

No. 865,044.

PATENTED SEPT. 3, 1907.

W. ISHAM & F. E. MILLER.
ROAD CULVERT AND BANK RETAINER.

APPLICATION FILED DEC. 6, 1906.

2 SHEETS—SHEET 1.

FIG. 1.

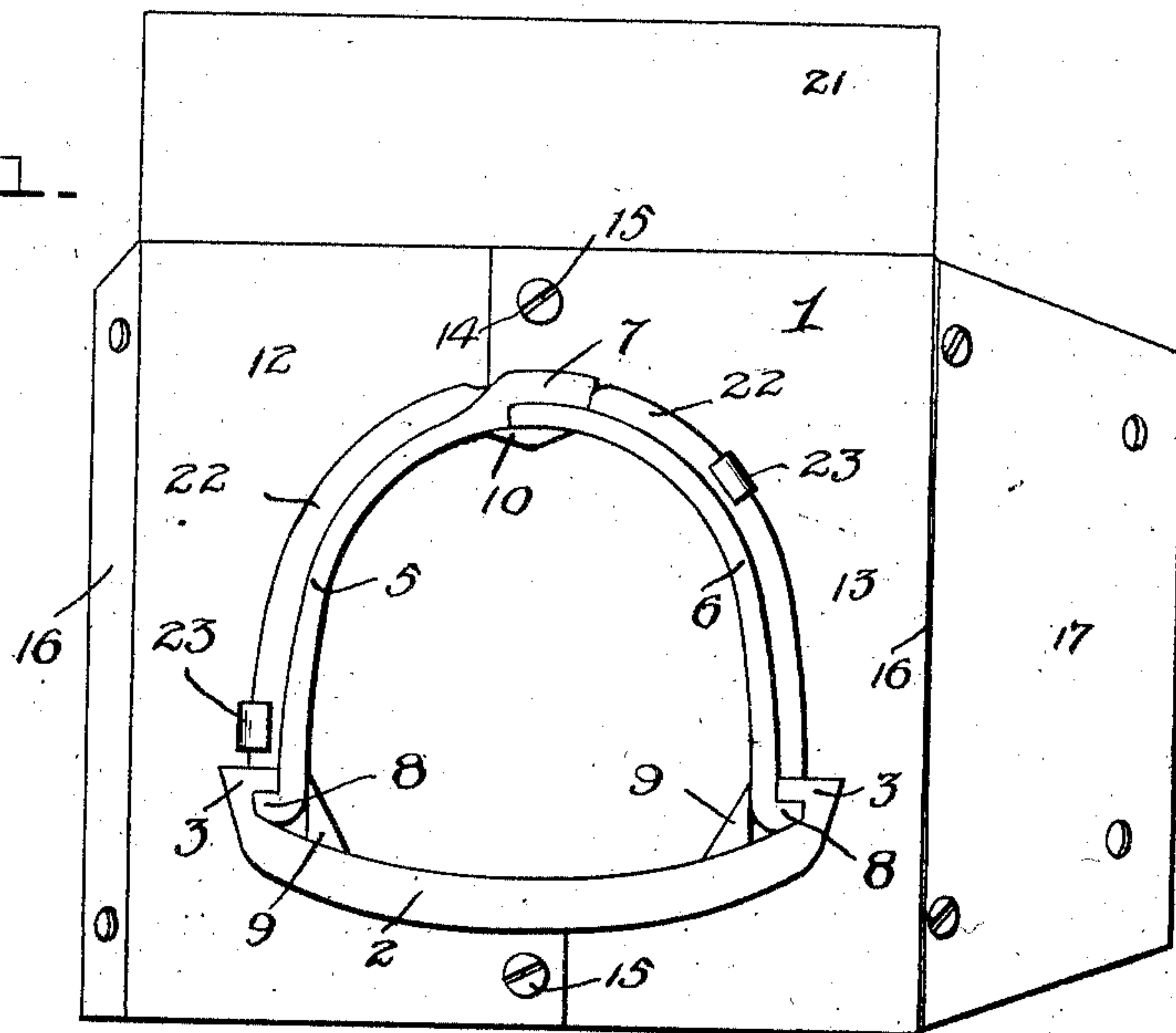
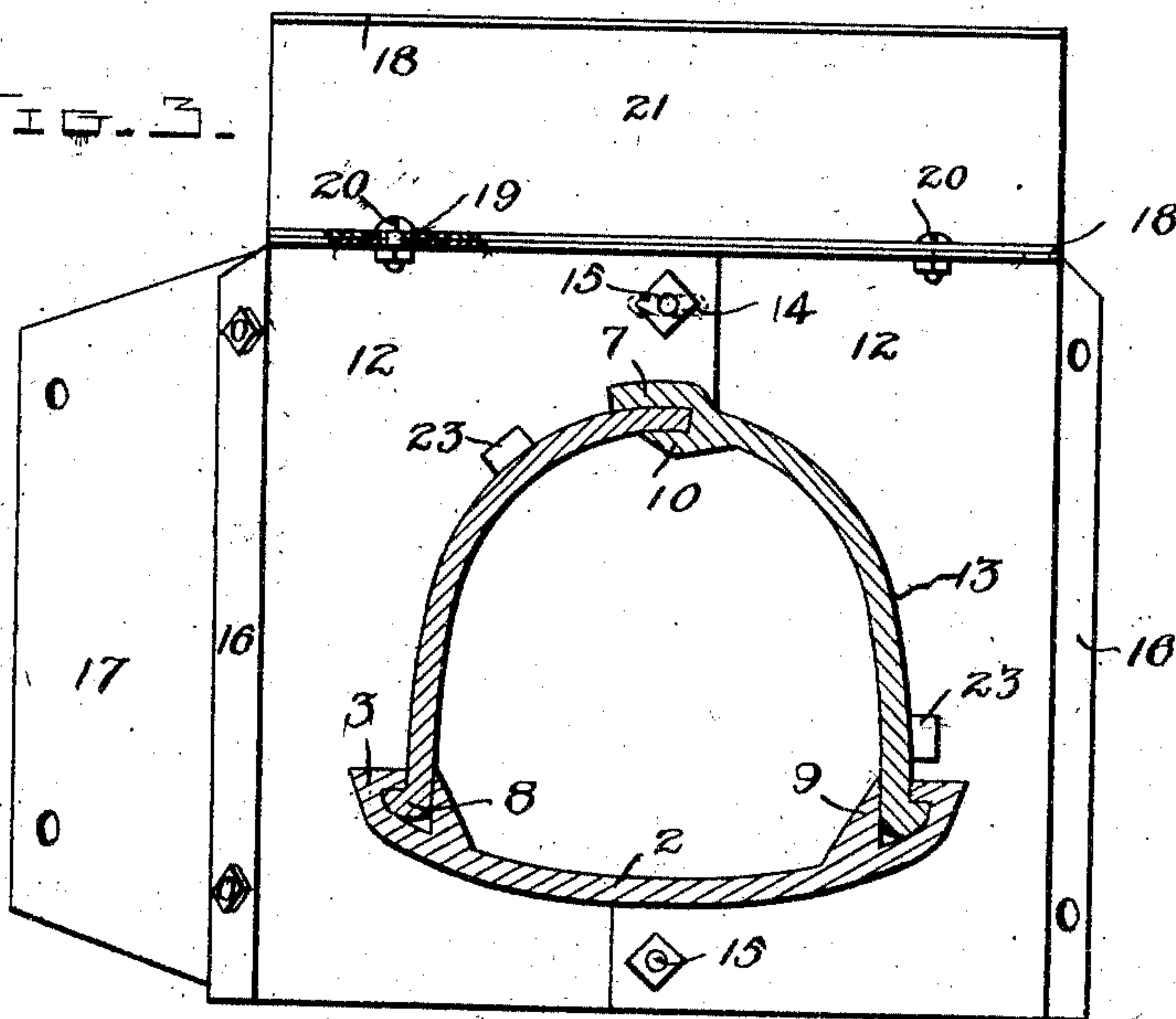


FIG. 3.



Witnesses

Chas. R. Griesbauer
C. H. Griesbauer

by

A. B. Wilson & Co.

Attorneys

Inventors
W. ISHAM AND
F. E. MILLER.

No. 865,044.

PATENTED SEPT. 3, 1907.

W. ISHAM & F. E. MILLER.
ROAD CULVERT AND BANK RETAINER.

APPLICATION FILED DEC. 8, 1906.

2 SHEETS—SHEET 2.

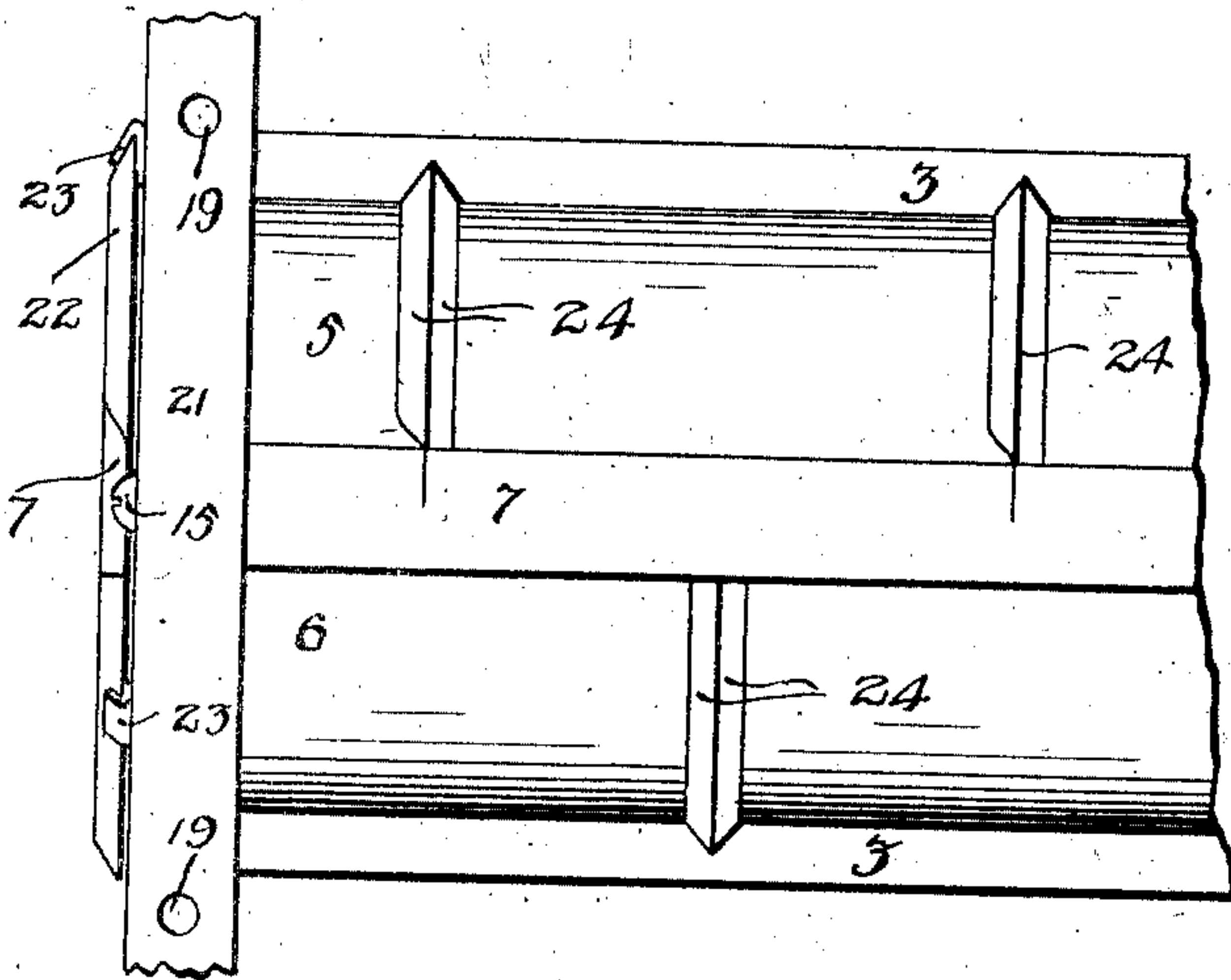


FIG. 2.

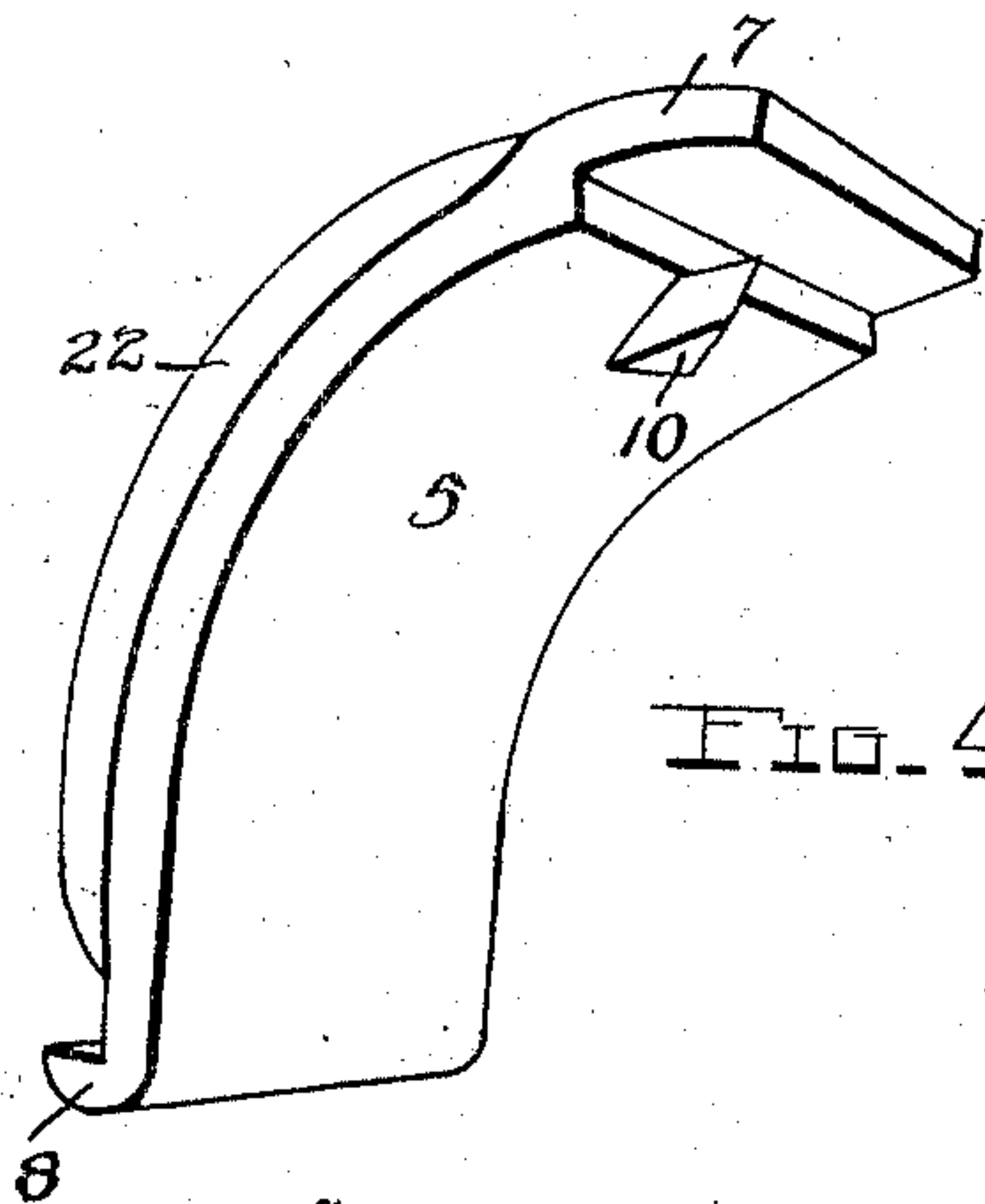


FIG. 4.

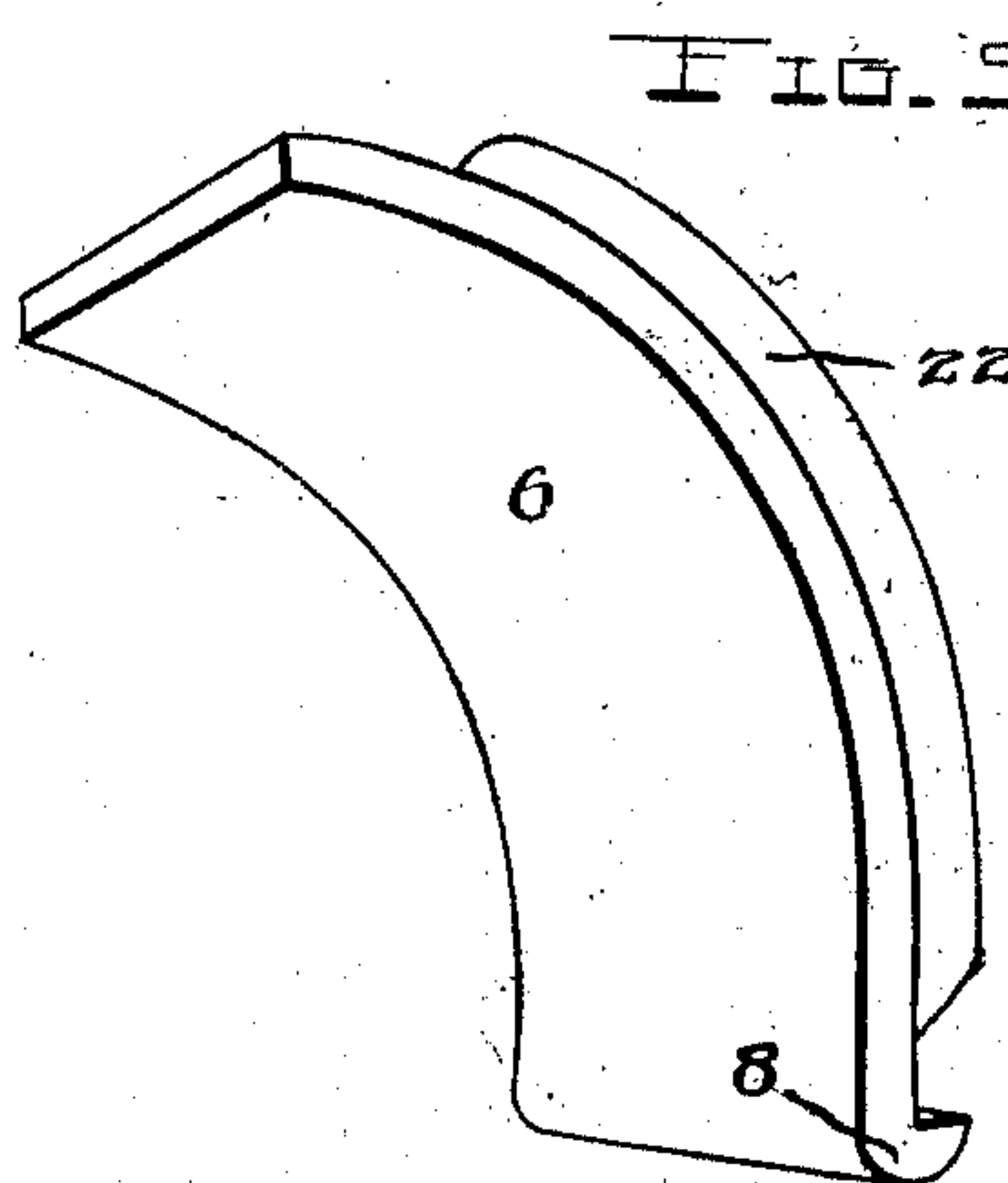


FIG. 5.

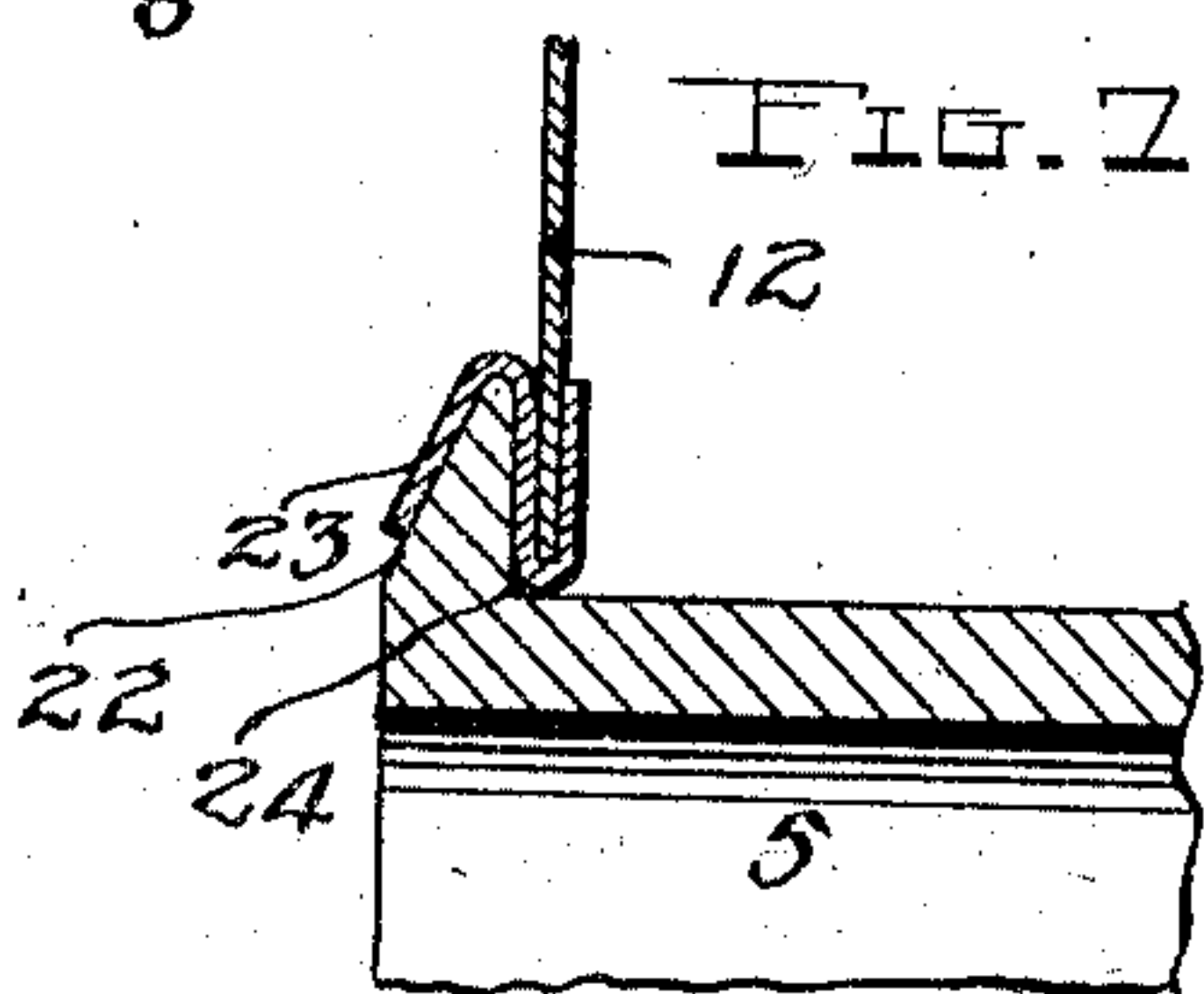


FIG. 7.

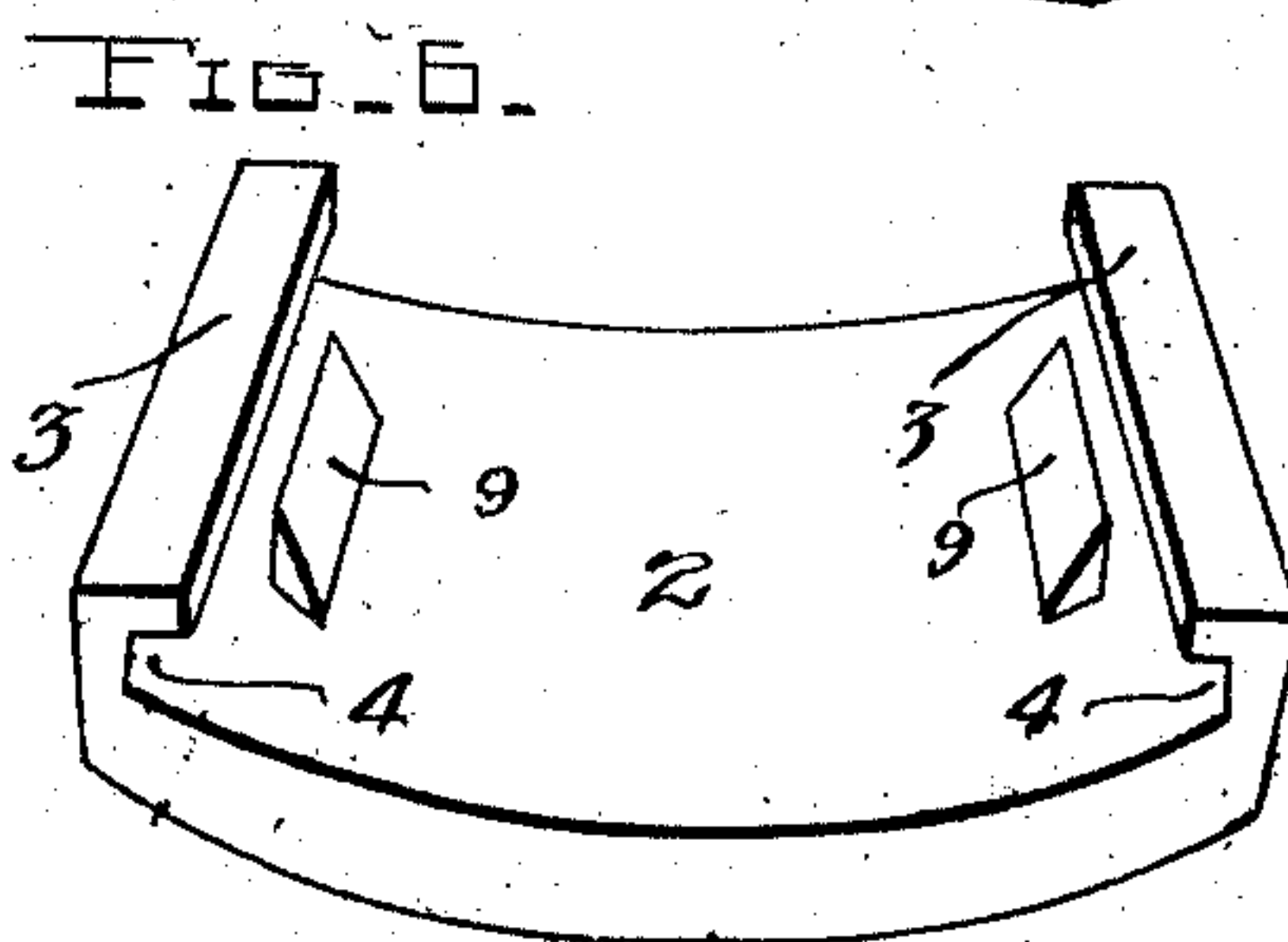


FIG. 6.

Witnesses
Chas. R. Griesbauer.
C. H. Griesbauer.

Inventors
W. ISHAM AND
F. E. MILLER.
by *A. B. Wilson & Co.*
Attorneys

UNITED STATES PATENT OFFICE.

WILLIAM ISHAM AND FRANK E. MILLER, OF BUTTERNUT, MICHIGAN.

ROAD-CULVERT AND BANK-RETAINER.

No. 865,044.

Specification of Letters Patent.

Patented Sept. 3, 1907.

Application filed December 6, 1906. Serial No. 346,607.

To all whom it may concern:

Be it known that we, WILLIAM ISHAM and FRANK E. MILLER, citizens of the United States, residing at Butternut, in the county of Montcalm and State of Michigan, have invented certain new and useful Improvements in Road-Culverts and Bank-Retainers; and we do 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 improvements in combined road culverts and bank retainers.

The object of the invention is to provide an improved road culvert composed of separable interlocking sections by means of which the culvert may be readily set up in position for use.

A further object is to provide an adjustable bank retaining plate or wall adapted to be secured to and used in connection with the culvert to protect the bank or sides of the roadway at the ends of the culvert, means being provided whereby said retaining plate or wall may be extended to any desired length or height and at any desired angle.

With the above and other objects in view, the invention consists of certain novel features of construction, combination and arrangement of parts, as will be hereinafter described and claimed.

In the accompanying drawings:—Figure 1 is a front view of the a culvert and bank retainer constructed in accordance with the invention; Fig. 2 is a top plan view, showing the manner of arranging the sections of the culvert to break joint; Fig. 3 is a vertical cross sectional view of the same looking toward the rear side of the bank retaining plate or wall; Fig. 4 is a perspective view of one of the side sections of the culvert; Fig. 5 is a similar view of the opposite side section; Fig. 6 is a similar view of the bottom section; Fig. 7 is a detail sectional view through a portion of one end of the culvert and the bank retaining wall, showing the manner of connecting these parts together.

Referring more particularly to the drawings, 1 denotes the culvert, which consists of a base section or bottom 2 having on its opposite side edges upwardly-projecting flanges 3, in which are arranged longitudinally-disposed grooves or channels 4. The upper portion of the culvert is formed by side sections 5 and 6, which curve inwardly at their upper edges and overlap to form the top of the culvert. The upper edge of the side section 5 is provided with an offset overhanging projection 7, which engages the upper side of the adjacent edge of the section 6, said upper end of the section 6 fitting into the offset portion of the section 5, as shown. The lower edges of the side sections 5 and 6

are provided with outwardly-projecting flanges 8, which are adapted to be engaged with the grooves or channels 4 in the opposite edges of the base-section 2.

Formed on the inner side of the base-section 2 adjacent to the opposite edges thereof are upwardly-projecting lugs 9, which are adapted to engage the adjacent inner side walls of the side sections 5 and 6 to hold the flanges 8 on the lower edges of the same into engagement with the grooves 4 of the base section. On the inner wall of the side section 5 adjacent to the offset projection 7 is formed a series of lugs 10 adapted to project beneath and engage the inner face of the opposite side section 6, when the latter is in engagement with said offset projection. The lugs 9 and 10 serve to effectually prevent the collapsing of the sections of the culvert, thereby forming a strong durable construction, which will readily adjust itself to the expansion and contraction of the metal sections, due to the changes in the weather.

In assembling the base and side sections to form the culvert, the sections are arranged to break joint, this being accomplished by providing the sections at each end of the culvert of unequal length, as clearly shown in Fig. 2 of the drawings.

Adapted to be used in connection with the culvert and secured to one or both ends of the same are bank retaining walls 12, which preferably consist of a main culvert engaging portion formed of two adjustably connected plates 13, the inner edges of which are recessed or cut out to fit upon the outer surface of the culvert. The engaging-ports of the plates 13 overlap above and below the culvert, said overlapping portions being provided with aligned slots 14. Through the slots 14 are arranged clamping bolts 15, by means of which the plates are adjustably secured together. The outer side edges of the plates 13 are bent at an angle to the plates to provide attaching flanges 16, to which are adapted to be bolted or otherwise secured extension plates 17, of which there may be any desired number, said plates being bolted together to form projecting wings, which may be of any desired length depending upon the number of plates thus secured together. The wings formed by the plates 17 may be arranged at any desired angle with respect to the plates 13 forming the main portion of the retaining wall.

The upper edges of the plates 13 are bent to form right angular, rearwardly-projecting flanges 18 having formed therein elongated apertures 19 to receive clamping bolts 20, by means of which top extension plates 21 are secured to the upper edge of the main retaining wall, thereby providing for the increase in the height of the retaining wall. There may be any desired number of the plates 21, the opposite edges of each of which are bent to

form right angular, rearwardly-projecting attaching flanges, through which are arranged fastening bolts to secure the plates together one above the other, thus providing for the increase in height of the retaining wall to any desired extent. By providing the elongated apertures 19 and the flanges on the upper ends of the plates 13, the attachment of the top plates thereto will not interfere with the lateral adjustment of said plates 13.

The outer ends of each of the end sections of the culvert are provided with radially-projecting, substantially V-shaped flanges 22, with which are engaged one end of zig-zag or Z-shaped clips or fastening devices 23. The ends of the fastening devices 23 are engaged with the inner edges of the plates 13 forming the main portion of the wall, thereby securely fastening the retaining wall to the ends of the culvert. On the inner ends of the end sections of the culvert and on the ends of each of the intermediate sections are formed radially-projecting flanges 24. These flanges 24 are substantially triangular in cross section and have a flat or right angular outer surface, said flat right angular outer surface of the adjoining sections being engaged to form a close connection or joint between said coincident or adjoining section.

From the foregoing description, taken in connection with the accompanying drawings, the construction and operation of the invention will be readily understood without requiring a more extended explanation.

Various changes in the form, proportion and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the ad-

vantages of this invention, as defined by the appended claims.

Having thus described our invention, what we claim as new and desire to secure by Letters-Patent, is:—

1. A culvert provided with a marginal end flange and a bank-retaining wall having an opening to receive the culvert and in which the latter fits, said wall comprising a pair of plates provided with overlapping portions having coincident slots, clamping bolts entered through said slots for adjustably connecting said plates, and substantially Z-shaped clips having their end portions engaged respectively with said end flange and with the inner edges of the plates.

2. A culvert having a marginal end flange and a bank retaining wall having an opening to receive the culvert and in which the latter fits, said wall being arranged to bear against the flange and consisting of a pair of plates having overlapping portions provided with coincident slots, clamping bolts entered through said slots for adjustably connecting the plates, right angularly disposed flanges formed on the upper edges of the plates and provided with longitudinally extending slots, an extension plate having at its lower edge a flange to seat on said right-angularly disposed flanges and provided with slots, clamping bolts entered through said slots for attaching the extension plate to the wall, and substantially Z-shaped clips having their end portions engaged respectively with the end flange of the culvert and with the inner edge of the retaining wall.

In testimony whereof we have hereunto set our hand in presence of two subscribing witnesses.

WILLIAM ISHAM,
FRANK E. MILLER.

Witnesses:

F. A. PHELPS,
ELMER F. BARRET.