W. E. WESTFALL.

SILENCER CONSTRUCTION FOR FIREARMS.

APPLICATION FILED MAY 7, 1914.

1,111,202.

Patented Sept. 22, 1914.

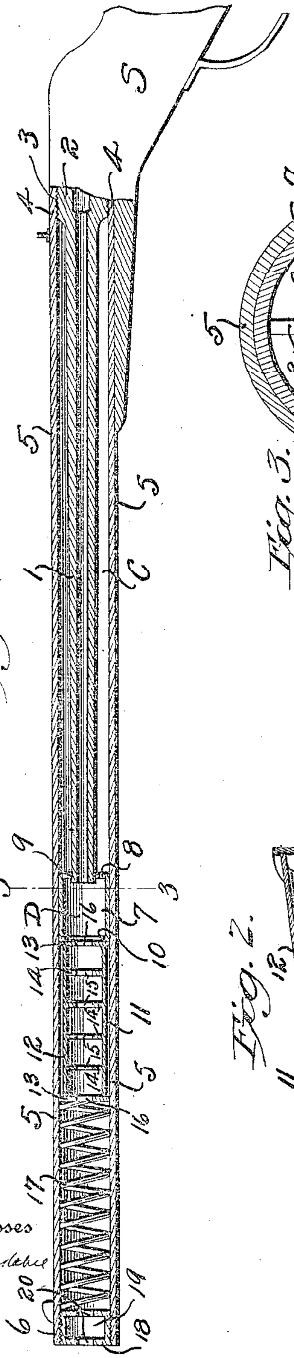

Fig. 1.

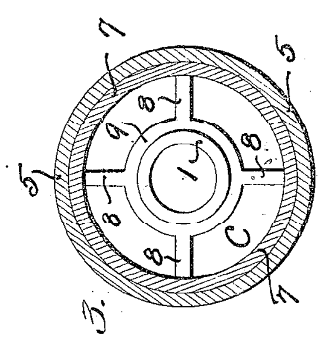

Fig. 3.

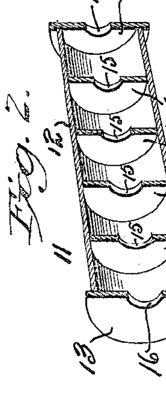

Fig. 2.

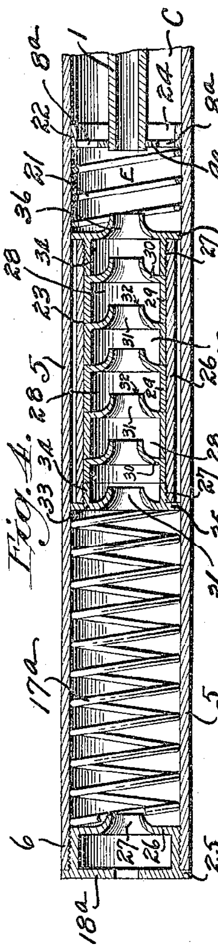

Fig. 4.

Witnesses

Inventor

WALTER E. WESTFALL.

By

His Attorney

UNITED STATES PATENT OFFICE.

WALTER E. WESTFALL, OF MARYVILLE, MISSOURI.

SILENCER CONSTRUCTION FOR FIREARMS.

1,111,202. Specification of Letters Patent. Patented Sept. 22, 1914.

Application filed May 7, 1914. Serial No. 836,989.

To all whom it may concern:

Be it known that I, WALTER E. WESTFALL, a citizen of the United States, residing at Maryville, in the county of Nodaway and State of Missouri, have invented certain new and useful Improvements in Silencer Construction for Firearms, of which the following is a specification.

This invention relates to firearms, and has special reference to a novel construction which silences the usual report incident to the explosion of the cartridge or shell.

The chief objection to many silencer constructions, especially those in the form of an attachment, is that they obstruct the line of vision between the sights, and for this reason it is necessary to employ special sight devices which not only increase the cost of the firearm, but must necessarily be larger than ordinary sights, thereby making the weapon unwieldly and hard to handle. Furthermore, silencer attachments which are fixed to the muzzle end of the barrel make the gun unsightly, and also have other objections which the present construction aims to overcome.

Accordingly, the present invention has in view as its principal object the provision of a novel construction of silencer which may be built in with the firearm so that to all outward appearances, the gun is of ordinary construction.

Another object of the invention is to provide a simple and durable device of this character having but few inexpensive parts whose particular arrangement is such that they may be readily assembled to constitute a silencer that effectively muffles the report of the explosion so that no noise is discernible other than a slight whistle or whir due to the exit of the projectile and the exhaust of spent gases.

With the above and other objects in view which will more readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination and arrangement of parts hereinafter more fully described, illustrated and claimed.

A preferred and practical embodiment of the invention is illustrated in the accompanying drawings, in which—

Figure 1 is a longitudinal sectional view showing the application of the invention. Fig. 2 is a detail perspective view, showing a half section of the check valve. Fig. 3 is a cross sectional view on the line 3—3 of Fig. 1 drawn to a larger scale. Fig. 4 is an enlarged detail sectional view showing a modification of the invention.

Similar reference characters designate corresponding parts throughout the several figures of the drawings.

In carrying out the invention it is preferable to employ a gun barrel of special construction, though it will of course be understood that many gun barrels now in common use can be readily adapted to the present invention.

By reference to Fig. 1 it will be observed that the numeral 1 designates a gun barrel which is formed at its breech end with an annular enlargement 2, which is preferably externally threaded as at 3 and adapted to receive the interiorly threaded end 4 of a silencer casing designated in its entirety by the reference character 5. The said silencer casing 5 is preferably in the form of a cylindrical tube which is longer than the gun barrel 1, and has its exhaust end 6 interiorly threaded similar to the end 4.

When the end 4 of the silencer casing has been screwed onto the enlargement 2 of the gun barrel, both members are ready for positioning in the gun stock designated in its entirety by the reference character S, and because of the enlargement at the breech end of the gun barrel, the external wall of the latter is spaced from the inner wall of the silencer casing to provide a gas chamber C, as clearly shown in Fig. 1. In order to maintain the proper relation of the assembled parts and render the firearm absolutely accurate, this particular arrangement makes it necessary to support and center the muzzle end of the gun barrel 1, and to this end there is provided a removable and replaceable cylindrical spacing sleeve 7 designed to fit snugly within the silencer casing and having at one end a plurality of radially projecting arms 8 that are connected with a collar 9 which receives the muzzle end of the barrel 1. The radial arms 8 and collar 9 carried by the spacing sleeve 7 form a barrel centering spider which supports the muzzle end of the barrel, and at the same time permits communication between the chamber C formed around the body of the gun

barrel and an initial gas-arresting chamber D formed by the spacing sleeve 7. The end of the spacing sleeve 7 opposite that having the barrel centering spider is preferably formed with an inturned abutment flange 10 which constitutes a seat and stop for a sliding check valve 11. This sliding check valve 11 includes in its organization a cylindrical valve body 12 having at each end a disk-like end cap 13, the peripheral edges of which snugly contact with the inner walls of the silencer casing to form an effective gas seal without hindering the movement of the sliding check member. The interior of the said valve 11 is provided with a plurality of spaced apart baffle disks 14 each having a concentric centrally arranged opening 15 which are in alinement with similar openings 16 in the end caps 13. For the purpose of holding the check valve 11 against the abutment flange 10 of the spacing sleeve, there is provided a resetting spring 17 which is arranged within the silencer casing so that one end thereof bears against one of the end caps 13 of the check valve, while the other end abuts against the inner wall of an end plug 18 screwed into the exhaust end 6 of the silencer casing. This end plug 18 is preferably hollow to provide an air chamber 19 while its end walls are provided with concentric openings 20 which are in alinement with the openings 15 and 16 of the check valve, which in turn are in direct alinement with the bore of the gun barrel 1.

By reference to the manner of assembling the structure described, it will be noted that the arrangement of parts is such that this operation may be expeditiously accomplished. That is to say, the silencer casing may be readily screwed onto the breech end of the gun barrel, while the muzzle end of the latter is firmly supported by the spider on the spacing sleeve 7 which may be easily pushed into the open end 6 of the silencer casing, and then the check valve may be placed in position with the resetting spring to hold it against the seat formed by the spacing flange, and the chambered end plug screwed into the end 6 of the silencer casing to hold all of the parts in their assembled relation. In addition to providing an easy method of assembling, this construction also makes it easy to replace or repair damaged parts.

By particular reference to Fig. 4, it will be noted that a modified silencer construction is shown. In carrying out this form of the invention, the same type of silencer casing is used as shown in Fig. 1, the same being designated by the reference character 5, while the gun barrel 1 assumes the same relation to the silencer casing in this form as it does in the other.

In the form of the invention shown in Fig. 1, it has been found that upon the return of the check valve 11 to its seat against the end of the spacing sleeve by the action of the resetting spring, a noticeable click is heard due to the contact of the end cap with the inturned abutment flange of the said spacing sleeve. In order to overcome this objection, the spacing sleeve is done away with in the modification shown in Fig. 4, and in its place is substituted a recoil or shock absorbing spring 21. The said spring 21 is confined between a centering spider 22 and a check valve 23, so that in effect a chamber E is formed in the same manner as the chamber D of Fig. 1.

In the present instance, the centering spider 22 includes a body portion in the form of a ring 24 which snugly fits against the inner wall of the silencer casing, and has radially disposed arms 8^a which support a collar 9^a which has the same function as the collar 9 in the other form of the invention. A resetting spring 17^a is also employed in this construction to return the check valve 23 to its normal position, and permit it to yield upon the impact of the discharge of the cartridge or shell, while the chambered end plug 18^a is used to form an abutment for one end of the spring 17^a, to enable it to exercise its resetting function. In connection with the end plug 18^a, it will be observed that the only substantial difference between the same and the end plug 18, is that the former is provided with a peripheral cap flange 25, and has its inner wall 26 formed with a conical portion 27 whose apex is open.

The check valve 23 comprises a cylindical valve casing 26 which is preferably of smaller diameter than the silencer casing and interiorly threaded at each end as indicated at 27. This casing 26 is designed to accommodate a plurality of removable and replaceable baffle members 28. Each of the said baffle members 28 are substantially cup shaped and include side walls 29 and bottom walls 30 which are formed with conical portions 31 which are cut away to provide openings 32. These baffle members 28 are arranged within the casing 26 so that their conical portions 31 open toward the muzzle of the gun barrel 1. In other words, these cup-like members 28 are arranged so that the conical portion of one member projects into the chamber formed by the side and bottom walls of an adjacent member, and the outer faces of the conical portions 31 form deflecting surfaces for the exhausting gases. For the purpose of holding the baffle members 28 within the casing 26 there is provided a holding cap member 33 for each end of the valve casing. Each of these cap members 33 has a threaded neck 34 which permits the same to be screwed into the threaded portions 27 of the valve casing,

and also has a bearing flange 35 which abuts against the edge of the valve casing 26 while the peripheral edge thereof slidably engages the interior of the silencer casing to form a gas tight joint. Each of the caps 33 is provided with a centrally depressed open end conical portion 36 which is disposed in the same direction as similar portions 31 of the baffle members 28. Thus, it will be apparent that the reverse sides of the conical portions 31 and 36 will effectively impede the exit of the exploded gases, inasmuch as the same will be held within the pockets formed by the cupped baffle members, even more so than in the other construction of valve member. In this form of the invention it will be apparent that the check valve is mounted between two springs which tend to maintain the same in its normal position. The recoil spring 21 prevents the valve from striking a solid seat and making a noise, and at the same time helps to equalize generally the force of the shock.

Upon the explosion of a cartridge or shell in the gun barrel 1, the smoke and gases issuing from the muzzle of the latter, will be first received by a chamber formed between the barrel centering spider and the end of the check valve, in both forms of the invention. The gases will also be permitted to expand rearwardly into a chamber around the gun barrel, and will also try to make their exit through the mouth of the silencer, but in pursuing this course will encounter the check valve and chambered end plug. This is also true of both forms of the invention, so that it will be apparent that in each instance the impact of the explosion will be received by a yielding check valve which will tend to check the exit of gases through the mouth of the silencer and tend to deflect a portion of the same back into a chamber formed around the gun barrel. The present construction effectively provides for equalizing the shock of the explosion throughout the weapon, while at the same time muffling the sound thereof without impeding the accuracy or hindering the exit of the projectile from the firearm.

I claim:

1. A gun silencer construction, including in combination with a gun barrel, a tubular silencer casing telescoping with said gun barrel and spaced therefrom to form an annular chamber, and yielding check means arranged in said casing in front of the muzzle of the gun and adapted to deflect exhausting gases into the said annular chamber.

2. A gun silencer construction, including in combination with a gun barrel, a silencer casing entirely surrounding said barrel and spaced therefrom to provide a chamber extending from the breech end to the muzzle, and a check valve unit yieldingly held between the muzzle of the gun and the mouth of the silencer casing and having at one side thereof an initial gas receiving chamber in communication with the chamber formed around the body of the gun barrel.

3. A gun silencer construction including in combination with a gun barrel, a silencer casing interiorly threaded at each end, a chambered end plug having a central opening screwed into one end of said casing, while the opposite end receives said gun barrel, means for centering and supporting the muzzle end of the gun barrel within the casing, a check valve slidably arranged between the muzzle of the gun barrel and said end plug, and spring means for maintaining the check valve in its normal position.

4. A gun silencer construction including in combination with a gun barrel, a silencer casing interiorly threaded at each end, a chambered end plug having a central opening screwed into one end of said casing, while the opposite end receives said gun barrel, means for centering and supporting the muzzle end of the gun barrel within the casing, a check valve provided with a plurality of interior baffle members and a central longitudinal passage, said check valve slidably arranged between the muzzle of said gun barrel and the end plug, and spring means interposed between said valve and end plug to maintain the former in its normal position.

5. A gun silencer construction including a gun barrel having a threaded enlargement at its breech end, a silencer casing interiorly threaded at each end and having one end threaded to the threaded enlargement of the gun barrel, a chambered plug having openings secured within the other threaded end of the silencer casing, means within said casing for centering and supporting the muzzle of the gun barrel to hold the latter in spaced relation to the casing to provide a chamber, check means also having a central opening interposed between the muzzle of the gun barrel and the end plug and adapted to deflect exhausting gases into the chamber around the gun barrel, and spring means for maintaining the check valve in position.

6. A gun silencer construction including in combination with a gun barrel, a silencer casing fitted thereto and spaced therefrom to provide a chamber between the barrel and the casing, said casing also extending beyond the muzzle of the barrel, a check valve arranged in said casing before the muzzle of the gun barrel, means for spacing the check valve from the muzzle of the gun to provide an initial gas-arresting chamber in communication with the chamber around the gun barrel, and spring means for maintaining the check valve in normal position.

7. A gun silencer construction including in combination with a gun barrel, a silencer

casing fitted thereto and spaced therefrom to provide a chamber around the barrel, said casing also extending beyond the muzzle of the barrel, means for centering and supporting the barrel within the silencer casing, a check valve within said casing, means for spacing said valve from the centering and supporting means to form a chamber which communicates with the chamber around the gun barrel, and spring means for maintaining the check valve in normal position.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

WALTER E. WESTFALL.

Witnesses:
GEO. T. ELLISON,
KATHERN MERRIGAN.