

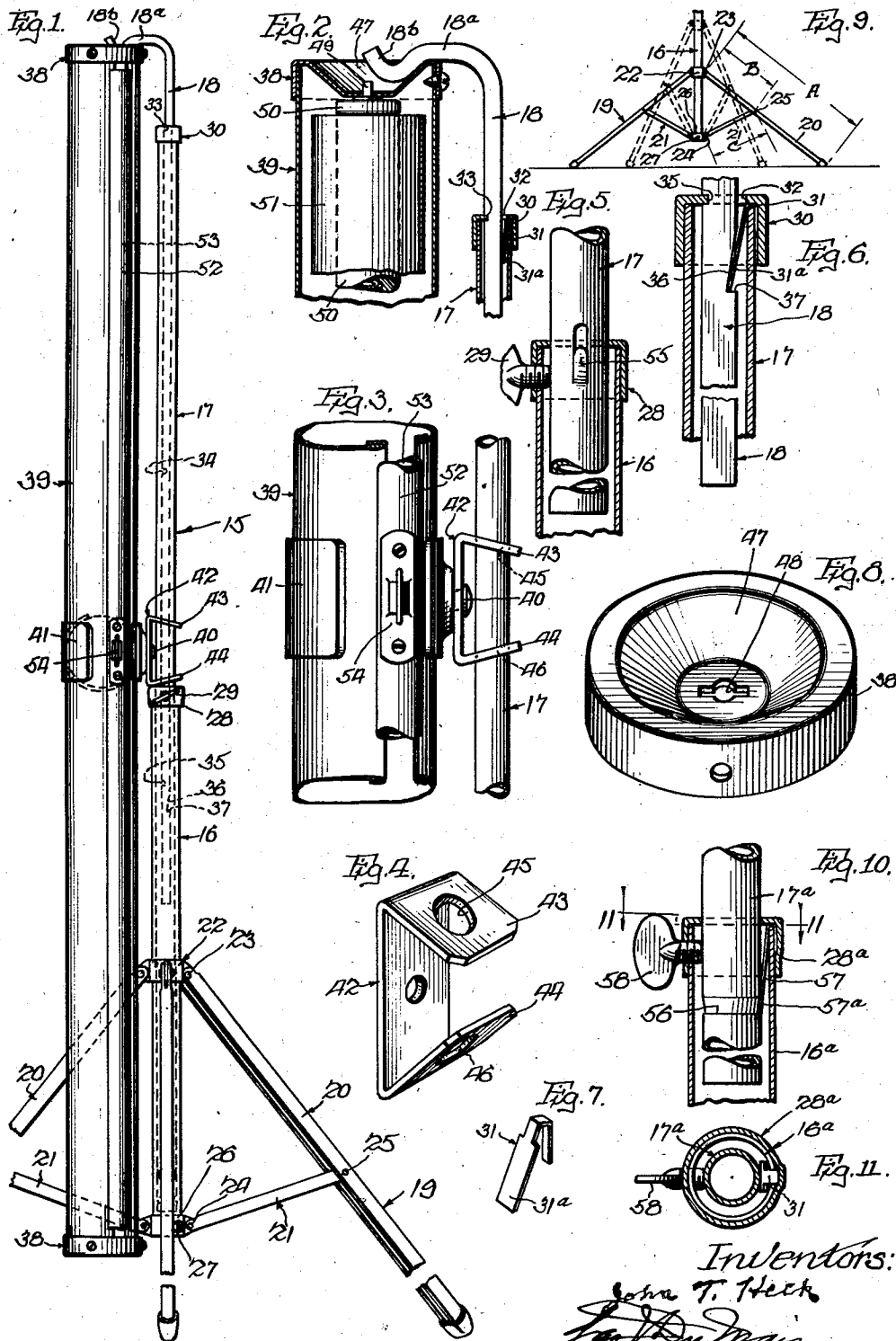
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J. T. HECK ET AL

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PICTURE SCREEN SUPPORTING STRUCTURE

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Inventors:

John T. Heck
Leo A. Mais

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PICTURE SCREEN SUPPORTING
STRUCTURE

John T. Heck, Elmhurst, and Leo J. Du Mais, Chicago, Ill., assignors to Da-Lite Screen Company, Inc., Chicago, Ill., a corporation of Illinois

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The present invention relates to improvements in a portable picture screen and is more particularly directed to the picture screen supporting structure on which is carried a suitable reel of picture screen which may be easily and readily set up for use and collapsed for portable purposes.

It is an object of the present invention to provide a picture screen supporting structure which is inexpensive to manufacture, strong and durable, simple in construction and having the fewest number of parts to facilitate assembling and with the co-acting parts so arranged and constructed to be releasably adjusted to various positions to expose predetermined lengths of picture screen and to maintain these predetermined exposed lengths of screen throughout the entire range of adjustments.

A further object is the provision of a structure wherein the picture screen reel is suitably carried in a case which has a pivoted U-shaped bracket of spring steel secured thereto and which bracket frictionally grips its companion member to permanently retain the bracket and the case in fixed position thereon.

And a further object is the provision of a tripod structure in which the pivotal connections are so arranged as to be self locking in any position to which the tripod is opened.

A still further object is the provision of a structure which permits a pivotal swinging adjustment of the picture screen after the same has been set up for use.

Other and further objects will become apparent from the ensuing description and claims.

Referring to the drawings:

Figure 1 is a view in side elevation of the structure in upright position with the tripod extended to support the same and illustrating the case in locked position parallel with the structure.

Figure 2 is an enlarged partial detail sectional view of the upper portion of the screen structure illustrating the extension rod locking the same in position.

Figure 3 is an enlarged detail fragmentary view illustrating the case bracket and the method for locking the same on its upright structure.

Figure 4 is an enlarged detail perspective view of the spring bracket illustrated in Figure 3.

Figure 5 is enlarged partial detail sectional view illustrating the adjusting means for varying the height of the case on the structure and the manual means for locking the same in selected raised positions and also showing the stop means

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for limiting the extreme upward movement of the tube.

Figure 6 is an enlarged vertical detail sectional view illustrating the locking and holding means at the upper portion of the structure and with spring means serving as a stop for limiting the extreme upward movement of the extension rod.

Figure 7 is an enlarged detail perspective view of the spring shown in Figure 6.

Figure 8 is an enlarged detail perspective view of the end cap at each end of the case serving as a pivotal center for the screen roller.

Figure 9 is a schematic diagrammatic view illustrating the arrangement of the tripod for adjusting the same to various heights and whereby it is automatically retained in any adjusted position without locking means.

Figure 10 is an enlarged detail vertical sectional view illustrating a modified form of stop means for the intermediate member.

Figure 11 is a detail cross sectional view taken substantially on the line 11—11 of Figure 10.

It will be obvious to those skilled in the art to which the invention appertains, that the structure is so simplified as to be easily assembled by merely attaching one part to the other, the parts being so arranged that they will be permanently retained in position while the structure is being assembled.

The accompanying drawings, therefore, are submitted merely as showing the preferred exemplification of the invention.

Referring to the drawings, the reference numeral 15 designates a structure embodying the invention. The same includes telescopic members arranged and designated in the following manner, the larger tube 16 being at the lower portion of the structure, the intermediate tube 17 and the upper member or square extension rod 18.

The tubular member 17 and the extension rod 18 co-act to raise or lower the height of the supporting structure and the tripod designated as a whole as 19 also co-acts to adjust the height of the screen when the structure is set up in usable position.

The tripod 19 is of a novel construction and is secured to the lower end of the tube member 16 with the upper end of the tripod free to slide along the tube for collapsing and opening the tripod during the closing and setting up operations. The pivotal centers of the tripod legs 20 and connecting arms 21 are so arranged that the slidable or top sleeve 22 of the tripod may be

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positioned to extend the legs at the desired angle to provide a sufficient rest to support the structure and to thereby adjust the same for various heights by reason of varying the spread of the tripod legs. To accomplish this result, it is necessary that the legs and the arms be of certain dimensional proportions and their pivotal centers be of certain proportions with respect to each other. As for example (Fig. 9), assume the length A of the legs 20 to be $19\frac{1}{2}$ inches from their pivotal centers 23 to the free end thereof, the arms 21 will have one end pivoted to the leg 20 at a distance B of approximately $8\frac{1}{2}$ inches from the leg pivots 23, and the arms 21 will have a length C of $6\frac{7}{8}$ inches between their pivotal centers 24 and 25, respectively. The lower fitting 26 of the tripod 19 is secured to the tube 16 and 27, and the tripod is easily collapsed and with the upper sleeve 22 thereof slidable on the tube member 16 and adjustable for various heights depending on the span required of the legs. Due to the frictional contact of the free ends of the legs with the surface on which the tripod is resting, a frictional resistance will be afforded to the legs 20 and by reason of their pivotal connections 25 with the arms 21, the tripod will remain in its adjusted position to support the structure. In constructing a tripod of this type as mentioned above, it is not necessary to have a locking member or screw for securing the same in open position, as the weight of the structure on the tripod will only serve to hold the same more rigid.

The tube 16 is provided at its upper end portion with a cap 28 which has a thumb screw 29 therein and this tube 16 and cap 28 receive the lower end of the intermediate tube 17 and with the screw 29 serving to retain the intermediate tube locked in any height to which it is adjusted. The intermediate tube 17 is also provided with a cap 30 (Figs. 1 and 6) which retains a spring 31 in fixed position at the top edge of tube 17. The spring 31 is formed to overlie the edge of the tube 17 and with the inner leg 31^a thereof depending inwardly at an angle to exert a pressure on the extension rod 18 which is slidably positioned within the tube 17. The cap 30 is provided with a square opening 32 in the top thereof which permits of a longitudinal sliding movement of the rod 18 against the tension of the spring 31. The rod 18 is provided with a plurality of transverse kerfs 33, 34 and 35 which are arranged at predetermined intervals on the front face of the square extension rod 18, and are of a sufficient depth to engage the square opening 32 of the cap 30. These kerfs extend transversely across the face of the rod and when the rod is raised, the tension of the spring 31 will force the rod against the cap until one of the kerfs registers with the cap to lock the rod therewith. The kerf 33 serves to lock the case vertically.

The rearward face of the extension rod 18 is also provided near its lower end portion with an angular cut away portion 36 which provides a shoulder 37 against which the leg 31^a of the spring 31 will engage when the rod is brought to extreme upward position. This shoulder 37 provides a positive stop for the upward movement of the rod and prevents its accidental withdrawing from the tube 17. The kerfs 33, 34, and 35 provided in the rod and which kerfs engage the square opening 32 of the cap 30 are spaced so as to determine the predetermined length of screen web to be extended from the screen reel when the free end of the web is attached to the upper portion of the

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extension rod. The upper portion of the extension rod 18 is provided with a horizontal forwardly extending portion 18^a that terminates into a hook portion 18^b which has a dual purpose. One purpose of this hook 18^b is to lock the case in vertical position with the structure and its other purpose is to attach the free end of the screen web thereto for use.

The end caps 38 attached to each end of the case 39 are of concave formation and receive the hook 18^b of the extension rod 18 for holding the case in position as above mentioned. The case 39 is pivotally supported on the tube 17 intermediate its length at 40 by means of a center band 41 secured to the case and with the pivot 40 attached to a rider 42 which is of spring material and in the shape of a "Swedish clamp." In order to assemble the rider on the tube 17 the legs 43 and 44 thereof are expanded to substantially horizontal position and the tube 17 is then inserted through the openings 45 and 46 respectively, until the tube 17 is in its proper position, and then releasing the rider to permit the same to clamp the tube 17 by reason of its formation to permanently secure the rider in position on the tube. When the structure is in normal closed or opened position, the rider 42 rests on the cap 23 of the tube 16 which is the central position, to permit the case 39 to be freely swung from vertical to horizontal position when the tripod 19 is extended to support the structure in vertical position. The members 16 and 17 being round permit of a pivotal swinging movement of the upper portion of the structure to properly align the screen.

As above noted, the case end caps 38 are of concave formation 47 and are each provided centrally thereof with a combination round and rectangular opening 48 to receive either the pin or blade end 49 (only one of which is shown) of a spring roller 50 pivotally supported in the case between the end caps. A length of screen web 51 is attached and coiled around the roller 50 and the free end of the web is provided with a pocket 52 into which is inserted a slat 53 which has a slat-pull 54 that provides means for drawing out the screen web from the case 39 and for attaching the same to the hook 18^b of the extension rod 18.

The tube 17 is provided near its lower end portion with a sheared out upwardly projecting lug 55 which permits the lower end of the tube 17 to be inserted into the tube 16 through the cap 28 and at which time the lug will yield until it has passed the cap and will then spring outwardly to form a stop to limit the extreme upward movement of the tube by reason of the engagement of the lug 55 with the under surface of the cap.

Referring now more specifically to Figures 10 and 11 which show a modified form of stop means for the tube 17 and which tube in this form is designated as 17^a. This tube 17^a is provided near its lower end portion with an annular groove forming a shoulder 56 which is brought into engagement with the spring 57 when the tube is raised. The spring is secured between the top end of the tube 16^a and the cap 28^a and offers a frictional resistance to the sliding movements of the tube 17^a which is retained in adjusted positions by means of a thumb screw 58 which is threaded through the cap 28^a and the tube 16^a. As the tube 17^a is raised and has reached its uppermost position the end 57^a of the spring 57 will engage the groove 56 of the tube and limit its upward movement to prevent the accidental removal of the tube 17^a from the tube 16^a.

As will be noted in Figure 8, the cap is of a one

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piece formation and is constructed to receive either the pin end or blade end of the roller 50 and these caps provide a perfect guide to pivotally support the roller centrally of the case. The concave portion of the case end caps will receive the hook portion 18^b of the extension rod 18 to lock the case 39 in position when the structure is collapsed for portable purposes.

As above pointed out, a supporting structure of this character will require a minimum amount of material and the arrangement of parts and their construction will facilitate the assembling of the device with an appreciable saving in the cost of manufacture.

We claim:

1. In a supporting structure employing a plurality of telescopic members, the uppermost pair of telescopic members cooperating to support a reeled screen web in extended condition, one of said pair of telescopic members having the screen web reel permanently secured thereto, means on the other of said pair of telescopic members for attachment of the free end of the screen web thereto for supporting predetermined exposed lengths of the screen web unwound from the reel, means on said telescopic members cooperating to retain them in adjusted positions the said one telescopic member being adjustable with respect to the lowermost member, and means coacting with said one and lowermost telescopic members for facilitating manual adjustment thereof.

2. In a supporting structure of the character described, the combination of a plurality of telescopic members having supporting legs, the two uppermost pair of telescopic members cooperating to support a reeled screen web in extended condition, one of said telescopic members having the screen web reel secured thereto, a screen web mounted on said reel, means on the other of said uppermost telescopic members to which the free end of the screen web is attached for supporting predetermined lengths of screen web unwound from the reel, means on said telescopic members cooperating to retain them in adjusted positions, said means comprising an inwardly directed extension on said one telescopic member and a plurality of openings in the said other telescopic member and with spring means urging said last mentioned member into engagement with the inwardly directed extension, and means on said one member coacting with the lowermost telescopic member for locking the same at different heights thereon.

3. In a supporting structure of the character described, the combination of at least three telescopic members, the largest of said members having supporting legs, a screen web and reel pivotally attached to the intermediate telescopic member, the upper telescopic member being adjustable with respect to said intermediate member and having means thereon to which the free end of the screen web is detachably connected for maintaining predetermined exposed lengths of screen web unwound from the reel, and means on said telescopic members cooperating to retain them in adjusted open positions said retaining means permitting of adjustments to expose various lengths of screen web unwound from the reel and for facilitating vertical adjustment of the reel while retaining the adjusted screen length.

4. In a supporting structure employing telescopic members having supporting legs, a screen web and reel carried on an intermediate

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telescopic member, the upper telescopic member cooperating with the intermediate member for holding a predetermined length of screen web unwound from the reel, means on said intermediate and upper telescopic members forming lock means for holding them in normal and raised positions, said lock means comprising a fixed cap on said intermediate member having an opening therein, said upper member having a sliding and a transverse shifting movement in said opening and being provided with a plurality of transverse slot openings, manually controlled lock means on said intermediate and lower telescopic members for locking the intermediate member at different heights on the lower member while maintaining the predetermined length of screen web, and stop means coacting between said intermediate and lower members preventing separation thereof.

5. In a supporting structure of the character described, the combination of three telescopic members, a reeled screen web attached for pivotal movement to the intermediate telescopic member, the upper telescopic member being adjustable with respect to said intermediate member and having means thereon for attachment of the screen web thereto, and a tripod carried by the lower telescopic member, said tripod comprising a slidable sleeve and a fixed lower fitting and with the tripod legs being pivoted to said sleeve and each leg having a connecting arm pivoted thereto at a point above its longitudinal center, the length of each arm being less than the distance between its pivot to the associated leg and the pivot of said legs to the sleeve, said arms having their other ends pivoted to said fixed fitting and supporting the weight of the structure which is transferred to the legs through the arms thereby holding the arms and legs in adjusted open position without the use of locking means.

6. In a supporting structure of the character described, the combination of three telescopic members, a reeled screen web carried for pivotal movement on the intermediate telescopic member, the upper telescopic member being adjustable with respect to said intermediate member and having means thereon for attachment of the screen web thereto, and a tripod connected to the lower telescopic member, said tripod comprising pivoted legs each having a connecting arm pivoted thereto above the center point of its length and each arm having a length less than the distance between the pivotal center of the legs and the pivotal point of the arm to the associated leg, thereby facilitating the adjustment and positioning of the legs to any desired angle, said legs remaining in adjusted positions without the use of locking means.

7. In a supporting structure of the character described, a reeled screen web pivotally carried thereon, an adjustable member on the structure, said member having means thereon for attachment of the screen web thereto, a bracket of spring material positively gripping the structure and providing the pivotal center of the reeled screen web, said bracket being of substantially U-shape and having an opening in each leg thereof through which the structure extends to be permanently gripped thereby for holding the reeled screen web in fixed pivotal position on the structure and movable with the structure.

8. In a supporting structure employing telescopic members having supporting legs therefor, a case having a screen web and reel carried therein and for rotation on an intermediate tele-

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scopable member, the upper of said telescopable members being adapted for vertical adjustment and cooperating with the intermediate member for holding a predetermined length of screen web unwound from the reel, means on said intermediate and upper telescopable members forming lock means for holding them in normal and raised positions, said lock means comprising a cap having an opening therein and fixed to the intermediate member and said upper member having pre-determined slot openings therein and being slideable and shiftable for transverse movements, and a spring retained by said cap in the intermediate member and urging the upper member against one edge of the cap opening for engagement of the slot openings of said uppermost member with the cap, and means on said upper member adapted to engage the case for locking the same against movement when said

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case and reel are in parallel relation with the structure.

JOHN T. HECK.
LEO J. DUMAIS.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
930,406	McDonald	Aug. 10, 1909
1,203,853	Contal	Nov. 7, 1916
1,214,979	VonAhnen	Feb. 6, 1917
1,917,369	Heck	July 11, 1933
2,335,884	Raven	Dec. 7, 1943
2,355,799	Heck	Aug. 15, 1944
2,361,119	Owens	Oct. 24, 1944