United States Patent [19]

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[11] **3,869,868**

[45] **Mar. 11, 1975**

[54] RETAINING WALL SUPPORT DEVICE

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[22] Filed: **Dec. 27, 1973**

[21] Appl. No.: **428,815**

[52] **U.S. Cl.** **61/49,** 52/169

[51] **Int. Cl.** **E02b 3/14,** E02d 11/00

[58] **Field of Search** 61/49, 39, 35; 52/169

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Primary Examiner—Jacob Shapiro

[57] **ABSTRACT**

In a preferred embodiment of the invention, there is provided a retaining wall which is available in separate combinable parts of simple construction effecting a retaining wall of improved strength and durability, including a series of spaced-apart stake elements having grooves in each of lateral faces such that baffle elements are slideable between the stake elements into the opposing grooves thereby making it possible to drive down consecutive serially arranged stake elements spaced apart from one-another the width of the baffle element, and thereafter sliding the baffle elements downwardly into the opposing grooves and locking the baffle elements against axial sliding movement thereafter, and securing a back-bracing structure thereto at upper and lower portions of the baffle element each portion respectively of each of the interspaced baffle elements interspaced alternately between the consecutive series of stake elements, each back support including an inclined support shaft attached to the upper portion of the baffle element by an insertable locking-fit structure and the lower portion of the inclined support shaft being detachably securable to a rearward end of the horizontal flat-faced structure having a flat face on each of opposite faces extending each uprightly, and the forward end of the horizontal flat-faced element being attached to the base of the baffle element and thereafter earth fill piled on top of the upwardly-directed flat face to thereby anchor the support structure, preferably filling the earth fill upwardly to the entire height of the stake and baffle elements.

4 Claims, 8 Drawing Figures

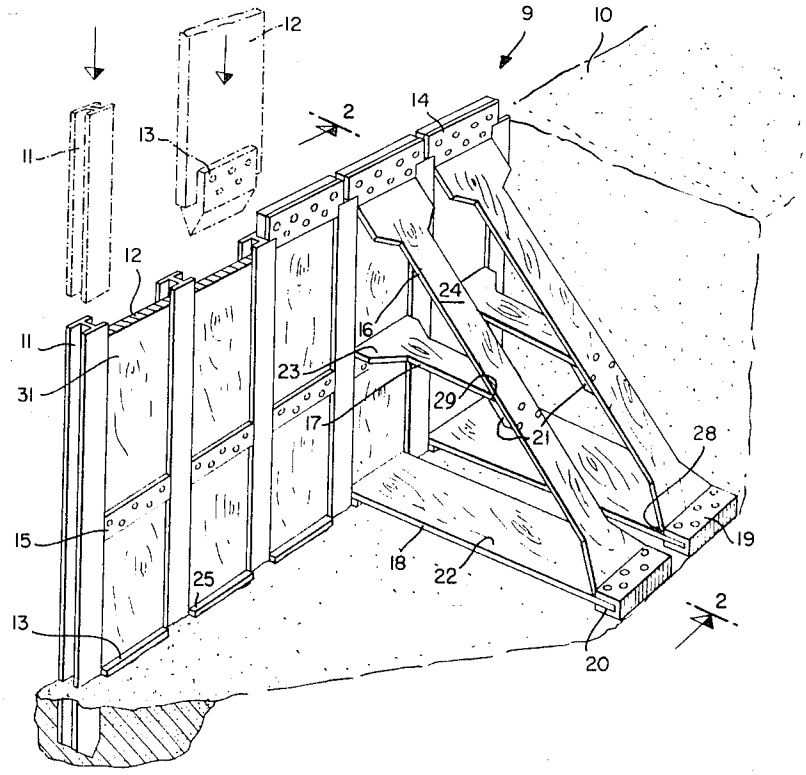


FIG. 1

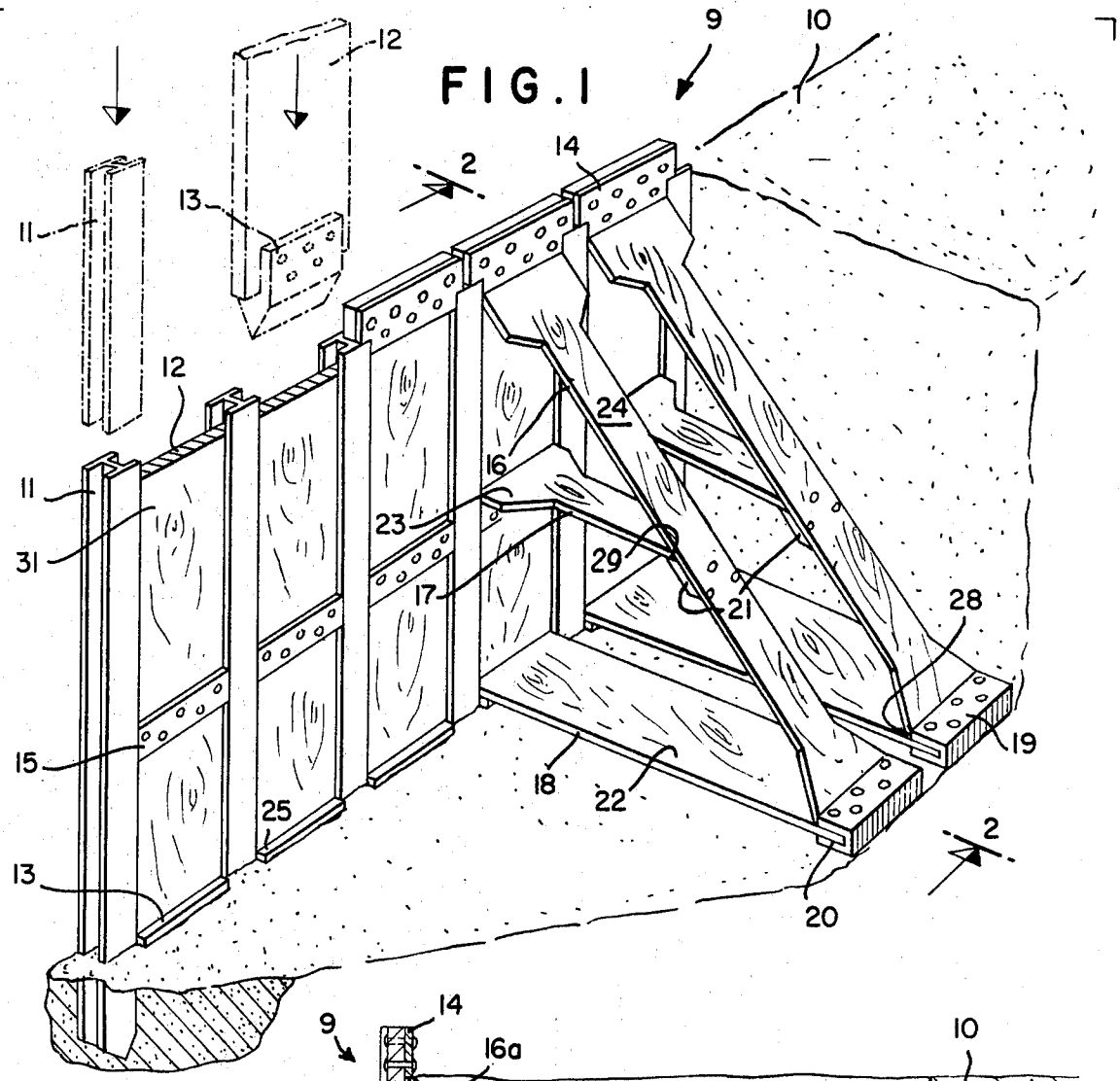
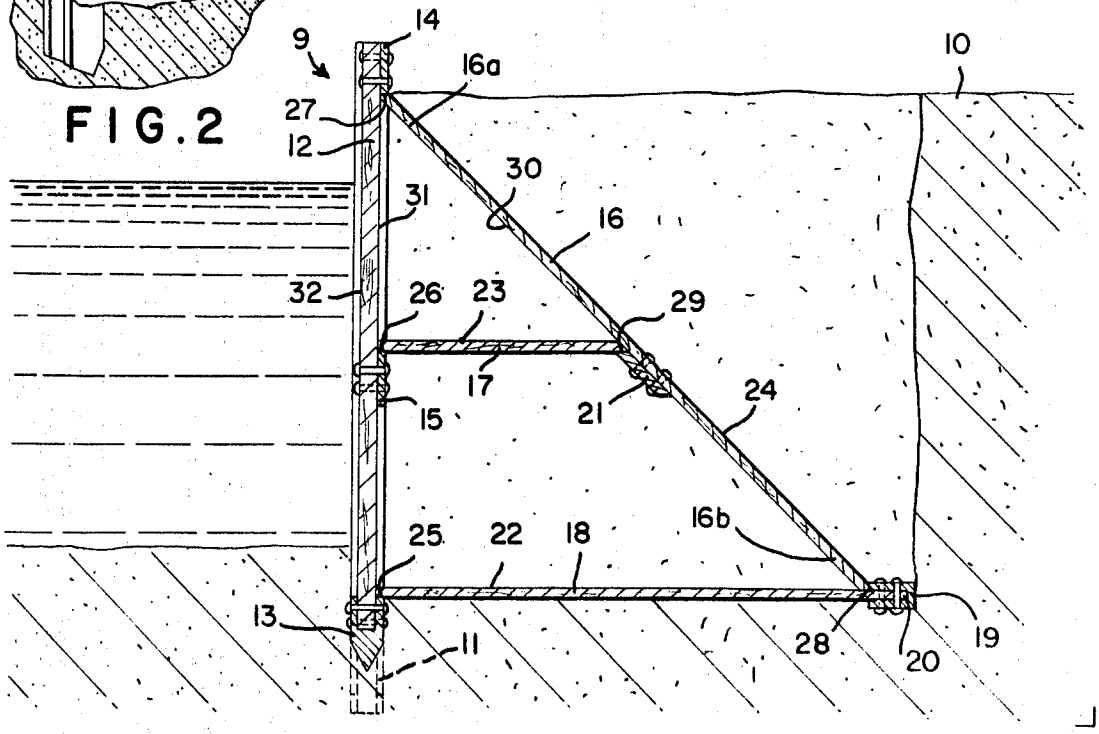

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FIG. 2


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16b
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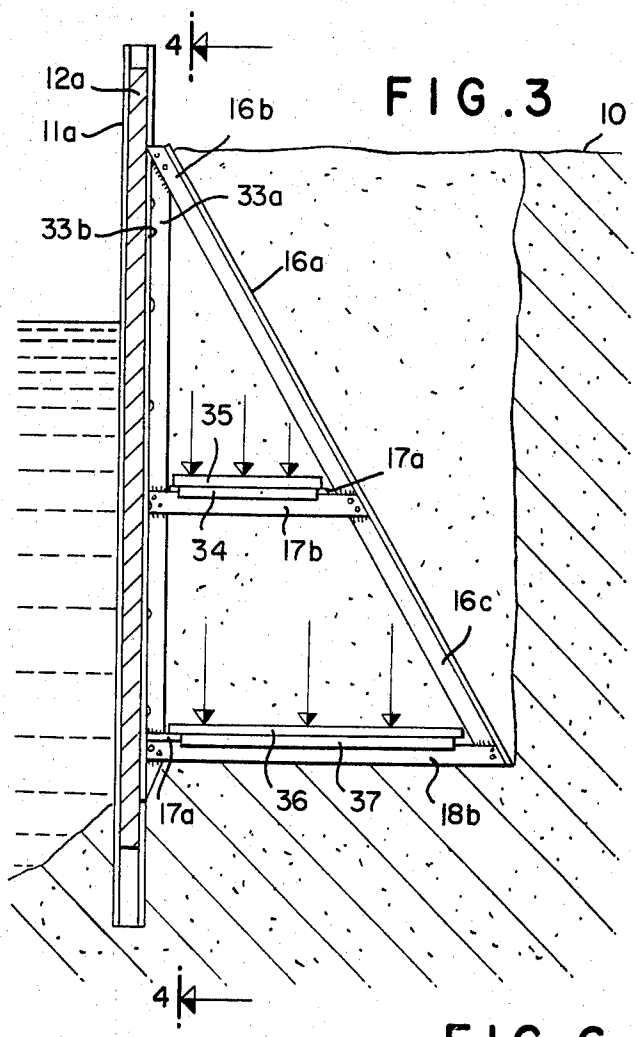


FIG. 3

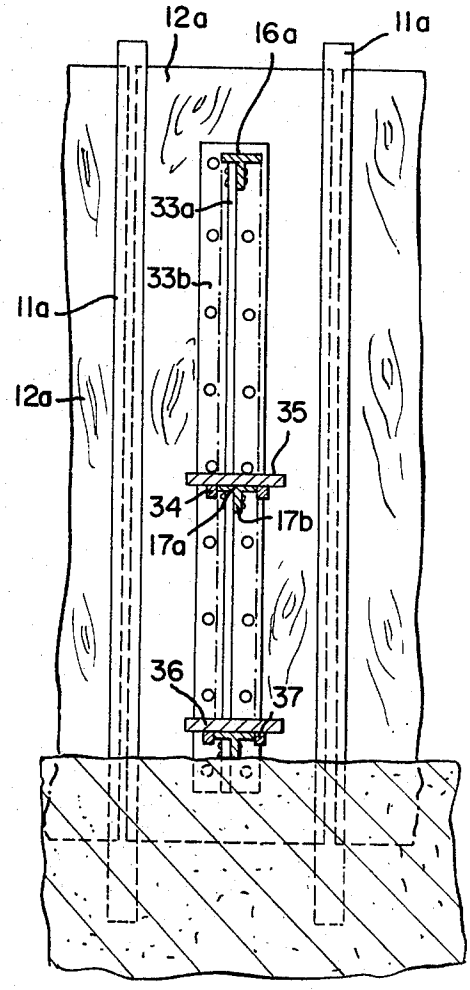


FIG. 4

FIG. 6

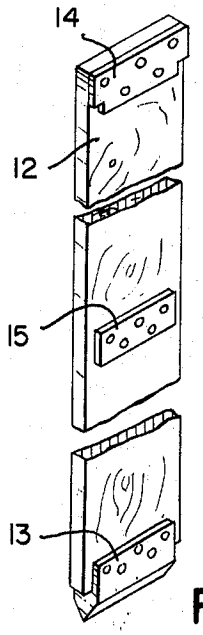


FIG. 8

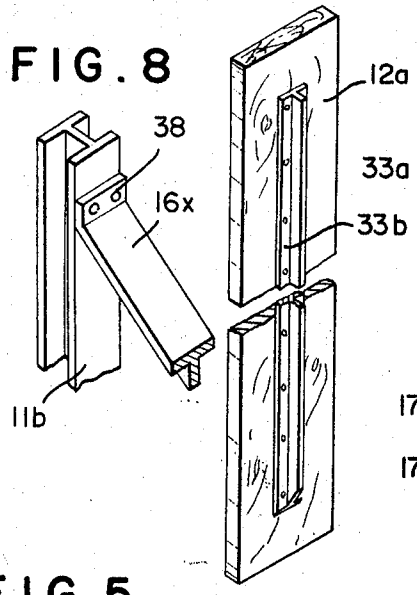


FIG. 5

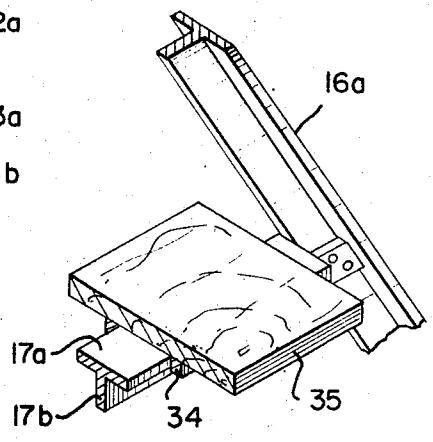


FIG. 7

RETAINING WALL SUPPORT DEVICE

This invention is directed to an improved retaining wall structure.

BACKGROUND TO THE INVENTION

Prior to the present invention, there have existed numerous complicated and impractical sorts of retaining walls from the standpoint of required great strength and durability while concurrently being of simple structure particularly of the type that may be mass produced and shipped and assembled on site, with a minimum of experience and insulation time required, the prior devices because of the lack of these attributes and benefits being substantially impractical and unacceptable competitively on the market today at a time of high costs of materials and labor. Also, because of the high cost of materials and labor, as well as the desired perfection of product, the strength and durability of prior devices have been less than satisfactory.

SUMMARY OF THE INVENTION DISCLOSURE

Broadly the invention is directed to objects overcoming one or more of the difficulties and problems and disadvantages of the type discussed above.

Another object includes a new structure and method of installation of a retaining wall device.

Another object is to provide a retaining wall structure adaptable to varying environmental conditions.

Other objects are apparent from the preceding and following disclosure.

One or more objects of the present invention are obtained by the invention as defined herein.

Broadly the invention includes a series of stake elements of such cross-sectional configuration as to be receivable between baffles alternately between spaced-apart stake elements of the series, with opposite edges of the respective baffle elements being shaped to coordinatedly locably mesh as the baffle elements are mounted in contact with opposing faces of adjacent spaced-apart stake elements, with the baffle element being lockable into its inserted position between the spaced-apart stake elements, together with back-support bracing structure secured to at least one of the stake element and baffle element of each consecutive pair thereof, an upper face of a lower situated horizontal structure being positioned to receive earth-fill or concrete or rock or any other type of fill composition on top thereof of the flat face such that the weighted-down flat-face anchors-down the bracing element which fixedly thereby secures the baffle and stake elements against torque forces acting against the retaining wall of joined stake elements and baffle elements alternately. Preferably the bracing support is detachably lockable at its base and at the top of the inclined support element to a rearward face of the baffle structure at each respectively of a base portion and an upper portion of the baffle element after the baffle element has been slid axially longitudinally into its lock-position between adjacent spaced-apart driven-down stake elements in the opposing grooves of adjacent spaced-apart stake elements. Accordingly, the stake elements are driven downwardly into the earth bed a predetermined depth of desired preferred depth-anchoring engineering capability, and thereafter the baffle elements are slid downwardly between adjacent spaced-apart stake elements, and thereafter the back-bracing supports are assembled and attached lockably the upper and lower

back faces as described above and as illustrated in the Figures to be described hereafter, of the respective baffle elements or of the respective stake elements, followed by the pouring of the land fill material, onto the top of the lower upwardly facing flat face of the horizontal bracing support structure, in a series of simple and speedy operations.

The invention may be better understood by reference to the following Figures.

THE FIGURES

FIG. **1** illustrates in a back and side perspective view a typical and preferred embodiment of the present invention in partial cut-away and partial cross-section.

FIG. **2** illustrates a side cross-sectional view as taken along lines **2—2** of FIG. **1.**

FIG. **3** illustrates a side in-part cross-sectional view of an alternate embodiment, this view corresponding to that of FIG. **2.**

FIG. **4** illustrates an in-part elevation in-part cross-sectional back-side view of the FIG. **3** embodiment as taken along lines **4—4** of FIG. **3.**

FIG. **5** illustrates an in-part-cutaway view of a slidable baffle member which is a component part of the combination illustrated in FIG. **1,** in perspective view thereof.

FIG. **6** illustrates in perspective view a baffle member in partial view thereof of the combination of the FIGS. **3** and **4** embodiment.

FIG. **7** illustrates a view as taken along lines **7—7** of FIG. **3,** therefore in partial cross-section and in perspective view thereof.

FIG. **8** illustrates a still further embodiment in an in-part view in back and side perspective, for the spike-drivable element.

DETAILED DESCRIPTION OF THE INVENTION

In greater detail, the FIGS. **1, 2,** and **5** illustrate a particular preferred embodiment of the present invention. In particular, the novel sea retaining wall **9** includes a combination of elements with fill or dirt **10**—shown in cut-away—normally piled on top of surfaces **22** and **23** respectively and surface **24** of the brace support elements **18, 17,** and **16** respectively as a massive weight which thereby anchors these support elements **18, 17** and **16** into a non-movable securing state in their respective supporting functions in being pressed against the rearward face **31** of the baffle element **12** of FIG. **1** and **5,** thereby preventing the baffle element **12** from being pressed rearwardly from between the side-track spaces of opposed spike-elements **11** into which the baffle element is slid from position **12'** after the spike-elements **11** are driven downwardly from position **11',** the base end of the element **12** having mounted thereon a downwardly directed wedge element for securing the lower end within the substrate ground as a further anchor and to avoid against leakage of water therebeneath. The forward end of the flat member **18** rests on the upper edge-surface **25** of member **13,** and the lower face of member **17** rests on upper edge **26** of the member **15,** and the upper end-face of element **16** rests against the lower face **27** of the element **14,** the elements **13, 15** and **14** being each fixedly secured to the back face **26** as illustrated in the FIGS. **1** and **5.** Typically, also, there is provided a base member **19** secured to the member **18** rearward end such as to provide a forwardly directed face **28** against which the lower end

16b of the member **16** may be braced while the upper end is braced against the lower face **27**, as upper end **16***a*. In like manner, typically, there is included a member **21** secured to a lower face **30** of member **16** so as to provide an upper edge surface **29** against which the bottom face of element **16** rests. The member **19** typically provides the cavity **20** into which the member **18** rearward end is securable, the upper and lower surfaces of the U-clamp **19** providing greater strength and support for the pressure rearwardly of the end **16***b* against surface **28** and against upper surface **22** of member **18**. The elements **13**, **14**, **15**, and **19** and **21** are typically secured by bolts, nuts, and/or brads or the like, as illustrated.

In the FIGS. **3**, **4**, **6**, and **7**, there is illustrated a second typical embodiment of the invention, in which parts corresponding to similar or identical elements of the above described embodiment of FIGS. **1**, **2** and **5**, are identified as the same except with an additional "a" designation, as **16***a* corresponds to **16**, for example. This embodiment differs in two main respects, instead of the support members **16***a*, **17***a* and **17***b*, and **18***a* and **18***b* being each a member having an upper flat face, broad-enough to be efficiently anchored by fill earth or other equivalent fill material, instead these members **16***a*, **17***a*, and **18***a* are merely standard structure but mountable of specially designed very-broad-faced member **35** and **36** having mounting downwardly spaced apart dual flanges **34** and mounted on respective surfaces **17***a* and **18***a*; also, the illustrated support members are secured to the flange **33***a* of the plate **33***b* mounted on back face of member baffle **12***a*.

FIG. **8** embodiment differs from either of the above-noted embodiments only in the support **16***x*, and the other equivalent support members being secured to the rear face of the spike-element instead of to the rear face of the baffle element. The baffle element would continue to slide downwardly into place just as in the two fore-going disclosed embodiments, typically. Accordingly, further illustration of this embodiment is not necessary since it may be identical otherwise to either of the above-described embodiments.

A major utility and achievement of the present invention is the simplicity of steps of erection of the structure such as in particular the deeply driven lower ends of the spike elements **12** together with the long brace support elements **18** weighted by filler thereon, jointly elements **12** and **18** serving to totally anchor and brace the base of the erected retaining wall **9** from slipping or pivoting outwardly in the common event of the sea floor giving-way in a seaward direction. This is in contrast to prior art sea-retaining walls which typically have solely the top of the wall secured as by a dead-man brace, which does not prevent the outward pivoting of the base of the wall.

In like manner it is within the scope and spirit of the present invention to make such modifications and substitutions of equivalents as would be apparent to a person of ordinary skill.

I claim:

1. A retaining wall device comprising in combination: a series of stake guide elements each of elongated shape axially longitudinally upright having a lower end thereof extending a predetermined depth below earth level into which the stake guide element is sunk, the upright elements of the series being parallel to one-another and consecutively spaced apart in the series each a predetermined spacing distance from adjacent stake guide elements of the series; a plurality of separate baffle elements each of longitudinally axially elongated shape having its longitudinal axis upright and defining opposite lateral edges extending uprightly each of predetermined shape flushly meshable with one of two opposite upright side edges of an adjacent one of the upright elements with which the baffle elements are interspersed, and including locking structure means such that the meshed lateral edges are fixedly locked to respective meshed upright elements' side edges secure against forward and backward movements from alignment between serially arranged stake guide elements on either side of respective baffle elements, and locked securely against axial movement longitudinally; earth-weight anchoring-support means comprising for each consecutive pair of adjacent stake guide element and baffle element a substantially horizontal means defining a broad upper face having a substantially wide predetermined width and a substantially long predetermined length anchored at one end thereof attached to said baffle element at a lower end portion of the baffle element at a back-side face of the baffle element such that the horizontal means extends substantially horizontally rearwardly, and an inclined bracing element axially longitudinally elongated secured fixedly to a rearward end portion of the horizontal means at one end of the bracing element and the remaining end of the bracing element being secured fixedly to an upper end portion of said baffle element, said predetermined width and said predetermined length being sufficiently large for fill-material placed thereon to anchor the baffle element against a base of the baffle element pivoting outwardly; and fill-material being filled on top of the upper face at a fill-material predetermined height sufficient for the mass thereof to anchor the bracing element against said pivoting outwardly as a result of movement by torque forces against forward faces of the stake guide elements and baffle elements, each stake guide element defining on each of opposite lateral upright faces an upright groove, and in which the groove opposite lateral edges of each baffle are shaped to have a cross-section such that the baffle element is axially slidable downwardly between spaced-apart stake guide elements within opposing grooves of the adjacent stake guide elements before being anchored fixedly by said fill-material, said horizontal means being fixedly anchored to a lower end portion of the baffle element with the inclined bracing element secured at an upper end of the baffle element fixedly to a rearward face of an upper portion of the baffle element to which the attached horizontal means is fixedly secured, each baffle element having a substantially flat forward face and an opposite substantially flat rearward face; and lock means for fixedly mounting the earth-weight anchoring-support means to its respective baffle element, there being a separate earth-weight anchoring-support means for each of the respective baffle elements, and each baffle element having a downwardly-directed wedge-shaped bottom terminal end.

2. A retaining wall device of claim **1**, in which said horizontal means comprises a substantially horizontally-positioned beam and a separate broad-faced sheet structure extending substantially horizontally rearwardly a predetermined distance and lying substantially horizontally across the horizontally-positioned beam, and the fill-material being filled on top of the broad-

faced sheet structure such that the weighted-down sheet structure anchors the horizontal beam therebeneath securedly.

3. A retaining wall device of claim **2,** in which stake guide element groove structure defines the groove along each of the lateral upright edges substantially the entire length of the portion located above the earth level into which the stake guide element is sunk.

4. A process for erecting a retaining wall device comprising in combination: driving spaced-apart separate stake elements into a body of ground-earth downwardly for a predetermined distance; slidably axially inserting between the spaced-apart separate stake elements in contact with each of opposing faces of the spaced-apart separate stake elements a flat-faced and wedge-ended baffle element extending parallel to the stake elements; and locking-in the baffle element each respectively, against axial sliding movement; and securing a flat-upper-faced elongated broad-faced support means for securedly attaching to and anchoring a lower portion of the baffle element with the support means extending rearwardly horizontally; securing an inclined support member at opposite ends thereof, one end to a rearward end portion of the horizontal support means and the other remaining end to an upper portion of the secured one of the stake elements and the baffle elements.

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