

June 7, 1955

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2,709,948

UNIVERSAL TYPE GUN MOUNT

Filed Jan. 21, 1950

2 Sheets-Sheet 1

Fig. 1A.

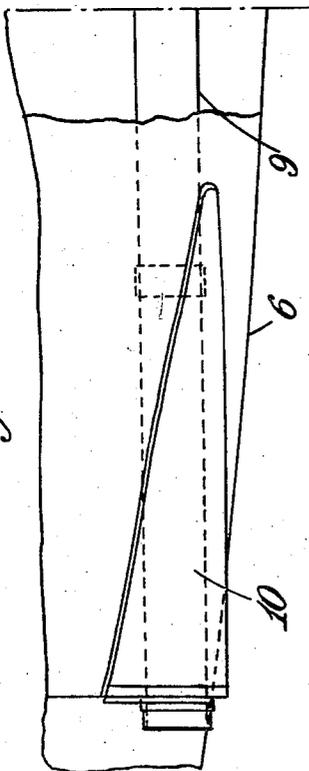
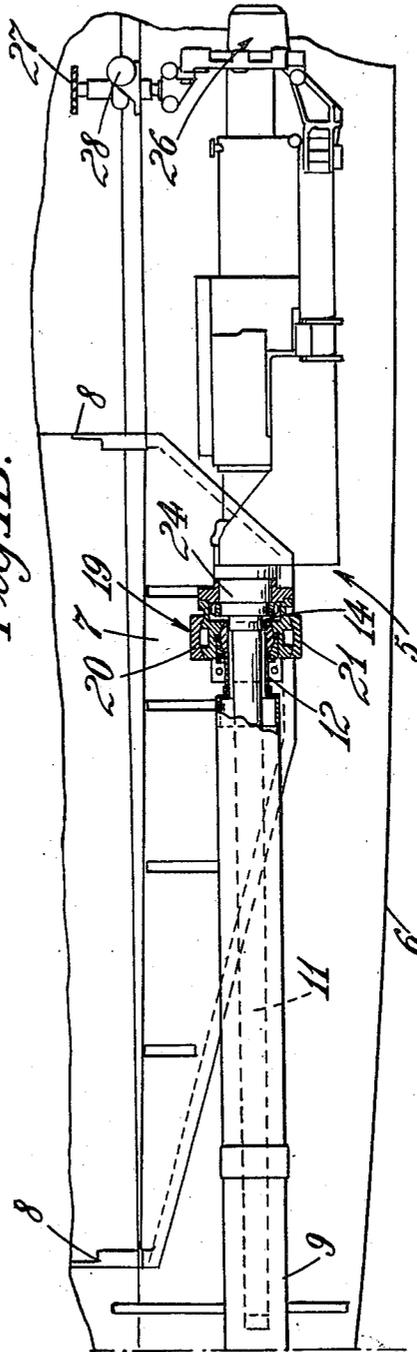


Fig. 1B.



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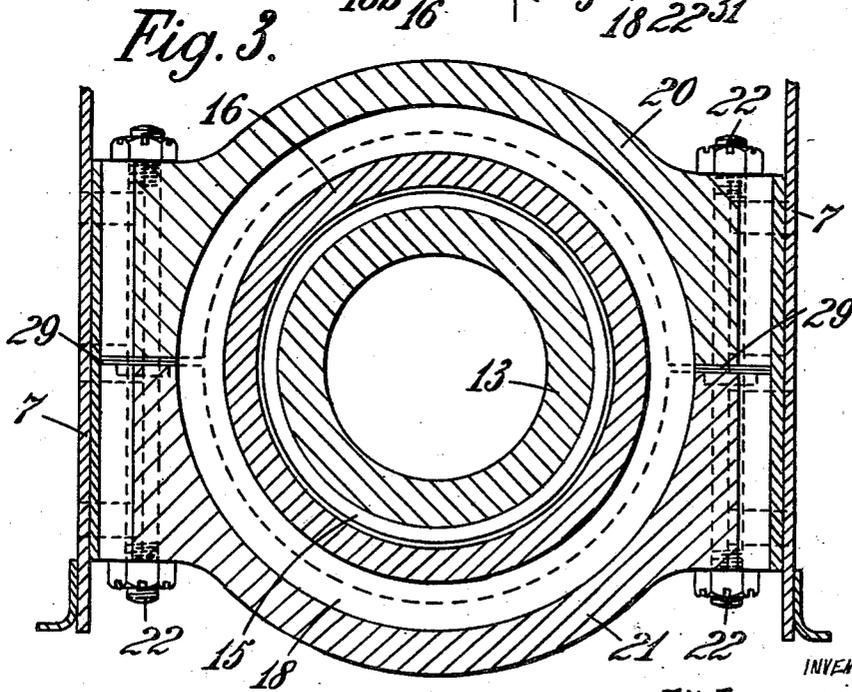
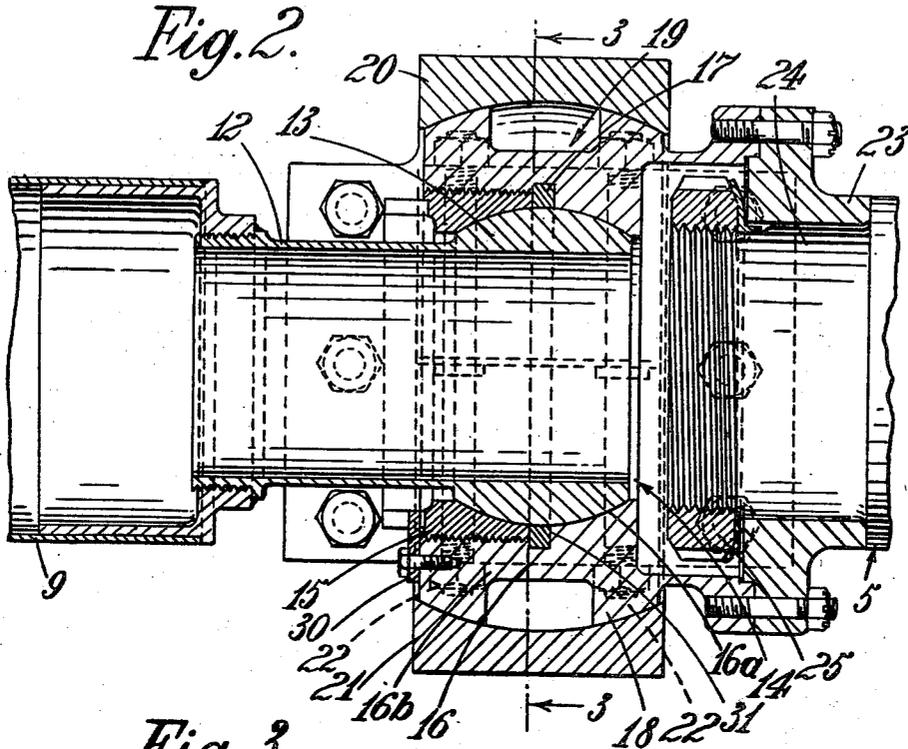
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UNIVERSAL TYPE GUN MOUNT

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Claims priority, application Great Britain January 27, 1949

10 Claims. (Cl. 89—37.5)

This invention concerns gun installations for vehicles, more particularly for aircraft, of the type in which the gun barrel lies along a blast tube carried by the vehicle and the gun is mounted on the vehicle independently of the blast tube.

The present invention has for its object to provide a gun installation of the type set forth in which the blast tube is readily removable to give access to the gun barrel, the gun is readily removable from the vehicle and the blast tube and gun are independently carried by the vehicle for movements relatively thereto and for movements relatively to each other. Another object is to reduce or prevent the passage of gases from the blast tube of the gun to inside the vehicle (or pilot's cockpit).

According to the present invention a gun installation of the type set forth is characterised in that the seating member of a first spherical-seating joint is the ball member of a second spherical-seating joint, the seating member of the second joint being carried by the vehicle, in that the blast tube is carried by the ball member of the first joint and the gun by the ball member of the second joint and in that the seating member of both joints is in two parts which are separable to allow the ball members thereof to be removed, the blast tube and its ball member being removable lengthwise of the tube and the gun and its ball member being removable transversely of the gun.

Preferably the ball members of the first and second joints lie the one within the other and both are carried within the seating member of the second joint.

A practical application of this invention is shown in the accompanying drawings whereof:

Figures 1A and 1B together constitute a side elevation, partly in section, of a gun installation in an aeroplane in accordance with the invention,

Figure 2 is a sectional elevation to a larger size of a part of the installation of Figure 1, and

Figure 3 is a section on the line 3—3 of Figure 2.

The gun, which is generally indicated by the reference numeral 5, lies within the fuselage 6 of an aeroplane (not shown). The fuselage forms a supporting structure for the gun and blast tube mount. The gun is carried by a gun housing 7 which is suspended from the spars 8 and a blast tube 9 extends forwardly from beneath the housing 7 and passes through an opening in the fuselage 6. The tube 9 projects through the fuselage to a small extent and is there covered by a fairing 10. The gun barrel 11 lies within the blast tube 9.

The inner end of the blast tube 9 has a tubular extension 12, the outer surface of which is formed as a ball member 13 which is universally mounted in a ball and socket member 16 to provide a universal connection or joint 14 for the blast tube. The member 16 of this first joint is formed with an axial aperture within which the ball member 13 is disposed. The inner surface of the member 14 includes a semi-spherical portion 16^a, which seats one end portion of the member 14, and a diametrically reduced threaded portion 16^b. A radial shoulder 31 is formed between the portions of the inner surface

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and an externally threaded ring 15 is provided and has an inner part-spherical surface. The ring is screw threaded into the portion 16^b in the lengthwise direction of the blast tube and forms a continuation of the semi-spherical portion 16^a, the ring forming a detachable means for retaining the ball member 13 in position. The ring 15 can abut against the shoulder 31 but it is preferred to provide a seal of heat-resisting material 17 against which the ring is screwed, the seal ensuring that gases in the blast tube may not pass through the first joint.

The member 16 of the joint 14 has an outer portion which is spherically formed and defines the ball member 18 of a second spherical-seating joint, generally indicated at 19, it being arranged that joint 14 lies within joint 19.

The ball member 18 is continuous in the circumferential direction and its seating member comprises two semi-circular abutting straps 20 and 21 which form a socket member or means. Shims 29 are provided between the straps so that they are spaced apart to a required extent. The two straps are drawn together by bolts 22 (Figure 3). The lower strap 21 is removable from the upper strap 20 which is permanently carried by the gun housing 7.

The member 18 has a tubular extension 23 which lies on the opposite side of the joints to the blast tube. A part 24 of the gun enters the extension 23 and is suitably secured therein by a ring 25 with the gun barrel passing through member 13 and extension 12 into the blast tube.

The gun is also supported by a rear mounting 26 having means 27, 28 for moving the gun so that its barrel 11 is relatively adjustable within the blast tube to a limited extent, the gun being moved about the joint 19. In this way the alignment of the gun may be adjusted.

With the construction described the ring 15 is easily removed whereupon the blast tube 9, extension 12 and member 13 may be withdrawn axially over the gun barrel. Access may then be had to the gun barrel. After removal of the blast tube, the strap 21 of joint 19 is also easily removed so that the gun may be lowered from housing 7—the rear mounting 26 having been previously disconnected.

In use, the joints 14 and 19 allow relative movements between the blast tube and the fuselage, between the gun and the fuselage and between the blast tube and the gun.

Joint 14 is effectively sealed at 17 against the passage of gases from inside to outside the blast tube and thence to within the fuselage.

The ring is prevented from accidentally working loose by a locking key device 30.

I claim:

1. In a mount for a gun and blast tube, a supporting structure, socket means carried by the supporting structure, a first annular ball member disposed in said socket means for universal movement, said ball member being provided with an axial aperture therethrough and being connected to the gun at one end with the barrel of the gun disposed through the aperture in spaced relation to the wall defining the aperture, a second annular ball member disposed concentrically between the gun barrel and the wall defining the aperture in the first ball member and mounted for universal movement in the wall, means releasably retaining the second ball member in the aperture, said second ball member being connected to a blast tube concentric to the longitudinal axis thereof, the tube being concentric to the barrel.

2. In a mount for a gun and blast tube, a supporting structure, socket means carried by the supporting structure, a first annular ball member disposed in said socket means for universal movement, said ball member having a spherical inner and outer surface and being connected to the gun, the barrel of which extends through the ball member in spaced relation to its inner surface, a second

ball member universally mounted in the first ball member and having an aperture therethrough receiving the barrel of the gun, and means releasably mounting the second ball member within the first ball member, said second ball member being connected to the blast tube, concentric to the longitudinal axis thereof, the tube being spacedly circumposed on the barrel.

3. In a universal mount for a gun and blast tube, a supporting structure, an annular socket member carried by the supporting structure, a first annular ball member disposed in said socket member for universal movement, said ball member having an outer spherical surface universally seated within the socket member and an inner surface, said inner surface being part-spherical at one end portion and being diametrically enlarged and threaded at the other end portion, a second ball member disposed within the first ball member and universally engaging the part-spherical portion of the inner surface, a ring threaded in the threaded portion of the inner surface and having a part-spherical inner periphery which forms a continuation of the part-spherical portion of the inner surface, said ring releasably retaining the second ball member within the first ball member, and said second ball member having an axial aperture therethrough for receiving the barrel of a gun and being connected to the blast tube, concentric to the longitudinal axis thereof.

4. In a universal mount for a gun and blast tube, a supporting structure, socket means carried by the supporting structure, a first ball member disposed in said socket means for universal movement, said ball member being provided with an aperture therethrough, said aperture being of an enlarged diameter for a portion of its length to form a shoulder, the bounding wall defining the portion of an enlarged diameter being threaded and the wall defining the portion of a reduced diameter being semi-spherical, a second ball member disposed in the aperture and universally engaging the semi-spherical portion of the wall, and a ring threaded in the threaded portion of the aperture and having a semi-spherical inner periphery which forms a continuation of the semi-spherical portion of the wall defining the aperture in the first ball member, and said second ball member having an aperture therethrough for receiving the barrel of the gun and being connected to the blast tube which is concentric to the barrel, and a sealing member interposed between the shoulder and the ring.

5. The combination of claim 3, wherein said socket means includes a pair of complementary semi-circular straps, one of said straps being fixedly mounted on the supporting structure and means releasably attaching the other of said straps to the first strap.

6. In combination, a gun having a barrel and a blast tube, a supporting structure for the gun, socket means carried by the supporting structure, a first annular ball member disposed in said socket means for universal movement, said ball member being provided with an axial aperture therethrough and being connected to the gun at one end with the barrel of the gun disposed through the aperture in spaced relation to the wall defining the aperture, a second annular ball member disposed concentrically between the gun barrel and the wall defining the aperture in the first ball member and mounted for universal movement in the wall, and means releasably retaining the second ball member in the aperture, said second ball member being connected to the blast tube concentric to the longitudinal axis thereof, the tube being spaced circumposed on the barrel.

7. In combination, a gun having a barrel and a blast tube, a supporting structure for the gun, socket means carried by the supporting structure, a first annular ball

member disposed in said socket means for universal movement, said ball member having a spherical inner and outer surface and being connected to the gun the barrel of which extends through the ball member in spaced relation with its inner surface, a second ball member universally mounted in the first ball member and having an aperture therethrough receiving the barrel of the gun, and means releasably mounting the second ball member within the first ball member, said second ball member being connected to the blast tube concentric to the longitudinal axis thereof, the tube being spaced circumposed on the barrel.

8. In combination, a gun having a barrel and a blast tube, a supporting structure for the gun, an annular socket member carried by the supporting structure, a first annular ball member disposed in said socket member for universal movement, said ball member having an outer spherical surface universally seated within the socket member and an inner surface, said inner surface being part-spherical at one end portion and being diametrically enlarged and threaded at the other end portion, a second ball member disposed within the first ball member and universally engaging the part-spherical portion of the inner surface, a ring threaded in the threaded portion of the inner surface and having a part-spherical inner periphery which forms a continuation of the part-spherical portion of the inner surface, said ring releasably retaining the second ball member within the first ball member, and said second ball member having an axial aperture therethrough for receiving the barrel of a gun and being connected to the blast tube, concentric to the longitudinal axis thereof.

9. In combination, a gun having a barrel and a blast tube, a supporting structure for the gun, socket means carried by the supporting structure, a first ball member disposed in said socket means for universal movement, said ball member being provided with an aperture therethrough, said aperture being of an enlarged diameter for a portion of its length to form a shoulder, the bounding wall defining the portion of an enlarged diameter being threaded and the wall defining the portion of a reduced diameter being semi-spherical, a second ball member disposed in the aperture and universally engaging the semi-spherical portion of the wall, and a ring threaded in the threaded portion of the aperture and having a semi-spherical inner periphery which forms a continuation of the semi-spherical portion of the wall defining the aperture in the first ball member, and said second ball member having an aperture therethrough for receiving the barrel of the gun and being connected to the blast tube which is concentric to the barrel, and a sealing member interposed between the shoulder and the ring.

10. The combination of claim 8 wherein said socket means includes a pair of complementary semi-circular straps, one of said straps being fixedly mounted on the supporting structure and means releasably attaching the other of said straps to the first strap.

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