May 31, 1932. R. SCHMITT 1,861,031

DITCH CHECK

Filed May 17, 1929

Fig. 1.

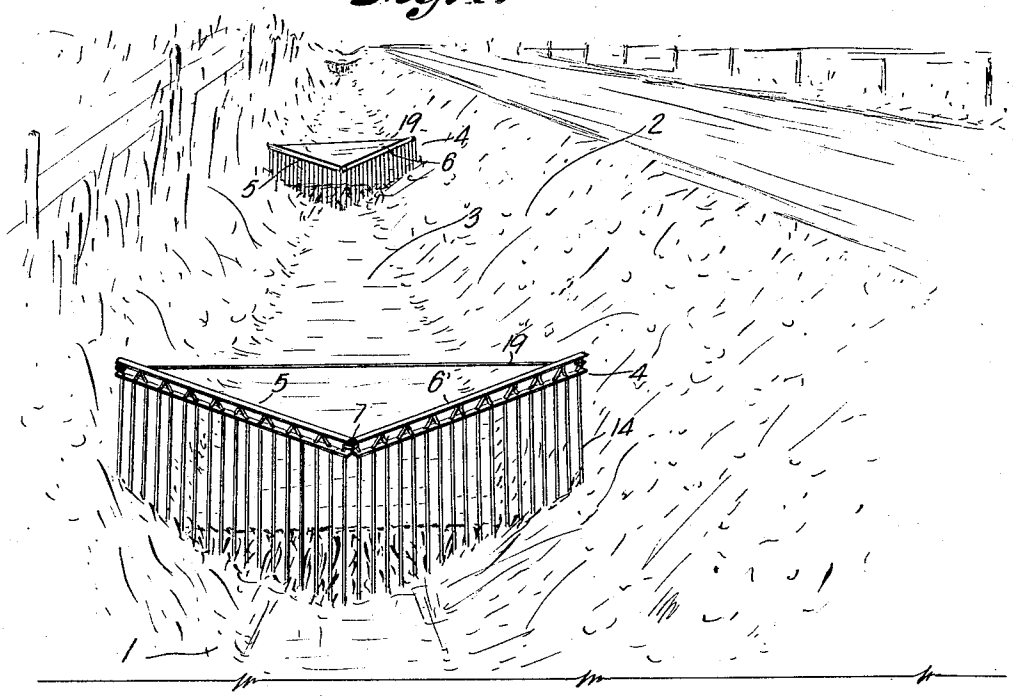


Fig. 2.

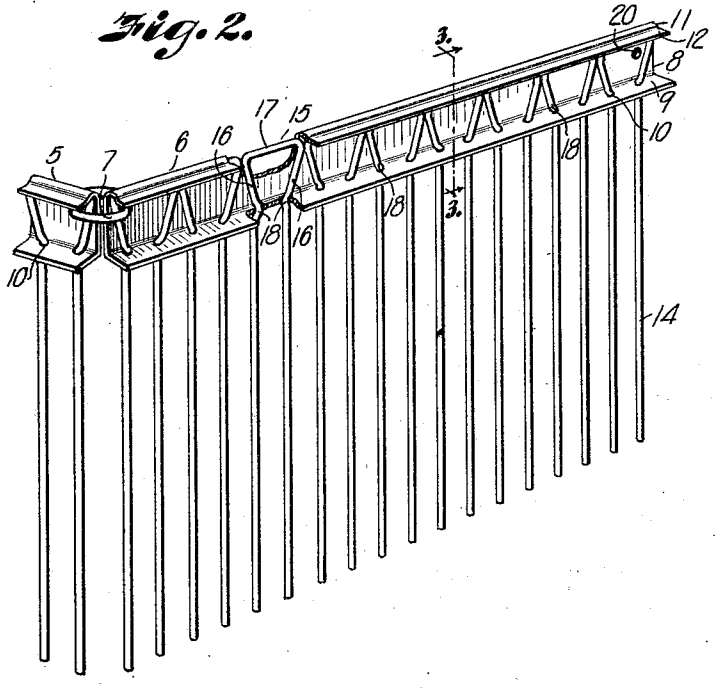
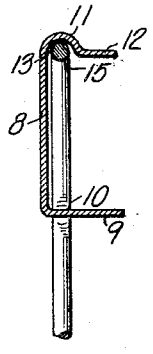


Fig. 3.



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DITCH CHECK

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My invention relates to jetties and more particularly to checks adapted to be installed in ditches, ravines, gullies and like water channels, for capturing and retaining solid material carried by water passing in the ditch and controlling the action of water on soil, the principal objects of the invention being to assure the effective functioning of the check when mounted in a ditch and to facilitate the flow of water past the check, this application being a division in part from my co-pending application Serial No. 190,211, filed May 10, 1927.

In the use of ordinary checks of this character material tends to collect at the center line of the ditch or at some position laterally of the center which cannot be predetermined, and flowing water tends to break new paths around the ends of the check whereby the normal contour of the ditch is disturbed and the check may be partly or wholly dislodged.

Further objects of my invention therefore are to assure the movement of water along the normal median line of the ditch to prevent the water from passing at or around the ends of the check and to enable the check to cause deposit of material symmetrically on the bottom of the ditch so that the check may function surely and without attention to effect the filling of the ditch and prevent material from being carried away.

Further particular objects of the invention are to facilitate the assembly of a checking device, and to reduce the number of parts involved in locking fingers to a head member to form a check.

In accomplishing these and other objects of the invention, I have provided improved details of structure, the preferred forms of which are illustrated in the accompanying drawings, wherein:

Fig. 1 is a perspective view of a ditch and my improved checks installed therein.

Fig. 2 is an enlarged detail perspective view of a portion of a ditch check, a channel bar being partly broken away for better illustration of the relation of wire fingers to the bar.

Fig. 3 is a more greatly enlarged section on the line 3—3, Fig. 2, showing the wire finger fragmentarily.

Referring in detail to the drawings:

1 designates generally a ditch including tapering side walls 2 and a bottom 3.

My invention comprises a jetty or ditch check 4 comprising in its preferred form a pair of channel bars 5 and 6 arranged in substantially longitudinally aligned relation and having adjacent ends hingedly connected as by a wire loop 7 preferably extending in the bodies or webs 8 of the bars, whereby the bars may be angularly positioned in relation to each other.

Each bar comprises a head member and includes a lower longitudinal horizontal flange or leg 9 having substantially aligned apertures 10, and an upper horizontal flange 11 having its outer edge portion 12 downbent or offset to form a longitudinal downwardly opening latching groove or socket 13 at the upper edge of the web and closely adjacent the same. The edge portion 12 comprises a resilient latch or keeper yieldable to admit the looped end of a finger member to the groove.

Fingers 14 are secured to the bar and extend substantially parallel with the plane of the web thereof and parallel with each other to form a grating section adapted to be installed in the ditch. The fingers are preferably of equal length, and their free ends are therefore aligned.

The fingers are preferably formed of relatively heavy wire or rods and as illustrated two relatively long and flexible fingers are formed of a single rod or wire comprising a finger member which is bent at its midpoint to produce a loop 15 comprising branches or arms 16 bent outwardly from the fingers and a connecting bar-like portion 17 adapted to be received in the groove and having greater length than the spacing of the fingers. The fingers extend in the apertures of the lower bar flange and the loop extends adjacent the web of the channel bar.

Each finger member is further provided with shoulder-like bent portions 18 at points where the branches 16 diverge laterally to form the loop, said shoulders being adapted

to overlie the upper face of the lower flange 8 and latch the fingers so that the loop itself is not required wholly to latch and retain the finger member in engagement with the bar.

A rod 19 has opposite ends connected with the outer ends of the channel bars, for example, said rod being mounted in openings 20 of the webs of the bars for retaining the bars in diverging position.

In assembling a section of the check, the fingers are mounted in the lower flange of the bar and slidingly moved until the shoulders 18 engage the flanges. In this position, the fingers are latched and retained by the lower channel flanges. The loops are of such length that their cross bars engage the lower faces of the upper channel flange at the outer edge of the resilient horizontal clip-like portion. The fingers are then rocked so that the loops swing under the portion 12 and displace it to admit the loops to the grooves, and engage the loops with the grooved portions of the upper flanges. The finger members are adapted to be mounted in regularly spaced relation so that the lateral ends or shoulders of the loops substantially engage each other.

Two or more of the sections may then be hingedly connected, for example by a wire loop inserted in the centrally disposed openings in the ends of the web portions of the head bars. The sections are thus adapted to be angularly related, and may be hinged vertically and laterally or horizontally.

The connecting bar is adapted in length to lock the free ends of the sections in desired horizontally hinged position, the sections being still free to hinge vertically.

In using the device, the channel bars form a triangular frame of which the connecting rod is the base, and the apex is the hinge joint. The fingers mounted in the channel bars complete the formation of a grating.

Any desired number of sections may be joined to form a structure for positioning in a particular situation, for example to form a jetty at the edge of a stream or ditch, or to span the end of the waterway.

A structure comprising a pair of hinged sections may be installed in a ditch with the apex pointed down stream and at the median line of the ditch or at a point in the desired median line of the current. The channel bars extend transversely of the ditch and extend upwardly outwardly with reference to the direction of flow of water.

The fingers are pressed into the soil and due to the tapering conformation of ditches the fingers at the ends will be impressed more deeply than the fingers at the hinged ends of the channel bars, and anchor the device, and the top flanges of the bars will constitute a weir.

Because of the nature of the hinge joint, the down stream central portion of the check may be depressed below the ends, for example 2 or 3 inches, to provide a downwardly inwardly inclined weir-like top edge for assuring centering of the current over the check.

When water carrying débris, silt, leaves and the like, moves in the ditch, material will be caught by the grating and detained, serving to further entangle material later brought by water, while the stream of water will tend to move on the median line of the ditch over the relatively low apical portion of the grating.

The device therefore tends to retain the current of water at the median line of the ditch, and obviates the hazard of building up of deposits on the median line whereby the current may be forced around an end of the check.

Soil washed into a gully by rain may therefore be detained, and losses due to erosion avoided. The check may be easily lifted out when covered, or raised to provide elevated portions to trap and collect trash and silt.

While a single section comprising a bar and finger locked thereto may be positioned right angularly across a ditch, a pair, preferably hingedly connected, and angularly related as shown, with the apex downstream and at a point where it is desired to have the middle of the stream, is markedly more effective as above set forth.

The connecting rod joining the free ends of the head bars or sections prevents spreading of the angularly inclined sections, and also tends to prevent the sections from being forced toward each other when water and material press against the central hinge of the head.

A check or a series of checks may be located in a grade ditch or highways, for example beside graveled roads, and tends to catch material including gravel washed from the road. When a road is to be regraded, the checks may be lifted, the material restored to the road, and the checks then replaced.

What I claim and desire to secure by Letters Patent is:

1. In a device of the character described, a head member comprising a channel including a web, a lower flange provided with apertures and an upper flange substantially parallel with the lower flange and having a longitudinal groove at its juncture with the web, and parallel spaced finger members comprising wires bent intermediate their ends to form loops including connecting bar portions having greater length than the spacing of the fingers, said fingers being adapted to pass through the lower flange apertures and the loop being adapted to stand in parallel relation with the web with its bar portion engaged in said groove.

2. A ditch check including a bar having a flange on one edge provided with apertures and a longitudinally grooved resilient flange

on the opposite edge of the bar having a free edge portion substantially parallel with said apertured flange, and finger members mounted in said apertures and having shoulders engaged with the apertured flange and head portions engaged in the groove of the second named flange.

3. A ditch check including a head comprising a web, a flange on one edge of the web having an aperture, a resilient flange on the opposite edge of the web substantially parallel with the first named flange and having an outer edge portion offset slightly from the edge of the web to form a resilient latching member, and a finger mounted in said aperture and having a shoulder engageable with the apertured flange and an upper end portion engageable with said latching member to displace the same for admitting said upper end portion of the finger into engagement with the web.

4. A ditch check including a head comprising a web, a flange on one edge of the web having an aperture, a resilient flange on the opposite edge of the web substantially parallel with the first named flange and having an outer edge portion offset slightly downwardly from the edge of the web to form a resilient latching member, and a finger including a portion mounted in said aperture and an upper end portion having a shoulder to engage the upper face of the apertured flange for limiting movement of the finger through the aperture, and having length substantially equal to the width of the web for engaging and displacing said resilient offset edge of the second named flange to admit the upper portion of the finger into engagement with the web.

5. A jetty for checking erosion in a ditch, including a bar having a web and a flange on one longitudinal edge of the web, a series of parallel U-shaped fingers having their upper portions abutting said web and flange and free lower portions extending in a plane parallel with the web for insertion in the bed of a ditch to support the bar and anchor the jetty, said free portions of the fingers having sufficient length to support the bar a substantial distance above the bed of the ditch and interpose the fingers vertically in the path of water flowing in the ditch for entangling material carried by the water, and a clip portion formed integrally with the web and flange for securing said fingers.

6. A jetty comprising a pair of horizontal bars, each including a vertical web and a right angular flange at one edge of the web, a series of parallel flexible U-shaped fingers on each bar having upper portions in contact with the web and flange, clip portions formed on the bars for securing the fingers thereto, the free lower portions of said fingers extending in a plane parallel with the web for endwise insertion in soil of a ravine and having sufficient length to support the bar a substantial distance above the surface of the soil for interposing the series of fingers in the path of water moving in the ravine, and means flexibly connecting adjacent ends of the bars for angular adjustment of the bars and series of fingers relative to the median line of the ravine and the surface of water flowing in the ravine.

7. In a jetty for checking erosion action of water flowing in a ditch, a head member comprising a pair of bars, each having a web and a flange along the upper edge of said web, extending substantially horizontally in angular relation in an upstream direction from the median line of the ditch to form an apex on said line, a series of parallel U-shaped fingers supported by the web and flange of each of said bars free from each other and insertable endwise in the bed of the ditch for supporting the head member and having sufficient length to elevate the bars substantially above the bed, the apex being at a lower elevation than the free end portions of the bars, and clip portions on said webs and flanges for securing said fingers thereto.

8. In a jetty for checking erosive action of water flowing in a ditch, a head member comprising a pair of bars having a web and a flange, U-shaped depending fingers carried by said bars vertically insertable in the bed of the ditch for supporting the bars and anchoring the jetty in a position transverse to the direction of flow of water, the bars having inner ends connected and extending horizontally and diverging from the connected ends to form an apex pointing in the direction of flow of water and located on the median line of the ditch, said fingers having lower portions free from each other and of sufficient length to permit insertion thereof in the bed a required distance for locating the bars at a desired elevation above the bed and adjusting the elevation of the apex of the jetty with reference to the elevation of the free ends of said bars, and clip portions formed integrally with said webs and flanges for securing said fingers.

9. In a jetty for checking erosive action of water flowing in a ditch, a preformed unit comprising a pair of bars, each having a web and a flange in end abutting relation, a series of flexible U-shaped vertical fingers depending from each of the bars to form jetty sections and having free portions insertable in the bed of the ditch to locate the unit transversely of the ditch with the abutting ends of the bars on the median line of the ditch for supporting the bars a substantial distance above the bed, said bars having a flexible connection for effecting adjustment of the angular relation of the sections to each other for forming a unit having sections diverging from an apex on the median line of a ditch upwardly with respect to direction of flow

of water in the ditch, said fingers being depressible in the bed and the connection operable to adjust the angular relation of the bars to a horizontal plane after insertion of the fingers in the bed, and clip portions integrally formed with said webs and flanges for securing said fingers to said bars.

In testimony whereof I affix my signature.

ROY SCHMITT.