

(No Model.)

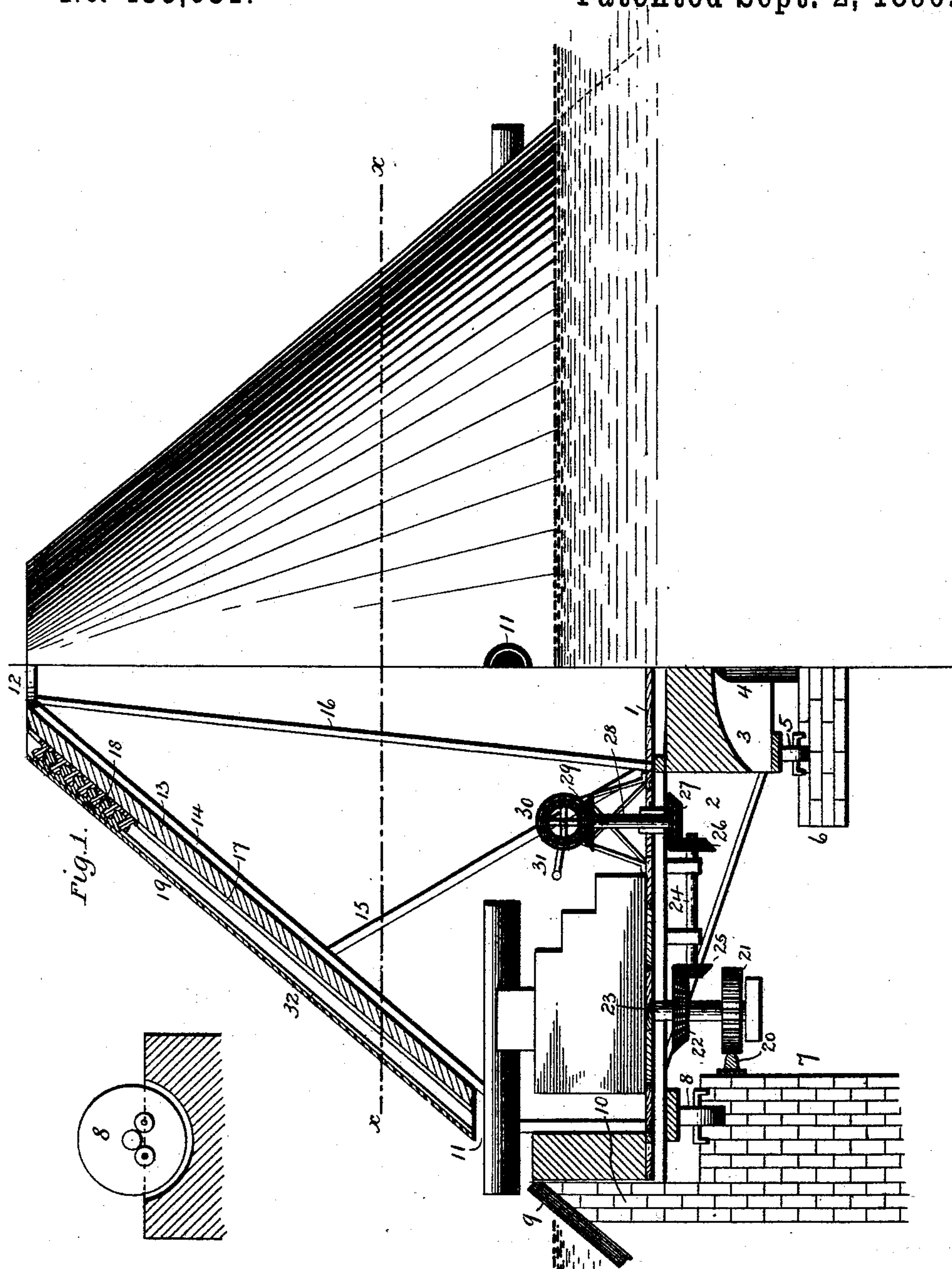
2 Sheets—Sheet 1.

A. D. HUFF.

REVOLVING FORTIFICATION FOR COAST DEFENSE.

No. 435,631.

Patented Sept. 2, 1890.



Witnesses:

Wm. S. Norton  
W. C. Brundage

Inventor.

Andrew D. Huff

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his Attorney

(No Model.)

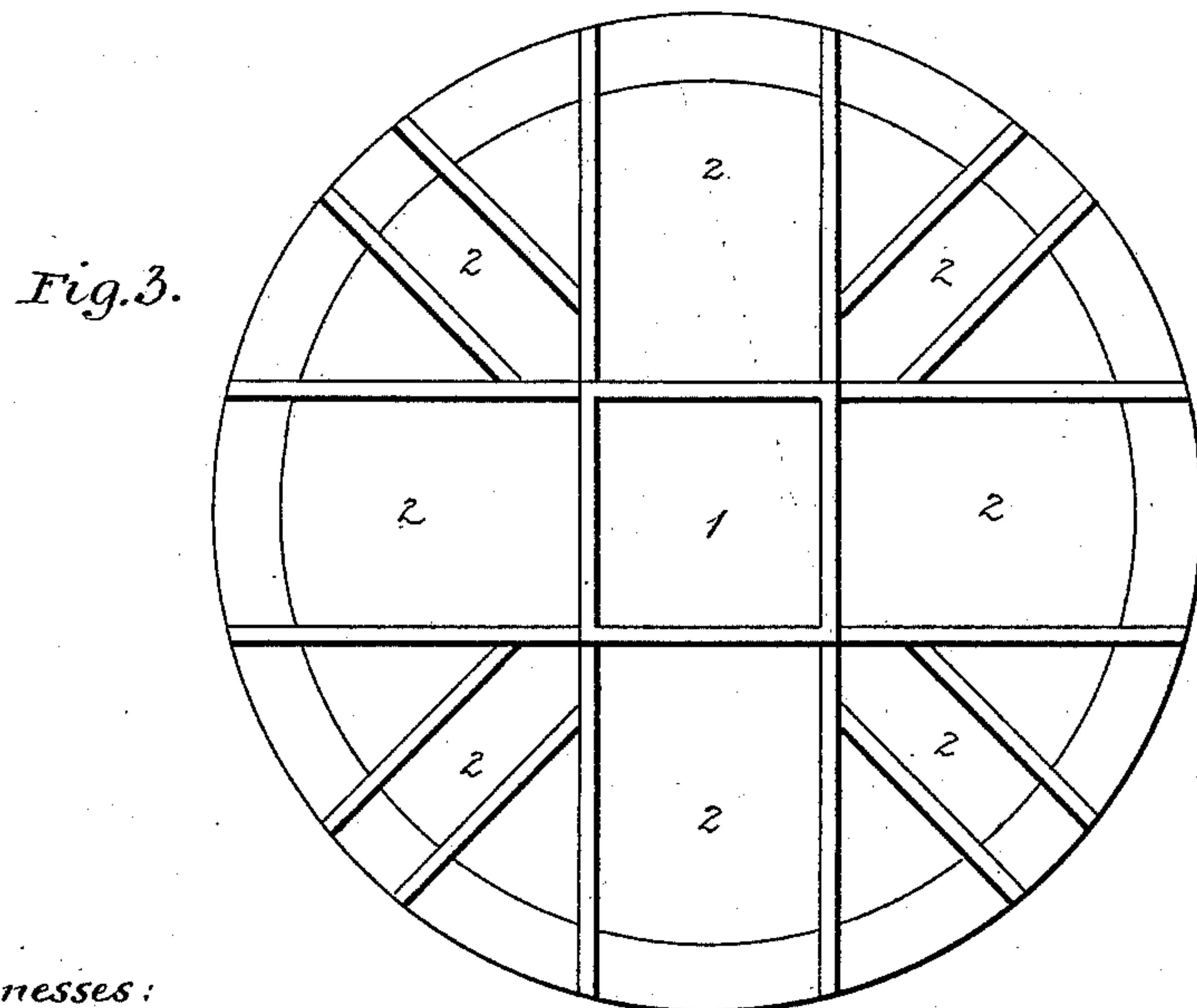
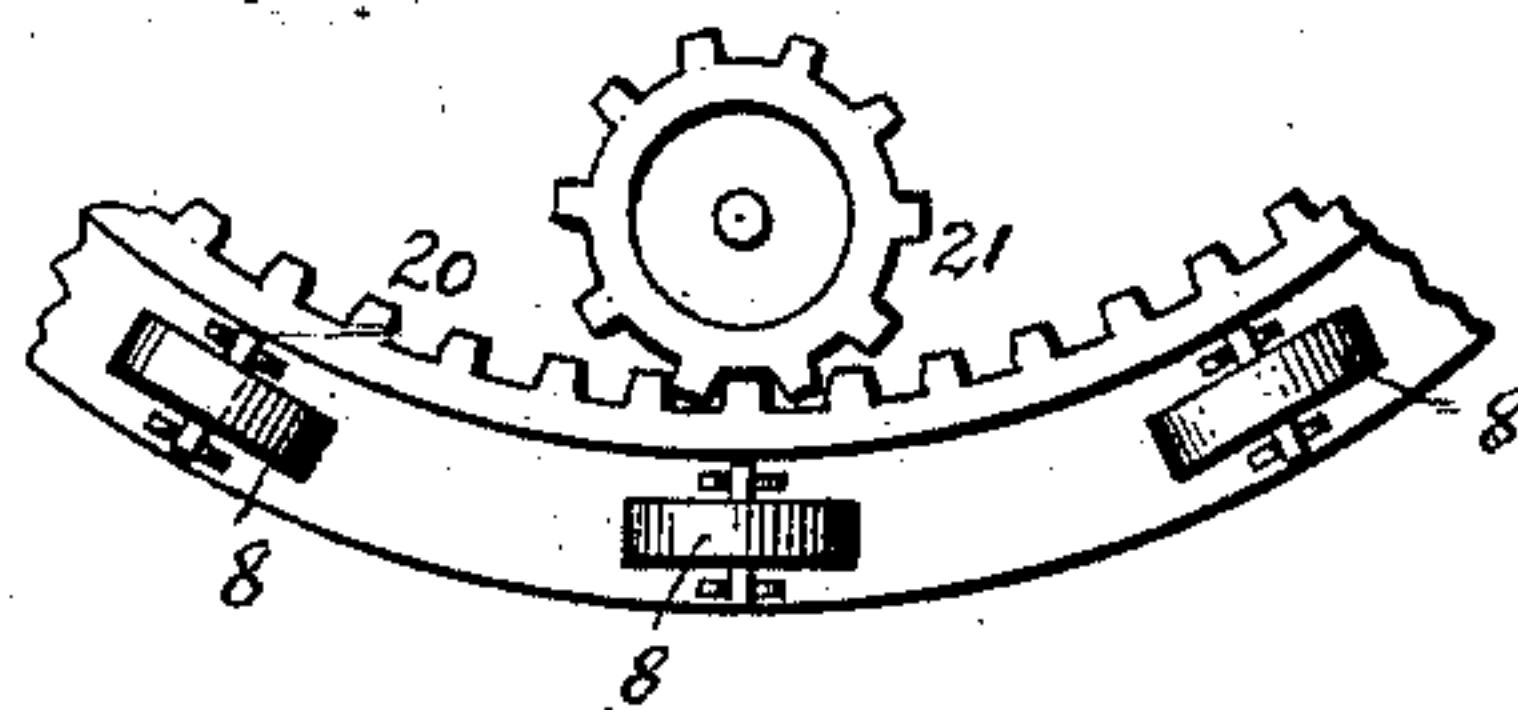
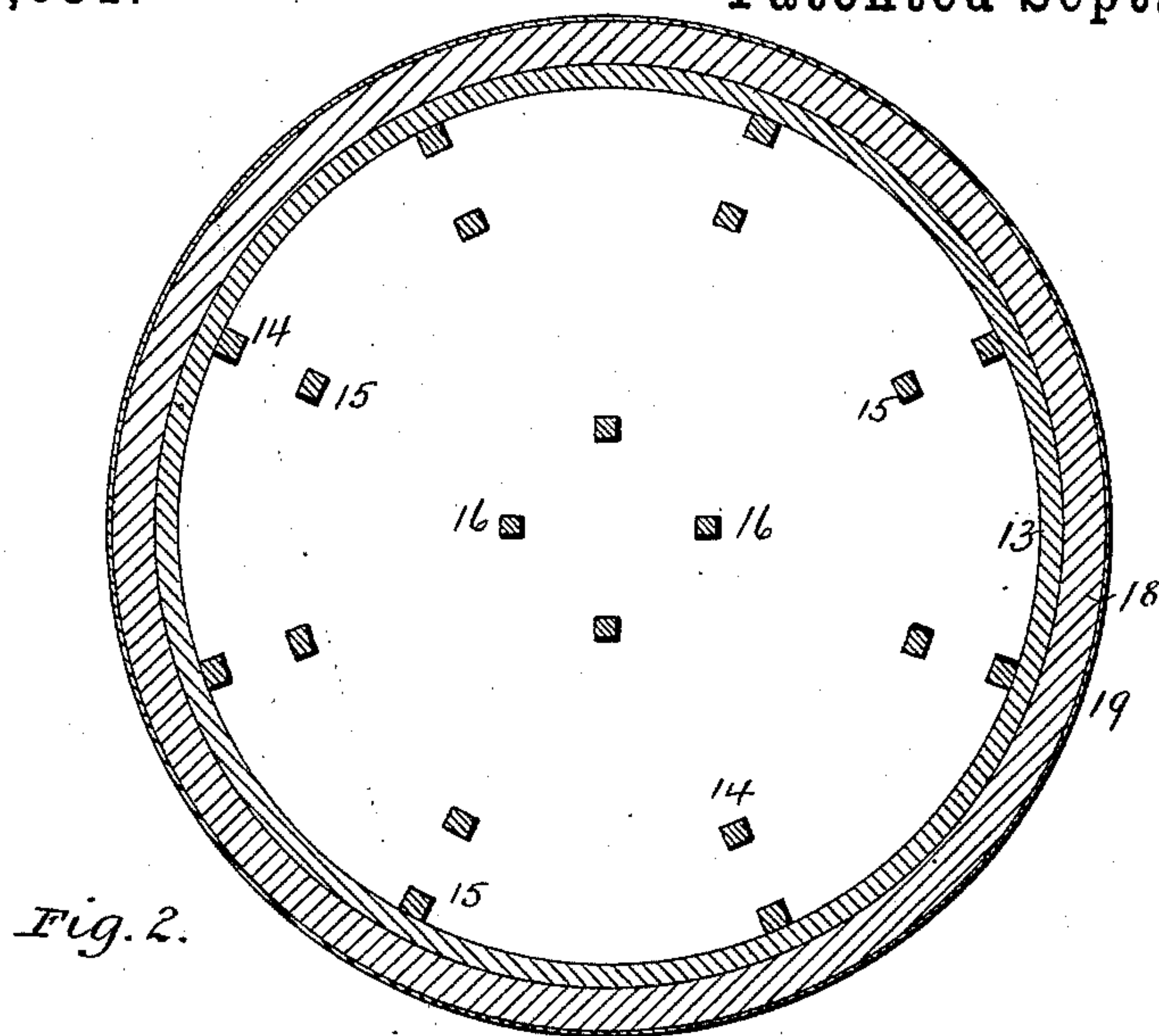
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Witnesses:

*Wm. H. Norton*  
*N. E. Prudden*

Inventor:

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by *James J. Tamm*  
his Attorney.



# UNITED STATES PATENT OFFICE.

ANDREW D. HUFF, OF DENVER, ASSIGNOR OF ONE-FOURTH TO ALFRED B. CASE, OF LEADVILLE, COLORADO.

## REVOLVING FORTIFICATION FOR COAST DEFENSE.

SPECIFICATION forming part of Letters Patent No. 435,631, dated September 2, 1890.

Application filed April 21, 1890. Serial No. 348,854. (No model.)

*To all whom it may concern:*

Be it known that I, ANDREW D. HUFF, a citizen of the United States, residing at Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Revolving Fortifications for Coast Defenses; 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.

This invention relates to that class of fortifications built of circular and conical form and supported upon a central pivot and rollers, whereby it may be revolved to cause its gun-ports to register with the muzzles of the guns within it at stated intervals, thus enabling such guns to be served with less danger from the fire of the enemy and enabling the structure to be revolved from within its interior with but a moderate expenditure of power.

To these ends my invention consists of the details of construction and arrangement of parts, as hereinafter described and claimed, and as shown in the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation, part in section, showing the special arrangement of gearing for revolving the fortification. Fig. 2 is a horizontal section on line  $xx$  of Fig. 1; and Fig. 3 a plan view with the floor removed, showing the arrangement of beams for supporting the floor. Fig. 4 shows a portion of a circular rack and a pinion gearing therewith for the purpose of revolving the fort.

In the drawings, 1 denotes the flooring supported by a base consisting of beams 2, made in sections and bolted and braced together, extending from a central block 3, resting on a pivot 4, and rollers 5 on top, of a pier 6, as shown in Fig. 1 of the drawings. In order to render the floor rigid and form a strong brace for the lower part of the fort, the beams 2 are tapered or inclined on the under side outwardly to the sides of the fort, as shown in Fig. 1. The pier 6 and wall 7 are arranged in a pit of such depth as will admit of the proper solidity to the foundation and support the floor of the fort below the ground. The

outer edge of the floor rests on rollers 8 upon the wall 7, as plainly seen in Fig. 1 of the drawings. The wall 7 of the foundation is provided with an extension 10, reaching to the surface of the ground and protected on its outer side by an armor of railroad-iron 9, extending into the ground and at an angle parallel with the pitch of the roof 32, as shown in Fig. 1 of the drawings.

The inner skin or layer of the roof of the fort is built up of oak boards bolted together, and consists of a vertical section 10, extending to the top of the railroad-iron, at which point one or more port-holes 11 are formed, and from the port-holes the roof tapers upwardly to a ring 12. The inner layer 13 of this part of the roof is also formed of boards supported by angle-irons 14 and iron braces 15 and 16, extending from the floor 1 to the roof and arranged in the manner shown to support the roof against contact of shot from the enemy's guns. On top of the tapering wood-work 13 is a steel sheathing 17, six inches thick, and on this two layers of railroad-iron 18, locked together, as shown, and upon the railroad-iron a steel plate 19 one foot thick. The railroad-iron 18 and the other slanting sections forming the roof of the fort are supported by the vertical section 10, which latter is supported by the floor 1, and the whole structure, save the armor 9, forming a protection for the stone-work, rests on the rollers 5 and 8 and kept thereon by the central pivot 4. It is of course understood that the under side of the floor is provided with suitable tracks for the rollers.

The guns may be worked in any well-known manner for loading and firing and prevented from rebounding, all as is well known and needless for me to describe. I provide such mechanism as may be operated by one man on the inside of the fort for revolving it from one position to another to bring the guns into the desired position, and to this end I provide the wall 7 on the inner side with a circular rack 20, with which meshes a gear-wheel 21 just below the bevel-pinion 22 on a vertical shaft 23, supported by hangers in any well-known manner. The horizontal shaft 24 carries bevel-pinions 25 and 26, the smaller



25 meshing with the pinion 22, and the larger  
 26 meshing with a pinion 27 on a vertical  
 shaft 28, extending up through the floor and  
 provided with a pinion 29 in gearing with a  
 5 wheel 30 on one end of a horizontal shaft,  
 having at its other end a crank 31, all sub-  
 stantially as shown. The part above the  
 floor of the revolving mechanism is held by  
 such suitable boxing and supports, as will be  
 10 readily understood by those skilled in the  
 art. From this construction and arrange-  
 ment of gearing one man can readily revolve  
 the fort and bring into position the several  
 guns as fast as they are fired and reloaded,  
 15 and thus all the guns may be fired at a sta-  
 tionary object.

I would have it understood that the fore-  
 going-described fortification can be used as  
 a turret for a ship with little modification in  
 20 the foundation, and do not therefore desire  
 to limit myself to any special location.

Having thus fully described my invention,  
 what I claim as new, and desire to secure by  
 Letters Patent, is—

25 1. A revolving fort having a tapering and  
 converging roof formed of an inner layer of  
 boards, a steel sheathing above said inner  
 layer, layers of railroad-iron above said sheath-  
 ing, and an outer steel sheathing, substan-  
 30 tially as shown and described.

2. In a revolving fort, a tapering and con-  
 verging roof consisting of an inner layer of  
 boards, a layer of sheet-steel, railroad-iron  
 locked together, and an outer steel sheathing  
 35 supported against inward strain by iron gird-

ers 14 and braces 15 and 16, extending from  
 the floor, substantially as described, and shown  
 by the drawings.

3. A revolving fort having a floor supported  
 by tapering beams extending from a central 40  
 block located centrally of said floor, rollers  
 8 and 5 on the under side of said floor and  
 block, in combination with the inner pier 6  
 and the outer wall 7 and mechanism whereby  
 the fort is revolved, all as set forth. 45

4. A revolving fort having a tapering and  
 converging roof formed of an inner layer of  
 boards, a steel sheathing above said inner  
 layer, layers of railroad-iron above said sheath-  
 ing, an outer steel sheathing, and a protective 50  
 armor extending divergingly from the line of  
 port-holes into the ground, as set forth.

5. The combination, with a revolving fort,  
 of the recessed block 3, located centrally of  
 and beneath the floor of the fort, roller 5 on 55  
 said block, foundation 6, located beneath the  
 block and having the pivot 4 thereon adapted  
 to enter the recess in the block, roller 8 on  
 said floor, the outer foundation 7, having  
 the rack 20 thereon, pinion 21, and gearing 60  
 mechanism, as described, adapted to be oper-  
 ated above the floor to revolve the fort, all  
 substantially as described.

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

ANDREW D. HUFF.

Witnesses:

THOMAS P. CAMPBELL,  
 ALFRED B. CASE.