D. T. ARREL.

CANOPY STRUCTURE.

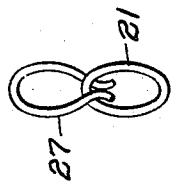
APPLICATION FILED AUG. 30, 1918.

1,286,895.

Patented Dec. 10, 1918.

2 SHEETS—SHEET 1.

FIG. 6.



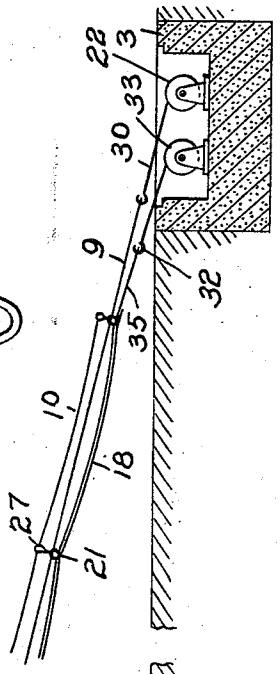


FIG. 3.

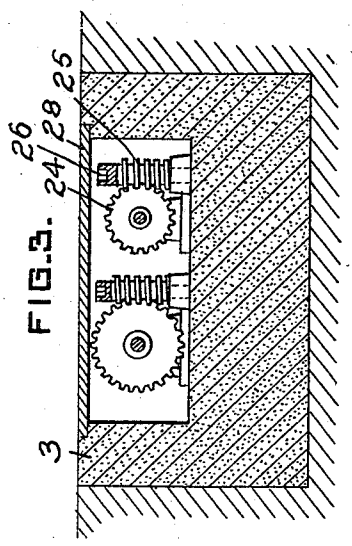


FIG. 1.

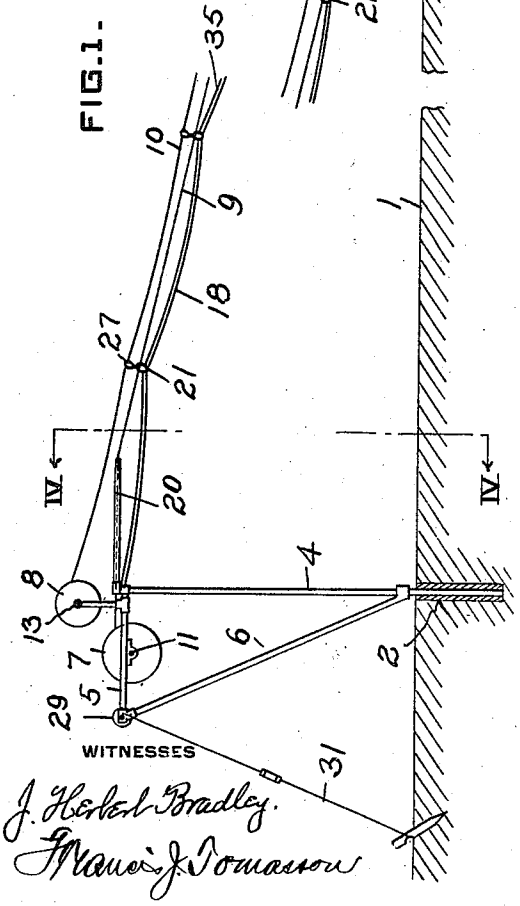
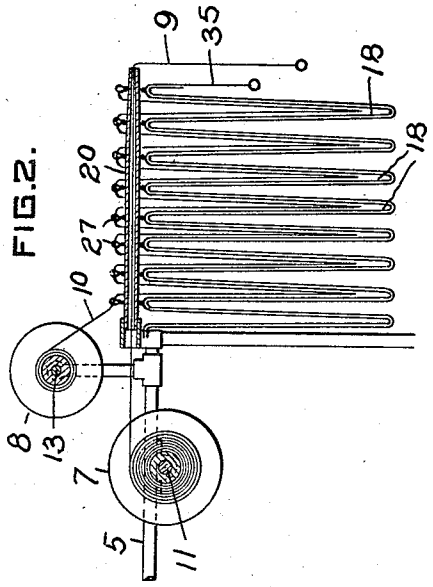


FIG. 2.



WITNESSES

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2 SHEETS—SHEET 2.

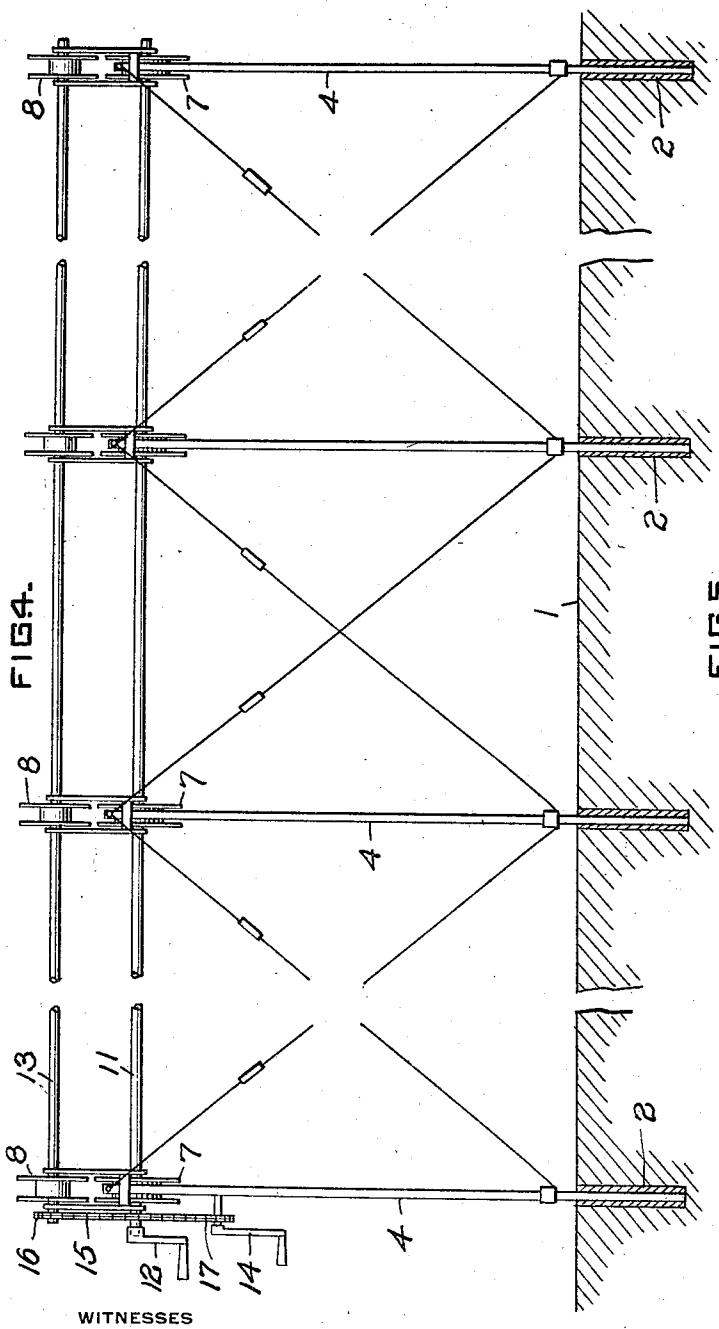


FIG. 4.

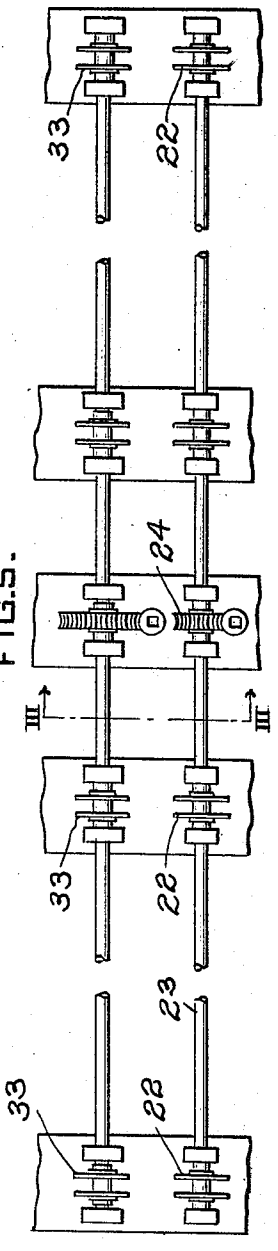


FIG. 5.

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UNITED STATES PATENT OFFICE.

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CANOPY STRUCTURE.

1,286,895. Specification of Letters Patent. Patented Dec. 10, 1918.

Application filed August 30, 1918. Serial No. 252,042.

To all whom it may concern:

Be it known that I, DAVID T. ARREL, residing at Youngstown, in the county of Mahoning and State of Ohio, a citizen of the United States, have invented or discovered certain new and useful Improvements in Canopy Structures, of which improvements the following is a specification.

The object of my invention is to provide an improved canopy structure which may be quickly and easily extended over an area desired to be protected against sun or rain.

A further object is to provide a canopy structure, which, when not required for its intended use, may be suitably stored in readiness for such use, and may be readily put in position for unfurling.

While the canopy structure which I provide may be used for various specific purposes, it finds particular applicability to the protection of playgrounds such as tennis courts, base ball diamonds, etc., and is so illustrated in the accompanying sheets of drawings.

Figure 1 is a side view of the preferred form of canopy structure, the cover being shown unfurled; Fig. 2 a detail view to enlarged scale of the upper portion of the canopy structure shown at the left end of Fig. 1, portions of Fig. 2 being shown in vertical section, and the cover being shown in furled position; Fig. 3 a vertical sectional view taken on the line III—III, Fig. 5; Fig. 4 an elevation taken on the general plane indicated by the line IV—IV, Fig. 1, the canopy or cover being omitted on Fig. 4; Fig. 5 a plan view of the reeling mechanism shown at the right end of Fig. 1; and Fig. 6 a perspective view of a detail of construction.

In the embodiment of my invention shown in the drawings, the surface of the playing-ground 1 is provided at one side of the playing space with a plurality of sockets 2 adapted to receive and support in vertical position a canopy structure, and the opposite side of the playground is provided with a trough or receptacle 3 in which there is placed a reel mechanism which will presently be described. As indicated in Fig. 1, the tops of the sockets 2 and of the receptacle 3 are flush with the playing surface 1 so that there is no obstruction to the general continuity of such surface.

While the canopy supporting structure may be variously made, each support preferably comprises a triangular frame consisting of a vertical rod 4, horizontal rod 5 and an oblique rod 6. Each of these supports is provided with a pair of reels 7 and 8, to the former of which there is attached one end of a flexible canopy-supporting line 9, and to the other of which there is attached one end of a flexible controlling line 10.

The several reels 7 of the supports may be simultaneously rotated by means of a shaft 11 which extends between the several canopy supports and is keyed to each of such reels. For rotating the shaft 11, a suitable crank arm 12 may be provided at one end thereof. In a similar manner the reels 8 of the several canopy supports may be simultaneously rotated by means of a shaft 13 adapted to be turned by crank arm 14, a suitable sprocket chain 15 connecting sprocket wheels 16 and 17 attached, respectively, to the end of the shaft 13 and to the rotatable portion of the crank arm 14.

A canopy or cover 18 which may be made of canvas or any other suitable material is, when not extended over the surface of a playground, adapted to be supported by a horizontally projecting arm 20 secured to the upper end of each of the canopy-supporting frames. As indicated in Fig. 2, the arm 20 is preferably tubular, the flexible supporting line 9 being threaded through it. However, it will be understood that the line 9 may be otherwise supported in parallel relationship to the arm 20 of each supporting frame. Attached to the upper face of the cover 18 there are a plurality of rings 21 spaced at suitable intervals in alinement with each projecting tubular arm 20. These rings surround the lines 9 and are large enough in diameter to also surround the arms 20. Thus it will be seen that, when the canopy is furled, it is supported by the arms 20, all of the rings 21 resting upon them.

When in unfurled or extended position, the canopy is supported by the series of lines 9, which extend from the several supporting frames to the reeling mechanism in the casing 3. This reeling mechanism, as shown in Figs. 3 and 5, consists of a plurality of reels 22, each keyed to a shaft 23 provided with a worm wheel 24. Geared to the worm wheel 24 there is a worm shaft 25 provided at its upper end with a wrench socket 26. By this mechanism the ends of the series of lines 9 may be held taut when the canopy is in unfurled position.

The series of lines 10, to which reference has already been made, are provided for furling the canopy or cover 18. To such end, there is attached at suitable intervals to each line 10 a plurality of members adapted to detachably engage the rings 21. These members preferably take the form of snap rings 27, one of which is shown particularly in Fig. 6 in engagement with one of the rings 21. Sewed or otherwise attached directly to the canopy in parallel relation to the lines 9 and 10, there is a third series of lines 35, the ends of which project beyond the outer edge of the canopy. The lines 35 may be ropes or heavy strips of canvas, and they serve as reinforcing members at the point of attachment of the rings 21 to the canopy. For holding the canopy extended upon the supporting lines 9 reeling mechanism, including reels 33, is provided for engaging and holding taut the free ends of the series of lines 35. This reeling mechanism is the same as that already described for engaging the series of lines 9, and hence need not be again specifically explained. As shown in Fig. 3, a suitable cover 28 may be provided for closing the upper end of the casing 3 so that normally the continuity of the surface is not interrupted.

That the canopy supporting structure in its entirety, consisting of the several interconnected supporting frames 4, 5, 6 may be readily moved to and from a hanger or shed, a wheel 29 is rotatably mounted at the meeting point of the rods 5 and 6 of each frame.

In the operation of the canopy structure it will be understood first that when not in use the cover 18 will be furled in the manner indicated in Fig. 2, and will be supported by the several arms 20. If the canopy is for the protection of a base-ball diamond, the sockets 2 may be arranged adjacent to one base line, and the reel receptacle 3 adjacent to an opposite parallel base line. In case of rain the players or ground attendants may grasp the supporting structure at the lower ends of the vertical rods 4 and wheel it to the proper position wherein the ends of each rod 4 will each be adjacent to a socket 2. The entire structure may then be raised and the lower ends of the rods 4 inserted into the sockets. The next step in the procedure is the withdrawing of the series of lines 9 and attaching the ends thereof to short lines 30 attached to the reels 22. It will be understood that the withdrawing of the lines 9 does not cause the canopy to become unfurled, such lines being unattached to the canopy. The cover 28 being removed from the receptacle 3, a wrench may be inserted into the socket 26 of the worm shaft 25 and such wrench turned to tighten the several lines 9. If desired, each of the several supports 4, 5, 6 may be provided with guys 31 acting oppositely to a pull on the lines 9.

To unfurl the cover 18, the outer edge thereof is drawn parallel to the lines 9, either by engaging such edge or the ends of the lines or strips 35. By such movement, the rings 21 are successively drawn over the outer ends of the arms 20 and slide upon the lines 9 toward the reel receptacle 3. When the canopy has thus been entirely removed from the supporting arms 20, the ends of the lines 35 are attached to short lines 32 secured to the reels 33, as shown in Fig. 1, and such reels are rotated to draw the canopy taut.

To furl the cover, the several lines 35 are detached from the short lines 32 and the reels 8 operated by the rotation of the crank arm 14 to draw the lines 10 toward the canopy support. This will cause the several rings 21 to be successively slipped over the outer arms 20. As the snap rings 27 move farther toward the reels 8, the rings 21 will snap out of engagement of the rings 27. In this manner the entire cover may be quickly furled upon its supporting arms 20. The series of lines 9 being then reeled upon the reels 7, the entire canopy support may be raised from the sockets 2, and, being tipped on its side, may be rolled to its protecting shed or hanger. Before the canopy may again be used, it will be necessary for an attendant to unreel the lines 10 and snap each ring 21 into its coöperating snap ring 27.

According to the provisions of the patent statutes, I have described the principle and operation of my invention together with the structure which I now consider to represent the best embodiment thereof. However, I desire to have it understood, that within the scope of the appended claims, my invention may be practised by various other forms of construction than that particularly shown in the drawings.

I claim as my invention:

1. In a canopy structure, the combination of a plurality of supports, a pair of reels carried by each support, a series of flexible supporting lines each attached at one end to one reel of each support, a series of flexible controlling lines each connected at one end to the other reel of each support and arranged above said supporting line, means for engaging and holding taut the opposite ends of said series of supporting lines, a canopy extensibly supported by said supporting lines, and means for attaching said canopy to said controlling lines for furling the canopy upon the supporting lines.

2. In a canopy structure, the combination of a plurality of supports each provided with a horizontally projecting arm and with a pair of reels, a series of flexible supporting lines each attached at one end to one reel of each support and extending parallel

to said arm, a series of flexible controlling lines each connected at one end to the other reel of each support and arranged above said supporting line, a canopy, rings secured at intervals to said canopy and surrounding said supporting lines, engaging members attached at intervals to said controlling lines and adapted to engage said rings, and means for engaging and holding taut the opposite ends of said series of supporting lines.

3. In a canopy structure, the combination of a plurality of supports each provided with a horizontally-disposed laterally-projecting tubular arm and with a pair of reels, a series of flexible supporting lines each attached at one end to one reel of each support and extending through said tubular arm, a series of flexible controlling lines each connected at one end to the other reel of each support, a canopy, rings secured at intervals to said canopy and surrounding said supporting line, and means secured to said controlling line for detachably engaging said rings.

4. In a canopy installation, the combination of a plurality of supports adapted to be inserted in sockets and held thereby in vertical positions, a pair of reels carried by each support, a series of flexible supporting lines each attached at one end to one reel of each support, a series of flexible controlling lines each connected at one end to the other reel of each support and arranged above said supporting line, separately operable reeling means adapted to be attached to the opposite ends of said series of supporting lines for extending and holding said lines taut, a canopy extensibly supported by said supporting lines, means for attaching said canopy to said controlling lines for furling the canopy upon the supporting lines, and means for holding said canopy taut when unfurled.

In testimony whereof I have hereunto set my hand.

DAVID T. ARREL.

Witnesses:
D. W. MUMAW,
AUSTIE HERBERT.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."