

UNITED STATES PATENT OFFICE.

ARTHUR TREVOR DAWSON AND GEORGE THOMAS BUCKHAM, OF WESTMINSTER, ENGLAND, ASSIGNORS TO VICKERS SONS & MAXIM, LIMITED, OF LONDON, ENGLAND.

BREECH MECHANISM OF ORDNANCE.

SPECIFICATION forming part of Letters Patent No. 778,174, dated December 20, 1904.

Application filed February 16, 1903. Serial No. 143 640.

To all whom it may concern:

Be it known that we, ARTHUR TREVOR DAWSON, lieutenant of the royal navy and superintendent of ordnance works, and GEORGE THOMAS BUCKHAM, engineer, both subjects of the King of Great Britain, both residing at 32 Victoria street, Westminster, in the county of London, England, have invented certain new and useful Improvements in the Breech Mechanism of Ordnance, of which the following is a specification.

This invention relates to gun-breech mechanism of the kind in which the breech is closed by a screw having interrupted or segmental screw threads or rings and pivoted on the stem of a swinging carrier hinged to one side of the breech, said breech-screw being of such form that it can be swung out of the gun by the said carrier immediately after receiving a partial turn for unlocking it.

The chief object of this invention is to provide simple and efficient means for imparting the aforesaid partial turn to the breech-screw, said means comprising a grooved or slotted radial arm forming part of or fixed to the breech-screw and a crank engaging directly with said arm and geared directly with an actuating-shaft on the carrier, the relative position of the radial arm and the crank being such that the maximum mechanical power will be exerted at or near the commencement of the unlocking movement of the breech-screw and that a locking-point will be provided when the said breech-screw is completely closed.

In the accompanying drawings, Figure 1 is an elevation of the breech end of a gun provided with our improved mechanism. Fig. 2 is a plan of the same. Fig. 3 is a face view of the breech-screw; and Fig. 4 an elevation of part thereof, showing the slotted or grooved arm thereon. Fig. 5 is a face view, and Fig. 6 an edge view, of the crank detached. Fig. 7 is a face view, and Fig. 8 an edge view, of a modified form of the crank.

A is the wall of the gun, B is the breech-screw, and C is the swinging carrier.

D is the crank, which is loosely mounted

on a pivot-pin *e* projecting from the forward face of the swinging carrier and which works in a plane parallel with the face of the breech-screw. Projecting from the forward face of the said crank is the pin or stud *d*, having an antifriction-roller *d'*.

b is the arm on the rear face of the breech-block, said arm projecting in a radial direction and having the groove *b'* formed in the rear face thereof, so as to receive the crank-pin *d*, as shown in Figs. 1 and 2. The said groove *b'* is represented as being straight. It may, however, be made of any suitable shape to vary the mechanical advantage of the system at any point, as desired and as is well understood. The relation of the crank *d* to the groove *b'* is, as already stated, such as to enable the maximum power to be exerted at starting to unlock the breech-screw and also to give a locking-point when the breech is closed, as shown in Fig. 1, or, in other words, said crank being substantially normal to the walls of the groove or slot when the breech is closed. By having the crank normal to the groove or slot in the radial arm when the breech is closed the beginning of the movement of the crank when opening the breech will actuate the breech-screw slowly, but with great power, and at the last stage of the opening movement the screw will be actuated quickly, though with less power. Consequently it will be evident that the maximum mechanical power is applied where needed, and it will also be evident that after the first movement of the crank, which causes the actuation of the breech-screw slowly, the remainder of the operation will be had very quickly, consequently saving time. When closing the breech, the operation is the reverse of that just set forth, the first movement rotating the breech-screw very quickly and the last movement the breech-screw slowly, but with the necessary power.

In the example illustrated the crank *d* is formed with the skew-teeth *d''*, which are adapted to engage with corresponding skew-teeth on the pinion *e'*, carried by the shaft *e''*, which is actuated by the hand-lever *C'* when

the breech is being opened or closed. We do not of course confine ourselves to the use of skew-gear for operating the said crank so long as it is actuated directly from the shaft
 5 c^2 . Bevel-gear may, if desired, be employed.

Instead of the aforesaid radial arm being slotted it may have a stud or projection to engage with a suitably-shaped slot in the crank.

In the case of large guns we may employ instead of the aforesaid hand-lever C' worm-gear, as is well understood.

The firing-gear illustrated in the drawings is of the kind described in the specification of a prior British patent, No. 10,606 of the year
 15 1896, and is intended to be actuated by a cam slot or groove d^3 of the crank d engaging with a stud or projection e on the sliding bar or member E of the firing mechanism, which bar or member operates as explained in the
 20 specification of a prior British patent, No. 22,606 of the year 1898. In cases where it is not required to operate the firing mechanism by the aforesaid crank the cam-groove d^3 would of course be dispensed with, and in this
 25 case the crank would be made as shown in Figs. 7 and 8.

We are aware that it has before been proposed to mount a crank on the swinging carrier for angularly displacing the breech-screw
 30 to lock and unlock the same to and from the breech; but in such cases it has been necessary

to either couple said crank to the breech-screw or to the crank-actuating mechanism by a connecting-rod or similar connecting device.

What we claim, and desire to secure by Letters Patent of the United States, is—

In gun-breech mechanism, the combination with the swinging carrier and the breech-screw, of a slotted or grooved radial arm fixed on the breech-screw, a crank on the
 40 carrier having a pin engaging with said slotted radial arm and also having a cam slot or groove engaging with a projection on the sliding bar of the firing-gear, said crank being substantially normal to the walls of the slot
 45 or groove when the breech is closed, skew-teeth on the base of said crank, a skew-pinion mounted on an axle carried by the carrier and gearing with said skew-teeth of the crank,
 50 and means for operating said axle and skew-pinion to rotate the breech-screw and to swing the carrier during the opening and closing of the breech, substantially as described.

In testimony whereof we have hereunto set our hands, in presence of two subscribing witnesses, this 3d day of February, 1903.

ARTHUR TREVOR DAWSON.
 GEORGE THOMAS BUCKHAM

Witnesses:

W. H. REYNER,
 HENRY KING.