April 9, 1963 K. G. COFFMAN 3,084,516

SELF-SETTING IRRIGATION DITCH DAM

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FIG. 1

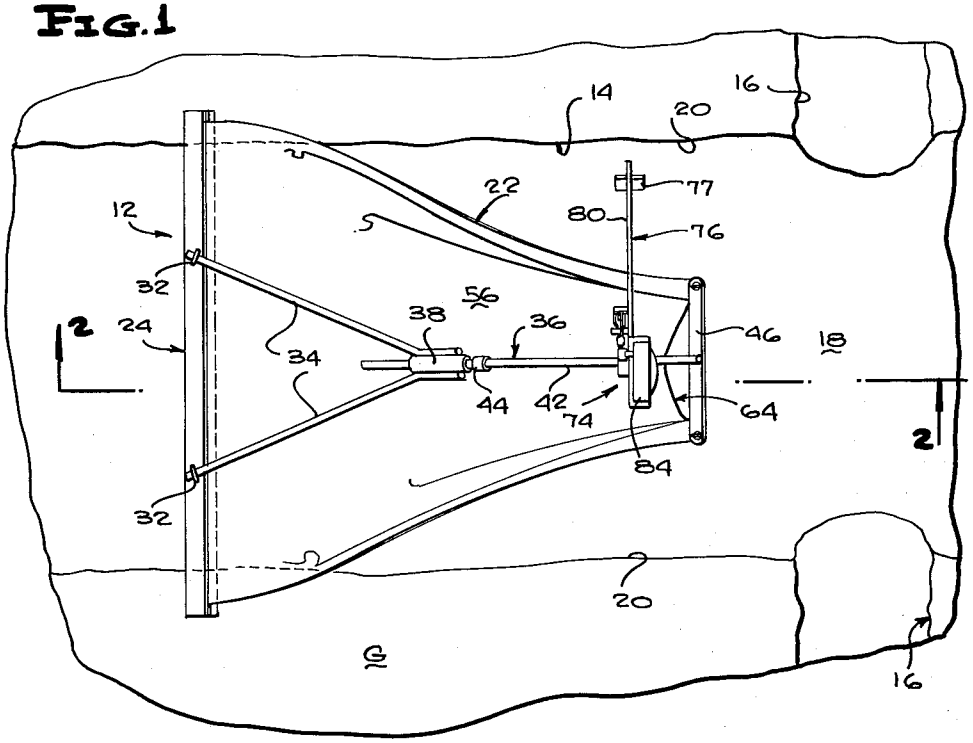
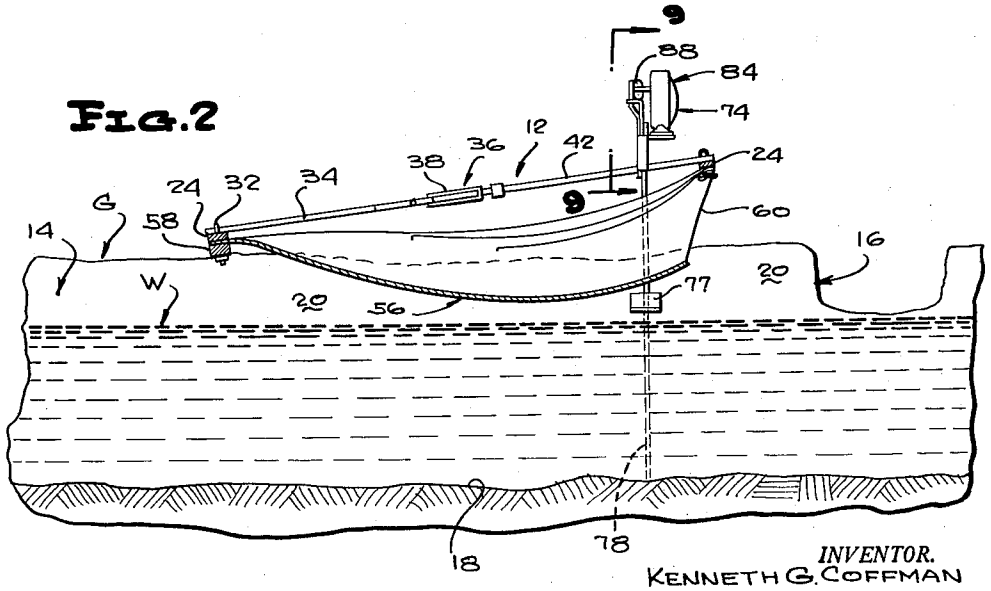


FIG. 2



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FIG. 3

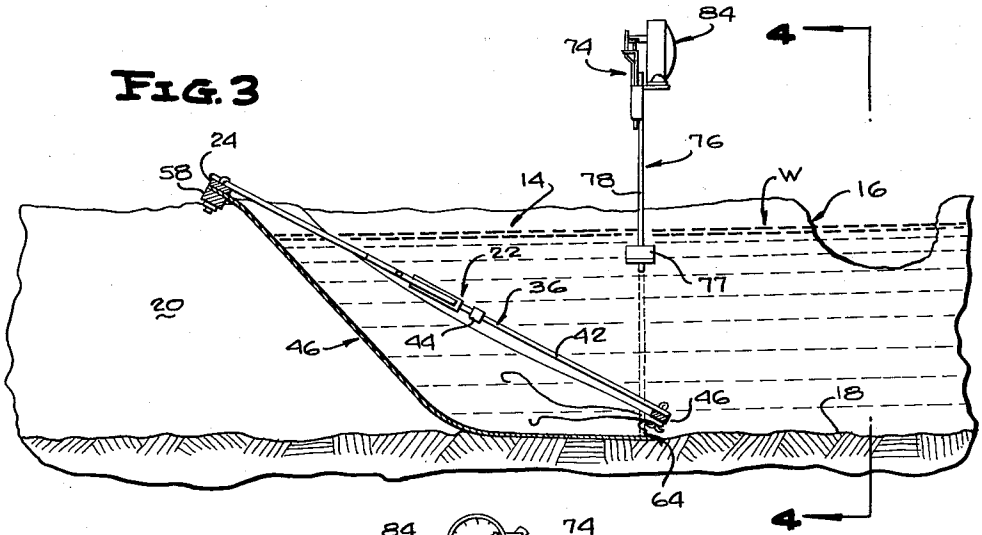


FIG. 4

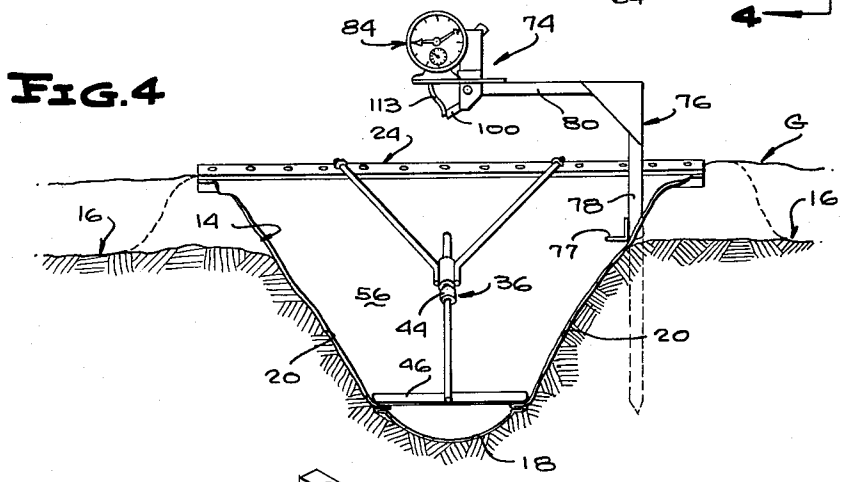
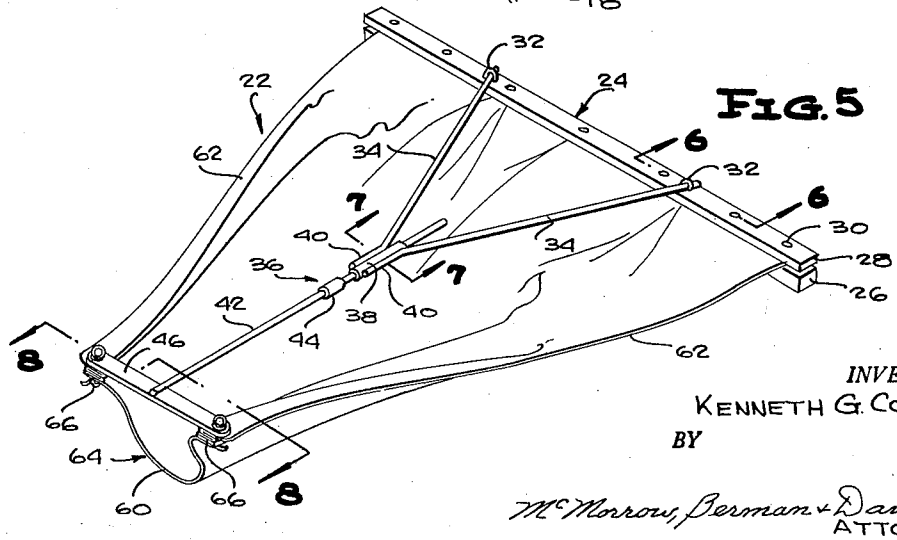


FIG. 5



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FIG. 6

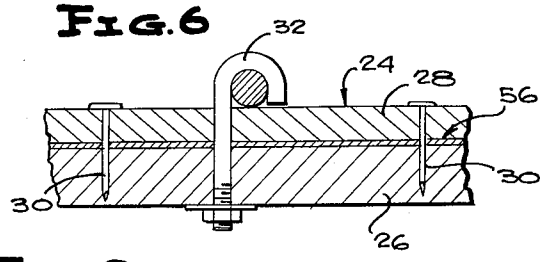


FIG. 7

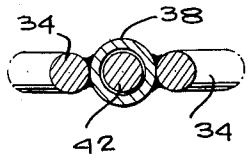


FIG. 8

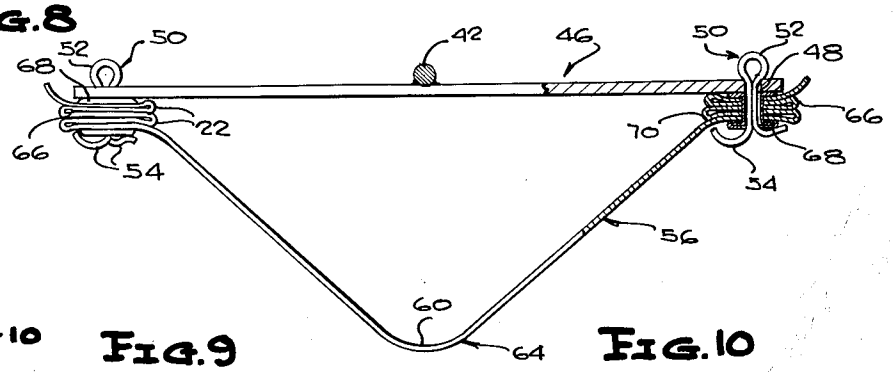


FIG. 9

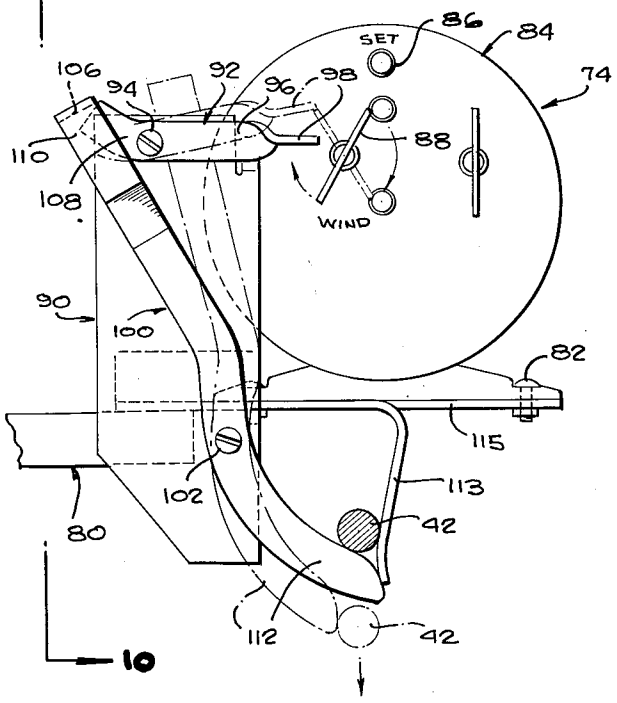
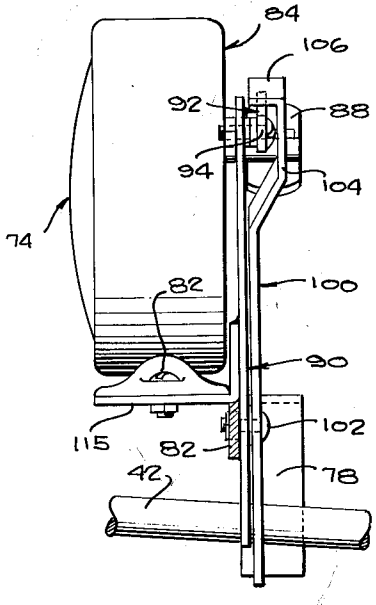


FIG. 10



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SELF-SETTING IRRIGATION DITCH DAM

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3 Claims. (Cl. 61—29)

This invention relates to a novel self-setting irrigation ditch dam having timing means for automatically releasing the dam into a ditch from an elevated inoperative position.

The primary object of the invention is the provision of a more practical, efficient, and more easily used dam of the kind indicated, which enables installation of dams at selected locations along a ditch, timed to be released into the ditch at predetermnied times, without requiring individual operation by an attendant or attendants.

Another object of the invention is the provision of a dam of the character indicated above whose flexible curtain is specially shaped, so that as the curtain is released and falls into the ditch, the lower end and sides of the curtain are automatically sealingly conformed to the unevennesses therein, such as projecting stones, by the flow pressure and weight of water in the ditch.

A further object of the invention is the provision of a dam of the character indicated above which has simpler and more effective curtain-supporting and curtain-positioning means, in conjunction with more efficient timed release mechanism.

Other important objects and advantageous features of the invention will be apparent from the following description and the accompanying drawings, wherein, for purposes of illustration only, a specific form of the invention is set forth in detail.

In the drawings:

FIGURE 1 is a schematic top plan view showing a dam of the invention installed across an irrigation ditch, the dam curtains being in elevated inoperative position;

FIGURE 2 is a vertical longitudinal section taken on the line 2—2 of FIGURE 1;

FIGURE 3 is a view similar to FIGURE 2, showing the dam curtain in depressed operative position in the ditch;

FIGURE 4 is a vertical transverse section taken on the line 4—4 of FIGURE 3;

FIGURE 5 is a perspective view of the dam curtain, per se;

FIGURES 6 and 7 are enlarged fragmentary vertical transverse sections taken on the lines 6—6 and 7—7, respectively, of FIGURE 5;

FIGURE 8 is an enlarged transverse vertical section taken on the line 8—8 of FIGURE 5;

FIGURE 9 is an enlarged vertical transverse section taken on the line 9—9 of FIGURE 2, showing the detent lever of the timing assembly in engaged position in full lines and in released position in phantom lines; and,

FIGURE 10 is a vertical transverse section taken on the line 10—10 of FIGURE 9.

Referring in detail to the drawings, wherein like numerals designate like parts throughout the several views, a dam of the present invention, generally designated 12, is shown installed relative to an irrigation ditch. The ditch 14 is a main ditch, as distinct from lateral ditches 16, shown as extending laterally from the main ditch 14, on levels spaced above the concave bottom 18 of the main ditch. The main ditch 14 is shown as typically having downwardly converging sidewalls 20, which reach downwardly from the ground surface G, and merge, at opposite sides, into the bottom wall 18.

The illustrated dam 12 comprises an apron assembly 22 which is composed of a straight transversely and horizontally elongated, relatively rigid support bar 24, longer than the width of the ditch 14, and adapted to rest, at its

ends, upon the ground surface G across the ditches. The bar 24 is preferably of wood and composed of a substantially square lower section 26, and a flat rectangular upper section 28, which are traversed, at equally spaced intervals therealong, by clamping nails 30. Suitably secured, as by means of clamping hook bolts 32 traversing the sections, upon the upper bar section 28, at equal distances from the ends of the section 28, are the rear ends of a pair of rearwardly divergent rods 34 of a dam curtain stretcher, or positioner, generally designated 36.

The stretcher 36 further comprises a longitudinal sleeve 38, to opposite sides of which forward end portions 40 of the rods 34 are suitably fixed. A longitudinal slide rod 42 has a rear end portion sliding through the sleeve 38 and a stop collar 44, intermediate its ends, for stop engagement with the sleeve. At its forward end, the rod 42 is suitably and centrally fixed upon a flat cross bar 46. The cross bar 46, as shown in FIGURE 4, is substantially shorter than the support bar 24, and is of a length so that its ends engage the ditch sidewalls 20, where they merge into the concave bottom wall 18, and space the cross bar above the trough of the bottom wall 18. The cross bar 46 is formed, at its ends, with holes 48 through which extend cotter pins 50, with their heads 52 bearing upon the upper surfaces of the cross bar, and their legs 54 extending beneath the cross bar.

The curtain assembly 22 further comprises a flexible curtain 56, of suitable material, such as canvas. As shown in FIGURES 1 and 5, the curtain 56 is of forwardly tapered polygonal shape, has a maximum width rear edge 58, a reduced width forward edge 60, and similar forwardly converging straight side edges 62. The rear edge 58 is clamped between the support bar sections 26 and 28, and is traversed by the clamping bolts 30. The narrow forward edge 60 of the curtain 56 is wider than the length of the cross bar 46.

In order to provide the curtain 56 with the desired sealing conformability to the sidewalls 20 and the bottom 18 of the ditch 14, produced by the flow of water in the ditch to the forward side of the dam 12, and the weight of the water, the side edges 62 of the curtain are left free, and the forward edge 60 is attached, only at its ends, to the cross bar 46, so that the intermediate part of the forward edge 60 sags into a concave lip 64, which is free to sealingly conform to the contours of the ditch bottom 18.

To produce the lip 64, the forward corners of the curtain 56 are folded or gathered, as indicated at 66, beneath the ends of the cros bar 46, and the legs 54 of the cotter pins 50 are extended down through grommets 68, secured in holes 70 provided in the folds 72, and spread against the lower ends of the grommets 68.

The dam 12 further comprises a timing assembly 74 which comprises an inverted L-shaped bracket 76, having a pointed vertical standard portion 78, adapted to be driven into a ditch sidewall 20, as shown in FIGURES 1 and 4, as far as a lateral stop bracket 77 and a horizontal foot portion 80, which extends to the middle of the ditch 14, at an elevation spaced above the curtain assembly 22, and at a location near to and slightly behind the forward end of the curtain 56.

Fixedly mounted, as indicated at 82, upon the inner or free end of the bracket foot portion 80, is a timer clock 84, which can be an ordinary spring-operated alarm clock, having a set button 86, and a rotary wind key 88, extending from one side thereof. A vertical bracket plate 90 is fixed to and extends upwardly from the foot portion 80, at the said one side of the clock 84, at one side of the key 88. A trip or trigger lever 92 is pivoted, intermediate its ends, and off-centered on a horizontal axis, as indicated at 94, on the upper part of the bracket plate

90, and has a long inner arm 96 which terminates in a horizontal finger 98, which is positioned in the path of rotation of the clock key 88, so that, when the key is rotating clockwise, it can engage under the finger 98 and tilt the lever 92 upwardly and outwardly to a released position, as indicated in phantom lines in FIGURE 9, out of a depressed set position, shown in full lines.

A vertically elongated vertical member or detent lever 100 is pivoted on a horizontal axis, as indicated at 102, to the lower part of the bracket plate 90, at a point below the middle or center of the lever 100. The detent lever 100 has a laterally outwardly offset upper end portion 104 having, at its upper end, a laterally inwardly extending lateral lug 106, which normally overlies the short outer arm 108 of the trip lever 92. The said short arm 108 is angled upwardly relative to the long trip lever arm 96 and has an outer end 110 which, in the set position of the trip lever 92, bears against the underside of the lug 106.

The detent lever 100 has an inwardly and downwardly curved lower portion 112, which, in the set position of the detent lever, is engaged beneath the forward part of the rod 42 of the curtain stretcher 36, in the elevated inoperative position of the curtain assembly 22, as shown in FIGURES 2 and 9, with the rod 42 bearing laterally against an abutment arm 113 which extends downwardly from a horizontal plate 115, fixed to and extending laterally from the free end of the bracket foot portion 80, upon which the clock 84 is mounted.

With the clock 84 wound and set to apply the key 88 to the underside of the finger 98 of the trip lever 92, at a predetermined future time, the attendant can leave the dam 12 without further attention, until it is desired to move the dam curtain assembly 22 out of the ditch 14. As the key 88 engages and elevates the trip lever 92, the end 110 of its short outer arm 108 disengages from the lug 106 on the upper end of the detent lever 100 so that the weight of the curtain assembly 22 causes the rod 42 to push the curved lower portion 112 of the detent lever 100 out of the way, and let the curtain assembly fall into the ditch 14.

The water W flowing toward the forward end of the curtain 56 and into the curtain 56, causes its side edges 62 and its forward edge 18 to flex into tight and conforming engagement with the sidewalls 20 and the concave bottom 18 of the ditch, so that no water can pass the curtain, and so that the level of the water rises in the ditch and flows therefrom through the lateral ditches 16.

The timing assembly 74 is reset simply by reengaging the lug 106 on the upper end of the detent lever 100 over the shorter outer arm 108 of the trigger lever 92, with the trigger lever overbalanced to its depressed horizontal set position, by the greater weight of its long inner arm 96. With the curtain assembly 22 in its elevated inoperative position and the stretcher rod 42 engaged over the curved lower end portion 112 of the detent lever 100, the curtain assembly 22 is again held up in its elevated inoperative position.

Although there have been shown and described herein preferred forms of the invention, it is to be understood that the invention is not necessarily confined thereto, and that any change or changes in the structure of and in the relative arrangements of components thereof are contemplated as being within the scope of the invention as defined by the claims appended hereto.

What is claimed is:

1. In combination, an irrigation ditch, a dam having a curtain assembly extending across the ditch and having one end resting upon the ground at opposite sides of the ditch, a stretcher on and carried by said assembly, and a timing assembly comprising a bracket mounted on the bank of said ditch and extending inwardly over the portion adjacent the other end of said curtain assembly, a vertical member swingably supported intermediate its ends on said bracket for rocking movement about a horizontal axis and having the lower end releasably engaged beneath said stretcher to hold the other end portion of said curtain assembly above said ditch, and clock-operated means on said bracket and releasably engaging the upper end of said member, said clock operated means including means shiftable from engagement with the upper end of said member whereby the member is freely swingable about its axis to permit the stretcher by the weight of the assembly push the lower end of the member aside and drop with the other end portion of the assembly into the ditch.

2. In combination, an irrigation ditch, a dam having a curtain assembly extending across the ditch and having one end resting upon the ground at opposite sides of the ditch, a stretcher on and carried by said assembly, and a timing assembly comprising a bracket mounted on the bank of said ditch and extending inwardly over the portion adjacent the other end of said curtain assembly, a vertical member swingably supported intermediate its ends on said bracket for rocking movement about a horizontal axis and having the lower end releasably engaged beneath said stretcher to hold the other end portion of said curtain assembly above said ditch, a clock mounted on said bracket, a rotatable key on said clock, and a trip lever pivoted intermediate its ends on said bracket for movement about another horizontal axis and having one end positioned in the path of rotation of said key and having the other end releasably engaged by the upper end of said member, the other end of said trip lever shiftable from engagement with the upper end of said member upon contact of its one end by said key responsive to rotation of said key whereby said member is freely swingable about its axis to permit the stretcher by the weight of the assembly push the lower end of the member aside and drop with the other end portion of said assembly into the ditch.

3. In combination, an irrigation ditch, a dam having a curtain assembly extending across the ditch and having one end resting upon the ground at opposite sides of the ditch, a stretcher on and carried by said assembly, and a timing assembly comprising a bracket mounted on the bank of said ditch and extending inwardly over the portion adjacent the other end of said curtain assembly, a vertical member swingably supported intermediate its ends on said bracket for rocking movement about a horizontal axis and having the lower end releasably engaged beneath said stretcher to hold the other end portion of said curtain assembly above said ditch, a lug on the upper end of said member, a clock mounted on said bracket, a rotatable key on said clock, and a trip lever pivoted intermediate its ends on said bracket for movement about another horizontal axis and having one end positioned in the path of rotation of said key and having the other end of said trip lever shiftable from engagement with said lug upon contact of its one end by said key responsive to rotation of said key whereby said member is freely swingable about its axis to permit the stretcher by the weight of the assembly push the lower end of the member aside and drop with the other end portion of said assembly into the ditch.

References Cited in the file of this patent

UNITED STATES PATENTS

1,117,543	Ames	Nov. 17, 1914
1,380,439	Thompson	June 7, 1921
2,592,290	Kearsley	Apr. 8, 1952
2,696,713	Bentrup	Dec. 14, 1954
2,732,686	Melin	Jan. 31, 1956