Sept. 6, 1949. M. A. MOON 2,480,948

PARA-KITE ATTACHMENT

Filed July 23, 1948 3 Sheets-Sheet 1

Fig. 1

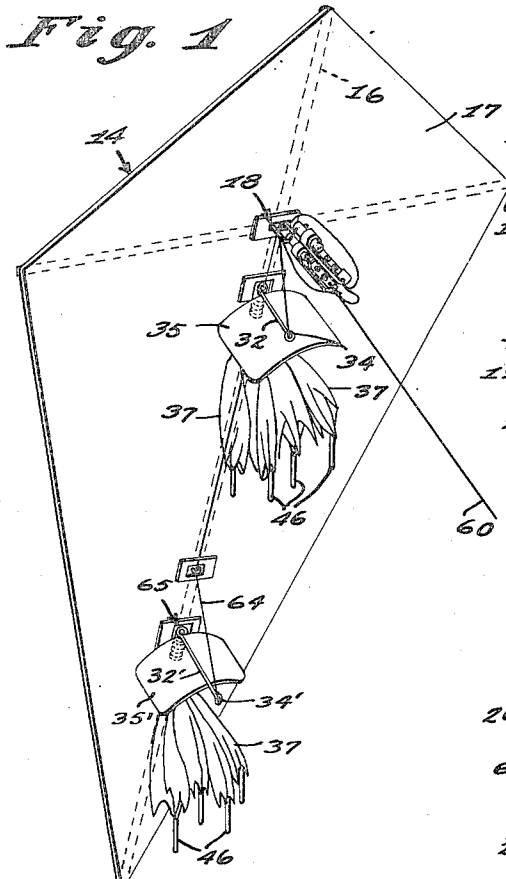


Fig. 2

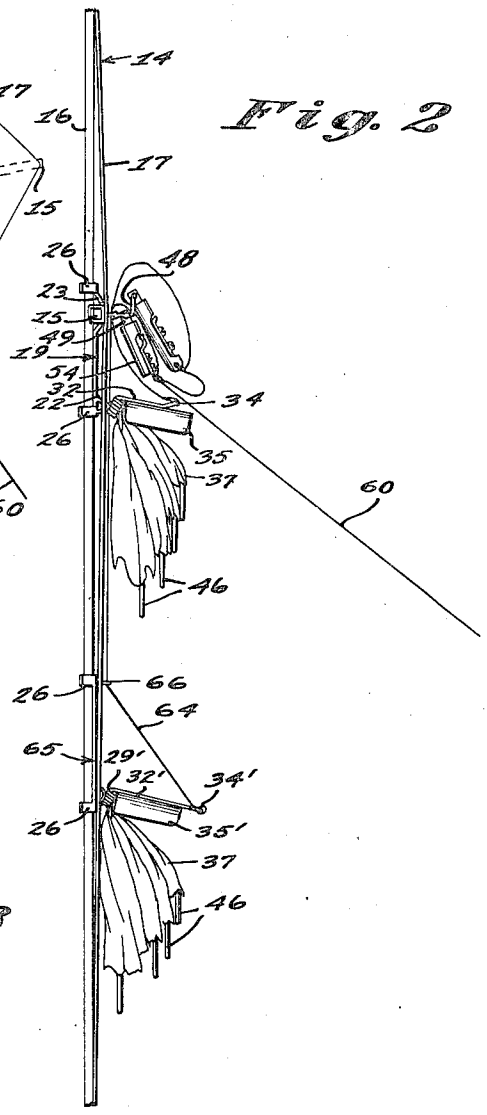
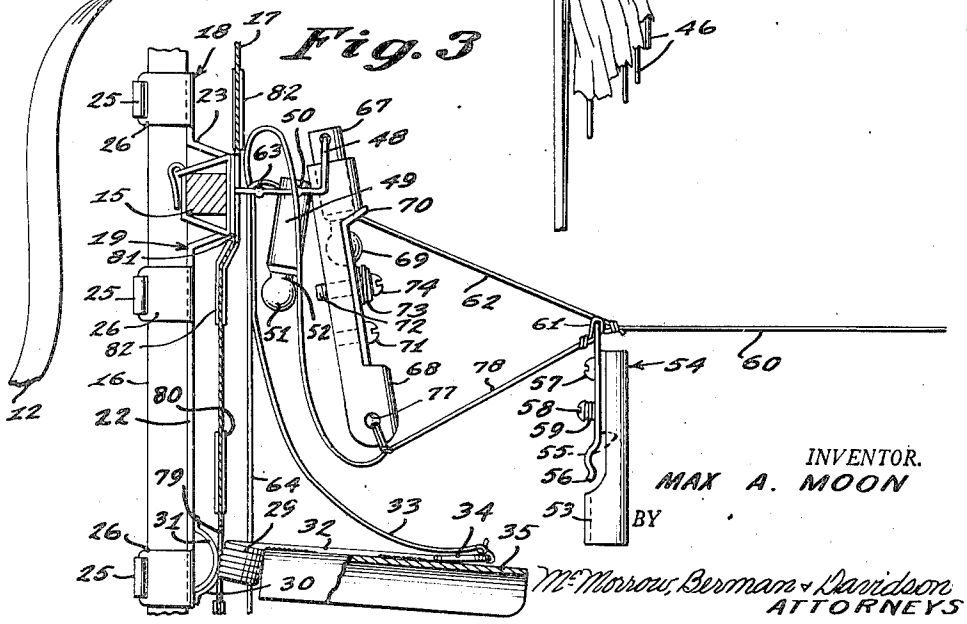


Fig. 3



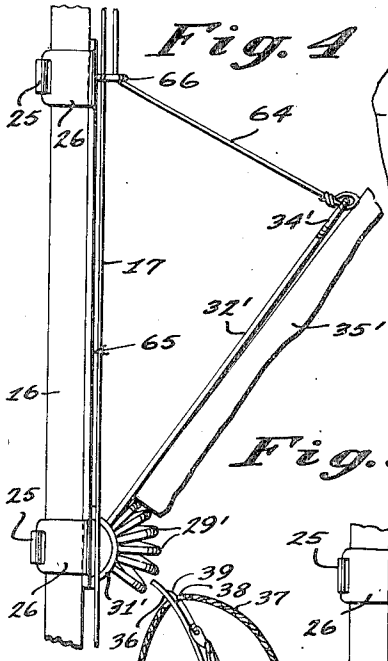
INVENTOR.
MAX A. MOON
BY

McMorrow, Berman & Davidson
ATTORNEYS

Sept. 6, 1949. M. A. MOON 2,480,948

PARA-KITE ATTACHMENT

Filed July 23, 1948 3 Sheets-Sheet 2



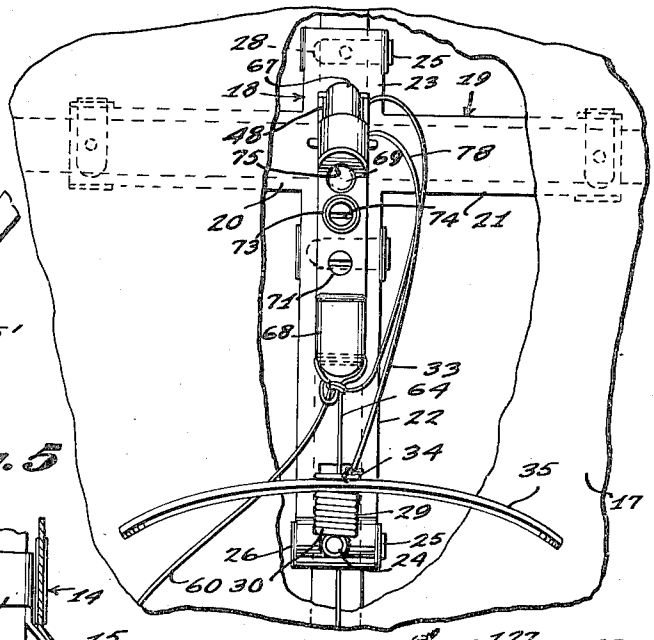
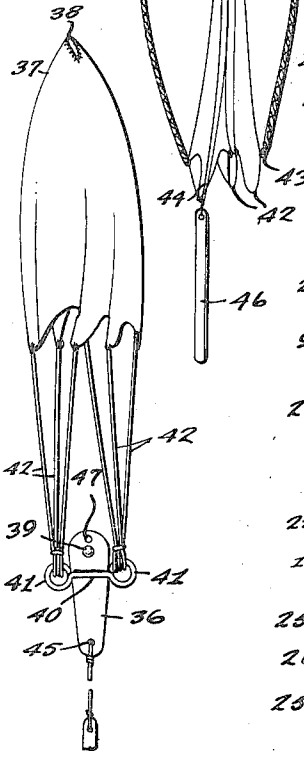


Fig. 5



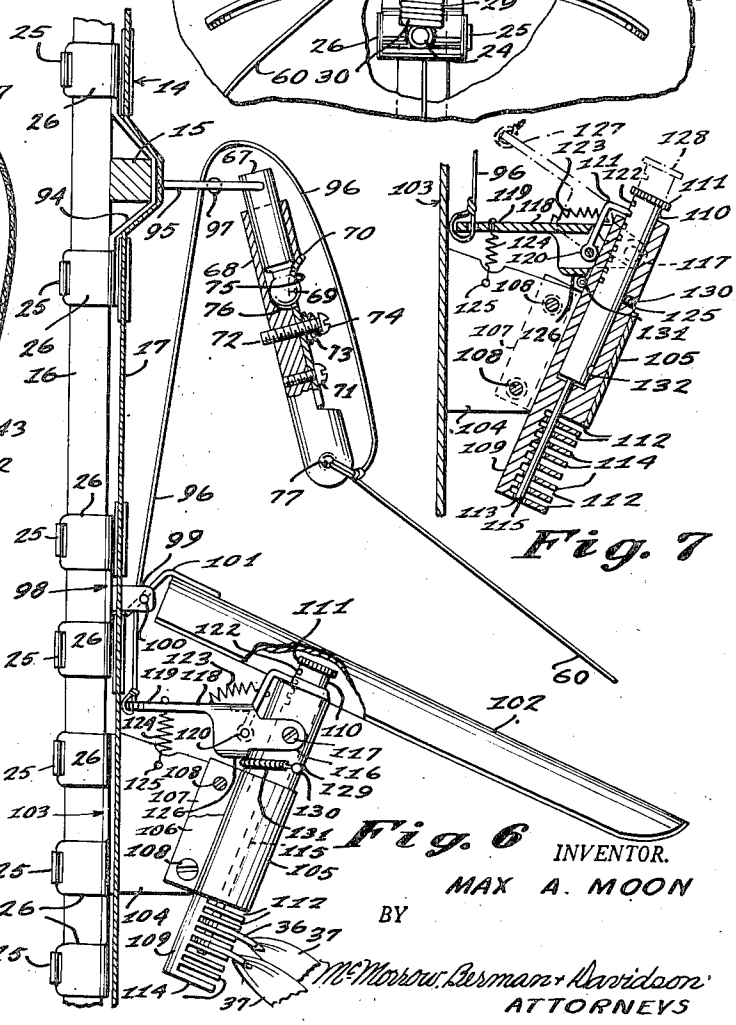


Fig. 7

Fig. 6

INVENTOR.
MAX A. MOON
BY
McMorrow, Berman & Davidson
ATTORNEYS

Sept. 6, 1949. M. A. MOON 2,480,948

PARA-KITE ATTACHMENT

Filed July 23, 1948 3 Sheets-Sheet 3

Fig. 8

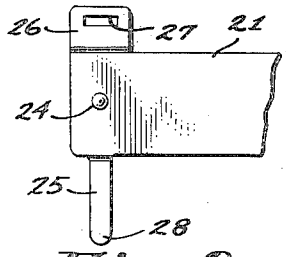


Fig. 9

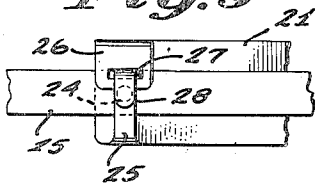


Fig. 10 Fig. 11

Fig. 12

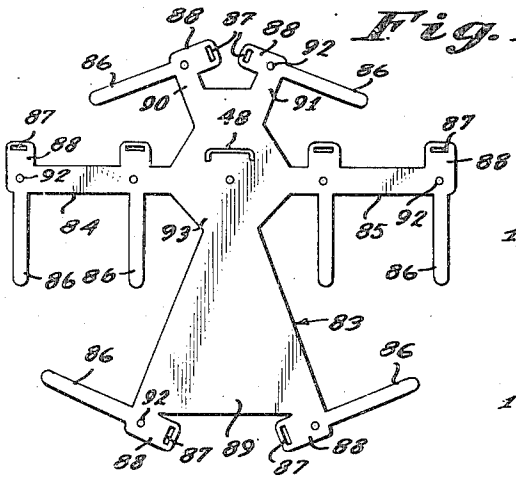
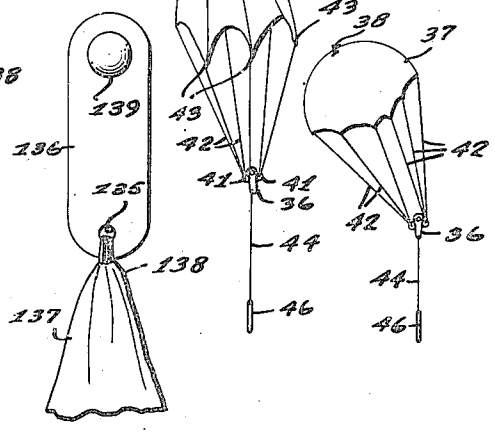


Fig. 14

Fig. 13



INVENTOR.
MAX A. MOON

BY

McMorrow, Berman & Davidson
ATTORNEYS

Patented Sept. 6, 1949

2,480,948

UNITED STATES PATENT OFFICE

2,480,948

PARA-KITE ATTACHMENT

Max A. Moon, Salem, Oreg.

Application July 23, 1948, Serial No. 40,381

9 Claims. (Cl. 244—155)

1

This invention relates to what I term a para-kite attachment, or a parachute attachment for kites, and particularly to a special equipment applied to a conventional kite adapted to have one or more releasable parachutes suspended thereon in flight.

The main object of my invention is to provide a kite of known type with a suitable attachment of the indicated character for releasably carrying at least one parachute suspended thereon in effective position to be released therefrom at will.

Another object is to have such an attachment for a kite serving to retain a group of parachutes captive to the kite in flight and including a normally locked release member capable upon operation thereof of releasing the parachutes while allowing the kite to remain aloft.

An important over-all object is to stimulate and increase interest in flying kites and the like by converting a kite into an educational toy and thereby improve the mechanical faculties of juvenile minds, and also promote better health through physical exercise in the open air by encouraging recovery of the parachutes descending from the kite thus equipped.

A further object is to have a parachute-carrying attachment for a kite capable of releasing more than one group of parachutes from the latter from which they are suspended.

It is also an object to provide such an attachment which may be quickly applied to a kite by manipulating a few fasteners to secure them to the framework of the kite.

An object of the invention is to provide a light, yet rugged attachment which may be readily applied to a manufactured or homemade kite enabling the kite to carry a maximum amount of entertainment articles, such as parachutes, pictures, celebration torpedoes, containers capable of releasing detonating caps, paper flowers or flags, etc.

An ancillary object is to have a parachute-carrying frame adapted for attachment to a kite with a releasing device thereon controlled by the cord or line running up to the kite.

It is even an object to provide a parachute-carrying attachment for kites as already outlined which may have any one of two or more releasing devices included in its construction for liberating the parachutes from the kite.

2

Other objects and advantages of my invention will appear in further detail as the specification proceeds.

In order to facilitate ready comprehension of the invention for a proper appreciation of salient features thereof, the invention is illustrated on the accompanying drawings forming part hereof, and in which:

Figure 1 is a perspective view of a typical diamond-shaped kite in flight and provided with parachute-carrying and releasing devices of the invention shown supporting groups of parachutes ready to be released therefrom;

Figure 2 is a side elevation of the same kite and parachute carrying devices as seen from the left in Figure 1;

Figure 3 is an enlarged fragmentary section of the kite with the releasing mechanism about to operate a parachute-carrying attachment associated therewith for releasing parachutes from the kite;

Figure 4 is an enlarged detail of a releasing mechanism showing the lever operated to release a parachute;

Figure 5 is a fragmentary front elevation illustrating latch mechanism controlling a parachute releasing mechanism;

Figure 6 is an enlarged section of the kite showing a single latch mechanism connected to and controlling a modified form of releasing mechanism, certain portions thereof being shown in side elevation;

Figure 7 is a vertical section of the releasing mechanism of Figure 6;

Figure 8 is an enlarged detail showing a fastener of the parachute-carrying device;

Figure 9 is another view of the same fastener detail when in place upon one of the ribs of the framework of a kite;

Figure 10 is an enlarged fragmentary section of the upper portion of a parachute showing the means by which it may be connected to the releasing mechanism of the knite attachment, certain portions thereof being shown in side elevation;

Figure 11 is a similar fragmentary section taken at substantially ninety degrees from that of Figure 10;

Figure 12 is a side elevation of a kite equipped with a simplified form:

Figure 13 is an enlarged elevation of a suspension link for a parachute adapted to cooperate with the releasing mechanism or device of Figures 9 and 10;

Figure 14 is a blank of sheet metal for the frame of the parachute-carrying device, being a modification of the frame shown in Figures 1 and 2, and suitable for a six-pointed or three-ribbed kite.

Throughout the views, the same reference numerals indicate the same or like parts.

Among outdoor pastimes for children, and even adults, kite flying occupies an important place. While this pastime is more or less seasonal, yet it is always possible to resort to it in clear weather when it is not too windy, but otherwise suitable for outdoor play.

In order to increase the interest and joy in flying kites and the like, I propose to add an attachment to a kite which will make it possible to carry aloft groups of miniature parachutes which may be dropped from the kite by merely giving a sudden pull or jerk upon the string connected to the kite, the intention being that physical exercise will be had by the children chasing and recovering the parachutes without considering this exercise as such, but rather as play.

Hence, in the practice of my invention, and referring again to the accompanying drawings, a typical diamond-shaped kite, generally indicated at 14, includes the conventional cross-ribs or sticks 15, 16 and provided with a cover 17 of paper or the like, the cross-sticks 16 and 15 having applied thereto a device embodying the present invention and generally indicated at 18. The parachute-carrying device 18 primarily consists of a cruciform metal plate 19 having two horizontal arms 20, 21 at the central junction of which a downwardly-projecting member 22 and a relatively short member 23 projecting upwardly from the mentioned central junction. At the end of each of the arms or projections just described is fixed a pin 24 by soldering, brazing or the like, adapted to be pressed into the wood of cross-stick 15. At the side of each end is also a strap 25 and projecting from the opposite side of the same end of the arm 20, for example, is an integral locking lug 26 having a slot 27, this construction facilitating the attachment of the arm to one of the cross-sticks 15 by having the strap bent upwardly about the stick and the corresponding locking lug 26 bent downwardly over the same stick 15, while extremity 28 of strap 25 extends through slot 27 and lug 26, and is bent downward upon the latter in locking position to form with this lug a fastener about the stick. This construction is used at the extremities of the arms 20, 21, 22 and upward projection 23 so that the entire cross-shaped sheet metal member 19 is thus firmly fixed on the framework of the kite 14. Naturally, the sheet metal used for member 19 is very thin and light, consistent with sufficient strength to serve the purpose of the present invention. In view of the fact that metal member 19 is secured to the cross-sticks 15 and 16 forming the main framework of the kite, they may also be considered as being reinforced by this metal member to a certain degree. On the other hand, the cross-shaped member 19 is attached to the kite for a dual purpose, first, in order to provide suspension means for the parachutes or other articles to be carried aloft by the kite, and dropped therefrom, and second, to support a latched releasing

member, the operation of which controls the supporting means to which the parachutes may be connected.

The kite may have a tail 12 attached to the lower end thereof to improve control thereof.

At the lower portion of the downwardly-extending member 22 of metal member 19 is soldered, brazed or welded a coil spring 29 at its inner end 30, while immediately above it is a small arcuate plate 31 secured at both ends to the mentioned extension 22. Upon the outer end of coil spring 29 is an integral arm 32 to which is attached an operating line 33 being secured to the eye 34 on arm 32, while along the length the latter is secured an arcuate metal windshield 35 serving to prevent the wind from tangling the parachute, to be described.

The spring 29 serves as a releasable retaining means for a plurality of suspension tongues 36 projecting upwardly from parachutes 37 through apertures 38 therein, the individual suspension tongues being brought in between the individual convolutions or turns of the spring 29. As particularly shown in Figures 10 and 11, the apex of each parachute 37 has a suspension tongue 36, preferably of metal, projecting upwardly therefrom through an aperture 38, and is provided near the upper end on one side with a retaining knob 39 which tends to be sufficiently obstructed by the coils of spring 30 to retain the suspension tongue in place when the spring is undisturbed. However, if by any means, the operating cord 34 is drawn upwardly so as to raise arm 32, the coils of spring 30 will be opened by the rear portion of the spring engaging against the arcuate plate 31, this virtually bending the spring open to release the suspension tongues 36 inasmuch as the coils of the spring then spread open sufficiently to allow the friction knobs 39 to escape from between the adjacent pairs of coils.

Within each parachute each suspension tongue 36 has a transverse wire 40 brazed, soldered or welded thereto, this wire terminating at both ends in a pair of loops or eyes 41, 41, the upper portion of the suspension tongue projecting freely upwardly from these eyes through aperture 38 without being in any way actually attached to the parachute at that point. When the tongue 36 is suspended in the upper position, the parachute rests on eyes 41. In order to provide a ballast for the parachute, the mentioned eyes on suspension tongue 36 have two groups of converging cords 42, 42 connected thereto, these cords at their other ends being connected at a plurality of points 43 about the edges of the shrouds of each parachute, and at the lower ends of tongue 36, a cord 44 connected to hole 45 carries a ballast 46, the arrangement being such that when a parachute is released from spring 29 by the latter being opened upon upward movement of spring arm 32 and its metal shield 35, tongue 36 with its eyes 41, cords 42, cord 44 and weight 46 will drop through the shrouds of the parachute, the tongue 36 leaving the aperture 38, when the ballast and tongue will quickly drop into the lowest attainable position with respect to the parachute, as particularly shown in Figures 4, 11 and 12, thus automatically straightening the lines 42 and 33, causing the parachute suddenly to open by encountering the resistance with the air when dropping downwardly through the same. In passing, it may be noted that the upper end of each suspension tongue 36 is provided with an alternative suspension means in

the form of a retaining aperture 47 adapting the tongue for engagement with a modified form of releasing device, yet to be described.

Referring now to the upper portion of metal attachment 19, as best seen in Figures 1, 2, 3, and 5, a forwardly-projecting and upwardly-bent yoke 48, upon the intermediate cross bar 50 of which a latch member 49 is pivotally suspended, projects a sufficient distance forwardly from member 18 to provide clearance for a swinging movement of said latch member. This latch member is preferably cylindrical throughout its upper portion, as best seen in Figure 3, and terminates at the lower end in a head 51 with a reduced portion or neck 52 connecting the head to the cylindrical portion above. Normally, the latch member is surrounded by the upper tubular portion 53 of a pendent latch 54 having a stop 55 abutting the head 51 of the latch member, while an upwardly projecting latch spring 56 secured to the latch 54 by means of a screw 57 releasably engages the head 51 on the latch member. The tension of the spring is capable of being nicely controlled by means of an adjusting screw 58 beneath the head of which is located a coil spring 59 engaging against spring 56. The purpose of the adjustable tensioning spring 59 is to adjust the tension of latch spring 56 sufficiently so that normal handling of the kite will not cause latch 54 to be released from latch member 49. To the lower projecting end of latch spring 56 is secured the control line 60 of the kite by the line being looped through an aperture in the lower end, while from the knot 61 of the line thus secured an upwardly-extending continuation 62 of the cord is threaded through the yoke 48 rearwardly of a rear crossbar 63 and continues downwardly to form the control line 64 connected to the outer end or eye 34' of a second spring arm 32', not to be described.

Spaced a distance down along the upright kite frame stick 16 is a second release device, generally indicated at 65, secured to this stick by straps 25 and lugs 26 and carrying a spring 29' for releasably engaging with the suspension tongues 36 of a lower group of parachutes 37, 37. The spring arm 32' also has a metal windshield 35' to prevent the wind from tangling the lines of the parachutes and otherwise snarling the latter when they are to be released. The arrangement is such that when the kite is in flight and controlled by line 60, the latch spring 56 is sufficiently strong to prevent the head 51 from escaping from the grip of this spring on the head by the ordinary pull of line 60 on the lower end of latch 54, but if a sudden jerk is transmitted up through kite line 60, the latch 54 will be abruptly drawn downward with spring 56 passing over head 51 in a downward direction and the tubular portion 53 of the latch will then slide down from about latch member 50 so that the latch body 54 is then suspended upon line 60, as best shown in Figure 3, which obviously will then pull on line 62 and its descending portion 64 which is connected to lower spring arm 32' through a loop 66 upon the upper end of fixture 65, converting the downward pull of cord 62 into an upward pull on cord 64 inasmuch as the upper or intermediate portion 62 of cord 60 is threaded within crossbar 63 of yoke 48 so as to remain slidably connected thereto. The upward pull on cord 64 naturally raises arm 32' and opens the coils or loops of springs 29' and thereby releases the suspension tongues 36 of parachutes 37, 37 therefrom, the presence of arcuate plate 31' facilitating the opening of the spring coils to cause such release of the parachutes.

It is to be noted that whether or not the latch 54 is engaged with the latch member 49, the tension of control line 60 is primarily transmitted to the yoke 48 projecting rigidly from the attachment 18 so that the position of the yoke largely determines the point from which the kite is controlled in flight. When the latch 54 has been released, the control line 60 is almost in line with cord 62 threaded through the yoke 48, and as the latter is connected with cord 64 and this in turn to arm 32' of spring 29', the tension is thus directly transmitted through cord 62 to the yoke.

Returning now to the upper coil spring 29 on upper attachment 18, and its operating arm 32 with shield 35, the operating cord 33, already mentioned, which is threaded up within crossbar 63 on yoke 48 is connected to the eye 34 of arm 32. To the outer upper end of the yoke 48 is connected a second latch member 67 which is swingably mounted and normally projecting into a corresponding partly tubular latch 68, with the downwardly directed head 69 of member 67 engaged by a latch spring 70 retained in place by a screw 71 and having the tension thereof regulated by adjusting screw 72 provided with a compression spring 73 beneath the screw head 74 and exerting resilient pressure against spring 70. The details of the second latch member 67 and latch 68 are substantially the same as in Figures 5 and 6, which latter view otherwise shows a modification by having but one latch with one latch member and a single modified parachute releasing mechanism, and hence both views may be referred to as also illustrating the features of the second latch, latch member and latch spring.

Thus, the latch spring 70 has an aperture 75 with which latch head 69 engages when the latter abuts a stop 76 upon the latch body 68, the lower end of this latch body having an aperture 77 to which a cord may be attached. Returning then to Figures 3 and 5, the operating cord 33 from the eye 34 of spring arm 32 is threaded up through yoke 48 within the crossbar 63 thereof with previously mentioned cord 64, and from thence drops down toward the lower end of latch body 68 to be connected therewith through aperture 77. Beyond the latter, the control cord 78 connects this aperture with the junction 61 of cords 60 and 62 with the first mentioned latch body 54. Control cord 78 is not drawing tightly by kite line 60 until lines 62 and 64 have been drawn taut by a sudden pull on line 60 to release latch body 54 from latch member 49, operating lower spring arm 32' and thereby causing spring 29' of lower fixture 65 to release the lower groups of parachute 37.

In connection with the kite thus far described, the apparatus serves to carry aloft two groups of parachutes or the like which may be released either at intervals or almost simultaneously, but it is intended normally to arrange to have the second set of parachutes suspended from the kite above the first set and released after the first or lower group has been released.

In other words, a jerk on control or kite line 60 will effect the release of latch body 54 from latch member 49, and by careful manipulation of line 60, the line 33 still being slack, the lower group of parachutes 37 may be released first and the other upper group only subsequently when line 60 is again jerked to release the second latch body 68 from latch member 67, the release

of the parachutes will resemble the descent to a group of paratroopers from an airplane, or even two separate groups jumping at two different intervals from the plane.

As best shown in Figure 3, the arcuate backing plate 31 of spring 29, as well as the latter spring, both project through an aperture 79 in the cover 17 of the kite, and in order to prevent the paper or other material of which the cover is made from tearing due to the presence of the aperture, adhesive strips such as Scotch tape or the like 80 may be applied around the edges of this aperture. In similar fashion the upper yoke 48 projects through an aperture 81 in the cover 17, while also in this case adhesive strips of material such as Scotch tape or the like at 82 are applied around the aperture in order to prevent tearing of the paper cover.

Before proceeding to consider modifications of the parachute-releasing mechanism described, it is obvious that it may be applied to other types of kites than as shown in Figures 1, 2, 3 and 5, which show merely two cross-sticks 15 and 16, for star-shaped or hexagonal kites may also be used for this purpose, but in such case the metal member 19 is replaced by another sheet metal frame or body, generally indicated at 83, in Figure 14, the two sides arm 84, 85 being readily attached by straps 86, 86, etc., being passed through the apertures 87, 87 of lugs 88, 88, etc., while the lower broad section at 89 may be attached to the lower diverging portions of two crossed inclined kite sticks by the lower straps 86, 86 being passed through apertures or slots 87 in lugs 88, while upon the upper portions of the same sticks the upper projections 90 and 91 are similarly secured to the sticks by the upper straps 86 being similarly assembled with lugs 88. In each case a pin 92 is attached in a position between each outer strap and lug for insertion into the wood of the stick beneath. In this case, the yoke 48 with its suspended latch member 49 is secured directly to the intermediate section 93 of sheet metal member 83 by brazing, soldering or welding or in any other manner well known in the art, inasmuch as member 83 merely serves in the same fashion as does member 19 to form an anchorage for the mentioned yoke member at its intermediate portion, while the wide lower end 89 serves to carry the spring 29 and the arcuate spring back plate 31, these latter members being omitted from Figure 14 in order to clarify the view.

It has been stated that not only diamond-shaped kites may be used for the present purpose, but also hexagonal and other kites not specifically referred to, but it is also possible to somewhat modify the releasing means so that other devices and release mechanisms may be used upon the kite to retain the parachutes in association therewith, and also to release the same at will. A modification of the releasing means is shown in Figures 6 and 7, while the latch means in this case, best shown in Figure 6, corresponds in every detail with the second latch member 67 and second latch body 68 and associated parts shown and described in connection with Figures 1, 2, 3, and 5. In the present form, however, the latch member and latch body are the only latching means, the metal plate 94 resembling plate 19 and having a yoke 95 on which latch member 67 is swingably mounted, a kite cord 60 being connected directly to the lower end aperture 77 of latch body 68. From the latter, a release cord 96 is brought up to the yoke 95 and threaded down within a cross-bar 97 and directed downwards to the releasing means, now to be described. At this point it should be mentioned that while only one latching couple is mounted on the kite 14, which is substantially the same as shown in the first views, in this case also the releasing mechanism serves to hold or release only one group of parachutes, a few at a time.

Upon vertical kite stick 16 is fixed a plate 98 by the straps 25 and slotted lugs 26 and having a pair of forwardly projecting lugs 99 in which are pivotally mounted the pivot members 100 of a downwardly directed supporting lug 101 fixed upon and supporting an upwardly swingable windshield 102. Below the mentioned plate 98 is secured a further plate 103 as in the case of plates 19, 94 and 98, by means of straps 25 and slotted lugs 26, and to this plate is soldered, brazed or rivetted a forwardly projecting mounting bracket plate 104. To the latter is secured a clamping plate 105 by means of a pair of opposite clamping strips 106 holding the inwardly directed flanges or ends 107 of plate 105 upon both sides of bracket plate 104 by screws 108, 108. Clamped in a rearwardly inclined position within the cylindrical portion of plate 105 is a socket member 109 having a plunger 110 slidably projecting with its upper flanged end 111 from the top thereof. The lower portion of socket member is transversely slotted from the front at 112, 112, and is also axially drilled from the bottom at 113 through the resulting forwardly projecting ledges 114, 114 to receive a downwardly extending locking rod 115 projecting rigidly from the lower end of plunger 110. Upon the upper sides of the plunger are pivotally mounted a pair of opposite lugs 116 (one shown) by means of pins or screws 117, the lugs forming the fulcrum portions of a lever 118 having a rearward arm 119 to the end of which the release cord 96 is connected.

Rearwardly of lugs 116, the pivot pin 120 supports a rockable feeding pawl 121 adapted to engage between any two of a row of teeth 122 upon the upper rear portion of plunger 110, a spring 123 biasing the pawl against said teeth, while a tension spring 124 connected at one end to arm 119 of lever 118 and at the other end to an aperture 125 in bracket plate 104 normally holds the lever arm down with the lower stop portion 126 engaging against the plunger.

Assuming that the kite is in flight, and that the latch assembly and releasing mechanism are disposed substantially, as shown in Figure 6, the pin 115 extends down through slots 112 and ledges 114 and also through apertures 47 of any and all suspension tongues 36 of a group of parachutes 37 which project into slots 112 between the ledges 114. The arrangement is such, that when the kite line 60 is subjected to a sudden jerk, the latch body 68 will be released from latch member 67 by spring 70 releasing head 69 thereof, immediately causing a pull to be exerted on cord 96, and from the yoke 95 downward this cord will thus be pulled upward. Thereby, the lever arm 119 will also be raised into the position indicated in broken lines in Figure 5 and 127, this movement also raising pivot mounting 120 and with it the pawl 121 about pivot screws 117, the immediate result being that plunger 110 is raised by pawl 121 to the position 128 shown in broken lines. Such raising of the plunger withdraws the locking rod 115 thereof from several of the lowest slots 112 and the suspension tongues 116 therein, releasing the latter in one group and

thus releasing three or four parachutes simultaneously.

However, as this only releases a limited number and not all parachutes suspended by their tongues from member 109, it is possible to release a second group, or all the rest by first slacking the kite string 60, thereby also slacking cord 96 to allow spring 124 to return lever 118 to its initial low position, as shown in full lines, and with it also pawl 121. In order to prevent plunger 110 from following the pawl to original position, and also to provide an extreme limit for the upward movement of the plunger, a cross rod 129 is held in an open slot 130 by encircling spring 131 about socket member 109 in such position as to hold rod 130 resiliently and frictionally against the side of the plunger, tending to hold the latter in attained position. When, therefore, the lever 118 and pawl 121 have been restored to original position while the plunger 110 remains in the raised position resulting from the first stage of operation of the lever and pawl, a second tug on kite string 60 will again draw lower end of cord 96 upward with consequent raising of lever arm 119 and pawl 121 for the second time, the plunger will be raised further so as to withdraw locking rod 115 from the upper slots 112 and the parachute tongues 36 which may have been held therein by the rod. This second stage of the upward movement of the plunger 110 will thus release a further group or the rest of the parachutes from the kite, but as the plunger is raised sufficiently to bring a transverse stop notch 132 in the plunger into register with cross rod 129, allowing the latter to drop into the notch under bias of spring 131 and thereby preventing further upward travel of the plunger. When the parachutes are again to be engaged by their suspension tongues in slots 112 by rod 115, the cross rod 129 is simply lifted outward by the fingers and, with the tongues in place, plunger 110 is pushed down until locking rod 115 extends down to the lowest ledge 114 on member 109, the pawl 121 in the meantime being also held away from teeth 122 on the plunger. Thereafter, the pawl is released to engage again against the plunger teeth and the kite is ready for a new cycle of operation.

As shown in Figure 12, the kite equipped with the single latch assembly including latch body 68 connected at 77 to kite string 60 and latch member 67 mounted on yoke 95 may have a single releasing coil spring 29 cooperating therewith with the spring arm 32 operated by cord 133 connected thereto and threaded through yoke 95 and also connected to the kite line at the apertured end 77 of latch body 68. A single tug on line 60 will, in this case, release the latch body 68 from latch member 67 and cause cord 133 to draw arm 32 upward to open the coils of spring 29 and thereby release all the suspension tongues 36 gripped between the coils of the spring, and thus release all of the parachutes simultaneously. A shield may, of course, be mounted on spring arm 32 as in Figures 1, 2 and 3. The mentioned cord 133 is preferably provided with a stop disk 134 fixed at a predetermined point along the cord to engage against the underside of the yoke when the parachute or parachutes have been released, in order to take the strain off the lower releasing spring 29, and its arm 32.

The parachutes are intended to be interchangeably used with the different releasing devices disclosed. In this connection, witness the fact that the suspension tongues 36 used on the parachutes

thus far described have both a retaining knob 39 for engagement with the coils or springs 29 and a retaining aperture 47 for engagement with the locking rod 115. Yet, another simple form of suspension tongue 136, shown in Figure 4, may also be used with release spring 29, being provided merely with a retaining knob 139 and at the lower end being sewed directly through its aperture 135 to the apex 138 of a parachute 137. In connection with this form of parachute, ballast may be connected to the shrouds as on parachutes 37.

The basic sheet metal member 19 or 83 may, of course, be modified to assume different forms according to the different shapes of the kite, and particularly the arrangement of their cross-sticks forming their frames, while the latch and latch member may also be modified in size and form, and obviously other release devices than those shown and described in the Figures 1 and 2, and also Figures 9 and 10, may be used so long as the general principles remain the same, namely, that the parachutes or other articles suspended from the kite in flight may be released at will by a tug or two upon the kite line 60, with the result that the parachutes separate and float away individually to the ground. It is also true that while metal has been mentioned as the preferred material for the basic sheet metal members 19 and 83, etc., plastics and other materials may also be used and the invention, is therefore, not limited to the use of metal for this purpose, nor even for the links or the suspension tongues upon the parachutes.

Manifestly, many other variations may be resorted to and parts and features may be modified or used without others or substituted by others within the scope of the appended claims.

Having now fully described my invention, I claim:

1. A para-kite attachment for a kite having at least two cross-sticks including a sheet metal frame having a plurality of arms or extensions projecting therefrom, each arm having anchoring means at the end thereof for enveloping one of said cross-sticks, the sheet metal frame being adapted to be secured to the cross-sticks beneath the cover of the kite, a yoke rigidly mounted on said sheet metal frame and projecting through said cover, a latch member pivotally suspended from said yoke having a locking head upon one end thereof, a latch body normally engaging with said latch member and having a latch spring releasably retaining said locking head associated therewith, a kite-control line connected to said latch body, a coil spring secured at one end upon another portion of said sheet metal frame and projecting through said cover and having an arm projecting from the other end of said spring for bending the spring and opening the coils thereof, at least one parachute having a suspension tongue or link connected thereto with an engagement portion thereon adapted to be clamped between the coils of said spring and be releasably retained thereby, a second coil spring mounted at one end thereof upon one of the cross-sticks of said kite and projecting through the cover thereof and having an operating arm projecting from said spring effective to bend the latter and open the coils thereof upon movement of said operating arm, the second coil spring also being effective to clamp suspension tongues or links of additional parachutes between the coils thereof, two operating control cords connected individually to the arms projecting from the coil springs

and to said latch body, and means individually mounted adjacent to each coil spring for facilitating the opening of the coils thereof upon movement of the arms thereon by said operating control cords when the latch body is released by release of the locking head from engagement with said latch spring, both operating control cords extending from the arms projecting from the coil springs to the latch body through said yoke.

2. A para-kite attachment for a kite having at least two cross-sticks including a sheet metal frame having a plurality of arms or extensions projecting therefrom, each arm having anchoring means at the end thereof for enveloping one of said cross-sticks, the suspension means upon one portion of the frame including a yoke rigidly mounted on said sheet metal frame and projecting through said cover, the sheet metal frame being adapted to be secured to the cross-sticks beneath the cover of the kite, a latch member pivotally suspended from said yoke having a locking head upon one end thereof, a latch body normally engaging said latch member and having a latch spring releasably retaining said locking head associated therewith, an adjustable headed screw upon the latch body having a compression spring mounted thereon between the head thereof and said latch spring for adjusting the tension of the latter against the locking head, a kite-control line connected to one end of said latch body, a coil spring secured at one end thereof to said sheet metal frame and projecting through said kite cover, an operating arm projecting from the other end of said coil spring, an arcuate member fixed upon said sheet metal frame adjacent to said coil spring in effective position to facilitate bending said coil spring and opening the coils thereof when said operating arm is moved, there being at least one parachute provided with a suspension tongue or link having a retaining portion adapted to be engaged by the coils of said spring, an operating control line connected at one end to the latch body and being threaded through said yoke and connected at the other end to the operating arm on said coil spring, the arrangement being such that a sudden pull or jerk on the kite-control line will effect release of the latch spring from engagement with the locking head of the latch member and consequent release of the latch body from the latter with a resulting pull on the operating control line and thereby the raising of said control arm and opening of the coils of said spring to effect release of the suspension tongue or link of the parachute to free the latter from the kite.

3. A para-kite attachment for a kite having at least two cross-sticks including a substantially flat frame having a plurality of arms or extensions projecting therefrom, each arm having anchoring means for securing it to one of said cross-sticks, a suspension means upon one portion of the frame, releasable latch means suspended from said suspension means, a kite-control line attached to said latch means and effective to release the latter upon suddenly pulling or jerking said control line, at least one parachute having a suspension tongue or link thereon, a coil spring secured at one end to the frame below the latch means and having an operating arm projecting from the other end thereof for bending the spring and opening the coils of the latter, an arcuate sheet-material windshield fixed along the operating arm at the crest thereof, at least one parachute having a suspension tongue connected thereto with an engagement portion thereon adapted to be clamped between the coils of said spring and be releasably retained thereby, an operating control cord connected at one end to the end of said operating arm and at the other end connected to said latch means so that release of the latter will effect opening of the coils of said spring, and an arcuate backing plate fixed upon said frame adjacent to said spring in effective position to increase the opening of the coils thereof when said operating arm is moved by said operating control cord.

4. A para-kite attachment for a kite having at least two cross-sticks, including a sheet metal frame having a plurality of arms or extensions projecting therefrom, each arm having anchoring means at the end thereof for enveloping one of the cross-sticks, a suspension means upon one portion of the frame, releasable latch means suspended from said suspension means, a kite-control line attached to said latch means and effective to release the latter upon suddenly pulling or jerking said control line, at least one parachute having a plurality of cords or lines attached to the shrouds thereof and converging into a common connection or knot, a ballast weight connected to said knot or common connection having a suspension tongue or link projecting therefrom and adapted to be brought up through a slit in the apex of the parachute, a releasable parachute-retaining means spaced from the suspension means on said frame having locking means for engaging and retaining said suspension tongue or link in association with said retaining means, a movable release member connected to the latter effective to release said retaining means upon movement thereof, an operating control cord or line interconnecting the movable release member and said releasable latch means so that release of the latter will effect release of said retaining means through said operating control cord or line and thereby effect release of said parachute from the kite.

5. A para-kite attachment for a kite having at least two cross-sticks including a sheet metal frame having a plurality of arms or extensions projecting therefrom, each arm having anchoring means at the end thereof for enveloping one of said cross-sticks, the sheet metal frame being adapted to be secured to the cross-sticks beneath the cover of the kite, a yoke rigidly mounted on said sheet metal frame and projecting through said cover, a first latch member pivotally suspended from the outer end of the yoke and terminating in a locking head upon one end thereof, a first latch body engaging with said latch member and having a latch spring releasably retaining the locking head in association with said latch body, a cross bar spaced and secured to the yoke within the first latch member, a second latch member pivotally suspended upon the cross bar and terminating in a locking head upon one end thereof, a second latch body engaging with the second latch member and also having a latch spring releasably retaining the locking head of the second latch member in association with said second latch body, a first coil spring secured at one end thereof to another portion of said sheet metal frame below said yoke and projecting through said cover, an operating arm projecting from the other end of the spring for bending the latter, and opening the coils thereof, an arcuate windshield secured along the crest thereof to the operating arm, a second metal frame secured to one of the cross sticks of said kite, a second coil spring secured at one end thereof to the second

metal frame below the first-mentioned metal frame and projecting through said cover, a second operating arm projecting from the other end of the second coil spring, a second arcuate windshield secured along the crest thereof to the second operating arm, a plurality of parachutes having individual suspension tongues connected thereto with a retaining portion upon each adapted to be engaged between and releasably retained by the coils of both coil springs, means individually mounted adjacent to each coil spring for facilitating the opening of the coils thereof upon movement of the operating arms, a kite cord connected directly to the lower portion of the second latch body, an operating cord connecting the latter with the operating arm on the second coil spring through said yoke, a further operating cord interconnecting the lower portions of both latch bodies, and an operating cord interconnecting the lower portion of the first latch body and the operating arm of the first coil spring through said yoke.

6. A para-kite attachment for a kite having at least two cross-sticks including a sheet metal frame having a plurality of arms or extensions projecting therefrom, each arm having anchoring means at the end thereof for enveloping one of said cross-sticks, the sheet metal frame being adapted to be secured to the cross-sticks beneath the cover of the kite, a yoke rigidly mounted on said sheet metal frame and projecting through said cover, a latch member pivotally suspended from said yoke having a locking head upon one end thereof, a latch body normally engaging with said latch member and having a latch spring releasably retaining said locking head associated therewith, a kite-control line connected to the latch body, a bracket member having a second metal frame secured to one of the cross-sticks of said kite below said sheet metal frame, an elongated socket member rigidly secured upon the bracket member and projecting upwardly, a plunger slidably mounted in the upper portion of the socket member with the upper end exposed above the latter, a series of forwardly directed ledges spaced apart upon the lower end of the socket member, a locking rod projecting axially downward from the lower end of the plunger through a corresponding bore in the ledges when the plunger is retracted, a lever pivotally mounted upon said socket member having an operating end extending rearwardly toward the second metal frame, a spring urging the operating end of the lever downward to initial operative position, an operating cord connected at one end to said operating end of said lever and extending through said yoke and being connected at the other end to the lower end of said latch body, a series of teeth upon the upper portion of said plunger, friction means upon said socket member retaining said plunger in attained position, a feeding pawl pivotally mounted upon said lever intermediate the pivot mounting thereof upon said socket member and the operating end thereof and terminating in a tooth-engaging end, and a spring urging the latter into engagement with the teeth on said plunger, and a stop on said lever limiting downward movement thereof.

7. A para-kite attachment for a kite having at least two cross-sticks including a sheet metal frame having a plurality of arms or extensions projecting therefrom, each arm having anchoring means at the end thereof for enveloping one of said cross-sticks, the sheet metal frame being

adapted to be secured to the cross-sticks beneath the cover of the kite, a yoke rigidly mounted on said sheet metal frame and projecting through said cover, a latch member pivotally suspended from said yoke having a locking head upon one end thereof, a latch body normally engaging with said latch member and having a latch spring releasably retaining said locking head associated therewith, a kite-control line connected to the latch body, a bracket member having a second metal frame secured to one of the cross-sticks of said kite below said sheet metal frame, an elongated socket member rigidly secured upon the bracket member and projecting upwardly, a plunger slidably mounted in the upper portion of the socket member with the upper end exposed above the latter, a series of forwardly directed ledges spaced apart upon the lower end of the socket member, a locking rod projecting axially downward from the lower end of the plunger through a corresponding bore in the ledges when the plunger is retracted, a lever pivotally mounted upon said socket member having an operating end extending rearwardly toward the second metal frame, a spring urging the operating end of the lever downward to initial operative position, a supporting plate secured to said one of the cross-sticks of the kite and having a pair of supporting lugs projecting rigidly therefrom, an arcuate windshield projecting forwardly from said lugs having a rear lug pivotally mounted upon said supporting lugs, an operating cord connected at one end to said operating end of said lever and extending through said yoke and being connected at the other end to the lower end of said latch body, a series of teeth upon the upper portion of said plunger, friction means upon said socket member retaining said plunger in attained position, a feeding pawl pivotally mounted upon said lever intermediate the pivot mounting thereof upon said socket member and the operating end thereof and terminating in a tooth-engaging end, and a spring urging the latter into engagement with the teeth on said plunger, and a stop on said lever limiting downward movement thereof.

8. A releasable parachute-attaching means for a kite comprising releasable latch means supported on said kite, a kite-control line attached to said latch means effective to release said means upon sudden jerking of said control line, a parachute including a suspension element connected thereto, a releasable parachute-retaining means on said kite including locking means engaging said suspension member, a releasable member connected to said locking means and movable to release said retaining means upon movement thereof, and a control line connected between said released member and said releasable latch means so that release of said latch means will effect release of said retaining means and thereby effect the release of said parachute from the kite.

9. A releasable parachute attachment for a kite comprising a sheet metal frame for attachment to the kite, a suspension means on one portion of the frame, releasable latch means suspended from said suspension means, a kite-control line attached to said latching means and effective to release the latter upon suddenly jerking said control line, a parachute including a suspension tongue, a releasable parachute-retaining means spaced from the suspension means on said frame including locking means for engaging and retaining said suspension tongue in

engagement with said retaining means, a movable release member connected to the latter effective to release said retaining means upon movement thereof, an operating control cord interconnecting the movable release member and said releasable latch means so that release of the latter will effect release of said retaining means through said operating control cord, thereby effecting release of said parachute from the kite.

MAX A. MOON.

REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
1,735,309	Albrecht	Nov. 12, 1929
1,804,244	Brady	May 5, 1931
2,464,720	Rose	Mar. 15, 1949