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W. L. SWARTZ

2,140,945

FIREARM BALANCER

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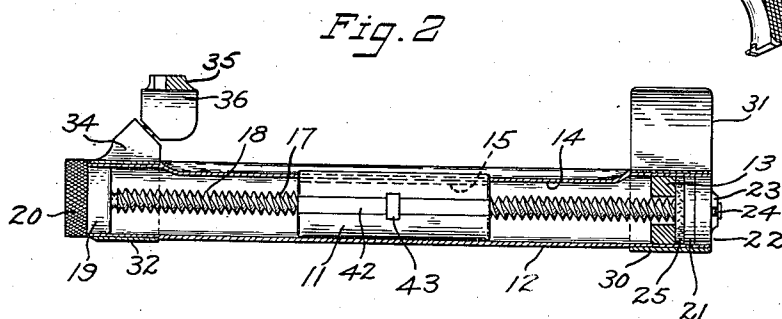
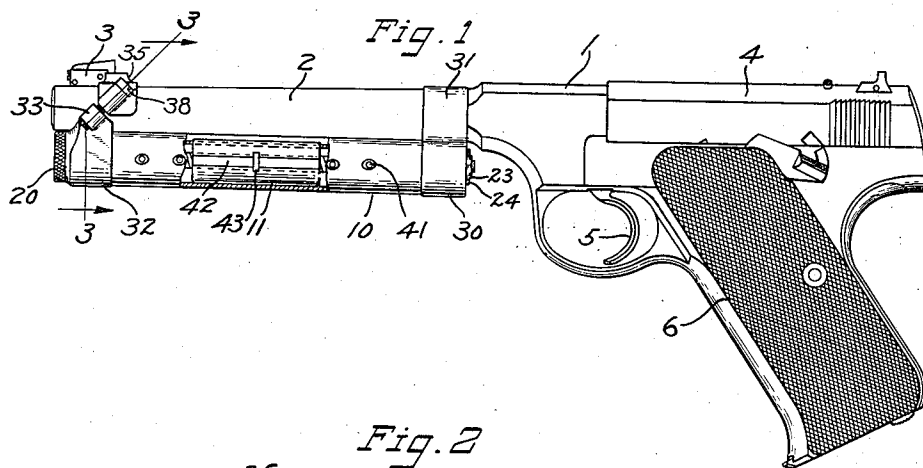


Fig. 3

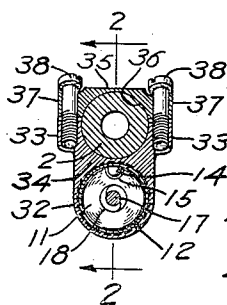


Fig. 4

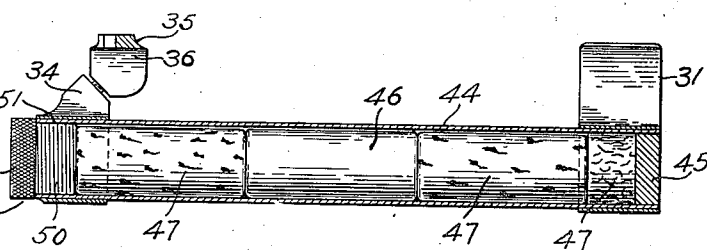
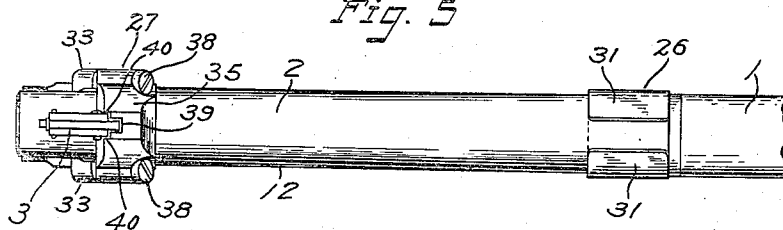


Fig. 5



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UNITED STATES PATENT OFFICE

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FIREARM BALANCER

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13 Claims. (Cl. 42—1)

The purpose of this invention is to provide a construction whereby the center of gravity of a firearm can be changed. The balance or "feel" of a firearm is largely controlled by the location of its center of gravity and users of firearms differ in their preferences as to this balance or "feel."

It is the primary object of the invention to provide a firearm having an adjustable balancing means with an adjustment member positioned exteriorly of the gun for accessibility.

It is also an object of the invention to provide a balancer having details of construction resulting in a smooth exterior, ready adjustability, freedom from unintentional change of adjustment, and absorption of shocks incident to use.

A further object is to provide a separate adjustable balancer attachment, preferably associated with the firearm barrel, and the necessary support members by which such a device may be readily attached to or removed from the barrel.

Other objects and advantages will be apparent to those skilled in the art.

In the accompanying drawing I have shown the embodiments which I now deem preferable, but it will be understood that the drawing is intended for illustrative purposes only and is not to be relied upon as limiting or defining the scope of the invention, the claims forming a part of this specification being relied upon for that purpose.

In the drawing:

Fig. 1 is a side view of a firearm with a balancer attached thereto, a portion of the balancer being broken away to show the internal construction.

Fig. 2 is an enlarged longitudinal section of the balancer taken on the line 2—2 in Fig. 3, the firearm barrel being omitted.

Fig. 3 is a transverse section taken on the line 3—3 in Fig. 1.

Fig. 4 is an enlarged longitudinal section of an alternative form of balancer.

Fig. 5 is an enlarged plan view of a balancer such as shown in Figs. 1 or 4 associated with the barrel of a firearm.

The invention is not limited to any particular type of firearm but for the purpose of this specification I have illustrated it in conjunction with an automatic pistol.

The automatic pistol, generally indicated at 1, comprises a barrel 2, front sight 3, breech bolt 4, trigger 5, and grip 6. As the particular type of firearm does not constitute any part of this invention further detailed description thereof is not necessary.

Referring now to Figs. 1, 2 and 3 wherein I have shown one form of the invention, there is associated with the firearm 1 a balancing means 10 which is adjustable to change the center of gravity of the entire assembly. By preference and in accordance with one phase of the invention the balancing means is readily adjustable at any time from the exterior of the firearm; and also by preference and in accordance with another phase of the invention the balancing means is directly associated with and is immediately adjacent the barrel of the firearm. The balancing means 10 may be an independent unit constructed separately from the firearm 1, and it is so shown in the drawing, but as to this I do not limit myself.

The balancer 10 includes a longitudinally adjustable weight 11 and a longitudinal guide therefor. Preferably there is a tube which encloses or substantially encloses the weight and provides a smooth exterior, and this tube may serve as the guide or as a part thereof. A suitable means is provided for normally holding the weight in any desired position of adjustment, and when there is an enclosing tube such as 12, this means for holding the weight is preferably within the tube.

As shown and as preferred, I provide an adjusting means for the weight which is operable from the exterior of the firearm and which also serves as the means for holding the weight in adjusted position. For this purpose a longitudinally extending threaded member or screw may be provided. When there is an enclosing tube such as 12, the screw is preferably within the tube, as shown at 17, and is externally threaded and extends through a threaded hole in the weight 11, but I do not necessarily limit myself to an externally threaded screw. The weight and the screw are relatively rotatable, and preferably it is the screw that is rotatable, the weight being held against rotation while being permitted to move longitudinally.

In the drawing, the screw 17 is shown as including the threaded portion 18, an enlarged bearing portion 19, and the knurled, exteriorly positioned adjusting portion 20 at the forward end.

The weight is held against rotation with respect to the guide or tube 12 and for accomplishing this the weight and tube have complementary non-circular cross sections. As shown the means for preventing relative rotation are found in the longitudinal inward projection or rib 14 on the

tube and the complemental groove 15 in the weight.

In order to prevent unintentional disassociation of the balancer structure so far described I provide the tube 12 with the internal shoulder piece 13 against which means on the screw 17 may abut. For this purpose I utilize the washers 25 and 21 in conjunction with a nut 22 having a slotted boss 23 projecting from one face. A pin 24 passing through a hole in the screw 17 is positioned in the slot to prevent rotation of the nut with respect to the screw.

The balancer is subjected to the sudden and severe shocks of recoil when the gun is fired and it is considered desirable, although not essential, to provide means for absorbing these shocks. While I do not wish to limit myself to any particular form of shock absorbing means I have shown a simple, yet efficient, construction for effecting such absorption. In accordance with this phase of the invention the washer 25 is formed from a resilient material and this allows for a slight longitudinal cushioned movement between the tube 12 and screw 17. By forming the washer 25 from felt, or some other equivalent material, the necessary resiliency is obtained and it may be further utilized to absorb lubricant for promoting the smooth operation of the balancer.

In order to prevent any unintentional change in the adjustment of the balancer, means may be provided to hold the parts in their adjusted position. Different means could be provided for this purpose but when the balancer takes the form described, a resilient means may be provided to draw the knurled head 20 into frictional engagement with the end of the guide 12 with a constant force, the friction serving to hold the several parts in their adjusted position. While a separate resilient member could be incorporated in the balancer for this purpose I now prefer to utilize the already described structure for performing this additional function. The washer 25, when made from felt and of sufficient thickness to absorb the shocks, has sufficient resiliency to hold the knurled head 20 in firm frictional engagement with the end of the guide 12.

In a balancer in conformity with the invention it is deemed preferable to provide means by which the user can readily determine the position of the weight member. The object of this is, of course, to enable the user to return the weight to the desired position in case its location should have been changed due to any cause. One way of providing such indication is to have means on the weight member visible to the user so that from the location of such means with respect to a reference point the position of the weight member is known. While other constructions may be used within the scope of the invention, I prefer the simple, yet efficacious, construction to be now described. The guide 12 is provided with one or more apertures 41 through which the position of the weight 11 is observable. In order to increase the visibility of the weight and to aid in more accurately determining its position with respect to a reference aperture, a recess 43 may be formed in the weight and readily visible means, such as white paint, placed in this recess. Furthermore, a groove 42 may be formed longitudinally of the weight in which contrasting means, such as black paint, may be placed to more clearly show up the white paint in the recess 43.

The balancer construction so far described can be incorporated as an integral part of a firearm

when manufactured or may be utilized as an attachment for any firearm and I shall now describe the means whereby it may be used as the latter.

The balancer may be associated with any part of a firearm but I have shown it as attached to the barrel. This location is now preferred as a maximum change in balance or "feel" of the firearm results from a given displacement of the weight when it is so located. The balancer should be securely attached to the firearm so that no relative movement of the two takes place when the firearm is in use, as otherwise aiming would be made difficult. When the balancer is associated with the barrel one method of securely attaching the same is to provide the forward end of the balancer with a supporting member which engages the opposite sides of the front sight as well as holds the two against relative longitudinal movement. In accordance with this phase of the invention the balancer is preferably mounted beneath and adjacent the barrel and a support for the forward end of the balancer may embody the construction now to be detailed. A support is generally indicated at 27 and comprises two parts. One part has a body portion 32 surrounding and secured to the tube 12, the body having a groove 34 therein for receiving the lower half of the barrel and apertured ears 33, 33 projecting laterally from the opposite sides. The upper part 35 of the front support is grooved at 36 to engage the upper half of the barrel and this part of the support also has laterally extending apertured ears 37, 37 which cooperate with the ears 33 and screws 38 to clamp the two parts of the support together around the barrel. The recess 39 in the upper part of the front support results in the shoulders 40 which engage the opposite sides of the front sight to prevent rotation of the support with respect to the barrel.

To further securely attach the balancer to the barrel a rear support may be provided. I have shown one form for such a rear support, the same being generally indicated at 26. My rear support 26 comprises the body portion 39 which is secured to the tube and two arm portions 31, 31 which partially surround the barrel. The ends of the arms 31 are spaced apart sufficiently to permit the support 26 to slide by the front sight when the balancer is being mounted on the barrel.

In Fig. 4 I have shown an alternative form of balancer. This form includes a guide member such as the tube 44 which is preferably closed at one end by a closure 45. Within the tube is positioned a balancing member or weight 46 which is positionally held in place by a plurality of spacing members 47, three such members being shown although any desired number could be used. Two members are preferably formed of a light material such as cork, for instance, and the member positioned next to the closure 45 may be formed of a somewhat more resilient material such as felt for absorbing the shocks incident to firing. The forward end of the guide member 44 may be closed by any desired type of closure. I have shown a closure 48 which includes a knurled portion 49 and a threaded portion 50 which is adapted to cooperate with the internally threaded portion 51 of the guide member. The rear resilient spacing member 47 not only functions to absorb the shocks but also serves to produce frictional engagement between the threads on the closure 48 and the tube to prevent the

accidental turning of the closure which would be undesirable as it would permit the weight 46 to freely shift in the tube.

It is obvious that by removing the closure 48 the relative positions of the weight and spacers 47 may be changed to effectively change the balance of the firearm.

This alternative embodiment of the invention may be associated with a firearm in any of the ways noted above in connection with the embodiment of Figs. 1, 2 and 3, and I have shown supports of the same type in each case. For this reason no further description of the supporting means shown in Fig. 4 is considered necessary.

The embodiment illustrated in Fig. 4 is disclosed and claimed in my copending divisional application Serial No. 211,441, filed June 2, 1938.

While two embodiments of the invention have been described, it should be understood that many changes in the specific construction could be made within the scope of the invention as defined in the appended claims.

I claim:

1. A balancing attachment for a firearm comprising in combination, a guide member, a balancing weight member, a third member associated with the first two members, and means associated with one of the three members for preventing rotation of the same with respect to one of the other two members, the other two members having cooperating screw threads thereon whereby rotation of one causes longitudinal movement of the other.

2. A balancing attachment for a firearm comprising in combination, a guide member, a balancing weight slidable longitudinally of the guide member and having a screw threaded hole therethrough, means for preventing rotation of the balancing weight with respect to the guide member, a screw threaded member extending through the hole in the balancing weight, and means for preventing any substantial relative longitudinal movement between the guide and screw threaded members whereby rotation of the last mentioned member serves to move the weight relative to the guide member.

3. A balancer for a firearm comprising in combination, a guide member, a balancing weight member, a third member associated with the first two members, means associated with one of the three members for preventing rotation of the same with respect to one of the other two members, the other two members having cooperating screw threads thereon whereby rotation of one causes longitudinal movement of the other, and means for absorbing shocks to which the balancer may be subjected.

4. A balancer for a firearm comprising in combination, a guide member, a balancing weight slidable longitudinally of the guide member and having a screw threaded hole therethrough, means for preventing rotation of the balancing weight with respect to the guide member, a screw threaded member extending through the hole in the balancing weight, means for preventing any substantial relative longitudinal movement between the guide and screw threaded members whereby rotation of the last mentioned member serves to move the weight relative to the guide member, and resilient means positioned between the screw threaded and guide members for absorbing shock and for causing the two to frictionally engage each other with a substantially constant force.

5. A balancer for a firearm comprising in com-

bination, a guide member having a shoulder thereon, a balancing weight slidable longitudinally of the guide member and having a screw threaded hole therethrough, means for preventing rotation of the balancing weight with respect to the guide member, a screw threaded member extending through the hole in the balancing weight and beyond the shoulder on the guide member, and means on the screw threaded member engageable with the shoulder for preventing any substantial relative longitudinal movement between the guide and the screw threaded members, the last said means including a lubricant absorbing resilient washer.

6. A balancer for a firearm comprising in combination, a guide tube, a balancing weight enclosed within the guide tube, means constituting a normally assembled part of the balancer for moving the balancing weight longitudinally of the guide tube, and means for indicating the position of the balancing weight within the guide tube.

7. A balancer for a firearm comprising in combination, a guide tube having at least one aperture in its side wall, a balancing weight enclosed within the guide tube, and means constituting a normally assembled part of the balancer for moving the balancing weight longitudinally of the guide tube, the position of the balancing weight within the guide tube being observable through the aperture.

8. A balancer for a firearm comprising in combination, a guide tube having at least one aperture in its side wall, a balancing weight longitudinally movable within the tube, means constituting a normally assembled part of the balancer for moving the balancing weight longitudinally of the tube, and indicating means on the balancing weight observable through the aperture for determining the position of the balancing weight within the tube.

9. A supporting clamp for use with a firearm having a barrel and a front sight on the barrel, comprising in combination, a body portion adapted to be secured to an article to be associated with the firearm barrel, and means extending from said body having portions for at least partially surrounding the barrel in clamping relation and for engaging the opposite sides of the front sight to thereby prevent rotation of the clamp with respect to the barrel.

10. A supporting clamp for use with a firearm having a barrel and a front sight on the barrel, comprising in combination, a body member having a portion adapted to be secured to an article to be associated with the firearm barrel and having a groove in another portion for snugly receiving substantially half of the barrel, a second member having a groove therein for snugly receiving the other half of the barrel and having shoulders for engaging the opposite sides of the front sight, and means for clamping the members together around the barrel.

11. In combination with a firearm having a barrel and a front sight on the barrel, a tube extending substantially parallel to the barrel, supporting means adjacent one end of the tube, arms extending from said supporting means partially around the barrel with the ends of the arms spaced apart so that the support may be slid along the barrel with the front sight passing between the spaced apart arm ends, and supporting means adjacent the other end of the tube in clamping engagement with the barrel and having means thereon for engaging the opposite sides of the front sight.

12. The combination of a firearm including a barrel having a bore therein, and an adjustable balancer positioned adjacent and beneath the bore, said balancer comprising a portion fixed
5 relative to the firearm, a weight movable relative to the said fixed portion and substantially enclosed thereby, and means constituting a normally assembled part of the balancer and at least partially positioned exteriorly of the firearm for moving the weight.
13. A balancing attachment for a firearm adapted to be supported beneath the barrel of the firearm comprising in combination, a guide member, a balancing weight within and substantially enclosed by the guide member and movable longitudinally thereof, and means constituting a
5 normally assembled part of the attachment and at least partially positioned exteriorly of the guide member for selectively so moving the weight with respect to the guide member or for holding it against such movement.
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