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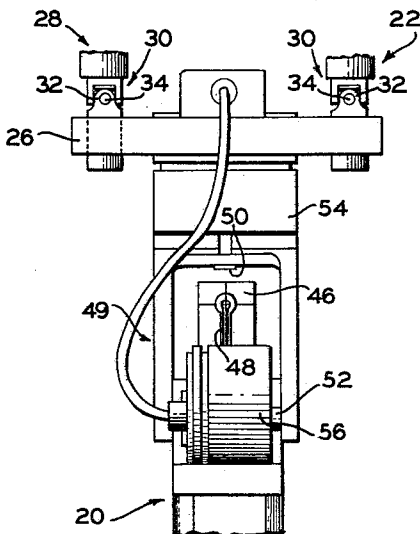
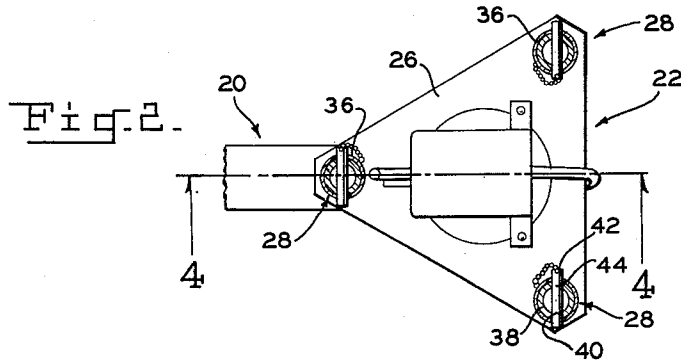
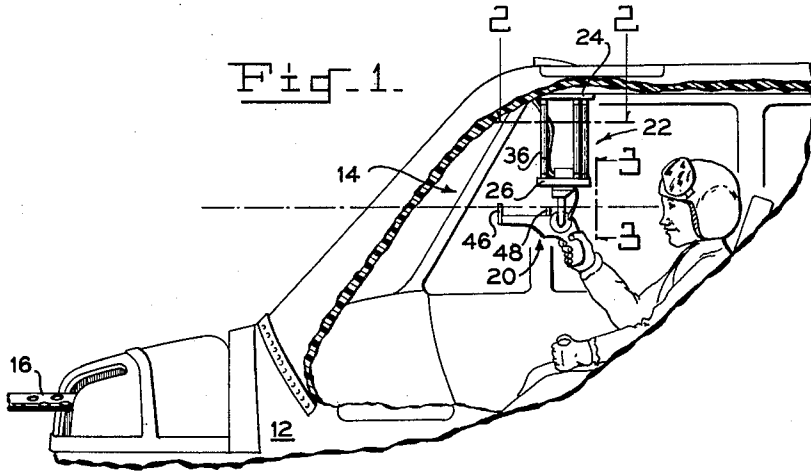
D. P. TASSIE

3,070,886

FLEXIBLE MOUNT FOR REMOTE-CONTROLLED SIGHT

Filed May 23, 1961

2 Sheets-Sheet 1



INVENTOR.  
Douglas P. Tassie  
BY  
S. J. Rotondi & A. J. Dupont

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D. P. TASSIE

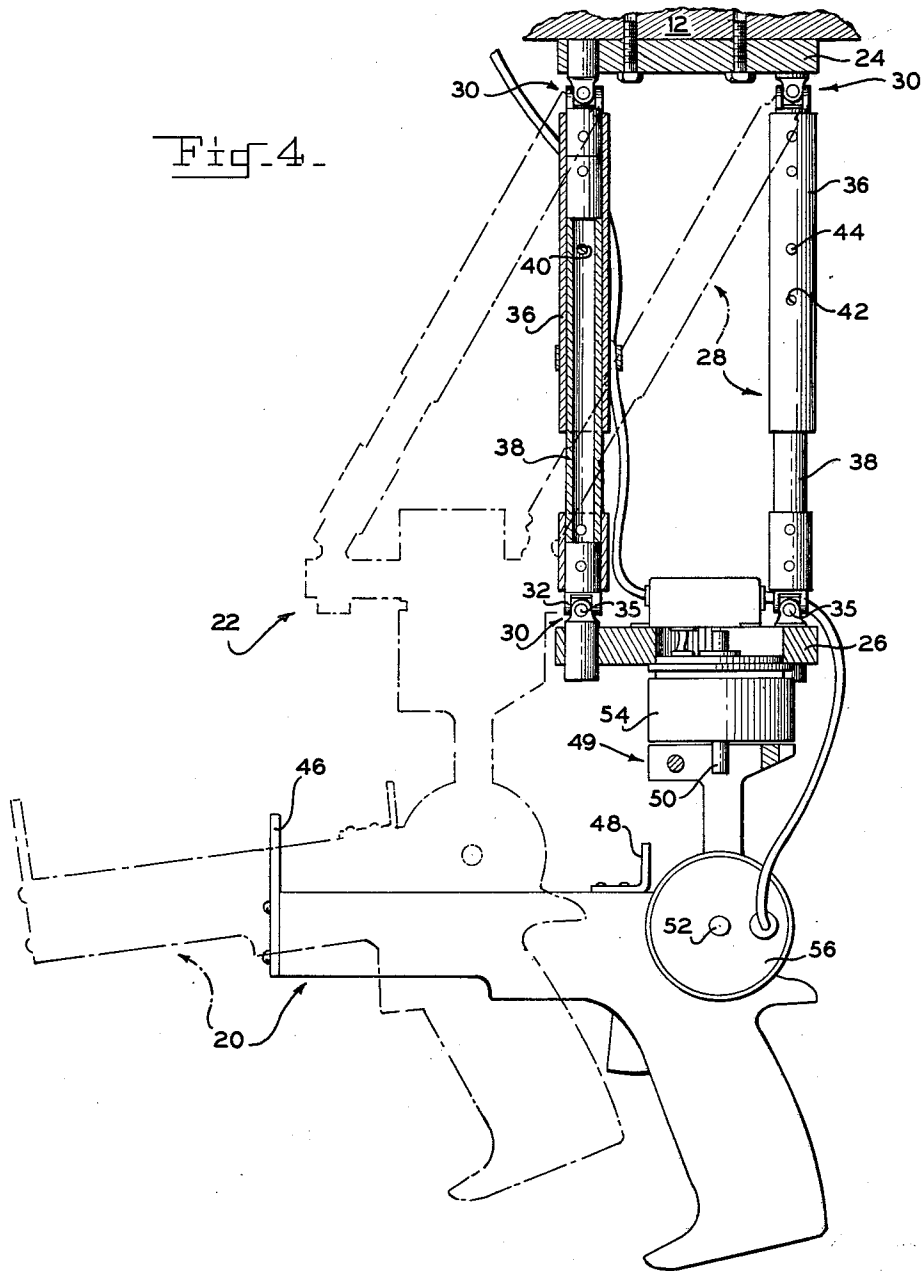
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2 Sheets-Sheet 2

Fig. 4



INVENTOR.

Douglas P. Tassie

BY

S. J. Rotondi & A. J. Dupont

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**FLEXIBLE MOUNT FOR REMOTE-CONTROLLED SIGHT**

Douglas P. Tassie, St. George, Vt., assignor, by mesne assignments, to the United States of America as represented by the Secretary of the Army

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2 Claims. (Cl. 33-47)

This invention relates to sights for guns remotely located therefrom in a carrier vehicle and pertains more particularly to devices for mounting the sights thereto.

In gun-carrying vehicles where flexibly mounted guns are aimed and fired from a remote control station by a sight director through electrical means, it is necessary that the sight director and the devices for controlling the aim of the guns have a constant relationship and for convenience the geometrical planes of the carrier provide the common planes of reference.

In the past, it has been the practice to mount the sight director by fixed bracket means to the structure of the carrier at the control station to assure constant relationship between the sight director and the guns. This, however, raises the design problem of finding the optimum location for mounting the sight director so that it may be conveniently sighted on a target at all angles, within the range of movement of the associated guns, and of providing a mounting surface for the sight director at the optimum location. It has been found that, even when the sight director is mounted to the carrier at the optimum point, it is oftentimes inconvenient in view of the variable conditions encountered in combat, such as when combat casualties require a quick replacement of operating personnel, because differences in the height of operators require a change in the vertical position of the sight-director for convenience in sighting.

It is, therefore, one object of this invention to provide a convenient and stable platform on which to mount a sight director for remotely located guns.

It is another object of this invention to provide for a sight director a flexible mount which maintains the sight director in constant relationship with the carrier structure and the gun mounts.

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 drawings in which:

FIG. 1 is an elevational view of the cockpit of an aircraft showing the sight director attached to the aircraft by the flexible mount;

FIG. 2 is an enlarged view taken along line 2-2 of FIG. 1;

FIG. 3 is an enlarged view taken along line 3-3 of FIG. 1; and

FIG. 4 is an enlarged view taken along line 4-4 of FIG. 2 showing in phantom the sight director displaced forwardly and sighted downwardly.

Shown in the figures is the cockpit of a gun-carrying aircraft 12 which cockpit is also a control station 14 for the operation of a gun 16 extending forwardly from the aircraft. Gun 16 is flexibly mounted for pivotal movement in both a vertical and a horizontal plane relative to aircraft 12.

Gun 16 is aimed at a target by a sight director 20 which is located at control station 14 and which is mounted, as hereinafter described, for rotation on an elevation and an azimuth axis for sighting alignment with a target. Sight director 20 is attached to aircraft 12 by means of a flexible mount 22, which comprises a mounting plate 24 fixedly attached to the aircraft so as to be horizontally disposed relative thereto, a base 26 and three rods 28 hav-

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ing a universal joint 30 at each end. Mounting plate 24 and base 26 are both of equilateral triangular configuration and of similar size and they are flexibly connected by the three rods 28 through means of the universal joints 30.

Universal joints 30 are of the type used in drive shafts for torque transmission and each is formed by a pair of yokes 32 which are flexibly connected by a pair of transversal pins, as is well known in the art to permit relative pivotal displacement in planes normal to each other. One of each pair of the transversal pins, noted at 34, is longitudinally disposed, relative to aircraft 12, and the other ones, noted at 35, are laterally disposed. Universal joints 30 are connected to mounting plate 24 and base 26, whereby the rods 28 are equally spaced each to the other so that the center distances between the universal joints on each of the rods are equal. Universal joints 30 are non-rotatably connected to base 26 and mounting plate 24 and, therefore, the base is flexibly movable relative to mounting plate 24 for fore and aft displacement on lateral pins 35 (FIG. 4) and for lateral displacement on longitudinal pins 34 (FIG. 3) and maintains a parallel relationship relative to the mounting plate wherever displaced within the range of movement permitted by rods 28 and the associated universal joints 30. Moreover, any rotational tendency in base 26 is resisted by the torsional rigidity of rods 28 and universal joints 30 to maintain constant azimuth relationship between base 26 and aircraft 12.

Rods 28 each includes a hollow tube 36 which telescopically receives a shaft 38. A transversal hole 40 in shaft 38 is alignable with one of a plurality of holes 42 in tube 36 to receive a pin 44 so that the rods are extendable in equal increments and are always of identical lengths.

Sight director 20 is of pistol configuration and is provided with a front sight 46 and a rear sight 48. Sight director 20 is mounted on base 26 by a linkage 49 so as to depend therefrom and so as to be rotatable around a vertically disposed axle 50, centrally located through the base, for azimuth sighting, and so as to be rotatable around an axle 52, laterally disposed parallel to the base, for elevational sighting.

A potentiometer 54 is mounted in linkage 49 at axle 50 to electrically signal to the control units (not shown) of gun 16 any changes in the azimuth position of sight director when rotated to sight at a target. Another potentiometer 56 is mounted in linkage 49 at axle 52 to electrically signal any changes in the elevational angle of the sight director.

From the foregoing it is clearly apparent that sight mount 22 provides in base 26 a platform for mounting sight director 20 which may be flexibly moved to convenient locations at control station 14 for sighting while maintaining the elevation and azimuth axes of the sight director in constant relationship to the geometrical axes of aircraft 12.

Although a particular embodiment of the invention has been described in detail herein, it is evident that many variations may be devised within the spirit and scope thereof and the following claims are intended to include such variations.

I claim:

1. In a vehicle for carrying flexibly mounted guns operated from a remote control station, the combination of a sight director, a base, linkage for mounting said sight director to said base for rotation around an elevation and an azimuth axis, a mounting plate attached to the vehicle at the control station horizontally respective to the vehicle, and means for flexibly connecting said base to said mounting plate so as to maintain a parallel relationship between said base and said mounting plate during flexible

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displacement of said base relative thereto, said means including three rods and a universal joint mounted to opposite ends of each of said rods, said universal joint on one end of each of said rods being fixed to said base and said universal joint on the opposite end of each of said rods being fixed to said mounting plate so that the distances between each of said rods are equal and so that the distances between the axes of said universal joints at opposite ends of said rods is the same for each thereof.

2. A combination as defined in claim 1 wherein said universal joint comprises a pair of yokes flexibly connected by a pair of pins for relative pivotal displacement in planes normal to each other, and wherein said uni-

versal joints are fixed to said base and said mounting plate so that said pair of pins are respectively disposed laterally and longitudinally relative to the vehicle.

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