Aug. 4, 1931. A. PROCOFIEFF-SEVERSKY 1,817,901

SKID

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Fig. 1.

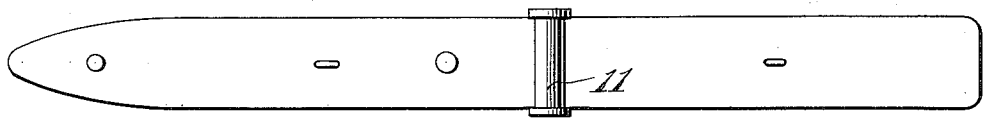


Fig. 2.

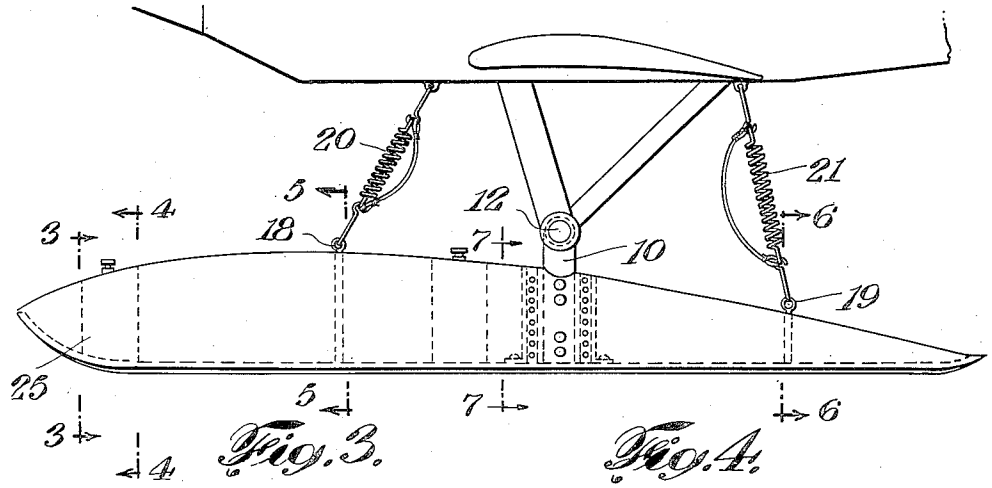
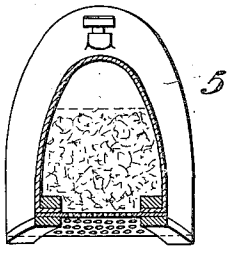


Fig. 3. Fig. 4.



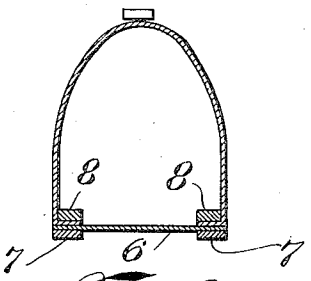
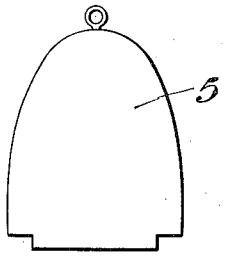
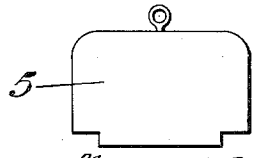


Fig. 5. Fig. 6.





Inventor

Alexander Procofieff Seversky

By his Attorney

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Fig. 7.

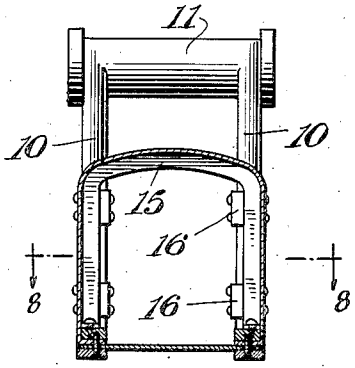


Fig. 8.

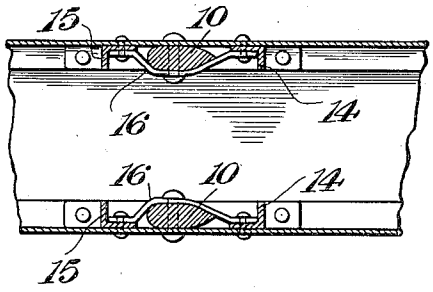


Fig. 9.

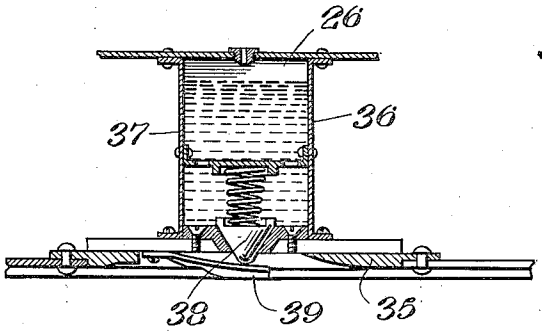


Fig. 10.

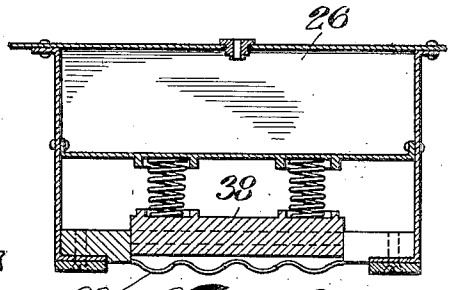
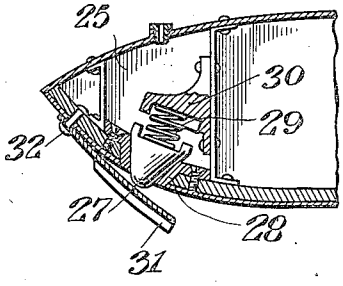


Fig. 12.

Fig. 11.



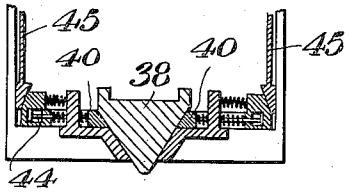
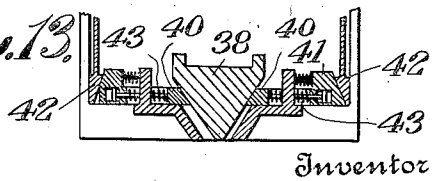


Fig. 13.



Inventor

Alexander Procofieff Seversky

By his Attorney

Emery Booth Janney Varney

Patented Aug. 4, 1931

1,817,901

UNITED STATES PATENT OFFICE

ALEXANDER PROCOFIEFF-SEVERSKY, OF NEW YORK, N. Y., ASSIGNOR, BY MESNE ASSIGNMENTS, TO SEVERSKY AIRCRAFT CORPORATION, A CORPORATION OF DELAWARE

SKID

Application filed March 26, 1927. Serial No. 178,533.

The present invention has been developed in connection with the production of an improved skid for landing gear for aircraft and such an arrangement will be described for the purpose of illustrating the principles of the invention but this description is illustrative merely and is not intended as defining the limits of the invention.

There are certain advantages in making the ground engaging skids or skis of aircraft landing gear from metal because of the facility of manufacture and strength obtainable but when metal skids are used in the snow or water the adherence of freezing snow and ice to the under surface of the skid makes serious trouble. It has been found that if the surface of the metal is suitably lubricated the tendency of the snow and ice to adhere is reduced or eliminated. The present invention provides a metal skid of improved construction having provision for lubricating the ground engaging surface. This is of advantage in landing on and taking off from snow and in other circumstances where lubrication is desired. The preferred construction affords a rigid shell-like structure which is preferably of stream line contour with oil carrying space within. Other features of and advantages obtained by the invention will appear from consideration of a selected illustrative embodiment thereof.

In the drawings forming a part hereof—

Figure 1 is a top plan view of a monocoque skid or pontoon constructed in accordance with and embodying the principles of the invention.

Figure 2 is a side view of the skid indicating the manner of attachment to an aircraft.

Figures 3, 4, 5, 6 and 7 are sectional views taken respectively on the lines 3—3, 4—4, 5—5, 6—6 and 7—7 indicated on Figure 2.

Figure 8 is a horizontal sectional view taken on the line 8—8 of Figure 7.

Figure 9 is a central vertical sectional view taken longitudinally of the skid showing the arrangement of an oil reservoir.

Figure 10 is a transverse sectional view of the same.

Figure 11 is a longitudinal sectional view showing in detail the arrangement of a reservoir at the forward end of the skid, and

Figures 12 and 13 are sectional views showing an auxiliary valve means for closing the outlet port.

The arrangement shown for the purpose of illustrating the invention comprises a monocoque skid, pontoon, or other equivalent, forming a part of the landing gear of an airplane. The skid consists of a hollow shell of stream line contour, the shape of which is designed to give the desired strength in a hollow shell structure. As shown, the skid comprises an upper shell 5, formed to provide strength longitudinally of the skid and to present a substantially stream line contour externally, together with a base plate 6 which may be flat or corrugated transversely and which is secured rigidly to the upper shell 5. Metal or wood strips 7 may be secured to the bottom of the lower plate 6 to provide ground engaging runners which will take the wear when the aircraft lands on a hard surface as, for example, on hard ground or on a specially constructed platform. Preferably, the runners 7 are positioned adjacent the joint between the upper shell and lower plate and cooperate with inner reinforcing members 8 to reinforce the joints and to stiffen the skid.

Any suitable provision may be made for attachment of the skid to the landing gear. As best shown in Figures 7 and 8 upright members 10 are rigidly secured within the shell and adjacent the lateral edges thereof, which members are connected by a hub member 11 arranged to fit the usual axle 12 of the aircraft landing gear. The shell is preferably reinforced adjacent the points of attachment of said upright members 10 as by means of angle members 14 and 15. Suitable strips 16 are secured to the angle bars 14 and 15 and to the uprights 10 to make rigid the structure.

In order to hold the skid in horizontal position, suitable tie members are connected to said skid and to the body of the aircraft or to the landing gear thereof. In the arrangement shown eyes 18 and 19 are suitably formed as part of the skid and to these eyes suitable tie members 20 and 21 are secured, these members preferably being yieldable to

permit a slight rocking movement of the skid on the axle 12.

The invention provides means for lubricating the bottom of the skid in order that either friction may be reduced or in the event of landing on snow, the snow may not cling and freeze to the metal surface of the skid. The oil is preferably carried in the skid itself. As shown two oil chambers 25 and 26 are provided within the skid shell. As best shown in Figure 11 the forward oil chamber 25 is provided with an outlet at the bottom thereof. This outlet is closed by a valve 27 engaging the suitable seat 28 and normally held in closed position by a spring 29 confined between the valve 27 and a fixed bracket 30 secured to one wall of the oil chamber. Any suitable provision may be made for moving the valve 27 to open position to permit flow of the oil. Preferably, automatic means is provided for moving this valve and as shown a yieldable skid member 31 is riveted at its forward end to the skid as indicated at 32. The skid member 31 is preferably formed of spring steel arranged normally to lie in a position substantially out of engagement with the valve 27 but arranged to be pressed inwardly against said valve to open same during landing of the ski or during take off.

The spring skid member 31 may be so designed that it will guide the oil from the outlet 26 down along the under surface of the skid, or it may be so arranged that the oil flows on to the ground or snow in front of the bearing surface of the skid. In the particular arrangement shown this member is transversely corrugated providing grooves so that it will not in any event operate to close the outlet 26 when pressed upwardly by engagement with the ground. Ordinarily it is not necessary to provide means for directing oil to a point forward of the control member 31 but obviously such means may be provided if desired.

The oil chamber 26 is in general similar to the oil chamber 25 previously described. As shown it comprises a casting 35 with partition walls 36 and 37 within the skid which serve to reinforce the skid and to form the oil chamber. The valve 38 is operated by a spring member 39 as in the case of the valve hereinbefore described.

Inasmuch as the valves controlling the oil chamber outlets are opened automatically by engagement of the skid with the ground, it is desirable to provide manually operable means for closing said valves after landing or while the aircraft is resting above the ground. This can be done in any suitable or preferred manner. In the arrangement shown auxiliary valve members are provided which may be moved inwardly by cams.

Referring to Figures 12 and 13, in which is shown a sufficiently illustrative arrangement, auxiliary valve seat members 40 are provided in position to be moved inwardly against the valve 38 to close the outlet when this valve is held in its inner position. As shown the members 40 are moved inwardly by slides 41 actuated by cams 42. The slides 41 and valve members 40 are normally held at a predetermined distance from each other by springs 43 on rods 44 and when the cams 42 are moved downwardly by the rods 45, which extend above the skid for operation, the members 40 will be spring pressed against the valve 38.

Oil has been mentioned as a typical lubricant but this is merely illustrative. As a matter of fact, soap or soap solution is in some respects a better lubricant.

The invention may be variously embodied and various changes may be made in the embodiment described without departing from the spirit of the invention as defined in the appended claims.

I claim:

1. A skid comprising a lubricant chamber, a valve and means for automatically opening said valve upon engagement of the skid with the ground to distribute lubricant to the ground engaging surface of the skid.

2. A skid comprising a lubricant chamber, an outlet therefor, a valve normally closing said outlet and pressure actuated means operable upon engagement of the skid with the ground to open said valve.

3. A skid of monocoque construction comprising a lubricant chamber, an outlet therefrom, a valve normally closing said outlet, a ground engaging skid element arranged upon pressure with the ground to open said valve and serving as a guide to carry lubricant from the outlet toward the surface of the skid.

4. A skid comprising a lubricant chamber having an outlet, a valve normally closing said outlet toward the forward end of the skid, manually operated means for closing said outlet and means for directing lubricant from said outlet to the under surface of said skid.

5. A skid comprising a lubricant chamber, an outlet therefor, means for automatically opening and closing said outlet, and manually operated means for closing said outlet in opposition to said automatically opening means.

6. The combination with a skid and means for conveying lubricant to the ground engaging surface thereof of means for controlling the flow of lubricant automatically or manually.

In testimony whereof, I have signed my name to this specification this 15th day of March, 1927.

ALEXANDER PROCOFIEFF-SEVERSKY.