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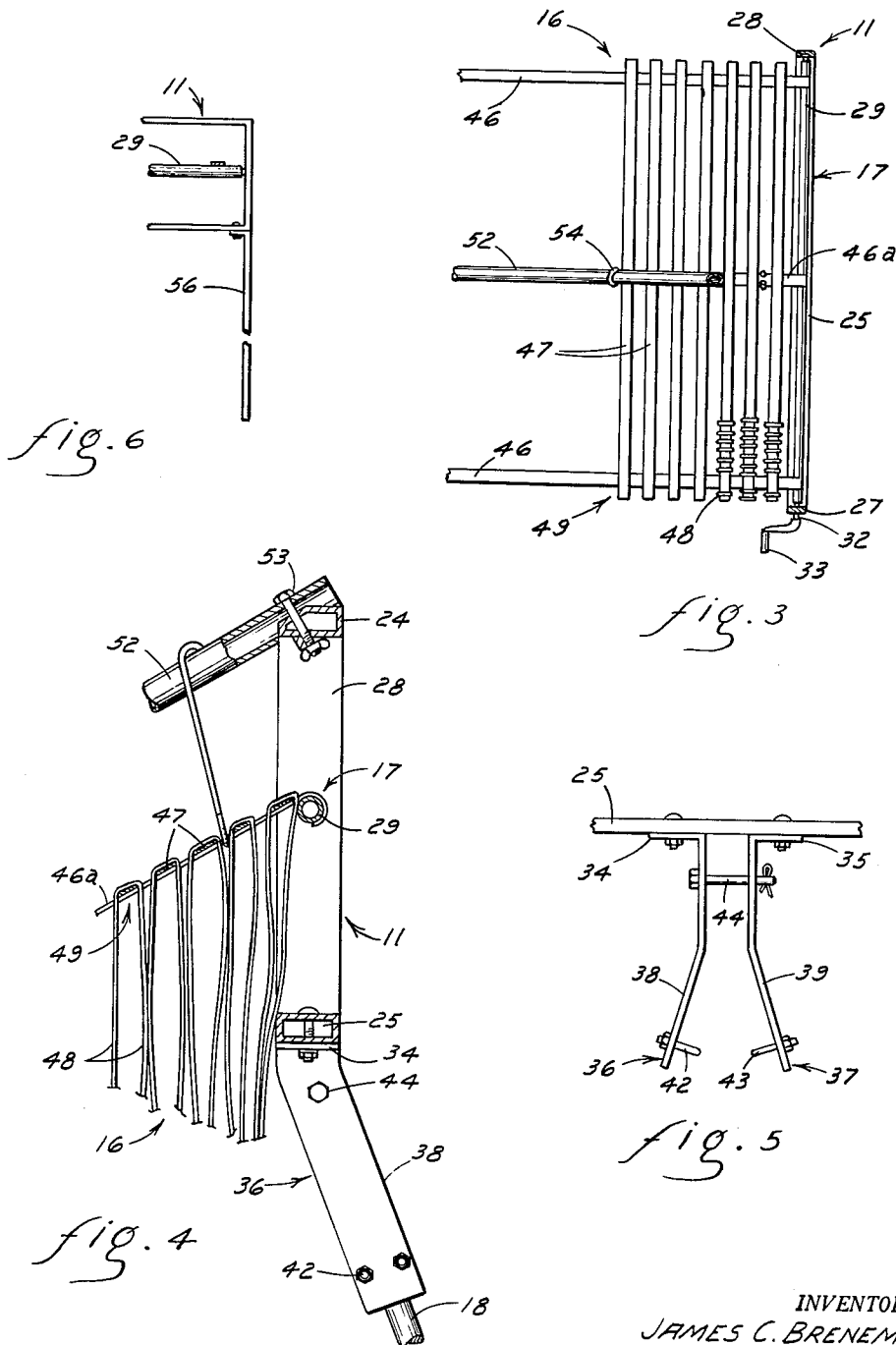
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PORTABLE BACKSTOP FOR ARROWS

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PORTABLE BACKSTOP FOR ARROWS

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This invention relates in general to a structure for stopping objects which are impelled toward but miss a target and, more particularly, to a portable backstop for arresting the movement of arrows without damage to or from the arrows.

It is often necessary, or desirable as a matter of convenience to locate an archery target, or similar device, where damage may be inflicted by or upon those arrows which miss the target. In order to avoid the damage caused by the arrows, it has for many years been standard practice to provide a backstop behind the archery target for the purpose of stopping the arrows which miss the target. Such backstops are often made from baled fibers, such as bales of hay or the like, which bales are piled one upon the other to form a wall. Although such a backstop can effectively stop the arrows, it has been found unsatisfactory for a number of reasons. In the first place, it is difficult to move and, therefore, necessitates a substantially permanent installation, which not only interferes with the care and maintenance of the surrounding area, but also severely restricts the use of the archery target. Furthermore, and of equal importance, baled fibers, such as hay, deteriorate with use and from the weather so that they not only present a bad appearance by themselves, but also create an unsightly condition in the surrounding area.

In addition to the above objections to conventional, existing backstops, it has been found that the removal of arrows from a fibrous backstop, wherein they have become embedded, often results in the loss of an arrow head, particularly where hunting type arrow tips are used. This same problem results from the use of backstops fabricated from other relatively soft materials, such as particulate substances, into which the arrow tip may become embedded. Where, in order to overcome this problem, relatively non-penetrable backstops are used, the arrow tip and/or the arrow is often eventually damaged from the impact with such a backstop.

Accordingly, a primary object of this invention has been the provision of a portable backstop for objects, such as arrows, which are impelled toward but miss a target and, more particularly, for stopping arrows which miss an archery target.

A further object of this invention has been the provision of a portable backstop for arrows, as aforesaid, which can be mounted upon or adjacent to the structure supporting the archery target, which can be easily and quickly assembled for use and disassembled with equal ease when it becomes desirable to move the target to a different location.

A further object of this invention has been the provision of an arrow backstop, as aforesaid, which is neat in appearance, which is sturdy in construction, which is effective in preventing damage to or by arrows, which can be used without creating an unsightly condition, which is light in weight, and which requires a minimum of space in serving these purposes.

Other objects and purposes of this invention will become apparent to persons familiar with this type of equipment upon reading the following specification and examining the accompanying drawings, in which:

FIGURE 1 is a front elevational view of an arrow back-

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stop embodying the invention in association with a structure for supporting a target.

FIGURE 2 is a side elevational view of said arrow backstop and target support.

FIGURE 3 is a broken, sectional view taken along the line III—III in FIGURE 2.

FIGURE 4 is an enlarged sectional view taken along the line IV—IV in FIGURE 1.

FIGURE 5 is an enlarged fragment of FIGURE 1.

FIGURE 6 is an enlarged fragment of FIGURE 1, including a modification thereto.

For convenience in description, the terms "upper," "lower" and words of similar import will have reference to the arrow backstop of the invention in its normal position of use as shown in FIGURES 1 and 2. The terms "front," "rear" and words of similar import will have reference to the right and left ends respectively of the arrow backstop as appearing in FIGURE 2. The terms "inner," "outer" and derivatives thereof will have reference to the geometric center of the arrow backstop and parts associated therewith.

General Description

The objects and purposes of the invention, including those set forth above, have been met by providing a portable arrow backstop comprised of a frame which may be supported upon or adjacent the structure holding the target, and a curtain which is mounted at one end upon the frame and extends downwardly and rearwardly therefrom behind the target. The frame supports a spool or reel mechanism to which the upper end of the curtain is secured, and upon which said curtain can be wound. The curtain includes a flexible panel having a plurality of flexible elements extending downwardly therefrom for the purpose of intercepting and retarding arrows which miss the target. A rigid guide member slopes downwardly and rearwardly from the upper end of the frame to the ground for the purpose of supporting the curtain so that said panel thereof lies substantially within a single, downwardly sloping plane.

Detailed Construction

The arrow backstop 10 (FIGURES 1 and 2), which has been selected to illustrate a preferred embodiment of the invention, is comprised of an elongated frame, which is mountable upon the upper end of a structure 12, for supporting an arrow target 13. A reel mechanism 17 is supported upon the frame 11 for rotation around a horizontal axis. The arrow backstop also includes an elongated flexible curtain 16 which is secured along one edge thereof to the reel mechanism 17 upon which said curtain can be rolled for storage or transport thereof.

The target support 12 (FIGURES 1 and 2) may be of a conventional type having three legs 18, 19 and 20 and a horizontal ledge 23 secured to and extending between the front legs 18 and 19 for the purpose of supporting the target 13. The frame 11 is comprised of upper and lower horizontal frame elements 24 and 25, respectively, and vertical end elements 27 and 28 which are rigidly secured to the ends of said horizontal elements 24 and 25 to form an open, horizontally elongated frame. The reel mechanism 17 is comprised of a shaft 29 rotatably supported upon and between the vertical end elements 27 and 28, preferably midway between the upper and lower frame elements 24 and 25. The shaft 29 has an extension 32 which projects through the end element 27 and which is engaged by the crank 33 for the purpose of rotating the shaft.

A pair of brackets 36 and 37, which may be identical and substantially L-shaped, have horizontal flanges 34 and 35 which are secured to the lower frame element 25

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so that their vertical flanges 38 and 39 extend downwardly and embrace the remote surfaces of the legs 18 and 19, respectively, near the upper ends thereof. The lower ends of the flanges 38 and 39 may be rigidly but removably secured to the legs 18 and 19 by a pair of U-bolts 42 and 43. Additional securement is provided by a pin 44 which is inserted through appropriate aligned openings through the upper ends of the vertical flanges 38 and 39 and the adjacent portions of the front legs 18 and 19.

The curtain 16 (FIGURES 3 and 4) is comprised of a plurality of elongated flexible bands 46 which may be fabricated from woven fibers, from plastic or the like, and which are preferably of substantially uniform length. The one end of each band 46 is secured to the shaft 29 at a selected point thereon and said bands are substantially longer than the distance from said shaft to the lower end of the target support. A plurality of substantially rigid rods or strips 47, which may be made from metal, wood, plastic or the like, are secured in any convenient manner to the bands 46 at uniform, spaced intervals lengthwise of said bands. The strips 47, which are advantageously of uniform length, are preferably arranged so that they are perpendicular to the lengthwise extent of the bands 46 and form therewith a panel 49.

A plurality of elongated, flexible elements 48 (FIGURES 2 and 4) are secured to said strips 47 in any convenient manner, as by tying or stapling, preferably at uniform intervals along the strips 47 so that the elements extend downwardly therefrom. In this particular embodiment, the elements 48 may be pieces of rope which pieces are secured at their mid-points to the strips 47 at intervals approximately one inch apart. Said rope elements are approximately one quarter of an inch in diameter and they preferably extend downwardly from said strips 47 in substantially uniform lengths of between one and two feet, depending largely upon the slope of the curtain with respect to the ground and the type of object being stopped. The elements 48 on any given strip 47 are preferably staggered with respect to the location of the elements on the two adjacent strips. In general, the slope of the curtain is preferably within the range between 30 and 45 degrees. However, it should be understood that the slope of the curtain and the exact quantity, size, distribution and texture of the elements 48 may be varied substantially within the scope of this invention, depending upon the type of object and, for that matter, the type of arrow with which the backstop may be used. For example, the elements 48 may be flat, narrow and flexible strips of plastic, leather or the like.

In use, the curtain 16 normally extends rearwardly and downwardly from the shaft 29 to the ground or other surface supporting the tripod 12. Under most circumstances where the frame 11 is mounted upon the target support 12, said support usually requires bracing to resist backward tipping under the weight of the curtain 16, the rearward end of which is anchored to the ground or other supporting surface. To eliminate a possibility of such tipping, and at the same time to insure the proper positioning of the curtain 16, an elongated guide member 52, which may be a lightweight metallic tube, is secured near one end thereof by means of the bolt 53 to the upper frame element 24 midway between the ends thereof. The guide member 52 (FIGURE 2) is preferably somewhat longer than the bands 46 so that it can engage the ground or other supporting surface rearwardly of the rearward end of the fully extended curtain 16.

A plurality of connectors 54 (FIGURE 2), which may be S-shaped hooks as illustrated, are slidably supported upon the guide member 52 for the purpose of releasably supporting the curtain 16 beneath the guide member 52 and substantially within a single downwardly sloping plane. The lower ends of the connectors 54 (FIGURE 3) are, in this embodiment, engaged with the center band 46a, preferably at uniform intervals along said band. The

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upper ends of the connectors 54 are arranged so that they can be moved upwardly with respect to the guide member 52 for release therefrom. As stated above, anchor means, such as the stake 55 (FIGURE 2), may be used to hold down the rear end of the curtain.

Under some circumstances, it may be desirable to support the frame 11 independently of the tripod or other target support 12. In such case, the frame 11 may, as shown in FIGURE 6, be provided with a pair of legs, one of which is indicated at 56, which legs are located at opposite ends of the frame and extend downwardly therefrom. Moreover, the legs 56 may be used to augment the support provided by the target support 12.

Operation

With the target support 12 and frame 11 assembled as appearing in FIGURES 1 and 2, the curtain 16 is moved into position for use by grasping the rearward or outer edge thereof and unrolling it rearwardly from the shaft 29. As the curtain 16 is moved rearwardly, the upper ends of the connectors 54 are mounted upon the guide member 52, whereby said curtain 16 is moved downwardly and rearwardly along the guide member 52, substantially within one rearwardly sloping plane. When the curtain 16 has been fully unrolled from the shaft 29, its rearward end may be anchored, if desired, by connection thereof to a stake 55 or to the lower end of the guide member 52, and the backstop is now ready for use.

When an object, such as an arrow, is shot at and misses the target 13, within the lateral and vertical boundaries of the backstop 10, the leading end of the arrow will strike the downwardly hanging elements 48. The impact of the arrow tip against the elements 48 and the friction developed by the arrow shaft as it moves through said elements will promptly retard the movement of the arrow and, at the same time, tend to deflect the arrow downwardly. The downward deflection results from the fact that the upper ends of the elements are secured and the lower ends are unsecured. Thus, the resistance of the elements 48 to movement of the arrow therethrough tends to develop a downward component of force which deflects the arrow downwardly. Such downward deflection, which is encouraged by the force of gravity, tends to cause the arrow to move through the remaining elements in its path from the point of initial impact with said elements toward the rearward end of the curtain. Normally, however, the movement of even a swiftly moving arrow will be retarded so that it is diverted toward, and drops to, the ground without damage to itself or to the other objects before it reaches the rearward end of the curtain.

It has also been found that if the arrow is not sufficiently deflected downwardly by the elements 48 in its path, said arrow will strike the lower surface of the panel 49 defined by the bands 46 and strips 47 and glance off toward the ground, hence through the elements 48. That is, because the strips 47 are arranged in a gradual, downward slope and because the arrow will be traveling in an arcuate path which will normally curve downwardly, the arrow will engage the panel 49 at a very low angle of attack and, therefore, will not damage the panel. Furthermore, the arrow will move away from the panel at a similar, small angle and, therefore, be forced to pass through the remaining rearward elements 48 almost as though the glancing impact with the panel 49 had not occurred.

When it becomes desirable to move the arrow backstop 10 and/or the target support 12, the arrow backstop is prepared for this action by releasing the anchoring means connected to its rearward end and rolling the curtain onto the shaft 29 by turning the crank 33. As the connectors 54 reach the upper end of the guide member 52, they are raised and disconnected therefrom and rolled up with the curtain. Since the connectors are preferably made from light weight wire rod, they will have very little or no effect upon the rolling of the curtain 16 upon the shaft 29. The guide member 52 may now be disconnected

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from the frame 11 by removing the bolt 53, after which said frame can be disconnected from the target support for separate movement, if desired, or it may be moved with the target support.

Although a particular preferred embodiment of the invention has been disclosed above in detail for illustrative purposes, it will be understood that variations and modifications of such disclosure, which lie within the scope of the appended claims, are fully contemplated.

What is claimed is:

1. A backstop for a target, comprising: a frame structure and means for supporting said frame structure upon a surface adjacent a target; reel means supported upon said frame structure for rotation around a substantially horizontal axis and actuating means for rotating said reel means; a flexible curtain having one edge secured to said reel means and extending lengthwise of the rotational axis thereof, said curtain being capable of extending from said reel to a point below said target; a plurality of elongated elements supported upon said curtain and depending from the lower side thereof when said curtain is extended; and means for holding said curtain at an acute angle with respect to said surface so that said elements depend from said curtain in substantially parallel positions and at angles which are substantially complements of said acute angle.

2. A back stop for a target, comprising: a frame structure and means for supporting said frame structure near the upper end of the target; a flexible panel having one end edge thereof secured to said frame structure in a substantially horizontal position, said panel being capable of extending downwardly and sidewardly from said frame structure below the level of the lower end of said target; a plurality of elongated, flexible elements secured to said panel and extendable from one side thereof at closely spaced intervals thereon; and means for holding said panel in a position sloping downwardly and away from said frame structure and at an acute angle to a horizontal

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plane, whereby said elongated elements hang downwardly from said panel at angles which are complements of said acute angle.

3. A portable backstop for use with an archery target mounted upon a target support, comprising: an elongated frame structure; bracket means for mounting said frame structure upon the upper end of the target support; reel means supported upon said frame structure for rotation around a substantially horizontal axis and crank means for rotating said reel means; a plurality of elongated, flexible bands secured at one end of each to said reel means at spaced intervals axially thereof, said bands being of substantially uniform length greater than the distance from said reel means to the lower end of said target support; a plurality of substantially rigid strips of substantially uniform length secured to said bands perpendicularly thereof and at spaced, uniform intervals therealong; a plurality of elongated flexible elements secured to each of said strips and arranged for hanging from one side thereof; an elongated guide member secured near one end thereof to the upper end of said frame structure, said guide member being longer than said distance from said reel means to the lower end of said target support; and a plurality of connectors secured to one of said bands and said strips, said connectors being slidably engageable with said guide member whereby said strips and said bands are held substantially within a single plane sloping downwardly from said reel means.

References Cited in the file of this patent

UNITED STATES PATENTS

398,816	Rehfuss	Feb. 19, 1889
1,545,772	Jacobs	July 14, 1925
1,804,117	Russell	May 5, 1931
1,952,187	Wade	Mar. 27, 1934
2,899,208	Wallsteiner	Aug. 11, 1959