March 26, 1940. P. E. J. DENOIX 2,194,849

PIECE OF ORDNANCE

Filed Dec. 27, 1937 2 Sheets-Sheet 1

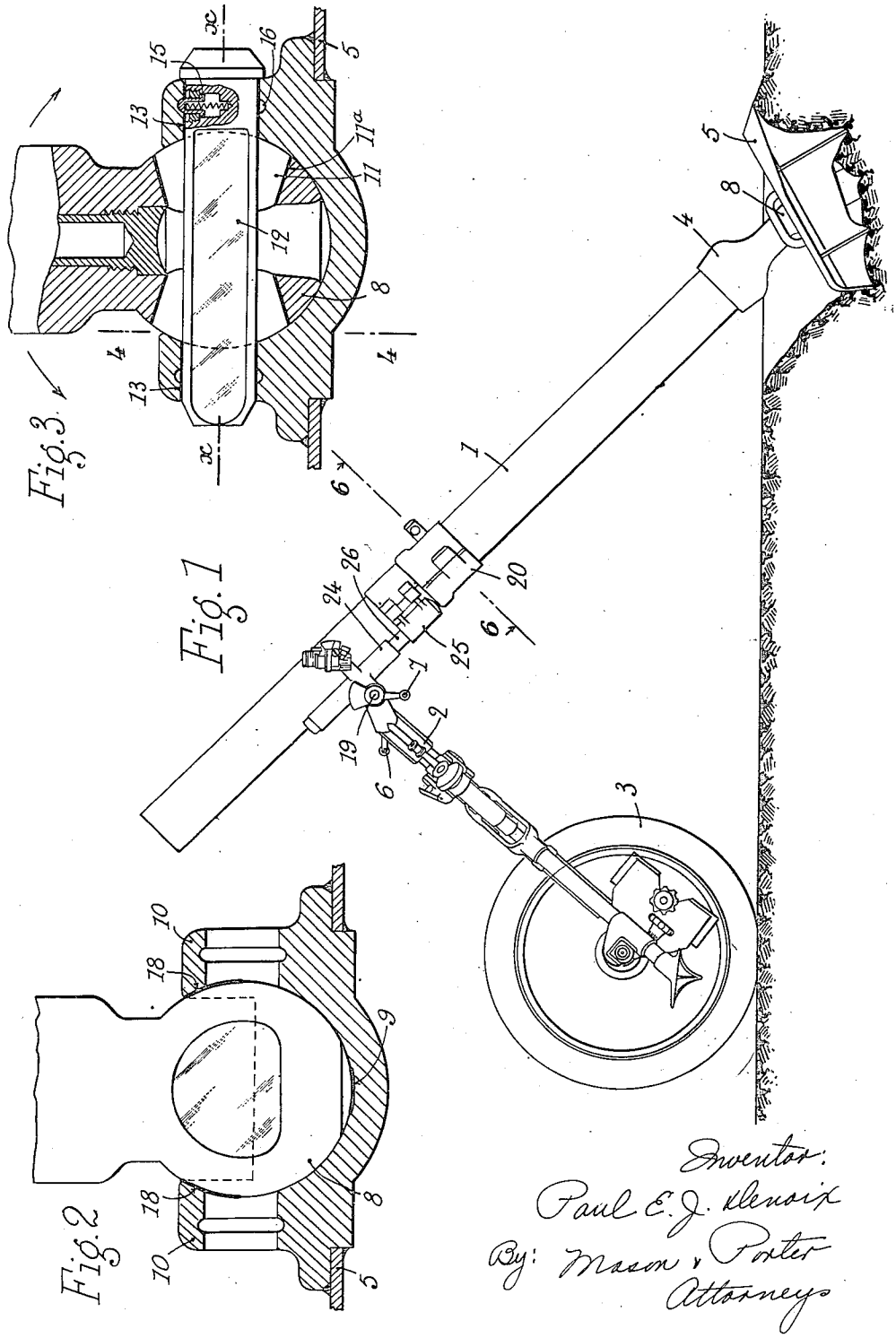

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Fig. 8

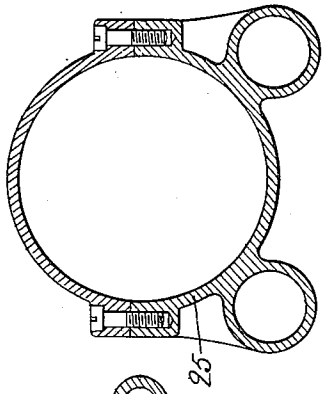


Fig. 5

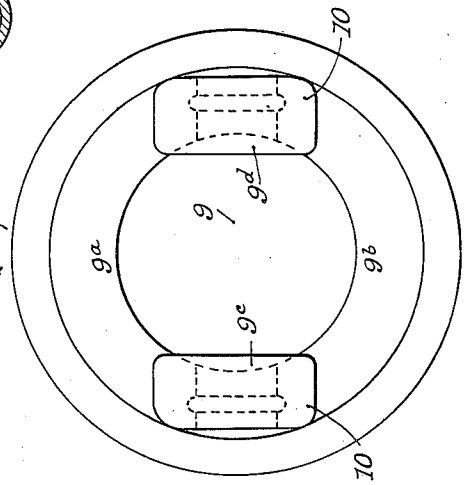


Fig. 6

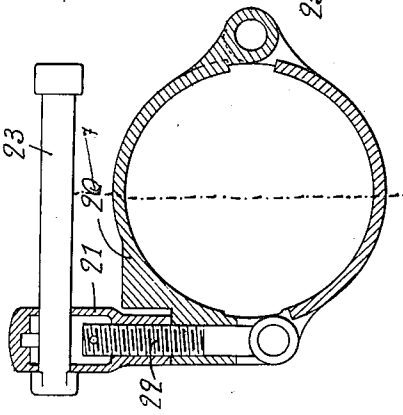


Fig. 7

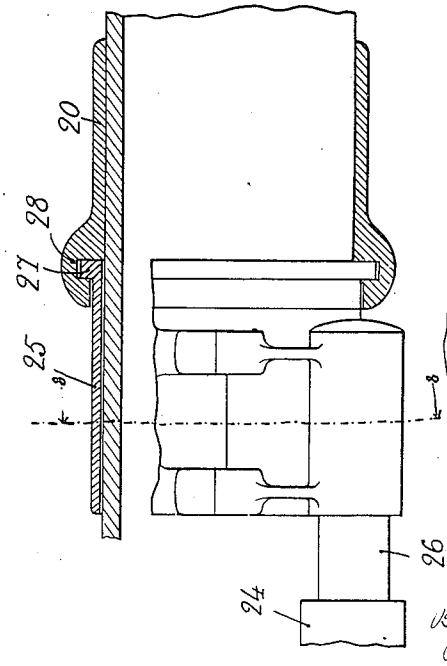
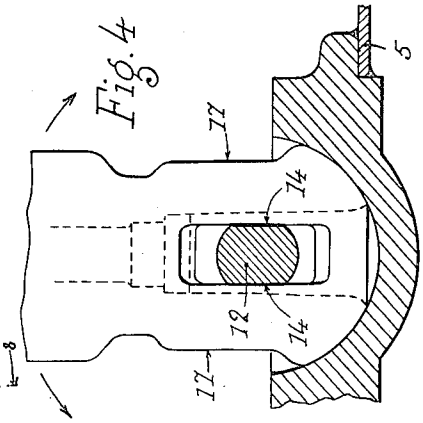


Fig. 4



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Patented Mar. 26, 1940

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UNITED STATES PATENT OFFICE

2,194,849

PIECE OF ORDNANCE

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Application December 27, 1937, Serial No. 181,969
In Switzerland December 31, 1936

2 Claims. (Cl. 89—40)

This invention relates to improvements in a piece of ordnance of the type comprising a gun barrel the chase of which is supported on a mounting of any kind, while the head of the breech rests in a recess or socket on a base plate set on the ground.

When the barrel is rifled, it is advisable that the articulation of the breech head in the recess of the base plate should, while enabling the gun to be pointed in elevation and lateral direction, prevent any rotation of the barrel when a shot is fired in order to prevent any undue stressing of the carriage.

The present invention relates more particularly to an articulation which fulfills the foregoing condition, and is characterised in that the head of the breech is connected to the recess by means of a bolt which is adapted to turn in the bearing blocks of the recess and is provided, in the portion passing through the head of the breech, with flats bearing against corresponding surfaces of the bore provided in said head, so that the barrel, in swinging through the line of fire when the gun is being elevated, carries round the bolt; which turns in the bearings, the said bore in the head of the breech being also widened so as to allow the requisite angular displacement of the breech when the gun is being pointed in the lateral direction.

The torque applied to the gun barrel when a shot is being fired is thus transmitted to the bolt through the relatively wide surfaces of the flats, thereby ensuring a good distribution of the effort and reducing the stressing of the connecting member.

The bearings for the bolt are provided in lugs which form, in known manner, lateral extensions of the spherical surface of the recess, over more than a hemisphere and are intended to enable the head of the breech (which is in the form of an incomplete sphere) to be locked in the interior of the recess by turning it so as to bring the parts having the greatest diameter into engagement with said lugs.

This arrangement, while allowing the requisite mobility of the articulation in pointing the gun and causing the base plate to absorb the torque at the moment of firing, prevents the head of the breech from rebounding in the recess due to the reaction of the recoil.

The gun is connected to its carriage in such a way as to allow a slight rotation between the carriage or mounting and the barrel during the traversing operation.

In the special case in which the gun is connected to the carriage by means of an elastic or detachable device, said device is articulated to a collar, or similar member, integral with the gun, the articulation being preferably effected by means of a second collar, integral with the elastic device so as to enable the gun to be turned on its axis without affecting the elastic connecting device.

Further features and advantages of the invention will become apparent from the following description taken in conjunction with the accompanying drawings, in which:

Fig. 1 is a side elevation of a mortar embodying the invention;

Fig. 2 is an elevation of the head of the breech in the locked position in the recess of the base plate, the latter being in vertical section along the axis of the articulation bolt;

Fig. 3 is a section through the entire articulation along a vertical plane passing through the axis of the bolt;

Fig. 4 is a section along the line IV—IV of Fig. 3;

Fig. 5 is a plan of the recess;

Fig. 6 is a section along the line VI—VI of Fig. 1;

Fig. 7 is a section along the line VII—VII of Fig. 6; and

Fig. 8 is a section along the line VIII—VIII of Fig. 7.

In the embodiment shown, the piece of ordnance comprises a gun barrel 1 (Fig. 1), the chase of which rests on a carriage 2 provided with wheels 3, while the breech 4 bears against a base plate 5. The weapon is pointed by means of an elevating crank 6 and a traversing crank 7.

The rear end of the breech 4 terminates in a head 8 which is spherical on the whole, and which is adapted to be inserted in a corresponding recess or socket 9 in the base plate 5 (Figs 2 and 5). In the zones 9*a*, 9*b*, this recess is at most hemispherical and is extended, in the areas 9*c*, 9*d*, beyond that limit, by lugs 10, integral with the shell of the recess. The sphere of the breech 8 is provided with a bore 11 (Fig. 3) to receive a bolt 12 which is adapted to turn in bearings 13 provided in the shell of the recess 9. In its midway portion, said bolt is provided with flats 14 (Figs. 3 and 4), which fit against corresponding flats in the bore 11 in such a manner that the bolt is carried round by the head 8 when the barrel 1 is swung about the axis x—x in elevating the gun.

One or more locking devices, each being formed, for example, by means of a spring-bolt

15 (Fig. 3) lodged in the bolt 12 and engaging in a groove 16 in the shell 9, prevent the bolt 12 from accidentally slipping out of position.

The bore 11 is widened at 11*a* (Fig. 3) to allow the necessary freedom of angular movement of the breech 8 in pointing the gun in the lateral direction.

The breech head 8 is provided, in known manner, with flats 17 (Figs. 2 and 4) which are turned to face the lugs 10 of the recess 9, when the sphere 8 is to be inserted in the latter. After being inserted, the head 8 is given a quarter-turn, to lock it in place, the portions 18 of the head 8 being then confined under the lugs 10, whereupon the articulation bolt 12 can be inserted.

While retaining the method of articulation by means of the bolt 12 and the same design of the bore 11, a different arrangement may be adopted for locking the sphere in the recess, but the system shown offers the advantage of simplicity, in that the locking lugs 10 also serve as bearing brackets for the bolt 12.

The arrangement of the present invention may also be applied in cases where the head of the breech is combined with a head integral with the carriage so that the two form the male member of the articulation.

When the traversing screw 19 (Fig. 1) is not parallel with the axis of the bolt 12, the act of pointing the gun in the lateral direction tends to cause the barrel 1 to turn slightly on its longitudinal axis. In the embodiment shown, this shifting tendency is prevented by the following device.

In its forward part, the barrel 1 rests, in known manner, in a hinged collar 20. This collar is tightened up against the barrel by means of a nut 21 which coacts with a bolt 22 and is controlled by a rod 23.

By means of an elastic-connection or releasing device (also known), said collar is connected to the upper part of the carriage 2. According to the invention, the collar member 25 (Fig. 1) which carries the members 26 of the releasing device to be connected to the barrel 1, is arranged so as to be able to turn about the axis of the barrel 1 and, for this purpose, comprises a flange 27 (Fig. 7) which is adapted to turn in a groove 28 in the fixed collar 20.

The method of connecting the barrel 1 with the carriage 2 may differ from that illustrated and does not necessarily include the release device 24, the essential condition being that rotation should be possible between the barrel 1 and the carriage 2, the act of pointing the gun in the lateral direction being able to turn the collar 25, but not the barrel 1.

It is obvious that the invention is applicable to any type of carriage, with or without wheels.

It should be well understood that the embodiment described with reference to the accompanying drawings had been given purely by way of example and that various alterations and modifications may be made therein without departing from the scope of the invention as defined in the appended claims.

I claim:

1. In a piece of ordnance of the class comprising a rifled gun barrel, a breech at the rear end of said gun barrel, a mounting to support the forward portion of the gun barrel and a base plate to be laid on the ground to support said breech, the combination of a spherical breech head formed with flats and with a bore, a spherical socket on said base plate to receive said breech head, lugs on said base plate extending laterally the surface of the socket for more than an hemisphere, said lugs being adapted to lock the breech head in the interior of the socket when the breech head has been turned to bring its widest part in engagement with the lugs, bearings provided in said lugs, a bolt in said bore of the breech head to connect the breech head to the base plate, said bolt being adapted to pivot in said bearings and being formed with flats in the portion of the bolt which passes through the bore of the breech head, said bore having flat surfaces corresponding to the flats of the bolt and engaged therewith, said bore in the breech end being also widened to allow the angular displacement of the breech when the gun barrel is being traversed, and connecting means between the gun barrel and said mounting to allow a rotation between said gun barrel and said mounting.

2. In a piece of ordnance of the class comprising a rifled gun barrel, a breech at the rear end of said gun barrel, a mounting to support the forward portion of the gun barrel and a base plate to be laid on the ground to support said breech, the combination of a spherical breech head, formed with flats and with a bore, a spherical socket on said base plate to receive said breech head, lugs on said base plate extending laterally the surface of the socket for more than an hemisphere, said lugs being adapted to lock the breech head in the interior of the socket when the breech head has been turned to bring its widest part in engagement with the lugs; bearings provided in said lugs, a bolt on said bore of the breech head to connect the breech head to the base plate, said bolt being adapted to pivot in said bearings and being formed with flats in the portion of the bolt which passes through the bore of the breech head, said bore having flat surfaces corresponding to the flats of the bolt and engaged therewith, said bore in the breech end being also widened to allow the angular displacement of the breech when the gun barrel is being traversed, a first collar fixed to the gun barrel, a second collar rotatably mounted in the first collar, an elastic connection device between said second collar and the mounting, said elastic connection device being adapted to absorb the shock of recoil at firing.

PAUL EMILE JOSEPH DENOIX.