Oct. 4, 1955 T. O. HENRIKSON 2,719,729

SPRING OPERATING MEANS FOR STAKES FOR LOG BUNKS

Filed Aug. 15, 1951 4 Sheets-Sheet 1

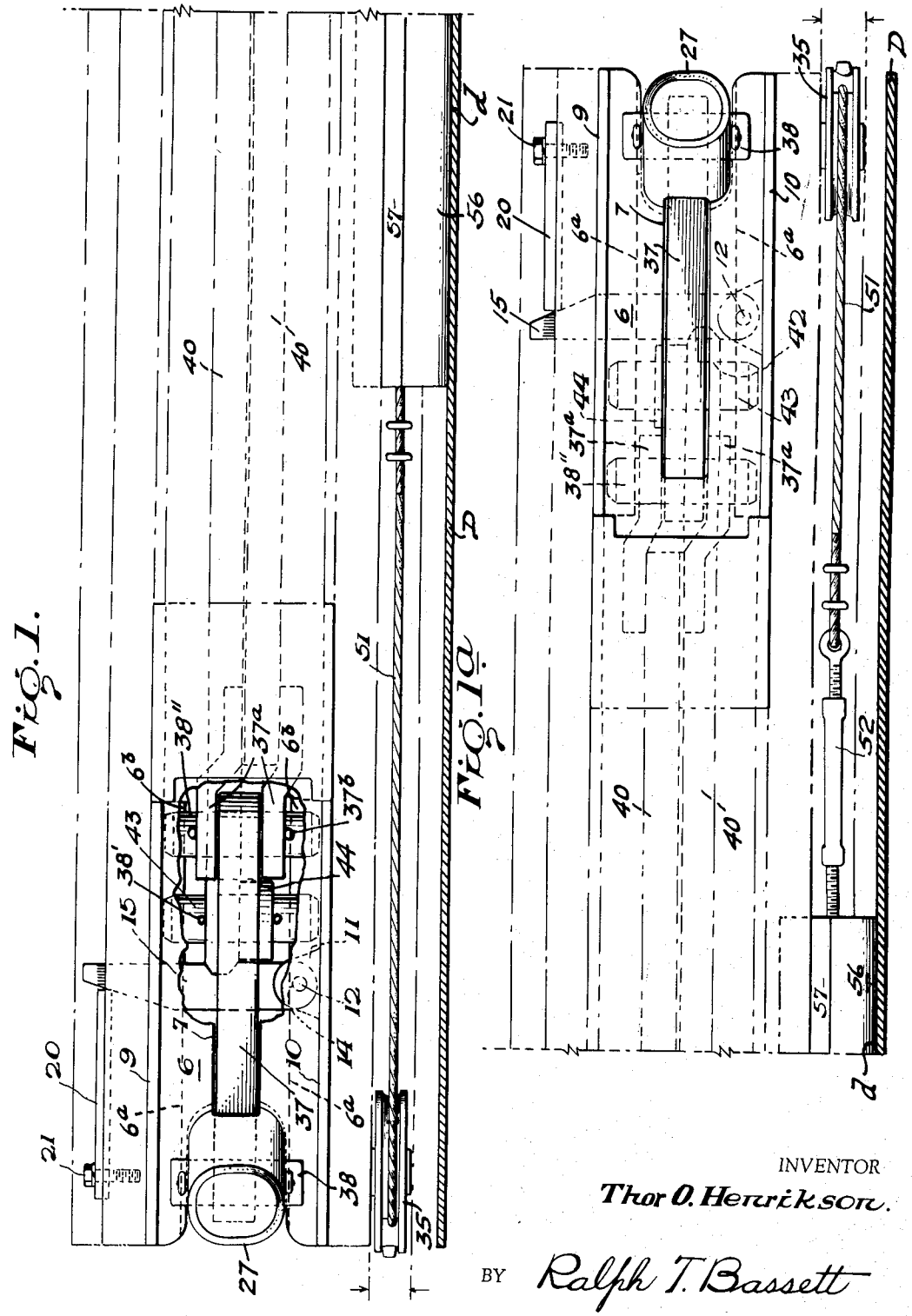


Fig. 1.

Fig. 1a.

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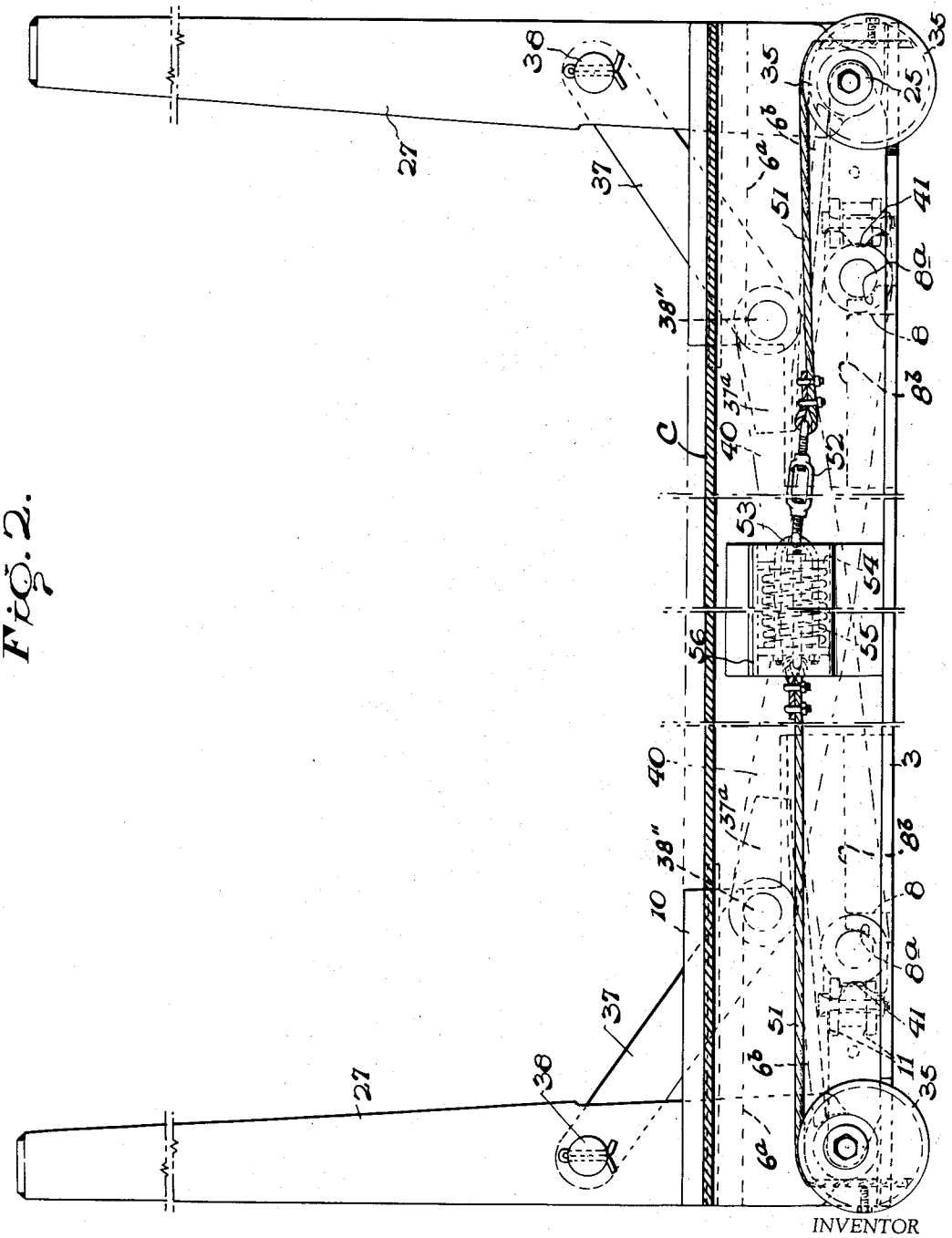


Fig. 2.

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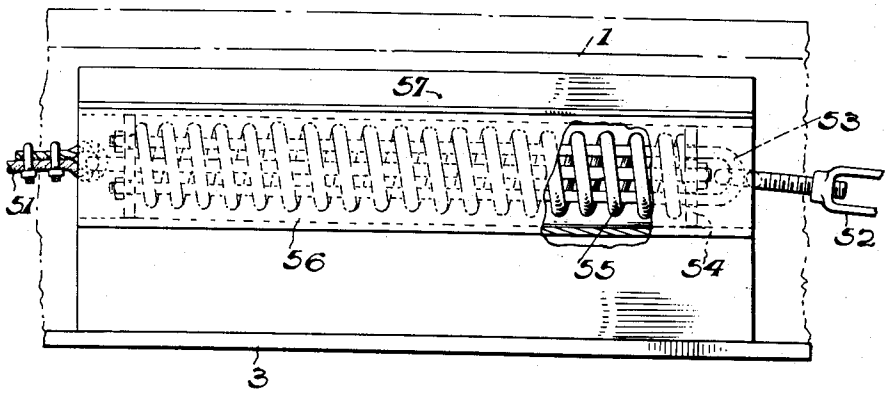
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SPRING OPERATING MEANS FOR STAKES FOR LOG BUNKS

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Fig. 3.



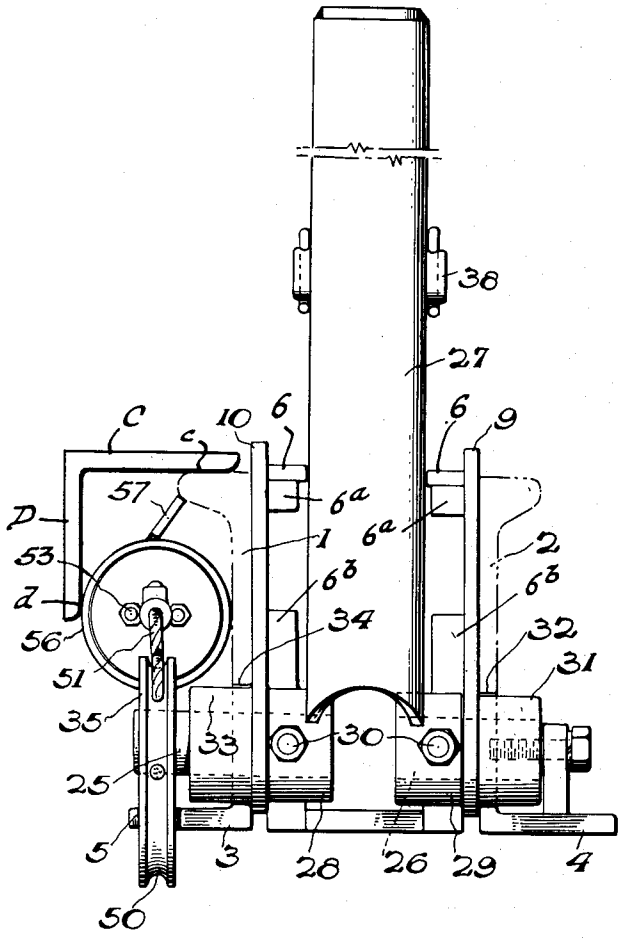


Fig. 4.

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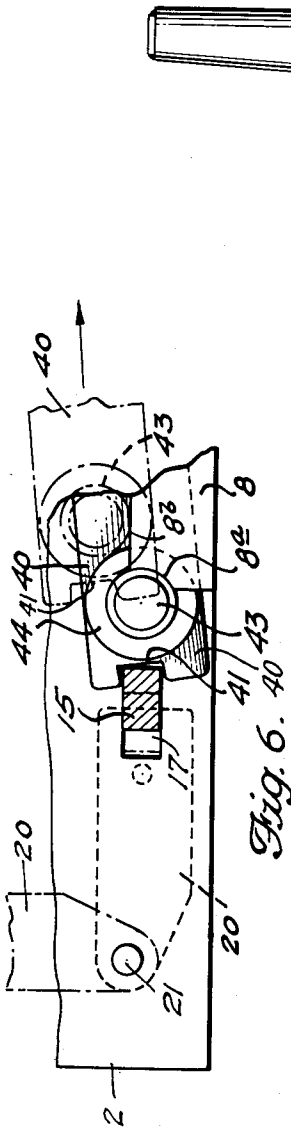


Fig. 6.

Fig. 5.

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2,719,729

SPRING OPERATING MEANS FOR STAKES FOR LOG BUNKS

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Application August 15, 1951, Serial No. 241,996

12 Claims. (Cl. 280—145)

This invention relates to improvements in high stake bunks such as are used in the logging industry and has for its main object the production of a structure of the type in question in which return springs are provided for the return of the stakes to their upright position, the assembly further including suitable release and lock equipment whereby each of the stakes provided for the bunk may be readily operated and locked by mechanism so positioned and arranged as to avoid hazards to the operator.

One of the main features of the invention consists in the provision of reaction springs which operate through cam mechanisms directly affixed to the stake hinges, the reaction springs functioning to return the stakes to their upright position and being so arranged that assemblies including control rods or tripper bars may be combined therewith.

A further object of the invention is the provision of stop means for the control rods, the stop means including a roll or rolls carried at the end portions of the control rods and associated with rigid transverse wall portions to retain the stakes in their operating upright position after release of a safety lock.

A further object of the invention is to provide a structure of the type in question capable of use in either the rod controlled stake or on the chain or cable type stake.

Further objects of the invention will more clearly hereinafter appear by reference to the accompanying drawings forming a part of this application, in which like characters of reference designate corresponding parts throughout the several views, in which:

Figs. 1 and 1[a] show a top plan view of a bunk assembly;

Fig. 2 is a side elevation;

Fig. 3 is a side elevation showing the reaction spring assembly;

Fig. 4 is an end view;

Fig. 5 is a side elevation partly in section of a modified form of the invention; and

Fig. 6 is a detail of the operating rod extremity and lock.

The bunk body may be of general conventional type to include a pair of outwardly facing bulb angles **1** and **2**, provided with the usual base flanges **3** and **4**, respectively, one of the flanges **3** being recessed near each end as at **5** to provide for the arrangement of the stake operating cams to be hereinafter described. At each end of the bunk body a filler is inserted and welded to the inner faces of the side walls **1** and **2**, each of the fillers including a top plate **6** formed with an elongated central slot **7** to provide clearance for the movement of the stake, the link connecting the stake and the tripper bar. Each of the fillers as shown in Fig. 2 includes a connecting wall forming a stop **8**, these connecting wall portions or stops **8** being arranged substantially centrally of the two sides plates **9** and **10** of the filler member and substantially at the base of these parts. Longitudinal rails **8[b]** extend along the base of the filler plates and brace the stops **8** and reinforce the parts. Projecting from the inner face of the

plate **10** are the vertically spaced lugs **11** formed with aligned bores **12** for the reception of a pivot pin **14** for pivotally supporting the latch members **15**, the latter extending through slots **17** (Fig. 6) formed in the opposite wall **9** of the filler member and the adjacent portion of the side wall **1** of the bunk body to permit a swinging movement of the latch members **15** for releasing the same from locking engagement with the notched ends of the tripper bar, as will be more fully hereinafter described. The safety locks **20** are pivoted on pins **21** screwed into the outer end of the stake pivot pins, these safety locks **20** swinging in a vertical plane on their pivot to a position with their free ends abutting the face of the latch **15** to prevent the latter from swinging horizontally on its pivot.

The outer end portions of the bunk body and filler structures are formed with aligned transverse bores for receiving pivot pins **25** and **26** which pivotally support the stakes **27**. The stakes **27** are shown as of tubular form having their lower end portions welded to hub elements **28** and **29** which axially receive the inner ends of the pivot pins **25** and **26** and are rigidly fixed thereto as by bolts **30**. The pivot pin **26** extends through the side wall **9** of the filler and hub **31** which seats in the recess **32** in the wall **2**. The pivot pin **25** is similarly mounted in plate **10** and hub **33**, and is received in the recess **34** of the bunk wall **1**. The hub **31** is welded to the side plate **9** and the hub **33** is welded to the side plate **10**, these hubs **31** and **33** having openings in axial alignment with the openings in the plates **9** and **10** for the passage of the pivot pins **26** and **25**. The pivot pin **25** is elongated to project sufficiently outward of the bunk wall **1** to provide a mounting for the eccentric pulley **35** which rotates with the pivot pin **25** and with the stake **27** and is received in the recess **5** heretofore mentioned, formed in the flange **3** of the bunk wall **1**. The mounting of the stake assembly at each end is substantially identical and each stake is connected to a link **37** by a pivotal connection **38** and with its tripper bar **40** by pivotal connection **38″**. The links **37** operate through the elongated slots **7** heretofore mentioned and formed in the horizontal cross plate **6** of the filler assembly. The outer free ends of the tripper bars **40** are formed with end recesses **41** (see Fig. 6) for receiving the latches **15** swinging on their pivots **14** and carried by one of the filler walls as heretofore described. The recesses **41** also permit engagement of a starter bar as hereinafter described. The ends of each of the tripper bars are formed with transverse openings **42** to receive pins **43**, the bearing for the pin **43** being increased by means of a hub **44** which is welded to the side of the tripper bar **40** with its opening in alignment with the opening **42** formed in the tripper bar extremity. The pin **43** is held against longitudinal displacement in any suitable manner, as by transverse lock pins **38′** and is free to rotate when engaging cooperating faces. Pin **43** rests against the transverse lower connecting wall **8** of the filler assembly, this connecting wall **8** having an arcuate recessed face **8[a]** for engagement with the co-acting face of the pin and normally provides sufficient friction for preventing an upward movement of the tripper bar when the latch **15** is released from the end thereof. It will be noted that the link pin **38″** which connects the operating member **40** with the link **37** is provided with added bearing surface by virtue of the angular connecting plates **37[a]** arranged at each side of the link **37** and the tripper bar **40**, being welded to the opposite faces of the latter and being formed with perforations in their extended offset ends for alignment with the perforation in the lower end of the link **37**. The pins **38″** extend substantially from side wall to side wall and are locked against lateral displacement by the pins **37[b]**, these pins travelling between the upper guide rails **6[a]** and the lower guide rails **6[b]** on the inner faces of the plates **9** and **10**, as best shown in Fig. 4, the lower

guide rail 6^b being inclined downwardly as shown in Fig. 5 to permit the proper travel of the hinge pin 38''. The guide plates 6^a and 6^b form a part of the filler assembly and are welded integral therewith, the upper guide plate 6^a being at the junction of the side plate **10** and the top plate **6**, and the lower plate 6^b being immediately therebelow and properly spaced to facilitate the movement of the link pin 38''. The linkage for the control bars for the hinged stakes are in substance conventional.

As heretofore described, the eccentric pulleys **35** are grooved at **50** in their periphery to receive a cable **51**, the free end of which is connected through a turnbuckle **52** with a U-bolt **53** of the spring assembly shown in Fig. 3. The spring assembly includes the oppositely arranged and positioned U-bolts **53** which are positioned to act as guides for the follower plate **54** at each end of a spring element **55**, this spring element being a free element mounted on the U-bolts and being compressible by the movement of either cable on either cam as controlled by the stakes at each end of the bunk assembly.

As best shown in Figs. 3 and 4 the spring assembly is contained in a cylinder **56** which is suitably secured directly to the bunk body as well as through the supporting plate **57** which is welded to the outer wall of the bunk wall **1**, the cylinder **56** being properly positioned and the spring being of such a size as to provide for the alignment of the cables **51** with the center of the pulley face to insure proper movement of the related parts during their operation. The turnbuckles **52** are shown as provided for one cable although normally each cable will be so provided. It is desirable that ample provision be made for providing suitable tension and eliminating slack as is conventional in such instances.

It will be apparent to one skilled in the art that the present equipment is suitable for use either with bunks equipped with cable or chain stake tie members or bunks equipped with rods to control either single or double end stakes, in either instance the construction and arrangement of the spring return mechanism functioning positively and in accordance with requirements and being so constructed and arranged as to be suitable for attachment to conventional structures which may already be in use and not so equipped. With this automatic stake return mechanism shown it is not necessary for an operator to get up on the browlog to lift the stake into position, which is not only a difficult operation but also hazardous. In operation of the present device the stake is released for dumping by disengaging the safety lock **20** by swinging it on its pivot **21** and then swinging the latch member **15** from the notch in the end of the tripper bar. These tripper bars are equipped with one or more rolls which normally lie in the arcuate transverse recesses 8^a formed in the outer faces of the stop members **8**. After the latch member **15** has been swung clear of the notch **41** in the tripper bar, an operator can insert a rod or bar through the slots **17** (Fig. 6) formed in the wall **9** and into the slot or notch **41** at the end of the tripper bar and raise the tripper bar to free the rolls from their seat in the stop members **8**. This will free the stakes which will swing outward under weight of the load to permit the load to discharge. The dumping of the load automatically compresses the spring by swinging the stake members, and when the load has been discharged the compressed spring returns the stakes to their vertical position, in which position the rolls at the end of the tripper bar are again seated in the transverse arcuate recess 8^a of the stop cross member **8** and when so positioned the tripper and safety locks can be swung into place to secure the parts.

In Fig. 5 a modified form of bunk is illustrated in which one stake is rigid and the other swinging, the rigid stake being indicated at A and the swinging stake by reference character **27**, corresponding to the main form of the disclosure. The swinging bunk mechanism includes the link **37**, control bar **40**, and pin roller **43** as well as other parts corresponding to these parts in the dual swinging bunk structure. The spring return mechanism is essentially modified in that only a one-way spring is used, this spring being enclosed in the tubular casing **56** having the guideway B therein for the passage of the rod *b* on which is arranged the compression spring, adjustment being provided in the usual manner.

In both forms of the invention a shield or housing is provided for the exposed parts in the form of a angle, the leg C of which overlies the bulb of the bulb angle side **1** and is welded thereto as at *c*. The leg C of the angle shield is of sufficient length to position the leg D in abutting relation against the outer face of the spring housing **56** as shown at *d*, to which housing it may be welded if desired.

The shield or protector angle C—D which overlies the spring mechanism will be of such dimensions as to protect the operating mechanism throughout its length including the cable and eccentric spool assembly at the end of the bunk. The length of the shield is indicated best in Fig. 2, while the arrangement of the shield can be clearly seen in Fig. 4 of the drawings forming a part of this specification. In the modified form of the invention the shield or housing C—D will be arranged to overlie the exposed cable and eccentric spool and associated parts as shown in Fig. 5. Normally the spring housing **56** will in itself be of sufficient sturdiness to resist shock, this housing as heretofore stated, being braced by the angle plate **57** which is welded to the bulb and to the housing as seen in Fig. 4.

The present invention, in either form or modified for accommodation to either light or heavy bunks, is of such a character that the standard bunk assembly can be modified to permit the attachment of the various parts forming the instant invention. It is of course understood that the filler at each end of the bunk is separately constructed, positioned within the bunk extremity, and welded in place. It will also be obvious to one skilled in the art that the use of cam rollers **35** in association with the springs and stakes, facilitates the stake movement, insuring efficient and effective stake action from its upper to lower position and return, and permits the use of a larger and more extensive assembly.

What I claim is:

1. In a log bunk structure including spaced side walls, filler assemblies at each end of the bunk contained within said walls, a pair of aligned pivot pins arranged transversely at the outer end portions of said filler assemblies, said pairs of pivot pins having one end extending through the side walls of said bunk body, stake members fixed to said pairs of pivot pins, links connected to said stake members and to tripper bars, said tripper bars extending in opposite directions and being contained within said bunk body, a shoulder formed at the extremity of each tripper bar, transverse pins carried at the ends of the tripper bars, stop plates extending transversely of the filler assemblies and forming seats for said pins, cam members fixed on said pins extending on the outside of the bunk wall, a compression spring arranged exteriorly of the bunk wall and longitudinally thereof, followers at each end of said spring, and cables fixed to said cams and rotatable about the periphery thereof, said cables being each connected to one of the followers for compressing said spring upon the lowering of either of said stakes and rotation of its cam.

2. In a log bunk structure including a body formed of spaced walls and connecting members, stakes pivoted at each end of the bunk body, eccentric pulleys fixed to the ends of the stake pivots, cables each having one end fixed to one of said pulleys and adapted to be wound about their periphery when the latter are rotated by movement of said pivoted stakes, tripper bars connected to said stakes and movable within the bunk structure, means for locking the tripper bars to secure the stakes in vertical position, and spring means connecting the other ends of said cables, said spring means being vari-

ably compressed in conformance with the eccentric mounting of the pulleys by rotation of either of said pulleys by lowering its associated stake to provide energy for returning said stakes to their normal upright position.

3. The structure of claim 2 characterized in that stop means are provided for retaining the tripper bars against movement upon release of the locking means.

4. The structure of claim 2 characterized in that the spring means includes a compression spring cooperating between the stakes for compression upon movement of either of the stakes to its downward position.

5. The structure of claim 2 characterized in that the spring means is contained in a housing fixed to the outside of the bunk body.

6. The structure of claim 2 characterized in that the means for connecting the springs to the eccentric pulleys includes cables having take-up means associated therewith for removing slack from said cables and applying tension thereto.

7. In a log bunk including a body formed of spaced walls and connecting members, filler assemblies fixed between the spaced walls of the bunk body at each end thereof, transversely extending pivot pins carried by the filler assemblies and extending through one of the spaced walls, stakes fixed to the pivot pins, eccentric pulleys fixed on the ends of the pivot pins laterally of one wall of the bunk body, tripper bars for each stake, stop members fixed to the filler assemblies, means at the ends of the tripper bars for engaging the stops, lock arms for securing the tripper bars in engagement with said stops, when said stakes are in their upper position, a compression spring, and cables secured to said eccentric pulleys and adjustable by rotation about the same, said cables having their ends connected to said spring for compressing the same upon lowering of either of said stakes.

8. In a log bunk structure including a body formed of spaced walls and connecting members, filler assemblies fixed at each end of the body and between said spaced walls, a stake mounted on a pivot pin at one end of the bunk, a tripper bar arranged longitudinally within said bunk and linked to said stake, means for locking said tripper bar to hold said stake in its vertical

position, and a stake return mechanism, said mechanism including an eccentrically mounted pulley fixed to said pivot pin for rotation therewith, a spring extending longitudinally of and adjacent the outer face of one of said spaced walls, and a cable connection between said spring and pulley periphery, said cable winding about said pulley when said stake is lowered and simultaneously compressing said spring to provide energy for returning said stake to its upright position, said eccentrically mounted pulley being so arranged on said pin as to apply greater compression to said spring at one end of the stake movement.

9. The structure of claim 8 characterized in that the pulley is eccentrically mounted on the stake pivot to vary the load on the spring during the stake movement.

10. The structure of claim 8 characterized in that means are provided for varying the adjustment of the spring tension.

11. The structure of claim 8 characterized in that a housing is provided for the spring actuating mechanism adjacent the outer side wall of said bunk structure.

12. In a log bunk, a bunk body, stakes mounted on pivot pins at the ends of the bunk body, eccentrically mounted pulley members fixed to said pivots, a compression spring assembly arranged along the outer side wall of the bunk body, cables connected at one of their ends to said springs and at their opposite ends to the periphery of said eccentric pulleys for normally urging said stakes to upright position, take-up means for said cables to adjust the same for normally retaining said stakes in their upright position, means for locking the stakes in their upright position, and additional means for preventing lowering of the stakes after the unlocking operation.

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