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MUZZLE CLAMP END DEVICE FOR TWIN BARRELED ARTILLERY PIECE

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2 Sheets-Sheet 1

Fig. 1

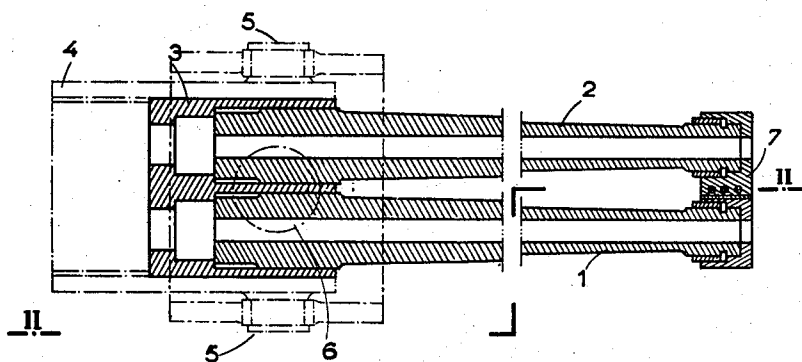
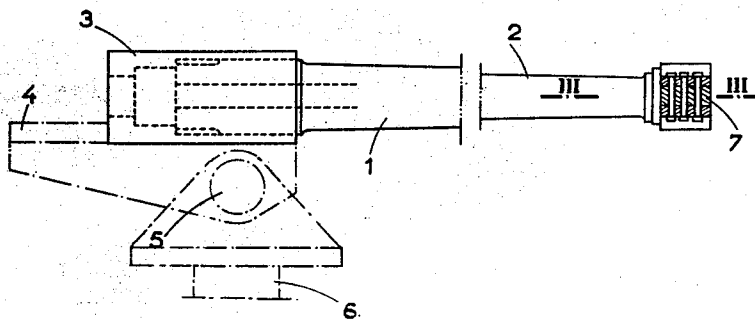


Fig. 2



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Fig. 3

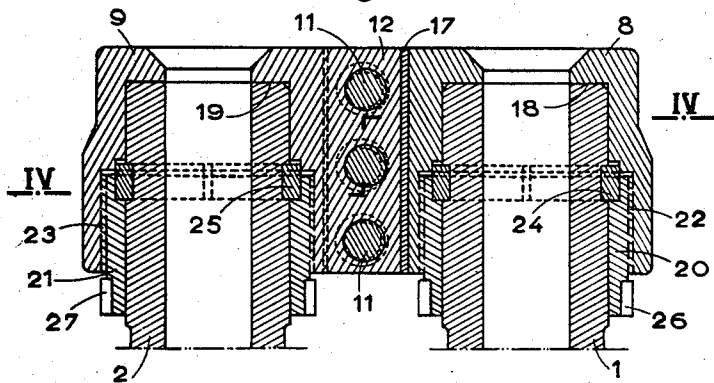


Fig. 4

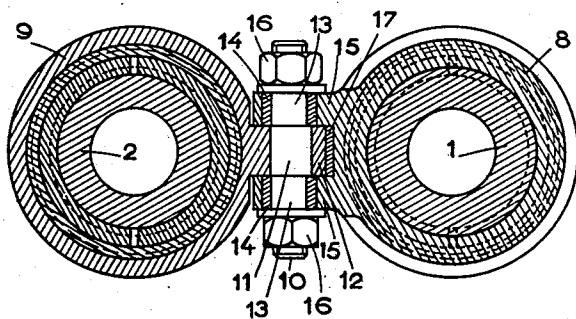
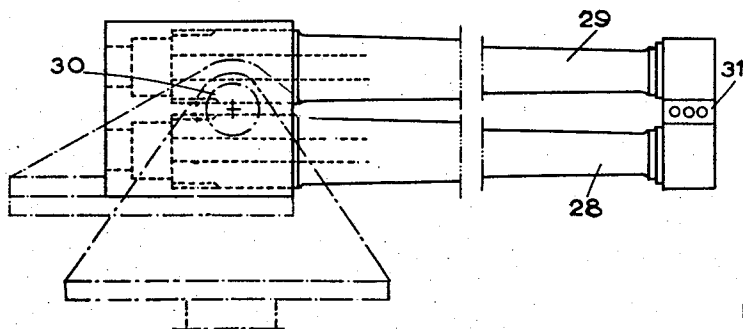


Fig. 5



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3 Claims. (Cl. 89—14)

This invention relates to improvements in artillery pieces comprising two identical twin barrels of not inconsiderable length, and fixed to a common sleeve in such a manner as to recoil together. It relates particularly to the case where the firing system is not arranged for the simultaneous firing of both barrels but on the contrary is so arranged that the barrels fire one after the other although they recoil together.

The coupling of the two barrels by which that barrel which did not fire is carried back in the recoil by the barrel which did fire, offers certain advantages. In particular the recoiling mass is larger, the recoil is shorter and the return to the firing position is quicker, which in automatic artillery pieces permits the increase of the rate of firing.

The two barrels may be arranged one by the side of the other or one above the other. In order to make things clear, the principle of the invention will be explained on the assumption that the two barrels are arranged side by side and it will be understood that it applies also to the other case.

In this type of gun, where in order to allow the gun to be aimed a vertical pivot is arranged at equal distances from the axes of the barrels, an important difficulty has hitherto been encountered. Since the two barrels fire in fact one after the other, the assembly of the barrels has a tendency to swing to one side or the other depending on which barrel is being fired.

From this a deviation of the direction of firing from each barrel results, a phenomenon which hitherto has not been investigated, it seeming logical to believe that, when firing, the shot from the right gun would be deflected towards the right owing to a very weak partial rotation about the pivot and to the resiliency of the mounting, and the shot from the left gun would be deflected towards the left.

Thorough investigations have been able to show that on the contrary, if the barrels are not of a short length, the one on the right side has its shot deflected towards the left and vice versa.

The deviation in the sense opposite to what had been expected is probably due to a flexure of the barrels at the moment of the shot. The effect of this flexure is combined with that of the partial rotation, but in the opposite sense.

According to the invention the total deviation can be reduced to zero by a reduction of the flexibility of the barrels in such a manner that this flexibility has only the effect of compensating the partial rotation about the pivot. In this design a muzzle clamp is provided which connects the two barrels at their muzzles or at regions closely adjacent to their muzzles, the barrels being fitted into the muzzle clamp and the latter being practically indeformable.

When the two barrels are arranged one above the other, the deviations manifest themselves with respect to the horizontal axis for the deviation of the guns, i. e. the axis of the trunnions, and would affect not the di-

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rection of the shots, but their height. The means proposed according to the invention for abolishing them would be exactly the same.

The invention will now be described in more detail with reference to particular embodiments given by way of example and illustrated in the drawings.

Figures 1, 2, 3 and 4 relate to an embodiment where the two barrels are arranged side by side,

Figure 1 is a diagrammatic horizontal section on the plane of the axes of the barrels of a twin-barrelled gun comprising the improvements according to the invention,

Figure 2 is a view in elevation and partly in section on the line II—II of Figure 1,

Figure 3 is a section on the line III—III of Figure 2,

Figure 4 is a section on the line IV—IV of Figure 3,

Figure 5 shows a modification, the invention being here applied to an embodiment wherein the two barrels are arranged one above the other.

The gun illustrated in Figures 1 to 4 comprises two barrels 1 and 2 having a common sleeve or breech member 3.

The two barrels recoil simultaneously upon a cradle 4 (shown in chain dotted lines).

The two barrels may on the other hand swing upwardly or downwardly about the trunnions 5, and the assembly may turn about the vertical pivot 6.

As will be seen in Figure 1, the pivot 6 is situated at equal distances from the axes of the barrels 1 and 2.

Figure 1 shows that, when one barrel only fires, the assembly of the two barrels has a tendency to turn towards the side on which is the gun which has been fired. The deviation due to this rotation is, in the absence of the improvements according to the invention, overcompensated by the flexure of the barrels.

According to the invention a muzzle clamp 7 is provided which reduces this flexure.

It has been ascertained that when the barrels 1 and 2 are fitted at their muzzles or in the region immediately adjacent their muzzles, into an indeformable muzzle clamp, there is no longer any deviation of the shot.

Figures 3 and 4 show a particular embodiment of the muzzle clamp 7.

This muzzle clamp may in fact be a single piece provided simply with clamping means to keep it in place. However, as shown in the drawing, a device for adjusting the span of the muzzle clamp may be provided, in order to make it possible for example to rectify errors of machining, or to correct the parallelism of the barrels, or, by a slight pre-deformation to perfect the parallelism of their shots, notably when it has been disturbed by an external cause, for example by a deficient functioning of the remote control system.

The muzzle clamp illustrated in Figures 3 and 4 comprises two parts or sleeves 8 and 9 in which the barrels 1 and 2 are fitted.

These parts are connected to one another by bolts 10 each of which has an eccentric portion 11. This portion 11 passes through a tail piece or shoulder 12 integral with part 9 of the muzzle clamp, whereas the non-eccentric portions 13 of the bolts 10, disposed in the rings 14, pass through the portions or shoulders 15 of part 8 of the muzzle clamp.

Nuts 16 allow the rotary position of the bolts 10 to be fixed.

In addition a wedge 17 may be provided which is placed between the tail piece 12 of part 9 of the muzzle clamp and part 8 of the muzzle clamp. This wedge 17 fixes definitely the total span of the muzzle clamp.

The housing of the muzzles 1 and 2 in the muzzle clamp is attained, as regards the embodiment repre-

sented in Figures 3 and 4, by the support of two abutments on the muzzle of the gun.

The parts 8 and 9 abut on the ends 18 and 19 of the muzzles, and the sleeves 20 and 21 slidably mounted on these muzzles are screwed by means of screw threads 22 and 23 into the parts 8 and 9. The sleeves 20 and 21 abut on shoulders constituted by rings 24 and 25 each consisting of two halves. The rings 24 and 25 are lodged in corresponding grooves in the barrels.

The fitting of the muzzle clamp in place is very easy; it suffices to engage the parts 8 and 9 on the muzzles separately from one another, then to screw into the parts 8 and 9 the sleeves 20 and 21 which have been previously fitted on the muzzles.

The assembly can be carried out easily owing to the notches 26 and 27 provided at the back of the sleeves.

In the course of the assembly the parts 8 and 9 abut on the ends 18 and 19 of the barrels, and the sleeves 20 and 21 abut on the rings 24 and 25 which can be easily fitted before the engagement of the parts 8 and 9 of the muzzle clamp, since they consist of two halves.

The parts 8 and 9 of the muzzle clamp can then be connected to one another by fitting the bolts 10 and the rings 14.

When the adjustments have been made, it suffices to fit the wedge 17 in a manner corresponding to the adjustment in order to fix definitely the position of the muzzle clamp.

As will be seen in Figure 3, the parts 8 and 9 of the muzzle clamp and the sleeves 20 and 21 are in contact with the muzzles of the barrels on which they slide with lubricated friction while being brought into position. Thus an excellent housing of the barrels in the muzzle clamp is attained.

Figure 5 illustrates a modification concerning the case where two barrels 28 and 29 are arranged one above the other, the pivot axis perpendicular to the plane of the axes of the barrels, i. e. here the trunnion 30, being at equal distances from the barrel axes.

The deviations of aim which are abolished owing to the invention are here vertical deviations. This is attained by means of a muzzle clamp 31 analogous to the muzzle clamp 7 described with reference to Figures 1 and 2.

It will be understood that the invention is not limited to the embodiments described hereinabove, and details thereof may be modified without departing from the scope of the invention. In particular the mounting of the muzzle clamp may make use of screw threads directly cut into the barrels.

What I claim is:

1. In a muzzle clamp for an artillery piece having alternately firing twin identical barrels mounted for simultaneous recoil in a common breech member mounted on trunnions for elevation of the barrels, a sleeve mounted on and adjacent the muzzle of one of said barrels, a second sleeve mounted on and adjacent the muzzle of the other barrel, interdigitating extensions carried by said sleeves and means for adjustably spacing and locking said sleeves together including bolts having eccentric portions passing through said interdigitating extensions for manual rotation therein.

2. In a muzzle clamp for an artillery piece having alternately firing twin identical barrels mounted for simultaneous recoil in a common breech member mounted on trunnions for elevation of the barrels, a ring mounted around and adjacent the muzzle of one of said barrels, a sleeve mounted on said barrel and bearing on the end of said barrel, means engaging said sleeve and bearing on said ring, a radially and axially extending shoulder on said sleeve, a second ring mounted around and adjacent the muzzle of the second of said barrels, a second sleeve mounted on said second barrel and bearing on the end of said second barrel, second means engaging said second sleeve and bearing on said second ring, spaced parallel shoulders on said second sleeve receiving between them said first shoulder and means for locking said shoulders together.

3. A muzzle clamp as described in claim 2 in which said locking means include bolts passing through said shoulders and eccentric portions on said bolts engaging said first shoulder, rotation of said bolts adjustably spacing and locking said sleeves together.

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