

No. 762,564.

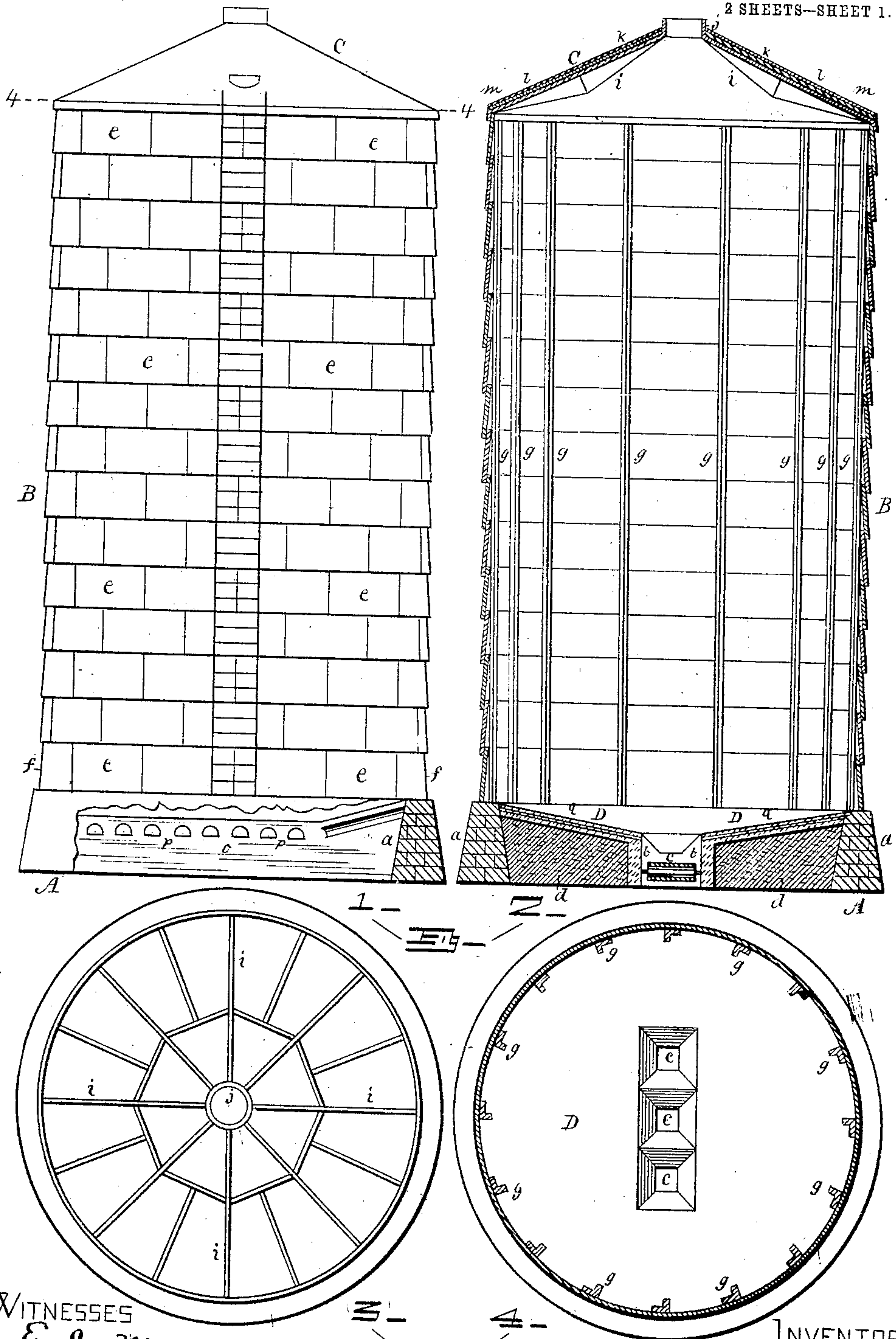
PATENTED JUNE 14, 1904.

C. A. P. TURNER.
GRAIN TANK.

APPLICATION FILED NOV. 24, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



WITNESSES

E. C. Moore
S. M. Dickey

INVENTOR

Claude A. P. Turner
By J. W. Powers Atty

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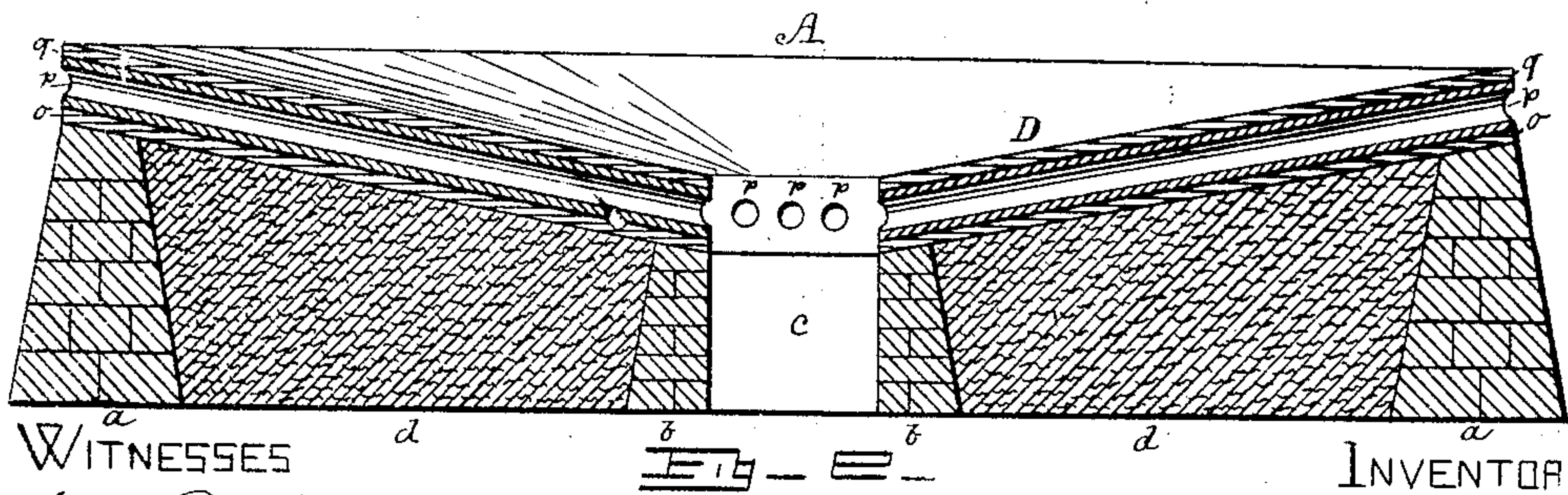
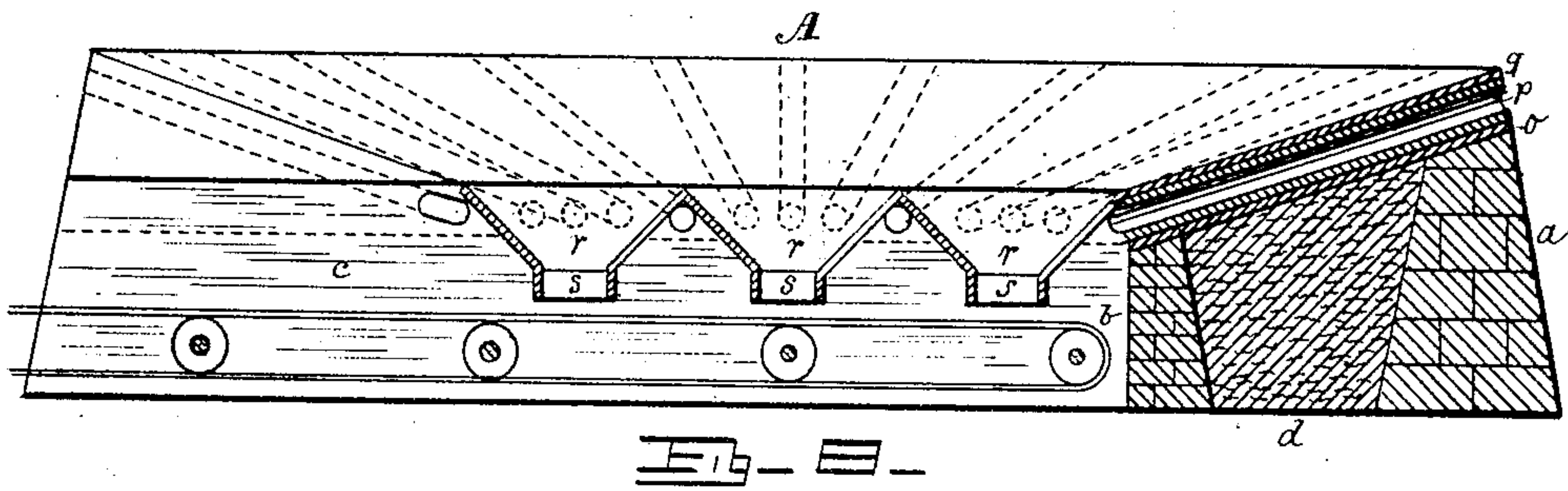
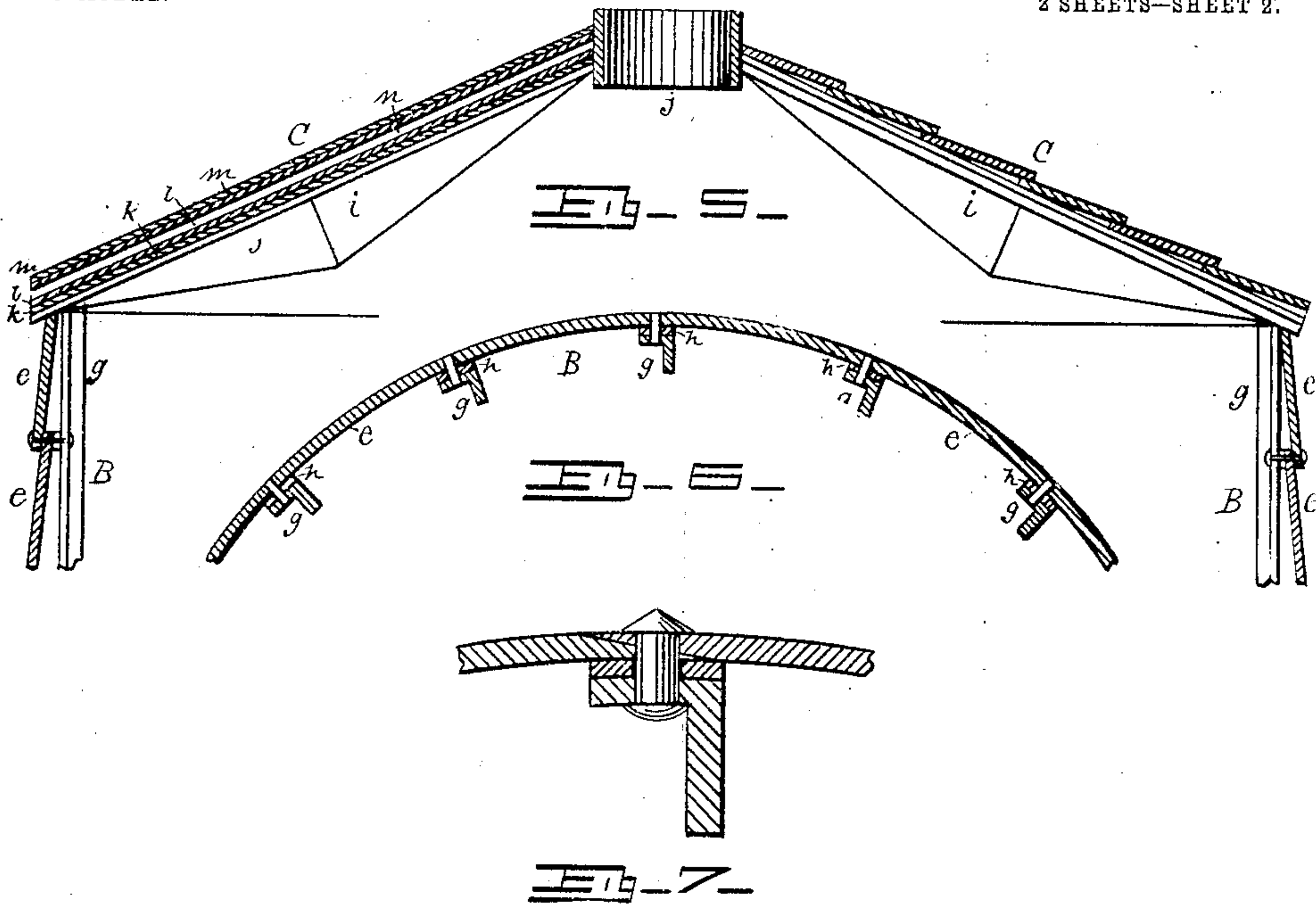
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S. M. Dickey
E. G. Dickey.

INVENTOR

Claude A. P. Turner
By J W Powers
Atty

UNITED STATES PATENT OFFICE.

CLAUDE A. P. TURNER, OF MINNEAPOLIS, MINNESOTA.

GRAIN-TANK.

SPECIFICATION forming part of Letters Patent No. 762,564, dated June 14, 1904.

Application filed November 24, 1902. Serial No. 132,691. (No model.)

To all whom it may concern:

Be it known that I, CLAUDE A. P. TURNER, of Minneapolis, county of Hennepin, and State of Minnesota, have made new and useful Improvements in Grain-Tanks, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates particularly to cylindrical grain-tanks, my purpose being to overcome some of the defects common to grain-tanks of this class.

In cylindrical grain-tanks as at present constructed it is a common practice to use plates much heavier than are necessary to withstand the lateral thrust of the grain in order to retain their shape under the side friction of the grain when filling and emptying them. It is also a common practice in the construction of cylindrical grain-tanks to lap the plates outward at their upper edges for convenience in calking.

In my construction I use side plates of sufficient strength to withstand the lateral thrust of the grain and stiffen them against buckling vertically under the grain friction by means of vertical ribs located at suitable intervals, as shown in the drawings. (See Figs. 2 and 4.)

Another defect in cylindrical grain-tanks as at present constructed is in the construction of their roof-shells, which being of metal are good conductors of heat and being exposed to the direct rays of the sun subject the upper surface of the grain to considerable variation of temperature, accompanied by condensation upon the outer side of roof, which I avoid somewhat by constructing my roofs of non-conducting material—such, for example, as concrete and expanded metal covered with the usual coating of pitch and gravel or of tiles supported by a suitable framework of metal, which tiles are in turn covered with the before-mentioned pitch and gravel.

Again, experience with concrete bottoms of grain-tanks laid upon sand filling shows a considerable amount of damaged grain either as the result of moisture working through the concrete or by condensation upon the

floor due to the cement being of a lower temperature than the grain thereupon.

In my construction I lay a course of concrete upon the exterior wall, the interior walls and the sand filling lying between the said exterior and interior walls, upon which concrete I place a course of hollow tiles, upon which tiles in turn I lay another course of cement, thus forming a dry floor.

In the drawings, Figure 1 is a side elevation of my tank and a sectional view of its foundation; Fig. 2, a vertical section of the tank foundation and floor; Fig. 3, a top view with the roof-covering removed; Fig. 4, a horizontal section of Fig. 1, taken on the line 4 4; Fig. 5, an enlarged vertical section of the roof; Fig. 6, a fragmentary horizontal section of the shell; Fig. 7, another fragmentary section of the shell, a cross-section of one of the ribs and of a washer; and a relief view of a rivet; Fig. 8, a vertical section of the base or foundation, taken longitudinally with the vault; and Fig. 9, the same, but taken transversely to the vault.

Similar letters refer to similar parts throughout the several views.

A is the foundation; B, the tank; C, the roof, and D the floor.

The foundation A consists of the exterior wall *a*, which supports the superstructure, the interior walls *b*, which walls form the vault *c*, into which the grain falls and from which it is drawn in emptying the tank, and of the sand filling *d*, lying between the said exterior and interior walls. Having constructed the foundation A, I erect thereon the tank B, which tank rests upon and is supported by the exterior wall *a*.

The construction of the tank B is as follows: Taking a requisite number of steel plates *e* of the proper weight to form a circle of the desired diameter, I scarf their ends and rivet them together end to end, thus forming my first or lower section *f*. To this lower section *f* I rivet other plates, thus building my tank to the required height, always having the lower edges of the plates overlap (lap outside) the upper edges of the plates next below them, thus producing horizontal joints

adapted to shed water and rendering calking unnecessary. To stiffen the plates and to prevent their buckling vertically by the grain friction when filling and emptying the tanks, I erect vertical ribs *g* at suitable intervals, to which I rivet the side plates *e*. In riveting the plates *e* to the ribs *g* I place washers *h* between the said plates *e* and the said ribs, using for the purpose iron washers or the like, through which I pass the rivets before driving, this construction allowing the use of lighter plates than are generally used.

The construction of the roof *C* is as follows: To the upper edge of the top section of plates I rivet or bolt the lower ends of my radial trusses *i*, (the rafters,) the upper converging ends of which I rivet or bolt to the ring *j*, which ring constitutes the opening in my roof through which the grain is spouted in filling my tank. Upon these trusses I lay a course of expanded metal *k*, upon which metal I spread a course of concrete *l*, which concrete in turn I cover with a coat of pitch and gravel *m*, thus forming a water-tight roof of comparatively non-conducting material, or I may lay a course of tiles *n* upon my concrete filling *l*, said tiles being arranged in radial courses extending from the ring *j* to the outer edge of the roof, (the eaves,) and therefore adapted to carry off any accumulation of moisture either from condensation therein or percolation thereto, and in turn cover my tiles with the usual coating of pitch and gravel, thus forming a non-condensing or dry roof.

The construction of the floor *D* is as follows: Upon the foundation *A* (which foundation consists of the exterior wall *a*, the interior walls *b*, and the sand filling *d*, lying between the said exterior and interior walls) I spread a course of concrete *o*, which concrete extends from the circumferential wall of the tank *B* to the vault *c*. Upon this course of concrete I then lay hollow tiles *p*, arranging them (preferably) in downwardly-inclined radial courses extending from the circumferential walls of the tank *B* to the vault *c*, in which their converging open ends terminate. These tiles in turn I cover with a second course of concrete or cement *q*, thus constructing an inwardly-inclined drained floor.

The hoppers *r* are formed of concrete or cement. They serve to conduct the grain into the vault *c* through suitable spouts *s*, from which in turn it passes to the conveyer.

What I claim as new and desire to secure is—

1. In a cylindrical grain-tank, the combination of the floor consisting of alternate layers of cement and tiles, a shell mounted thereon, constructed of steel plates scarfed and riveted at their sides, overlapped and riveted at their horizontal joints, and stiffened against buckling vertically by properly-disposed ribs to which the plates forming the said shell are

riveted; and a roof for said shell consisting of a metallic frame and cement, and having a waterproof covering, as pitch and gravel thereon, substantially as shown and described.

2. In a grain-tank of the character herein shown and described, the combination in the floor, of a course of concrete laid upon and supported by the exterior and interior walls, and the said sand filling intermediate the said exterior and interior walls; a course of tiles laid upon the said course of concrete, and a second course of concrete or cement laid upon the said tiles, substantially as shown and described.

3. In a grain-tank of the character herein shown and described, the shell constructed of steel plates scarfed and riveted at their ends, and stiffened vertically by properly-disposed vertical ribs, to which the said plates are riveted, substantially as shown and for the purposes specified.

4. In a grain-tank of the character herein shown and described, the combination of a base or foundation, said base or foundation consisting of exterior and interior walls of masonry; sand filling intermediate the said walls, a course of concrete or cement laid upon the said sand filling, a course of tiles laid upon the said course of concrete, and a covering of concrete or cement laid upon said course of tiles, and a tank mounted upon the said foundation, said tank consisting of scarfed, lapped and riveted plates forming a shell, and vertical ribs to stiffen the said shell; of the roof *C* consisting of a metal frame, a course of concrete or cement laid upon the said frame, a course of tiles laid upon the said course of concrete or cement, and a covering of pitch and gravel laid upon the said course of tiles, substantially as shown and described.

5. In a grain-tank of the character herein shown and described, the base or foundation consisting of exterior and interior walls, sand filling intermediate the said exterior and interior walls, a course of concrete or cement laid upon the said walls and filling, a course of tiles laid upon the said course of concrete or cement, and a covering of concrete or cement laid upon the said course of tiles, substantially as shown and for the purposes specified.

6. In a grain-tank of the character herein shown and described, having a foundation and a vault therein, the floor *D* consisting of a layer of concrete or cement laid upon the said foundation, tiles laid upon the said foundation, said tiles being arranged in radial courses and terminating in the said vault, and a second course or covering of concrete or cement laid upon the said tiles, substantially as shown and described.

7. In a grain-tank of the character herein shown and described the combination of the base or foundation *A* the tank *B* mounted

thereon, and the roof C; said base or foundation consisting of exterior and interior walls of masonry, sand filling intermediate the said walls, a course of concrete or cement laid upon the said sand filling, a course of tiles laid upon the said course of concrete or cement, and a covering of concrete or cement laid upon the said course of tiles; said tank consisting of scarfed lapped and riveted plates to form a shell, vertical ribs to which the said shell is riveted, and washers lying between the said shell and the said ribs, through which

the said rivets pass; and the said roof consisting of a metal frame, a course of concrete or cement laid upon the said frame, a course of tiles laid upon the said course of concrete or cement, and a cover of pitch and gravel laid upon the said course of tiles, substantially as shown and described.

CLAUDE A. P. TURNER.

Witnesses:

F. G. O'BRIEN,
E. J. O'BRIEN.