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FIRE FIGHTING APPARATUS AND METHOD

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3 Claims. (Cl. 169—1)

This is a continuation of copending application Serial No. 109,433, filed May 11, 1961 for Apparatus and Method for Dispensing Fluids, now abandoned, and relates to improved fighting methods and apparatus therefor.

It will be well known that present-day fire-fighting methods and apparatus are inadequate for extinguishing forest fires and the like. For example, forest fires spread to the surrounding areas by passing from tree top to tree top in the windward direction at a relatively rapid rate. As the tree tops burn, flaming branches thereof fall from the tops of the trees to the ground and cause burning of the underbrush. Therefore, the main reason why forest fires rapidly spread to surrounding areas is due to the fact that the fire races through the tree tops under the influence of the wind and not along the ground.

However, prior-known fire-fighting apparatus and methods have been confined to fighting the forest fire on the ground and are, therefore, inadequate in extinguishing the fire that races through the tree tops. Thus, the only effective prior-known method of fighting such forest fires was to tend to isolate the fire area by clearing an area well in advance of the ravaging fire. However, because this method is very time-consuming, the fire break wall or cleared area must be started at a great distance from the fire so that the same can be completed by the time the fire reaches the cleared area in order to stop the fire whereby a large amount of forest area is sacrificed to the advancing fire.

One of the many hazards of this type of fire-fighting method is that the wind can change directions so that the fire races off in a new direction away from the fire break wall without having the fire break wall perform its function.

Another method of fighting such fires is to attempt to extinguish the fire from the ground with fire hoses and the like by trucking water into the fire area. However, because the fires are located in forests, no means are provided for getting the fire-fighting equipment and water to the scene of the fire. Even when such equipment is brought to the fire area, the heat thereof prevents the fire fighters from getting close enough to extinguish the fire in the tree tops.

Attempts have been made to fight the fire from the air by carrying destructible containers filled with water or the like in aircraft over the scene of the fire and, thereafter, dropping the containers from the aircraft so that the containers will burst when hitting the ground and thereby spray the water contained therein over the fire. However, as previously mentioned, the main source of the forest fire is in the tree tops and not at the ground level, whereby such method has been found to be inadequate.

According to the teachings of this invention, however, novel apparatus and methods are provided for adequately fighting such forest fires by extinguishing the fire at the source thereof, namely, in the tree tops.

For example, one embodiment of this invention comprises a self-contained unit having fluid storage means for receiving a desired fluid from a source of fluid. The unit also has a nozzle for emptying the fluid from the storage means when desired, the nozzle being operated by a person carried in the unit.

Such unit is selectively attached to a hovering type of downdraft or vertical prop wash creating aircraft such as a helicopter or the like, whereby the aircraft can fly the unit over the fire area and hover on the windward side thereof so that the operator of the unit can control the distribution of fluid from the storage tanks thereof to the fire at the source thereof in the tree tops. In this manner, forest fires and the like can be adequately extinguished without building time-consuming and sometimes inadequate fire breaks and the like.

Another embodiment of this invention includes the steps of providing a plurality of the aforementioned units and transporting the same either through the air or on the ground to a body of water, such as the lake or river, disposed closely adjacent the fire area. Such units are then floated on the body of water and while being floated thereon have their storage means filled with water from the body of water.

Thereafter, when one of the units has been filled with a supply of water, the hovering type of aircraft, such as a helicopter or vertical takeoff and landing type of aircraft, attaches itself to the unit and flies the unit over the fire area. When the unit is over the fire area, the aircraft hovers on the windward side thereof whereby the unit can be moved closely adjacent the source of fire without harm to the operator thereof and the operator can control the distribution of the water from the storage means onto the fire in the tree tops. As the water is being distributed from the unit, the downward force of the air being delivered by the rotating propeller, rotor or the like of the hovering aircraft, causes the water being distributed from the unit of this invention to break up into droplets and be dispersed in an effective manner to extinguish the fire in the tree tops.

After the unit has been emptied in the above manner, the aircraft flies the emptied unit back to the body of water and floats the same thereon. The now emptied unit can be refill with water from the body of water and, while that unit is being refilled, the aircraft can pick up another filled unit and fly the same back to the fire area to repeat the fire-fighting cycle.

In this manner, one aircraft can substantially continuously fight the fire while another unit is being refilled with water.

Therefore, it can be seen that this invention provides improved methods and apparatus for adequately fighting forest fires at the source thereof in a manner hereetofore unknown in the fire-fighting art.

However, it should be understood that this invention is not limited to apparatus and methods for fighting fires located only in the forest, as the same is readily applicable to fighting fires in the cities and other areas as well.

For example, such fire-fighting units of this invention can be rapidly transported to the fire area in a city by an aircraft and immediately begin to fight the fire without any time delay, whereas the conventional engine and ladder system must fight traffic to arrive at the fire scene and,
thereafter, hook up hoses and ladders before the fire fighting can begin. Further, the methods and apparatus of this invention can be utilized to fire fights in relatively tall buildings in which the conventional hydro and ladder fire-fighting system are limited to the height that the ladder thereof can reach.

Also, it should be understood that this invention is not to be limited to a fire-fighting apparatus and method, as methods and apparatus of this invention can be utilized for dispensing any type of fluids, as desired, from an aircraft.

For example, the methods and apparatus of this invention can be utilized to combat pests and the like by spraying pest-control fluid from the air over the infested area. In this regard, the apparatus and methods of this invention could be utilized to fight the gypsy moth, which begins its harmful activities in a relatively small area and then gradually spreads its destruction in an ever-widening circle. It is believed that the methods and apparatus of this invention could fight such a pest more effectively than heretofore has been possible by means of conventional airplane-spraying methods heretofore described.

Accordingly, it is an object of this invention to provide an improved apparatus for dispensing fluids from an aircraft or the like.

Another object of this invention is to provide an improved method for dispensing fluid from an aircraft or the like.

A further object of this invention is to provide an improved apparatus for fighting fires from an aircraft or the like.

Also, it is an object of this invention to provide fire fighting apparatus which can be used in conjunction with conventional unmodified aircraft, thus avoiding the expense of purchasing and maintaining specifically constructed aircraft solely for fire fighting purposes.

A further object of this invention is to provide improved methods and apparatus for fighting forest fires at their source, thereof, namely in the tree tops.

Other objects, uses and advantages of this invention are apparent from a reading of this description, which proceeds with reference to the accompanying drawings forming a part thereof, and wherein:

FIGURE 1 is a perspective view illustrating the improved fluid-dispensing unit of this invention.

FIGURE 2 is a fragmentary, perspective view of the fluid-dispensing unit illustrated in FIGURE 1 and illustrates floating means secured thereto.

FIGURE 3 is a fragmentary, elevation view illustrating the method of attaching the fluid-dispensing unit of this invention to an aircraft or the like.

FIGURE 4 is a top schematic view of the unit of this invention and illustrates the piping system thereof.

FIGURE 5 is a schematic view illustrating the piping and valving arrangement of this invention in a simplified form.

FIGURE 6 is a fragmentary, perspective view illustrating another embodiment of this invention for attaching floating means to the fluid-dispensing unit of this invention.

FIGURE 7 is a fragmentary, cross-sectional view taken on line 7-7 of FIGURE 6.

FIGURE 8 is a schematic view illustrating the cooperative relationship between the fluid-dispensing unit and the downdraft creating aircraft in extinguishing a tree-top forest fire.

While the various methods and apparatus of this invention hereinafter described as being particularly adaptable for fighting forest fires, it is to be understood that the same are equally adaptable for fighting other types of fires or for spraying any type of fluid in a desired area.

Therefore, this invention is not to be limited to the embodiment thereof illustrated in the drawings, as the drawings are merely utilized to illustrate one of the wide variety of uses for this invention.

While the term "spray" will be used to some degree herein, it is to be understood that I do not use the term in the normal sense of the word because an ordinary spray is inadequate for fighting fires of this type described herein. Accordingly, it will be understood that as used herein, the term "spray" means controlled distribution of large volumes of liquid. It is also to be understood that the term "liquid" is intended to include chemicals or mixtures thereof as well as water or other liquids useful for fire fighting purposes.

Referring now to FIGURE 1, the self-contained, fluid-dispensing unit or capsule of this invention is generally indicated by the reference numeral 10 and comprises a frame structure of any suitable design and configuration and having a lower platform 14 for supporting a pair of inflatable storage tanks 16, a self-contained, electrical power and control unit 18, a motor-driven pump 20, FIGURE 4, and a nozzle unit 22.

The fluid-dispensing unit 10 is so constructed and arranged that an operator can stand in a compartment 24 disposed between the storage tanks 16 and effectively operate the unit 10 in a manner hereinafter described, whether the unit 10 is on the ground or in the air.

The unit 10 is adapted to be transported on the ground by having a plurality of wheels 26 rotatably secured on wheel shafts 28 and 30 secured to the frame 12 and projecting beyond the wheels 26, for a purpose hereinafter described. The wheel shafts 28 and 30 are secured to the frame 12 to permit turning of the unit 10 on the ground and is interconnected to a tongue or yoke 32 adapted to be attached to a motor vehicle or the like for pulling the unit 10 on the ground.

When it is desired to float the unit 10 on a body of water, a pair of floats or pontoons 34, FIGURE 2, normally carried on the unit by a pair of brackets 36, FIGURE 1, secured to the frame 12 of the unit 10, are interconnected to the wheel shafts 28 and 30 on each side thereof in the manner illustrated in FIGURE 2.

In particular, the floats or pontoons 34 carry a pair of brackets 38 surrounding the floats 34 and having a pair of spaced and apertured lugs 40 adapted to be telescoped over the free ends of the wheel shafts 28 and 30 after the cotter pins 42 and lock nuts 44 have been removed therefrom. After the pontoons 34 have been disposed on the wheel shafts 28 and 30, the lock nuts 44 and cotter pins 42 are replaced to hold the pontoons 34 on the unit 10.

In this manner, the pontoons or floats 34 are detachably secured to the unit 10 to float the same on a body of water and can be removed, when desired, when the unit 10 is being transported on the ground.

As illustrated in FIGURE 4, the attached floats 34 project downwardly from the fluid-dispensing unit 10 so as to float the entire unit 10 on a body of water, the floats 34 being formed in any suitable manner and of any suitable material.

Alternatively, the floats 34 can be secured to the unit 10 to float the same on a body of water in the manner illustrated in FIGURES 6 and 7.

In particular, the pair of opposed floats 34 are operatively interconnected together by yokes 46 having fastening members or blocks 48 welded at each end thereof and detachably secured to the lugs 40 of the brackets 38 of the floats 34 by bolts 50. Each fastening member 48 carries a pair of projecting plates 52 extending upwardly on each side of the fastening member 48 to define a slot 54 therebetween into which the opposed free ends of the wheel shafts 28 and 30 can be inserted, in the manner illustrated in FIGURES 6 and 7, so that the wheel shafts 28 and 30 rest on the fastening members 48 when the unit 10 is disposed on the float assembly illustrated in FIGURE 6.

In this manner, the float unit cradle assembly illustrated in FIGURE 6 can be floating on the body of water, and the aircraft carrying the fluid-dispensing unit 10 can set the same down onto the float assembly illustrated in FIGURE 6, so that the unit 10 can be floated.
on the assembly. Thereafter, the unit 10 can be attached to the aircraft in the manner hereinafter described and raised upwardly from the float assembly and carried away therefrom whereby the float assembly can be utilized for supporting the unit 10 when desired. Thus, when the float assembly of FIGURE 6 is utilized, the weight of the float assembly is not borne by the aircraft when flying the unit 10 to the fire area or the like, as in the manner when the floats 34 are attached to the unit 10, as illustrated in FIGURE 2.

Further, when the float assembly of FIGURE 6 is utilized, the floats 34 are not carried by the unit 10 when the unit 10 is carried to the fire-fighting area and, thereby do not present any obstructions in the way of the fluid-distributing unit 22, as would be provided when the floats 34 are attached thereto in the manner illustrated in FIGURE 2.

The fluid-dispensing unit 10 is adapted to be detachably secured to the undercarriage of an aircraft or the like in the following manner.

As illustrated in FIGURES 1 and 3, a pair of cross
members 56 are carried by the frame 32 of the fluid-dispensing unit 10 at the top thereof. Each crossbar 56 has two pairs of opposed plates 58 secured thereto and projecting upwardly therefrom. Each pair of plates 58 defines a slot 60 therebetween and carry a removable pin 62 which spans the slot 60 thereof in the manner illustrated in FIGURE 1.

When it is desired to attach the undercarriage 64, FIGURE 3, of the aircraft 66 to the fluid-dispensing unit 10, the pins 62 are removed, whereby the lower bars 68 of the undercarriage 64 of the aircraft 66 are adapted to be received in the slots 60 defined between the pairs of plates 58, in the manner illustrated in FIGURE 3. Thereafter, the pins 62 are replaced so that the lower bars 68 of the undercarriage 64 of the aircraft 66 are disposed between the crossbars 56 and the pins 62, so that upon upward movement of the aircraft 66 the unit 10 can be carried therewith.

In this manner, the aircraft 66 can be detachably secured to the fluid-dispensing unit 10 when desired. Thus, when the unit 10 is floating on a body of water 70, as illustrated in FIGURE 3, the aircraft 66 can fly over the same and hovering downwardly into a position for the undercarriage 64 thereof to be attached thereto in the above manner. Conversely, the aircraft 66 carrying the unit 10 can move to a position over the body of water 70 until the unit 10 is floating thereon through the action of the floats 34 and, thereafter, be detached therefrom by the removable pin 62, so that the aircraft can then be attached to another unit 10 when desired.

The attaching means 62 of the fluid dispensing unit 10 can also be utilized for storing the pontoon arrangement of FIGURE 2 on the unit 10 when the unit 10 is not in use.

In particular, the detached pontoons 34 can be inverted so that the lug plates 40 thereof are disposed in the slots 60 between the plates 58 whereby the pins 62 can be utilized to fasten the lug plates 40 of the pontoons 34 to the frame 12 of the unit 10, the ends of the pontoons 34 resting in the brackets 36 of the unit 10.

As illustrated in FIGURE 4 and in simplified form in FIGURE 5, the pump 20 carried by the fluid-dispensing unit 10 has an outlet 72 respectively interconnected to a pair of conduit means 74 and 76. The conduit means 74 and 76 are respectively connected to T-connectors 78 and 80.

The T-connector 78 is interconnected to a valve 82 disposed intermediate the T-connector 78 and another T-connector 84, the T-connector 84 being interconnected at one side thereof to the left-hand storage tank 16 and at the other side thereof to a conduit 86 leading to the pump inlet 88.

Similarly, a valve 90 is disposed intermediate the T-connector 80 and another T-connector 92, the T-connector 92 having one side thereof connected to the right-hand stor-

age tank 16 and the other side thereof interconnected to a conduit 94 leading to the pump inlet 88.

A pair of valves 96 and 98 are respectively disposed in the conduit means 86 and 94 before the same reach the pump inlet 88.

The T-connector 78 is interconnected to a nozzle 100 by a flexible conduit means 102, the flexible conduit means 102 having a valve 104 disposed therein.

Similarly, the T-connector 80 is interconnected to the nozzle 100 by a flexible conduit means 106 having a valve 108 disposed therein.

The inlet 88 of the pump 20 is interconnected to a flexible conduit means 110 having a valve 112 disposed thereon and a screened intake 114 at the outer free end thereof, the screened intake 114 being detachable from the conduit means 110 whereby the conduit means 110 can be interconnected to any desired source of fluid, such as a fire hydrant or the like.

When it is desired to fill the storage tanks 16 with fluid, such as water or the like the operator connects the conduit means 110 to a supply of said fluid. For example, when the storage tanks 16 are to be fed water from a body of water or the like and the fluid-dispensing unit is floating on that body of water in the above manner, the conduit means 110 is dropped over the side of the unit 10 whereby the screened intake 114 thereof is disposed in the body of water 70 in the manner illustrated in FIGURE 5.

Alternatively, the conduit means 110 can be interconnected to any other type of fluid supplying means, as desired.

Thereafter, the operator opens the valves 82, 90 and 112 and closes the valves 96, 98, 104 and 108. Subsequently the pump 20 is turned on whereby water from the source 70 is drawn in through the screened intake 114 of the conduit means 110 into the pump inlet 88. The water drawn into pump inlet 88 is forced out of the outlet 72 into the conduit means 74 and 76 whereby the water passes through the open valves 82 and 90 into the storage tanks 16 to uniformly fill the same. Any air in the tanks 16 escapes through the top bungs 116 thereof.

Of course, any fluid pressure system, such as a fire hydrant or the like, can be utilized to fill the storage tanks 16 directly through the top bungs 116 thereof.

After the tanks 16 have been filled in the above manner, the fluid in the storage tank 16 can be emptied and sprayed out through the nozzle 100 when desired in the following manner.

The operator now closes the valves 82, 90 and 112 and opens the valves 96, 98, 104, and 108. Thereafter, the pump 20 is turned on whereby the fluid is drawn uniformly from the tanks 16 through the conduit means 86 and 94 into the pump inlet 88. The fluid drawn into the pump inlet 88 is forced out of the pump outlet 72 into the conduit means 74 and 76 whereby the water forced through the conduit means 74 and 76 enters the conduit means 102 and 106 through the opened valves 104 and 108 and is directed through the nozzle 100 to be discharged outwardly therefrom.

The amount of the fluid distributed on a fire is controlled by the operator by manipulation of lever 118 carried by the nozzle 100 and which regulates a throttle valve 120 disposed in the nozzle 100, the position of the throttle valve 120 controlling the amount of fluid distributed by the nozzle 100.

As illustrated in FIGURE 1, nozzle 100 is secured between a pair of posts 122 pivotally carried on a yoke-like member 124 pivotally secured on top of a post 126.

In this manner, the nozzle 100 is adapted to be moved in a vertical arc by pivoting the posts 122 on the yoke 124 in a horizontal arc by moving the yoke 124 relative to the post 126. For example, the nozzle 100 can be moved through a vertical arc of approximately 175° and through a horizontal arc of approximately 175°. Thus, the operator can point the nozzle 100 in any desired direction on that side of the fluid-dispensing unit 10 by merely manipu-
ulating the handle 125 of unit 22 is a manner that is apparent. Should it be desired to utilize the fluid from only one of the storage tanks 16, either the valve 96 or the valve 98 can be closed when the pump 20 is operating to force the fluid out through the nozzle 100.

The power unit 18 of the fluid-dispensing unit 10 can be battery operated or comprise an internal combustion engine, if desired. In either event, the power unit 18 is utilized to drive the pump 20 in a conventional manner. In addition, the power unit 18 can operate a suitable electrical system for not only providing light in the operator compartment 24 of the unit 10 but also for providing lighting to scan the area where the fluid from the storage tanks 16 is to be distributed.

Accordingly, it can be seen that the fluid-dispensing unit 10 of this invention is a completely self-contained unit that provides its own power for pumping fluid into and out of the storage tanks 16 and for lighting any desired area. Operation of the fluid-dispensing unit 10 and the method of this invention will now be described.

Assuming that a forest is on fire, a pair of fluid-dispensing units 10 are transported to a body of water disposed closely adjacent the fire area, the units 10 being pulled by the ground by suitable equipment, if desired, in the manner previously described, or flown to the body of water.

For example, the fluid-dispensing units 10 may be transported on the ground to the nearest helicopter airport. When a fire breaks out, the helicopter is attached to one of the units and flies the same to a body of water disposed closely adjacent the fire area whereby the unit 10 can be floated on a body of water. The helicopter is then detached from the unit 10 and flies back to the airport to get the other unit 10. While the aircraft is flying back to the airport, the unit 10 on the body of water can be operated in the above manner to fill the storage tanks 16 thereof with water so that when the aircraft returns with the other unit 10, the first unit is ready to be flown to the fire area while the second unit 10 is being filled with water.

Alternately, both units 10 can be transported on the ground to the body of water.

Thereafter, the units 10 are floated on the body of water, either by the pontoon arrangement illustrated in FIGURE 2, or by utilizing the pontoon cradle assembly illustrated in FIGURE 6.

When the fluid-dispensing units 10 are floating on the water, both of the units 10 are operating to fill the storage tanks 16 thereof in the above manner by drawing the water through the screen inlet 114 of the conduit means 110 into the storage tanks 16, if the units 10 have not already been provided with fluid in the storage tanks 16 thereof.

A hovering type of downdraft creating aircraft 66, such as a helicopter or the like having a propeller 67, then comes over one of the filled fluid-dispensing units 10 and is interconnected thereto by the pin arrangement 62 previously described. The aircraft 66 then lifts the filled unit 10 from the body of water 70 and flies the same over the fire area.

As suggested in FIGURE 8, the aircraft 66 hovers closely over the fire area, preferably on the windward side thereof, to permit the fluid-dispensing unit 10 to be brought as close as possible to the fire raging through the tree tops below, whereupon the operator of the unit 10 adjusts the valving in the above manner to permit the pump 20 to spray the water from the storage tanks 16 out through the nozzle 100, the operator directing the spray from the nozzle 100 by moving the same in the desired horizontal and vertical arcs.

As the water is sprayed from the nozzle 100, the force of the air being directed downwardly by the hovering means of the aircraft 66, such as the propeller or rotor 67 thereof, spreads and drives the discharged water downwardly in a deluge of large and small drops while at the same time beating the flames down and out and dissipating the tremendous heat generated by the fire, this heat preventing close approach to the fire by conventional ground equipment. In addition, this descending action of the aircraft 66 keeps the flames of the fire from reaching the operator of the unit 10.

When the unit 10 has been completely emptied in the above manner onto the fire below, the aircraft 66 flies the now-empty unit 10 back to the original body of water and leaves the same there to be filled in the above manner. While that unit 10 is being refilled, the aircraft 66 takes the other filled unit 10 back over the fire area, whereby that filled unit 10 can be emptied onto the fire in the same manner as previously described.

In this manner, one aircraft 66 can handle two units 10 in a sequence whereby one unit 10 is being emptied on the fire while another unit is being filled, and, thereby, is able to substantially maintain fire fighting equipment over the fire area at all times.

Thus, it can be seen that the methods and apparatus of this invention are particularly adaptable for fighting forest fires, the extinguishing fluid being directed at the critical point of the fire racing through the tree tops, a feature heretofore unattainable by prior-known fire fighting methods and equipment especially when combined with a utilization of the vertical propwash of a hovering aircraft.

However, it is to be understood that the methods and apparatus of this invention could be utilized for fighting fires in the city, as previously described, the aircraft being able to rush the fire-fighting units 10 to the scene of the fire in a minimum of time, without being bothered by traffic and the like, whereby the units 10 can immediately be brought into action without time-consuming erection of ladders, hoses and the like. Such fire fighting equipment can also be utilized to fight the fires in rather tall buildings, which are not reachable by standard ladder equipment.

In addition, it should be understood that this invention can be utilized in dispensing other types of fluid, if desired; for example, the method and apparatus of this invention can be utilized in spraying insecticide and the like for controlling pests and the like.

What is claimed as new is as follows:

1. A method for spraying liquid on a fire to extinguish the same and comprising the steps of providing a plurality of units each having liquid storage means and having means for filling said storage means and for emptying said storage means, floating said units on a body of water, filling one of said units with said water while said one unit is floating thereon, attaching said filled unit to an aircraft, flying said filled unit over a fire area, emptying said water from said one unit on said fire while maintaining said unit in the air, flying said now emptied unit back to said body of water, attaching said one unit from said aircraft to float the same on said body of water; and, thereafter, attaching another filled unit to said aircraft to be emptied on said fire while said one unit is being refilled with said water from said body of water.

2. A fluid-dispensing unit comprising a frame, fluid storage means carried by said frame, pump means carried by said frame, said pump means being adapted to fill said storage means with fluid from a source of fluid and being adapted to empty fluid from said storage means, means carried by said frame for floating said unit on a body of water, means carried by said frame for readily detachably securing said unit to an aircraft, and wheel shafts carried by said frame, said shafts carrying wheels for moving said unit over ground, and said means for filling said unit being detachably secured to said wheel shafts, said means for floating said unit comprising a pair of floats interconnected together by a pair of spaced yokes, said yokes being detachably secured to said wheel shafts.

3. A fluid-dispensing unit comprising a frame, fluid storage means carried by said frame, pump means carried by said frame, said pump means being adapted to fill said storage means with fluid from a source of fluid and being adapted to empty fluid from said storage means, means carried by said frame for floating said unit on a body of water, means carried by said frame for readily detachably securing said unit to an aircraft, and wheel shafts carried by said frame, said shafts carrying wheels for moving said unit over ground, and said means for filling said unit being detachably secured to said wheel shafts, said means for floating said unit comprising a pair of floats interconnected together by a pair of spaced yokes, said yokes being detachably secured to said wheel shafts.
ried by said frame, said pump means being adapted to fill said storage means with fluid from a source of fluid and being adapted to empty fluid from said storage means, means carried by said frame for floating said unit on a body of water, and means carried by said frame for readily detachably securing said unit to an aircraft, said means for floating said unit comprising a pair of floats interconnected together by a pair of spaced yokes, said yokes being detachably secured to said frame.

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