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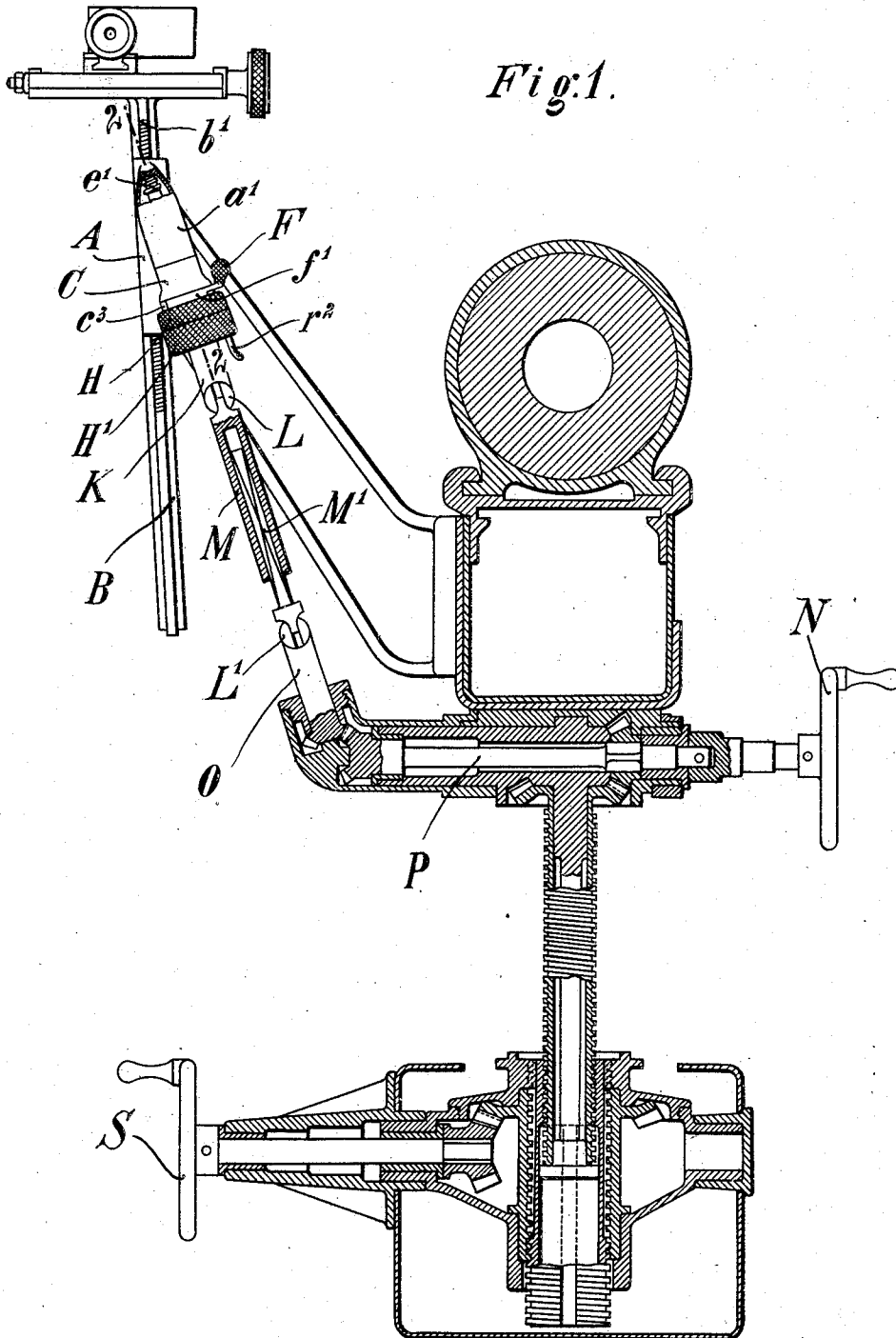
PATENTED MAY 5, 1908.

O. GRAUHERING.

GUN WITH SCREW ELEVATING MECHANISM AND ADJUSTABLE SIGHT DEVICE.

APPLICATION FILED MAR. 26, 1906.

2 SHEETS—SHEET 1.



*Witnesses*  
*J. M. Thompson*  
*H. L. Allen*

*Inventor*  
*Oscar Grauhering*  
*By Knight & Co. attys.*

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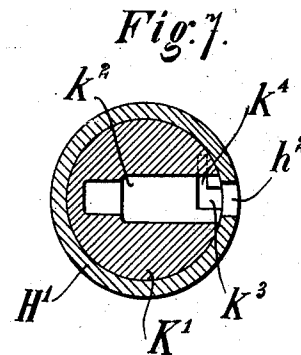
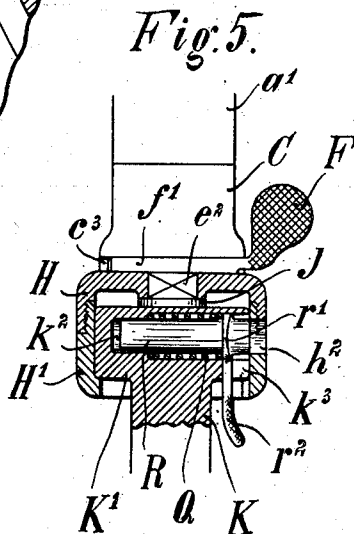
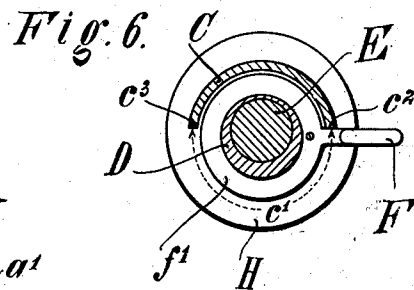
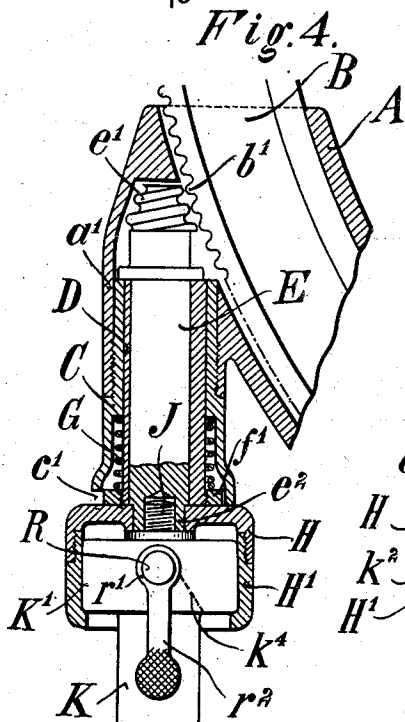
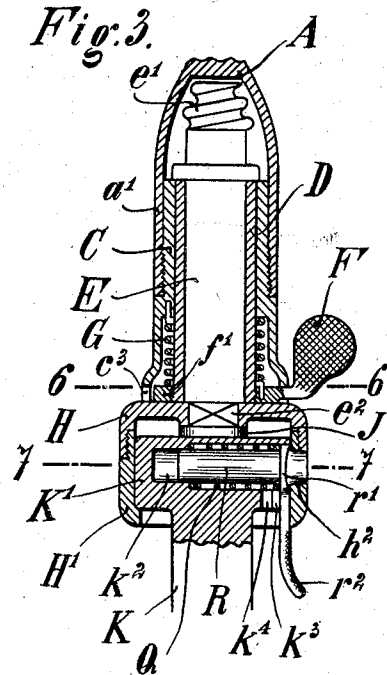
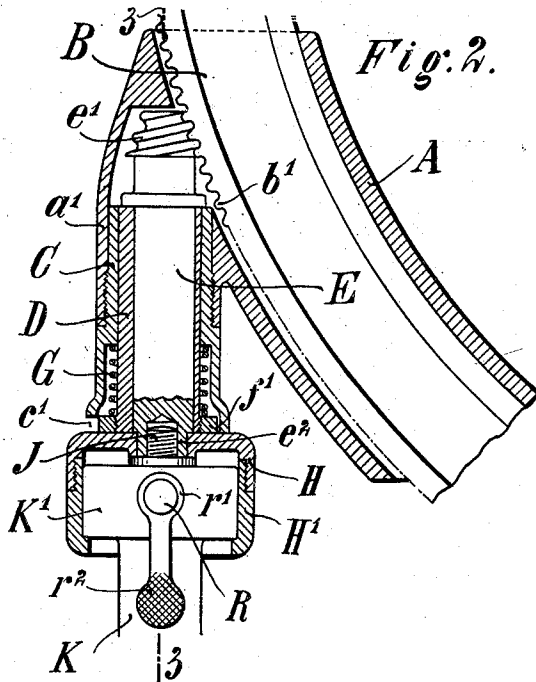
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2 SHEETS—SHEET 2.



Witnesses  
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# UNITED STATES PATENT OFFICE.

OSKAR GRAUHERING, OF ESSEN-ON-THE-RUHR, GERMANY, ASSIGNOR TO FRIED. KRUPP AKTIENGESELLSCHAFT, OF ESSEN-ON-THE-RUHR, GERMANY.

## GUN WITH SCREW ELEVATING MECHANISM AND ADJUSTABLE SIGHT DEVICE.

No. 886,598.

Specification of Letters Patent.

Patented May 5, 1908.

Application filed March 26, 1906. Serial No. 308,151.

*To all whom it may concern:*

Be it known that I, OSKAR GRAUHERING, a subject of the Emperor of Germany, and a resident of Essen-on-the-Ruhr, Ruttenscheid, Germany, have invented certain new and useful Improvements in Guns with Screw Elevating Mechanism and Adjustable Sight Devices, of which the following is a specification.

The present invention relates to guns with independent sight line, such as described in Patent 809,818 granted to Otto Lauber and Friedrich Stock, January 9, 1906, and in the United States Patent 813,979, February 27, 1906, and the object of the invention is to improve such guns so as to provide for a rough and fine adjustment of the sight device independently of the elevating mechanism.

In the accompanying drawing, one embodiment of the invention is shown applied to a gun that corresponds to the embodiment shown in Figures 1 to 4 of Patent 813,979.

Fig. 1 is a vertical transverse section through a gun and its elevating mechanism, parts being shown in elevation. Fig. 2 is a section on the line 2--2, Fig. 1, on an enlarged scale and looking from the right; Fig. 3 is a section on the line 3--3, Fig. 2, looking from the left; Fig. 4 is a view corresponding to Fig. 2 with the positions of some parts changed; Fig. 5 is a view partly corresponding to Fig. 3, with the position of one part changed; Fig. 6 is a section on the line 6--6, Fig. 3, looking from above, and Fig. 7 is a section on the line 7--7, Fig. 3, looking from above and with some parts omitted.

The devices which form the subject matter of United States Patent 809,818, and of United States Patent 813,979 will not be described in this specification as they are fully explained in said patent and patent application.

A bushing C (Figs. 1 to 6) is screwed into the tubular projection  $a^1$  of a guide piece A for the attachment bar B (Figs. 1, 2 and 4). In the bushing C is rotatably mounted a second bushing D (Figs. 2 to 4 and 6) which serves as bearing for the shaft E of the adjusting worm  $e^1$  for the attachment bar B. The bore of the bearing for the shaft E is eccentric to the bore of the bushing C so that by turning the bushing D, the worm  $e^1$  can be brought out of engagement with the teeth  $b^1$  of the attachment bar. A ring  $f^1$ , which is provided with a handle F (Figs. 1, 3, 5 and

6) is rigidly secured on the lower end of the bushing D. The handle F projects through a slot  $c^1$  (Figs. 2, 4 and 6) in the bushing C, the slot permitting the handle to be turned  $180^\circ$ . The end walls  $c^2$  and  $c^3$  (see in particular Fig. 6) of the slot  $c^1$  are so located that the worm  $e^1$  meshes with the teeth  $b^1$  of the attachment bar, when the handle F lies against the wall  $c^2$ , while the worm is disengaged from the teeth when the handle lies against the wall  $c^3$ . A helical spring G (Figs. 2 to 4) having one end engaging the bushing C and having its other end engaging the ring  $f^1$  (Fig. 3), tends to hold the bushing D in the position shown in Figs. 2 and 6, in which the handle F lies against the wall  $c^2$ .

A bell-shaped bushing consisting of two parts H and  $H^1$  (see also Fig. 1) which have a screw-threaded connection with each other, is rigidly connected to the shaft E by means of the non-circular or squared portion  $e^2$ , and a headed screw J (Figs. 2 to 5) engaging the squared portion.

The bushing H,  $H^1$ , is rotatably but non-slidably connected with a cylindrical head  $K^1$  (Figs. 2 to 5 and 7) on a shaft K (see also Fig. 1) which is connected to the gimbal-joint L of the jointed or flexible and longitudinally movable coupling L M M<sup>1</sup> L<sup>1</sup> (Fig. 1) which is described in the application Serial No. 280,100, and which is connected with the shaft connection O P leading to the hand-wheel N (Fig. 1).

The head  $K^1$  is provided with a stepped bore  $k^2$  (Figs. 3, 5 and 7) which extends at right angles to the shaft K and which has rotatably and slidably mounted therein a bolt R which is provided with an abutment  $r^1$ . The outer end of the bolt is capable of entering into a bore  $h^2$  (Figs. 3, 5 and 7) in the sleeve H  $H^1$ . A spring Q (Figs. 3 and 5) which is located in the large portion of the bore  $h^2$  and abuts against the offset therein, and against the abutment  $r^1$  of the bolt R, tends to move the bolt outwardly or, in other words, to hold it in the position in which the bolt R is within the bore  $h^2$ , and the abutment  $r^1$  lies against the inner wall of the bushing H  $H^1$  (Fig. 3). In this position of the bolt R, the shafts K and E are coupled together.

The abutment  $r^1$  extends downwardly in the form of a handle  $r^2$  (Figs. 1 to 5), for which a guide-slot  $k^3$  (Figs. 3, 5 and 7) is pro-

vided in the head  $K^1$ , the slot permitting the bolt R to be shifted such a distance from the position shown in Fig. 3, that it passes out of engagement with the bore  $h^2$ . At the end of the slot  $k^3$  towards the axis of the shaft K is a notch  $k^4$  (Figs. 3, 4 and 7) which extends at right angles to the slot and into which the handle  $r^3$  can be swung when the bolt R is brought out of engagement with the bore  $h^2$  (Fig. 5).

The sight device can be adjusted by means of the hand-wheels N S (Fig. 1) of the elevating mechanism, in the manner described in Patent 813,979 when the parts are in the position in particular illustrated in Figs. 2 and 3, that is to say, when the worm  $e^1$  is held into mesh with the teeth  $b^1$  of the attachment bar B by means of the spring G, and when the shafts K and E are coupled together through the medium of the bolt R and the bushing H  $H^1$ .

If now for some reason or the other, such as breakage, the shaft connection connected to the hand-wheel N or the coupling L M  $M^1$   $L^1$  do not permit adjustment of the sight-device by means of the hand-wheel N, the bolt R is first brought out of the bore  $h^2$  of the bushing H  $H^1$  and is thereupon secured in the disengaged position (Fig. 5) by swinging the handle  $r^2$  into the notch  $k^4$ . By turning the bushing H  $H^1$ , the sight-device can now be adjusted in the guide-piece A independently of the elevating mechanism, to the elevation that corresponds to the distance of the target, and the sight-device can subsequently be directed at the target by turning the hand-wheel N or S of the elevating mechanism.

If the distance that the attachment bar B is to be moved in the guide-piece A independently of the elevating mechanism, is great, the handle F is moved against the action of the spring G from the position shown in Fig. 6 to the position in which it lies against the wall  $c^3$  of the slot  $c^1$  and it is held in that position. The worm is now out of mesh with the teeth  $b^1$  of the attachment bar B (Fig. 4) and rough adjustment can be imparted to the attachment bar directly by hand. This done, the handle F is released, and the spring G returns the worm  $e^1$  into engagement with the teeth  $b^1$ , whereupon the fine adjustment of the attachment bar can be effected by turning the bushing H  $H^1$ . During the coupling and uncoupling of the worm  $e^1$ , the shaft E moves laterally and this movement is partaken of by the bushing H  $H^1$ , the shaft K and the jointed and longitudinally movable coupling L M  $M^1$   $L^1$ .

If the gun be limbered and it is desired to bring the attachment bar into the traveling position, that is to say, the position in which the head of the attachment bar rests on the guide-piece A, it is most suitable to use the procedure employed for the rough

adjustment of the sight-post as above described, that is to say, the worm  $e^1$  is first uncoupled and the attachment bar is thereupon moved directly by hand in the guide-piece A. This procedure is also possible when the coupling R H  $H^1$  is in the coupling position and the aforesaid insertion of the attachment bar can, therefore, also take place by normal use of the gun, that is to say, when the independent sight-line is employed.

Having now described my invention, what I claim as new is:

1. The combination with the gun, a sight device, an elevating mechanism for the gun, connected to the sight device to adjust the latter relatively to the gun during the adjustment of the gun to maintain the sight at a substantially fixed angle to the horizon, and means for adjusting the angle of the sight device independently of the elevating mechanism, of additional means for adjusting the sight device.

2. The combination with the gun, a sight device, an elevating mechanism for the gun, connected to the sight device to adjust the latter relatively to the gun during the adjustment of the gun to maintain the sight at a substantially fixed angle, and means for adjusting the angle of the sight device independently of the elevating mechanism, of means for disengaging the sight device from the last mentioned adjusting means to permit the rough adjustment of the sight device independently of its adjusting means.

3. The combination with the gun, a sight device, an elevating mechanism for the gun; a flexible connection between the sight device and the elevating mechanism for adjusting the former relatively to the gun during the adjustment of the gun to maintain the sight at a substantially fixed angle, and means for adjusting the angle of the sight device independently of the elevating mechanism, of means permitting said sight adjustment means to be coupled to and uncoupled from the sight device to permit rough adjustment.

4. The combination with the gun, a sight device, an elevating mechanism for the gun, connected to the sight device to adjust the latter relatively to the gun during the adjustment of the gun to maintain the sight at a substantially fixed angle, and means for adjusting the angle of the sight device independently of the elevating mechanism, of means permitting a part only of said adjusting means to be employed to produce an adjustment of the sight.

5. The combination with the gun, a sight device, and an elevating mechanism for the gun, connected to the sight device to adjust the latter relatively to the gun during the adjustment of the gun to maintain the sight at a substantially fixed angle, of means for adjusting the angle of the sight device inde-

pendently of the elevating mechanism, said means having the portion that engages the sight device adapted to be uncoupled from the rest of the adjusting means.

5 6. The combination with the gun, a sight device, an elevating mechanism for the gun, connected to the sight device to adjust the latter relatively to the gun during the adjustment of the gun to maintain the sight at  
10 a substantially fixed angle to the horizon and means permitting the adjustment of the angle of the sight device to the horizon independently of the elevating mechanism.

7. In a gun, the combination with the  
15 sight-device and the elevating mechanism, of means for adjusting the sight-device by means of the elevating mechanism, additional means for adjusting the sight-device independently of said first-named means,  
20 and means for disengaging the sight-device

from both of said means to permit manual rough adjustment of the sight-device.

8. In a gun, the combination with the sight-device and the elevating mechanism, of means for adjusting the sight-device by 25 means of the elevating mechanism in an opposite direction to the movement of the gun barrel, additional means for adjusting the sight-device independently of said first-named means, and means for disengaging 30 the sight-device from both of said means to permit manual rough adjustment of the sight device.

The foregoing specification signed at Düsseldorf, this fifth day of March, 1906.

OSKAR GRAUHERING.

In presence of—

WILLIAM ESSENWEIN,  
PETER LIEBER.