

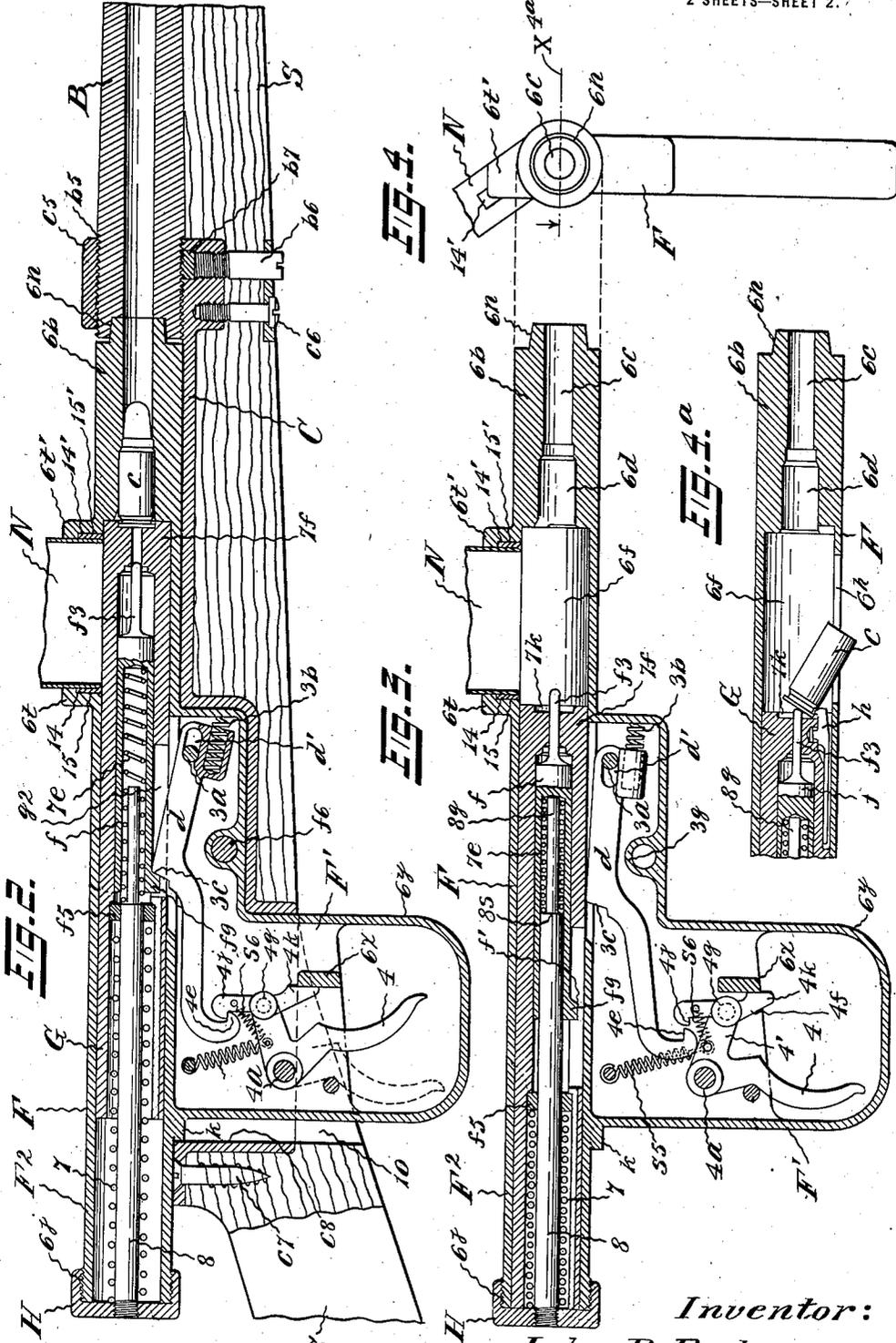
J. D. PEDERSEN.
FIREARM.

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UNITED STATES PATENT OFFICE.

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To all whom it may concern:

Be it known that I, JOHN D. PEDERSEN, a citizen of the United States, residing in Jackson, in the county of Lincoln and State of Wyoming, have invented certain new and useful Improvements in Firearms, of which the following is a specification.

This invention relates to breechloading firearms, and more especially to such firearms of the auto-loading class.

A principal object of my present improvements is to provide breechloading firearms in which the bolt-mechanism and the operating devices incidental thereto, shall be arranged and assembled as an auxiliary mechanism that is separate from the main stock and barrel, so that each said mechanism may constitute one of a series of similar auxiliary arms adapted to be readily and quickly exchanged one for another.

A further object is to furnish an improved breechloading bolt-gun of the class indicated, in which the exchangeable auxiliary arm not only may be operated as an auto-loading firearm, but also may be made in a series of sizes, (especially as to length and range of projectile), so that with a single stock and barrel,—designated as the "primary" arm,—of a given size, several sizes of the auxiliary arm may be used one at a time. Thus, a soldier or hunter may be provided with a single primary arm, and with two auxiliary arms, adapted respectively for using ammunition suitable for different ranges.

Since the relatively heavy stock and barrel,—when of usual "military" construction and properly combined,—constitute a simple and substantial "primary" arm which has a minimum liability to injury, and since the light-weight and auto-loading auxiliary mechanism with its small and highly organized details is much more liable to accident from both external and internal causes, therefore, by means of my present improvements, it becomes practicable to provide a soldier (without overburdening him) with two, or even three, of the auxiliary mechanisms for use in connection with one primary arm, so that in the event that one of said mechanisms becomes disabled another may be instantly substituted therefor and thereby maintain in service a completely operable firearm having a full-sized stock and the long barrel now deemed to be necessary for military rifles. Furthermore,

each of the auxiliary mechanisms, or arms, is available for use as a pistol, and independently of the primary arm, especially for short-range work.

When two of the auxiliary arms of different sizes are to be used one at a time on the same primary arm, the required difference in the size of the auxiliary arms may be obtained simply by making one of them longer than the other, and then arranging the bolt thereof to have a suitably lengthened stroke. Thus the two auxiliary arms may use cartridges which are of the same diameter, but of different lengths, respectively; in each case, however, the projectiles should be of a diameter suitable for the barrel of the particular primary arm which is to be employed. Similarly, projectiles of one length and diameter may be used in cartridge shells of different lengths, and having, respectively, different quantities of powder, thereby providing for the widely varying requirements of short-range and long-range shooting. Also, as already well-known, a difference of powder charge may be provided for by making the "powder-case" portion of the cartridge shell of a proportionate diameter; this may require, however, in some instances, that two of the auxiliary arms shall have their respective mechanisms fitted with breech-bolts of different diameters. In this connection, it should be noted that in this system of organizing the complete firearm, a series of the auxiliary arms which are of different sizes, lengths and proportions, and which thus use cartridges of various sizes and power, may all be used exchangeably, or one at a time, on one "primary arm" as a base-member therefor; and, also, may be so used successively on primary arms having respectively different lengths and weights of stocks and barrels. Thus, for instance, with two primary arms and three auxiliary arms,—each of a different "size",—a complete firearm may be made up by selection and assemblage in six different ways.

In the accompanying drawings forming a part of this specification, Figure 1 is a side view of a firearm of the shoulder arm class made in accordance with my present invention; in this view, for convenience of illustration, the rearward and forward portions of the stock, S, also the forward part of the long main barrel, B, are omitted.

Fig. 2 shows a longitudinal vertical sec-

tion through the mechanism illustrated in Fig. 1, including the entire length of the removable, or auxiliary firearm mechanism; in this view the bolt-mechanism and the several operative details appurtenant thereto, are shown in the firing position thereof.

Fig. 3 is a sectional view through the auxiliary mechanism (this being shown removed from the primary arm) and corresponds with that portion of Fig. 1, with the exception that the bolt is shown fully retracted and that the trigger-and-sear devices are disconnected as normally occurs immediately after the arm is fired.

Fig. 3^a is a view similar to a portion of Fig. 3, for showing a further stage in the cycle of action of the trigger and sear devices.

Fig. 4 is an end elevation of the frame of the auxiliary mechanism as seen from the right-hand in Fig. 3.

Fig. 4^a is a fragmentary sectional view in line X^{4a}, Fig. 4.

Fig. 5 is a cross section in line X⁵ of Fig. 1; and,

Fig. 6 is a cross section in line X⁶ of Fig. 1.

Similar reference characters designate like parts in all the views.

For the purposes of this application the "primary arm" may be said to consist of a main barrel, as B, a stock, as S, and some suitable means for so connecting these members that they may serve as one element of a firearm which will be completed by installing on the connected stock and barrel, an auxiliary arm comprising a complete mechanism for placing and firing the cartridges, and for extracting and ejecting the shells. Accordingly, it will be convenient in practice to provide the usual wooden stock of the primary arm with an adjunctive member, in the nature of a reinforcement, such for instance, as C, which,—as shown in the drawing,—may have the general form of an extended bed piece, or base-plate, while serving in part as a means for connecting the barrel B and stock S. Thus the member C may constitute wholly or in part a mechanism-seat which is located on or above the stock and rearward of the barrel, and is adapted for receiving thereon the frame, as F, of a firearm mechanism that is provided with a short barrel, as 6^b, forming a rearward extension of said main barrel. In the present instance, the secondary frame, F, is shown having assembled therein the reciprocable bolt, G, and the other operative details of a firearm which for the purposes of this description is designated as an auxiliary firearm, or firearm mechanism; this auxiliary firearm is preferably,—as herein illustrated,—in and by itself, a completely operable "auto-loading" firearm.

In practice, the primary arm should be

provided with the usual sights (not herein shown), and the main barrel, B, may be held assembled on the fore-stock by the customary releasable fastenings (not shown) which, being common, do not require particular description here. In order, however, to secure a rigid support and connection of the rearward end of the barrel B with the stock, (Fig. 2), I have shown the barrel-end 6^b threaded into the forward end 6^a of said stock-member, so that by turning it, the barrel may be adjusted longitudinally on the stock and relative to the auxiliary arm. The barrel may be clamped in place by a set-screw, as 6^c, an ordinary soft-metal shoe, as 6^d, being preferably provided for directly bearing against the barrel. The seat-plate C may be held in place by ordinary screws or fastenings, as for instance, the screws 6^e and 6^f.

The primary arm in addition to having the main barrel, also constitutes a primary frame (as well as a heavy base-member) for the complete firearm, (Fig. 1); similarly, the frame F constitutes a complete framework for the secondary arm. At the forward end thereof the frame F is provided with a short barrel, 6^b, which is preferably formed integral with the frame, (Figs. 2, 3). This short barrel has formed therein the cartridge chamber 6^d, and at its forward end is preferably shaped to engage (by some suitable interlocking arrangement) with the main barrel B. For this purpose, barrel 6^b may have a tenon-like forward end, as 6^a, which is preferably slightly conical as shown, and which is fitted to enter and fit closely in a socket-like space formed in the rearward end of barrel B,—as clearly indicated in Fig. 2,—whereby the two barrels, B and 6^b, are united at a point forward of said cartridge chamber, into one continuous gun-barrel. Said barrels are shown in the drawings as if made without rifling, but it is obvious that in practice, they may be provided with such rifling as may be deemed suitable for the projectiles to be used therein; in some instances, the bore, 6^c, of the auxiliary barrel 6^b may be a smooth bore (Fig. 3), while the rifling (not shown) is formed only in the main barrel B.

In the drawings, the frame F is shown made in a preferred form thereof, comprising the bolt-casing F² and,—depending therefrom,—a casing, as F', within which the trigger-sear devices (or "fire-control" mechanism) are assembled. The frame is shown having formed therein a mortise, 10, suitably shaped and proportioned for receiving said trigger-sear casing F'. This mortise should be made long enough for permitting the frame F to be retracted on the primary arm to disengage the tenon 6^a from the barrel B; this movement (not shown) will permit said frame F to be removed by

lifting it directly upward, thereby withdrawing said casing F' out of the mortise. These operations are performed, of course, in a reverse manner when applying the auxiliary arm to the primary arm. For protecting the trigger, 4, said casing F' may be extended downwardly and shaped into a trigger-guard, as 6^v , located below the stock, S.

10 On account of the considerable length of the frame F, the rearward end thereof (at the left-hand in Fig. 3), may in practice be lifted a slight distance (not shown) prior to said retraction thereof, so that a stop face, or abutment, as k , may be formed on the frame for engaging forward of an abutment-face, as c^s , of the aforesaid seat-plate C, (Fig. 2), for thereby resisting a rearward movement of the frame F on the stock by means of a direct engagement of these members. However, it should be understood that said abutment face, k , of the frame F may, if desired, be omitted in some instances.

25 For releasably holding the auxiliary arm in place on the primary arm, any suitable and well-known kind of disconnectible holding device may be employed, but I prefer for such purpose, a transversely-disposed bolt or locking-pin, as f^a , (Fig. 5), provided with suitable means,—as lever arm f^r ,—whereby this pin may be removed and replaced by hand, whenever occasion may require. Said pin f^a is shown extending through the side walls, 3^h , $3^h'$, of said casing F' , and through the solidly-formed portion 3^s of the frame F, thereby forming a strong and firm connection between the members F and C. A thread on the pin f^a engages in the threaded hole at 3^l , Fig. 5, in said casing wall $3^h'$, whereby to reliably hold the pin in place. When thus fitted, said pin-arm f^r constitutes a crank arm whereby said pin may be screwed into and out of place,—all in an evident manner.

50 In the frame, F, the cartridge chamber 6^d is extended rearwardly and enlarged to form the breech-bolt chamber, 6^t , in which the bolt G is reciprocable, forwardly by the power-spring 7, and rearwardly,—when a cartridge is fired,—by cartridge actuation. The bolt G is made hollow for carrying therein the firing-pin f , and is also shown provided with a short arm or connection extending through the frame-slot 6^s , and there provided with the weight or momentum-block, 7^b , which also serves as a handle whereby to retract said bolt by hand to the loading position, Fig. 3. When thus retracted,—by hand or otherwise,—the forward end 7^t of the bolt comes rearwardly of the opening 6^h in the frame F, so that a cartridge, as c^3 (Fig. 6) will drop downward in the magazine N, and stand partially forward of the bolt G, so that on the for-

ward movement of the bolt, the cartridge will be pushed forward,—or “placed,”—into the firing position,—see Fig. 2. The magazine, N, is only partially shown, since the proper detail and arrangement thereof will be evident; it may be made of sheet metal and removably held in place by means of ribs, as 14 , $14'$, fitting in grooves, as 15 , $15'$, formed in the projections 6^t , 6^v of the frame F.

The rearward end of said chamber 6^t may be closed by a cap, as H, removably-fixed to the frame F by a screw-thread, as 6^i , or in other convenient manner. The cap H, supports the abutment-rod 8, and also serves as a stop for limiting the rearward movement (Fig. 3) of the bolt G. Similarly the forward end, 8^s , of said rod 8 serves to stop the retraction of the firing-pin f before the bolt G is fully retracted, so that the point, f^a , of this pin will operate as an ejector, as clearly indicated in Fig. 4^a. For retracting the shell, as c , from the barrel 6^b , the bolt G may be provided with an ordinary extractor as h , operating in a well-known manner.

The power-spring 7, acts against a face, at f^s , on the bolt G, and thus operates on the full retraction of the bolt to immediately drive the bolt forward and so load the arm. During this loading stroke of the bolt, the sear notch, or face, as f' , of the firing-pin f engages the sear d on the face 3^c thereof, and thus the firing pin is held in the firing position thereof, Fig. 2. Said pin f is preferably of tubular form, as illustrated, and may be forwardly actuated by the spring 7^c which is shown supported against a shoulder, as 8^s on said abutment-rod 8. To provide in a convenient manner for the desired coaction of the pin f directly with the sear d , a slot, g^2 , is formed in the tubular portion of the bolt G, and the sear-engaging face f' is formed on the forward side of the projection f^o of the firing pin; thus the sear d can be so arranged as to project upwardly into the slot g^2 and there engage with said projection f^o when the bolt G is in or near its forward position,—see Fig. 2. Thus the sear d , in connection with devices for operating the same, constitutes portions of a complete fire-control means, which, in the present instance is contained within a casing, F' , extending downwardly through the mortise, 10, of the stock, so that the fire-control means is manually accessible and operable from below the stock.

For so controlling the operation of the sear-member d that the firearm will operate as an auto-loading arm, but not as an auto-matic arm, I have provided a sear-retracting trigger device having a disconnecting means, and in Figs. 2, 3 and 3^a, I have illustrated a preferred form and arrangement thereof. One feature of this improved arrangement

of the fire-control means relates to the sear-member, as *d*, whereby this is made non-retractable by the trigger excepting when both the firing pin and the bolt *G* are in proper position therefor. For this purpose, said sear-member is herein shown supported to have a reciprocatory movement in a direction longitudinally of the bolt movement. The sear-member being pivoted on the pin *3^a*, which passes through the slot *d'*, therefore the sear-actuating spring *3^b* operates to swing the sear upwardly toward its position in Fig. 2, and also to force the sear rearwardly, as in Fig. 3. Said sear spring *3^b*, however, is normally overcome by the stronger firing spring *7^e*, so that when the mechanism is in firing position, (Figs. 2 and *3^a*), the sear-member *d* will be carried forward, and so bring the hook *4^e* thereof into the trigger-engaging position shown in Figs. 2 and *3^a*. Thus said member *d*, when arranged as here described, may be said to constitute a two-motion sear device, the two movements thereof being, respectively, in transverse directions.

For coacting in a preferable manner with the sear *d* when this is arranged as aforesaid, the trigger, 4, is pivotally supported,—as by pin *4^a*,—in the casing *F'* of the frame *F*, and is provided with a by-pass device arranged to engage with said sear-member only when this is in its forward position, see Fig. *3^a*. The by-pass device may consist in a small lever, as *4^f*, pivoted at *4^g* to the trigger-arm *4^f*, and provided at one end with the sear-engaging hook *4^f*, and at the other end, *4^k*, engaging with a movement-limiting face or stop, as *6^x*, appurtenant to the frame *F*. A spring *s^e*, may be arranged for operating the trigger, and another spring, *s^e*, for normally holding said lever-end *4^k* against the stop *6^x*. On releasing the trigger 4 from its retracted position, (Fig. 3),—after the sear is in its said firing position,—the by-pass hook *4^f* rides over the sear-hook *4^e* as illustrated in Fig. *3^a*, and thus comes to the sear-engaging position shown in Fig. 2. If, now, the trigger 4 be drawn back as in Fig. 3, the said hook *4^f* draws down the sear *d* and thereby releases the firing-pin *f*, whereupon the sear is forced back by its spring *3^b* to the non-engaging position thereof (Fig. 3) relative to the by-pass hook *4^f* of the trigger. Thus the trigger device is for a time made inoperative, as a result of the peculiar mode of action of the two-motion sear, and this result occurs each time the arm is fired, and however rapidly the firing takes place.

The improved fire-control mechanism herein illustrated and described,—since it comprises a two-motion sear-member combined with a trigger device having a by-pass means,—is regarded as being peculiarly adapted for use in connection with my pres-

ent invention, but other suitable arrangements (not herein shown) of the fire-control means may, if desired, be employed in some instances. The particular construction and arrangement, however, of fire-control means which I have herein set forth, is regarded as being a separate subject-matter which is in the nature of a machine-element, or mechanical movement, and which, therefore, is intended to constitute in part the subject-matter of a separate application to be concurrently pending herewith.

Having thus described my invention, I claim:

1. A firearm comprising, as one element thereof, a primary arm which consists of a connected stock and main barrel and which has a mechanism-seat on the stock and rearward of said main barrel, and comprising, in combination and as a second element thereof, a firearm mechanism removably fixed on said mechanism-seat and provided with a barrel forming a rearward extension of said main barrel, and with cartridge placing and firing devices.

2. A firearm comprising, as one element thereof, a primary arm which consists of a connected stock and main barrel and which has a mechanism-seat on the stock and rearward of said barrel, and comprising, in combination and as a second element thereof, an auxiliary firearm removably fixed on said mechanism-seat and comprising a frame provided at the forward end thereof with a barrel forming a rearward extension of said main barrel, and also provided with cartridge placing and firing devices inclosed within the frame, and with a fire-control means.

3. A firearm comprising, as one element thereof, a primary arm which consists of a connected stock and a long main barrel and which has a mechanism-seat on the stock and rearward of said main barrel, and comprising, in combination and as a second element thereof, an auxiliary firearm removably fixed on said mechanism-seat and comprising a frame provided at the forward end thereof with a short barrel having a tenon and socket connection with said main barrel, whereby said short barrel forms a rearward continuation of the main barrel, and means appurtenant to the firearm for adjusting the longitudinal position of the main barrel and the auxiliary firearm one relative to the other.

4. In a firearm comprising a primary arm which consists of a shoulder-arm having a stock and main barrel, the combination with said shoulder-arm of an auxiliary firearm comprising a frame which is removably fixed on said stock rearward of the main barrel, and which is provided with cartridge placing and firing mechanism coöperative with the main barrel.

5. In a firearm comprising a primary arm which consists of a shoulder-arm having a stock and a main barrel, the combination with said shoulder-arm of an auxiliary firearm comprising a frame which is removably fixed on said stock rearward of and in cooperative relation with the main barrel, and which is provided with cartridge-firing and shell-extracting means, and with fire-control means manually operable from below the stock.

6. In a firearm comprising a primary arm which consists of a shoulder-arm having a stock and main barrel, the combination with said shoulder-arm of an auxiliary firearm mechanism comprising a frame which is removably fixed on said stock rearward of the main barrel, and which is provided with cartridge-firing and shell-extracting means, and with fire-control means in cooperative relation with the main barrel.

7. In a firearm comprising a primary arm which consists of a shoulder-arm having a stock and main barrel, and having a mortise downwardly through the stock, the combination with said shoulder-arm of an auxiliary firearm mechanism comprising a frame which is removably fixed on said stock rearward of the main barrel, and which is provided with cartridge-firing and shell-extracting means, said frame also having a casing extending downwardly through

the mortise of the stock, and having in the casing a fire-control means manually operable from below the stock.

8. In a firearm comprising, as one element thereof, a primary arm which is without operable members therein and consists of a connected stock and main barrel, and which has a mechanism-seat on the stock and rearward of said barrel, the combination with said primary arm of an auxiliary magazine firearm removably fixed on said mechanism-seat and provided with a barrel forming a rearward extension of said main barrel.

9. In a firearm comprising, as one element thereof, a primary arm which is without operable members therein and consists of a connected stock and main barrel, and which has a mechanism-seat on the stock and rearward of said barrel, the combination with the primary arm of an auxiliary firearm comprising a frame removably fixed on said mechanism-seat and provided with a barrel forming a rearward extension of said main barrel, said frame also having a casing for a trigger-sear mechanism in which the trigger device thereof extends to a position below said primary arm.

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Witnesses:

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