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P. KAMINSKI

MEANS FOR CORRECTING ERRORS IN GUN TRAINING DEVICES

Filed August 23, 1921

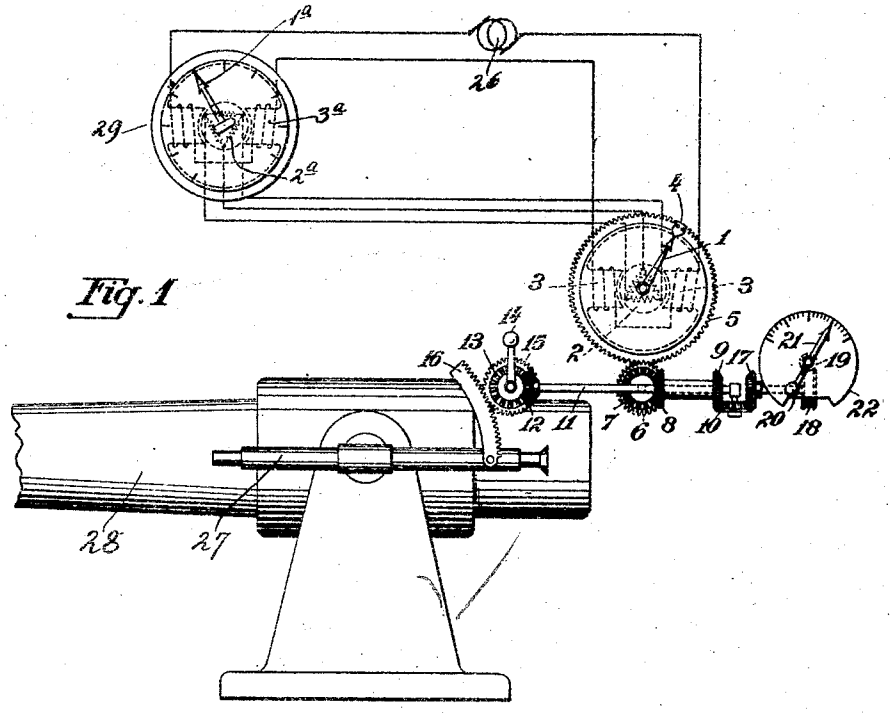


Fig. 1

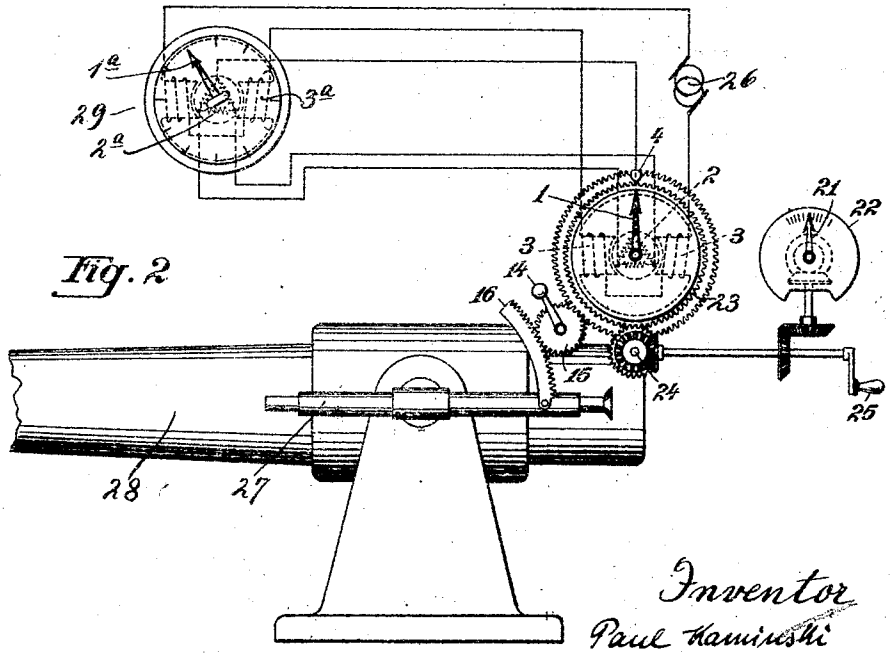


Fig. 2

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33. GEOMETRICAL INSTRUMENTS.

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UNITED STATES PATENT OFFICE.

PAUL KAMINSKI, OF BERLIN-PANKOW, GERMANY, ASSIGNOR TO SIEMENS & HALSKE, AKTIENGESELLSCHAFT, OF SIEMENSSTADT, NEAR BERLIN, GERMANY, A CORPORATION OF GERMANY.

MEANS FOR CORRECTING ERRORS IN GUN-TRAINING DEVICES.

Application filed August 23, 1921. Serial No. 494,582.

To all whom it may concern:

Be it known that I, PAUL KAMINSKI, a citizen of the German Empire, residing at Berlin-Pankow, Germany, have invented certain new and useful Improvements in Means for Correcting Errors in Gun-Training Devices (for which I have filed applications in Germany 8. 1. 14; Japan 9. 7. 20, Nr. 38830; Spain 1. 7. 20, Nr. 74338; Holland 28. 7. 20; Italy 22. 6. 20; Denmark 14. 7. 20; Norway 21. 6. 20; Sweden 18. 6. 20), of which the following is a specification.

This invention has for its object an arrangement for directing the fire of guns aboard ship or of a battery of guns, such that from one central position the range is given to every gun. It may happen that the point of aim ordered for the guns to be trained at, is not clearly visible to the gun spotter. If for instance, when firing at a vessel, the water line is to be taken as aim, this line may in hazy weather, rough sea, or darkness not be recognizable with the distinctness necessary for accurate aiming. However, the tops of the masts, the smoke stacks, and other portions of the vessel above the deck may be clearly distinguishable aiming points upon which a gun may be trained with sufficient accuracy. If the gun spotter were to train the gun to the inclination ordered by the control station and arbitrarily alter the point of aim, he would, instead of the waterline hit the point of the mast or the projectile might drop into the water a certain distance behind the target.

According to my invention, the sight setter adjusts it in the manner hitherto customary in accordance with the instructions given to him by the control station. The device which adjusts the line of sight in the telescopic sight on the gun in respect of the axis of the gun barrel by the inclination ordered, is arranged by me in such a way that the projectile hits the intended target notwithstanding the gun spotter individually shifting the point of aim. To enable him to do this effectively, he must know the angle by which he shifts his point of aim in respect of that ordered by the control station.

In order to accomplish this I use a so-called "follow-the-pointer" system in which a pointer, which is operated electrically from a control station, transmits instructions regarding the object to be adjusted, while a so-called "following pointer", is operated mechanically from the object to be controlled such that, when both pointers coincide, the controlled object shows the desired adjustment. Into the transmission members operating the "following pointer" I insert a supplementary gear of the design shown in Fig. 1. I may, however, attain the same object by inserting transmission members which act upon the pointer proper as illustrated in Fig. 2.

In the annexed drawings:

Fig. 1 shows the transmission members for operating the follow-up pointer; and

Fig. 2 shows the transmission members arranged to operate the pole yoke of the electrically controlled pointer.

In Fig. 1, the pointer is represented by 1 which in a known manner of telecontrol transmission shown on the drawing, is rotated by the armature 2 of an electric signal receiver between the magnet poles 3 from the control station. This control station, indicated at 29 in Fig. 1, consists of a field pole yoke 3^a similar to that shown at 3 in the receiving station, both yokes being energized in series by a single phase alternating current supplied from source 26. The armature 2 of the receiver and 2^a of the transmitter are both three-phase wound and are both connected together with each other in three-phase fashion as shown. The following pointer 4 is attached to the gear wheel 5 which engages the gear wheel 6. Gear wheel 6 is fixed upon the same spindle as the bevel gear 7 acting upon the planetary gear 10 via the bevel gears 8 and 9, thus driving the spindle 11. The end of this latter spindle carries a bevel gear 12 which engages with the bevel gear 13. The spindle which carries this bevel gear 13 has attached to it a hand crank 14 and a spur gear 15, the latter engaging the toothed segment 16 which is fastened to the telescopic sight 27 of the gun 28 and moves it. Moreover, a second bevel gear 17 engages with the planetary gear 10, the spindle of this bevel gear carrying at its other end a worm gear 18 which may be turned by the worm 19. The spindle of the worm 19 is provided with a crank 20 and a pointer 21, the latter moving over a scale 22 subdivided

into portions of an angle. If the point of aim of the gun spotter is the same as that ordered to be aimed at by the control station, the pointer 21 is placed upon the zero mark of the scale 20. If now the sight setter turns the crank 14, he also shifts at the same time the sighting device through the segment 16 thus causing the following pointer 4 to register with pointer 1 which is telecontrolled from the control station 29; this is effected through the planetary gearing 10 and the intermediate gearing. However, if the gun spotter shifts his point of aim through a certain angle in respect to the point of aim ordered by the control station, he adjusts this angle on the scale 22 through shifting the pointer 21 thus transmitting the difference in the angles through the planetary gearing 10 upon the following pointer 4. The operation of the sighting device remains the same as hitherto and the difference in the angles set may be read off at any time on the scale 22.

In Fig. 2, the receiving pointer is again represented by 1, this pointer being turned by similar means as described before from the control station 29 by the armature 2 between the magnet poles 3. The magnet poles are fixed to a rotative gear wheel 23 which engages a further gear wheel mounted upon the spindle 24. The latter is connected through a train of bevel gears with the crank 25. Through another train of bevel gears the pointer 21 moving upon the scale 22 is set by moving the crank 25. The following pointer 4 and the sighting device 27 are operated by a special gearing in substance similar to that shown in Fig. 1. If the gun spotter again sets by means of the crank 25 the angle through which he shifts the point to be aimed at on the scale 22, he shifts by the amount of this angle the position of the magnet yoke 3 and therefore the position of the pointer 1, which moves further according to its field. Now the sight setter who turns the following pointer 4 after the pointer 1, thereby shifts the line of sight also by the like amount.

What I claim is:

1. In an electrical system for the telecontrol of sight-setting devices for guns in combination a transmitter, placed at a control station and adapted to be adjusted corresponding to the gun elevation-angle for the distance of a target, a receiver located near the gun having an indicating pointer, electrical connections between said transmitter and said receiver for operating said indicating pointer, a following pointer arranged at said receiver to follow the indicating pointer, a separate elevation angle adjusting device having a scale with angular graduation, means for transmitting the adjustment of said separate device to one of said pointers, a sight device and means for turning said following pointer to register with said indicating pointer and for setting simultaneously said sight device.

2. In an electrical system for the telecontrol of sight setting devices for guns, in combination a system comprising a transmitter and a receiver having a movable field winding, and an indicating pointer controlled by said receiver and adapted to indicate the transmitted elevation angle and a following pointer at said receiver, a separate elevation angle adjusting device adjacent to said receiver having a scale with angular graduation and an indicating element, hand operated means for turning simultaneously the field winding of said receiver and the indicating element of said separate device, a sight device mechanically connected to the following pointer of the receiver and means for causing the simultaneous operation of the following pointer and said sight device.

In testimony whereof I affix my signature.

PAUL KAMINSKI.