July 17, 1962 G. MAYR 3,044,566

JET-PROPELLED SKI

Filed May 5, 1960 2 Sheets-Sheet 1

Fig. 1

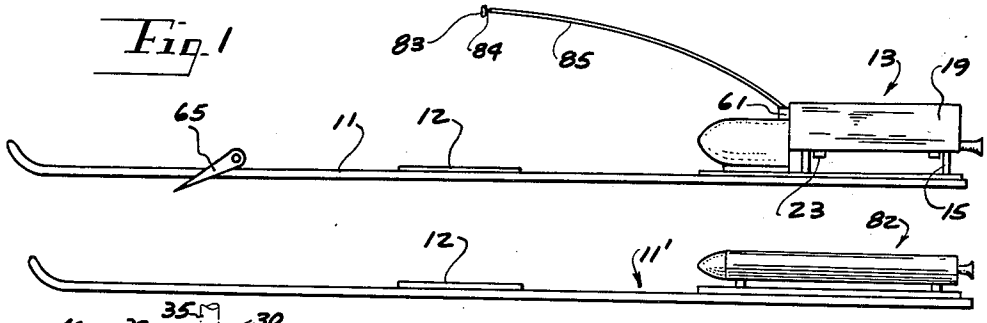


Fig. 2

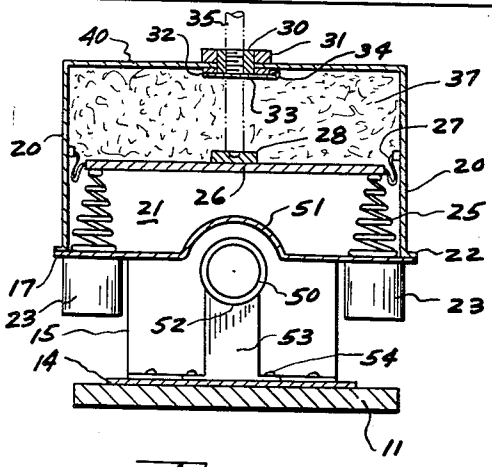


Fig. 5

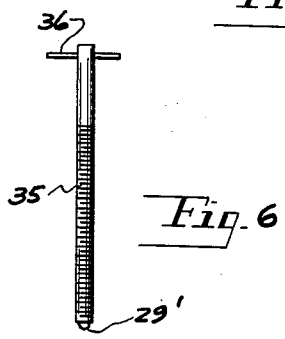


Fig. 6

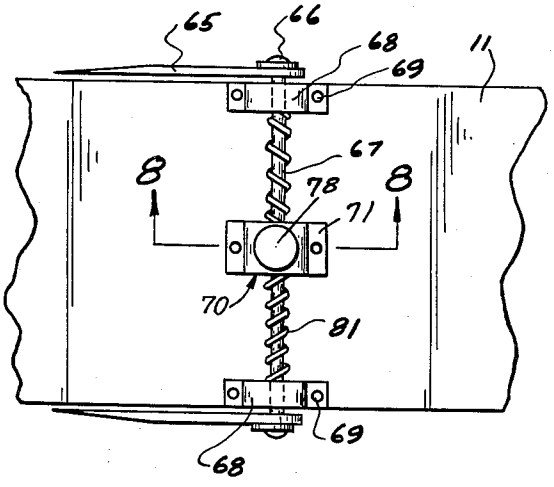


Fig. 7

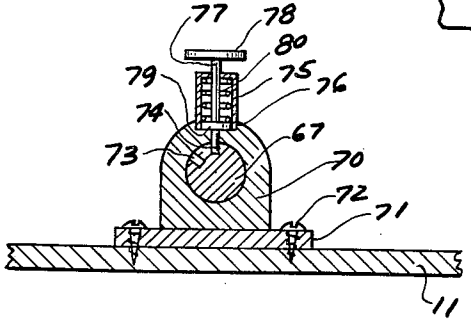


Fig. 8

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JET-PROPELLED SKI

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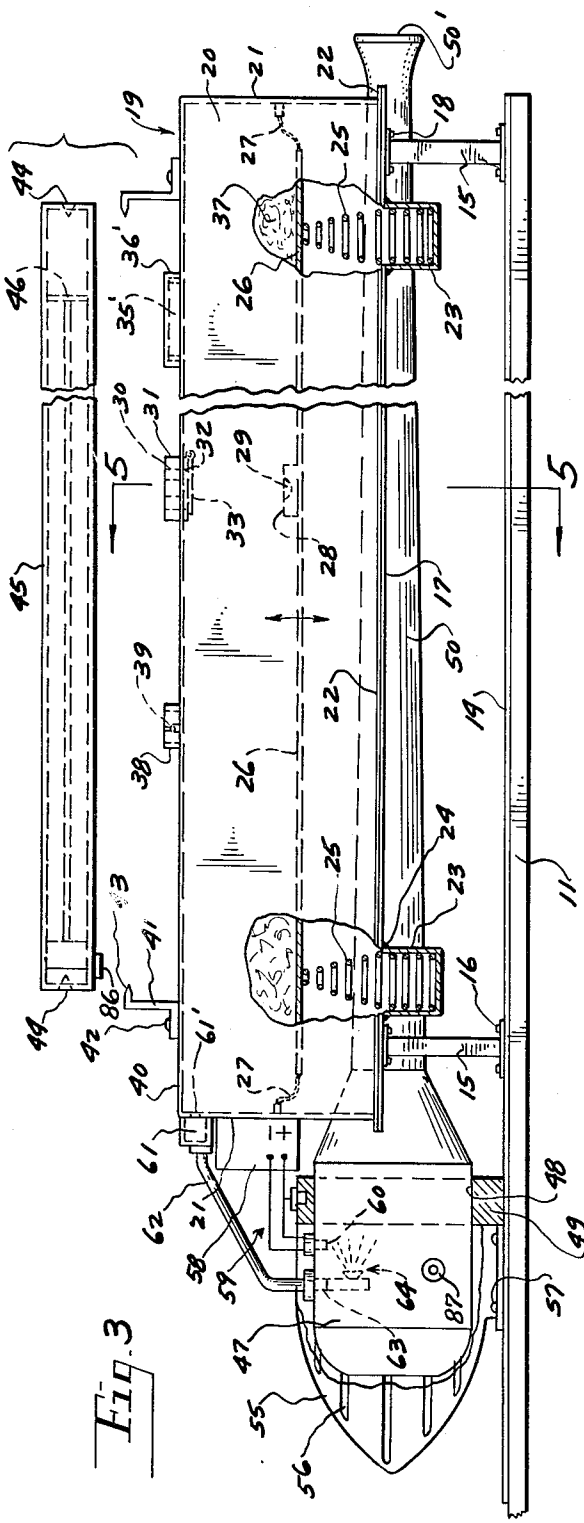


Fig. 3

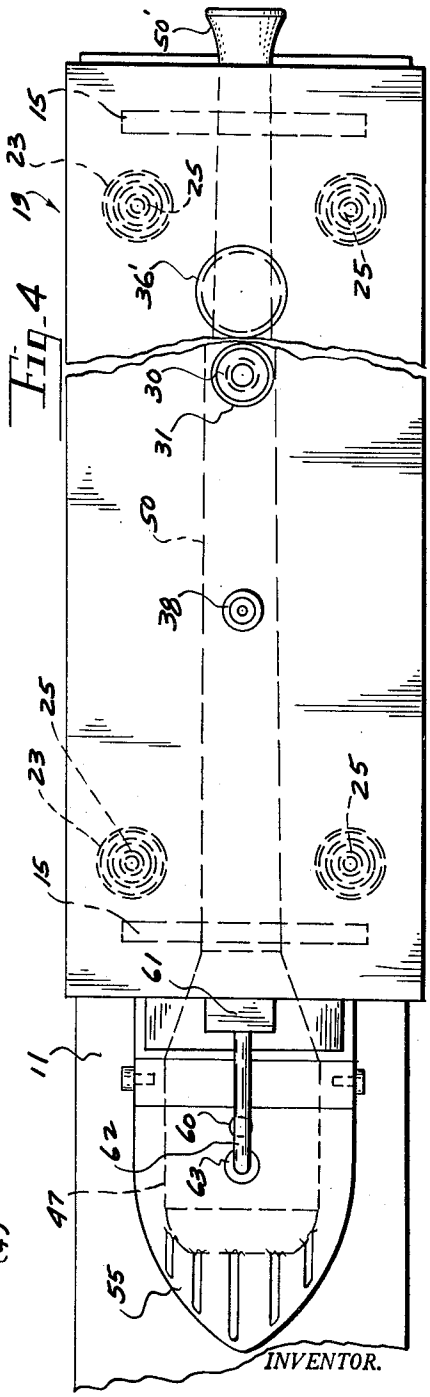


Fig. 4

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United States Patent Office 3,044,566 Patented July 17, 1962

3,044,566

JET-PROPELLED SKI

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Filed May 5, 1960, Ser. No. 27,113
5 Claims. (Cl. 180—3)

This invention relates to a rocket or jet-propelled ski.

It is the object of the present invention to provide a rocket or jet-propelled ski designed as individual transportation for man for supplying motive power to the said skis wherever he goes, such as over mountain tops, snow covered roads and deserts, frozen lakes and icy roads. Such a device would be particularly useful in certain northernmost countries, such as Alaska and Finland, for illustration.

Heretofore rockets have been developed for use on sleds normally moving on tracks. However, there is a great limitation in the field of activity for jet-propelled sleds. On the other hand, there is practically no limitation upon where man may go with jet-propelled skis, as for example hills, mountains, stony deserts and other areas where it would be extremely impractical to use a jet-operated sled.

A jet-operated ski is something distinctly different from the jet or rocket operated sled. It is therefore a primary object of the present invention to apply power to conventional types of skis and to eliminate the heretofore manual effort required, particularly in traveling over stretches of horizontal terrain, for example, where with the present jet or rocket-operated skis, speeds up to 50 or 60 miles an hour would easily be possible, corresponding to speeds often developed in going down mountains or hills.

It is a further object to design a jet or rocket-operated ski which is simple in construction, capable of mass production and low in cost.

It is a further object of the present invention to provide a jet or rocket operated ski which should be particularly helpful to men who must be outdoors in snowy climates for hours, or even for days when employed in checking conditions of snow and ice as affecting telephone wires and poles, or for use by the armed services. Such a device would save hours and hours of time due to the speeds which may be developed and would be particularly useful in the defense of the country for ski troops.

It is accordingly the primary object of the present invention to provide a jet rocket for rocket operated ski, which is easily attachable and which would be fully effective in providing motive power for the skis, particularly for use on substantially level snowy areas and for moving over great distances at high speeds.

These and other objects will be seen from the following specification and claims in conjunction with the appended drawings, in which:

FIG. 1 is a schematic side elevational view of a ski with a jet motor mounted thereon.

FIG. 2 is a similar view with a rocket motor mounted thereon.

FIG. 3 is a side elevational view on an enlarged scale of the rear of the ski shown in FIG. 1 with portions of the illustration broken away for clarity.

FIG. 4 is a fragmentary plan view of FIG. 3.

FIG. 5 is a section taken on line 5—5 of FIG. 3.

FIG. 6 is an elevational view of the hand operated screw for activating the fuel tank compressor plate as fragmentarily illustrated in dotted lines in FIG. 5.

FIG. 7 is a fragmentary plan view of the front portion of the ski shown in FIG. 1 on an enlarged scale illustrating the brake mechanism.

FIG. 8 is a section taken on line 8—8 of FIG. 7 on an increased scale.

It will be understood that the above drawings illustrate merely a preferred embodiment of the invention and that other embodiments are contemplated within the scope of the claims hereafter set forth.

FIG. 1 shows a conventional type of ski 11 with a central mounting pad 12 adapted to receive in a conventional manner a releasable fastening structure by which the user adapts his shoes to the skis. This construction being conventional, it is omitted from the drawing and from the description.

In FIG. 1, there is generally indicted at 13, a jet motor mounted and secured upon the rear end portion of the ski, as will be hereafter described, whereas in FIG. 2 there is shown a similar ski 11' having mounted upon its rear end the rocket motor 82. It is contemplated as a part of the present invention that the ski may be either rocket or jet propelled.

Referring now more particularly to FIGS. 3, 4, and 5, the elongated ski 11 fragmentarily shown in FIG. 3 carries upon its upper surface the fibre insulating panel 14. Longitudinally spaced upright brackets 15 are respectfully mounted on the ski and inwardly of the end thereof, as shown in FIG. 3, with the bottom flange of the respective brackets secured to the ski as by the fasteners 16.

The said brackets are for the purpose of supporting the fuel tank, generally indicated at 19. Said fuel tank includes the substantially rectangular bottom plate 17 which, however, as shown in FIG. 5, has an upwardly arched longitudinal and central portion 51 to receive the exhaust tube 50 of the jet engine as hereafter described.

The fuel tank 19 also includes the opposed longitudinally extending side walls 20, the front and rear walls 21 and the top wall 40. As shown in FIGS. 3 and 5 the lower edges of the side walls 20 are outwardly flanged at 22 for connection with the bottom wall 17 to thus complete the fuel tank construction and wherein it is noted that the said fuel tank is mounted centrally over the longitudinally spaced upright brackets 15 and fixedly secured thereto as by suitable fasteners 18, shown in FIG. 3.

Depending from the undersurface of the tank bottom wall 17 adjacent the forward end of plate 17 are a pair of transversely spaced cups 23 secured to the undersurface of the bottom plate 17 as by the welds 24 and with the interior portions of the cup open to the plate 17. There is an additional pair of transversely spaced depending cups 23 adjacent the rear portion of plate 17 and similarly secured thereto. These cups are for the purpose of supporting the respective conical springs 25 nested within the said cups and with their upper ends projecting into the interior of the tank 20 so as to support the rectangular elongated pressure pad 26. Said pad is loosely positioned on the interior of said tank and peripherally and sealingly joined thereto as by the continuous flexible attaching element 27, which is preferably constructed of nylon and which is peripherally secured around the pressure pad 26 along its outer edge, and the outer edge of the attaching means 27 is peripherally secured to an interior central portion of the tank 20 throughout its interior periphery.

Thus the pressure pad 26 against which the supply of fuel 37 will bear, is centrally positioned adjustably within the tank 20 and rests upon the springs 25. This provides a means of placing fuel 37 under compression, as the tank is filled through the tank inlet 35' normally closed by the conventional cap 36'.

Centrally mounted upon the pressure pad 26 is the reinforcement block 28 with ball groove 29 at its central portion adapted to receive the ball end 29' of the hand screw 35 carrying the transverse handle 36.

The top surface of the tank is apertured to receive the interiorly threaded sleeve 30, FIG. 5, which is retained fixedly with respect to the top wall 40 of the tank by the

respective discs 31 and 32, which are suitably pressed on to the said sleeve. The closure gate 33 bears against the lower end of the sleeve 30, being hingedly mounted against the undersurface of the tank top wall, as at 34, said hinge including spring biasing means for normally maintaining the closure gate 33 in the position shown in FIG. 5.

An air bleed valve is indicated at 38 upon the top wall of the tank and containing a conventional check type of valve 39 as shown in FIG. 3. Before the tank is filled with the fuel 37, which may be a semi-solid type of fuel or a liquid fuel, the hand screw 35 is projected and threaded through the sleeve 30 in FIG. 5 which automatically tilts the gate 33 to an open position. The handle is threaded down through the sleeve until its ball end 29' engages the ball groove 29 in the block 28 upon the pressure pad 26.

Further application of rotary power to the screw 35 causes the pressure pad 26 to be depressed within the tank 20 against the action of the four springs 25. Thus within the limits of the flexible sealing and attaching means 27, which peripherally seals the pressure pad 26 with respect to the central interior portions of the tank, the said pressure pad may be lowered towards and adjacent the bottom wall 17 in the tank. Thereafter, fuel is introduced through the inlet 35'—36' until the fuel is under a pressure filling the said tank which overcomes at least, or corresponds to the combined pressure of the compressed springs 25.

The cap 36' is then threaded back on to the tank inlet 35' and the screw 35 removed and with the gate 33 closed the supply of fuel 37 within the tank is under a constant pressure exerted by the compressed springs 25.

Referring particularly to FIG. 3, the pair of longitudinally spaced brackets 41 are secured at 42 upon the top wall 40 of the fuel tank and includes the mounting projections 43 in opposed relation adapted for extension into the axial depressions 44 at opposite ends of the removable hand pump 45 to thus provide a convenient means of transporting the hand pump with the jet engine assembly. The hand pump 45 includes a conventional reciprocating manually operated reciprocating piston 46 for applying compressed air to the jet engine during the initial starting, as required. The pump includes outlet 86 adapted for registry with nipple 87 on jet engine 47.

It is contemplated, however, that an air pump could be employed of any other form or a suitable compressor for the intended purpose, or on the other hand a sealed chamber containing compressed air could be used for engine starting. These are things, however, which tend to render the device more complicated, and though such means may be employed, it has been found that in the preferred present embodiment of the invention that a simple hand pump or hand compressor 45 serves the purpose efficiently.

The conventional jet engine 47 and its specific mechanism forms no part of the present invention and accordingly a detailed explanation of its construction operation is omitted. However, as shown, the present jet engine generally indicated at 47 includes the burner housing or combustion chamber housing which is positioned within the recess 48 in the mounting bracket 49, which is suitably secured to a portion of the ski 11.

There is in conjunction with the combustion chamber of the jet engine, the elongated and rearwardly tapered exhaust tube 50 of a substantially conventional construction and which flares outwardly at its end as at 50' in a conventional manner.

As above described, the bottom plate 17 of the tank 19 is longitudinally formed or grooved upwardly at 51 so as to provide a substantial clearance and spacing for the exhaust tube 50, whose rearward end is supported by the additional bracket 53 anchored at 54 to the fibre insulation strip 14 upon the ski body 11, as best shown in FIG. 5.

The protective cap or grille 55 with a series of apertures 56 formed therethrough is mounted over the forward portion of the combustion portion of the jet engine 47 for protectingly enclosing the same and at its base is secured to the ski as by the fasteners 57, FIG. 3. A suitable battery casing, is indicated at 58 mounted on the forward end of the tank 19 for storing a proper type of battery for ignition purposes and which includes connected thereto the lead wires 59, which extend to the firing means 60 upon the interior of the combustion chamber. This firing means is for the purpose of igniting the fuel mixture and may be a form of glow plug or spark plug or any other suitable ignition means.

Directly above the battery casing, and also mounted upon the tank is the housing which contains the shutdown control for the engine, as well as the fuel regulator, as designated generally at 61. The fuel regulator communicates as at 61' with the interior of the tank for receiving the fuel 37 which is under pressure, as above described. The fuel as regulated is delivered through the conduit 62 to the fitting 63 and is sprayed or otherwise delivered in finely divided form to the interior of the combustion chamber as by the fuel delivery fitting 64, being a conventional construction which, in itself forms no part of the present invention.

It is contemplated that the jet engine is applied to the present invention as a unit in association with the other elements above described and that the detail of construction of the jet engine forms no part of the present invention. Thus there is provided on the rear portion of the ski as generally indicated in FIG. 1 as at 13, a jet engine, together with the proper fuel tank and means for supplying fuel under pressure through the fuel regulator 61 to the combustion chamber of the jet engine as at 47, generally indicated in FIG. 3.

It is contemplated as a part of the present invention that brakes be employed not for the purpose of stopping the forward motion of the ski, but for maintaining the ski immobile after the engine has been started until the user is desirous of proceeding forwardly. For this purpose there are provided in the preferred embodiment a pair of elongated pointed brake arms 65 which are transversely mounted at their rear ends upon the rotatable shaft 67 as by suitable fastening means 66, FIG. 7. The pointed ends of the brake arm 65 normally extend into the snow or ground surface and serve as a means for retaining the ski against forward movement until the said anchor plates 65 have been withdrawn from the snow and rotated to the horizontal position of use extending forwardly.

The transverse rock shaft 67 for the said brake arms 65 extends through and is journaled on the pillow blocks 68 secured as at 69 to edge portions of the ski towards the forward end thereof. The coiled springs 81 extend around the shaft 67 and at their one ends are anchored to the pillow blocks 68. The other ends of the springs are fixedly secured to the shaft 67, and are placed under torsional stress when the brake arms 65 have been rotated angularly to the securing position shown in FIG. 1.

Suitable locking means are employed for retaining the shaft 67 in the braking position shown. For this purpose and arranged centrally upon the ski is a control housing 70 with its mounting plate 71 secured at 72 to the said ski. The shaft 67 extends through the bore of the upright housing 70 and, as is noted in FIG. 8, a pair of angularly related radial grooves 73 and 74 are formed within the portion of the shaft which lies within the housing 70. These are for the purpose of retaining the braking members 65 either in braking position or in release position.

The housing 75 is mounted as at 76 upon the top of the housing 70 and guides the vertically adjustable rod 77 carrying a handle 78 at its outer end. The said rod carries a small piston 79 at a point intermediate its ends and suitably secured thereto. Coil spring 80 surrounds the rod within the housing 75 and is interposed between the top wall thereof and the said piston for

the purpose of normally urging the free end of the rod 77 into one of the apertures 74 or 73 in the said rod 67.

In the position of the parts shown in FIG. 8, the lower free end of the rod 77 is nested within the radial recess 74 in the rod or arm 67 and which carries the brake arms 65. This corresponds to the positioning of the brakes shown in FIG. 1 in braking position. If the handle 78 is manually lifted so as to disengage the lower end of the shaft 77 from the rod 67, under the action of the coil springs 81, the shaft 67 automatically rotates in a clockwise direction until the radial aperture 73 is in registry with the lower end of the rod 77 after which the coil spring 80 is effective for moving the free end of the shaft 77 down into locking relation with respect to the said radial aperture 73. This provides a means of returning the brake arms 65 to a horizontal release position for normal operation.

Whenever the brake is in use, as in FIG. 1, the springs 81 are under torsional stress. Just as soon as the release 78 is elevated manually, the said springs are effected to rotate the shaft 67 to a release position so that the radial aperture 73 registers with the spring-biased locking shaft 77. This position of shaft 77 corresponds to a position of the locking arms 65 which is horizontal and with the pointed ends free of the ground surface and in general alignment with the horizontal plane of the ski so as not to obstruct horizontal movement of the said ski.

At the same time, the spring biasing permits an easy release of the braking elements 65 as the ski itself is manually moved rearwardly at the same moment as the release 78 is activated. The spring-biased shaft 77 thus secures the brake mounting shaft 67 in release position so that it may not accidently drop down and cause an accident by the sudden stopping of the ski.

Thus there has been described the ski assembly upon which a jet engine 13 has been mounted and which, it is believed, will be fully effective for transporting the user at relatively high speeds and over level or hilly surfaces of ice and snow.

It is contemplated also as a part of the present invention that instead of a jet engine 13, a rocket type of engine may be employed upon the ski as indicated generally at 82 in FIG. 2, the ski being designated 11'.

As schematically shown in FIG. 1 there is a flexible conduit 85 which is connected to the fuel control including a suitable regulator valve as indicated at 61. The flexible cable 84 extends through the member 85 and carries at its end the knob 83 by which the skier will have manual control for the fuel regulator and may shut the same off as desired. It is contemplated for convenience that the flexible cable 84 carrying the control 83 may extend through the skier's belt or otherwise be readily accessible to thus provide a convenient means of shutting off power to the jet engine as desired. This functions just like the manual choke on a car or other vehicle.

Having described my invention, reference should now be had to the following claims.

I claim:

1. In combination, a ski and a jet engine mounted on the rear top surface thereof, and including an exhaust tube in longitudinal registry with the ski and extending rearwardly thereof, a pair of longitudinally spaced brackets mounted on the ski adjacent the rear thereof, an elongated fuel tank secured upon said brackets rearwardly of said engine and spaced above said exhaust tube, a fuel regulator control on said tank communicating therewith, means for delivering fuel from said regulator into the combustion chamber of said engine, and means within said tank for applying a continuous pressure upon the fuel therein, said fuel pressure means including a series of spaced coil springs nested within the bottom of the tank, a pressure pad compressively bearing against said springs, and an apertured flexible sealing web at its outer periphery sealingly joined to the interior walls of said tank and at its inner periphery sealingly joined to peripheral portions of said pressure pad, the expansive action of said springs on said pressure pad applying continuous pressure to said fuel, said pad movable vertically under spring action.

2. In combination, a ski and a jet engine mounted on the rear top surface thereof, and including an exhaust tube in longitudinal registry with the ski and extending rearwardly thereof, a pair of longitudinally spaced brackets mounted on said ski adjacent the rear thereof, an elongated fuel tank secured upon said brackets rearwardly of said engine and spaced above said exhaust tube, means for delivering fuel to the combustion chamber of said engine, a series of spaced coil springs nested within the bottom of said tank, a pressure pad compresively bearing against said springs, and an apertured flexible sealing web at its outer periphery sealingly joined to the interior walls of the tank and at its inner periphery sealingly joined to peripheral portions of said pressure pad, the expansive action of said springs on said pressure pad applying continuous pressure to said fuel, said pad movable vertically under spring action.

3. In combination, a ski and a jet engine mounted on the rear top surface thereof, and including an exhaust tube in longitudinal registry with the ski and extending rearwardly thereof, a pair of longitudinally spaced brackets mounted on the ski adjacent the rear thereof, an elongated fuel tank secured upon said brackets rearwardly of said engine and spaced above said exhaust tube, means for delivering fuel to the combustion chamber of said engine, pairs of longitudinally spaced cups depending from opposite end portions of the tank in communication therewith, a coiled spring nested in each cup and extending up into the tank, a pressure pad compressively bearing against said springs, and an apertured flexible sealing web at its outer periphery sealingly joined to the interior walls of said tank and at its inner periphery sealingly joined to peripheral portions of said pressure pad, the expansive action of said springs on said pressure pad applying continuous pressure to said fuel, said pad movable vertically under spring action.

4. In combination, a ski and a jet engine mounted on the rear top surface thereof, and including an exhaust tube in longitudinal registry with the ski and extending rearwardly thereof, a pair of longitudinally spaced brackets mounted on the ski adjacent the rear thereof, an elongated fuel tank secured upon said brackets rearwardly of said engine and spaced above said exhaust tube, a fuel regulator control on said tank communicating therewith, means for delivering fuel from said regulator into the combustion chamber of said engine, means within said tank for applying a continuous pressure upon the fuel therein, said fuel pressure means including a series of spaced coil springs nested within the bottom of said tank, a pressure pad compressively bearing against said springs, an apertured flexible sealing web at its outer periphery sealingly joined to the interior walls of said tank and at its inner periphery sealingly joined to peripheral portions of said pressure pad, the expansive action of said springs on said pressure pad applying continuous pressure to the said fuel, said pad movable vertically under spring action, the tank including a top wall, an interiorly threaded fitting mounted on and extending through said top wall, a spring biased closure within said tank normally closing the aperture in said fitting, and a hand operated pressure screw threaded down through said fitting and operatively engaging said pressure pad for projecting the same downwardly compressing said springs facilitating filling the tank with fuel above said pressure pad.

5. In combination, a ski and a jet engine mounted on the rear top surface thereof, an exhaust tube connected with said jet engine in longitudinal registry with the ski and extending rearwardly thereof, a pair of longitudinally spaced brackets mounted on the ski adjacent the rear thereof, an elongated fuel tank secured upon said brackets

rearwardly of said engine and spaced above said exhaust tube, a fuel regulator control on said tank communicating therewith, means for delivering fuel from said regulator into the combustion chamber of said engine, and means within said tank for applying a continuous pressure upon the fuel therein, said tank including a bottom wall, said wall having a longitudinal groove curved upwardly spaced about and loosely receiving said exhaust tube.

References Cited in the file of this patent

UNITED STATES PATENTS

1,954,830	Richards	Apr. 17, 1934
2,134,587	Simmons	Oct. 25, 1938
2,509,603	Marin	May 30, 1950
2,761,282	Allen	Sept. 4, 1956
2,822,667	Drexel	Feb. 11, 1958
2,868,127	Fox	Jan. 13, 1959
2,906,091	Kretschmer	Sept. 29, 1959
2,935,846	Neale et al.	May 10, 1960

FOREIGN PATENTS

479,845	Canada	Jan. 1, 1952
530,131	France	Sept. 24, 1921
1,174,616	France	Nov. 3, 1958
118,365	Switzerland	Jan. 3, 1927
274,110	Switzerland	June 16, 1951