

July 2, 1946.

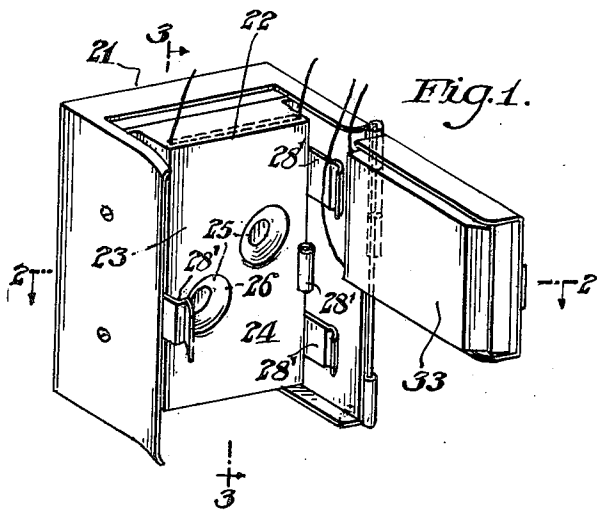
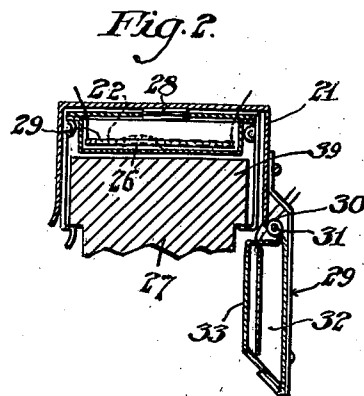
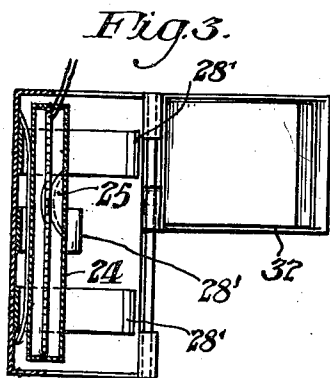
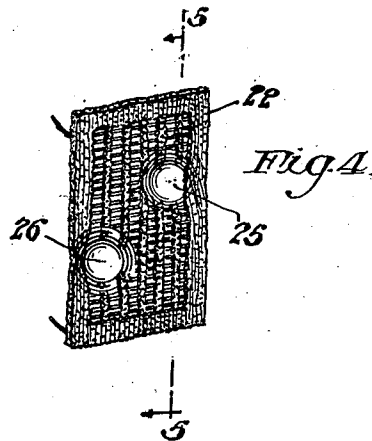
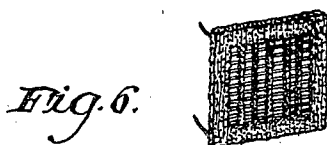
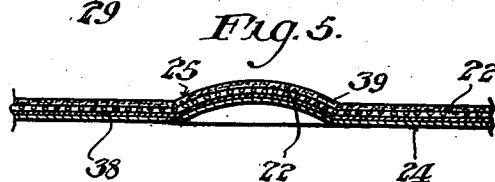
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2,403,415

HEATING GUNS

Filed Oct. 1, 1943

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

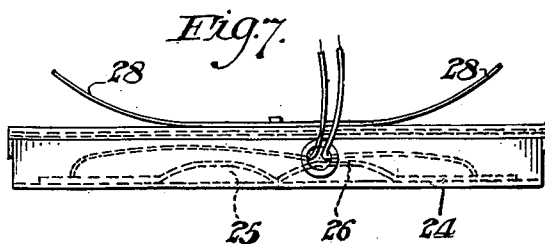
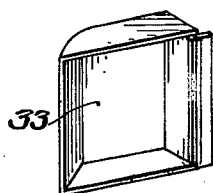


Fig. 8.

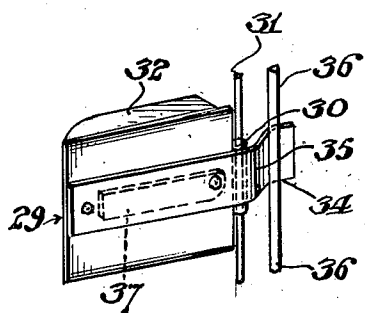
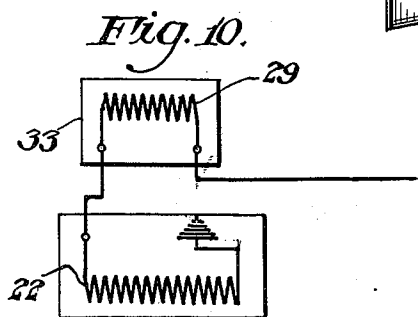
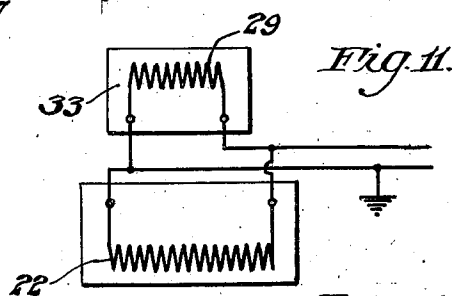


Fig. 9.



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UNITED STATES PATENT OFFICE

2,403,415

HEATING GUNS

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Application October 1, 1943, Serial No. 504,597

4 Claims. (Cl. 219—19)

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This invention relates to heating guns.

The object is to provide such means equally adapted for mounting the heater either on the right hand or left hand side of the gun.

It is common practice to manufacture gun heaters especially for the right hand or the left hand mounting. This practice is inconvenient and expensive. It is therefore the object of the present invention to provide means equally applicable for right hand or left hand mounting. Such a device is especially useful with Aircraft guns or the like. By the use of this device such heaters are readily changeable from one type to the other, without substantial expense or delay.

By the use of my improved device the heater assembly can be used on either the right hand or left hand side of the gun without interfering with any attachments which may be mounted on the guns.

Another object of my invention is to provide an efficient heater for guns where the heaters alone are in thermal contact with the gun, thus assuring the efficient heat transfer to the gun without conducting some heat to the frame. This is accomplished by the use of insulating bodies and means of supporting springs between the heater and the frame.

Another object of my invention is to provide a heater which can be removed or replaced without the loss of the main part of the assembly.

By sealing the seams of the unit or heater housing I make them water-proof to avoid any vapor or water seeping through the seams.

Another object of my invention is to provide a heater readily adjustable, with means to avoid any sliding effect which may take place when the gun is in operation.

The invention also comprises means for protecting the resistance wire against abrasions and grounds, by insulating the bare resistance wire with fibreglass yarn before they are fabricated into a unit.

The invention comprises such means and also other improvements in connection with such invention, as will be described.

Referring to the drawings, which illustrate merely by way of example, suitable means for effecting my invention;

Fig. 1 is a view in perspective of the device embodying my invention; said device being shown as standing on end.

Fig. 2 is a section on the line 2—2 of Fig. 1.

Fig. 3 is a section on the line 3—3 of Fig. 1.

Fig. 4 is a perspective view of a fabricated re-

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sistance element, showing depressions in the face thereof.

Fig. 5 is a section on the line 5—5 of Fig. 4, on an enlarged scale.

Fig. 6 is a similar view of the side heater element without depressions.

Fig. 7 is a side elevation of the housing for the main resistance.

Figs. 8 and 9 are views in perspective of complementary parts of the housing for the side heater element.

Figs. 10 and 11 are diagrams of suitable wiring.

Similar numerals refer to similar parts throughout the several views.

Referring to Fig. 1:

The frame 21 is provided for supporting and adjusting the heating element 22, which is enclosed in the housing or box-like formation 23. This heating element is preferably an electric resistance which may be in the nature of a fabricated sheet.

The face or front wall 24 of the housing is provided with concavo-convex formations 25 and 26, which appear on the inner side of said wall as convex projections. These formations are arranged diagonally in said face 24.

Only one formation is engaged for right-hand mounting to keep the heater assembly in proper location. For left-hand mounting, the assembly naturally is turned around, thus engaging the other formation, leaving, in either case, one formation not in use.

All the guns of this type, especially machine guns, have only one projection.

The fabricated resistance sheet 22, which forms with its housing, the main heater, is provided with similar concavo-convex formations 25 and 26, and are pressed between the registering formations on the plate 24 and the surface of the gun body 27 when the same register. The pressure is under a stiff spring 28, so that an extremely effective pressure contact is maintained between said distortions when the same are in register.

When the proper depression in the face 24 of the heater is brought into register with the projection 39 on the gun surface, the desired result is achieved.

The preferred insulation between the heater and the gun surface, is mica 40 or similar material, which provides an effective electrical insulation while having effective heat conductivity. The preferred insulation between the heater and the frame, should be highly effective to both heat and electrical insulation as above indicated.

As stated, 21 indicates the frame for carrying the heater 22 to the surface of the gun body 27. The frame 21 is provided with side walls or flanges having suitable spring clips 28 to hold the parts in proper relative and co-acting relationship, and especially insuring effective contact between the heater and the gun surfaces.

The side heater 29 is provided with a supporting sleeve 30, slidably mounted on the rod 31, secured to the frame 21. This arrangement is for purposes of adjustment relatively to either right or left-hand position of the main heater, as herein described.

The side heater formation 29 comprises a receptacle 32 for receiving the heating element, and a cover 33 for enclosing the same. This cover or closure 33 has a fitting engagement with the receptacle. A resilient strip 34 is secured to the receptacle body having a bend 35 at its free end engaging a guide 36, thus providing an additional guide and support for the side heater. A leaf-spring 37 between the two elements 32 and 33, serves to maintain effective pressure upon the surface of the gun.

The preferred insulation for the resistance comprises mica between the heater 22 and the gun surface, and glass wool or the like, as at 41, should be used between the heater and the frame.

The main heater 22 and the side wall heater 29 are provided with the spring 37 and spring 38 for securing even resilient pressures between said heaters and the surfaces of the gun.

Figs. 10 and 11 show preferred schemes for the wiring of the heating elements.

What I claim is:

1. A heating device for guns, comprising an electrical resistance, a housing enclosing the same, a frame for securing the heater to the gun for right-hand or left-hand position, the gun having a contact surface provided with a convex formation, the housing having a contact face

provided with two spaced apart concavo formations each of which is adapted for selective registration with said convex formation, and resilient means for insuring effective contact between the heater and the gun.

2. A heating device for guns, comprising an electrical resistance, a housing enclosing the same, a frame for securing the heater to the gun for right-hand or left-hand position, the gun having a contact surface provided with a convex formation, the housing having a contact face provided with two spaced apart concavo formations each of which is adapted for selective registration with said convex formation, and resilient means for disengageably securing the housing to the frame.

3. A heating device for guns, comprising an electrical resistance, a housing enclosing the same, a frame for securing the heater to the gun for right-hand or left-hand position, the gun having a contact surface provided with a convex formation, the housing having a contact face provided with two spaced apart concavo formations each of which is adapted for selective registration with said convex formation, and resilient means for disengageably securing the frame to the gun in either right-hand or left-hand position.

4. A heating device for guns, comprising an electrical resistance, a housing enclosing the same, a frame for securing the heater to the gun for right-hand or left-hand position, the gun having a contact surface provided with a convex formation, the housing having a contact face provided with two spaced apart concavo formations each of which is adapted for selective registration with said convex formation, and a side heater pivotally secured to the frame and provided with resilient means for securing effective contact with a side surface of the gun.

GERRIT VAN DAAM.