting points of the reticulated or net-work surfaces of said skeleton wall, to firmly interlace the several structures, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

CARL RABITZ.

Witnesses:

PAUL BOECK,
B. ROY.