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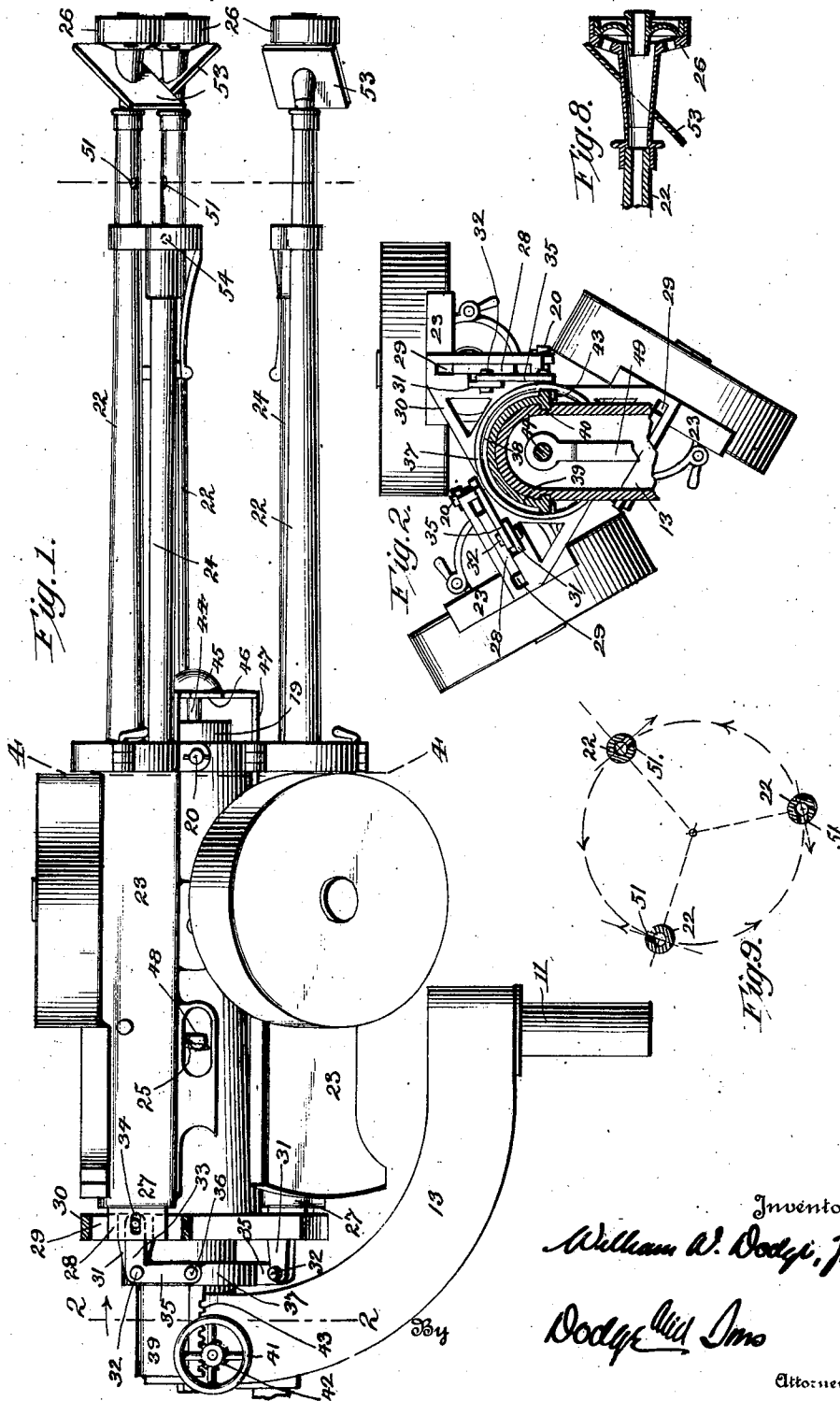
W. W. DODGE, JR

1,551,809

MACHINE GUN

Filed Dec. 10, 1923

3 Sheets-Sheet 1



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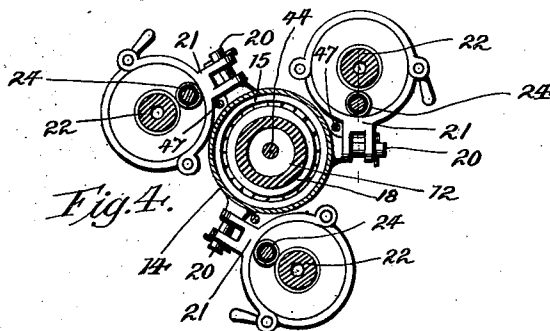
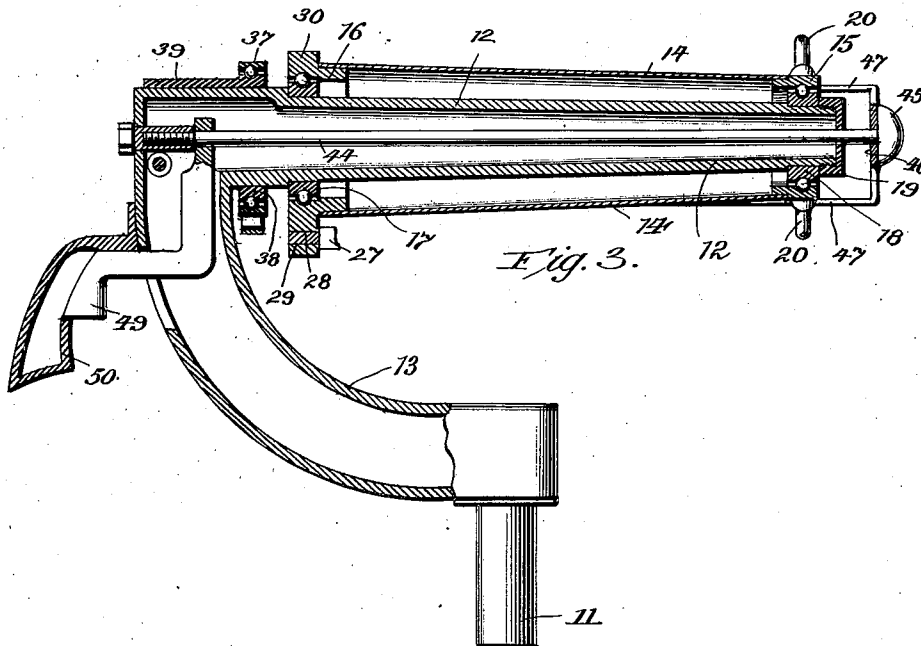
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3 Sheets-Sheet 2



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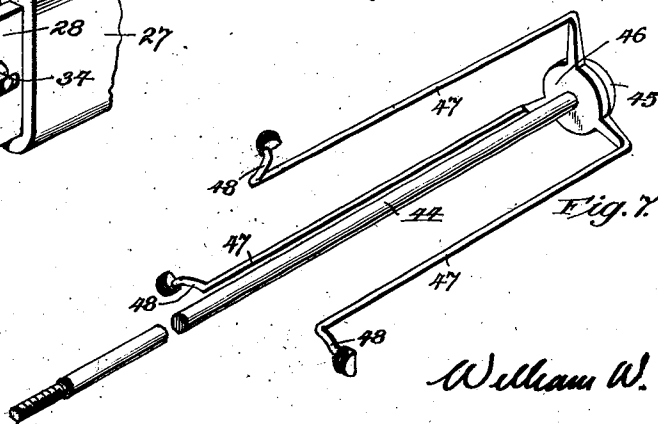
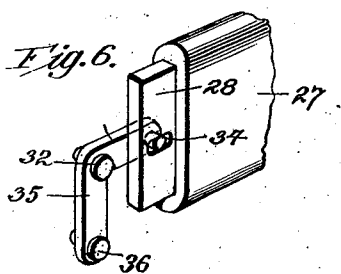
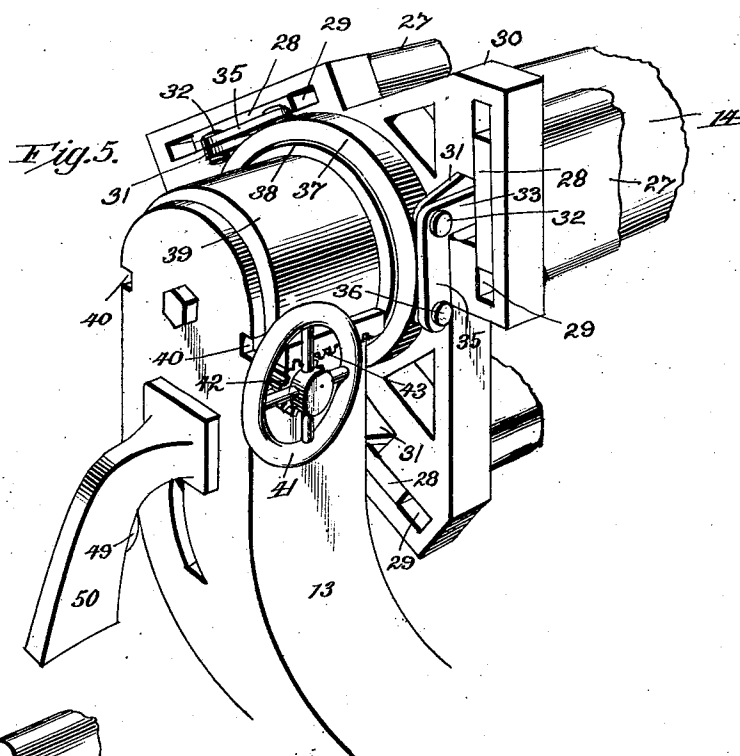
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MACHINE GUN

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UNITED STATES PATENT OFFICE.

WILLIAM W. DODGE, JR., OF ASHEVILLE, NORTH CAROLINA.

MACHINE GUN.

Application filed December 10, 1923. Serial No. 679,747.

To all whom it may concern:

Be it known that I, WILLIAM W. DODGE, Jr., a citizen of the United States, residing at Asheville, in the county of Buncombe and State of North Carolina, have invented certain new and useful Improvements in Machine Guns, of which the following is a specification.

This invention relates to machine guns, and particularly to such guns when mounted in rotatable gangs to turn on an axis approximately parallel with the bores of the guns and thus produce intense cones of fire.

This general arrangement has heretofore been suggested, but as far as I am aware such prior devices have required some power means for rotating the guns, a requirement which severely limits the practical utility of the device for combat purposes.

The present invention provides extremely simple means for deriving the necessary power from the propelling charges fired in one or more of the guns. To do this I provide ports through which parts of the powder gases are discharged in directions approximately tangential to the rotary path of the guns. I prefer that the ports lead directly from the bores of the barrels near the muzzles, but they may lead from the gas cylinders of gas-operated guns, or from recoil checks if such be used, the checks in the last named case being modified to vent the gases rearward and to one side.

Another feature of the invention relates to means for producing a simultaneous angular adjustment of the guns, relatively to the axis of rotation, so as to produce convergent, parallel or divergent fire at will while the guns are being fired. I prefer to arrange the adjusting mechanism so that while all the guns are parallel simultaneously, they will simultaneously assume different degrees of divergence or convergence, so that each gun develops a cone of fire different from, though concentric with, the cones of the other guns.

The invention may be used with various types of machine guns, but is illustrated in the accompanying drawings as applied to the well known Lewis gun, for the reason that this is a gas operated gun, and hence offers an opportunity to illustrate how the gases may be taken from the actuating cylinder.

In the drawings:

Fig. 1 is a side elevation of a three-gun unit constructed according to my invention.

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

Fig. 3 is a longitudinal axial section of the rotatable carrier and its support.

Fig. 4 is a section on the line 4—4 of Fig. 1.

Fig. 5 is a fragmentary perspective view showing the mechanism for adjusting the guns relatively to the axis of rotation.

Fig. 6 is a fragmentary perspective detail of certain parts shown in Fig. 5.

Fig. 7 is a perspective view of the trigger actuator.

Fig. 8 is a detail of one type of recoil check which may be used to cause or assist in causing the desired rotary motion.

Fig. 9 is a diagram showing the preferred arrangement of the gas ports in the barrels.

The entire unit is mounted for orientation on a trunnion 11, which is formed as an integral part of a frame member consisting of a horizontal arm 12 and an offset support 13. The arm 12 is circular in cross section, and preferably is tapered and hollow, as shown. The position and form of the trunnion 11 depend, in large measure, on the conditions under which the gun is to be used, and the drawing is illustrated only.

The rotating member which carries the guns consists of a sleeve 14, which has, fixed in its opposite ends, the outer races 15 and 16 of two annular ball bearings of the combined radial and thrust type. Bearings of this type are common articles of commerce, and hence need not be described in detail. The inner race 17 of the rear bearing seats against a shoulder on the arm 12, and the inner race 18 of the front bearing is clamped against another shoulder on the arm 12 by means of a cap nut 19 (see Fig. 3). Any other bearing structure, relatively frictionless and capable of resisting the thrust of recoil, may be substituted.

Carried by the sleeve 14, and at the forward end thereof, are three radial trunnions, one for each gun. On these the guns are pivoted. In the case of the Lewis gun, I use the standard mounting yoke. The trunnions are shown at 20 and the mounting yokes at 21.

The guns are shown in general outline only, as their construction is standard and well understood. The barrels are shown at 22, the receivers at 23, the gas cylinders at 24, the triggers at 25 and the recoil checks at 26. These may be of special construction as hereinafter explained.

At the rear ends of the receivers 23, I attach, in lieu of the usual spade grips, butt members 27, each having a guide-lug 28. The guide-lugs 28 are confined in slots 29 formed in a triangular yoke 30 which is mounted on the sleeve 14 at the rear end thereof. Adjacent each slot 29 is a corresponding rearwardly projecting bracket 31, and to the brackets 31 are pivoted at 32 the bell-crank levers which are used to adjust the guns relatively to the axis of rotatable sleeve 14.

The arms 33 of the three bell-cranks have pin and slot connections 34 with the lugs 28, and preferably are slightly unequal in effective length, so that for a given angular movement of the three arms, there will be produced slightly unequal movements of the lugs 28, and hence of the corresponding guns. The other arms 35 of the three bell-cranks are connected by ball and socket bearings 36 with the outer race 37 of an annular ball bearing whose inner race is shown at 38. This bearing is also of the combined radial and thrust type.

The inner race 38 is carried by a slide 39, which is guided in ways 40, and which is arranged to move forward and backward at the rear of the arm 12 above the support 13. Some means for adjusting the position of the slide 39 is desirable, and for purposes of illustration I show a hand-wheel 41, to which is fixed a pinion 42 meshing with a rack 43 formed on the slide 39. Various other mechanisms may be used, the one shown being probably the simplest possible.

The parts are so arranged that all the guns may be set parallel to the axis of sleeve 14 simultaneously by a proper adjustment of the wheel 41, or may be caused to converge or diverge, the latter being the adjustment most commonly used. When the arms 33 have different effective lengths, the various guns will simultaneously assume slightly different convergent and divergent positions, so that each gun will trace a cone of fire different from that of the other guns. This produces a better distribution of fire than would be had if all the guns traced the same cone of fire. However, in any case where the latter result is desired, it can readily be secured by making the arms 33 of equal effective lengths.

To fire the guns simultaneously, I provide a stem 44; which is longitudinally slidable axially through arm 12, and which has at its forward end a head 45. Rotatably mounted on stem 44, in position to be en-

gaged and drawn rearward by head 45, is a trigger actuator 46, which has rearward projecting arms 47, one for each gun. The arms 47 are guided by the sleeve 14, so as to be compelled to rotate with it, and carry, at their rear ends, the trigger engaging lugs 48. The lugs 48 operate the triggers when stem 44 is drawn to the rear. To operate the stem 44, I provide a master trigger 49, which is fixed on the stem 44, and which is associated with the pistol grip 50 by which the entire group of guns is aimed.

To rotate the guns and their carrying sleeve, I provide the ports 51, in one or more, and preferably in all of the barrels. In addition to, or in lieu of these ports, I may use special recoil checks 26, shown in Figs. 1 and 8. These depart from the standard type in the provision of means to deflect the vented gases laterally. Such means may take various forms, but as a simple expedient I suggest the addition of deflecting vanes 53, which permit the modification of existing checks.

As suggested, the ports 51 might be formed in the gas cylinders 24, but as these cylinders are connected directly with the barrels, there is no functional difference, except such advantage as arises from the use of a single gas port in the barrel both to operate the action of the gun, and to produce the rotating effort. A possible position for such ports is indicated at 54 in Fig. 1.

Assuming that all the guns are in the "ready to fire" condition, and that the guns are properly aimed, all that the operator need do is to press the master trigger 49, which acting simultaneously upon the triggers 25, of all the guns, puts them all into action. The powder gases discharged through the ports 51 will immediately start the rotary movement of the guns, thus distributing the fire of each gun in a circular path. While the guns are at rest, or while they are being fired, they may be angularly adjusted relatively to the axis of sleeve 14 by rotating the wheel 41. The effect of the unequal links 33 is to adjust individual guns simultaneously for different degrees of divergence or convergence so that the various guns cover the target effectively.

While I show three guns, it is obvious that more or fewer might be used. I find the offset relation of the gun illustrated in Fig. 2 to be particularly favorable in connection with Lewis guns, because it permits the construction of a compact unit with ample clearness for the drum magazines, characteristic of this gun. It will be understood, however, that any known type of machine gun capable of being fed from a box or drum magazine may be mounted and rotated according to the present invention,

and that no limitation to gas operation of the machine gun per se is implied. While I prefer the use of individual blast ports 51, I recognize the possibility of combining this with the gas port, which feeds the operating gas cylinder, and the possibility of using gases from the recoil check to produce the rotary effort. Consequently, I use the term "powder gases" and "gases from the propelling charges" in the claims as an inclusive term broad enough to cover the various suggested and other functionally similar expedients, when not specifically limited.

15 What is claimed is:

1. The combination of a plurality of machine guns each having an independent automatic action, said guns being mounted to rotate about a common axis approximately parallel with their bores, and means for rotating said guns independently of said automatic action and actuated by powder gases derived from the propelling charges fired in one or more of said guns.

25 2. The combination of a plurality of machine guns each having an independent automatic action, said guns being mounted to rotate about an axis approximately parallel with their bores, and means for directing a portion of the powder gases from the propelling charges fired in one or more of said guns in a direction or directions approximately tangent to the rotary path of said guns.

35 3. The combination of a plurality of machine guns each having an independent automatic action, said guns being mounted to rotate about an axis approximately parallel with their bores, and means for diverting a portion of the powder gases generated by the propelling charges fired in one or more of said guns from the bores thereof and for discharging it in a lateral direction or directions whereby rotation of the guns about said axis is caused.

40 4. The combination of a plurality of machine guns each having an independent automatic action, said guns being mounted to rotate about an axis approximately parallel with their bores, the barrels of said guns being provided with ports leading directly from the bores of said guns near the muzzles thereof and arranged to discharge powder gases in such directions as will induce rotation of said guns about said axis.

55 5. The combination of a rotatable carrier, a plurality of independently operable machine guns pivotally mounted thereon, with their bores approximately parallel with the axis of rotation thereof; an actuator mounted to rotate with said carrier and operatively connected with said guns, the parts being so constructed and arranged that axial movement of said actuator varies the angular position of said guns; and means for ad-

justing said actuator axially while said carrier rotates.

6. The combination of a rotatable carrier, a plurality of independently operable machine guns pivotally mounted thereon, with their bores approximately parallel with the axis of rotation thereof; an actuator mounted to rotate with said carrier and operatively connected with said guns, the parts being so constructed and arranged that axial movement of said actuator varies the angular position of said guns; means for adjusting said actuator axially while said carrier rotates; and means for discharging powder gases from the barrels of said guns in lateral directions, whereby said carrier and guns are rotated.

7. The combination of a rotatable support, a plurality of machine guns movably mounted on said support so as to be capable of adjustment thereon to vary the angle of their bores relatively to the axis of rotation; means operated by propelling charges in the guns for rotating said guns about said axis; and means for adjusting said guns simultaneously during rotary movement thereof.

8. The combination of a rotatable support; a plurality of machine guns movably mounted on said support so as to be capable of adjustment thereon to vary the angle of their bores relatively to the axis of rotation; means for rotating said guns about said axis; and means for adjusting said guns constructed and arranged in one adjustment to position all the guns with their axes simultaneously parallel with their axis of rotation, and in other adjustments to set each gun at a different angle with said axis from the corresponding angle of other guns.

9. The combination of a rotatable support; a plurality of machine guns movably mounted on said support so as to be capable of adjustment thereon to vary the angle of their bores relatively to the axis of rotation; means for rotating said guns about said axis; and means for adjusting said guns including a plurality of unequal levers, whereby each gun is adjusted simultaneously with others but at a different rate.

10. The combination of a rotatable support; a plurality of machine guns having laterally projecting magazines, the guns being pivotally mounted on said support in offset relation whereby clearance for the magazines is afforded with the barrels of the guns close to the axis of rotation; means operable while said support is in rotation and serving to vary the dispersion of fire by adjusting the guns relatively to said support; and means for rotating said guns by energy derived from the propelling charges fired therein.

11. The combination of a rotatable support; a plurality of machine guns having

laterally projecting magazines, the guns being pivotally mounted on said support in offset relation whereby clearance for the magazines is afforded with the barrels of the guns close to the axis of rotation; means operable while said support is in rotation and serving to vary the dispersion of fire by adjusting the guns relatively to said support; and means for rotating said guns by the blast of powder gases discharged from the barrels thereof. 10

In testimony whereof I have signed my name to this specification.

WILLIAM W. DODGE, JR.