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PIVOT GUN.

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1,376,793. Patented May 3, 1921.

Fig. 1.

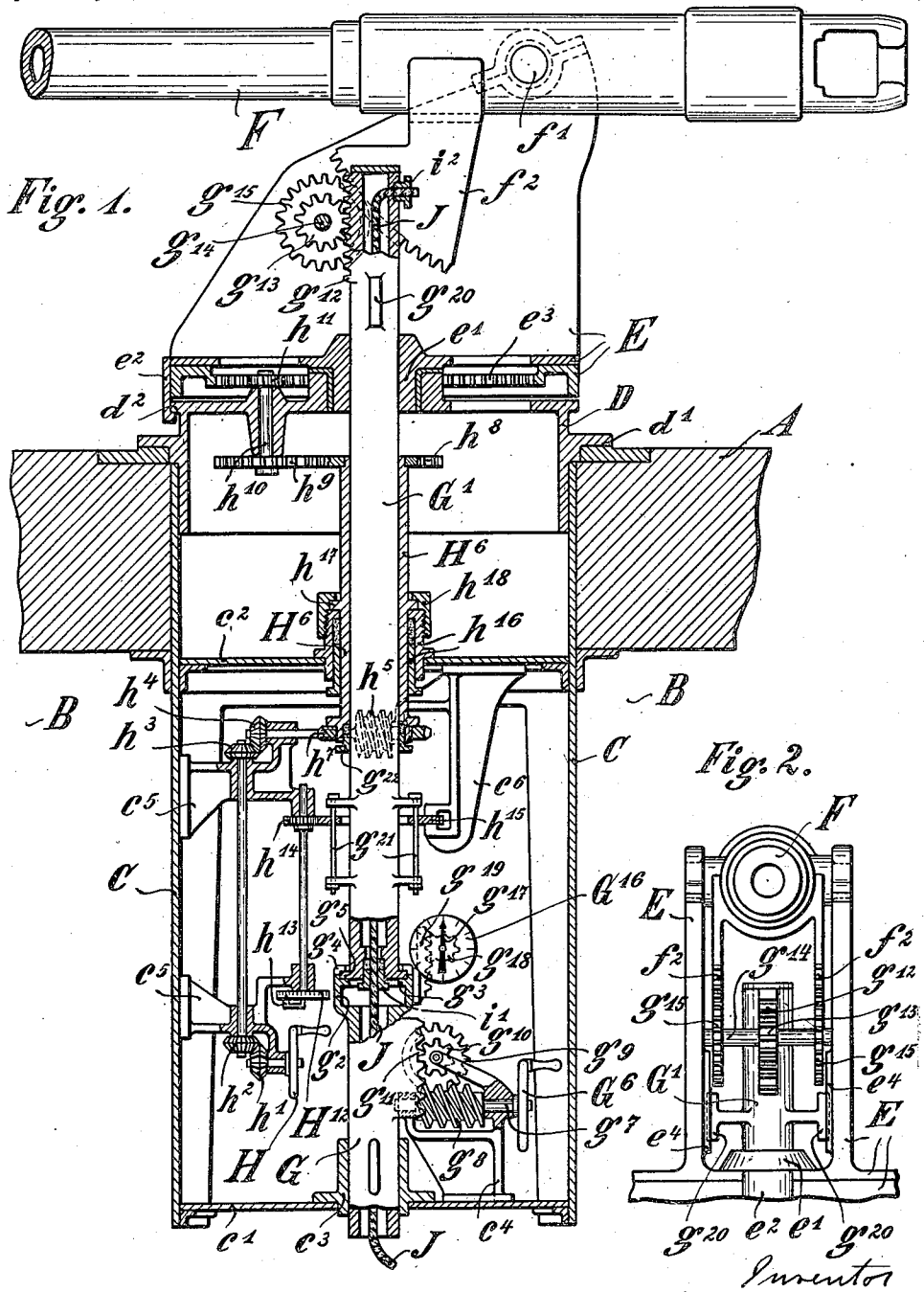


Fig. 2.

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PIVOT-GUN.

1,376,793. Specification of Letters Patent. Patented May 3, 1921.

Application filed September 4, 1920. Serial No. 408,391.

To all whom it may concern:

Be it known that I, JULIUS BECKER, residing at Essen, Germany, a citizen of the German Republic, have invented a certain new and useful Improvement in Pivot-Guns, of which the following is a specification.

The present invention refers to a pivot gun, which can be pointed from the interior of a covered chamber.

The invention will be described with reference to the accompanying drawings in which—

Figure 1 is a vertical section substantially of the gun together with parts of the covered position and

Fig. 2 is a portion of the left hand end view of Fig. 1.

Through an opening in the cover A, which shuts off the inner chamber B of the covered position from outside, projects a shaft C provided with a floor c^1 and a tightly closed cover c^2. Into the part of the shaft C, which is situated above the cover c^2 projects the pedestal mounting D of the gun which is rigidly connected to the cover A. Between the cover A and a flange d^1 on the pedestal D is inserted a packing ring. The upper carriage E of the gun, in which the gun barrel F is mounted by means of horizontal trunnions f^1, is adapted to rotate relatively to the pedestal D about the axis of the pivot pin e^1, which is mounted in the pedestal. The upper carriage E is prevented from being lifted off the pedestal by lugs e^2, which engage under a flange d^2 on the pedestal D. Between the gun barrel F and the upper carriage E is inserted an elevating gear and between the upper carriage and the pedestal D a traversing gear. The mechanism for operating the pointing gears is placed in the covered chamber B.

The elevation is imparted to the barrel F by the aid of a two-part thrust bar G G^1, the axis of which coincides with the axis of the pivot pin e^1. The lower part G of the thrust bar engages with a guide sleeve c^3 rigidly fixed to the floor c^1 and in which the part G can move longitudinally but cannot rotate. At the upper end the part G of the bar is enlarged into a sleeve g^2 having an internal flange g^3, between which flange and a two part cover g^4 for the sleeve g^2 is located an annular groove into which fits a flange g^5 on the upper part G^1 of the rod. In this way the two parts G G^1 of the thrust bar are connected to each other so that the part G^1 can rotate but not move longitudinally with reference to the lower part G. The lifting movement is imparted to the bar G G^1 by turning a hand wheel G^6, the shaft g^7 of which is carried in a bracket c^4 rigidly connected to the floor of the shaft c^1. The rotation of the shaft g^7 is transmitted by a worm gear g^8 g^9 to a toothed wheel g^{10}, which coöperates with a rack g^{11} on the part G of the thrust bar G G^1. The worm wheel g^9 and the toothed wheel g^{10} are likewise mounted on the bracket c^4.

The part G^1 of the thrust bar, which passes through the cover c^2 of the shaft C and a boring of the pivot pin e^1 carries on its end projecting between the walls of the under carriage E projections g^{20} (see Figs. 1 and 2) which fit into vertical guides e^4 (see Fig. 2) on the walls of the upper carriage and it further carries a rack g^{12}. This rack coöperates with a toothed wheel g^{13}, the shaft of which is carried in the upper carriage and carries two toothed wheels g^{15} which gear with toothed sectors f^2 mounted on the gun barrel F.

The elevation imparted to the gun barrel by raising or lowering the thrust bar can be read off by the gun layer on an elevation indicating disk G^{16} arranged at the level of the eyes in the shaft C. The pointer g^{17} for this disk is rotated by means of a toothed wheel g^{18} mounted on the wall of the shaft and is driven by a rack g^{19} mounted on the part G of the thrust bar.

The traverse is imparted to the gun barrel by rotating a hand wheel H, the rotation of which hand wheel is transmitted by two pairs of bevel wheels h^1 h^2 and h^3 h^4 to a worm h^5 and bearings c^5 are provided for the shafts of this gearing on the shaft C. The worm h^5 engages with worm wheel h^7 which is fixed on a tube H^6. This tube H^6 surrounds the bar G^1 and is prevented from moving longitudinally by a collar h^{17} thereon which engages between the body of a stuffing box h^{16} mounted on the cover c^2 and a nut h^{18} screwed to the body. On the end, which projects upward through the cover c^2, the tube H^6 carries a toothed wheel h^8, which coöperates with a toothed wheel h^9. The vertical shaft h^{10} of the toothed wheel h^9, which is mounted in the pedestal D of

the gun, carries a second toothed wheel h^{11}, which gears with an internal series of teeth e^3 on the upper carriage E. The traverse imparted to the upper carriage E and the gun barrel F is transmitted by the guide e^4 g^{20} to the bar G^1 and can be read off on a stationary traverse indicating disk H^{12}, the pointer h^{13} for this disk being rotated by means of a toothed wheel h^{14}, which is mounted on the shaft C and gears with a toothed wheel h^{15} located coaxially with the bar G^1. This toothed wheel is non-rotatably connected to the bar G^1 by means of vertical guide rods g^{21}, which are mounted on the bar G^1 and which are passed through borings provided therein, the said tooth wheel being prevented by a holder e^6 mounted on the cover e^2 from following the lifting movement of the bar G^1.

The tube H^6 is packed from the parts e^2 and G^1 by the stuffing box h^{16} and a second stuffing box g^{22}. The bar G G^1 is provided with a central through aperture through which the electric cables J for a firing mechanism and other purposes are passed, and which cables are packed at the point where they enter the part G^1 of the bar by a stuffing box i^1 and at the point where they emerge by a stuffing box i^2.

The arrangement described, in which the operating parts of the pointing gears do not take part in the rotating movement of the upper carriage, is distinguished first by the fact the said rotating movement has no action on the adjustment of the elevation indicating pointer g^{17} so that special means (*e. g.* differential gears) for eliminating this action are not necessary. Furthermore the fact that both the elevation indicating pointer g^{17} and also the traverse indicating pointer h^{13} are adjusted by one and the same part of the operating mechanism (the bar G^1) contributes to the simplification of the arrangement and also to accuracy in the indication of the elevation and traverse imparted. It is also of advantage that the parts G^1 and H^6 of the operating mechanism of the two pointing devices are passed through one and the same opening in the cover e^2 and that therefore at this point one packing merely is necessary between the movable parts and one fixed part (e^2). This packing is only of small dimensions and is subjected to small strains so that it can be kept permanently tight with ease.

Claims:

1. A device of the class described comprising a pivot gun, a chamber, a shaft projecting from the wall of said chamber, a gun pedestal extending from said chamber at a point opposite said shaft, a gun carriage supported thereon, a cover-plate in said shaft, a two part thrust bar extending through said cover-plate, an elevating and traversing mechanism carried by the gun carriage and means within said shaft, acting through said thrust bar, for operating said elevating mechanism.

2. A device of the class described comprising a pivot gun, a carriage therefor, a chamber provided with an opening, a pedestal projecting from said opening on the one side of said chamber, a hollow shaft projecting from said opening at the other side thereof and forming a continuation of said pedestal, a cover-plate positioned in said hollow shaft, a two part thrust bar extending through said cover-plate, a packing for said thrust bar, a traversing and elevating mechanism carried by the gun carriage, means within said shaft for rotating the carriage and one part of the thrust bar therewith and means in said shaft for longitudinally moving said thrust bar, as and for the purpose set forth.

3. An apparatus of the class described comprising a pivot gun, a carriage therefor, a pedestal, a chamber provided with an opening from which said pedestal projects, a hollow shaft projecting from the opposite side of said opening, a traversing and elevating mechanism mounted on the gun carriage, a flooring and cover-plate for said hollow shaft, a thrust bar extending through the cover-plate and operatably engaging the elevating mechanism, means for moving said thrust bar longitudinally to elevate the gun and an indicator operatively connected to the thrust bar for indicating the elevation.

4. An apparatus of the class described comprising a pivot gun, a gun carriage, a pedestal therefor, a chamber provided with an opening from which said pedestal projects, a hollow shaft projecting from said opening in the opposite direction from the pedestal, a flooring and cover-plate for said hollow shaft, a two part thrust bar extending through said cover-plate, a tube surrounding said thrust bar and projecting through said cover-plate, a packing therefor, a traversing gear mounted on the gun carriage, means operatably connecting said tube to the traversing gear and means within said hollow shaft for operating said traversing gear.

5. An apparatus of the class described comprising a pivot gun, a gun carriage, a pedestal therefor, a chamber provided with an opening from which said pedestal projects, a hollow shaft projecting from said opening in the opposite direction from the pedestal, a flooring and cover-plate for said hollow shaft, a two part thrust bar extending through said cover plate, a tube surrounding said thrust bar and projecting through said cover-plate, a packing therefor, a traversing mechanism mounted on the gun carriage, means operatively connecting said tube to the said traversing mechanism, means contained in said hollow shaft for

rotating said tube and an indicator operatively connected to said traversing mechanism for indicating the angle of traverse of the gun.

6. An apparatus of the class described comprising a pivot gun, a gun carriage, a pedestal therefor, a chamber provided with an opening from which said pedestal projects, a hollow shaft projecting from said opening in the opposite direction from the pedestal, a flooring and cover-plate for said hollow shaft, a two part thrust bar extending through said cover-plate, a tube surrounding said thrust bar and projecting through said cover-plate, a packing therefor, an elevating and traversing mechanism mounted on the gun carriage, means positioned within the hollow shaft for longitudinally moving the thrust bar and operating the elevating mechanism, means also positioned within said hollow shaft for rotating the sleeve to operate the traversing mechanism, the upper part of said thrust bar being rotatable independently of the lower part, and indicators positioned within said hollow shaft for indicating the degree of adjustment imparted to the gun barrel.

7. An apparatus of the class described comprising a pivot gun, a gun carriage, a pedestal therefor, a chamber provided with an opening from which said pedestal projects, a hollow shaft projecting from said opening in the opposite direction from the pedestal, a flooring and cover-plate for said hollow shaft, a two part thrust bar extending through said cover-plate, a tube surrounding said thrust bar and projecting through said cover-plate, a packing therefor, a traversing and elevating mechanism mounted on the gun carriage, means contained within said hollow shaft for longitudinally adjusting the thrust bar to operate the elevating mechanism, means contained within said housing for rotating the tube to operate the traversing mechanism, said thrust bar being formed with a central aperture to receive cables of an electrical firing mechanism.

8. In an apparatus of the class described the combination with a closed chamber of a hollow shaft disposed in one of the walls of said chamber, a pedestal forming a continuation of said shaft and projecting out of said chamber, a cover for said hollow shaft, a gun mounted on said pedestal and means contained in said shaft and passing through said cover for operating said gun.

9. An apparatus of the class described comprising a pivot gun, a gun carriage, a pedestal therefor, a closed chamber provided with an opening from which said pedestal projects, a hollow shaft projecting from said opening in the opposite direction from the pedestal, a flooring and cover plate for said hollow shaft, a traversing and elevating mechanism located on the gun carriage, means for operating said traversing and elevating mechanism, said means extending from within said hollow shaft and passing through the same opening in said cover plate.

10. An apparatus of the class described comprising a pivot gun, a gun carriage, a pedestal therefor, a closed chamber provided with an opening from which said pedestal projects, a hollow shaft projecting from said opening in the opposite direction of said pedestal, a cover plate for said hollow shaft, an elevating and traversing mechanism mounted on said carriage, a two-part thrust bar extending from said chamber to the elevating mechanism and projecting through said cover plate, a tube surrounding said thrust bar and projecting through said cover plate, means operatively connecting said tube to the traversing mechanism, means contained in said hollow shaft for operating said tube and said thrust bar for traversing and elevating the gun barrel, means for packing said tube against said cover plate and means for packing said thrust bar, both of said packing means being accessible from within said hollow shaft.

The foregoing specification signed at Essen, Germany, this 2nd day of June, 1920.

JULIUS BECKER.

In presence of—
HANS GOTTSMANN,
JOSEF OLBERTZ.