June 7, 1932. C. G. GILLY 1,862,114

AIRPLANE ENGINE HEATER

Filed July 7, 1930 2 Sheets-Sheet 1

Fig. 1.

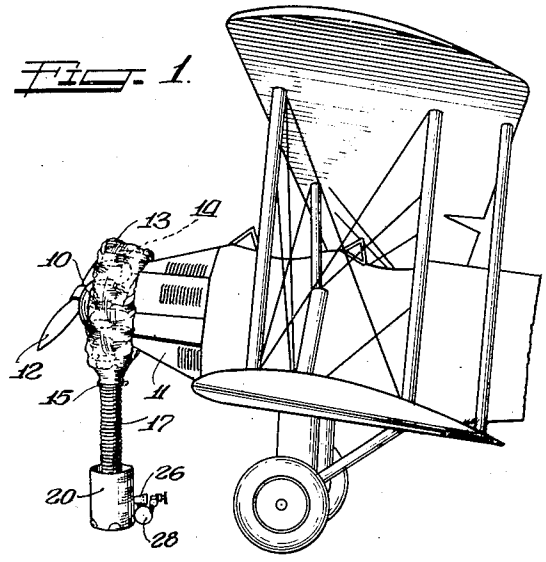


Fig. 2.

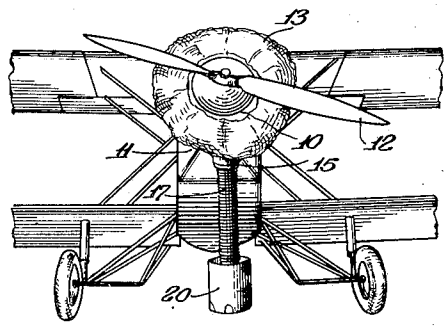
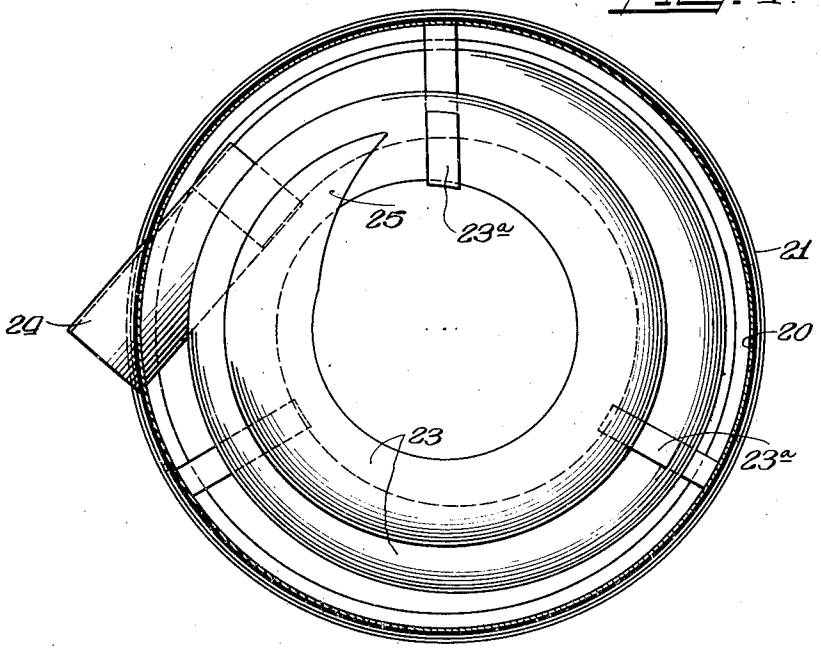


Fig. 4.



Inventor:
Charles G. Gilly.

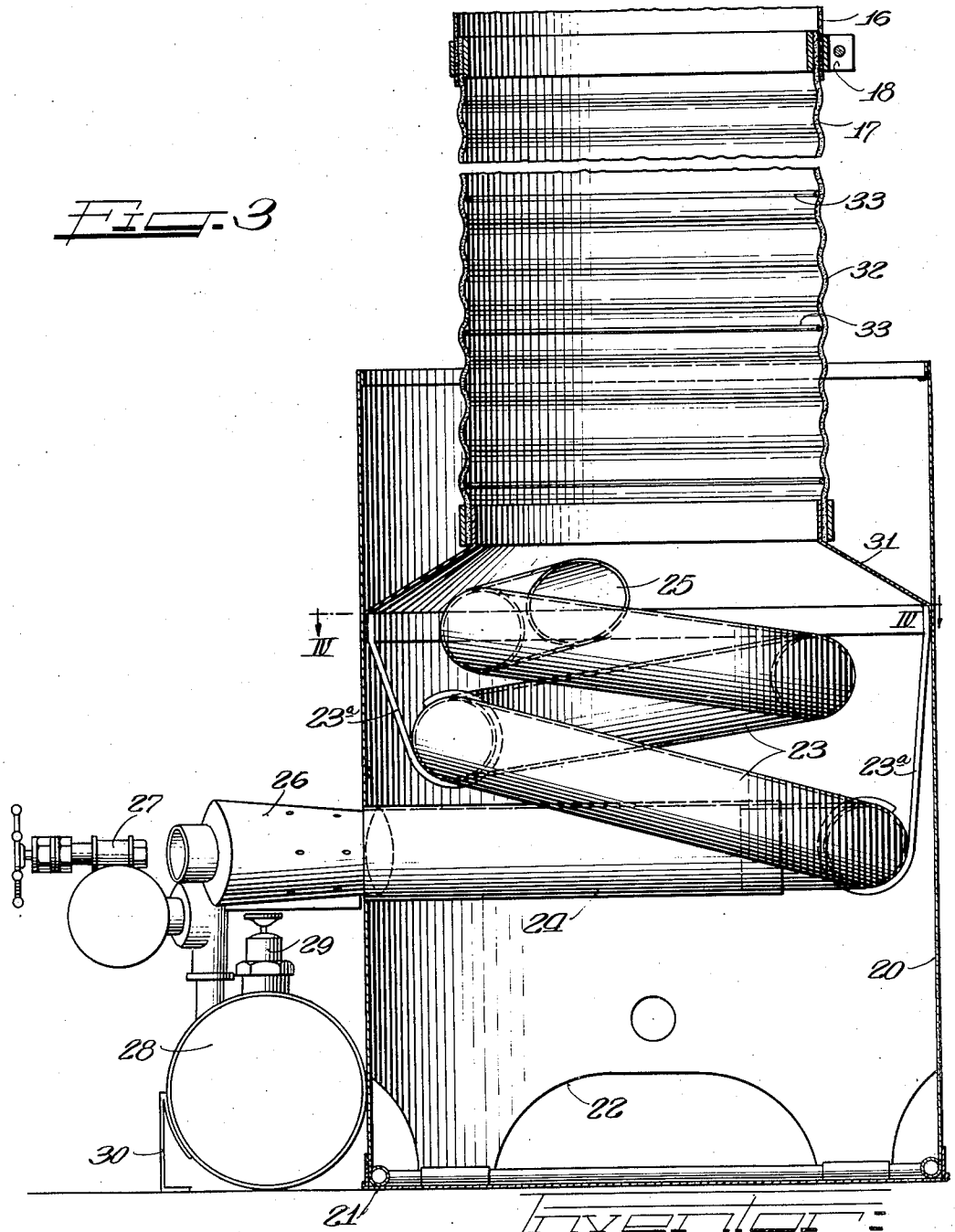
By: Charles G. Wills Attys.

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Fig. 3



Inventor:
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By: Charles G. Wells Attys.

Patented June 7, 1932 1,862,114

UNITED STATES PATENT OFFICE

CHARLES G. GILLY, OF WAUSAU, WISCONSIN

AIRPLANE ENGINE HEATER

Application filed July 7, 1930. Serial No. 466,092.

This invention relates to heaters for airplane engines and has special reference to providing a light, compact and portable heater adapted to warm up engines either in the hangar or out in the open field.

It is an object of this invention to provide a readily portable heater for heating airplane engines prior to starting the same under severe weather conditions. It is well known that a cold engine is difficult to start and in fact may be so cold as to congeal the oil in the bearings or oil sump in which case starting the cold engine without preliminary warming up might readily result in serious damage thereto due to failure of the lubricating system to supply oil to the working parts. Warming the oil alone does not help since it will congeal again when it reaches the cold engine parts, and similar reasoning applies to localized heating of other parts such as the induction system. If a hangar is available the whole airplane can be warmed up therein but will then be subjected to severe temperature stresses upon being rolled out of the hangar. It is therefore preferable, even in a hangar, to warm up the engine alone in severe weather, and in a cross country trip for example such a procedure is the only practical one when the take off must be from an open field. Since the engine of a plane left out in the open is provided with a suitable protective cover or jacket it is convenient for the purposes of this invention to utilize the jacket to confine the heat adjacent the exposed parts of the engine and to this end I provide a heater having a flexible outlet connection discharging into such a jacket or enclosure.

It is another object of this invention to provide a light, compact and conveniently arranged portable heater for the purposes described wherein a heating torch and flexible outlet tubing can be packed within the body of the heater when not in use.

It is a further object of this invention to provide a heater utilizing a gasoline blow torch, the flame from which is absorbed and extinguished in a heating coil prior to the mixture of the spent but still hot gases with the air heated by said heating coil.

Other and further important objects of this invention will be apparent from the disclosures in the specification and the accompanying drawings.

This invention (in a preferred form) is illustrated in the drawings and hereinafter more fully described.

On the drawings:

Figure 1 is a fragmentary side elevation of the engine mounting and adjacent parts of an airplane showing the application of the heater of this invention thereto.

Figure 2 is a front view thereof.

Figure 3 is a central vertical section through the heater of this invention, with parts shown in elevation.

Figure 4 is a cross section on the line IV—IV of Figure 3.

The heater of this invention is applicable to any type of airplane and engine since the form of the enclosing engine cover is immaterial as long as it serves to blanket and confine the heat to adjacent engine parts. Consequently the illustration of a radial type of engine is not to be understood as being in any way a limitation to the use of the heater with an engine cover of the form disclosed, since airplane engines are normally provided with canvas jackets, which may be tailored to fit individual engines, and in connection with the heater of this invention might be provided with a bottom inlet suitable for the flue or outlet of the heater, but not necessarily making sealing engagement therewith.

The illustrated airplane is of the tractor type wherein a radial engine 10 is located in the nose of the fuselage 11, the engine 10 driving a propeller 12. Normally such an engine may be provided with a canvas jacket 13 covering the exposed engine parts such as the projecting cylinder heads 14. Lacking such a specially made jacket a tarpaulin may be used to cover the engine. In the case of the jacket shown, a bottom entrance 15 is provided in the form of a ring 16 which may be clamped to the outlet tube 17 of the heater, as by a clamping band 18, when the heater is to be used to warm up the engine.

The heater proper comprises an open end-

ed shell 20 provided with removable end closures 21 one of which is shown at the bottom of Figure 3. Adjacent the bottom the shell is partially cut away to form air inlet or draft vents 22. Inside the shell is located a spiral coil 23 of tubing the entrance end of which engages in a short tube 24 passing through the wall of the cylinder. The upper or outlet end 25 of the coil 23 terminates about two thirds of the ways up from the bottom of the shell and is cut at an angle to facilitate the mixing of the gases discharged therefrom with the air surrounding the coils in the shell, which air flows upwardly due to the heating thereof by the coils, the air inlet vents 22 facilitating the air flow. The coil 23 may be supported in the shell in any convenient manner as by the hangers 23*a* as shown.

A gasoline or other type of portable blow torch is provided comprising a burner tube 26, a spray valve 27, a fuel reservoir 28, and a pump 29 for producing the necessary pressure for spraying the fuel. The burner tube is introduced into the outer end of the tube 24, the products of combustion passing up through the spiral coils and heating the same, the spent but still hot gases being mixed with the air flowing up through the coils 23 to increase the heat delivery. The torch is preferably so made that it may be placed in the bottom of the shell 20 when not in use, and is provided with a suitable bracket 30 for support when applied to the tube 24.

A frusto-conical metal gathering hood 31 is positioned inside the shell just above the spiral coils, and to this hood is attached a suitable length of flexible asbestos fabric tubing 32, which forms the outlet tubing 17 previously mentioned. The tubing is held to form by a number of inserted rings 33. When not in use the tubing is collapsed into the top of the shell and a cover placed thereover. In use the tube is extended or drawn up and attached to the ring 16 of the engine jacket, forming in effect a flexible chimney from the heater to the engine jacket.

The operation of this device is as follows:

After igniting the torch, preferably at a safe distance from the airplane, the burner thereof is inserted in the end of the tube 24 and the flexible asbestos tube is drawn up from the shell and attached to the bottom of the engine jacket or cover. If the cover is without the special mounting ring a suitable aperture can be provided therein and the tube supported in any convenient manner to discharge within the cover or jacket. Air entering through the bottom vents in the shell becomes heated by the hot spiral tubing and this heated air, mixed with the spent gases escaping from the upper end of the spiral coil, travel upwardly through the asbestos tubing to the airplane engine. The temperature attained in the heater discharge is in the neighborhood of 350° F. and is sufficient to quickly warm an airplane engine to a convenient starting temperature even under the severest weather conditions.

It will thus be seen that I have invented a new and improved portable heater for warming up airplane engines prior to starting, which heater is compact and light enough to be carried by an airplane while making cross country trips, and which can be set up in operation and be effective to thoroughly warm up an engine in a comparatively brief interval.

I am aware that many changes may be made and numerous details of construction may be varied through a wide range without departing from the principles of this invention, and I therefore do not purpose limiting the patent granted hereon otherwise than necessitated by the prior art.

I claim as my invention:

1. A portable heater for the purpose described comprising an open ended casing having removable end closures and draft vents thereinto adjacent the bottom thereof, a heating coil in said casing the discharge end of which coil discharges the spent gases into the casing to mix with the heated air flowing therethrough, a blow torch discharging into the entrance end of said heating coil, and an extensible outlet connection connected to the casing and which is adapted to be nested within the upper part of the casing when not in use.

2. A portable heater for the purpose described comprising an open ended casing having removable end closures and draft vents thereinto adjacent the bottom thereof, a heating coil in said casing the discharge end of which coil discharges the spent gases into the casing to mix with the heated air flowing therethrough, a blow torch discharging into the entrance end of said heating coil, and a collapsible outlet tube connected to the casing and which is adapted to be nested within the upper part of the casing when not in use.

3. A portable heater for the purpose described comprising an open ended casing having removable end closures and draft vents thereinto adjacent the bottom thereof, a heating coil in said casing the discharge end of which coil discharges the spent gases into the casing to mix with the heated air flowing therethrough, a blow torch discharging into the entrance end of said heating coil, and flexible conduit means connected to the casing for delivering the heated mixture of air and spent gases.

4. A heater for warming up airplane engines which are provided with a protecting jacket, comprising a shell, a flexible outlet tube connecting the shell to the engine jacket, draft vents adjacent the bottom of the shell, and heating means associated with said shell comprising a portable torch, and a spiral coil

within the shell receiving the discharge from said torch and in turn discharging the spent gases into the air flowing through said shell.

5. A heater for airplane engines having an enveloping closure, comprising a shell open at top and bottom, a spiral coil of tubing positioned within said shell and having one end passing through the wall of the shell, the other end having an angular outlet within the shell at a higher level than the other end, a torch discharging into the outer end of the tubing outside the shell, air inlet openings adjacent the bottom of the shell, a gathering hood within the shell above the tubing outlet therein, and a flexible pipe attached to said hood and extensible to connect with the enclosure enveloping the airplane engine.

6. A heater for airplane engines having an enveloping closure, comprising a shell open at top and bottom, a spiral coil of tubing positioned within said shell and having one end passing through the wall of the shell, the other end having an angular outlet within the shell at a higher level than the other end, a torch discharging into the outer end of the tubing outside the shell, air inlet openings adjacent the bottom of the shell, a gathering hood within the shell above the tubing outlet therein, and a flexible pipe attached to said hood and extensible to connect with the enclosure enveloping the airplane engine, said flexible pipe being foldable into the top of the shell when not in use.

In testimony whereof I have hereunto subscribed my name at Wausau, Marathon County, Wisconsin.

CHARLES G. GILLY.