A. J. WILEY.

METAL FLUME.

APPLICATION FILED JUNE 9, 1911.

1,019,871.

Patented Mar. 12, 1912.

2 SHEETS—SHEET 1.

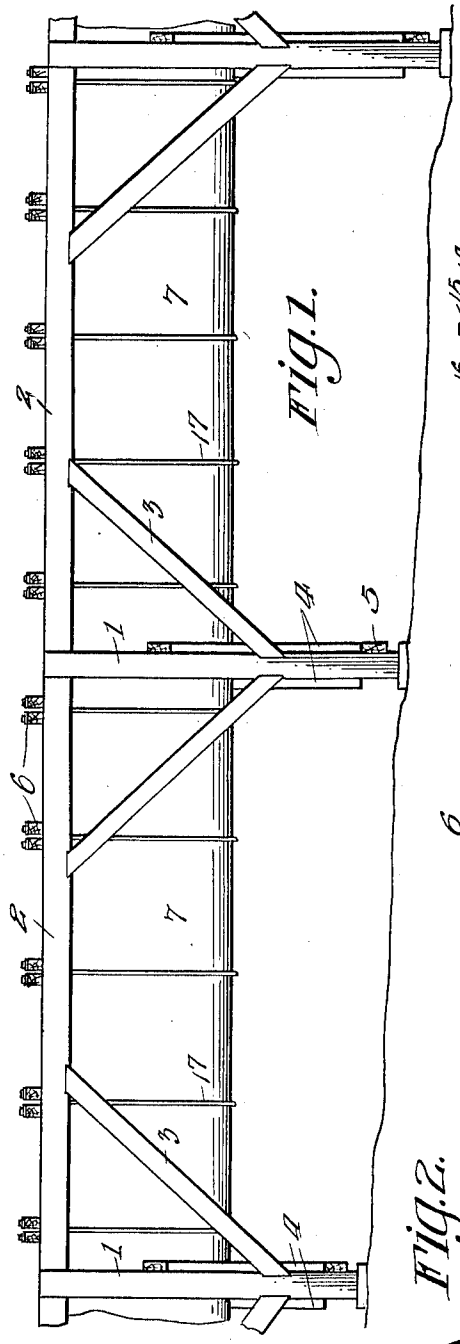

Fig. 1.

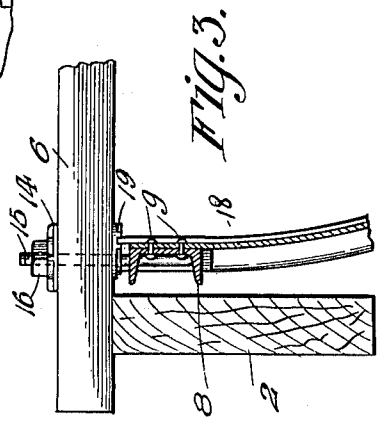

Fig. 3.

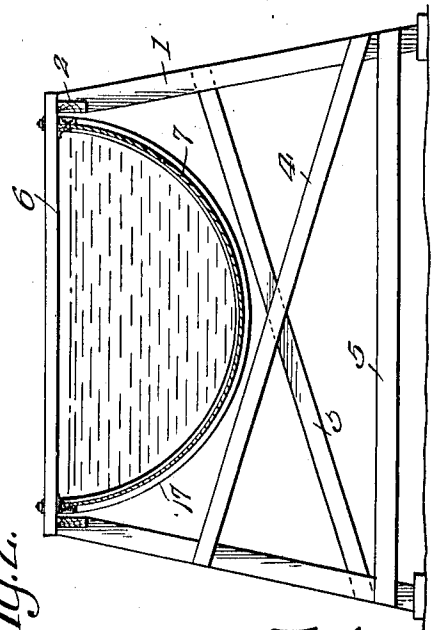

Fig. 2.

Witnesses
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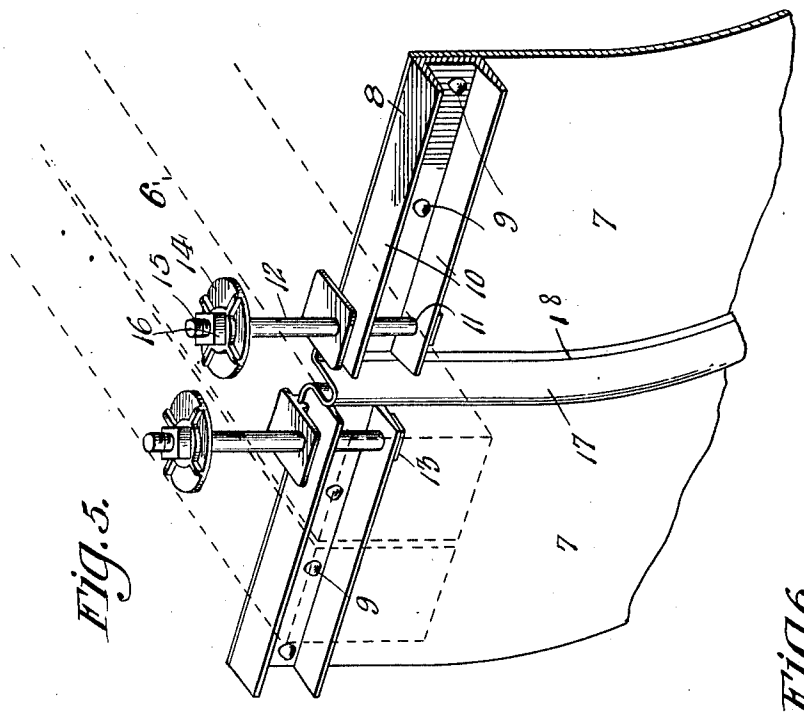

Fig. 5.

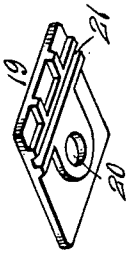

Fig. 6.

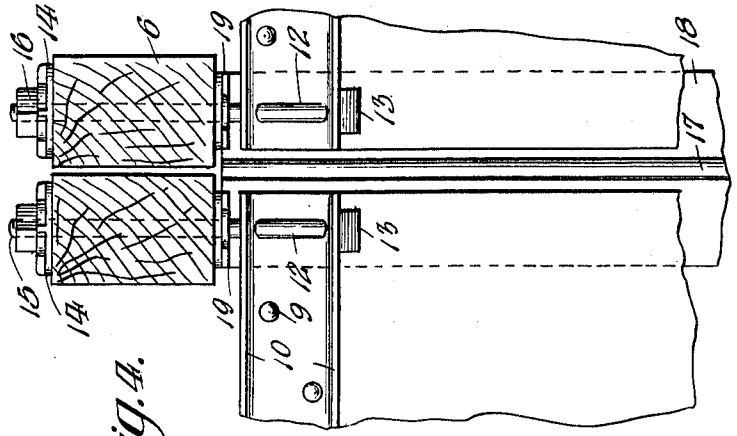

Fig. 4.

Witnesses
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UNITED STATES PATENT OFFICE.

ANDREW J. WILEY, OF BOISE, IDAHO.

METAL FLUME.

1,019,871. Specification of Letters Patent. Patented Mar. 12, 1912.

Application filed June 9, 1911. Serial No. 632,289.

To all whom it may concern:

Be it known that I, ANDREW J. WILEY, a citizen of the United States, residing at Boise, in the county of Ada and State of Idaho, have invented certain new and useful Improvements in Metal Flumes, of which the following is a specification.

This invention relates to an improvement in metal flumes and refers particularly to that type of flumes in which a thin metal shell is used for conveying water for irrigation, power or other purposes, the metal shell forming the carrying channel being made in successive sections of proper curvature and joined together to make a continuous channel.

The special feature of my metal flume is the joint between successive sections. To facilitate erection the joints should be made without rivets or bolts; to allow for expansion and contraction they should have a certain amount of flexibility; to give a high coefficient of discharge they should present a smooth interior surface. They should add a certain amount of lateral stiffness to the thin shell of the flume, and they should be capable of adaptation to any ordinary horizontal or vertical curve without the use of special joints or splices. In addition to the above it is important that the strength of the thin shell should be increased by stiffening its longitudinal edges and preventing their tendency to buckle between points of support.

To attain the objects stated my invention broadly stated consists of a flume composed of sections having their edges connected by a joint which will allow for contraction and expansion but will be proof against damage or breakage.

The invention further consists of a metal flume composed of a series of sections and a novel form of adjustable and accommodating joint, for the sections.

The invention further consists of a metal flume embodying novel features of construction and combination of parts for service substantially as disclosed herein.

In order that the detailed construction of my metal flume may be fully understood and its many advantages be appreciated I have illustrated in the accompanying drawing a metal flume constructed in accordance with and embodying my invention.

Figure 1 represents a side elevation of a sufficient portion of a complete flume to illustrate my invention. Fig. 2 represents a transverse sectional view of the complete flume. Fig. 3 represents a detail sectional view of one side of the flume showing the construction of my novel form of joint for the flume sections. Fig. 4 represents an elevation on an enlarged scale showing the complete joint at one side of the flume. Fig. 5 represents a perspective view of the joint or connection for the flume sections, and Fig. 6 represents an enlarged perspective view of one of the clamping or bearing plates to fully show its detailed construction.

Referring by numeral to the drawings in which similar characters of reference denote corresponding parts in all the views: The numeral 1 designates the posts or uprights; 2 the longitudinal rails; 3 the braces leading from the posts to the rails, 4 and 5 the transverse braces and 6 the flume supports, the whole structure forming the frame of the flume.

The flume proper is composed of the series of curved sections 7 of thin sheet metal, to the ends of which contiguous with their top edges are secured the channeled bracing irons or strips 8. These channeled strips are rigidly secured by the series of longitudinally disposed rivets or bolts 9, and the parallel walls 10 of the strips near their meeting ends are formed with alining openings 11, which receive the rods 12, having heads 13, bearing upon the lower walls of the strips the upper portions of the rods 12 passing through the flume supports 6, and having the bearing or clamping plates 14 and upon their threaded ends 15, the securing nuts 16. From this construction it will be seen that I provide a flume composed of a series of similar curved sections which are firmly supported from the frame, and in the spaces between the flume sections is placed the curved rib 17, formed with the lateral wings or sides 18, and in use the rib fits snugly between the ends of the flume sections and the wings or sides rest flush or smooth against the inner face of the flume sections and to rigidly secure the rib and wings thereof I provide the novel clamping and securing plate 19, which has the opening 20 to receive the clamping rods 12 and is formed with the channel or groove 21, which engages the wings or sides of the rib and rigidly secures the rib in position. It will be understood that the rods can be

adjusted to clamp the ribs as firmly as desired, also that the ribs may be of curved, inclined or flat shape as desired.

Among the advantages of my invention are its carrying capacity as the interior of the flume is free from rivets or other projections, so that it will have a low coefficient of friction and a high discharge capacity; its vertical strength as the reinforcing of the edges of the metal sheets by a member strong enough to transmit the weight of the load to the ends of the section dispenses with intermediate supports and simplifies the construction; provision for expansion and contraction as the grooved joint takes care of the expansion and contraction between each section so that the movement required at the joints is extremely small; rigidity and tightness as motion due to expansion and contraction being taken care of by the bending in the expansion joint, there is no movement between the shell and the splice rib, which insures the permanency and tightness of this joint; provision for curvature and shape is one of the special advantages of this flume since it can be made to fit any curvature, either horizontal or vertical, without previous provision having been made for the curvature, so that the flume can be laid as cheaply on a curve as on a straight line, the curvature being taken care of at each joint, the angles between the chords are small and the flow of water is more regular than in flumes with special joints for curvature; regularity of shape or form as the groove in the splice ribs gives great strength to the circular form in which it is rolled, and this insures a true circular shape to the shell of the flume. In short this invention secures a smooth interior, surface, it provides for expansion and contraction; it secures great lateral stiffness; and it provides for either horizontal or vertical curvature. It also gives such stiffness to the thin shell that it dispenses with intermediate supports between the joints, and is simple, inexpensive and is efficient and practical from every point of view.

I claim:

1. In a metal flume, the combination of a thin shell composed of metal sections curved in a semi-circular shape, metal plates or strips secured to the ends of the said sections, hangers connected to said strips, and a curved rib forming the joint between the sections.

2. In a flume for conveying water, the combination of a thin metal shell curved in a semi-circular shape with channeled strips attached longitudinally to each end to strengthen the shell and dispense with intermediate supports.

3. In a flume for carrying water, the combination of a thin metal shell having attached strengthening channeled strips along the horizontal ends, with hangers at each end for carrying the weight of the flume to the supporting structure.

4. In a flume for conveying water, the combination with the successive sections of curved metal suspended by hangers from a structure of interior centrally grooved metal joint members secured to the sections, and means for securing said joint members and metal sections together.

5. In a flume for conveying water, the combination with the shell having the curved metal sections, of the channeled plates secured to the ends of the sections, the hangers connected to said plates, the joint members secured to the sections, and means for securing said joint members and metal sections together.

6. In a flume for conveying water, the combination of a thin metal shell of semi-circular shape made in separate sections, a grooved metal splice of semi-circular shape, channeled plates secured to the ends of said sections, and means for securing said grooved metal splice and sections together.

7. A metal flume composed of curved sections, channeled plates secured to the ends of said sections, ribs between said sections and having wings, and threaded bolts having plates engaging said wings whereby the union of the said sections and ribs is made.

8. A metal flume, composed of sections, metal plates or strips secured to the ends of the sections, hangers connected to said strips, and a curved rib forming the joint between the sections.

9. A metal flume, composed of sections, a curved rib between the sections, plates engaging and securing the rib to the ends of the sections and means for securing the plates and supporting the sections.

10. In a metal flume, the combination of the curved sections, the channeled plates at the ends of the sections, the ribs between the sections having wings, the plates engaging the wings, and the clamping and supporting means.

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

ANDREW J. WILEY.

Witnesses:

WALKER S. BRUCE,

SIDNEY C. FULD.