

June 15, 1926.

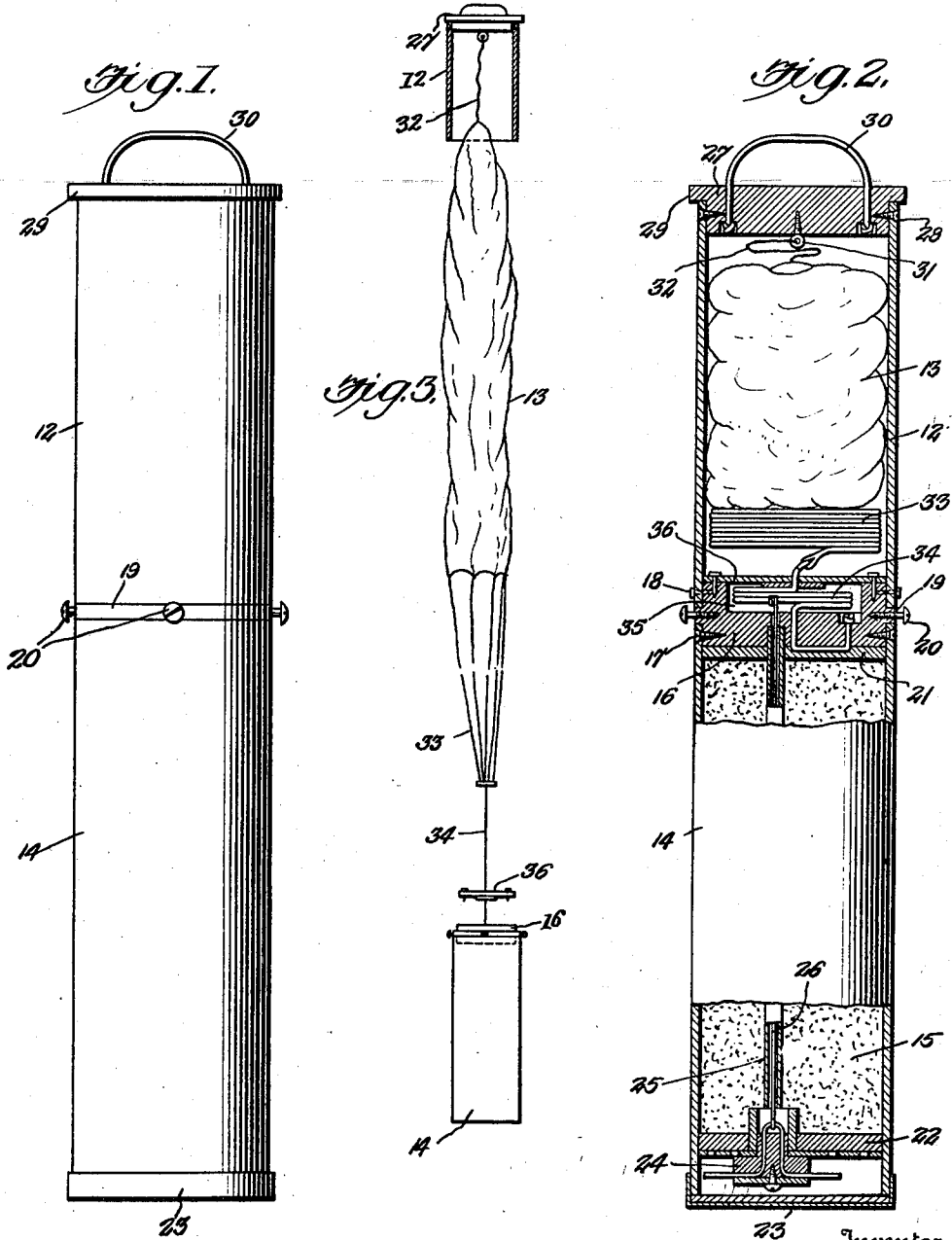
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S. WILEY

EMERGENCY LANDING FLARE

Filed August 3, 1925

3 Sheets-Sheet 1



Inventor
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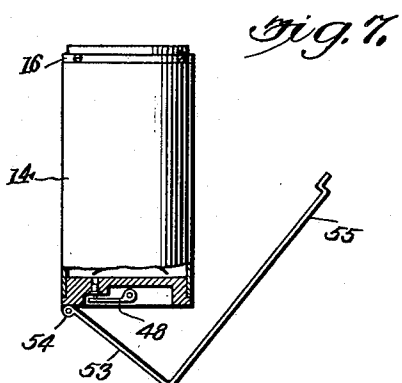
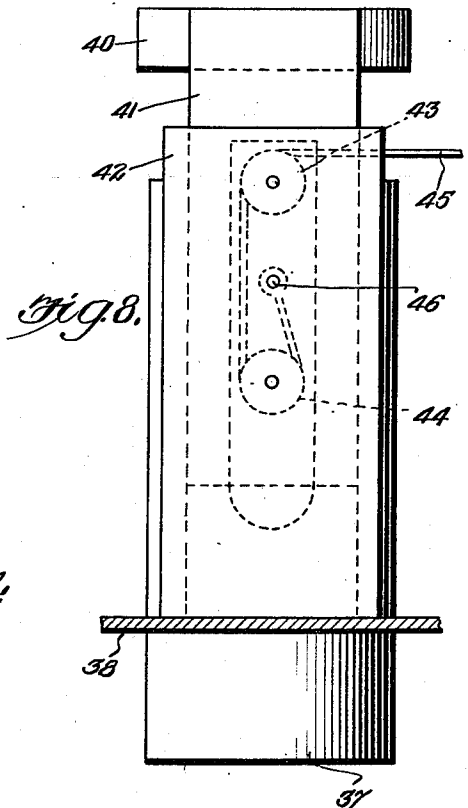
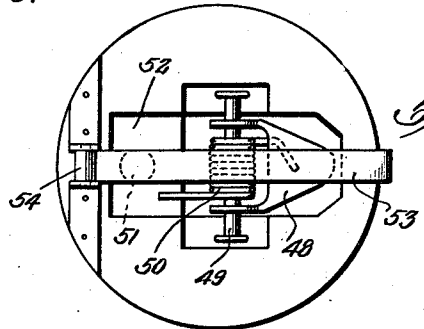
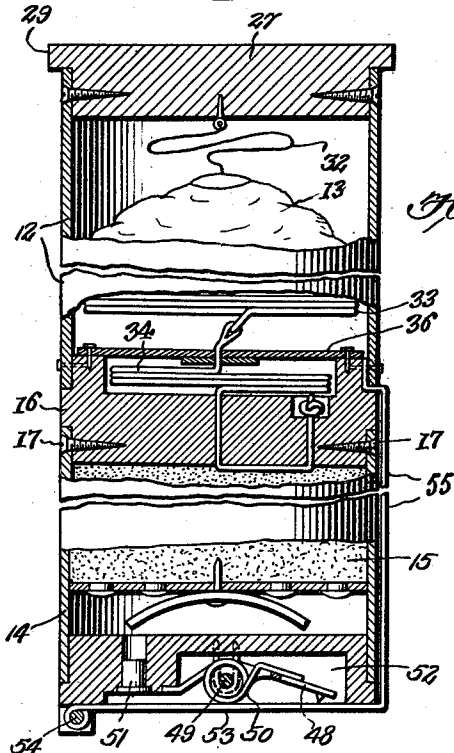
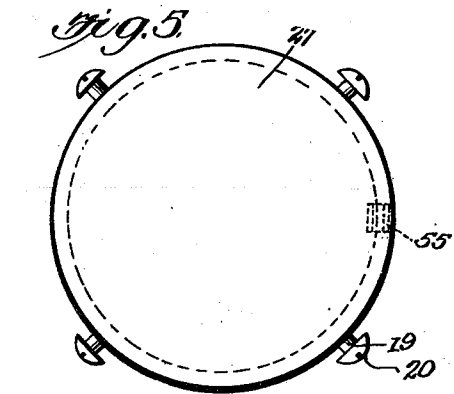
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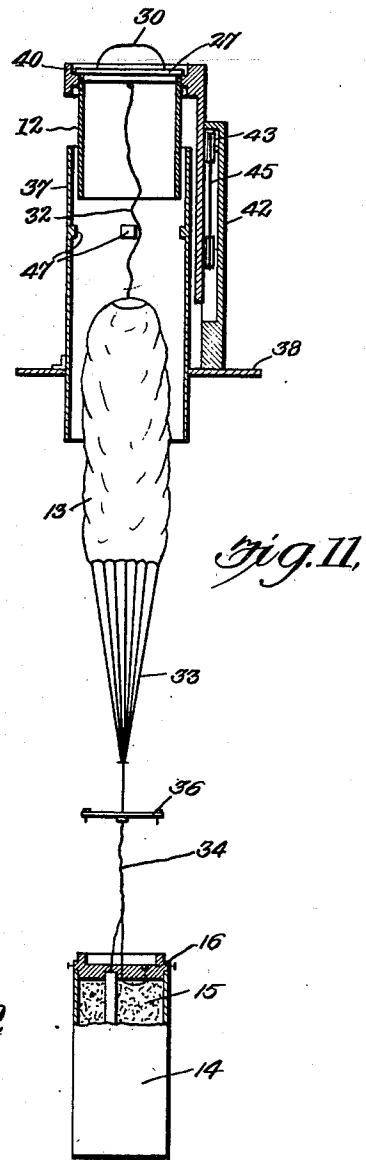
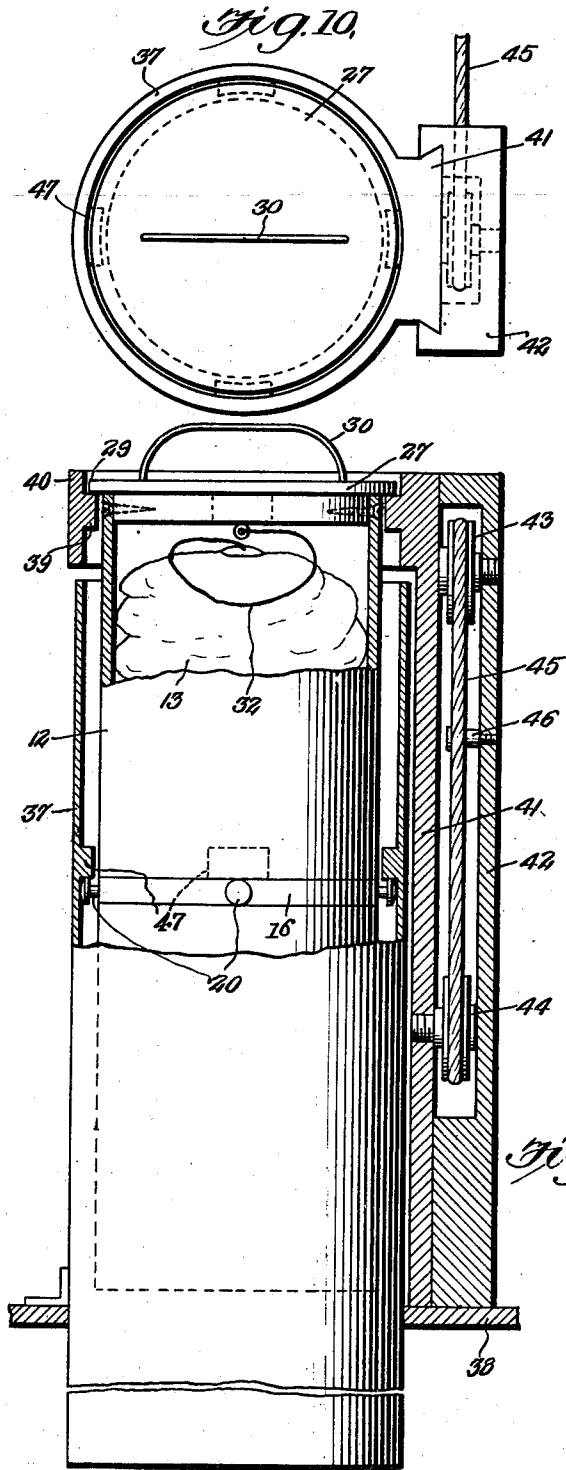
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EMERGENCY LANDING FLARE

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3 Sheets-Sheet 3



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EMERGENCY-LANDING FLARE.

Application filed August 3, 1925. Serial No. 47,967.

My present invention pertains to a parachute flare intended to be dropped from aircraft for the purpose of illuminating the land or water and any other objects beneath the flare.

The invention is adapted for use in making night landings by operators of aircraft who wish to land on fields not illuminated and due to the short interval of time from the instant the flare is launched until full illuminating is produced, it is especially adapted for emergency landings in unknown territory in case of storms or trouble.

With the foregoing and other objects in view, the invention will be more fully described hereinafter, and will be more particularly pointed out in the claims appended hereto.

In the drawings, wherein like symbols refer to like or corresponding parts throughout the several views:—

Figure 1 is a side elevation of an improved flare constructed according to the present invention.

Figure 2 is a longitudinal section taken centrally therethrough.

Figure 3 is a diagrammatic view showing the parachute drawn out from its case.

Figure 4 is a side elevation with parts broken away showing a slightly modified form of ignition mechanism.

Figure 5 is a top plan view of the same.

Figure 6 is a bottom plan view of the mechanism illustrated in Figure 4.

Figure 7 is a side elevation on a smaller scale with parts broken away showing the condition of the parts after the primer is operated.

Figure 8 is a side elevation with the support in section showing the launching device for the flare.

Figure 9 is a view taken at substantially right angles to Figure 8 and showing a portion of the device in elevation and a portion in section with the parts suspended in the launching device.

Figure 10 is a top plan view of the parts shown in Figure 9, and

Figure 11 is a diagrammatic view showing the condition of the parts in the act of launching the flare.

Referring more particularly to the drawings 12 designates a case for housing the parachute 13; and 14 indicates a somewhat

similar case for holding the illuminating composition 15. These cases may be made of paper or other appropriate material. The adjacent ends of the cases are brought together on a joining block or plug 16 of wood or appropriate material, the case ends being secured as by nails or other fastenings 17 and 18 to the plug. An annular rib 19 projecting centrally about the plug serves to space the ends of the two cases apart and also to hold the screws or lugs 20, which project beyond the sides of the device for a purpose later explained. The illuminating composition 15 is confined between the discs 21 and 22 and the disc 22 is spaced from the bottom 23 of the case to provide a place for containing the igniter assembly indicated at 24. This assembly may be of any well known construction. A tube 25 passes through the illumination composition 15 from the plug 16 to the igniter assembly. This tube houses the igniter wire 26 by means of which the igniter is operated.

The upper end of the parachute case 12 is closed by the cover 27 of wood or other appropriate material adapted to be received into the upper end of the case and to be secured thereto as by the nails or appropriate fastenings 28. The cover 27 is provided with an annular flange 29 which extends beyond the outer side of the case for the purpose of supporting the device in the launching tube as hereinafter referred to. The cover 27 may be provided with a handle 30 for carrying the device about prior to its insertion in the launching device and the cover is furthermore provided on its inner side with the screw eye 31 or other appropriate device to which to attach the parachute. The shrouds 33 of the parachute 13 are connected to the flexible cable 34 which is disposed in the cavity 35 in the upper portion of the joining block 16. This cable 34 is fixed in the safety disc 36 which acts as a cover for the cavity 35 and is nailed or otherwise secured to the block 16 as indicated in Figure 2. The igniter wire 26 is attached to the flexible cable 35, and the lower end of this cable is attached to the joining block 16.

The device so formed is adapted to be placed in the launching apparatus, as shown in Figures 8 to 11 inclusive. This launching device consists of a tube 37 mounted upon an airplane part as indicated at 38. The

device is placed in any convenient location in the body of the aircraft or fuselage of the airplane in such a manner that the flare will extend through an opening in the floor. The flare and the launching tube 37 will be disposed in a vertical position to permit the dropping of the flare out of the tube when required.

The flare is held in place in the tube by means of the engagement of the flange 29 on the top cover 27 with an internal shoulder 39 on the ring 40 of the supporting device. This ring 40 is capable of being lifted (compare Figures 9 and 11) and for this purpose it is supported upon the bar 41 having the dove tail side edges as indicated in Figure 10 and fitting into a complementary slot in the upright 42. This upright is hollowed out adjoining the bar 41 to receive the pulley 43 carried upon the upright and the lower pulley 44 carried upon the bar 41. A cable 45 is trained over these pulleys having one end secured as indicated at 46 in Figures 8 and 9 to a stud in the upright, while the other end passes out laterally and is disposed in position to be pulled upon by the operator. Of course any appropriate mechanism may be used to operate this cable. When the cable is pulled the ring 40 will be hoisted.

The lugs 20 of the flare are adapted to slip under internal lugs 47 within the launching tube 37. These lugs are spaced apart to permit the screws or lugs 20 of the flare to be inserted downwardly between the same and then turned to enable the lugs 20 to engage beneath the lugs 47 as shown in Figure 9.

When it is desired to make a landing at night and the flare is to be dropped to illuminate the unknown territory, the cable 45 is pulled, elevating the ring 40 and with it the parachute container 12. The parachute container will readily strip from the illuminant case as the fastenings 18 are only small pins or thin nails. During this operation the remainder of the flare structure is held against this upwardly pulling by the engagement of the lugs 20 and 47. When the parachute container 12 is pulled clear of the illuminant case, the flare falls from the aircraft, the parachute container 12 remaining in the releasing device. The illuminant 14 falls free from the launching tube 37, pulling the parachute 13 with it. The slack of the shrouds is taken up until the whole weight of the flare is brought on the attachment 32. The resulting jerk on this connection will strip off the safety disc 36 and permit the cable 34 to straighten out. The condition of the parts just referred to is indicated in Figure 11.

As the cable 34 straightens out it will pull upon the igniter wire 26 and operate the igniter thereby setting off the illuminating material 15. The further descent of the

flare will finally break the upper connection 32 from the parachute container 12, and the flare then becomes detached from all parts of the airplane. After approximately a fifty foot drop, the parachute opens supporting the burning flare as it floats to the ground.

In Figures 4 to 7 inclusive is shown a different type of igniter, which does not require a connection between the parachute and parachute container. This is the safety lever type and consists of a striker 48 mounted to swing about the pintle 49 and urged by the coil spring 50 to the position, shown in Figure 7 against the primer 51. The striker occupies normally a retracted position within a bottom cavity 52 in the bottom head of the illuminating case. In this position it is held by the safety lever 53 pivoted to the case bottom as at 54 and extending across the cavity 52. The lever is provided with an arm 55 which rises up along the side of the flare case. The upper end of this arm 55 is normally disposed through an opening in block 16 and held underneath the wall of the parachute case, Figure 4.

It is apparent that, so long as the parachute case remains in place on the illuminant case, the arm and lever will retain the position shown in Figure 4, holding the striker in a potential position. As soon, however, as the parachute case is stripped from the illuminant case, it will free the lever (see Figure 7). The lever and arm will fall down and permit the striker to become active when the illuminant case is free of the launching tube under the influence of the coil spring 50, thus igniting the illuminant.

It will be apparent from the foregoing that the invention produces a self-contained flare which will be positive in action and constructed with a view to its ready launching.

With the foregoing and other objects in view, my invention resides in the novel arrangement and combination of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed may be made within the scope of what is claimed without departing from the spirit of the invention.

What is claimed is:—

1. A flare comprising a case having compartments therein, illuminating material in one compartment, igniting means for said illuminating material, a parachute in the other compartment, a parachute compartment coupled to said parachute and adapted to be stripped from said illuminant case, movable means for engaging with said parachute case to support the flare and for stripping said parachute case to permit the flare to fall, and means for holding the case against movement.

2. A flare having a compartment for illuminant and a separate compartment for a parachute, a parachute in the last named compartment, the parachute case adapted to be stripped from illuminant case, a connection between said parachute case top and the parachute adapted to be detached on falling of the flare, means engageable with said parachute case for supporting the flare in an airplane, means for engaging the flare to hold the same against upward movement in said airplane but permitting downward movement thereof, and means to shift said supporting means whereby to strip the parachute case from the flare and permit falling thereof.

3. A flare comprising a case for illuminating material, and igniting means therein, a second case, a parachute normally housed in said second case, means for uniting the two cases, the parachute case adapted to be stripped from illuminant case, a separable connection between said parachute and the parachute case, a launching device carried by the airplane and having means for engaging said flare to prevent lifting movement but freely permitting falling movement of the flare, and liftable suspension means engaging with said parachute case adapted to strip the parachute case from the flare and permit falling thereof.

4. A flare comprising a case for illuminating material, igniting means therein, a second case, means to secure said cases together, a parachute in said second case, the parachute case adapted to be stripped from illuminant case, a separable connection between said parachute case top and the parachute and a second connection between the shrouds of the parachute and said means, liftable means in the airplane for supporting the flare from said parachute case and adapted to strip the parachute case, and means in the airplane to engage with the flare to avoid its lifting with said lifting means.

5. A flare comprising a case for illuminating material, an igniter therein, a second case joining with said first case, a parachute in the second case having its shrouds coupled to the flare, a parachute case adapted to be stripped therefrom, a separable connection between the top and parachute, a launching tube on the airplane for receiving said flare and having means to prevent upward movement of the flare therein, and liftable means engaging with said parachute case top for supporting the flare in the tube and adapted to strip the parachute case from the flare.

6. A flare comprising a case having a compartment for illuminating material, an igniter in the illuminating material, a parachute also in said case having its shrouds connected to the flare, the parachute com-

partment adapted to be stripped from the flare, a separable connection between said parachute case top and the parachute, a launching tube on the airplane, cooperating lugs between said flare and tube to avoid the lifting of the illuminant case, and a liftable supporting means for the flare engaged wholly with the parachute case for stripping the same.

7. A flare comprising a flare body having separate compartments therein, illuminating material and an igniter in one compartment, a parachute in the other compartment having its shrouds connected to the flare body, the parachute compartment adapted to be stripped therefrom and having a projecting flange at its top, a breakable connection between said parachute case and parachute, a liftable ring on the airplane engaging with said shoulder of the top of the parachute case, means to lift said ring, and means to hold the flare body against movement in the direction of stripping movement of the ring and parachute case.

8. A flare comprising a flare body, having a compartment for illuminating material, an igniter therein, and a second compartment, a parachute in said second compartment having its shrouds connected to the flare body, a flanged cover for the parachute compartment by means of which parachute compartment can be stripped from the flare body, a breakable connection between said parachute compartment and parachute, a tube on the airplane for receiving said flare body, cooperating lugs on said tube and flare for preventing upward movement of the flare body, a ring for supporting the flare body from said flanged cap, and means for lifting the parachute case while the flare body is held stationary.

9. A flare comprising a flare body having a compartment for illuminating material and an igniter, a second compartment, a parachute in said second compartment having its shrouds connected to said flare body, means to receive said flare body on the airplane for launching the same, said means and flare body having cooperating parts to prevent lifting movement of the flare body, a ring engaging with and supporting the flare body from said parachute case, a movable bar for supporting said ring, a post having a guide for said bar, and means arranged between said post and the bar for causing the lifting thereof.

10. A flare comprising a case for illuminating material and an igniter, a second case, a parachute in said second case, a joining block between said cases, a flexible connection between the shrouds of the parachute and said joining block, a safety means secured to said flexible connection and said block and adapted to be stripped from the

latter, and means coupled between said flexible connection and the igniter for setting off the latter.

5 11. A flare comprising a case for illuminating material and an igniter, a second case, a parachute in said second case, a joining block for receiving and joining the adjacent ends of said cases, said joining block having a cavity therein, a flexible connection
10 coiled loosely in said cavity and connected to the block and to the shrouds of the parachute, a safety disc coupled to said flexible connection and over the cavity in said block and adapted to be stripped from the block,
15 and means between said flexible connection and the igniter for setting off the latter.

12. A flare comprising a case for illuminating material and an igniter, a second case, a parachute in the second case, a joining block for receiving the ends of the cases,
20 said joining block having a cavity therein, a flexible connection loosely coiled in said cavity and secured to the block and to the shrouds of the parachute, a safety disc secured removably over said cavity and affixed
25

to said flexible connection, a connection between said flexible connection and the igniter, a parachute case and a breakable connection between said parachute case top and upper portion of the parachute. 30

13. A flare comprising a flare body having space for an illuminant and an igniter, a parachute also in said body and having its shrouds secured thereto, a strippable parachute case for said flare body, and means
35 normally engaged with said strippable parachute case for holding the igniter in a potential position.

14. A flare comprising a flare body having space for an illuminant and an igniting
40 mechanism, a lever for holding said igniting mechanism in potential position, said lever extending along said flare body, a parachute in and connected at its shroud end to said flare body, a strippable parachute case hav-
45 ing an opening to receive and confine said lever, and means to strip the parachute case from the flare body and from said lever.

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