June 26, 1945. F. L. VERA 2,378,959

GUN BARREL

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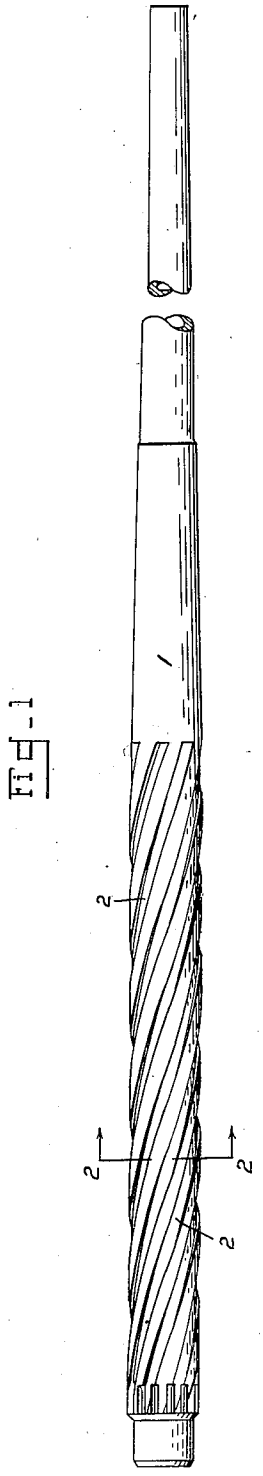

Fig. 1

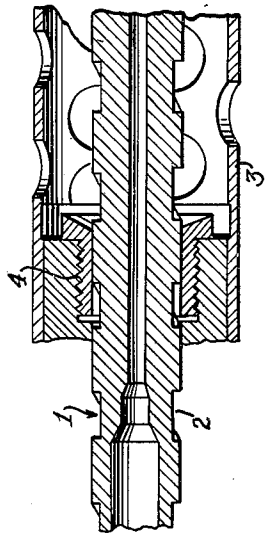

Fig. 3

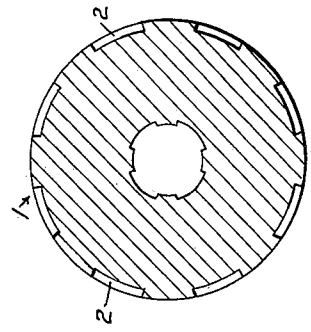

Fig. 2

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GUN BARREL

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3 Claims. (Cl. 89—14)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

The invention described herein may be manufactured and used by or for the Government for governmental purposes, without the payment to me of any royalty thereon.

This invention relates to improvements in gun barrels and more particularly to air cooling the barrel of a machine gun.

When cartridges are fired in a gun barrel, the heat generated by the combustion of the powder in the chamber and by friction of the bullet passing through the bore is considerable. The heat from a comparatively small number of cartridges fired in a gun barrel is however readily absorbed by the barrel without overheating. If, as in a machine gun, a great number of cartridges are fired in a short space of time the barrel soon becomes overheated and in this condition erosion of the bore is much faster. Furthermore in a recoiling barrel gun the expansion of the steel when the barrel becomes greatly overheated is generally sufficient to cause the barrel to bind in the barrel bearings and stop the firing.

Overheating of gun barrels is most common with aircraft type of machine guns because guns of this type are designed to fire a great number of rounds in a brief interval of time. Although these guns are capable of sustained firing, the length of burst is limited to a burst consistent with good functioning of the gun and without undue overheating. It is evident therefore that if the heat of the gun barrel could be dissipated more rapidly than is possible at present the gun could then be fired in longer bursts of ammunition which would be a decided advantage to the operator of the gun.

Accordingly it is an object of this invention to provide a gun barrel having an improved radiating surface for rapid dissipation of heat.

A particular object of this invention is to provide a machine gun barrel having an improved heat radiating surface especially adapted for cooling by the rapid movement of air along the surface of the barrel.

The specific nature of the invention as well as other objects and advantages thereof will clearly appear from a description of a preferred embodiment as shown in the accompanying drawing in which:

Fig. 1 is a side view of a gun barrel showing the spirally grooved exterior surface.

Fig. 2 is a cross sectional view taken along plane 2—2 of Fig. 1.

Fig. 3 is a sectional view of the rear barrel bearing portion of a conventional machine gun having a barrel constructed in accordance with this invention.

A conventional form of gun barrel 1 is provided with a plurality of evenly spaced grooves 2 about the periphery of barrel 1. As shown in the accompanying figures, the longitudinal grooves 2 are preferably spirally cut. It is well known in the art that firearm barrels have been provided with various types of grooves and fluted exterior surfaces for the purpose of increasing the radiating surface of the barrel. However, such surfaces were generally provided somewhat ahead of the chamber and continued forwardly to the muzzle end of the barrel. As shown, in Fig. 1 the grooves 2 are cut from the breech end forwardly for a distance equivalent to approximately one-third the length of the barrel, or to a point just slightly ahead of the hottest portion of the barrel. Grooves 2 are preferably rectangular in cross-section and are of a depth commensurate with respect to the strength of the barrel.

A barrel of the type described above is preferably used in a recoiling barrel machine gun and the grooves 2 on barrel 1 pass through the rear bearing of the machine gun such as the bearing 4 shown in Fig. 3 which in turn is mounted in the rear end portion of the conventional perforated barrel jacket 3. When using the gun on a rapidly moving vehicle, such as a plane, air is forced by the velocity of the vehicle along the grooves 2 through the bearing 4 of the gun thereby more efficiently cooling the bearing and the barrel.

Most machine guns are provided with perforated jackets similar to that shown at 3 in Fig. 3, to permit the airstream to flow around the gun barrel to aid in cooling the barrel. The conventional barrel however has no grooved or fluted surface which goes through the rear bearing of the machine gun, hence, this bearing cannot be efficiently cooled as the barrel solidly fills the bearing at all times with the result that both barrel and bearing become overheated to such an extent that a stoppage of the gun will occur while firing an extra long burst of ammunition. Normally when employing the conventional barrel the air coming in through the perforated jacket is merely trapped therein and very little cooling effect is obtained from the air blast.

Thus it is possible to fire a much longer burst of ammunition in a gun embodying this invention without danger of excessive overheating due to the rapid passage of air over the critical bearing area of the gun which increases the dissi-

pation of the heat generated by the explosion of the cartridges from the barrel. It should also be noted that a more efficient bearing surface is also obtained.

I claim:

1. In a machine gun having a reciprocating barrel and a bearing supporting the barrel, the improvement comprising a plurality of grooves in the barrel disposed about the periphery thereof, said grooves extending along the axis of the barrel, the periphery of said grooved portion of the barrel engaging the bearing in bearing relation.

2. In a machine gun having a reciprocating aircooled barrel and a bearing supporting the barrel, the improvement comprising a plurality of helical grooves in the barrel equally disposed about the periphery thereof, said grooves extending along the axis of the barrel, the periphery of the grooved portion of the barrel engaging the bearing in bearing relation.

3. In a machine gun having a reciprocating aircooled barrel and a bearing supporting the barrel, the improvement comprising a plurality of helical grooves in the barrel equally disposed about the periphery thereof, said grooves extending along the axis of the barrel and forwardly from the breech end of said barrel for a distance equal approximately to one third the length of said barrel, the periphery of the grooved portion of the barrel engaging the bearing in bearing relation in all positions of the barrel.

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