March 26, 1957 F. J. NOONAN ET AL 2,786,677

FOLDABLE BASKETBALL BACKSTOP

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FIG. 2.

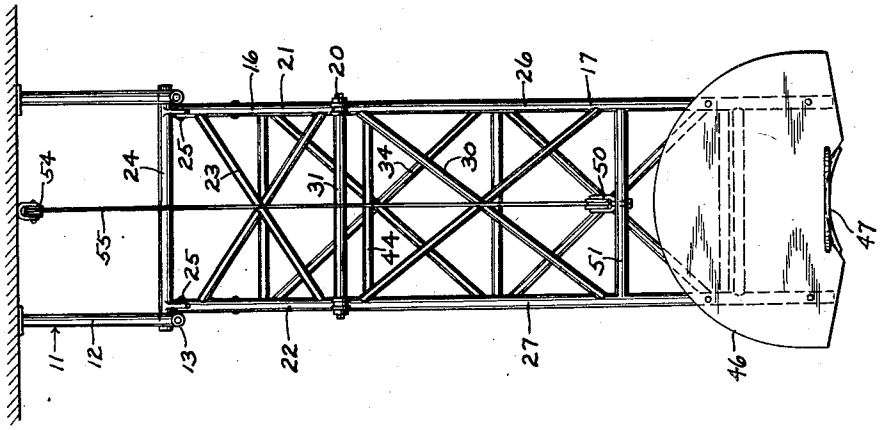
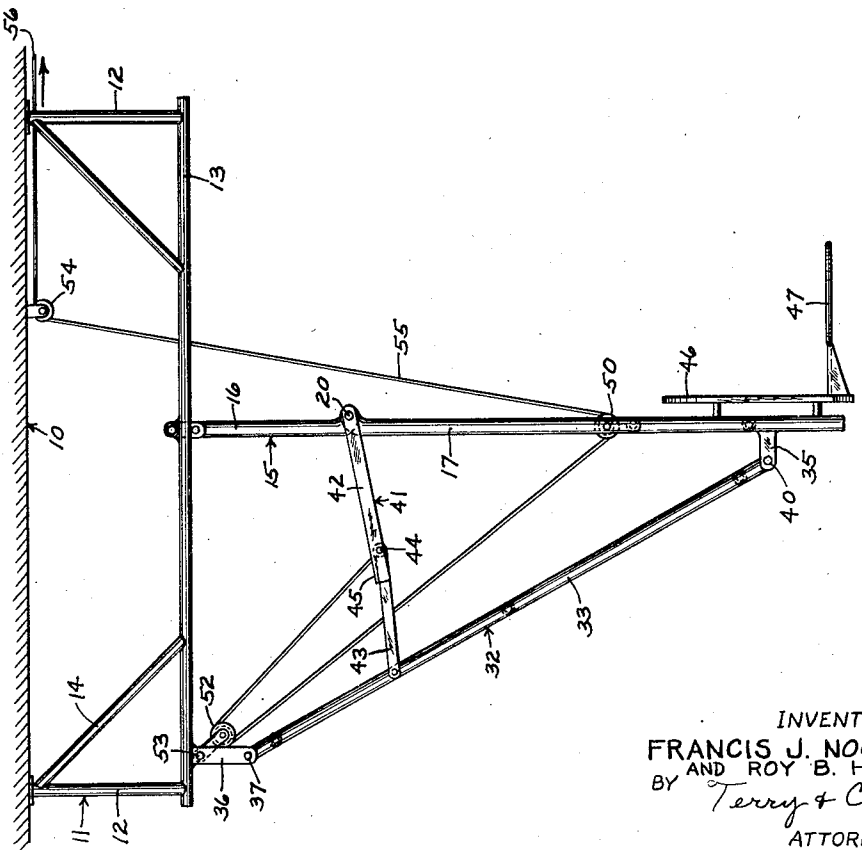


FIG. 1.



INVENTORS,
FRANCIS J. NOONAN
AND ROY B. HARPER
BY Terry & Cohn
ATTORNEYS.

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FIG. 4.

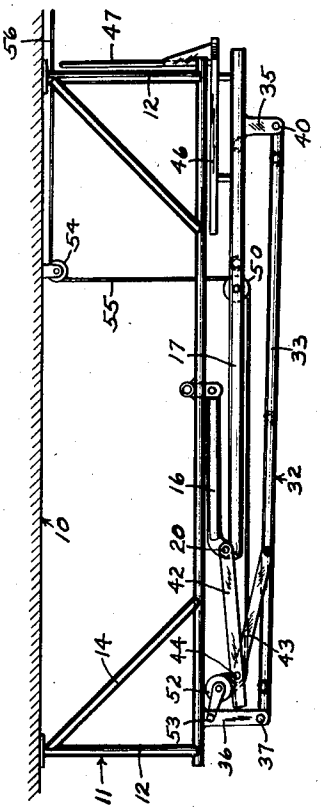
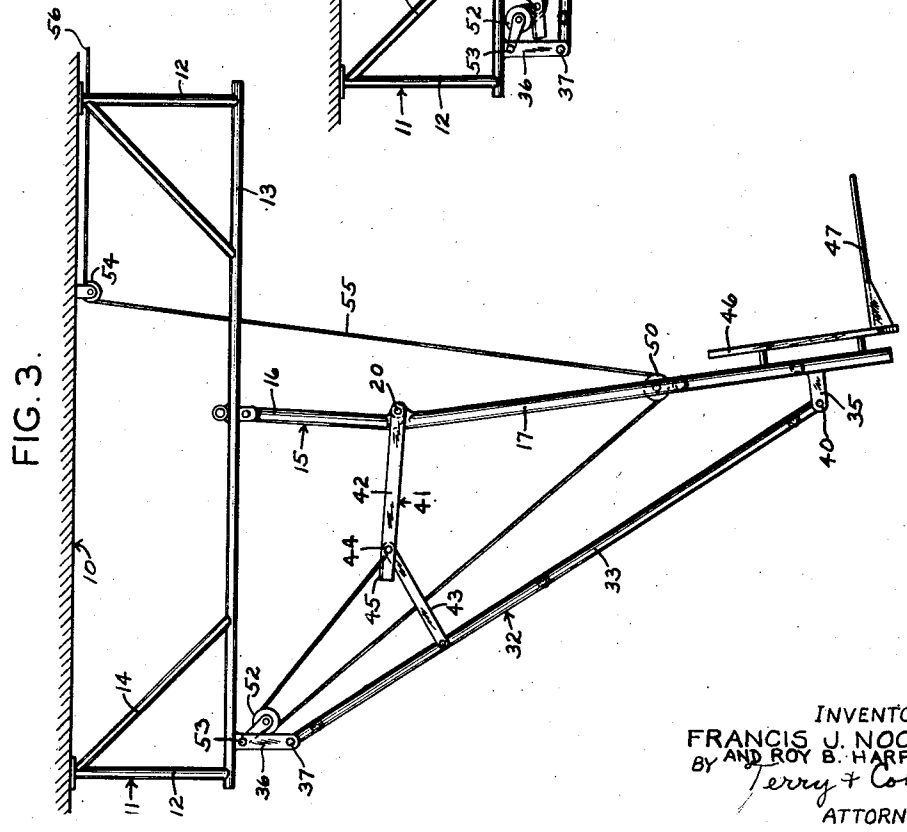


FIG. 3.



INVENTORS,
FRANCIS J. NOONAN
BY AND ROY B. HARPER
Terry & Cohn
ATTORNEYS.

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FOLDABLE BASKETBALL BACKSTOP

Francis J. Noonan and Roy B. Harper, Centralia, Mo., assignors to Narragansett Gymnasium Equipment Co., Centralia, Mo., a corporation of Missouri

Application June 6, 1955, Serial No. 513,242

9 Claims. (Cl. 273—1.5)

This invention relates generally to improvements in gymnasium equipment and apparatus, and more particularly to an improved foldable basketball backstop.

It is an important objective of the present improvements to realize a ceiling-suspended backstop apparatus that may be readily lowered to a normal operative position, and quickly and easily raised to a substantially horizontally folded, inoperative position.

Another important objective is realized by the provision of a truss structure that is particularly adapted to be swung forwardly upwardly from the normal operative position to a folded, inoperative position. This type of ceiling-suspended forward swingup backstop is frequently utilized where something in the nature of a gallery, balcony or the like is in fixed position between the backstop and the wall, or where walls must be kept clear for handball or other similar uses.

Still another important object is achieved by the arrangement of the truss elements which provides a durable, extremely rigid backstop in its lowered operative position, and which enables the hinge connections of a toggle brace and of a drop member to be broken so as to permit the elements to be raised to a horizontally folded position.

Yet another important object is realized by an arrangement of a plurality of pulleys and an interconnecting cable or line which coacts with the structural arrangement of the front-folding truss to provide the above noted advantageous result.

Another object of the invention is to provide a backstop apparatus which is durable in construction, and which can be economically manufactured and easily assembled.

The foregoing and numerous other objects and advantages of the invention will more clearly appear from the following detailed description of a preferred embodiment, particularly when considered in connection with the accompanying drawings, in which:

Fig. 1 is a side elevational view of the basketball backstop apparatus shown in the normal operative lowered position;

Fig. 2 is a front end view of the basketball backstop apparatus shown in Fig. 1;

Fig. 3 is a side elevational view of the basketball backstop apparatus shown in a slightly raised position, and

Fig. 4 is a side elevational view of the backstop apparatus showing the apparatus in its fully raised, inoperative position.

Referring now by characters of reference to the drawings, it is apparent that the basketball backstop apparatus is of a forward swingup type adapted to be mounted and fastened to a ceiling generally indicated at 10. The apparatus includes a supporting frame structure referred to at 11 which consists of four depending bars 12 attached to ceiling 10. A pair of longitudinal bars 13 are secured to and carried by depending vertical bars 12, the longitudinal bars 13 being arranged and disposed in substantially a horizontal plane. Inclined corner braces 14 are attached

to depending bars 12 and longitudinal bars 13, and serve to reinforce the frame structure.

Suspendedly mounted and carried by frame structure 11 is a foldable truss structure. This truss structure includes a drop member, indicated generally at 15, consisting of an upper drop portion 16 and a lower drop portion 17. The upper and lower drop portions 16 and 17 are hingedly connected as at 20 Fig. 1, while the upper drop portion 16 is pivotally connected to supporting frame 11.

More particularly, the upper drop portion 16 includes opposite side bars 21 and 22, as is best shown in Fig. 2, and cross bracing elements 23 interconnecting side bars 21 and 22. A cross bar 24 bridges longitudinal bars 13 of the frame structure, and is attached thereto. The bar 24 may be considered a part of the supporting frame 11. The upper ends (Fig. 2) of side bars 21 and 22 are pivotally connected, as indicated at 25, to cross bar 24.

Similarly, the lower drop portion 17 consists of opposed side bars 26 and 27 (Fig. 2), and of cross bracing elements 30. The side bars 26 and 27 are hingedly connected to the side bars 21 and 22 of upper drop portion 16 by bridging hinge rod 31. In the lowered extended position of the foldable truss structure, the drop portions 16 and 17 are aligned in a substantially vertical position.

A rigid brace member referred to generally at 32 (Fig. 1) normally extends rearwardly at an angle from said drop member 15, and is pivotally connected to the lower drop portion 17 and to the supporting frame structure 11. The brace member 32 includes opposite side bars 33, and intermediate bracing elements 34, as is shown in Fig. 2.

Describing more in detail the structural connection of brace member 32 with the lower drop portion 17 and frame structure 11, it will be noted in Fig. 1 that an extension 35 projects rearwardly from the lower end of drop portion 17, and more particularly from each side bar 26 and 27. These extensions 35 may be properly considered a part of lower drop portion 17. Another extension 36 extends downwardly from each longitudinal bar 13, and is located considerably to the rear of drop member 15. These extensions 36 may be considered a part of frame structure 11. Thus it is seen that side bars 33 of brace member 32 have one of their ends pivotally connected as at 37 to extension 36, and have the opposite ends pivotally connected as at 40 to extension 35. As will appear more clearly from a later description, the extensions 35 and 36 permit drop portions 16 and 17 and brace member 32 to lie in a substantially horizontal folded position, when raised.

Located at each side of the apparatus and between drop member 15 and brace member 32 is a toggle brace referred to generally in Fig. 1 at 41. The toggle brace 41 consists of arms 42 and 43 hingedly connected by rod 44, the rod 44 serving as a common hinge connection, and hence serving as a bridging piece. Arms 42 of toggle brace 41 are pivotally connected to drop portions 16 and 17 at their hinge connection 20, and the other arms 43 are pivotally connected to brace member 32. A stop element 45 is provided on arms 42 of toggle brace 41, the stop element 45 engaging the other coacting arm 43 to lock the arms 42 and 43 in the extended locked position shown in Fig. 1.

Fastened to the lower end of lower drop portion 17 is a basketball bank board 46, the bank board 46 being located on the forward side, or in other words to the right in Fig. 1, of drop member 15. A basketball goal hoop 47 is fastened to bank board 46, and is arranged in horizontal position as is shown in Fig. 1. As is shown in Fig. 4, the hoop 47 must be located so as to be able to clear the frame structure 11, whereby to permit fold-

ing of the drop member 15 and brace member 32 to the horizontal position shown.

The actuating mechanism consists of a plurality of pulleys and an interconnecting line arrangement. One pulley 50 is fastened to a brace bar 51 of lower drop portion 17, the pulley being located below toggle brace 41, and located substantially centrally between side bars 26 and 27. Another pulley 52 is mounted to a cross bar 53 attached to and bridging longitudinal bars 13, the pulley 52 being located substantially intermediate extensions 36. The pulley 52 is located above toggle brace 41, and is located rearwardly of pulley 50. A third pulley 54 is fastened to ceiling 10, and is located forwardly of and above the first pulley 50. The pulleys 50, 52 and 54 are arranged and aligned in substantially the same vertical plane. An actuating line 55 is passed over pulley 54, extends under pulley 50, extends over pulley 52, and thence is connected to toggle brace 41 at its hinged connection 44.

When the forward end 56 of line 55 is pulled in the direction of the arrow shown in Fig. 1, the line and pulley arrangement serves to break the hinge connections of the toggle brace 41 and of the drop portions 16 and 17, and acts to raise the truss structure from the extended, lowered position shown in Fig. 1 to the fully folded, retracted position shown in Fig. 4.

It is believed that the function and operation of this suspended type of front-folding basketball backstop apparatus has become fully apparent from the foregoing detailed description, but for completeness of disclosure, it will be noted that in the normal extended operative position, the drop portions 16 and 17 are aligned in a substantially vertical position, and that the toggle brace 41 is extended in its locked position. In this locked position, the arms 42 and 43 of toggle brace 41 are moved slightly past the aligned arrangement to prevent unintentional or accidental breaking of the hinge connection.

Assume that the truss structure is in the normally extended operative position of Fig. 1, and that it is desired to raise the truss structure to the inoperative folded position. Then the end 56 of line 55 is pulled in the direction shown by the arrow (Fig. 1). For convenience, it is possible to utilize a winch operatively connected to a power means (not shown) to actuate line 55. When line 55 is pulled as described above, the line acting through the pulley arrangement will first act to break the hinge connection of toggle brace 41 and the hinge connection of drop portions 16 and 17, as is shown in Fig. 3. It will become apparent that the force supplied through line 55 continues to fold toggle arms 42 and 43, and at the same time, acts through toggle brace 41 to fold drop portions 16 and 17. Simultaneously, a component of this force acts through pulley 50 to raise directly lower drop portion 17. Thus it is seen that both pulleys 50 and 52 act with line 55 to fold the truss structure.

When the truss structure is moved to the fully folded position, the component parts are disposed as shown in Fig. 4. Actuating line 55 acting through toggle brace 41 not only serves to fold toggle brace 41, but also aids in moving drop portions 16 and 17 to the folded horizontal positions shown in Fig. 4. Extensions 35 and 36 are of such length as to permit this result. It will be also noted that longitudinal bars 13 of supporting frame 11 are vertically spaced from ceiling 10 for a distance to permit the goal hoop 47 to be received therebetween.

To lower the truss structure from the folded inoperative position of Fig. 4 to the extended operative position of Fig. 1, the actuating line 55 is released, and the drop member 15 and brace member 32 are allowed to swing downwardly. Usually, the weight of the truss structure is sufficient to enable the component parts to assume the normal operative position shown in Fig. 1.

The line and pulley arrangement coacting with the particular hinge connection of the toggle brace 41 and of the drop portions 16 and 17 realizes a front-folding basketball backstop apparatus that may be quickly and easily raised from an extended operative position to a substantially horizontally folded, inoperative position.

Although the improvements have been described by making particularized reference to a single preferred embodiment, the detail of description is not to be understood as restrictive, numerous variants being possible within the principles disclosed and within the fair scope of the claims hereunto appended.

We claim as our invention:

1. In a foldable backstop, an overhead supporting frame, a truss comprised of a drop member consisting of an upper drop portion and a lower drop portion, the upper drop portion being pivotally connected to the supporting frame, and hingedly connected to the lower drop portion, a rigid brace member pivotally connected to said lower drop portion, and pivotally connected to the supporting frame, an upwardly breaking toggle brace having arms hingedly connected, one of said toggle arms being pivotally connected to said brace member, the other toggle arm being pivotally connected to said drop member at said hinge connection, a first pulley carried by said truss below said toggle brace, a second pulley normally located above said toggle brace, a third pulley normally located above said first pulley, and a line passed over the third pulley, under the first pulley, over the second pulley, and thence fastened to the toggle brace so that the toggle brace breaks upwardly when the line is pulled.

2. In a foldable basketball backstop, an overhead supporting frame, a truss comprised of a drop member consisting of an upper drop portion and a lower drop portion, the upper drop portion being pivotally connected to the supporting frame, and hingedly connected to the lower drop portion, a rigid brace member pivotally connected to said lower drop portion, and pivotally connected to said frame, an upwardly breaking toggle brace having arms hingedly connected, one of said toggle arms being pivotally connected to said brace member, the other toggle arm being pivotally connected to said drop member at said hinge connection, a first pulley normally carried by said truss below said toggle brace, a second pulley normally located rearwardly of said first pulley and located above said toggle brace, a third pulley normally located forwardly of and above said first pulley, and a line passed over the third pulley, under the first pulley, over the second pulley, and thence fastened to the toggle brace at its hinge connection so that said toggle brace breaks upwardly when the line is pulled.

3. In a front-folding basketball backstop, an overhead supporting frame, a truss comprised of a drop member consisting of an upper drop portion and a lower drop portion, said drop portions being hingedly connected, and normally arranged in aligned position, the upper drop portion having one end pivotally connected to said supporting frame, a rigid brace member pivotally connected to said lower drop portion, and normally extending rearwardly at an angle from said drop member, the brace member being pivotally connected to said supporting frame, an upwardly breaking toggle brace located between said drop member and said brace member, said toggle brace having arms hingedly connected and adapted to break open upwardly, one of said toggle arms being pivotally connected to said brace member, the other toggle arm being pivotally connected to said drop member at said hinge connection, a first pulley carried by said truss below said toggle brace, a second pulley located above said toggle brace rearwardly of said first pulley, a third pulley located forwardly of and above said first pulley, and a line interconnecting said pulleys and attached to said toggle brace so that the toggle brace breaks upwardly when the line is pulled, said line being adapted to break said hinge connection of said toggle arms and

of said drop member portions incident to raising the backstop.

4. In a front-folding basketball backstop, an overhead supporting frame, a truss comprised of a drop member consisting of an upper drop portion and a lower drop portion, said drop portions being hingedly connected, the upper drop portion being pivotally connected to said frame, an extension normally extending rearwardly of said lower drop portion, another extension normally extending downwardly from said frame, and located rearwardly of said drop member, a rigid brace member pivotally connected to said extensions, and normally arranged at an angle from said drop member, an upwardly breaking toggle brace having arms hingedly connected, one of said toggle arms being pivotally connected to said brace member, the other toggle arm being pivotally connected to said drop member at its hinge connection, a first pulley carried by said truss below said toggle brace, a second pulley located rearwardly of said first pulley, and located above said toggle brace, a third pulley located forwardly of and above said first pulley, and a line passed over the third pulley, under the first pulley, over the second pulley, and thence fastened to the toggle brace at its hinge connection so that said toggle brace breaks upwardly when the line is pulled.

5. In a front-folding basketball backstop, an overhead supporting frame secured to an overhead wall, a drop member consisting of an upper drop portion, and a lower drop portion, the drop portions being hingedly connected, and normally arranged in a vertical aligned position, the upper drop portion being pivotally connected to said frame, a bank and goal structure carried by said lower drop portion, an extension normally extending rearwardly of said lower drop portion, another extension normally extending downwardly from said frame, and located rearwardly of said drop member, a rigid brace member normally disposed at an angle from said drop member, said brace member being pivotally connected to said extensions, an upwardly breaking toggle brace located between said drop member and said brace member, the toggle brace having arms hingedly connected, one of said toggle arms being pivotally connected to said brace member, the other toggle arm being pivotally connected to said drop member at its hinge connection, a first pulley carried by said lower drop portion below said toggle brace, a second pulley located above said toggle brace and rearwardly of said first pulley, a third pulley located above and forwardly of said first pulley, and a line passed over the third pulley, under the first pulley, over the second pulley, and thence fastened to the toggle brace at its hinge connection so that said toggle brace breaks upwardly when the line is pulled, said line and pulley arrangement being adapted to break the hinge connection of said toggle arms and of said drop member portions incident to folding the drop member and brace member to a horizontal folded position.

6. In a front-folding backstop apparatus, an overhead supporting frame, a drop member consisting of an upper drop portion and a lower drop portion, each drop portion including opposite rigid side bars, bracing elements between said side bars, the side bars of said drop portions being hingedly connected, the side bars of said upper drop portion being pivotally connected to said frame, a rigid brace member including opposite rigid side bars, bracing elements between the latter said side bars, the side bars of said brace member being pivotally connected to the side bars of the lower drop portion, and pivotally connected to said frame, an upwardly breaking toggle brace at each side of said drop member, each toggle brace having arms hingedly connected, one of said toggle arms of each toggle brace being pivotally connected to one of the side bars of said brace member, the other arm of each brace being pivotally connected to one of the side bars of said drop member at its hinge connection, a bridging piece interconnecting said arms of said toggle braces at the hinge connection, a first pulley carried by said lower drop portion below said toggle brace, a second pulley located rearwardly of said bridging piece and of said first pulley, a third pulley located forwardly of and above said first pulley, and a line passed over the third pulley, under the first pulley, over the second pulley and thence fastened to the bridging piece so that the toggle braces break upwardly when the line is pulled.

7. In a front-folding basketball backstop apparatus, an overhead supporting frame, a drop member consisting of an upper drop portion and a lower drop portion, each drop portion including opposite rigid side bars, bracing elements between said side bars, the side bars of said upper drop portion being hingedly connected to the side bars of said lower drop portion, the side bars of said upper drop portion being pivotally connected to said frame, a brace member including opposite rigid side bars, bracing elements between the latter said side bars, extension elements extending rearwardly of the side bars of said lower drop portion, other extension elements extending downwardly from said frame, the side bars of said brace member being pivotally connected to said extension elements, the drop portions being normally aligned, the brace member normally extending rearwardly at an angle from the drop member, a pair of upwardly breaking toggle braces between said drop member and said brace member, one of said toggle braces being disposed at each side of said drop member, each of said toggle braces having arms hingedly connected, a bridging piece interconnecting the toggle braces at their hinge connections, one of the arms of each toggle brace being pivotally connected to a side bar of said brace member, the other arm of each toggle brace being pivotally connected to one of the side bars of said drop member at its hinge connection, a first pulley carried by the lower drop portion below said toggle brace, a second pulley located above said toggle brace and rearwardly of said first pulley, the second pulley being carried by said frame, a third pulley located above and forwardly of said first pulley, and a line passed over the third pulley, under the first pulley, over the second pulley, and thence connected to the bridging piece interconnecting the hinge connections of said toggle braces so that said toggle braces break upwardly when the line is pulled, the line and pulley arrangement being adapted to break the hinge connections of said toggle braces and of said drop portions, and to raise the drop member and brace member to a folded, substantially horizontal inoperative position.

8. In a foldable basketball backstop, an overhead supporting frame, a drop member consisting of an upper drop portion and a lower drop portion, said drop portions being hingedly connected, and normally aligned in operative position, the upper drop portion being pivotally connected to said supporting frame, a rigid brace member pivotally connected to said lower drop portion, and normally extending rearwardly at an angle from said drop member, the brace member being pivotally connected to the supporting frame, an upwardly breaking toggle brace located between said drop member and said brace member, the toggle brace having arms hingedly connected, one of said toggle arms being pivotally connected to said brace member, the other toggle arm being pivotally connected to said drop member at its hinge connection, a first pulley carried by the lower drop portion, a second pulley located rearwardly of the first pulley and located above the toggle brace, a third pulley located forwardly of and above the first said pulley, and a line passed over the third pulley, under the first pulley, over the second pulley, and thence fastened to the toggle brace at its hinge connection so that said toggle brace breaks upwardly when the line is pulled.

9. In a foldable backstop, an overhead supporting frame, a truss comprised of a drop member consisting of an upper drop portion and a lower drop portion, the upper drop portion being pivotally connected to the

supporting frame, and hingedly connected to the lower drop portion, a rigid brace member pivotally connected to said lower drop portion, and pivotally connected to the supporting frame, an upwardly breaking toggle brace having arms hingedly connected, one of said toggle arms being pivotally connected to said brace member, the other toggle arm being pivotally connected to said drop member at said hinge connection, a first line-engaging means carried by said truss below said toggle brace, a second line-engaging means normally located above said toggle brace, a third line-engaging means normally located above

said first line-engaging means, and a line passed over the third line-engaging means, under the first line-engaging means, over the second line-engaging means, and thence fastened to the toggle brace so that the toggle brace breaks upwardly when the line is pulled.

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