

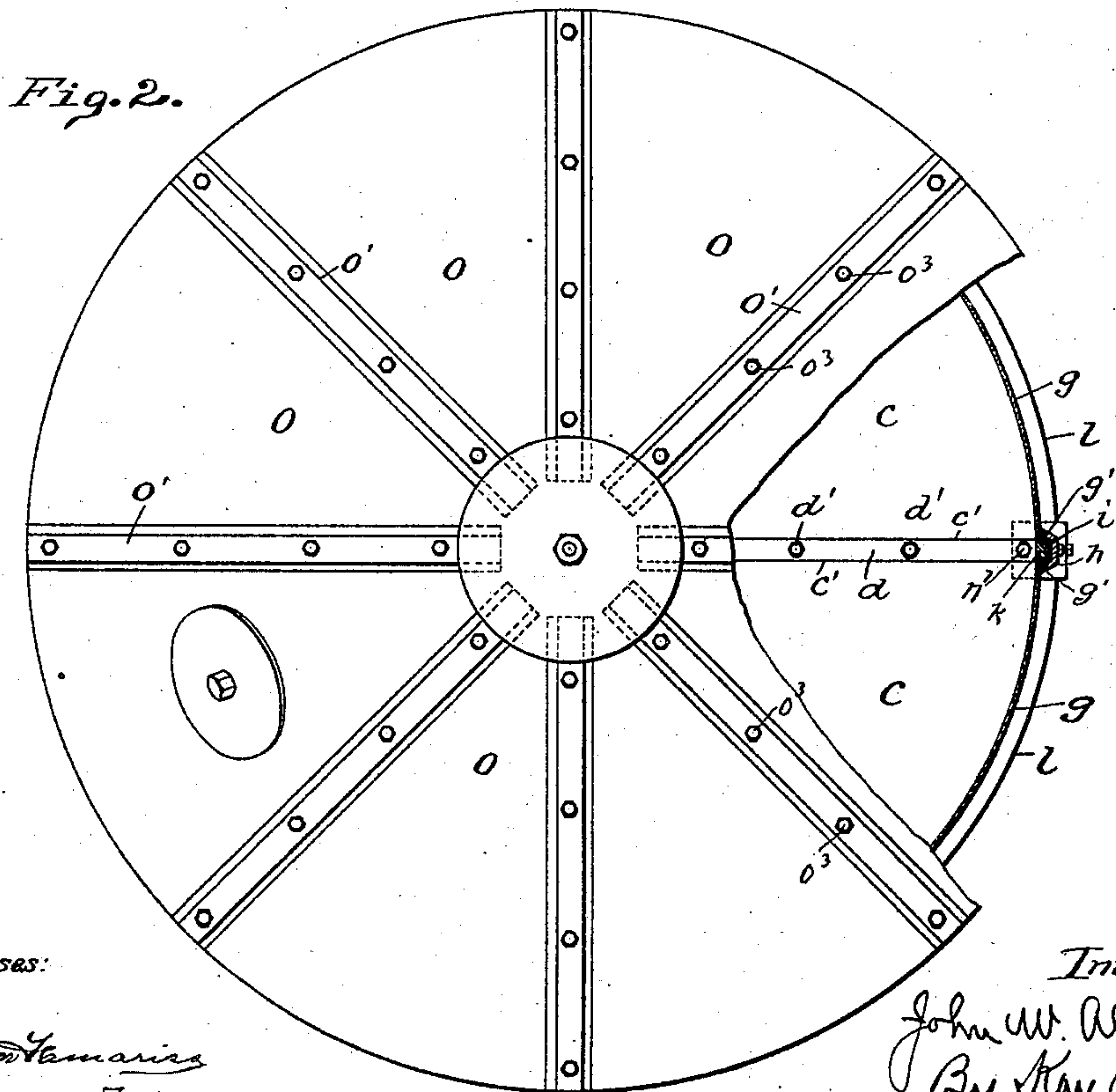
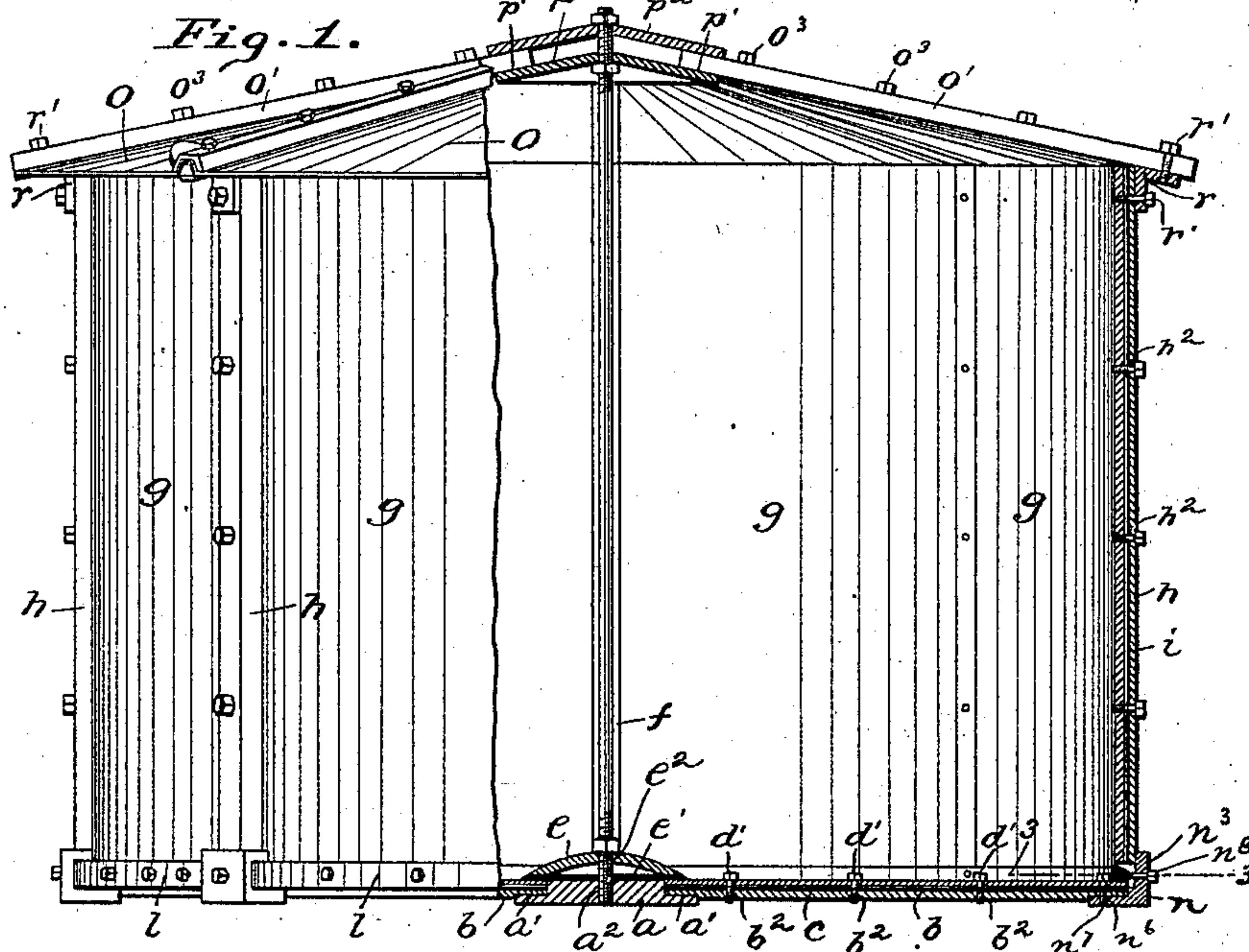
(No Model.)

3 Sheets—Sheet 1.

J. W. ABRAHAM'S.
TANK.

No. 577,097.

Patented Feb. 16, 1897.



Witnesses:

Walter Yarnall
Robert C. Totten

Inventor

John W. Abraham
By Kay & Totten
Attorneys.

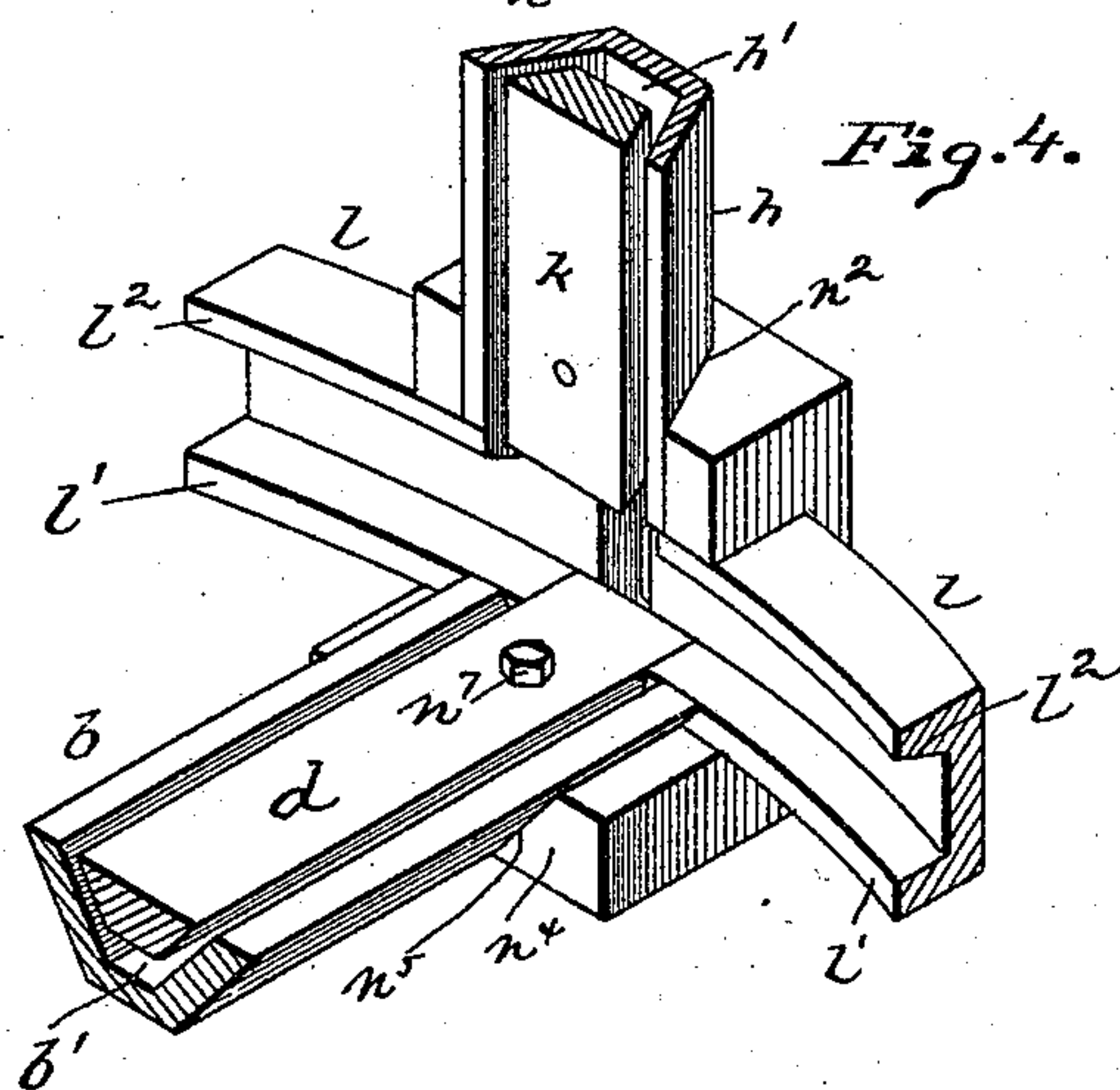
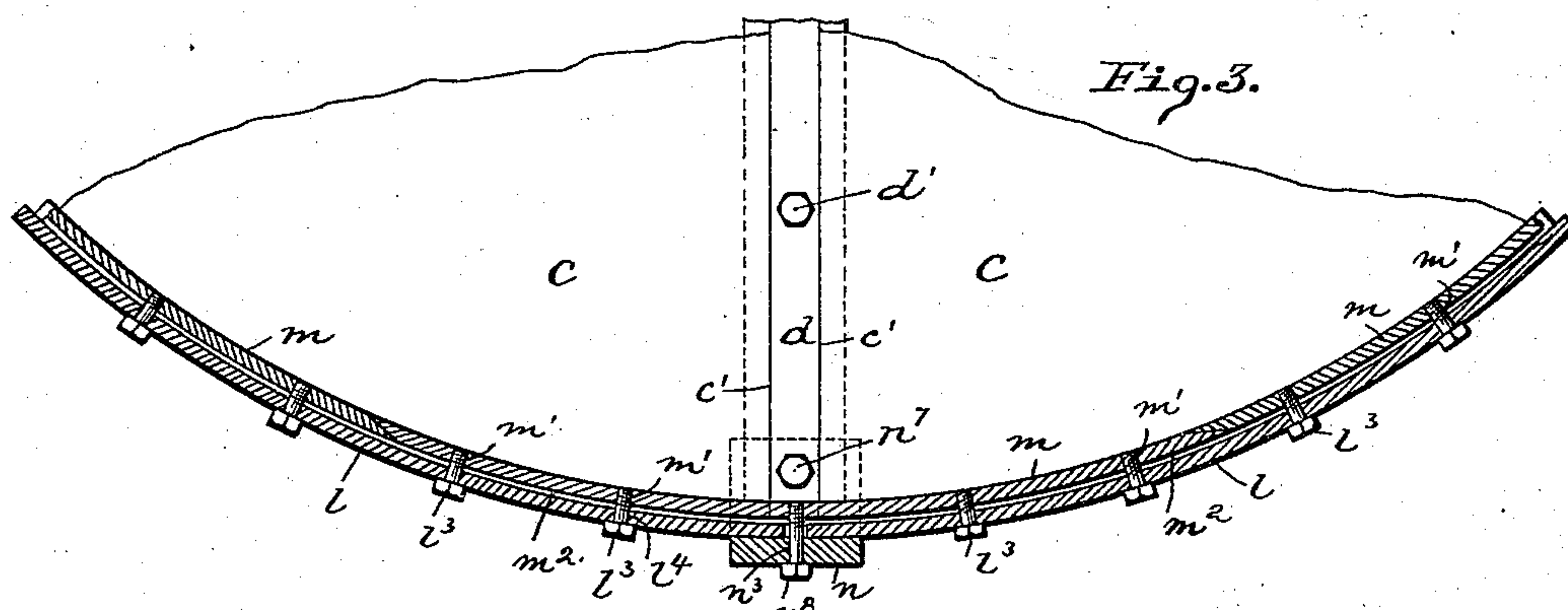
(No Model.)

3 Sheets—Sheet 2.

J. W. ABRAHAM'S.
TANK.

No. 577,097.

Patented Feb. 16, 1897.



Witnesses:

Walter H. Kamm
Robert C. Fother

Inventor:

John W. Abraham
By Kay & Fother
Attorneys.

(No Model.)

3 Sheets—Sheet 3.

J. W. ABRAHAMMS.
TANK.

No. 577,097.

Patented Feb. 16, 1897.

Fig. 5.

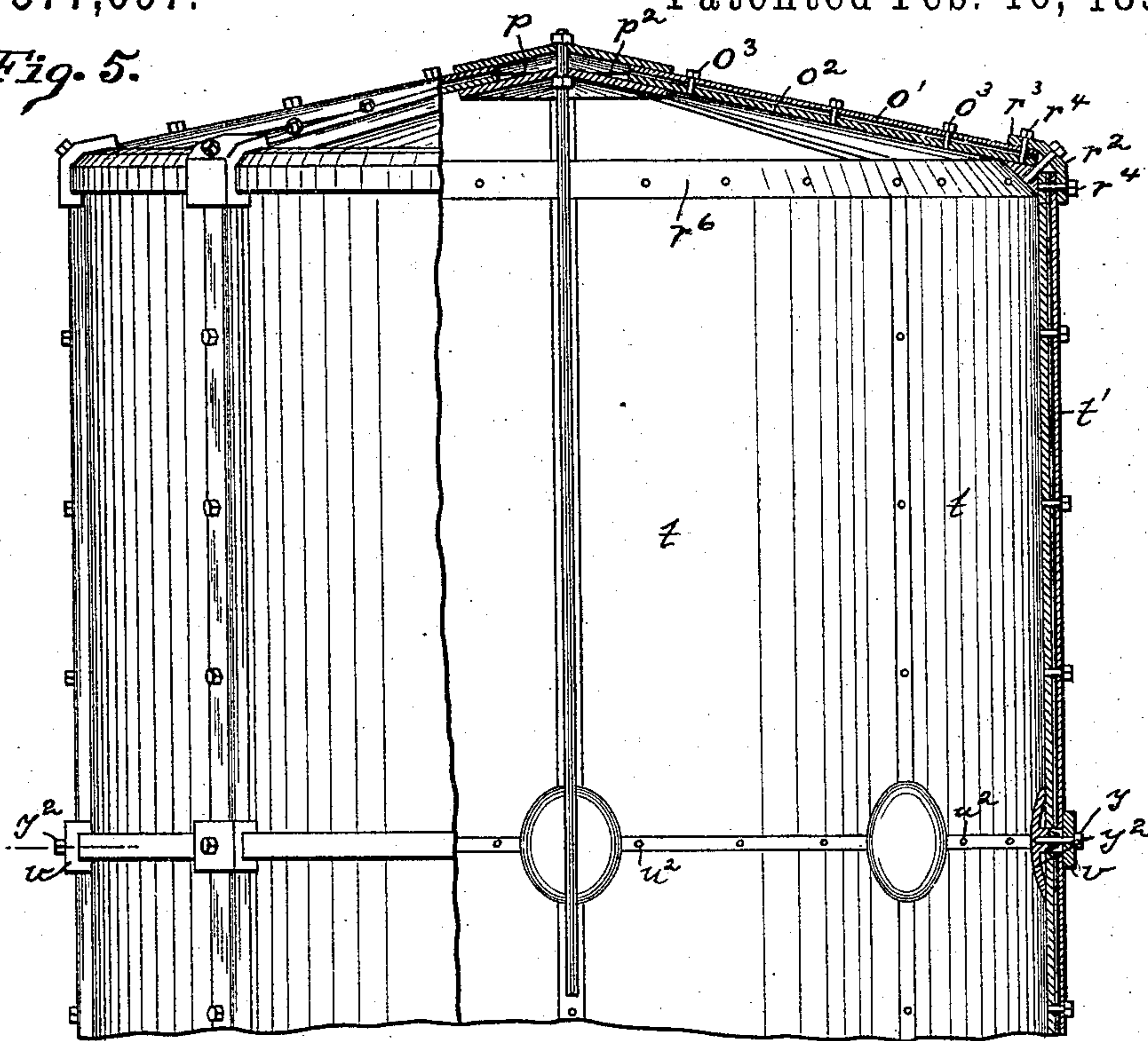


Fig. 6.

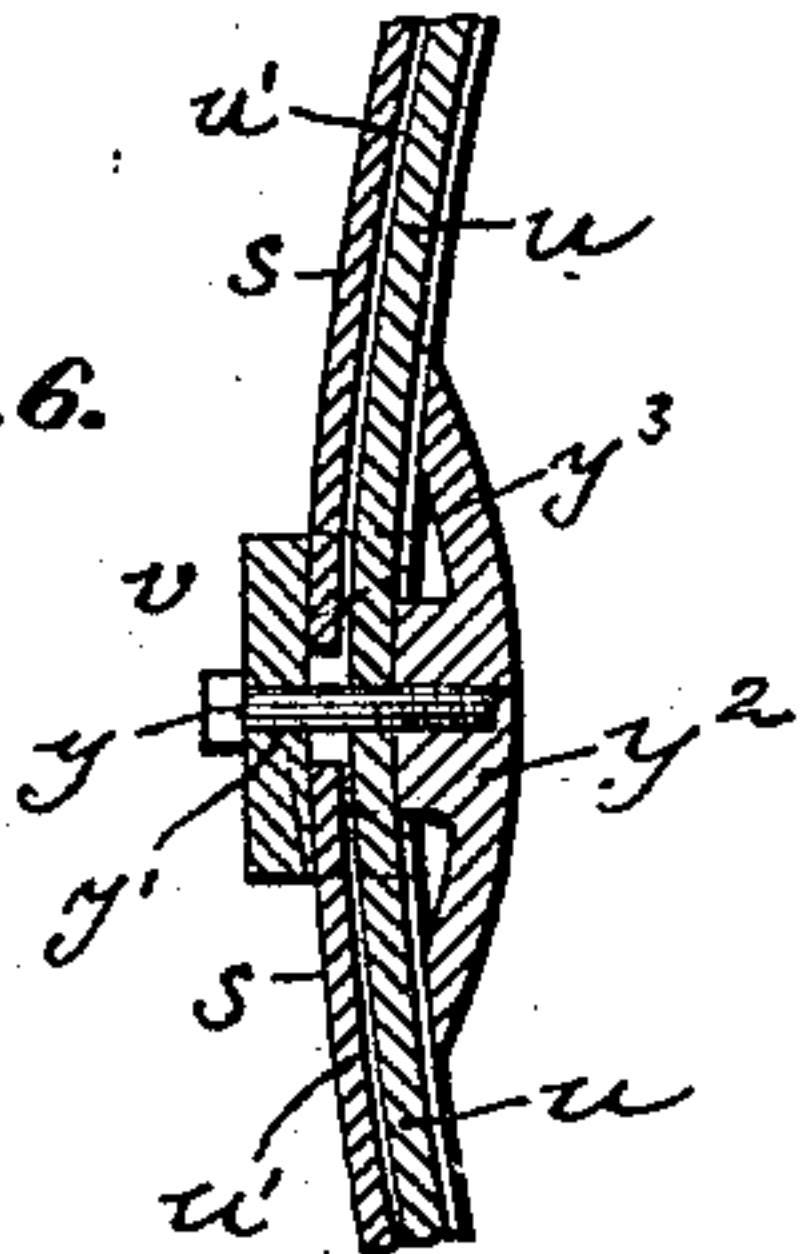


Fig. 8.

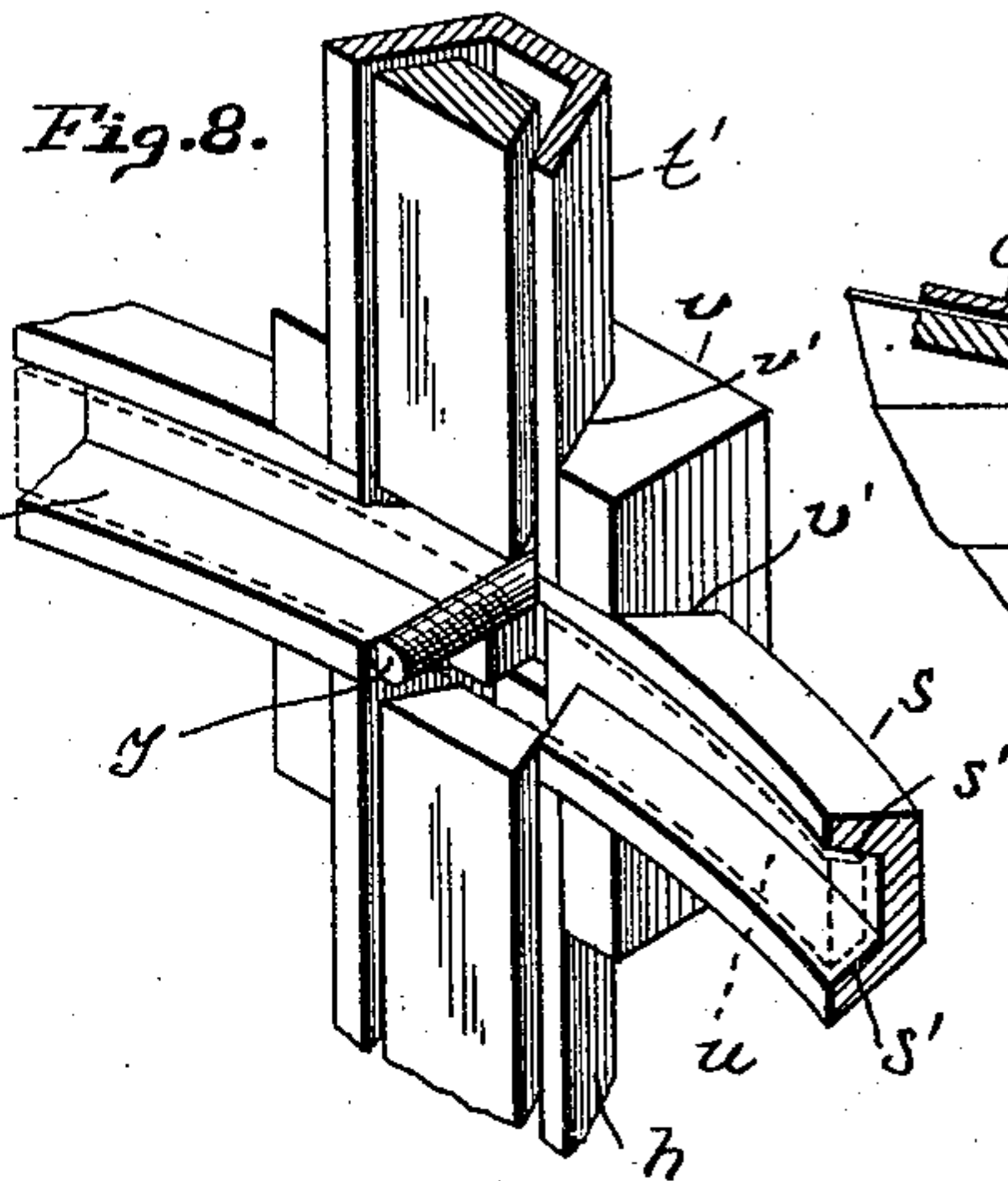


Fig. 7.

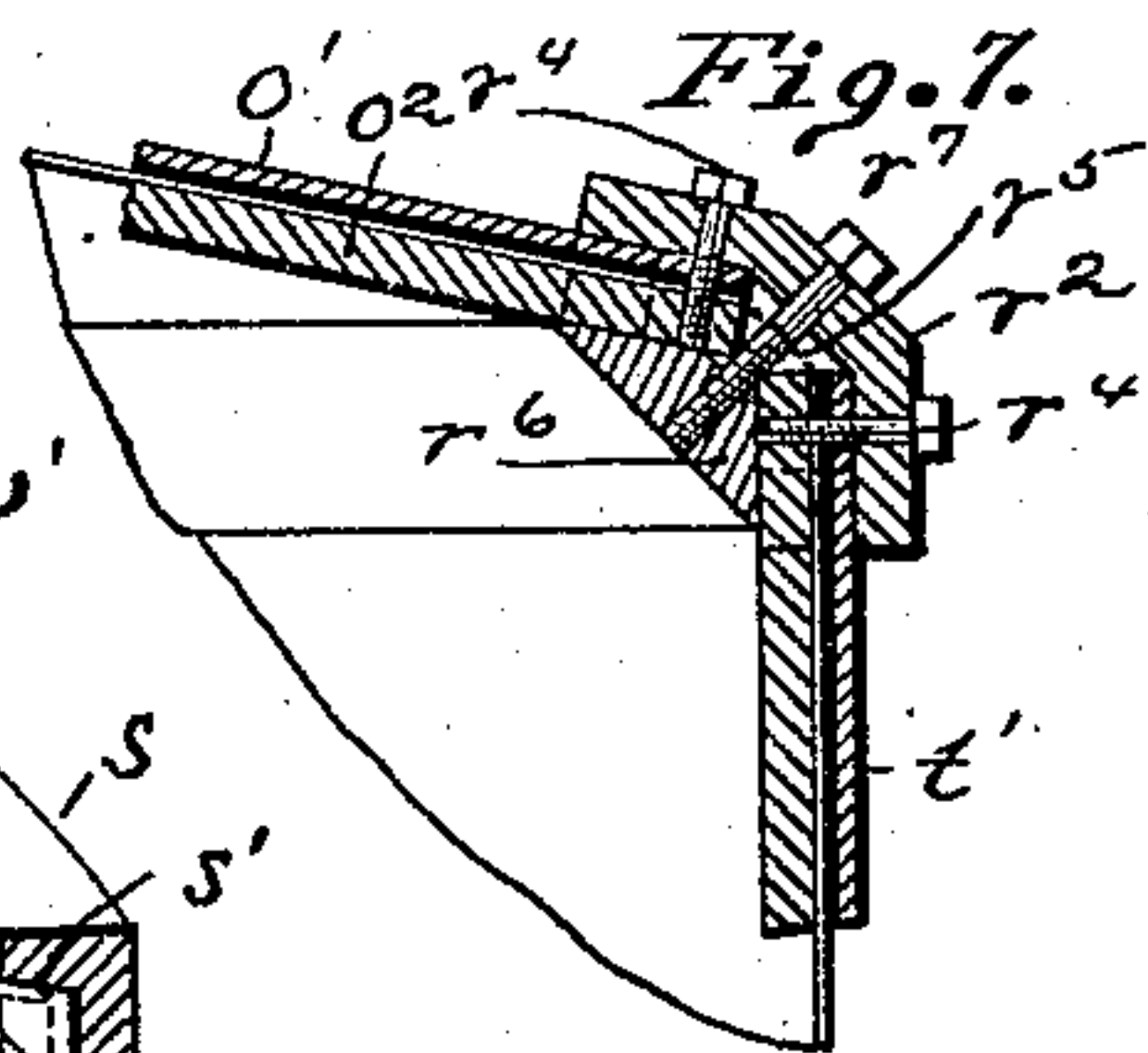
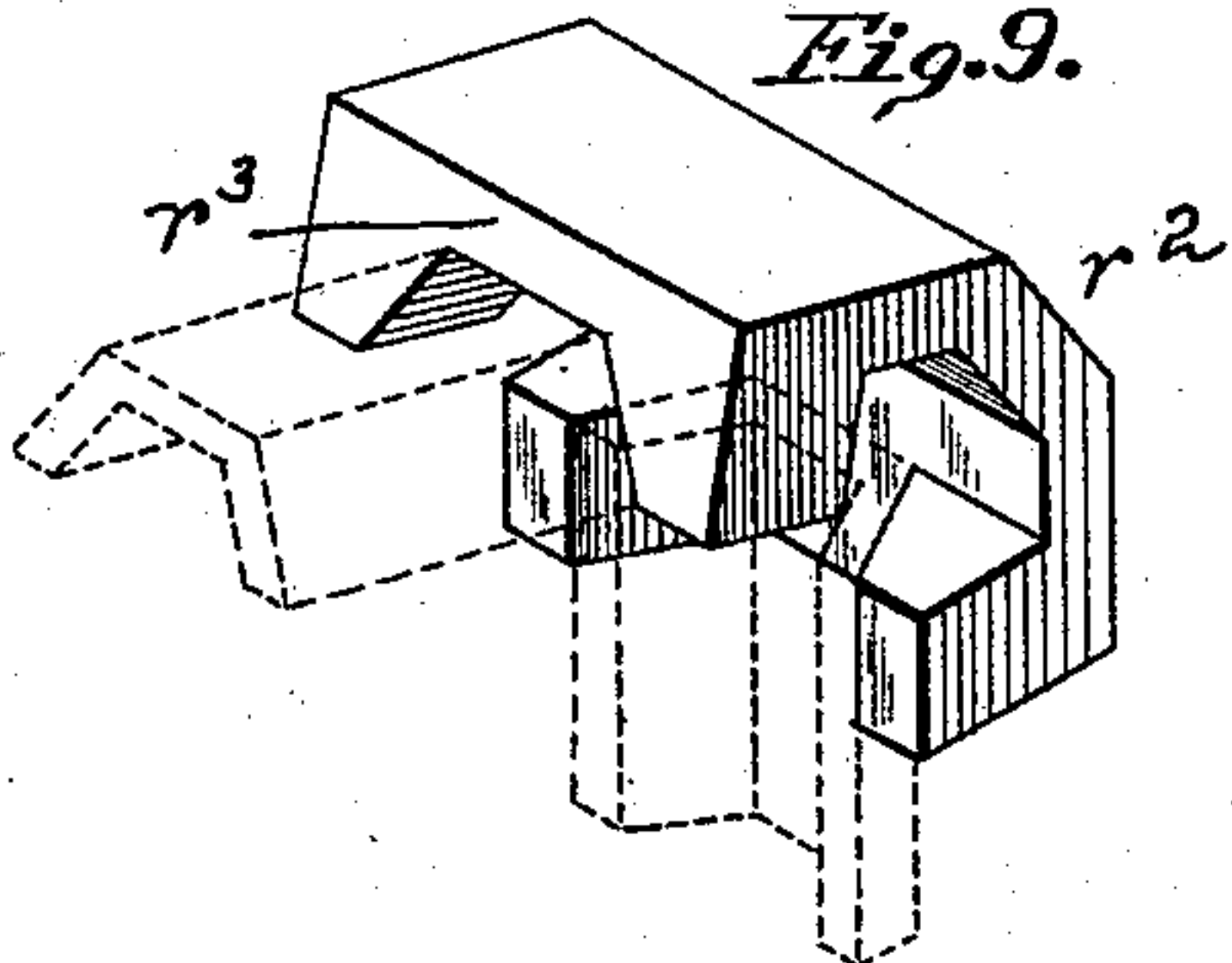


Fig. 9.



Witnesses:

Walter Yamarice
Robert C. Zoller

Inventor:

John W. Abrahamms
By Kay & Yotter
Attorneys.

UNITED STATES PATENT OFFICE.

JOHN WM. ABRAHAMS, OF ALLEGHENY, PENNSYLVANIA.

TANK.

SPECIFICATION forming part of Letters Patent No. 577,097, dated February 16, 1897.

Application filed June 20, 1896. Serial No. 596,294. (No model.)

To all whom it may concern:

Be it known that I, JOHN WM. ABRAHAMS, a resident of Allegheny, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Tanks; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to tanks for the storage of oil, water, gas, grain, or anything else to which it may be found applicable.

The general object of my invention is to provide a portable tank composed of a number of sections so bolted or clamped together as to form fluid-proof joints, and at the same time a tank which may be readily taken apart or put together again without the employment of skilled labor.

The invention comprises certain novel features, all of which will be fully hereinafter set forth and claimed.

To enable others skilled in the art to make and use my invention, I will describe the same more fully, referring to the accompanying drawings, in which—

Figure 1 is a side elevation, partly in section, of my improved tank. Fig. 2 is a top view, partly in section, of same. Fig. 3 is a section on line 3 3, Fig. 1. Fig. 4 is an enlarged perspective view of the shoe connecting the ribs. Fig. 5 is a side elevation, partly in section, of a tank with an extension added thereto. Fig. 6 is a section of the joint which unites the extension to the main body. Fig. 7 is a section showing the joint uniting the roof to main body of tank. Fig. 8 is an enlarged perspective view of the extension-joint, and Fig. 9 is a perspective view of shoe connecting the top to the sides.

Like letters indicate like parts in each of the figures.

I will first describe the construction of the bottom of the tank.

The letter *a* designates a circular base-piece which has the seats *a'* formed around its outer edge, said seats being preferably outwardly flaring. The base *a* has the central threaded openings *a²*. Fitting within the seats *a'* and radiating from the base *a* as a center are the ribs *b*. These ribs *b* correspond in cross-section to the shape of the seats *a'*, so that when placed with their ends in said seats they fit

neatly therein. The ribs *b* have the channels or grooves *b'* formed therein, said channels being preferably outwardly flaring. Threaded openings *b²* are formed at suitable intervals in the ribs *b*. These ribs may be formed of rolled metal.

The bottom proper is composed of a series of sheet-metal sectors *c*. The radial edges of the sectors *c* are bent, as at *c'*, to engage the channels *b'* of the ribs *b*. A strip *c²* of tar-paper or suitable packing material is then placed in the channel *b'*, conforming to the shape of said channel. Metal bars *d* corresponding to the shape of the channels *b'* are then placed in the channels to hold the edges *c'* of the sectors *c* and the strips *c²* in said channels *b'*. In order to retain said bars *d* securely in place and to provide for the clamping of the edges *c'* securely, the threaded bolts *d* pass through openings in said bars *d* and through the threaded openings *b²* in the ribs *b*. The bars *d* have their upper faces flush with the upper edges of the ribs *b*, so that an even bottom is obtained. In this manner I obtain very tight joints between the sectors, which under ordinary circumstances will preclude all leakage, but in case any leakage should occur at any of the joints it is only necessary to tighten up the bolts at that particular joint. By forming the bottom of sectors joined in the manner described any leak may be readily located or corrected. The employment of sectors of sheet metal for the bottom enables me to use less material, as a number of sectors may be cut from one sheet of metal with but very little scrap. After the sectors *c* have been secured in place a circular piece of tar-paper *e'* is placed over the upper face of the base *a* and a circular plate *e* is then placed on said tar-paper. A threaded bolt *f* passes through an opening *e²* in the plate *e* and through the threaded opening *a²*, whereby said plate may be forced down against said base *a*.

I will now describe the manner in which the walls of the tank are constructed.

The walls are made up of a series of sections composed of the sheet-metal plates *g*. These plates *g* are connected together along their edges in a manner similar to the sectors *c*. The vertical ribs *h* are similar to the bottom ribs *b* and have the channels *h'* and open-

ings h^2 formed therein. The edges g' of said plates g are bent to engage the channels h' of the ribs h . Strips i of tar-paper are placed within the channels h' , and bars k are fitted into said channels and held therein by the threaded bolts, all in the same manner as in the construction of the bottom hereinbefore set forth. The bars k are also flush with the inner faces of the metal plates g composing the walls, so that the inner walls of the tank are even and smooth. In the same manner as in the case of the bottom joints if any leakage occurs it is only necessary to tighten up the bolts at the particular joint where the leakage occurs, when it is quickly checked.

The sides of the tank are connected to the bottom in the following manner: The number of vertical ribs h correspond to the number of the bottom ribs b , and said bottom and side ribs are first brought into coincidence with each other. Arc-shaped strips of metal l , having the inwardly-projecting flanges l' l^2 , engage the bottom sectors c and side plates g , respectively, around the bottom of the tank. The lower edges of the side plates g and outer edges of bottom sectors c are bent within the channels of the strips l when arc-shaped strips m are fitted within said channels. These arc-shaped strips m have threaded openings m' formed therein. Threaded bolts l^3 pass through openings l^4 in the strips l and through the threaded openings m' in the strips m . These strips may be formed of rolled metal. Tar-paper m^2 is interposed between the faces of the strips m and the sectors c and side plates g . At the points of coincidence of the vertical ribs h and the bottom ribs b are the shoes n . These shoes may be formed of cast-metal and consist of the upwardly projecting portion n' , having the seat n^2 , formed therein corresponding in shape to the vertical ribs h , and within which the lower end of said rib is adapted to fit. This upwardly-projecting portion n' has the opening n^3 formed therein. The inwardly-projecting portion n^4 of said shoe n has a seat n^5 formed therein corresponding in shape to the outer end of the radial rib b , and within which said rib fits. This inwardly-projecting portion n^4 has the threaded opening n^6 , and a threaded bolt n^7 passes through an opening b^2 and through the threaded opening n^6 . A threaded bolt n^8 also passes through the opening n^3 and through a threaded opening in the strip m . These shoes act to clamp the adjoining ends of the ribs b and h , and, in conjunction with the strips l m , securely unite the sides of the tank to the bottom. The ends of the adjoining strips l fit in the shoes n , as shown in Fig. 4. The joints between the sides and bottom are practically liquid-proof, and in case of leakage the bolts l^3 and n^7 n^8 provide means for tightening the joints at whatever point the leak may occur.

The roof of the tank is constructed in the same manner as the bottom, being composed

of sectors of sheet metal o , connected together by means of the ribs o' , the bars o^2 , and bolts o^3 . The ribs o' radiate from the central circular plate p , which has seats p' formed therein to receive the upper ends of said ribs o' . A plate p^2 is bolted to the plate p , tar-paper being interposed to form a tight joint. It will be clearly observed without further description how the roof is constructed, in view of the description of the construction of the bottom.

The roof is connected to the sides in the following manner: The coincident vertical ribs h and roof-ribs o' are connected by the angle-irons r , bolts r' connecting said angle-irons to said ribs. The sectors o , forming the roof, have their outer ends projecting beyond the sides of the tank to form a shed for carrying off the water. This manner of uniting the roof to the walls applies where an airtight joint is not needed, as in the case of oil-tanks, but where the tank is to be employed for the storage of gas, for instance, I provide the connection shown in Figs. 5 and 7. In that case I employ shoes r^2 , similar in all respects to the shoes n , except that the upwardly-projecting portion r^3 , having the seat to receive the outer end of the rib o' , is at an incline corresponding to the angle of incline of the ribs o' . Bolts r^4 connect the shoes r^2 to the ribs h o' . To form a tight joint, the strips of angle-iron r^5 surround the tank between the shoes r^2 . The upper edges of the side plates and outer edges of top segments engage with the flanges of the angle-irons r' . Circular strips of metal r^6 engage with the strips r^5 on the inside and break joint with same. Bolts r^7 connect these strips. I interpose the customary tar-paper between said strips.

In case a tank such as described has been erected and it is desired to add to its height, this may be done in the following manner: The upper edges of the side plates g are bent to engage the grooves s' in the arc-shaped ribs s . The upper or additional section which is to be added to the tank already constructed is made up of the sheet-metal plates t , which are connected by the ribs t' in the same manner as the lower section. The lower edges of the plates t are bent to engage the grooves s' of the ribs s , and strips u are then fitted in said grooves, the strips of tar-paper u' being first interposed. The threaded bolts u^2 unite the ribs s to the strips u and by tightening up said bolts a very tight joint is made between the plates g and t . Clamps v are employed to unite the adjacent ends of the ribs h , t' , and s , and said clamp accordingly has four seats v' , within which the ends of said ribs fit. A threaded bolt y passes through a threaded opening y' in the clamp v and through a plate y^2 on the inside of the tank. A washer of tar-paper y^3 is interposed between the plate y^2 and the inner walls of the tank. It is to be understood that the roof,

being constructed in substantially the same manner as the bottom, is included within the claims covering said bottom.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A tank having a bottom composed of a series of radial ribs, sectors of metal with their edges engaging said ribs, and means for securing said sectors to said ribs, substantially as set forth.

2. A tank having a bottom composed of a series of radial ribs having channels formed therein, sectors of metal with their edges engaging said channels, and bars fitting in said channels and secured to said ribs, substantially as set forth.

3. A tank having a bottom composed of a series of radial ribs, a central base having seats to receive the ends of said ribs, said ribs having channels formed therein, sectors of metal with their edges bent to engage said channels, bars fitting in said channels and secured to said ribs, a plate on said central base, and a bolt passing through said plate and base, substantially as set forth.

4. A tank having a bottom composed of a series of radial ribs having outwardly-flaring channels formed therein with flat bottoms, sectors of metal with their edges bent to engage said channels, dovetailed bars fitting in said channels, said ribs and bars having coincident openings and bolts passing through said openings, substantially as set forth.

5. A tank having its bottom and sides formed of sheet-metal plates, a curved metal strip having an inwardly-extending flange engaging the lower edges of the side plates and an inwardly-extending flange engaging the outer edges of the bottom plates on the exterior of the tank, a metal strip engaging the lower edges of the side plates and the outer edges of the bottom plates on the interior of the tank, and bolts passing through said strips, substantially as set forth.

6. A tank having its bottom and sides formed of sheet-metal plates, a curved metal strip having an inwardly-extending flange engaging the lower edges of the side plates and an inwardly-extending flange engaging the outer edges of the bottom plates on the exterior of the tank, a metal strip engaging the lower edges of the side plates and the outer edges of the bottom plates on the interior of the tank, packing interposed between said strips, and bolts passing through said strips, substantially as set forth.

7. A tank having its bottom and sides formed of sections of sheet-metal plates, ribs having channels therein, said plates having their edges bent to engage said channels, bars fitting in said channels and secured to said ribs, arc-shaped metal strips having inwardly-

extending flanges engaging the lower edges of the side plates and inwardly-extending flanges engaging the outer edges of the bottom plates on the exterior of the tank between said ribs, arc-shaped metal strips on the interior of the tank, bolts passing through said strips, and the clamping-shoes connecting the coincident side and bottom ribs, substantially as set forth.

8. A tank having its bottom and sides formed of sections of sheet-metal plates, ribs having channels therein, said plates having their edges bent to engage said channels, bars fitting in said channels and secured to said ribs, arc-shaped metal strips having inwardly-extending flanges engaging the lower edges of the side plates and inwardly-extending flanges engaging the outer edges of the bottom plates on the exterior of the tank between said ribs, arc-shaped metal strips on the interior of the tank, bolts passing through said strips, and clamping-shoes connecting the coincident side and bottom ribs, clamping-shoes having seats therein to receive the lower ends of the side ribs and the outer ends of the bottom ribs, and bolts for securing said shoes to said ribs, substantially as set forth.

9. A tank composed of an upper and lower section, said sections being made up of sheet-metal plates connected by vertical ribs, substantially as set forth, arc-shaped ribs having channels formed therein, the upper edges of the metal plates of the lower section being bent to engage said channels, and the lower edges of the upper section being bent to engage said channels, arc-shaped bars fitting in said channels and held therein, and clamping-shoes connecting the coincident vertical ribs and arc-shaped ribs, substantially as set forth.

10. A tank composed of an upper and lower section, said sections being made up of sheet-metal plates connected by vertical ribs in the manner set forth, arc-shaped ribs having channels formed therein, the upper edges of the lower section being bent to engage said channels, and the lower edges of the upper section being bent to engage said channels, arc-shaped bars fitting in said channels and held therein, clamping-shoes having seats therein adapted to engage the coincident vertical and arc-shaped ribs, and a bolt passing through said clamping-shoes and through a plate on the interior of the tank, substantially as set forth.

In testimony whereof I, the said JOHN WM. ABRAHAMS, have hereunto set my hand.

JOHN WM. ABRAHAMS.

Witnesses:

ROBT. D. TOTTEN,
ROBERT C. TOTTEN.