Nov. 11, 1947. J. C. TROTTER 2,430,747

POWER OPERATED GUN MOUNT

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FIG. 1.

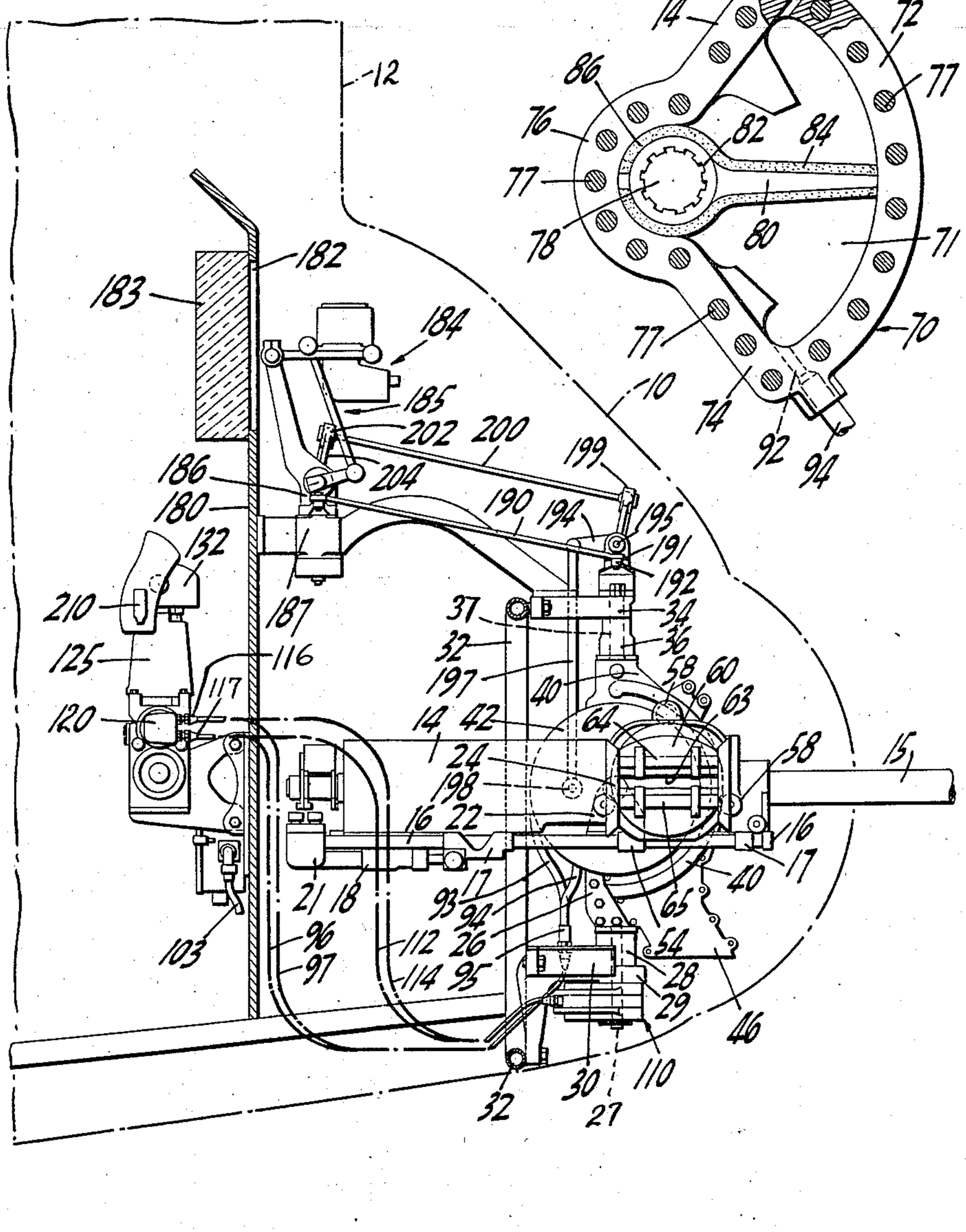

FIG. 3.

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FIG. 2.

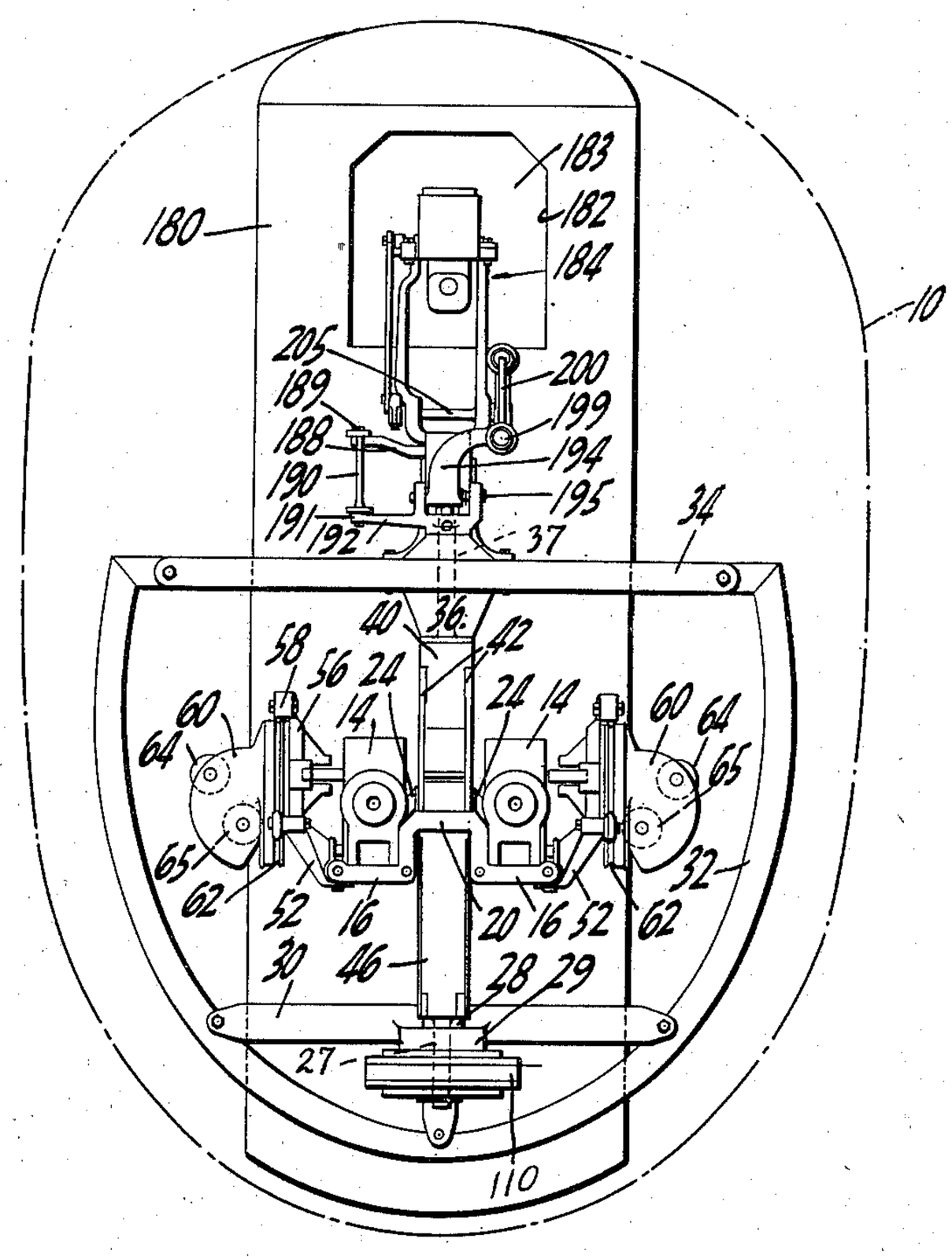

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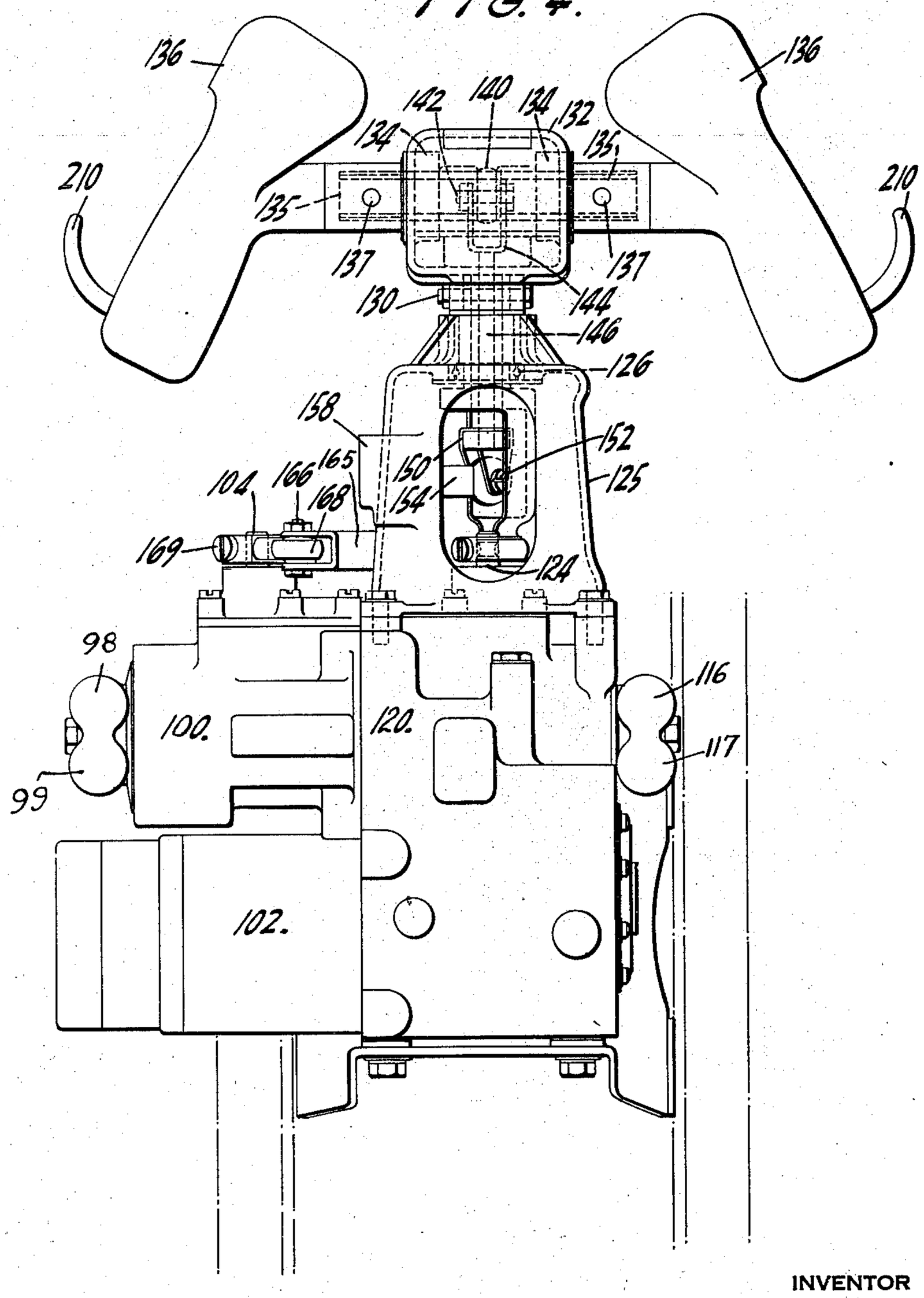
FIG. 4.



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POWER OPERATED GUN MOUNT

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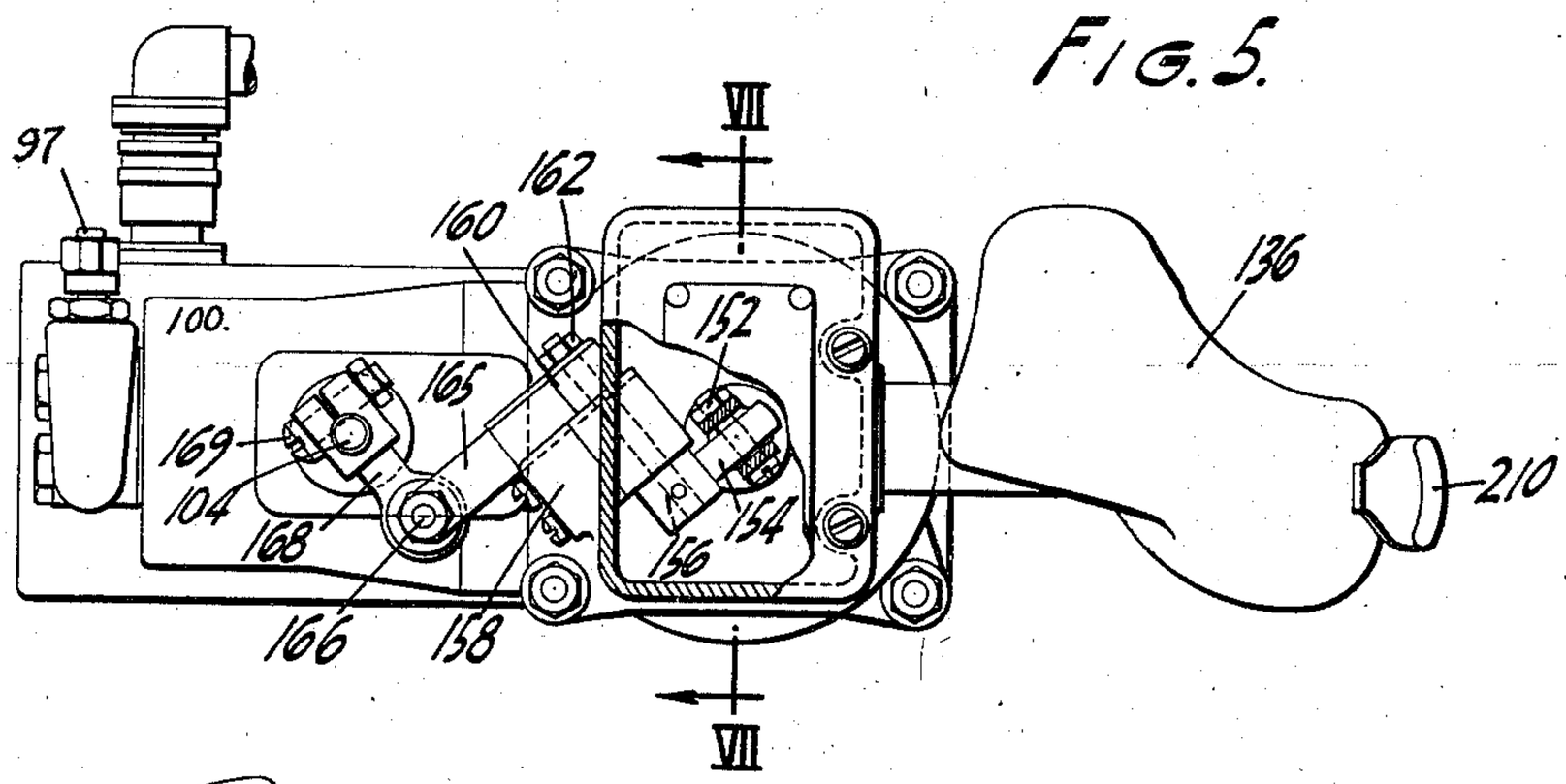
FIG. 5.



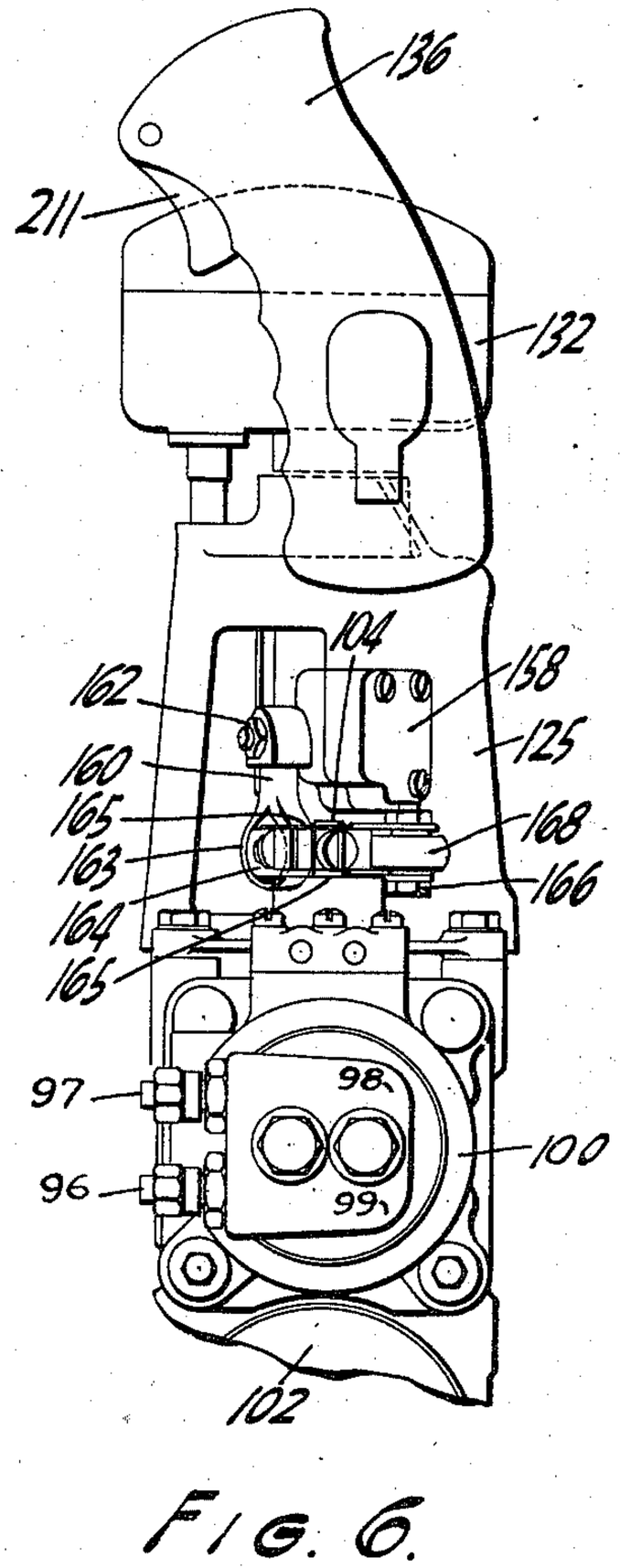
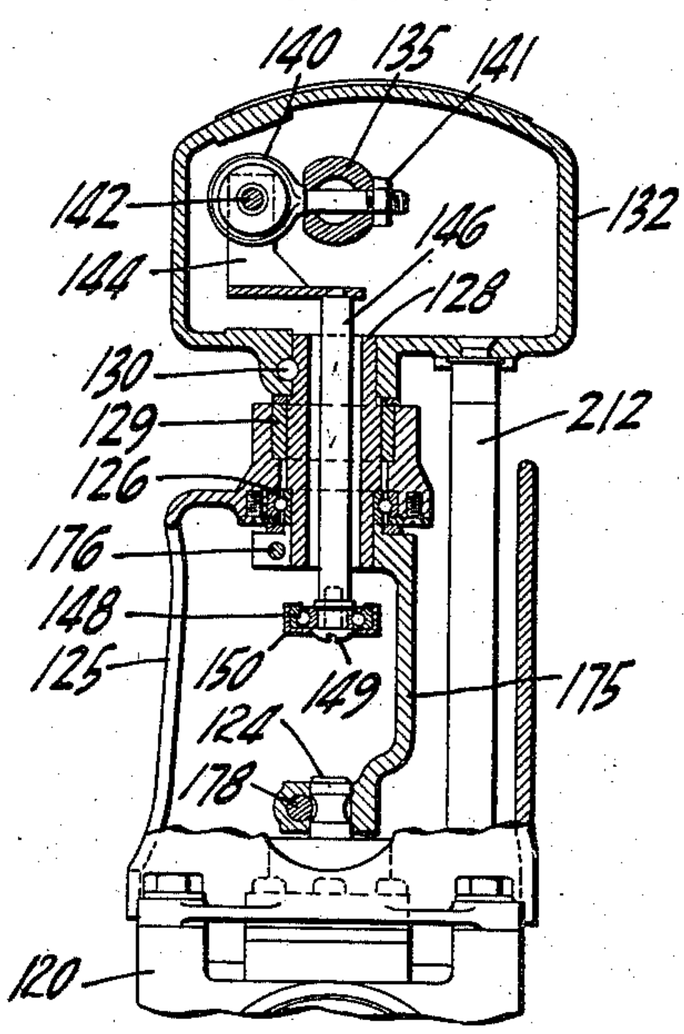


FIG. 6.

FIG. 7.



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UNITED STATES PATENT OFFICE

2,430,747

POWER-OPERATED GUN MOUNT

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Application January 30, 1943, Serial No. 474,166

5 Claims. (Cl. 89—37.5)

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This invention relates to ordnance, and more particularly to improved gun mount and gun aim control means for use in conjunction with machine guns, cannon, or the like when mounted upon aircraft.

One of the objects of the invention is to provide an improved gun mount and gun aim control arrangement for combat aircraft wherein the gun battery is mounted in improved manner for universal aiming adjustments at an extremity of the aircraft structure while provision is made for accommodation of the gunner at a position remote from the gun battery, and wherein gun sight and gun aim control devices are mounted adjacent the position of the gunner and connected to the gun battery by improved control actuation means. Another object of the invention is to provide an improved combination gun mount and ejected link receiver device which is mounted upon fixed supporting structure in such manner as to provide improved rigidity and stability of the gun battery, and in this respect the present invention embodies improvements over my earlier filed application Serial No. 438,400 filed April 10, 1942. Another object of the invention is to provide an improved ammunition feeding arrangement in conjunction with a gun battery arrangement of the type referred to. Other objects and advantages of the invention will appear from the specification hereinafter.

In the drawings:

Fig. 1 is a side elevation of a gun battery and gun sight and gun aim control arrangement of the invention, illustrated as being mounted in conjunction with a nose or tail turret of an aircraft;

Fig. 2 is an elevation of the gun battery and sight arrangement viewed from the right in Fig. 1;

Fig. 3 is a fragmentary section, on an enlarged scale, of a motor device of the gun aim control mechanism;

Fig. 4 is an elevation, on an enlarged scale, of the gun battery aim control means viewed from the left in Fig. 1;

Fig. 5 is a top plan of the mechanism of Fig. 4 with portions broken away;

Fig. 6 is a side view thereof; and

Fig. 7 is a fragmentary section taken along lines VII—VII of Fig. 5.

The invention is illustrated in the drawings as being embodied in a gun battery mounted within a blister or turret portion 10 of an aircraft which is indicated generally at 12. The gun battery comprises a pair of parallel guns having casing

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portions indicated at 14—14 and barrels 15—15 extending therefrom. The guns are separately mounted upon corresponding paired bearer cradles 16 so as to be slidable thereon in response to recoil forces of the gun firing operations; the guns being carried by means of longitudinally spaced slide brackets 17—17 extending from the guns to slidably engage the cradle frames. Hydraulic or spring shock absorbers and counter-recoil devices as indicated at 18 are connected to extend between relatively moving parts of the guns and the cradle frames to cushion the recoil forces of the gun firing operation and to provide the required counter-recoil movements of the guns.

The cradle frames 16—16 are interconnected at their forward ends by a cross tie member 20 and at their rear ends by a bracket 21 to provide the gun mount frame to be of integral unit form. At positions intermediately of the guns a pair of bracket arms 22—22 extend from the cradle frame in vertically extending parallel spaced relation to pivotally connect upon a trunnion bearing 24 carried by the upper end portions of a gun mount fork 26, for pivotal aiming adjustments of the gun in elevation. The fork 26 is formed at its lower end with a stub shaft portion 27 which is rotatably carried within a bearing 28 carried by a block 29 which is in turn supported by a cross bar 30 extending transversely between spaced leg portions of a tubular frame 32 carried by the aircraft structure. As illustrated by Fig. 2, the frame 32 is generally U-shaped in end view, and includes a second cross bar 34 at the upper reaches thereof. A bearing block 36 subtends from the cross bar 34 in opposed relation with respect to the bearing block 28 carried by the lower cross bar 30.

A C-shaped bracket 40 extends rigidly from the fork 26 and is provided at its upper end with a stub shaft 37 which is rotatably carried within the bearing block 36; whereby the fork-bracket unit is mounted upon the frame 32 so as to be freely rotatable about the aligned vertical axes of the bearing blocks 28—36. Thus, the gun battery is freely rotatable as a unit with the fork-bracket assembly upon the bearings 28—36 for azimuth adjustments of the gun battery aim, while the guns are freely rotatable relative to the fork 26 about the horizontal axis of the bearing 24 for elevational adjustments of the gun battery aim.

The central body portion of the bracket 40 is interiorly shaped to be substantially concentric of the axis of the trunnion bearing 24, and a

circular plate 42 is slide-fitted against each side of the bracket 40 to provide in conjunction therewith a drum-like unit disposed between the guns 14—14 concentrically of the elevational aiming axis thereof. The side plates 42—42 are connected to the brackets 22—22 so that the plates rotate with the guns in connection with elevational aiming adjustments of the gun battery; and the plates 42—42 are each slotted in registry with the ejected cartridge belt link port of the corresponding gun, whereby the cartridge belt links will be projected through the slotted portions of the side plates 42—42 into the drum-like receiver and will thereupon fall in response to the forces of gravity out of an apertured neck portion 46 of the receiver for discharge below the aircraft.

To feed ammunition to the guns 14—14 a cartridge belt guide device is mounted adjacent the ammunition feedway port of each of the guns. Each cartridge belt guide device comprises a bracket 52 (Fig. 2) extending from fixed connections to the corresponding gun mount frame member 16, as by means of fasteners 54 (Fig. 1). Each bracket 52 carries a frame 56 which is centrally apertured to permit the cartridge belt to be threaded therethrough for feeding into the corresponding gun ammunition feedway. Each frame 56 mounts at intervals peripherally thereof a plurality of rollers 58 disposed to rotatably receive therebetween and guide for rotational movement thereon a guide plate 60 having a circular peripheral track portion 62 engaged between the rollers 58 in positionally fixed but rotationally free relation. Each guide plate 60 is centrally slotted as at 63 and carries a pair of spaced parallel cartridge belt guide rollers 64—65 disposed parallel to the slotted portion of the guide plate for receiving therebetween a cartridge belt for threading through the guide frame 56 into the ammunition feedway of the gun.

The cartridge belts for feeding the guns will be arranged to train from magazines behind the guns through positions alongside the guns and thereabove, and thence between the guide rolls 64—65 and thence into the ammunition feedway ports of the guns with freely feeding movements. It will be understood that inasmuch as the guide plates 60—60 are rotatably mounted by means of the rollers 58 relative to the gun carried frames 56, the plates 60 will rotate freely in response to angularly directed pulls by the cartridge belts against the guide rolls 64—65 in such manner as to enable the guide rollers to bisect the angle between the directions of cartridge belt movement toward the guide rollers and from the guide rollers toward the gun ammunition feedways. Thus, acute twisting and turning of the belts in the region of the gun ammunition feedways will be avoided, and it will be understood that such automatic adjustments of the guide plates will take place under all conditions of elevational aiming adjustments of the gun battery relative to the aircraft fixed structure, and that therefore an improved ammunition feed arrangement will exist under all conditions of gun aiming adjustments.

To provide aiming adjustments of the gun battery, separate elevational control and azimuth control motor devices are employed. For this purpose the bracket 40 is arranged to house a vane type fluid pressure motor case 70. As illustrated in detail in Fig. 3, the motor case 70 is of generally segmental sectional form having its apex concentric of the trunnion bearing 24. More specifically, the motor case is illustrated as

comprising a housing formed of opposed side walls 71—71; an arcuate end wall 72; and opposite converging radial walls 74—74 leading from the end wall 72 into a semi-circular wall portion 76 arranged concentrically of the trunnion bearing 24. The motor case wall portions are assembled by means of bolts 77.

The motor case mounts a motor shaft 78 which is keyed to the hub of a vane type piston 80, as at 82. The piston 80 is preferably lined with a resilient packing material as indicated at 84 for pressure-sealing the sliding contact between the piston and the motor case. The packing material extends about the hub of the piston, as indicated at 86, so as to seal the bearing between the piston hub and the circular wall portion 76 of the motor case, whereby the piston 80 is adapted to divide the interior of the motor case into two pressure sealed compartments. The motor case includes fluid inlet-outlet ports at opposite sides of the piston, as indicated at 90—92 whereby fluid conduit devices 93—94 may be connected into open communication with the interior of the motor case at opposite sides of the piston 80 for application of fluid pressure forces alternately against opposite sides of the piston 80. The motor shaft 78 is keyed to the gun mount frame brackets 22, whereby upon oscillation of the piston 80 within the motor case 70 the gun mount frame cradling the guns 14 will be simultaneously oscillated for elevational adjustments of the gun battery aim about the axis of the trunnion bearing 24.

To provide fluid pressure responsive actuation of the motor piston 80, as referred to hereinabove, the conduits 93—94 will be preferably of torsionally flexible type, at least insofar as they extend into communication as at 95 with corresponding semi-rigid conduit members 96—97, such as may be formed of solid metal tubing or the like. At their opposite ends the conduits 96—97 connect into open communication with fluid intake-outlet ports 98—99 of a hydraulic pump which is indicated generally at 100 (Figs. 4–6).

The pump 100 may be of any suitable hydraulic pressure type pump, but is preferably of the continuous operation variable capacity type such, for example, as is disclosed in U. S. Patent 2,230,-875, wherein means are provided for reversing the flow of fluid within the pump and varying the output thereof from zero to maximum capacity while the pump maintains continuous operation. Inasmuch as such pumping devices are now well known in the art and are presently being manufactured and made available to the purchasing public, the pump of the illustration will not be described in further detail. An electric motor indicated generally at 102 (Fig. 4) is provided as an integral part of the pumping device for driving the latter, and it will be understood that the motor 102 will be arranged to be energized through lead-out power conductor means 103 connected to any suitable power supply source.

To control the direction of fluid discharge and the rate of displacement thereof by the pumping device 100, the control member of the pumping mechanism is arranged to extend vertically from the motor case as indicated at 104 (Fig. 4); the control member 104 being in the form of a shaft adapted to be rotated axially for manipulation of the control devices of the pumping mechanism in response to oppositely directed rotative movements of the control member 104 away from the

neutral position thereof. Thus, the pump 100 will be caused to circulate fluid under pressure through the closed circuit system comprising the conduits 93—94 and connections 98—99 in corresponding opposite directions, and at rates of displacement depending upon the degree of rotation of the control member 104 away from its neutral position.

For example, rotation of the control member 104 in clockwise direction away from its neutral position will cause fluid to be circulated through the conduit system associated with the motor case 70 in such manner as to drive the piston 80 in one direction, while opposite rotation of the control member 104 will cause the piston 80 to be driven in the opposite direction; and in any case the rate of movement of the piston 80 within the motor case 70 will depend upon the degree of rotation of the control member 104 away from its neutral position and will be irrespective of the magnitude of forces reacting against such movements of the piston 80 and consequently even though the loads upon the piston 80 associated with adjusting the elevational aim of the gun battery may vary widely under different conditions of gun aiming adjustment, the rate of gun aiming movements will simply depend upon the degree of control movement imparted by the gunner to the control member 104. It is because of this arrangement that the gun battery of the invention is responsive to control operation thereof in an improved manner, and whereby even though the control mechanism for the gun battery may be located at a position quite remote from the position of the gun battery the gunner will obtain immediate and accurate aim adjustments of the gun battery responsive to his manipulations of the control device.

To control the gun battery aim in azimuth a motor device 110 identical in form to the motor 70 described hereinabove is mounted upon the fixed bracket 30 and is arranged to have its motor shaft coupled to the gun battery support yoke 26 which is rotatably carried by the bearing 28. Opposite fluid conduits 112—114 are coupled into the case of the motor 110 at opposite sides of the piston thereof, as explained hereinabove in connection with the motor 70; and the conduits 112—114 in turn connect at their other ends into fluid inlet-outlet connections 116—117 of a second pump device 120 which is of the type of the pump 100 referred to hereinabove. The pump 120 is also geared to the motor 102, whereby closing of the starting switch controlling operation of the motor 102 simultaneously puts both pumps 100 and 120 into operation for immediate actuation of the gun aim adjustment mechanism in response to manipulation of the respective pump discharge control means. As in the case of the pump 100 the pump 120 is provided with a control shaft 124 which is adapted to be rotated axially in opposite directions away from its neutral position to obtain the reversible direction variable type displacement in conjunction with the conduit system 112—114 for reversible operation of the motor 110, as explained hereinabove in connection with control of the motor 70 by the control member 104.

To provide effective manipulations of the control members 104—124 for the purposes hereinabove referred to, there is provided a novel control device adapted to be manually manipulated with novel facility by a single operator in such manner as to readily procure either simultaneously or separately any desired elevational or

azimuth control adjustments of the gun battery. For this purpose a housing bracket 125 is mounted upon the top of the pump case to extend vertically therefrom substantially concentrically of the control shaft 124. At its upper end the housing 125 carries a circular ball bearing 126 mounting therein a tubular shaft 128 to extend through the bearing 126 so as to be rotatably carried at the upper end of the housing 125. A bushing 129 (Fig. 7) is fitted between the housing collar and the tubular shaft 128 at a position spaced from the bearing 126 so as to provide a two-point support system for the tubular shaft 128.

At its upper end the tubular shaft 128 carries by means of a keyed connection 130 a bearing housing 132 of generally box-like form. The housing 132 carries a pair of bearings 134—134 at opposite sides thereof which in turn rotatably mount a stub shaft 135 extending through perforated opposite end wall portions of the bearing housing 32. A hand grip 136 is keyed to each exteriorly extending end of the stub shaft 135 by means of pins 137—137. The hand grips 136—136 are formed to comprise generally columnar shaped bodies of smoothly rounded contour and are spaced apart at such a distance as to be conveniently gripped by the corresponding right and left hands of the gunner when seated or standing in front of the control mechanism. The hand grips are oppositely inclined in front view, as seen in Fig. 4, and similarly inclined in side view as seen in Fig. 6 to augment the naturalness of the posture of the gunner's arms and wrists and hands when gripping the control handles for gun battery aim control purposes. Thus, it will be understood that upon gripping of the control handles 136—136 with both hands, the gunner may conveniently either separately or simultaneously apply azimuth and elevational control actuations to the control unit by twisting the control handle unit in azimuth so as to rotate the tubular shaft 128 relative to the bracket housing 125 and by twisting the control handle unit so as to rotate the stub shaft 135 about its horizontal axis.

The stub shaft 135 is perforated to receive the shank of a screw eye 140 transversely therethrough at a position along the stub shaft in line with the axis of rotation of the tubular shaft 128 (Fig. 7). A nut 141 locks the screw eye 140 to the shaft 135 upon final assembly of the parts. The eye 140 pivotally connects by means of a pivot pin 142 with opposite arm portions of a U bracket 144 accommodated within the bearing housing 132. A pitman 146 is connected rigidly at its upper end to the bracket 144 so as to extend therefrom through the tubular shaft 128 in freely accommodated relation therein. At its lower end the pitman 146 carries a circular ball bearing 148, the inner race of which is fixed to the pitman by means of a screw 149. A cage 150 is fixed to rest upon the outer race of the bearing 148 and pivotally connects at opposite leg portions thereof by means of a pivot pin 152 with one end of a crank 154 (Fig. 4). The crank 154 is carried at its opposite end by means of a pin 156 which in turn is rotatably mounted upon a bearing block 158 fastened to the housing 125.

At its opposite end the pin 156 carries a downwardly directed crank arm 160, the assembly connection being made by means of a nut 162. At its lower end the crank arm 160 is hollowed at 163 to an internally spherical socket configuration to receive in universally rotatable relation therein a ball shaped center portion of a cross bar 164 carried by a pair of link plates 165 which extend for-

wardly to engage opposite extending end portions of a pivot pin 166 threaded through one end of a pitman 168. At its other end the pitman 168 is bored and split to fit upon the extending end portion of the control shaft 104 of the hydraulic pump 100, and a bolt 169 is provided to clamp the split end portion of the pitman 168 upon the control shaft. Thus, it will be understood that upon rotation of the control handles 136—136 about the horizontal axis of the stub shaft 135, the pitman 146 will be alternately raised and lowered whereupon the crank and linkage mechanism will cause the control shaft 104 of the pump 100 to be correspondingly rotated in either direction away from its neutral position, for control of the gun battery elevational control motor 70 as explained hereinabove.

A stirrup 175 (Fig. 7) having an upper collar portion encircling the tubular shaft 128 is clamped thereupon, as by means of a split collar and screw connection 176. The body portion of the stirrup 175 encircles the crank and linkage devices connecting to the lower end of the pitman 146 to avoid interference therewith, and at its lower end the stirrup 175 threads upon the upper end of the control shaft 124 of the pump 120, and is keyed thereto by means of a key pin 178. Thus, it will be understood that rotation of the entire control handle unit about the vertical axis of the tubular shaft 128, in response to manual pressures applied by the gunner upon the handles 136, will correspondingly rotate the control shaft 124 of the hydraulic pump 120, to obtain the azimuth adjustments of the gun aim control mechanism referred to hereinabove.

To facilitate sighting of the gun battery a gun sight is employed in conjunction with the gun battery mechanism referred to hereinabove. As illustrated in the drawing, it is arranged that the gunner be protected from enemy fire by means of armor plating as indicated at 180, and the plate is provided with a sighting aperture 182 covered by bullet-proof glass 183. The gun sight is illustrated at 184 as being of the conventional reflector type, and the gun sight is mounted upon a parallelogram linkage indicated generally at 185 carried by a post 186 rotatably mounted within a vertically disposed bearing 187 fixed to the armor plate or any other suitable stationary wall structure. Thus, the post and parallelogram linkage mechanism carrying the gun sight is freely rotatable about the vertical axis of the post 186. A crank arm 188 extends rigidly and laterally from the post 187 and pivotally connects at 189 to one end of a push-pull rod 190 extending forwardly into pivotal connection at 191 with a crank arm 192 extending laterally from and keyed to the top end of the stub shaft portion 37 of the C bracket 40 which is rotatably carried within the gun mount bearing block 36. Thus, as the gun battery pivots in azimuth about the aligned axes of the bearings 28—34 the crank and push-pull devices 188—190—192 transmit corresponding rotational movements to the gun sight mechanism about the axis of the bearing 187, whereby the gun battery and gun sight move in unison in connection with azimuth aim adjustments.

A bell crank 194 is pivotally mounted at 195 upon the upper end of the arm 192. One arm of the bell crank 194 is pivotally connected to a pitman 197 which connects at its other end by means of a pivotal connection 198 to the gun mount frame unit at a position eccentrically of the axis of the trunnion bearing 24. Consequently, whenever the gun battery aim is adjusted in elevation the pitman 197 rocks the bell crank 194 in corresponding directions. The other arm of the bell crank 194 pivotally connects at 199 to a push-pull rod 200 which extends rearwardly into pivotal connection at 202 with a crank 204 which in turn connects by means of a shaft 205 to an arm of the parallelogram linkage mechanism carrying the gun sight. Thus, rocking of the bell crank 194 will procure corresponding tilting of the gun sight 184 in vertical directions in exact correspondence with the elevational aim adjusting movements of the gun battery.

Gun fire interruption or dead-man triggers are conveniently carried by the control handles 136—136 as indicated at 210 so as to be disposed under the hands of the gunner when gripping the handles 136—136. Thus, the weights of the gunner's hands depress the triggers 210 for closing the gun fire control circuits, but whenever the gunner's hands fall away from the handles the triggers 210 will be released to return under spring tension forces to control circuit "open" condition. The customary firing triggers are carried at 211. The conductors connecting to the control triggers may be conveniently threaded through hollowed interior portions of the stub shaft 135 to lead into the bearing housing 132, and thence the conductors are conveniently carried downwardly into the stationary housing 125 by being threaded through a flexible tube 212 (Fig. 7), and thence into electrical connection with the gun operating mechanism.

Thus, it will be understood that the aim control mechanism of the invention comprises a novel and conveniently manipulatable manual control device which is adapted to be manually manipulated in exact consonance with the direction and degree of gun battery aim adjustment desired, and whereby in order to obtain any desired form of gun aim adjusting movement of the gun battery the operator will apply to the manual control device most natural forms of turning manipulations. It will also be understood that in view of the fact that the manual control device is closely coupled through positive acting link mechanisms with the pump output control means maximum accuracy of response of the latter to all manual control movements will be procured. Also, inasmuch as the rate of operation of the motor devices 70—110 are direct functions only of the degrees of deflection by the manual control device irrespective of the magnitude of reaction forces thereagainst, the response of the gun battery adjusting mechanism to the manual control movements by the gunner will in all cases be of improved order. It will be understood that the gun mount arrangement of the invention provides marked improvements and stability features over my prior gun mount arrangement referred to, in that the C bracket 40 of the present invention is formed with radially extending and diametrically opposed stub shafts 27—37 for mounting the C bracket upon the upper and lower bearings 36—28 so as to be firmly supported to an improved degree for withstanding the loads imposed upon the azimuth bearings due to the weight of the twin guns suspended thereon, while being freely rotatable about the vertical azimuth adjustment axis. Thus, the C bracket comprises simultaneously an improved primary support for the gun battery; a portion of the ejected link receiver housing; and convenient means for connecting the gun sight actuating linkage directly to the top portion of

the C bracket. Because of this feature the gun sight control linkage is adapted to most accurately follow the movements of the gun battery aim adjustments; and the design of the entire arrangement enables the elimination of a substantial number of structural and operating parts.

It will be further understood that although only one form of the invention has been shown and described in detail, it will be apparent to those skilled in the art that the invention is not so limited but that various changes may be made therein without departing from the spirit of the invention or the scope of the appended claims.

I claim:

1. A mount for a pair of machine guns or the like, comprising a support, a gun mount cradle adapted to mount therein a pair of guns in parallel side-by-side relation, bearing means mounting said cradle relative to said support so as to be pivotable relative to said support about a horizontal axis through said bearing means for gun elevational aiming purposes, said support having a curved portion of semi-circular sectional form and disposed concentrically of said axis of rotation and terminating at upper and lower ends thereof in stub shaft portions extending diametrically opposite in vertically aligned relation, a pair of circular plates disposed adjacent opposite side wall portions of said support, each of said plates being apertured to register with the ammunition belt ejected link ports of the corresponding of said guns and connected to said guns to rotate therewith so as to be adapted to receive belt links as they are ejected from said guns for transmission of said links through said casing interior and outwardly thereof at the bottom portion thereof, bearing means rotatably engaging each of said support stub shaft portions to mount said support for free pivoting movements relative to a supporting base about a vertical axis, a vane type fluid pressure motor case of segmental form mounted upon said support to extend within a portion of said casing and having a piston therewithin extending into keyed relation with said gun mount cradle, and means for introducing fluid under pressure to said motor case in controlled manner alternately at opposite sides of said piston to cause said cradle to oscillate in controlled manner about said axis of rotation for elevational adjustments of the gun battery aim.

2. A mount for a machine gun or the like, comprising a support, a cradle adapted to mount therein a gun, means mounting said cradle relative to said support so as to be pivotable about a horizontal axis relative to said support for gun elevational aiming purposes, said support having a hollow casing portion of generally circular sectional form disposed to be intersected by said axis of rotation and a pair of diametrically opposed shaft portions extending radially therefrom, a circular plate carried by said gun adjacent a side wall portion of said support, said plate being apertured to register with the ammunition belt ejected link port of said gun so as to be adapted to receive belt links as they are ejected from said gun for transmission thereof through said casing interior to a link discharge bottom portion thereof, a gun mount base, bearing means carried by said base and rotatably engaging said shaft portions for free rotation of said casing about a vertical axis, a vane type fluid pressure motor means of segmental form mounted within the confines of said casing and having a piston member keyed to said cradle, fluid pressure motor means coupled to one of said shafts, and means for introducing fluid under pressure selectively to said motor means for alternate opposite direction operation thereof to cause said cradle to oscillate in controlled manner about said horizontal and vertical axes of rotation for elevational and azimuth aiming adjustments of the mounted gun.

3. A mount for a pair of machine guns or the like, comprising a support, a gun cradle adapted to mount therein a pair of guns in parallel side-by-side relation and having a cross bar extending therebetween, said support having bearing means mounting said cross bar so that said cradle is pivotable about a horizontal axis relative to said support for gun elevational aiming purposes, a hollow drum mounted upon said support and extending between the positions of the mounted guns and intersected by said axis of rotation and having opposite side wall portions thereof apertured to register with the ammunition belt ejected link ports of the corresponding of said guns so as to be adapted to receive belt links as they are ejected from said guns for transmission thereof through said casing interior to a link discharge bottom portion thereof under all conditions of elevational adjustment of said guns, said drum having a pair of diametrically opposed stub shafts extending radially therefrom in vertical alignment, bearing means engaging said stub shafts for supporting the latter relative to a fixed base, a motor mechanism mounted within said casing and having action and reaction portions thereof connected to said cradle and to said support respectively, a second motor mechanism engaging one of said stub shafts, and means for energizing said motor mechanisms in controlled manner to cause said cradle to oscillate in horizontal and vertical manner about said axes of rotation.

4. A mount for a pair of machine guns or the like, comprising a gun mount base, a gun mount support, a gun cradle adapted to mount therein a pair of guns in parallel side-by-side relation and carried by bearing means to be pivotable about a horizontal axis relative to said support for gun elevational aiming purposes, a hollow drum extending from said support between the positions of the mounted guns and intersected by said axis of rotation and having diametrically opposite stub shaft portions extending vertically therefrom, bearing means carried by said support to rotatably engage said stub shaft portions, a motor mechanism mounted within said casing and having action and reaction portions thereof connected to said cradle and to said support respectively, a second motor mechanism carried by said base and coupled to one of said stub shaft portions, and means for selectively energizing said motor mechanisms in controlled manner to cause said cradle to oscillate about horizontal and vertical axes of rotation.

5. A mount for a machine gun or the like, comprising a base, a gun mount support, a cradle adapted to mount therein a gun, means mounting said cradle relative to said support so as to be pivotable about a horizontal axis relative to said support for gun elevational aiming purposes, said support having a hollow casing portion being generally of circular sectional form and disposed to be intersected by said axis of rotation and having a side wall portion thereof apertured to register with the ammunition belt ejected link port of said gun so as to be adapted to receive belt links as they are ejected from said gun for trans-

mission thereof through said casing interior to a link discharge bottom portion thereof, said support having a pair of diametrically opposed stub shaft portions extending radially of said hollow casing portion and in vertical alignment, bearing means carried by said base and engaging said stub shaft portions, gun sight means connected to one of said stub shaft portions for aim adjustment movements consonant therewith, motor means mounted within said casing and having a piston member keyed to said cradle, a second motor means carried by said base and coupled to the other of said stub shafts, and means for energizing said motor means to cause said cradle to oscillate in controlled manner about horizontal and vertical axes of rotation for elevational and azimuth aiming adjustments of the mounted gun.

JOHN C. TROTTER.

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