

No. 625,795.

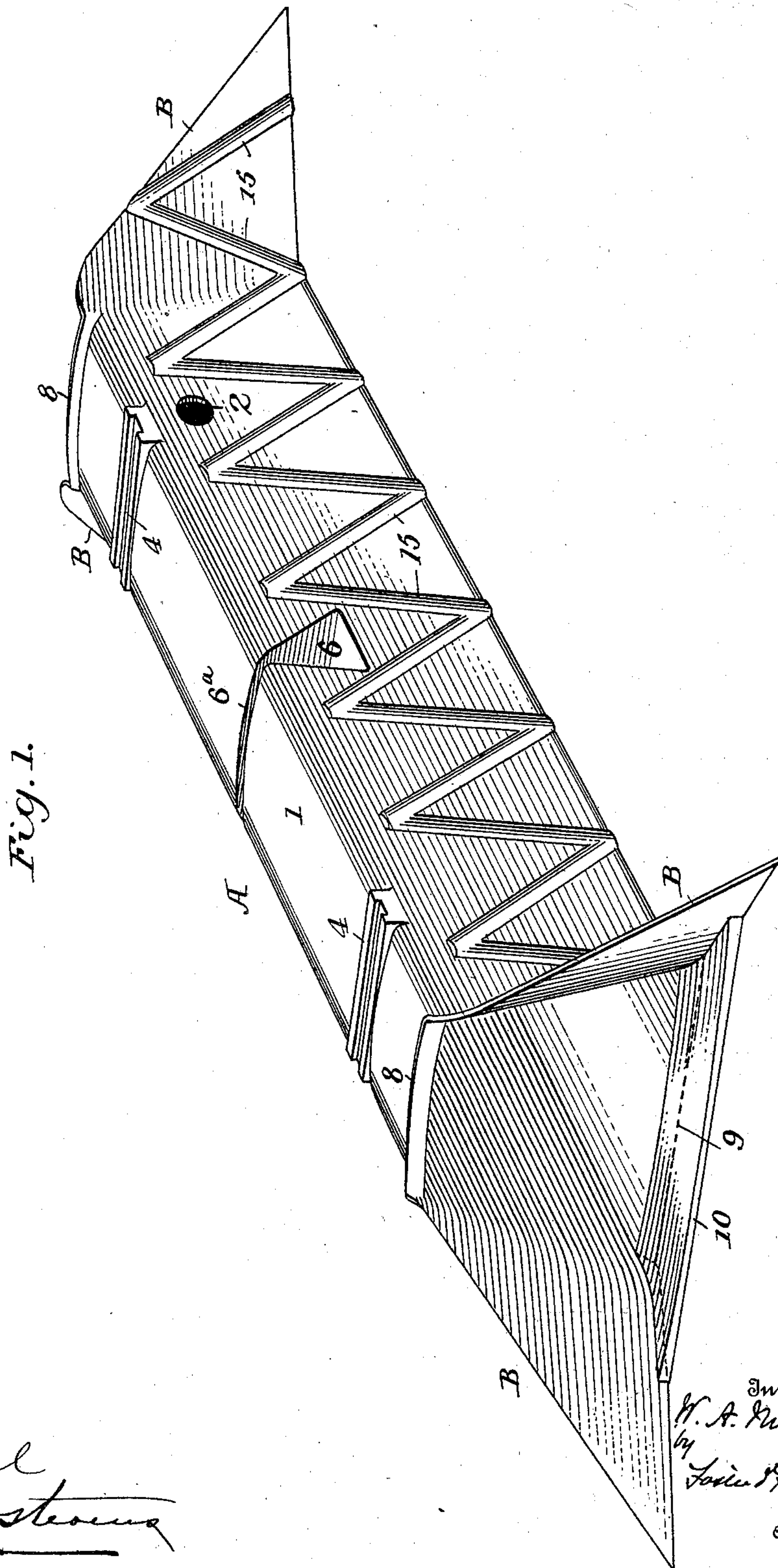
Patented May 30, 1899.

W. A. NICHOLS.
CULVERT.

(Application filed Apr. 20, 1898.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses

J. Hinkel
James Stearns

Inventor

W. A. Nichols

Forster & Freeman

Attorneys

No. 625,795.

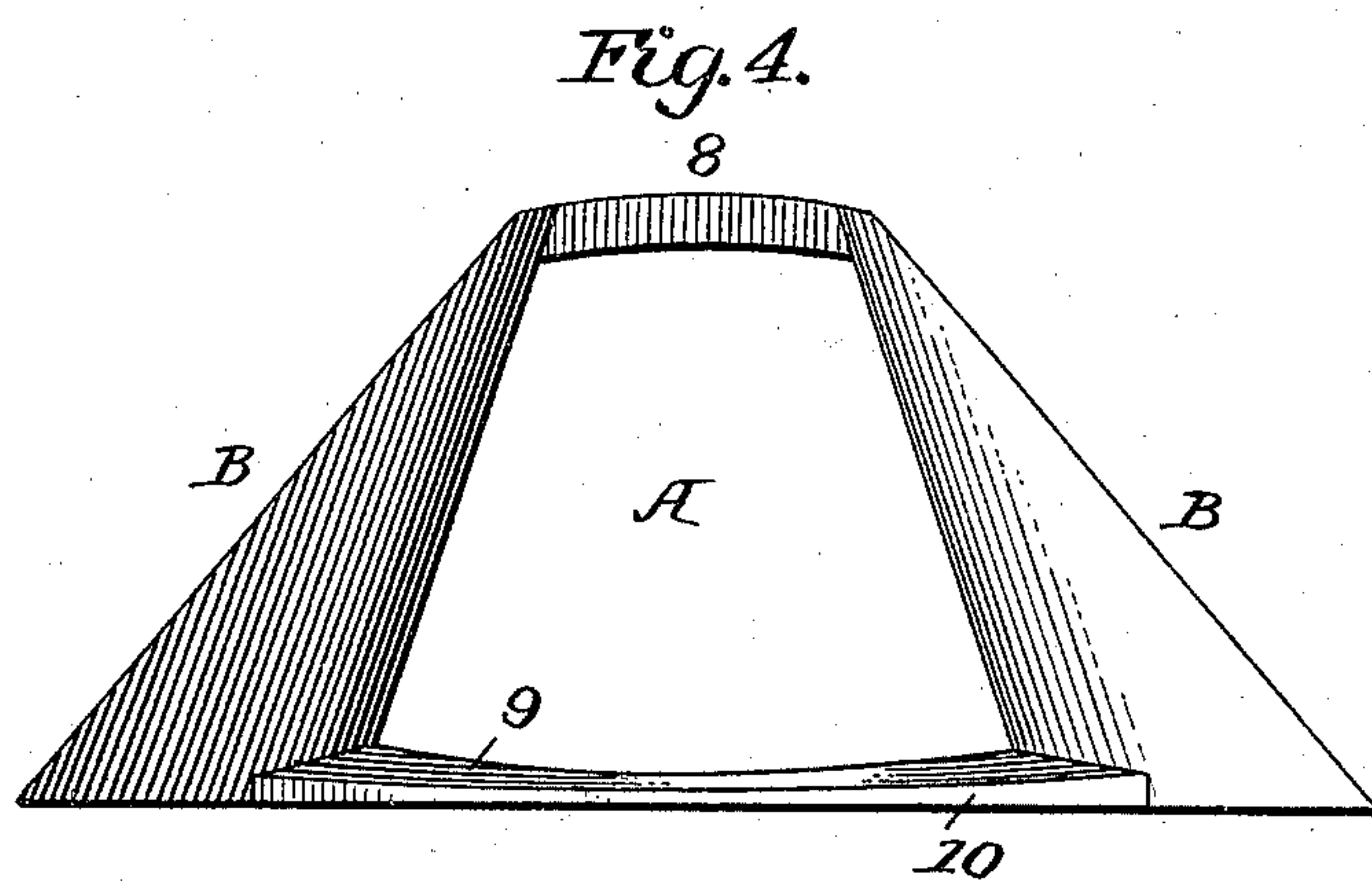
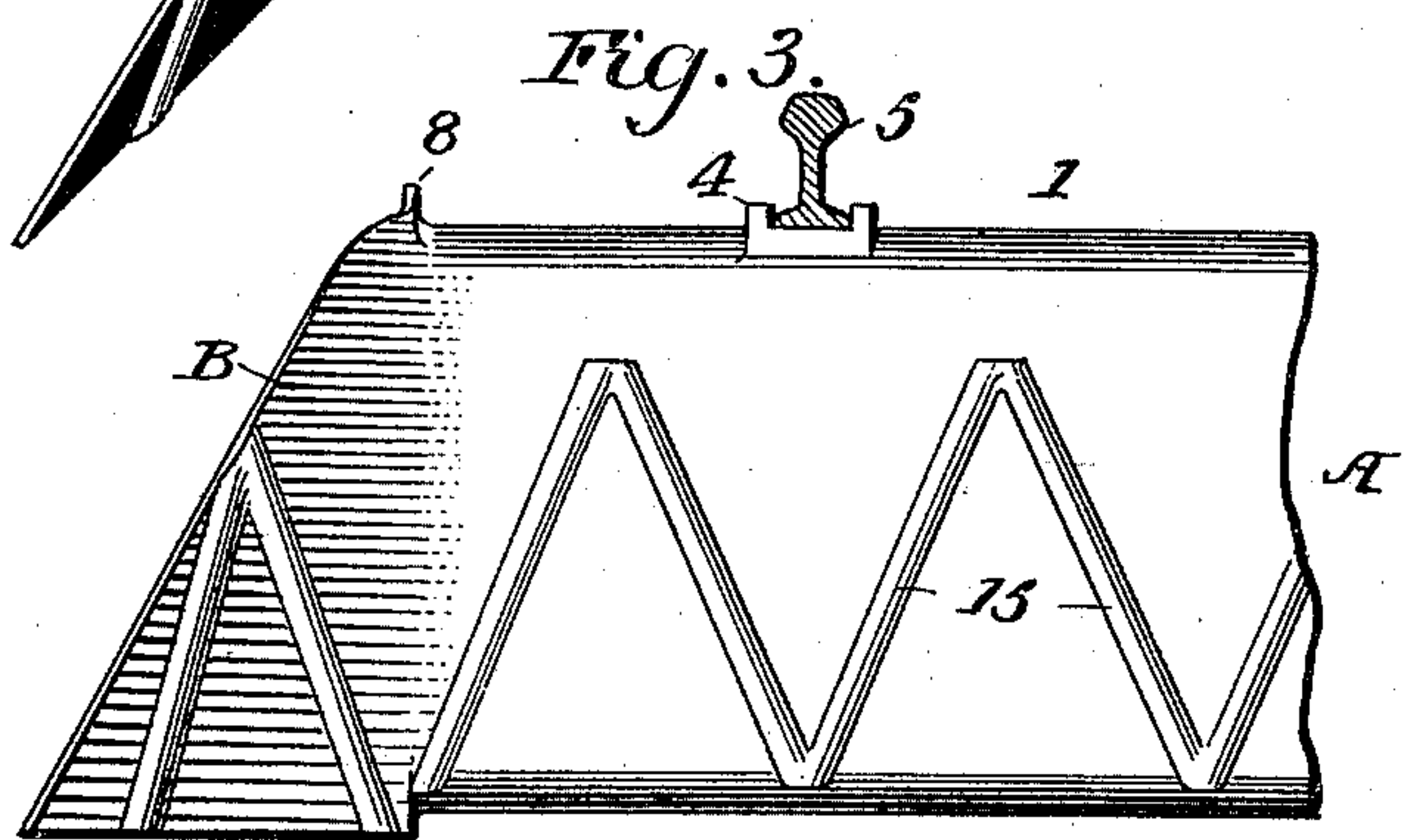
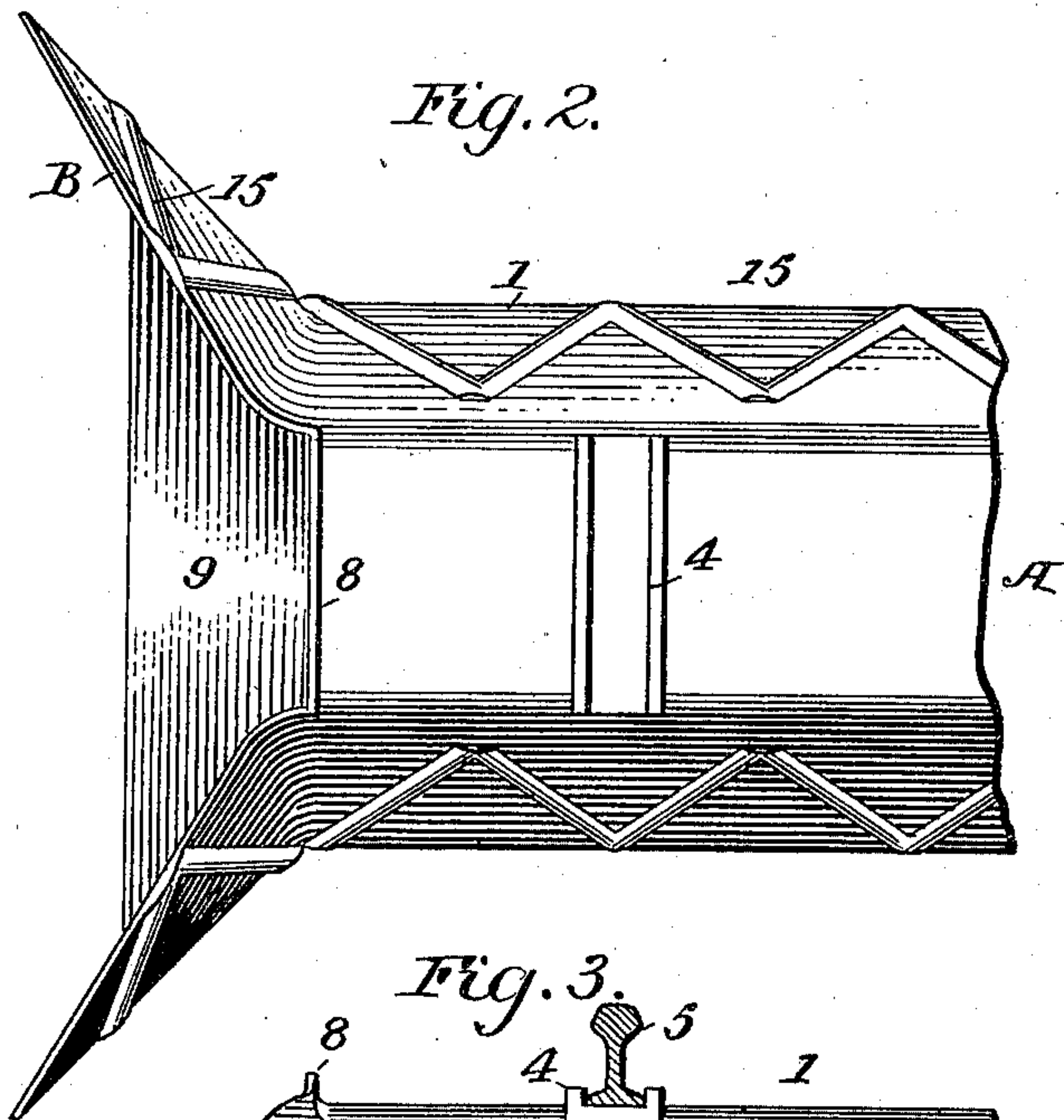
Patented May 30, 1899.

W. A. NICHOLS.
CULVERT.

(Application filed Apr. 20, 1898.)

(No Model.)

2 Sheets—Sheet 2.



Witnesses

Wm. Hinkel
James W. Stearns

Inventor

by *William A. Nichols*
Arthur J. Freeman
Attorneys

UNITED STATES PATENT OFFICE.

WILLIAM A. NICHOLS, OF ST. DAVIDS, PENNSYLVANIA.

CULVERT.

SPECIFICATION forming part of Letters Patent No. 625,795, dated May 30, 1899.

Application filed April 20, 1898. Serial No. 678,281. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM A. NICHOLS, a citizen of the United States, residing at St. Davids, in the county of Delaware and State of Pennsylvania, have invented certain new and useful Improvements in Culverts, of which the following is a specification.

This invention relates to certain new and useful improvements in portable culverts adapted for use beneath railway-tracks, roadways, &c.; and it is the object of the invention to provide an efficient and durable culvert which will retain the position in which it is laid without the necessity of a specially-prepared foundation and one which will effectually convey and carry off water and other material without becoming clogged either at its mouth or interiorly.

With this object in view the invention consists of a culvert constructed in the novel manner hereinafter more particularly described.

In the accompanying drawings, forming a part of this specification, and in which like letters and numerals of reference indicate corresponding parts, Figure 1 is a perspective view of a culvert adapted for use beneath railway-tracks, roadways, &c., the culvert being partially embedded in the ground. Fig. 2 is an enlarged plan view of one end of the culvert. Fig. 3 is a side view thereof, and Fig. 4 is a front elevation of the same.

Referring more particularly to the drawings, A designates the culvert, constructed, preferably, of metal and made or cast in a single piece, as shown. The culvert A comprises a main body or conduit portion 1, which in cross-section is formed with a slightly-concave bottom and with straight sides which converge upwardly and terminate in a rounding or slightly-rounding top, or the top may be flat with rounded edges. As thus constructed, the top and sides of the body constitute an arch, rendering the culvert capable of sustaining severe weights or strains, to which they are sometimes subjected, and the bottom or base of the culvert being broad there is little liability of its settling under such weights, and therefore a specially-constructed foundation is not required. The inner, bottom, and side walls of the culvert are smooth throughout its

length, thereby furnishing a clear runway inside for the passage of the water and other material free from the obstruction which would result from inwardly-projecting portions, and by reason of the bottom of the culvert being slightly concave the tendency of sand or other material is to fall to the transverse center or lowest part of the bottom, where it can be more readily washed away.

In some instances it may be desirable to connect sewer, drain, or other pipes to empty into the culvert, and in order that this may be effected openings 2 are formed in the sides of the culvert, near the top thereof, through which openings sewer, drain, or other pipes (not shown) may be fitted or extended. In some instances these openings may be formed in the top of the culvert or they may be formed in the sides, near the bottom thereof, as desired. When the culvert is to be laid immediately beneath railway-tracks, it is formed at or near its top with separated transverse-grooved bearings 4, into the grooves of which the rails 5 of a track may be laid, the bearings constituting seats for the rails and serving to maintain them against lateral displacement and in proper relative position.

Intermediate the rail-bearings 4 the culvert is formed with a transverse conduit 6 of suitable shape in cross-section, which conduit extends from one side of the culvert to the other, and in the top of the culvert is formed a transverse slot 6^a, through which communication may be had with the conduit. When the culvert is to be employed in connection with electric or cable railways, the conduit 6 forms a continuation of the conduit of such railways, through which the cable or electric conductor thereof may be extended. Of course where the culvert is not to be so employed the conduit 6 and rail-bearings 4 may be dispensed with.

At one or both of its ends the body portion 1 is provided with a transverse flange 8, which projects above the top of the said body portion. Forming continuations of the side walls of the main body are wings B, which wings diverge outwardly and constitute a flaring mouth at the end of the culvert. The wings B may be of any suitable shape and length, but preferably they are triangular in side elevation and their upper edges incline down-

wardly from the top of the flange 8 to the outer ends of the wings, while their lower edges are horizontal and extend below the bottom of the body portion. At points adjacent the mouth of the body portion 1 the wings B are slightly curved, and from this point the remaining surface is preferably formed flat. Extending from one wing to the other and from near the lower edges of said wings upward to the bottom of the passage of the culvert is a base-plate 9, at the outer edge of which is a downwardly-projecting flange 10. While in the case of culverts of small size it is preferred to form the wings B and base-plate 9 integral with the side walls and bottom of the culvert, it will be obvious that in culverts of larger size they may be formed separate from the main body of the culvert and secured thereto by riveting or otherwise.

In practice the culvert is embedded in an embankment or roadway, with its ends opening upon opposite sides thereof, the lower edges of the wings B and flange 10 entering the ground and preventing the earth beneath the culvert from being washed away, while the wings B and flange 8 prevent the earth at the top and sides of the culvert from dropping before the mouth thereof. Moreover, it will be obvious that the earth being packed up behind the wings B the wings serve as anchors and hold the culvert securely against shifting.

Heretofore while it has been customary to provide the ends of culverts with wings such wings have been constructed and arranged to leave abrupt surfaces and corners intermediate their outer ends, and the mouth of the culvert and these surfaces serve to obstruct the free passage of material, such as brushwood, carried with the water, and the corners become filled with debris, and consequently the mouth of the culvert soon becomes filled up and proper drainage is prevented. As thus constructed, however, the wings and base-plate present continuous unbroken surfaces to the water and other material, and as they gradually converge to the side walls and bottom of the culvert the material is guided directly into the end of the main body. It has also been customary to construct culverts in longitudinal sections adapted to be bolted or otherwise secured together; but unless the joints between the sections were made water-tight water from the interior of the culvert will leak through the longitudinal joints between the sections to the exterior of the culvert, washing the earth from the sides and bottom thereof, thereby impairing its foundation, causing it to settle, and resulting in a depression in the road-bed. By forming the culvert free of longitudinal joints it will be obvious that no leakage can take place, and the above disadvantage is overcome in consequence.

When culverts of great length are required, it would be difficult to form them in a single piece, and accordingly the body of the cul-

vert may be made in two or more sections, which may be joined at their ends in any suitable manner, forming a vertical joint. Each of the sections, however, is formed free of longitudinal seams.

In some instances it may be desirable to impart additional strength to the side walls or wings of the culvert, and this may be accomplished by forming the side walls or wings with strengthening-ribs 15, as shown.

It will be obvious from the above that an exceedingly simple yet strong culvert or conducting-main is produced capable of withstanding heavy weights and strains and one which when placed in position furnishes a ready means for the passage of water and its contained debris.

What I claim is—

1. A culvert comprising a main body portion, outwardly-flaring wings extending from one or both of the ends of said body portion and forming continuations of the side walls thereof, and flanges extending from the top and bottom walls of the body portion, substantially as described.

2. A culvert formed in a single piece comprising a main body portion and outwardly-diverging wings at one or both of its ends, the interior surfaces of the body portion and wings being smooth and unbroken throughout their length, substantially as described.

3. A culvert formed with a concave bottom, upwardly-converging sides, a top, and having at one or both of its ends top and bottom flanges and diverging side wings, substantially as described.

4. A culvert formed with a top, bottom and connecting side walls and provided at its top with separated grooved bearings each formed with continuous parallel flanges, substantially as described.

5. A culvert formed at one or both of its ends with a base-plate inclined upwardly to the bottom of the main body of the culvert, substantially as described.

6. A culvert formed with top, bottom and connecting side walls and being provided intermediate its length with a transverse conduit, substantially as described.

7. A culvert, drain or conducting-main formed with upwardly-converging side walls and with a concave bottom, substantially as described.

8. A culvert provided at its end with outwardly-diverging side wings and with a bottom plate connecting the side wings and inclined upwardly to the bottom of the main body of the culvert, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM A. NICHOLS.

Witnesses:

WM. H. R. LUKENS,
E. C. ALEXANDER.