M. P. EXLINE.

KITE.

APPLICATION FILED APR. 9, 1915.

1,166,750.

Patented Jan. 4, 1916.

2 SHEETS—SHEET 1.

FIG. 1.

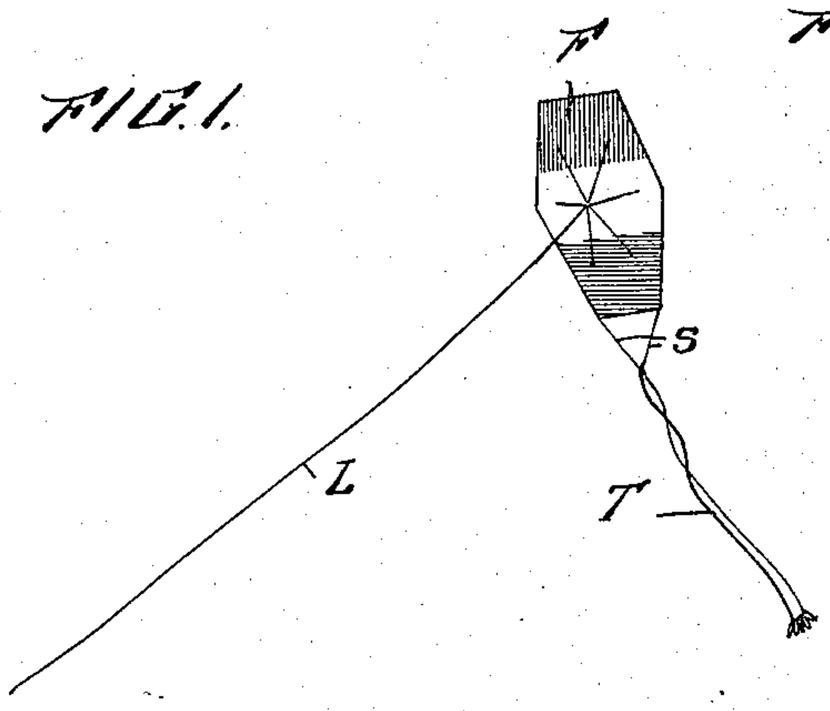

FIG. 2.

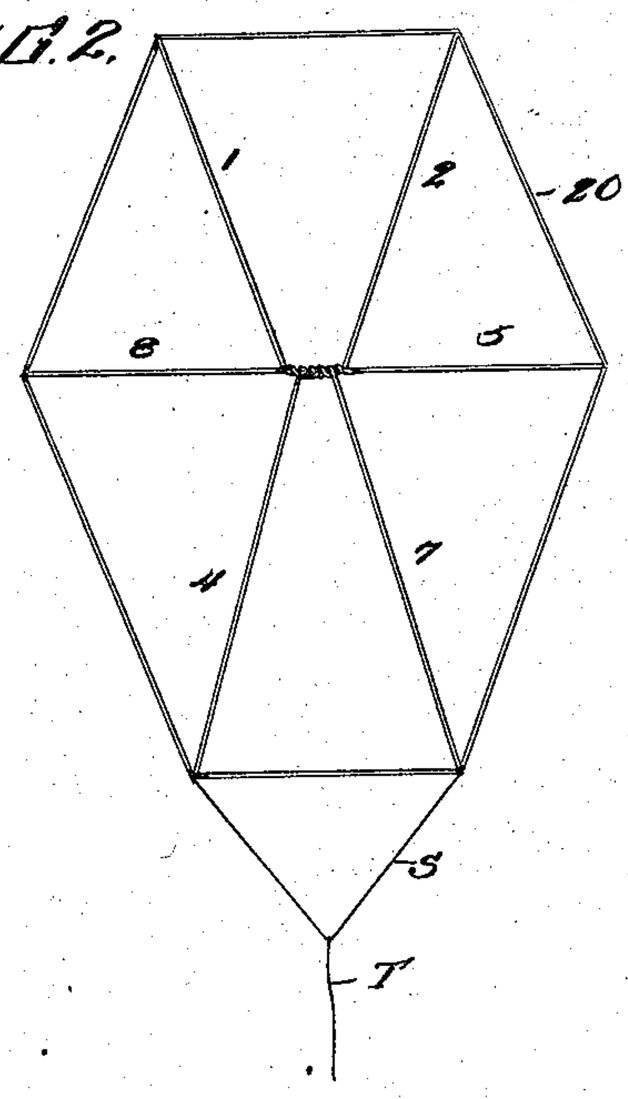

FIG. 3.

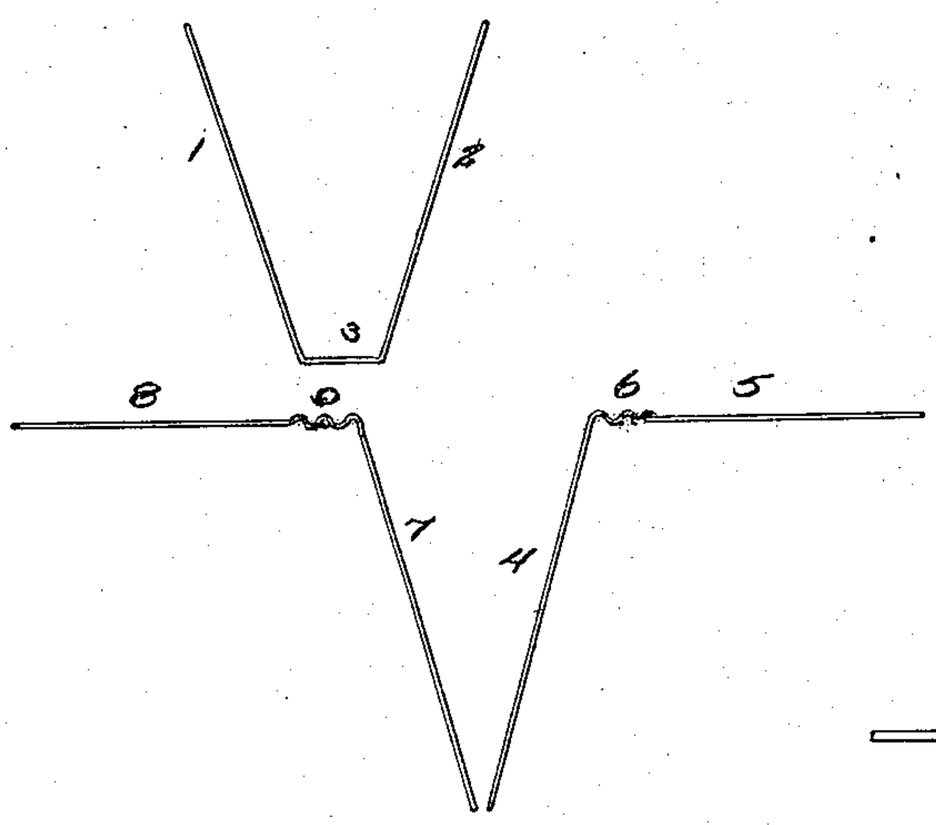

FIG. 4.

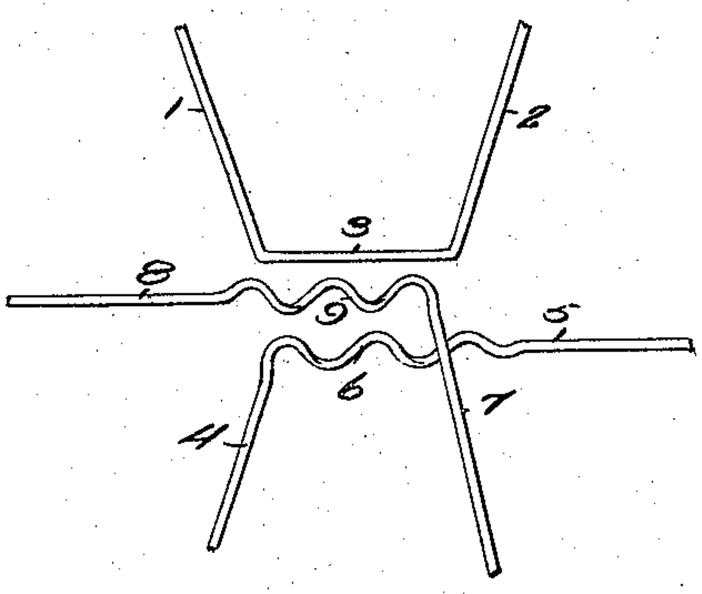

FIG. 5.

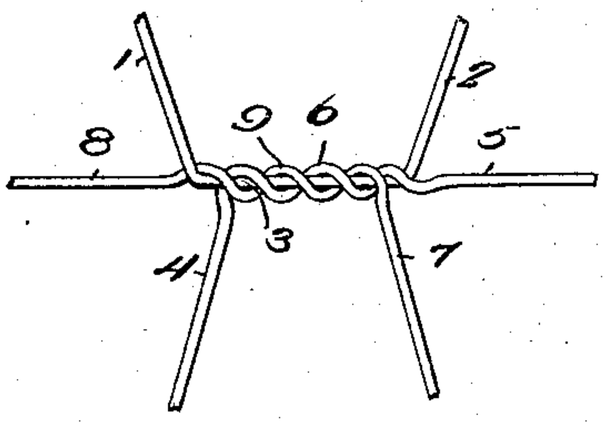

FIG. 6.

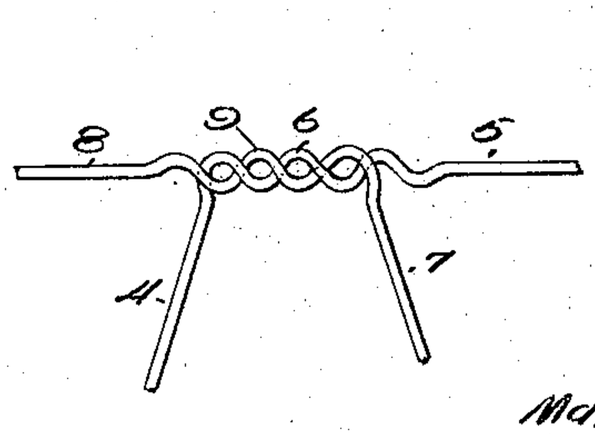

FIG. 7.

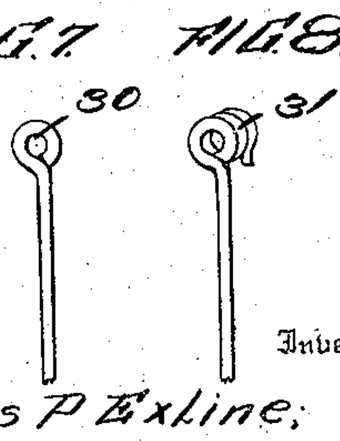

FIG. 8.

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2 SHEETS—SHEET 2.

FIG. 12.

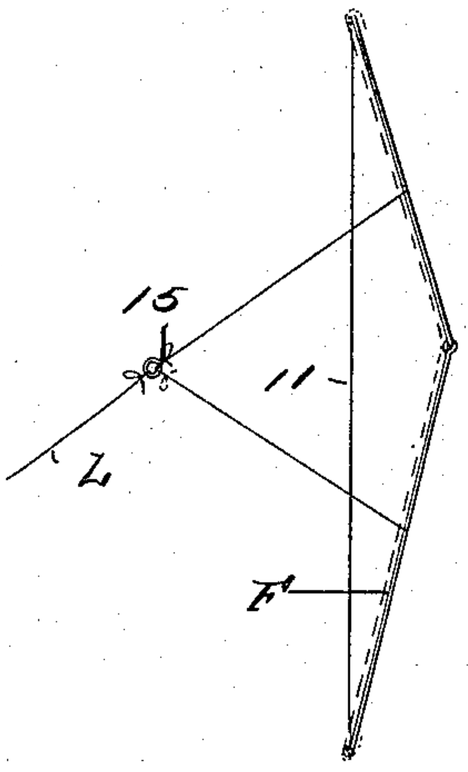


FIG. 13.

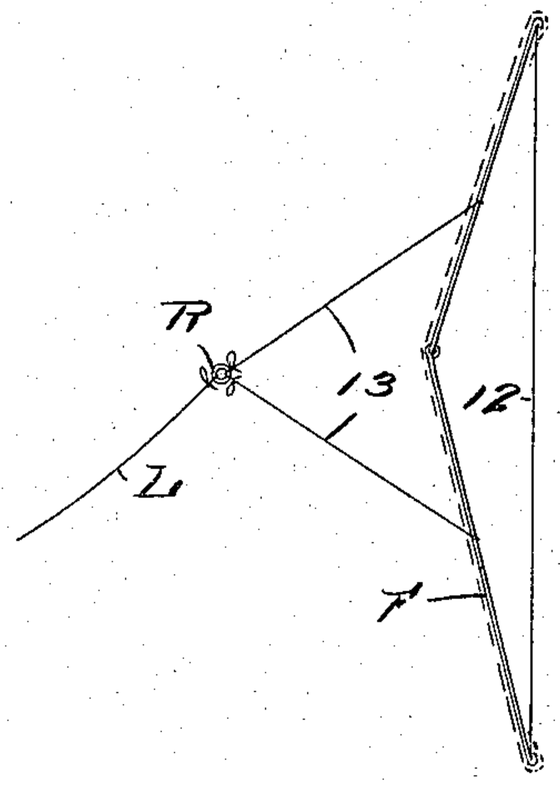


FIG. 14.

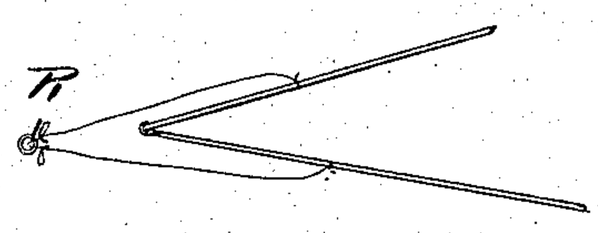


FIG. 9.

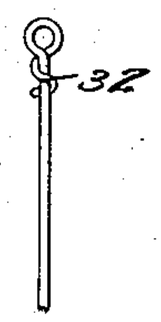


FIG. 10.

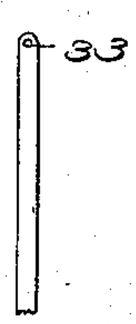


FIG. 11.

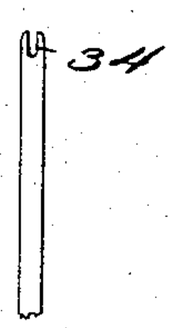


FIG. 15.

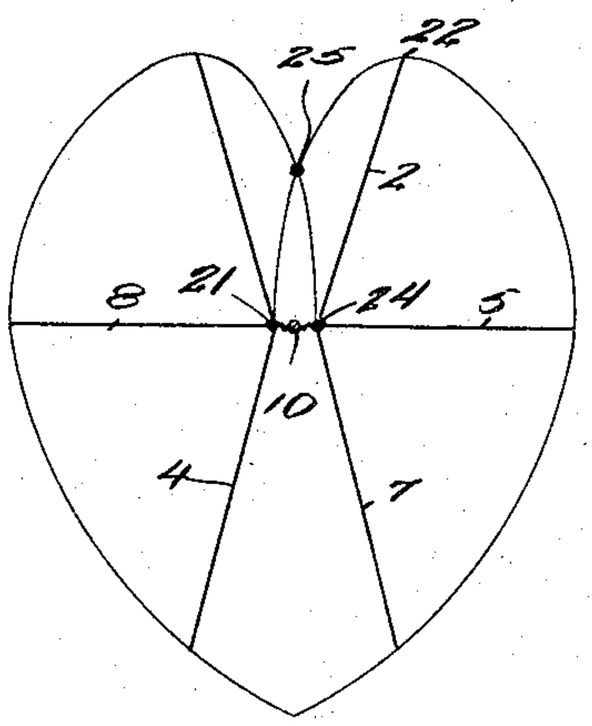
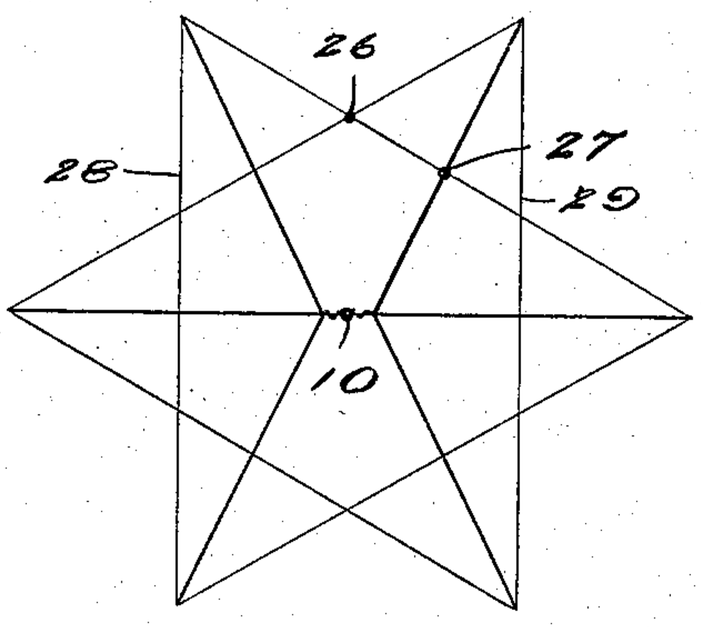


FIG. 16.



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KITE.

1,166,750. Specification of Letters Patent. Patented Jan. 4, 1916.

Application filed April 9, 1915. Serial No. 20,300.

To all whom it may concern:

Be it known that I, MARCUS P. EXLINE, a citizen of the United States, residing at Dallas, in the county of Dallas and State of Texas, have invented certain new and useful Improvements in Kites; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to aeronautics, and more especially to kites; and the objects of the same are to produce a light metal frame structure whose members may be adjusted with relation to each other and in some cases detachable so that the entire frame is of the knock-down type, to produce a kite whose upper and lower portions are hingedly connected so that the face of the kite may be stretched in a single plane as usual or dished or humped if desired, and to provide a peripheral element which may possess design features or outlined panels that could be covered or faced in different colors. These and other objects are carried out by constructing the kite as set forth in the following specification and claims.

I will say at the outset that in this description I have divided the kite as a whole into the following component parts or elements which are taken up separately as far as possible, viz: the "skeleton" or framework, which is itself made up of three members connected at their point of intersection by a peculiar form of joint; the guys connecting the several members with the line, and in some cases the trusses connecting the outer extremities of said members; the "frame" which in some cases is an ordinary cord extending around the periphery of the skeleton structure, and which in other cases may itself possess design features; the covering or "face" of the kite which is stretched over and attached to the skeleton and frame; and the tail where one is necessary. All these elements are collectively and individually illustrated in the accompanying drawings wherein—

Figure 1 is a general perspective view of this kite in the air, showing its face as shaded to represent red, white and blue, and showing the kite as possessing a tail. Fig. 2 is an elevation of the wire skeleton, peripheral cord, and tail support. Fig. 3 is a plan view of the three members of the skeleton separated from each other. Figs. 4, 5 and 6 are details of the joint on a much larger scale, Fig. 4 showing the three members entirely disconnected, Fig. 5 showing them connected, and Fig. 6 showing two of them connected and illustrating the space in which the third joint member would lie. Figs. 7 to 11 are details of the various forms of connection between the frame and the skeleton. Figs. 12, 13 and 14 are diagrammatic edge views, the first showing the kite as dished, the second showing it as humped, and the third showing the skeleton as being folded. Figs. 15 and 16 are plan views of the skeleton and design frames in heavy and light lines respectively, Fig. 15 showing a heart-shaped design, and Fig. 16 a star.

The face F of this kite which is shown in Fig. 1 and in dotted lines in Figs. 12 and 13, may be briefly disposed of as being sheet material such as paper or light fabric stretched over the skeleton and frame and secured around the latter at the edges of the sheet and possibly also secured at intermediate points to the skeleton bars. When this kite structure possesses design features, the face will of course conform to the periphery of such design, and the latter is susceptible of wide variation as will be explained below. The face might be made in differently colored panels for some designs, and a variety of panels could well be selected from the various geometrical figures which appear in Fig. 16. The tail T shown in Figs. 1 and 2 is carried by the skeleton, being preferably attached to it by a cord support as indicated at S. The line L will be connected with the several guys by any suitable means such as the ring R indicated in Figs. 12, 13 and 14, and by preference the guys will be separately tied to said ring so that their length may be adjusted when desired. No novelty is claimed for the parts thus far described.

The skeleton of this improved kite is made up of three members which are perhaps best seen in Fig. 3, and each is of light but rather stiff wire bent into two radial stretches and an interposed stretch which forms part of the joint yet to be described. The six radial stretches thus produced extend outward from what might be called the

common center of the kite to its corners, which latter are herein shown as the angles of a coffin-shaped structure, although I have adopted that shape as being the contour given the well-known kite of our boyhood and I do not wish to be limited to such shape. The radial stretches of the uppermost member we may call arms 1 and 2, converging downwardly and connected integrally at their lower ends by a straight interposed stretch 3. One of the other members forms the left leg 4, the right strut 5, and an interposed open coil 6; and the remaining member forms the right leg 7, the left strut 8, and an interposed open coil 9. The parts 3, 6 and 9 are entirely disconnected in Fig. 4 and are connected with each other in Fig. 5, whereas Fig. 6 shows them in the act of being connected. This is accomplished by running one coil onto the straight stretch 3, after which the coil of the other member can also be run onto such stretch and its convolutions will travel through the spaces between the coils of the member already in place. If the face of the kite is to be plane, or if it is to be deflected slightly from a plane and held rigidly in such position, solder may be applied to the inter-engaged stretches 3, 6 and 9 as indicated at 10 in Figs. 15 and 16. Other clamping or fastening means may be provided in place of solder, and in fact the coils may be crimped so closely on the straight stretch 3 that—with the assistance of the guys and trusses described below—said clamping means might be dispensed with. The length of the various stretches is of course dependent on the size of the skeleton desired, and the gage of the wire employed is immaterial although by preference I would make the skeleton of heavier wire than the frame element if the latter be of wire. If it be desired that the skeleton shall be adjustable or foldable, the clamping means will be entirely omitted.

In Fig. 12 the face of the kite is indicated as dished, and in Fig. 13 as humped. The former condition is brought about by bending the upper part of the skeleton forward at its joint with respect to its lower part, and connecting the upper ends of the arms 1 and 2 with the lower ends of the legs 7 and 4 by trusses 11 as of light wire or cord.

Fig. 13 shows trusses 12 which may connect the same points but stand behind the skeleton. The guys 13 run from points on the various radial stretches to the ring or other element R which connects them with the line L; and in order to have the general plane of the kite adjustable to the length of the line, these guys will be adjustably connected with said ring in any suitable manner, as by tying them thereto by bow-knots 15. The tail support cords S will probably lead from the lower extremities of the legs 7 and 4 to the tail as usual, but it is quite possible that the dishing or humping of the kite frame may dispense with the necessity for a tail and in any event I lay no claim to this detail.

The frame of this improved kite may be of cord or wire, and if the latter it may be of lighter gage than the wires of the skeleton. Ordinarily this frame would follow the periphery of the coffin-shaped outline as indicated at 20 in Fig. 2, and if so it is drawn tightly around the outer ends of the various radial arms of the skeleton; but it is quite possible to give it design shapes as indicated in Figs. 15 and 16. In the former case a heart is shown, and the frame is of wire beginning at the point 21 within the joint, carried upward and thence over the outer end of the arm 2 at the point 22, thence down around the outer ends of the right strut 5 and right leg 7 to a point 23, and thence upward around the left side of the skeleton and back to the point 24. At said points 21 and 24 this frame, which will preferably be of wire, may be soldered or otherwise connected with the skeleton; and solder or other forms of connection may also be used at the single point of crossing 25 or at any other points where the design frame wires cross each other, as seen at 26 in Fig. 16, or where the frame wires cross the skeleton as shown at 27. In the last-named view, the star-shaped design is made up of two triangles of wire, 28 and 29, and a detailed description thereof will not be necessary. As the periphery of the design in this case in no place projects beyond the outline of the skeleton, the members 28 and 29 may be of cord. These illustrations will be sufficient to show that the frame may provide design characteristics which of course are susceptible of wide variation. It is quite possible that such a frame could be applied to a skeleton which itself was deflected out of a single plane, as shown in Figs. 12 and 13. But whether the frame be a plain peripheral member 20 or has its own design or configuration as elsewhere shown, in practically all cases its stretches need connection with the outer ends of the radial members of the skeleton, and in Figs. 7 to 11 I have shown various forms of such connection. In Fig. 7 the outer end of a radial member is bent into an ordinary eye 30, in Fig. 8 this eye is repeated or coiled as at 31, in Fig. 9 the end of the eye is twisted around the shank of the radial member as at 32, in Fig. 10 the radial member is formed with a hole 33, and in Fig. 11 it is formed with a notch 34. This notch will not ordinarily be employed except where the frame elements are tightly stretched, as for instance in Figs. 2 and 16. With any of these forms of connection, it is possible to add a drop of solder when both the frame and the skeleton are of wire, for

the obvious purposes of giving strength and preventing the slipping of one member through the other.

It will not be necessary for the purposes of this specification to describe the manner in which this kite is made, either by constructing and assembling its elements, or by applying the face F and attaching and adjusting the guys and trusses. But special attention is directed to the fact that the three members of the skeleton are entirely separate as shown in Fig. 3 and may be run together as shown in Figs. 4, 5 and 6. Thus it is possible to manufacture and sell this kite in a knocked-down condition, accompanying it with illustrations and directions for assembling its parts. The package could contain various coverings and the guys and trusses, or these could be supplied by the purchaser, and the same is true of the line L. The manufacturer might even carry the invention to the extent of providing or suggesting such types of frames as would permit the skeleton to be folded as seen in Fig. 14, so that the user could pack it away or take it out of its package at will.

What I claim is:

1. The herein-described coffin-shaped kite-skeleton comprising three wire members whereof the first consists of two upstanding arms and an interposed stretch and each of the others consists of a lateral strut, and a depending leg, and means for connecting the inner portion of both struts with said stretch, for the purpose set forth.

2. The herein-described kite comprising a frame and a skeleton, the latter made up of a plurality of members whereof each includes two radial stretches united by an interposed stretch, the interposed stretches being coiled into and around each other at approximately the center of the kite.

3. The herein-described kite comprising a frame and a skeleton, the latter made up of a plurality of members whereof each includes two radial stretches standing at an angle to each other and integrally connected by an interposed stretch, all of said interposed stretches crossing each other and standing approximately at the center of the kite, and a joint for connecting them.

4. The herein-described kite comprising a frame and a skeleton, the latter made up of a plurality of members whereof each includes two radial stretches standing at an angle to each other and integrally connected by an interposed stretch, all of said interposed stretches standing approximately at the center of the kite and one of them being straight while the others are formed into open coils adapted to be twisted into each other and around said straight stretch, substantially as set forth.

5. The herein-described kite comprising a face, and a skeleton supporting the face and composed of three wire members whereof each comprises two radial stretches and an interposed stretch integrally connecting their inner ends, said interposed stretch of one member being straight and those of the other members being formed into open coils adapted to be twisted into each other and around said straight stretch, substantially as set forth.

6. The herein-described coffin-shaped kite-skeleton comprising three wire members whereof the first consists of two upstanding arms and an interposed straight stretch and each of the others consists of a lateral strut, a depending leg, and an interposed open coil, for the purpose set forth.

7. The herein-described coffin-shaped kite-skeleton comprising three wire members whereof the first consists of two upstanding divergent arms and a straight integral stretch connecting their inner ends, and each of the others consists of a lateral strut, a depending leg standing at an obtuse angle to the strut, and an open coil integrally connecting their inner ends, for the purpose set forth.

8. The herein-described coffin-shaped kite-skeleton comprising a plurality of members whereof each includes two radial arms integrally connected by an interposed stretch and certain of said stretches are coiled into and around each other at approximately the center of the kite, and means for clamping said stretches rigidly together.

In testimony whereof I affix my signature in presence of two witnesses.

MARCUS P. EXLINE.

Witnesses:
E. C. Blesi,
L. L. Montgomery.