Oct. 10, 1933. S. TREVERTON 1,929,527

FLOOD GATE FOR CULVERTS

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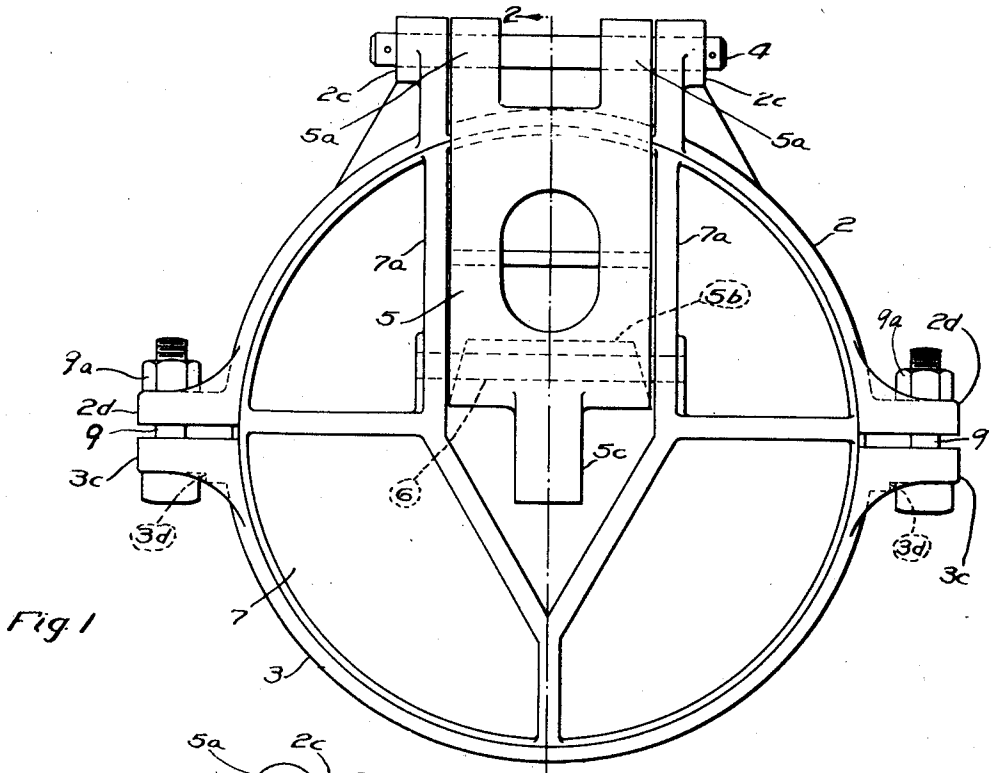


Fig. 1

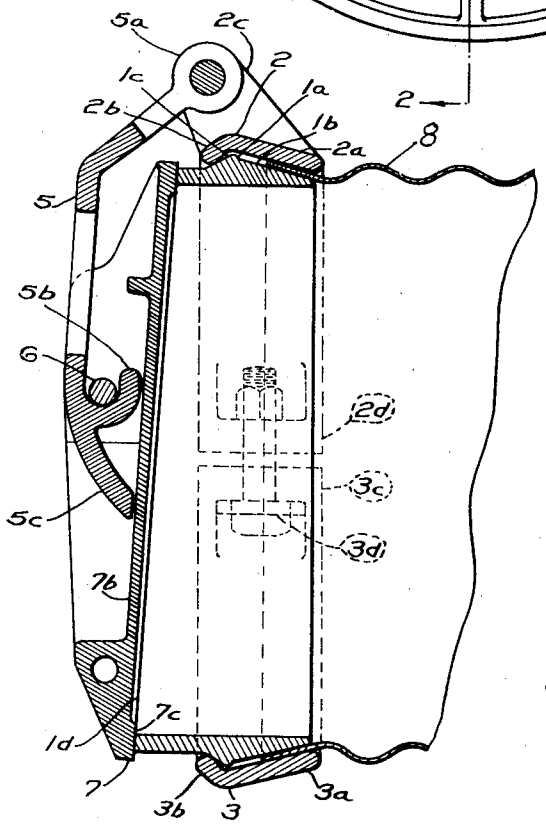


Fig. 2

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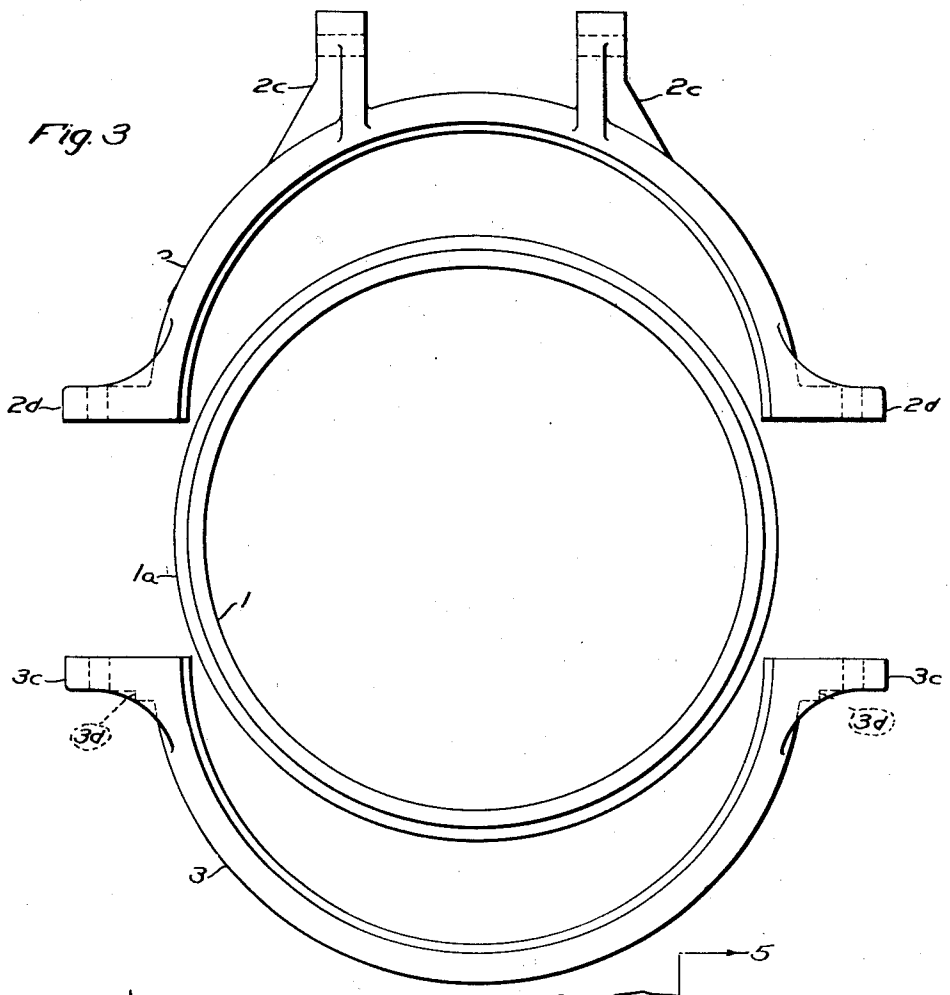
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FLOOD GATE FOR CULVERTS

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Fig. 3



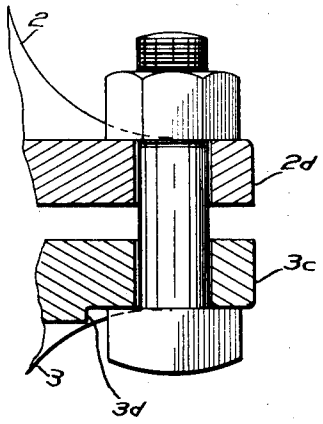


Fig. 5

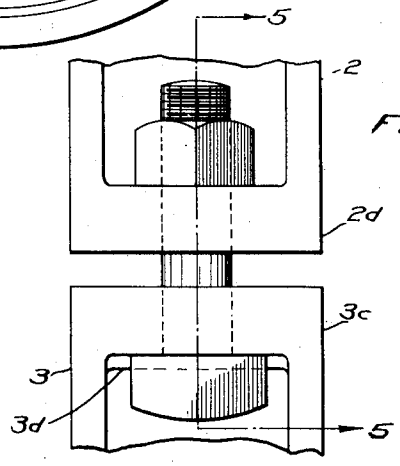


Fig. 4

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FLOOD-GATE FOR CULVERTS

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Application November 12, 1929
Serial No. 406,637

7 Claims. (Cl. 251—123)

This invention relates in general to culvert gates, and more particularly to a novel flood-gate for the outlet end of a corrugated culvert or the like.

The primary object of the invention is to provide a gate for the outlet end of a corrugated culvert, which shall permit discharge of drainage water therefrom, and shall be particularly effective to prevent back-flow of flood waters into the culvert during floor periods.

Another object of the invention is to provide a novel cast-iron floodgate for corrugated culverts and the like, which shall consist of a minimum number of easily manufactured parts, adapted to be readily assembled in the field, and in the assembly of which, a water-tight seal against backflow of floodwaters is formed at the outlet end of the culvert.

With the above and other objects in view, which will be more readily apparent as the nature of the invention is better understood, the same consists in the novel construction, combination and arrangement of parts hereinafter more fully described, illustrated and claimed.

A preferred and practical embodiment of the invention is shown in the accompanying drawings wherein

Fig. 1 is a front elevation of the assembled gate;

Fig. 2 is a cross-section through the assembled gate, taken on the line 2—2 of Fig. 1;

Fig. 3 is an exploded view of the ring and clamp members;

Fig. 4 is a fragmentary side elevation of adjacent ends of the clamp members, showing the manner in which these members are secured to each other, and

Fig. 5 is a cross-section, taken on the line 5—5 of Fig. 4.

Referring more particularly to the drawings, wherein like reference characters designate corresponding parts throughout the several views the gate consists of a ring 1, an upper clamp member 2, a lower clamp member 3, an upper hinge pin 4, a supporting link 5, a lower hinge pin 6 and a cover plate 7.

The ring 1 is provided with a peripheral annular rib 1*a* having a gently sloping rear face 1*b* and an abruptly sloping front face 1*c*. The front edge 1*d* of the ring is inclined as shown in Fig. 2 for a purpose to be presently disclosed.

The upper clamp member 2 is semi-circular in elevation, has a gently sloping rear portion 2*a*, an abruptly sloping front portion 2*b*, and is provided with spaced apertured upstanding bearings 2*c*. The ends 2*d* of the clamp member are apertured for the reception of connecting bolts.

The lower clamp member 3 is a semi-circular in elevation, and has a gently sloping rear portion 3*a* and an abruptly sloping front portion 3*b*. The ends 3*c* of the clamp member are apertured for the reception of connecting bolts and are also provided with shoulders 3*d* which serve a purpose to be presently described.

The supporting link 5 is provided at its upper end with spaced apertured bearings 5*a* and at its lower end with a hook 5*b* and a finger 5*c*.

The cover plate 7 is provided with spaced ribs 7*a*, the lower ends of which are apertured for the reception of the lower hinge pin 6. The web 7*b* of the cover plate is provided on its rear face with a raised annular portion 7*c* which is adapted to seat against the front edge 1*d* of the ring 1.

In assembling the aforesaid parts, the ring 1 is inserted as far as possible into the end of the corrugated culvert 8, as shown in Fig. 2, with the gently sloping rear face 1*b* thereof in contact with the inner surface of the culvert. The upper clamp member 2 is then placed in position with the portion 2*b* thereof in contact with the face 1*c* of the ring 1 and the portion 2*a* thereof in contact with the end of the culvert. The lower clamp member 3 is similarly placed against the lower portion of the culvert end, and bolts 9 are then inserted through the aligned apertures in the ends 3*c* and 2*d* of the clamp members 3 and 2 respectively. Nuts 9*a* serve to draw the clamp members 2 and 3 together and thereby positively grip the end corrugation of the culvert between the ring 1 and the clamp members. In thus drawing the clamp members 2 and 3 together, the abruptly sloping front portions 2*b* and 3*b* respectively thereof bear on the abruptly sloping front face 1*c* of the ring 1, thereby forcing the ring 1 backwards. Perfectly tight joints between the ring 1 and the end of the culvert and between the end of the culvert and the clamp members 2 and 3 are thus secured. Rotation of the bolts 9 during the operation of drawing the clamp members together is prevented by means of the shoulders 3*d* on the lower clamp member 3, these shoulders coming into abutment with the heads of the bolts 9 should the bolts begin to turn.

It will be noted that the portions 2*b* and 3*b* of the clamp members 2 and 3 respectively serve to prevent withdrawal of the ring from the culvert.

The supporting link 5 is then placed in such position that the apertures in its bearings 5*a* are aligned with the apertures in the bearings 2*c*,

and the upper hinge pin 4 is then inserted through the aligned apertures, as shown in Figs. 1 and 2. The lower hinge pin 6 is then inserted in the apertures in the spaced ribs 7a of the cover plate 7, and the latter suspended from the link 5, the pin 6 lying within the hook 5b of the link.

It should be noted that when the various parts have been assembled in the aforesaid manner, the cover plate 7 lies upon the inclined edge 1d of the ring 1, and the centers of gravity of both the cover plate and the link 5 lie outside and in advance of a vertical plane through the longitudinal axis of the upper hinge pin 4. Portions of the weight of the cover plate and its supporting link are thus utilized to maintain the cover plate in closed position, and the cover plate will open only when the water pressure in the culvert 8 is sufficiently great to overcome the pressure of the cover plate and its supporting link against the ring 1. The pivotal mounting of the cover plate 7 on the hinge pin 6 permits the plate to properly adjust itself on the inclined edge 1d of the ring 1, thereby assuring even contact with the ring. Undue swinging or pivotal movement between the cover plate and the supporting link is prevented by means of the finger 5c of the link 5. The lower end of this finger lies adjacent the web 7b of the cover plate and thus insures proper positioning of the cover plate against the ring 1.

It should also be noted that the side edges of the link 5 are adjacent the ribs 7a of the cover plate 7, the link thus preventing lateral movement of the cover plate with respect to the ring 1.

It will also be noted that the operation of drawing the clamp members together serves to cause the end of the culvert to conform to the shape of the ring, that is, if the end of the culvert has been deformed, the act of drawing the clamp members together will cause the culvert to assume the circular contour of the ring.

During flood periods, when the outlet end of the culvert is submerged beneath the level of the flood waters, the pressure of the flood waters will effectively maintain the cover plate in closed position.

From the foregoing, it will be apparent that the present construction provides an arrangement which will fulfill the objects herein set forth, and provides a simple, practical and reliable means for closing the outlet end of a culvert without interfering with the proper functioning of the culvert.

Without further description, it is thought that the features and advantages of the invention will be readily apparent to those skilled in the art, and it will of course be understood that changes in the form, proportion and minor details of construction may be resorted to without departing from the scope of the appended claims.

I claim:

1. In combination with a culvert, a flood-gate therefor, comprising a ring partially positioned within the end of the culvert, complementary semi-circular clamp members secured together in such relation as to grip the end of the culvert between the clamp members and the ring, and a cover plate suspended from one of said clamp members, said ring being provided with a peripheral annular rib having a gently sloping rear face and an abruptly sloping front face.

2. In combination with a culvert, a flood-gate therefor, comprising a ring partially positioned within the end of the culvert, complementary semi-circular clamp members secured together in such relation as to grip the end of the culvert between the clamp members and the ring, and a cover plate suspended from one of said clamp members, said clamp members having a gently sloping rear portion and an abruptly sloping front portion.

3. In combination with a culvert, a flood-gate therefor, comprising a ring partially positioned within the end of the culvert, complementary semi-circular clamp members secured together in such relation as to grip the end of the culvert between the clamp members and the ring, a link pivotally mounted on one of said clamp members and a cover plate pivotally suspended from said link, said ring being provided with a peripheral annular rib having a gently sloping rear face and an abruptly sloping front face.

4. In combination with a culvert, a flood-gate therefor, comprising a ring partially positioned within the end of the culvert, complementary semi-circular clamp members secured together in such relation as to grip the end of the culvert between the clamp members and the ring, a link pivotally mounted on one of said clamp members and a cover plate pivotally suspended from said link, said clamp members having a gently sloping rear portion and an abruptly sloping front portion.

5. In combination with a culvert, a flood-gate therefor, comprising a ring partially positioned within the end of the culvert, complementary semi-circular clamp members secured together in such relation as to grip the end of the culvert between the clamp members and the ring, a link pivotally mounted on one of said clamp members and a cover plate pivotally suspended from said link, said link having a hook shaped lower portion.

6. In a flood-gate for culverts and like conduits, an annular member adapted to be inserted in the end of a culvert, said member being formed with a rib on the peripheral surface thereof having an inclined rear face adapted to wedgingly engage the end of the culvert and a more abruptly inclined front face, and segmental clamp members adapted to be applied circumferentially of the annular member and formed with co-acting portions adapted to wedgingly engage said rib and the end of said culvert.

7. A flood-gate for culverts, comprising an annular ring adapted to be inserted in the end of a culvert, and segmental clamp members secured together in such relation as to grip the end of the culvert between the ring and clamp members, said annular ring and clamp members each being provided with an inclined face and an abruptly sloping face, the inclined faces gripping the end of the culvert therebetween as the clamp members are secured to the ring, and the abrupt faces coacting with each other to exert an axial thrust to the ring to force it into the end of the culvert, and a cover plate suspended from one of the clamp members.

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