Oct. 31, 1950 R. E. DUPLESSIS 2,527,715

FIRING CONTROL FOR MULTIPLE GUN MOUNTS

Filed June 6, 1945 2 Sheets-Sheet 1

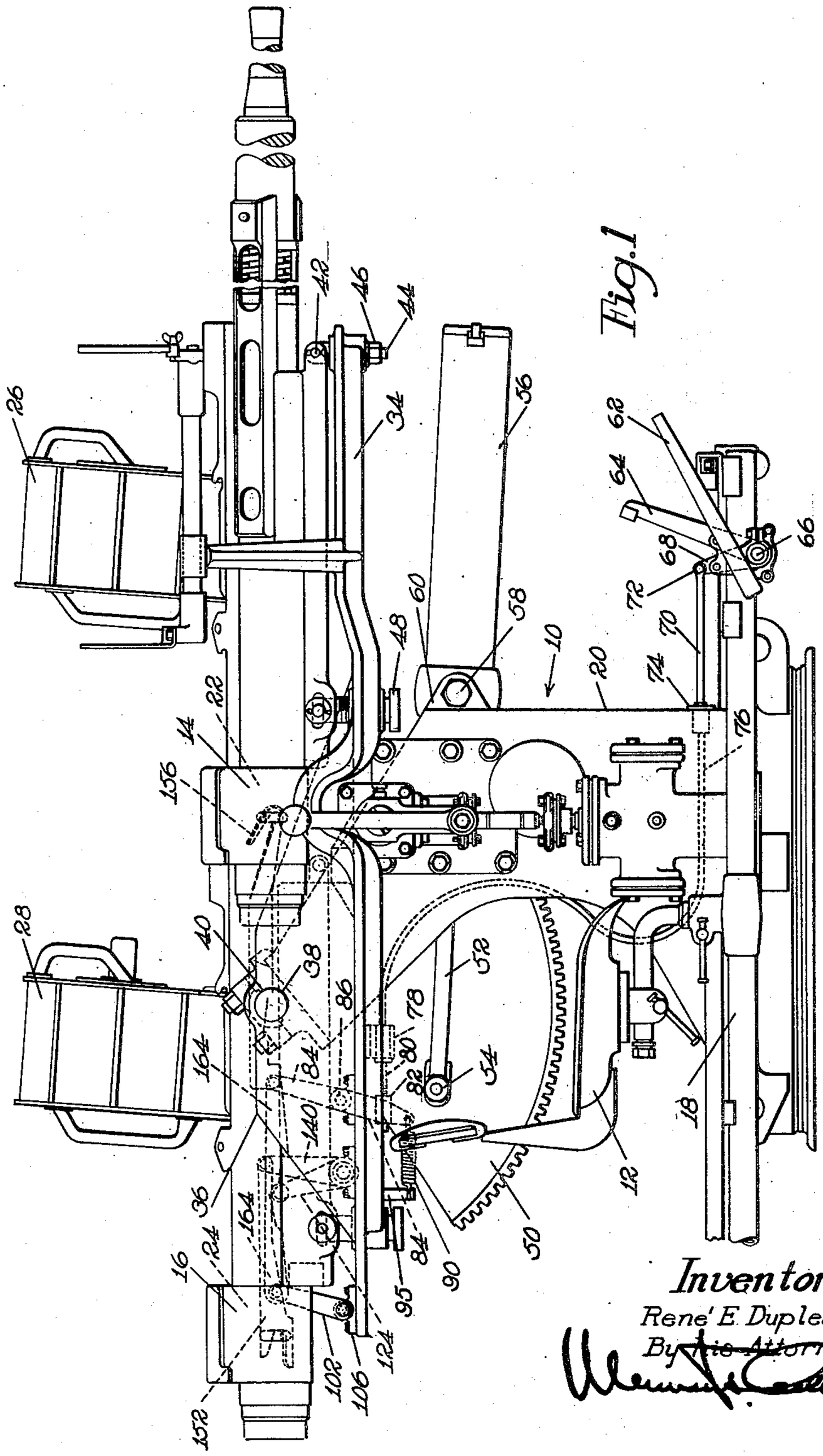

Fig. 1

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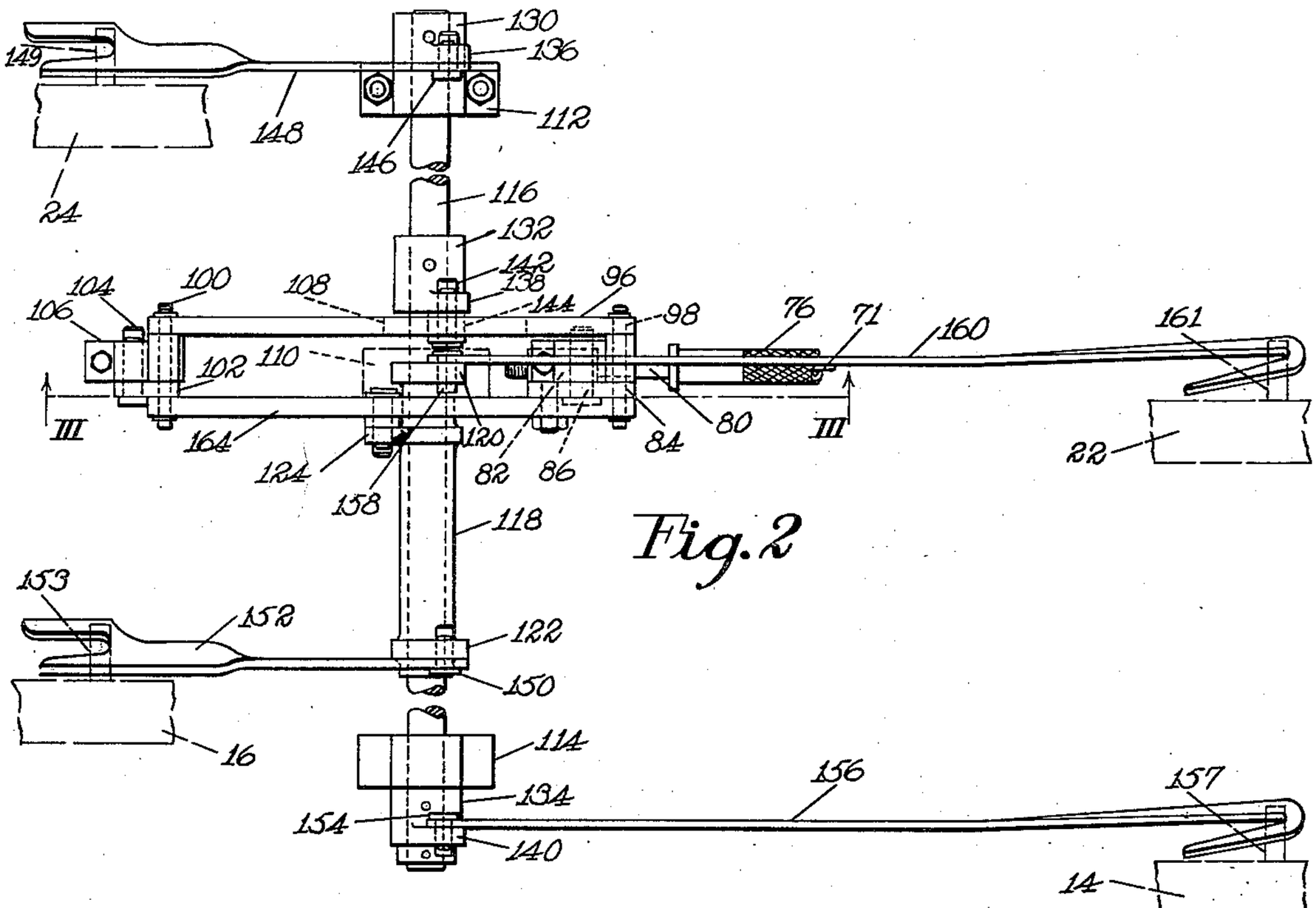

Fig. 2

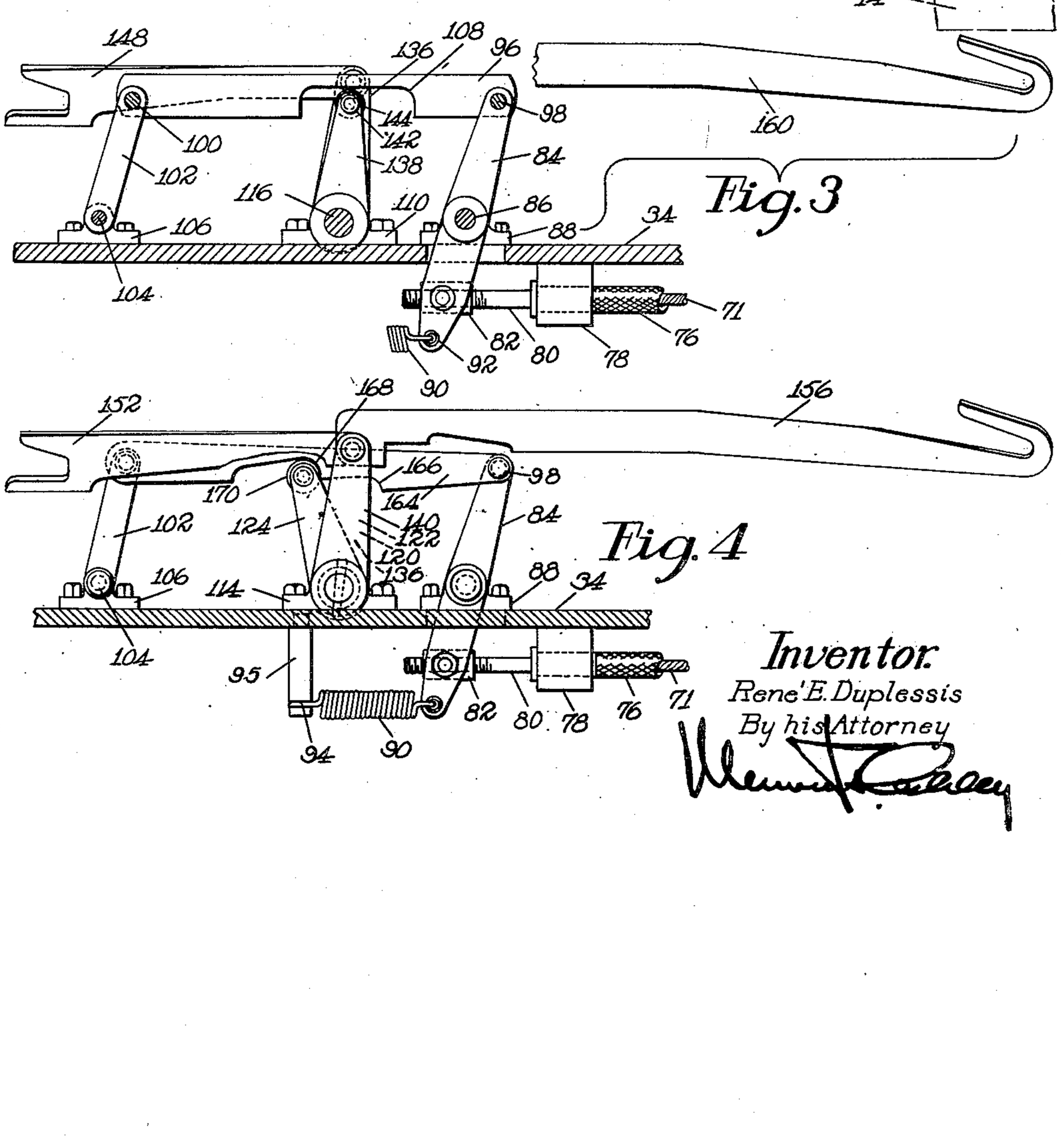

Fig. 3

Fig. 4

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FIRING CONTROL FOR MULTIPLE GUN MOUNTS

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1 Claim. (Cl. 89—127)

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This invention relates to ordnance of the automatic type and more particularly to a gun mount adapted to support a plurality of automatic guns, the mount being provided with a unitary means enabling the operator optionally to fire all or a lesser number of the guns at will.

If a single gunner is to fire a number of guns at a target it is obviously advantageous to provide him with a unitary control means whereby a lesser number of those guns may first be used to train all the guns on the target and whereby more than the lesser number of guns may then be fired. With such a control not only is an economy of ammunition realized but the operation of training the guns upon the target is facilitated as vibration of all the guns need not be contended with until the proper moment arrives. In a multiple gun arrangement for this purpose it is also highly advantageous to have the guns grouped as closely as possible for coordinated operation.

It is an object of this invention to provide an improved gun mount by means of which a plurality of trigger-operated guns may be operated in predetermined coordination, the operation being undertaken through a unitary control means placed on the mount.

For the purposes in view, and in accordance with various features of the invention, the illustrated mount is constructed with a common platform or support for a plurality of 20-millimeter machine guns. The construction is such that in operation the guns may be trained on a target by moving the platform, and mechanical linkages are provided on the platform by means of which some or all of the gun triggers may be operated. Further novelty is to be recognized in a remotely located treadle with associated linkages for operating the guns.

The above and other features of the invention, including novel details of construction and combinations of parts, will now be more particularly described in connection with the accompanying drawings and pointed out in the claim.

In the drawings,

Fig. 1 is a view in side elevation of a mount for a plurality of guns in which the present invention is embodied;

Fig. 2 is a plan view of the control means shown in Fig. 1 with portions of the guns blocked in to show their arrangement;

Fig. 3 is a sectional view along the line III—III of Fig. 2 with the addition of a portion in section of the supporting means; and

Fig. 4 is a view in elevation of the parts shown

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in Fig. 2 with a portion in section of the supporting means.

In Fig. 1 is shown a conventional gun mount generally indicated at **10** having a gunner's seat **12** at one side of four automatic guns. The seat **12** is mounted on an operator's platform **18** which is adapted to rotate with the main portion **20** of the mount about a vertical axis for the purpose of training the guns in azimuth, as is conventional. In the case of the mount illustrated only two guns, **14** and **16**, are shown in the most comprehensive elevational view (Fig. 1). However, there are four guns in this particular construction, two of them, **22** and **24**, being in alinement with the guns **14** and **16** as viewed in Fig. 1. Fig. 2 shows their staggered arrangement. The gun **14** is provided with a magazine **26** and the gun **16** is provided with a magazine **28**. The guns **22** and **24** are similarly provided with magazines (not shown). All four guns are mounted upon a platform **34**, this platform having upstanding flanges **36** which are suspended upon a shaft **38** carried in a bearing **40** on the main portion **20** of the mount. The mountings of all four guns, with respect to the platform **34**, are similar. A forward portion of the gun **14** (taken as representative of the other guns) is pivoted at **42** upon a pin **44** firmly attached to the platform **34** by a nut **46**. At a rear portion of the gun **14**, a second pin **48** is threaded into the platform **34** and provided with a locking means whereby the gun is held in adjusted position after bore sighting. The mounting of each gun on the platform **34** is subject to great variation and the specific means here shown forms no part of the present invention. For purposes of training the guns in elevation a motor driven gear segment **50** is attached to the platform **34** and an equilibrator rod **52** is shown pivoted to the segment **50** at point **54**. The rod **52** is connected to an equilibrator **56** pivoted at **58** to a bracket **60** upon the main portion **20** of the mount. Only one equilibrator is shown in the drawings but two equilibrators are used as is conventional. The specific power mechanism for training all the guns in azimuth and in elevation to follow a single target also forms no part of the present invention.

The guns **14**, **16**, **22** and **24** are mounted in staggered relation upon the platform **34** and this arrangement permits a compact grouping of the guns as parts such as the magazines may be placed more in alinement longitudinally of the guns instead of being placed side by side. The guns may also be turned on their axes in order to permit

them to be more closely grouped, the specific arrangement being dependent upon the type of guns used.

A foot rest 62 is rigidly mounted on the operator's platform 18 and closely adjacent thereto a firing treadle 64 is keyed to a shaft 66 mounted for rotation in bearings on the platform 18. A lever 68 is also keyed to the shaft 66 to rotate therewith upon depression of the treadle 64. A rod 70 is pivoted at 72 to the lever 68 and is arranged to slide in a conduit terminal 74 on the mount. The rod 70 is attached to a flexible single cable 71 (Figs. 2, 3 and 4) axially slidable within a conduit 76 which leads up to a bracket 78 fixed to the bottom of the platform 34. A rod 80 is attached to the upper end of the flexible cable 71 and is pivoted by means of a block 82 to a lever 84.

The lever 84 is pivoted to a short shaft 86 mounted in a bracket 88 attached to the platform or support 34. A spring 90 is attached at 92 to the lower end of the lever 84 and is also attached at 94 to a vertical pin 95 rigidly depending from the platform 34. A horizontal link 96 (Figs. 2 and 3) is pivoted at 98 to the upper end of the lever 84 and is also pivoted at 100 to a lever 102 rotatable on a shaft 104 held within a bracket 106 on the platform 34. The link 96 has a cut out portion 108 of a configuration as viewed in Fig. 3. Adjacent to the bracket 88 on the platform 34 is a bracket 110 fastened to the platform 34 and in axial alinement with this bracket 110 are fastened brackets 112 and 114 (Fig. 2). These brackets 110, 112 and 114 support coaxial and rotative members transverse to the platform 34. These members comprise a rotative shaft 116 and a sleeve 118, the latter being concentric with a portion of the shaft 116 as shown in Fig. 2. Integral with the sleeve 118 are two levers 120 and 122 of the same angularity with respect to the vertical and also a third lever 124 inclined rearwardly, that is, to the left as shown in Fig. 2. Pinned to the shaft 116 are three brackets 130, 132 and 134 bearing levers 136, 138 and 140, respectively. The lever 140 is co-planar with the levers 136 and 138 and, as the parts are positioned in Figs. 2 and 4, levers 120 and 122 (integral with the sleeve 118) also lie in that same plane. The lever 138 is provided with a pin 142 bearing a roller 144 and, as shown in Fig. 3, this roller 144 occupies approximately a mid position within the cut out portion 108 of the link 96. The lever 136 bears a pin 146 upon which is pivoted the forward end of a trigger bar or actuator 148, the rear end of which is forked, as shown. The lever 122 on sleeve 118 bears a pin 150 upon which is pivoted a trigger bar or actuator 152 similar to the trigger bar 148. The lever 140 bears a pin 154 upon which is pivoted a trigger hook or actuator 156 extending forwardly or to the right as viewed in Fig. 2. The lever 120 on sleeve 118 bears a pin 158 (Fig. 2) upon which is pivoted a trigger hook or actuator 160 similar to trigger hook 156. Parallel to the link 96 and arranged to be moved therewith upon the pivots 98 and 100 is a link 164 the configuration of which can be clearly seen in Fig. 4, it having a cut out portion presenting two shoulders 166 and 168, this cut out portion being for a purpose to be described hereinafter. As will be apparent, the levers 84 and 102 together with the links 96 and 164 constitute a system of levers which move or swing as a unit when the treadle 64 is moved. The arm 124 bears a roller 170 and, as viewed in Fig. 4, the roller 170 is in engagement with the shoulder 168.

The forked ends of the trigger bars 148 and 152 are arranged to engage the triggers 149 and 153 of one outside gun and one inside gun of the staggered arrangement. The hooks 156 and 160 are arranged to engage the triggers 157 and 161 of the other two guns.

Figs. 3 and 4 show the linkages while in non-firing positions. A gunner seated in the seat 12 and having the guns pointing in approximately the correct direction of the target is enabled correctly to train his guns during the firing of only two of them. He may do so by slightly depressing the treadle 64 to fire the two inside guns 16 and 22 and by watching the effect of his shots. This slight depression of treadle 64 will cause a pull of the flexible cable 71 through its conduit 76 and move the upper end of lever 84 to the left, as viewed in Figs. 3 and 4. As a consequence the lever 124 will be rotated counterclockwise as viewed in Fig. 4 because of the contact of roller 170 with the shoulder 168. As sleeve 118 rotates, the levers 120 and 122 will also be rotated with the result that trigger bar 152 and trigger hook 160 will actuate the triggers of the two guns 16 and 22. After properly training these two guns on the target and because of the lost motion arrangement shown (shoulder 168 comes into operation first and then shoulder 108 comes into operation) the gunner may further depress the treadle 64 with the result that lever 84 will swing still further, and the two guns 16 and 22 will continue firing (as the roller 170 will merely ride over the shoulder 168) and with such further or larger extent of motion, the shoulder 108 of link 96 will contact roller 144 and swing the lever 138 counterclockwise. Shaft 116 will therefore be turned counterclockwise and through levers 136 and 140 will move the trigger bar 148 and the trigger hook 156 to the left, firing the two exterior guns 14 and 24 as well. Upon releasing the treadle 64, the spring 90 will relieve the pressure upon the triggers. The two outside guns 14 and 24 will first cease firing, and then (if desired) the two inside guns 16 and 22 will cease firing. Retraction of the triggers from their firing positions is accomplished by the spring mechanisms present in the guns themselves as conventionally constructed.

It can be seen that the treadle 64 may be remotely mounted from the guns due to the flexible cable 71 connecting it to the linkages upon the platform 34 and that it is quite feasible to mount the treadle at a point still more remote from the guns—i. e.—it need not be mounted on the operator's platform 18 which is rotatable with the mount, but may be stationary. It also may be seen that although the apparatus of the drawings is adapted for the operation of four guns, more or fewer guns may be utilized by merely connecting suitable levers to either the sleeve 118 or the shaft 116 or to both. The apparatus is particularly advantageous when more than two guns are mounted, one or more guns constituting an inner group of guns to be fired first and two or more guns constituting an outer group to be fired later and with the first group. The operator has a convenient unitary control means whereby he is enabled accurately to train all of the guns on a target by the use of a lesser number of guns and at the most opportune moment to effect the use of all the guns.

Having described my invention, what I claim

as new and desire to secure by Letters Patent of the United States is:

A gun mount comprising a platform supporting a plurality of trigger-operated guns, the latter being in close and substantially parallel relation, said platform carrying a system of levers and being movable with said guns in elevation and in azimuth, a remotely mounted treadle with a flexible single cable arranged to convey motion of the treadle to said system of levers, coaxial and rotative members mounted on and extending transverse to said platform, trigger actuators arranged to engage the triggers of said guns, said actuators being pivoted to arms attached to said coaxial members, and said system of levers having a lost motion arrangement connecting said system with said coaxial members whereby an optional number of triggers may be pulled dependent upon the extent of movement given to the treadle.

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