July 18, 1961 J. B. SMITH ET AL 2,992,798

SURVIVAL KITS FOR FLIGHT PERSONNEL

Filed July 8, 1957 3 Sheets-Sheet 1

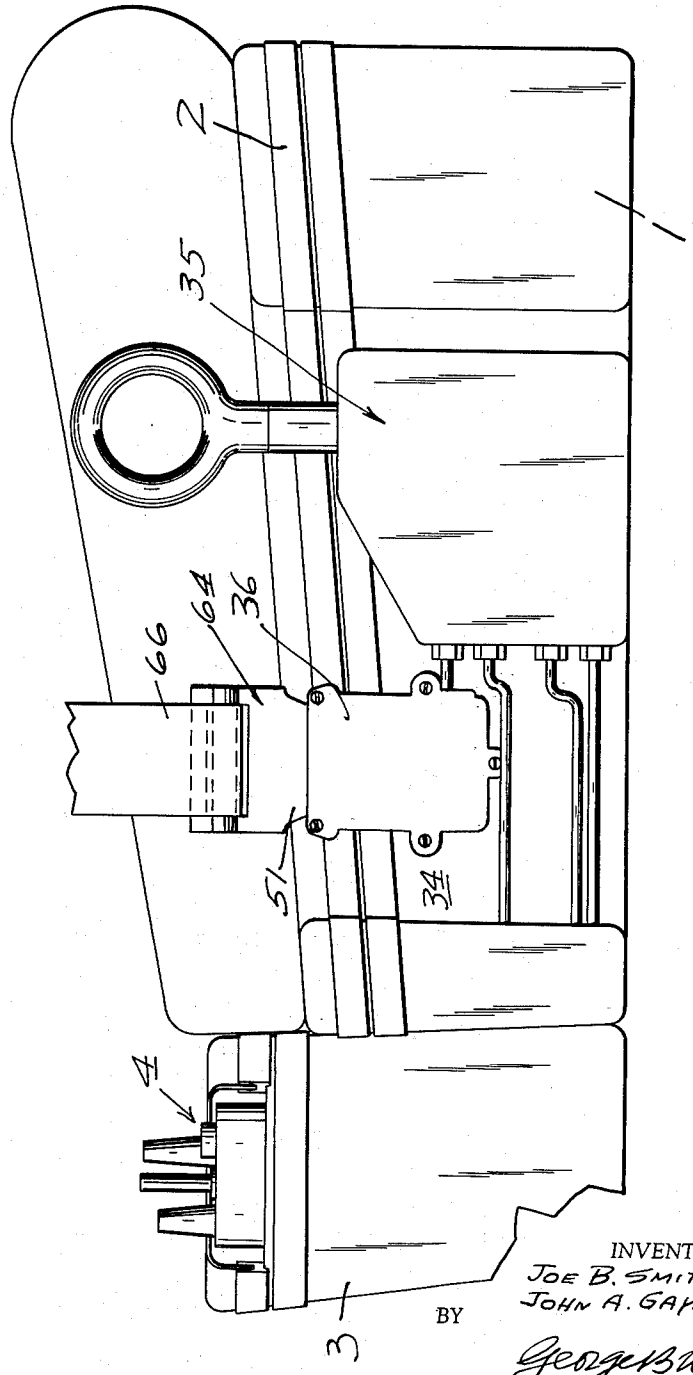


Fig. 1

INVENTORS
JOE B. SMITH
JOHN A. GAYLORD

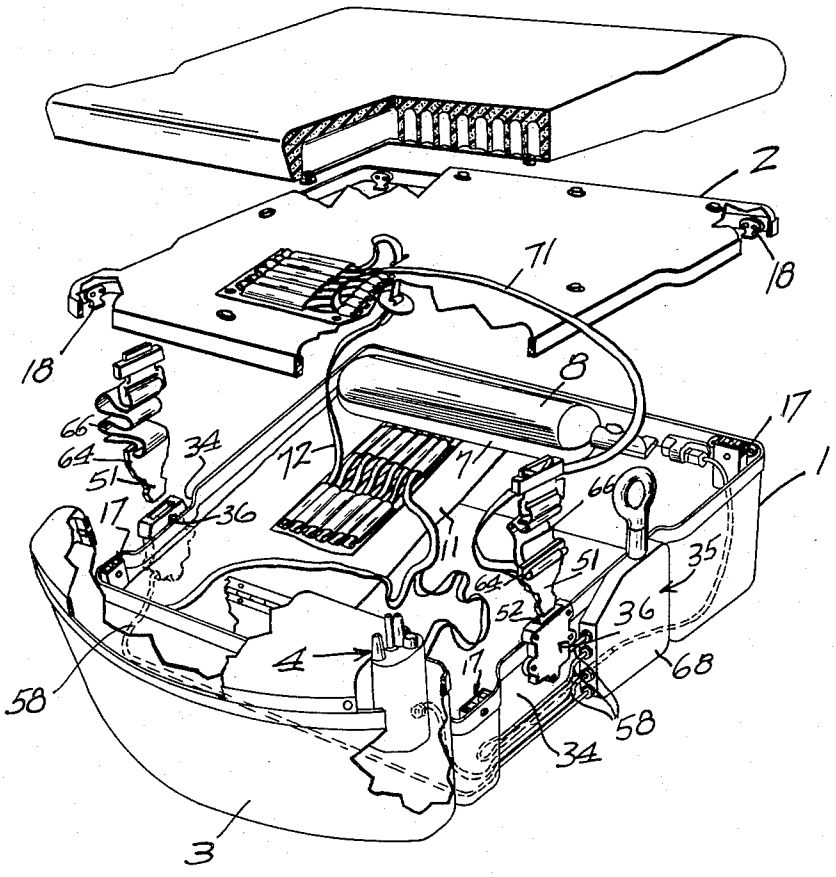
BY George B. White
ATTY.

July 18, 1961 J. B. SMITH ET AL 2,992,798

SURVIVAL KITS FOR FLIGHT PERSONNEL

Filed July 8, 1957 3 Sheets-Sheet 2

Fig. 2



INVENTOR.
JOE B. SMITH
JOHN A. GAYLORD

BY

George B. White
ATTY.

July 18, 1961 J. B. SMITH ET AL 2,992,798

SURVIVAL KITS FOR FLIGHT PERSONNEL

Filed July 8, 1957 3 Sheets-Sheet 3

Fig. 3

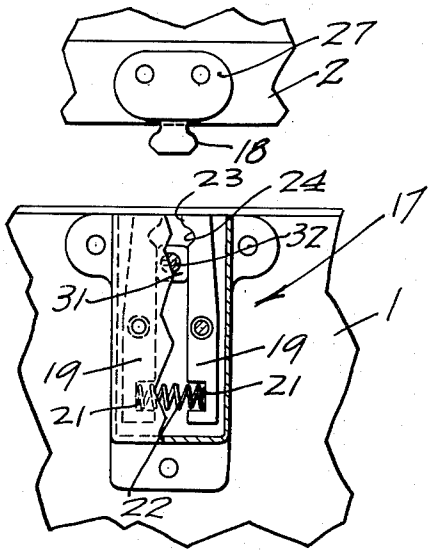


Fig. 4

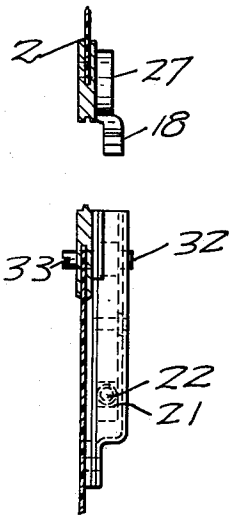


Fig. 5

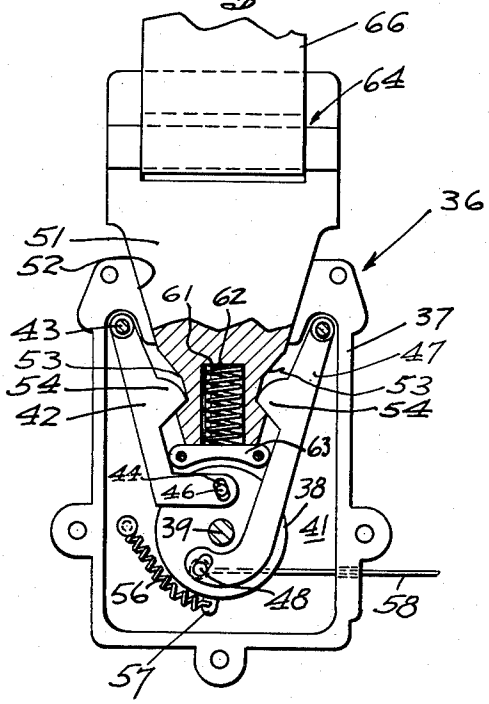
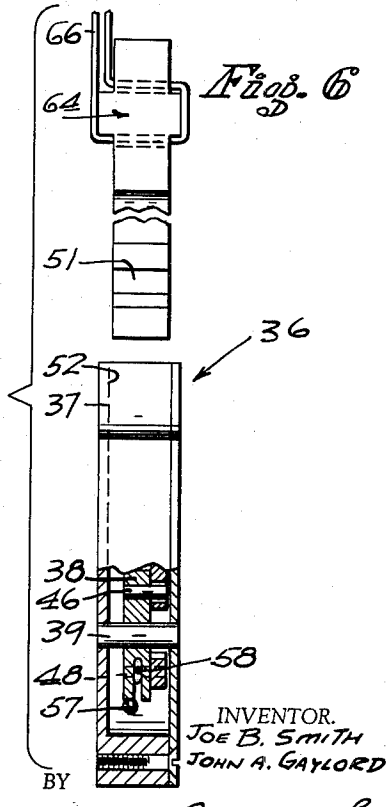


Fig. 6



INVENTOR.
JOE B. SMITH
JOHN A. GAYLORD

BY George B. White
ATTY.

United States Patent Office 2,992,798
Patented July 18, 1961

2,992,798

SURVIVAL KITS FOR FLIGHT PERSONNEL

Joe B. Smith and John A. Gaylord, San Rafael, Calif., assignors to H. Koch & Sons, Corte Madera, Calif., a partnership

Filed July 8, 1957, Ser. No. 670,477
4 Claims. (Cl. 244—138)

This invention relates to improvements in so called survival kits for flight personnel, and particularly of the type of survival kits which are adapted to be attached to the garment or parachute of such personnel so that when he is ejected or escapes from an airplane at high speed, the kit is in position to be released at a convenient time and actuate and provide for the various devices necessary for the survival in a parachute descent from an aircraft.

Kits of this type have been furnished in the past mostly in bundles or packages and they were hung on the straps of the parachute which in turn was secured to the aviator or flight personnel whenever in his seat. In such survival kit usually there is provided an oxygen tank and a device whereby the contents of that tank can be connected with a breathing mask, or the like, and also for the inflation of a flight suit so as to provide compensating pressure at high altitudes. In addition such kits usually include an inflatable rubber boat or raft and a gas under high pressure in a tank which can be connected to such raft to inflate the same while the person is still in the air so that he can be lowered into the escape raft or boat. There are other and various devices necessary for survival suitably packed in such kit.

The primary object of the invention is to provide a rigid box like container of such dimensions that it can fit in the seat of flight personnel under a usual seat cushion; the rigid kit case including an integral oxygen tank connectable to the breathing mask of the pilot as well as the inflatable boat or raft and the compressed gas container for its inflation; the rigid case has a rigid cover; and connecting devices between said cover and case and between the case and the parachute releasable quickly and easily and automatically upon escape.

The features of the invention include: a rigid case with a rigid lid thereon, the rigid case being adapted to accommodate the elements which are necessary in the usual survival kit and which are also connected by a quickly and easily releasable connection with the lid; means to release such connections only upon a predetermined pull; means being provided to connect the lid to the parachute by a lanyard in such a manner that the entire unit with the lid on the same is supported at a predetermined distance below the person when he is suspended on his parachute, and the said releasable connection being such that it resists normal pull upon the lid; additional locking device is being provided for releasably supporting the rigid case upon the hanging straps connected to the parachute of the personnel; means are provided whereby the release of such support can be quickly and rapidly accomplished; a secondary set of lanyards being provided within the casing and held by the lid so as to support the casing at a predetermined distance below the lid when the same are separated from one another; and manipulating means are provided in a predetermined position in a recess of the rigid case so as to be easily gripped to release the respective connections at will.

We are aware that some changes may be made in the general arrangements and combinations of the several devices and parts, as well as in the details of the construction thereof without departing from the scope of the present invention as set forth in the following specification, and as defined in the following claims; hence we do not limit our invention to the exact arrangements and combinations of the said device and parts as described

in the said specification, nor do we confine ourselves to the exact details of the construction of the said parts as illustrated in the accompanying drawings.

With the foregoing and other objects in view, which will be made manifest in the following detailed description, reference is had to the accompanying drawings for the illustrative embodiment of the invention, wherein:

FIG. 1 is a side view of our survival kit assembly in the rigid case.

FIG. 2 is a partly fragmental development view of the separable sections of the kit.

FIG. 3 is a fragmental partly sectional view of a corner of the casing and cover showing a catch detached from a keeper.

FIG. 4 is a fragmental partly sectional view of said corner of the casing and cover showing said catch and keeper in side view.

FIG. 5 is a side view of a strap plug and keeper engaged, and

FIG. 6 is a side view of said strap plug and keeper disengaged.

The salient parts of the invention herein include a rigid generally rectangular casing 1 on which is provided a rigid detachable lid 2. Along one side of the casing 1 is a tank 3 of rigid material as part of the casing, which tank 3 contains oxygen bottles and has suitable valved connections 4 to the usual mask and garments of aircraft personnel. Suitable releasing cord is provided to actuate the valve of the oxygen tank upon the escape of the person from the aircraft.

The rigid casing 1 is provided on another side thereof with a bracket 7 to hold a compressed air tank 8 connected by a suitable line to an inflatable boat or raft 11, stored within the casing. Under the raft 11 is suitably secured a suitable bag or the like for the usual necessities in a survival kit.

Inside of each of the four corners of the case is a suitable keeper 17 to engage and hold a catch 18 on the lid 2 frictionally with a predetermined holding force. Each keeper 17 includes a flat hollow casing fixed to the inside of the rigid casing and open at the top. A pair of holding levers 19 are pivoted intermediate their ends transversely of the casing. Each of the levers 19 has in its lower end a socket 21 and in the opposite sockets 21 is a coil spring 22 under compression so as to normally urge the lower ends of the levers apart and thereby urge the top ends of the levers toward one another. The top ends of the levers 19 have a curved protuberance 23 and depression 24 therein generally to correspond to the dovetail outline of the latch 18 projecting from the lid 2. This catch 18 is supported in position by a flange 27 attached to the side of the lid in alignment with and above the aforementioned catch 18. The catch 18 can be pressed in position and held resiliently between the levers 19 so as to be released only when the pull is sufficient to overcome the strength of the compression spring 22 and the friction between it and the corresponding recesses 24 of the levers 19 whereby the catch 18 is held until the predetermined force is applied to pull it out of the keeper 17.

In order to enable the manual freeing of the lid from the casing at will a cam 31 generally rectangular cross-section is provided on a cross shaft 32 which extends outwardly and is engageable by any suitable key or plier, or by coin or other element in an outside slot 33 thereof so as to turn the cam 31 and thus pry the levers 19 apart and release the catch 18 from the keeper 17. This is important because it is essential for the saving of the life of a person that the lid 2 be separated from the casing 1 at a desired altitude and thereby permit the inflation of the light raft in time for descent.

The kit is connected to and suspended from the usual parachute harness worn by flight personnel, for instance,

the type shown in United States Patent No. 2,726,832, issued on December 13, 1955 to E. A. Gimalouski et al. The releasable connection to the strap of the parachute harness includes a pair of keepers on the outside of the rigid casing. Depressions or recesses **34** on the opposite sides of the casing **1** accommodate keepers **36** and on one side the recess **34** also accommodates a manual releasing device **35**, within the outline of the casing **1** and lid **2**. Thus the unit fits into the usual seat in the aircraft beneath the person, yet it has maximum capacity and facility of manipulation.

As an illustrative embodiment herein in FIG. 5 each keeper **36** includes a casing **37** mounted flat in the adjacent recess **34**. A disc **38** is journalled on a pin **39** in the casing **37** so that the disc **38** is parallel with and along the back wall **41** of the casing **37**. A dog **42** is pivoted near the top of the casing **37** on a pin **43** and extends downwardly with its bent end engaging by means of an elongated slot **44** a pull pin **46** on the disc **38** above the journal pin **39** of the disc **38**. Another or opposite dog **47** is similarly pivoted at its top on the opposite top corner of the casing and has its bent end engaged by means of a similar elongated slot with a lower pull pin **48** below the center of the disc **38**.

A flat and tapered plug **51** extends through a tapered aperture **52** into the top of the casing **37**. The opposite edges of the plug **51** have opposite indents **53**. From each dog **42** and **47** projects a prong or tooth **54** into engagement with the respective indents **53** to hold the plug **51** in place in the casing **37**.

A coil spring **56** is anchored at an end thereof to the housing wall **41** and at its other end on an ear **57** on the lower periphery of the disc **38** so as to exert normally a pull in clockwise direction viewing FIG. 5, and thereby normally pulling the dogs **42** and **47** toward one another into plug engaging position.

A flexible line **58** extends generally tangentially from the lower portion of the disc **38** laterally through a vertical side **59** of the casing **37**. The line **58** is suitably anchored to said lower portion of the disc **38** so that when the line **58** is pulled, it turns the disc **38** in a contra-clockwise direction viewing FIG. 5. As the line **58** is thus pulled, the dogs **42** and **47** are pulled apart so that their teeth **54** disengage from the indents **53** and release the plug **51**.

A coil spring **61** in a socket **62** in the bottom of the plug **51** bears against a fixed abutment **63** above the disc **38** so that the spring **61** urges the plug **51** out of the keeper **36** so as to accelerate its release.

The top of the plug **51** is provided with the usual clasp **64** to which is suitably secured a suspending strap **66** connected to the parachute or to the person wearing the device.

Various devices may be employed for the purpose of releasing the entire casing pack from the parachute strap **66**. In the present illustration a manually operated device **35**, not shown in detail, is nested in the adjacent recess **34** on the outside of the rigid casing. From the housing **68** of the device **35** extend several flexible lines or cables **58** for the actuation of the respective devices such as the valve in inflating gas tank, the valve of the oxygen tank and whatever other devices have to be actuated after the pilot reached a certain minimum altitude. As the flexible lines **58** are pulled they release the plugs **51** as hereinbofer described. Thus the casing drops away from the person whenever he pulls the handle **68**. Thus at the predetermined altitude the connection between the plug **51** of the straps **66** and the keepers **36** can be released, and then the casing drops downwardly.

A lanyard **71** is attached to one of the clasps **64** and is suitably folded on the lid **2** so as to unfold as the casing **1** drops. The other end of this lanyard **71** is secured to the lid **2** so that after the length of this lanyard **71** is played out fully it jerks the lid **2** off the casing **1**. The sudden pull thus exerted by this lanyard **71** is sufficient to compress the springs **22** and release the catches **27** and free the casing **1** from the lid **2**.

Then the casing **1** drops away and unfolds a second lanyard **72**, one end of which is held on the lid **2**, and folded on the raft **11** and has its other end attached to the casing **1**. As this second lanyard **72** unfolds it releases the raft **11** and suspends it with the casing **1** at a predetermined distance beneath the lid.

The devices hereindescribed render the release operation positive and foolproof and assure the suspension of the items of the kit in suitable positions for the safe descent and survival of flight personnel.

We claim:

1. In a survival kit for connection to a harness worn by airflight personnel, in combination a rigid casing, a rigid lid on the casing, said casing and lid having an outline fitting in the usual seat of flight personnel in flight, said casing having recesses on opposite sides thereof; a keeper device in each recess, a plug insertable in said keeper device, releasable means in said keeper device to hold said plug therein, connecting elements extended from said plugs for suspending said plugs and said kit from said harness, manipulable means in one of said recesses connected to said keeper devices for releasing said plugs at will, and a suspending element extended from the kit for suspending the released kit from said harness at a predetermined distance beneath the flight personnel after said plugs are released from said keepers.

2. In a survival kit for connection to a harness worn by airflight personnel, in combination a rigid casing, a rigid lid on the casing, said casing and lid having an outline fitting in the usual seat of flight personnel in flight, said casing having recesses on opposite sides thereof; a keeper device in each recess, a plug insertable in said keeper device, releasable means in said keeper device to hold said plug therein, connecting elements extended from said plugs for suspending said plugs and said kit from said harness, manipulable means in one of said recesses connected to said keeper devices for releasing said plugs at will, coacting connecting elements on said lid and on said casing being releasable at a predetermined pull on the lid, a line connecting said lid to said harness so as to permit the dropping of said casing and lid together to a predetermined distance after said plugs are released, said line at said distance pulling said connecting elements apart so as to separate said lid from said casing, and another line connecting said lid to said casing to suspend said casing at a distance beneath said lid.

3. In a survival kit for connection to a harness worn by airflight personnel, in combination a rigid casing, a rigid lid on the casing, said casing and lid havin an outline fitting in the usual seat of flight personnel in flight, said casing having recesses on opposite sides thereof; a keeper device in each recess, a plug insertable in said keeper device, releasable means in said keeper device to hold said plug therein, connecting elements extended from said plugs for suspending said plugs and said kit from said harness, manipulable means in one of said recesses connected to said keeper devices for releasing said plugs at will, and a suspending element extended from the kit for suspending the released kit from said harness at a predetermined distance beneath the flight personnel after said plugs are released from said keepers, an integral tank formed along a side of the casing adapted to contain a gaseous substance needed for survival of flight personnel.

4. In a survival kit for connection to a harness worn by airflight personnel, in combination a rigid casing, a rigid lid on the casing, said casing and lid having an outline fitting in the usual seat of flight personnel in flight, said casing having recesses on opposite sides thereof; a keeper device in each recess, a plug insertable in said keeper device, releasable means in said keeper device to hold said plug therein, connecting elements extended from said

plugs for suspending said plugs and said kit from said harness, manipulable means in one of said recesses connected to said keeper devices for releasing said plugs at will, coacting connecting elements on said lid and on said casing being releasable at a predetermined pull on the lid, a line connecting said lid to said harness so as to permit the dropping of said casing and lid together to a predetermined distance after said plugs are released, said line at said distance pulling said connecting elements apart so as to separate said lid from said casing, and another line connecting said lid to said casing to suspend said casing at a distance beneath said lid, and coacting means between each plug and its keeper device to accelerate the ejection of the plug from the keeper device when released.

References Cited in the file of this patent

UNITED STATES PATENTS

2,114,301	Harrigan	Apr. 19, 1938
2,264,321	Manson	Dec. 2, 1941
2,366,455	Patten	Jan. 2, 1945
2,461,785	Sullivan	Feb. 15, 1949
2,467,037	Kajdan	Apr. 12, 1949
2,497,772	Horning	Feb. 14, 1950
2,726,832	Gimalouski et al.	Dec. 13, 1955
2,802,252	Gaylord	Aug. 13, 1957

FOREIGN PATENTS

695,255	Great Britain	Aug. 5, 1953
772,729	Great Britain	Apr. 17, 1957