

J. KRONE & J. BECKER.
SMOKE REMOVER FOR ORDNANCE.
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932,032.

Patented Aug. 24, 1909.

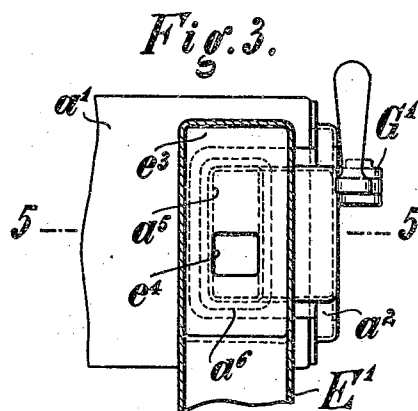
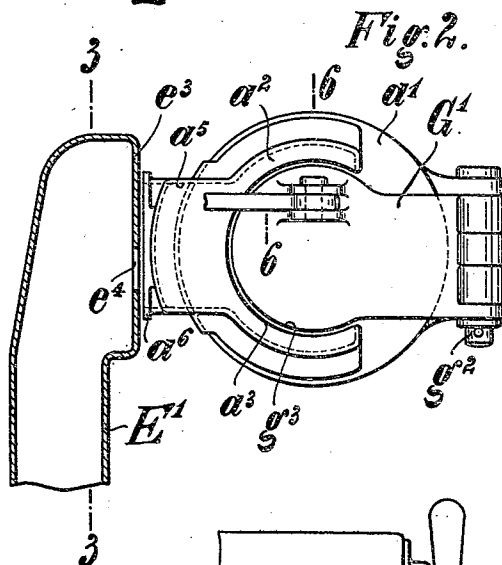
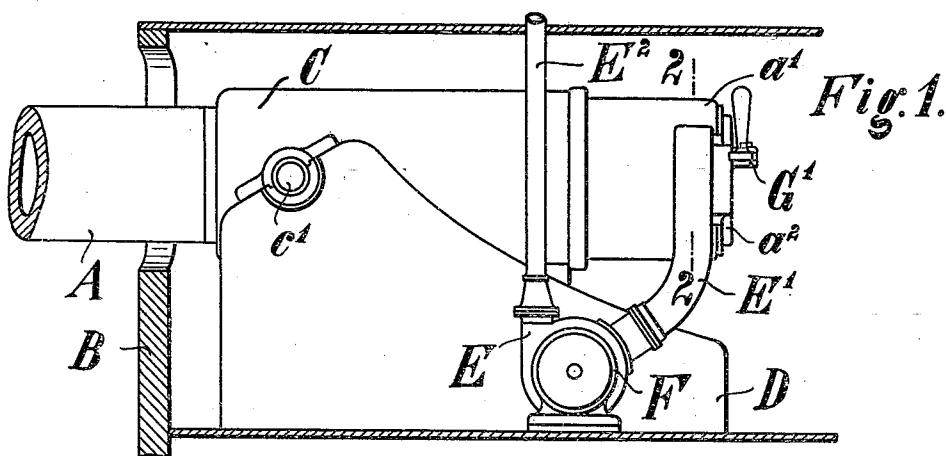


Fig. 4.

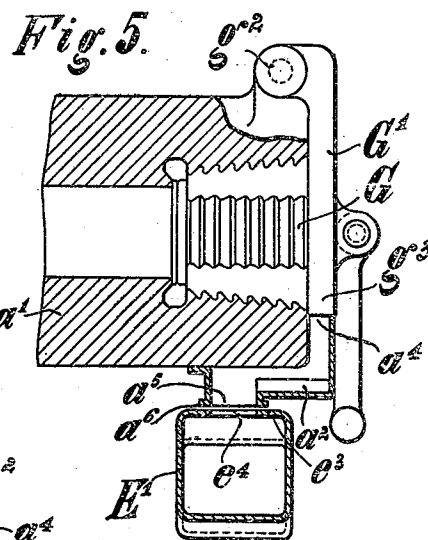
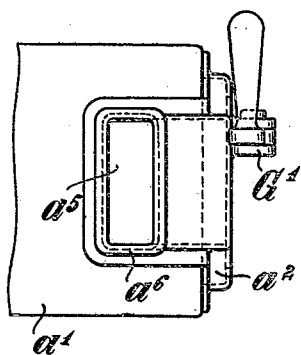
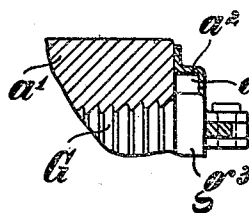


Fig. 6.



Witnesses
J. M. Wynkoop.
L. H. Nevitt

Inventors
Johannes Krone and
Julius Becker.
by King & Co. atty's

UNITED STATES PATENT OFFICE.

JOHANNES KRONE AND JULIUS BECKER, OF ESSEN-ON-THE-RUHR, GERMANY, ASSIGNORS TO
FRIED. KRUPP AKTIENGESSELLSCHAFT, OF ESSEN-ON-THE-RUHR, GERMANY.

SMOKE-REMOVER FOR ORDNANCE.

932,032.

Specification of Letters Patent. Patented Aug. 24, 1909.

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To all whom it may concern:

Be it known that we, JOHANNES KRONE, residing at Essen-on-the-Ruhr, and JULIUS BECKER, residing at Essen-on-the-Ruhr, Germany, both subjects of the Emperor of Germany, have invented a certain new and useful Improvement in Smoke-Removers for Ordnance, of which the following is a specification.

This invention relates to that type of apparatus for removing powder gases from gun barrels, in which a suction pipe is attached to the breech end of the gun barrel. Hitherto this kind of apparatus, which is described for example in the specification of Patent No. 864152, has only been used on guns in which the breech opening passes through the outer surface of the breech end of the gun barrel, as is the case in wedge breech mechanisms for example.

Now the object of the present invention is to provide an apparatus of the type above mentioned, which shall be capable of being used for that type of gun, in which the breech opening is situated at the front of the breech end of the gun barrel, as is the case in screw and cam breech mechanisms for example.

In the drawing: Figure 1 shows a side view of a constructional form of the apparatus constituting the subject matter of the invention, together with those parts of a barrel recoil gun and gun platform with which the invention is connected. Furthermore, and on a larger scale Fig. 2 is a section on the line 2—2 of Fig. 1, seen from the right. Fig. 3 is a section on the line 3—3 of Fig. 2, seen from the left, Fig. 4 is a side view, corresponding to Fig. 3, of the breech end of the gun barrel. Fig. 5 is a section on the line 5—5 of Fig. 3, seen from above, and Fig. 6 is a section on the line 6—6 of Fig. 2, seen from the left.

The gun barrel A of the barrel recoil gun—which is mounted in an armored turret—is movably mounted in the cradle C in the usual way, which latter is pivotally mounted, by means of the trunnions c' , in the gun carriage D.

Alongside the gun carriage D is placed a fan E, to drive which an electric motor F is employed. To the fan E is attached a suction pipe E' and a delivery pipe E^2 . The said delivery pipe E^2 leads through the roof

of the armored turret B and out into the open air.

The gun barrel A has a cam breech mechanism G, G' , the breech door G' of which is bounded on the side farthest from its pivot pin g^2 by a cylindrical face g^3 curved to the arc of a circle (see particularly Fig. 2), and the axis of which, when the breech mechanism is closed, coincides approximately with the longitudinal axis of the gun barrel.

To the breech end a' of the gun barrel is attached, on the side lying farthest from the pivot pin g^2 of the breech door, a cap-shaped smoke trap a^2 , which partially covers over the front and partially also the outer surface of the breech end a' in the manner shown in the drawing (see particularly Figs. 2 and 5).

In the part of the smoke trap a^2 which covers over the front of the breech end, is provided a recess a^3 (see Fig. 2) for the part of the breech door G' bounded by the surface g^3 , the shape of the said recess corresponding to that of the surface g^3 .

The part of the smoke trap a^2 bounded by the recess a^3 has an opening a^4 (see Figs. 5 and 6), which lies opposite the surface g^3 of the breech door when the latter is closed. The opening a^4 forms the inlet opening for the powder gases to be removed. In the side boundary wall of the part of the smoke trap a^2 which covers over the outer surface of the breech end, is a rectangularly shaped opening a^5 , which forms the outlet opening for the powder gases. The part of the wall of the smoke trap a^2 containing the opening a^5 , is provided with a flange a^6 , which is of rectangular form exactly like the opening a^5 , and the front of which forms a vertical plane to the axis of the trunnions c' .

The suction pipe E' is widened into box-shape at its free end, and provided with a front wall e^3 having a rectangular opening e^4 , and the outer boundary face of which forms a vertical plane at right angles to the axis of the trunnions c' . The arrangement is so contrived, that the wall e^3 stands opposite and quite a small distance away from the flange a^6 of the smoke trap a^2 , when the gun barrel, as shown in the drawing, is in the loading position. The openings e^4 of the suction pipe E' and a^5 of the smoke trap a^2 then lie directly opposite each other.

The opening e^4 is of the same breadth as the opening a^5 , its height however is smaller

than the height of the opening a^5 . In consequence hereof, the powder gases to be removed can pass over out of the smoke trap a^2 into the suction pipe E' at any desired elevation of the gun barrel, and within certain limits dependent upon the differences of height of the openings e^4 and a^5 . Any elevation of the gun barrel lying between the above mentioned limits, can be regarded as the loading position.

While shooting is going on, the fan E is continually in operation. After the gun has been fired with the barrel thereof elevated to correspond to the distance away of the target, the barrel recoils and then returns to the firing position again. At this stage the gun barrel is brought into the loading position, in which the opening a^5 of the smoke trap a^2 stands opposite the opening e^4 of the suction pipe. If now the breech mechanism G , G' be opened, by swinging the breech door aside about the axis of the pin g^2 , after previously unlocking the breech piece G , the powder gases remaining behind in the gun barrel will be drawn into the opening a^4 of the smoke trap, pass through the same, and proceed by the path a^5 , e^4 into the suction pipe E' of the fan E , which forces them into the delivery pipe E^2 ; from the delivery pipe E^2 the powder gases pass above the roof of the armored turret, into the open air, where they are no longer able to trouble the crew of the gun.

Having thus described the invention, what is claimed and desired to be secured by Letters Patent is:

1. In a smoke-remover for ordnance, the combination with a gun having an end opening breech closure; of a smoke collector overlapping a portion of the end surface of the gun barrel, said collector being provided with an intake adjacent to the end opening in the breech; and means for creating suction in said smoke collector.

2. The combination with a gun provided with an end opening breech closure; of a smoke collector overlapping a portion of the end surface of the gun barrel, said collector being provided with an intake opening adjacent to the end opening of said barrel and constructed to partially encircle said breech opening.

3. The combination with a gun having an end opening breech closure, of a smoke collector overlapping a portion of the end surface of the gun barrel and also a portion of the jacket surface thereof and provided with an intake adjacent to the end opening of the gun breech and provided with an outlet opening for said powder gases in that por-

tion which overlaps the jacket surface of the gun barrel, and means for causing a suction through said smoke collector.

4. The combination with a gun having an end opening breech closure, of a smoke collector overlapping a portion of the end surface of the gun barrel and provided with an intake adjacent to the end opening of the breech and with an outlet opening; and a suction conduit in close proximity to the smoke collector, said conduit having an intake in close proximity to the outlet opening of the smoke collector, and means for causing a suction through said suction conduit.

5. The combination with a gun having an end opening breech closure; of the hinge by which the breech closure is supported; a smoke collector overlapping a portion of the end surface of the gun barrel and surrounding that end of the hinge remote from its pintle, said collector being provided with an intake adjacent to the end opening of the breech; and means for inducing suction in the smoke collector.

6. The combination with a gun having an end opening breech closure; of the breech closure hinge provided with a cylindrical end remote from its pintle; a smoke collector having an open end conforming to the cylindrical end of the hinge said open end of the collector being arranged adjacent to the end opening of the breech; and means for inducing a suction in said smoke collector.

7. In an apparatus of the character described, the combination of the end opening breech block, the hinge supporting the same, said hinge being provided with a cylindrical end remote from its pintle, the smoke collector overlapping a portion of the end surface and jacket surface of the gun barrel, and provided with an open end in close conformation to the cylindrical end of the hinge when the breech is closed, said opening being arranged adjacent to the end opening of the breech; and an outlet in the outer wall of that portion of said collector which overlaps the jacket surface; a suction conduit having an opening adjacent to said outlet of the smoke collector, and means for inducing a suction in the suction conduit.

The foregoing specification signed at Düsseldorf, Germany, this 4th day of April, 1908.

JOHANNES KRONE.
JULIUS BECKER.

In presence of—
PETER LIEBER,
WILHELM FLASCHE.