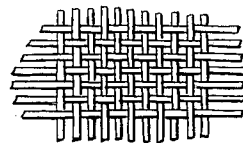
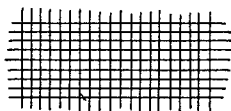
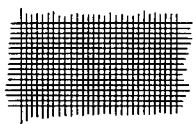
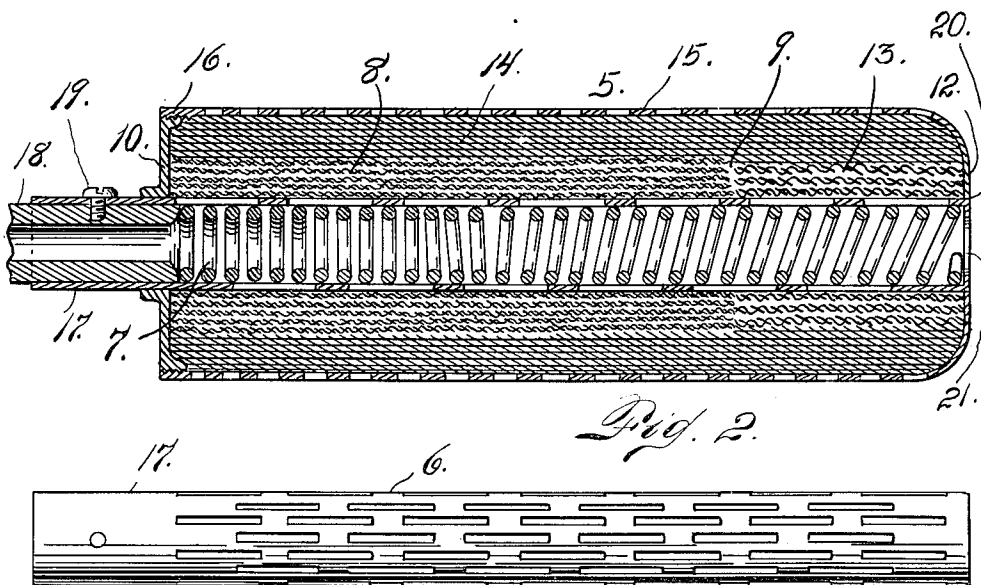
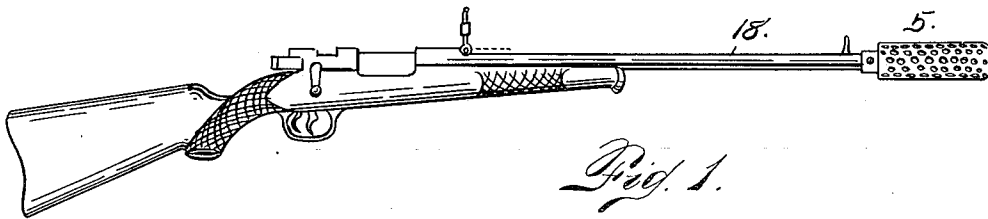


SILENCER.

1,127,250.

2 SHEETS—SHEET 1.



Witnesses
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1,127,250.

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2 SHEETS-SHEET 2.

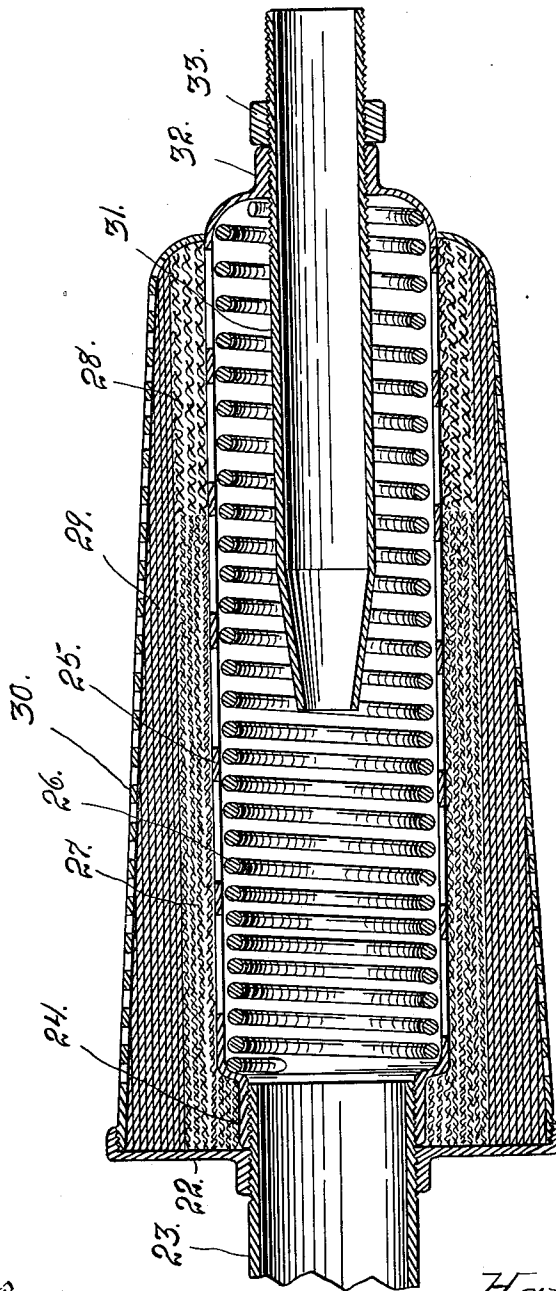


Fig. 7.

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SILENCER.

1,127,250.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, HANS HUMM, a citizen of the United States, residing at the city and county of Denver and State of Colorado, have invented certain new and useful Improvements in Silencers; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this specification.

My invention relates to improvements in silencers or means for neutralizing the sound or report resulting from explosions incident to the firing of guns, the operation of explosive engines, and other similar explosions or noises where the products of combustion must pass through a channel of substantial length before escaping into the atmosphere, thus making it practicable to apply an article of this character. As it is well known, the sound, as of the report of a gun, is due to the sudden disturbance of the atmosphere resulting from the escape of air and the products of combustion from the gun barrel under the great pressure due to the force of the explosion, this force or pressure being confined within the gun barrel until it reaches the atmosphere and at this instant the sound vibrations which form the report commence.

My object is to dissipate, as it were, the pressure of the air and products of combustion by causing the same to pass through multiplicity of relatively small channels whereby the compressed air and gas is so divided and broken up, or dissipated that it reaches the air in almost an infinite number of places and in relatively small quantities, with the result that not only is the force of the air and gas pressure practically neutralized, but the quantity of air or gas normally confined in the gun barrel is distributed over such a large area of atmosphere that the disturbance is practically unnoticeable.

Having briefly outlined my improved construction, I will proceed to describe the same in detail, reference being made to the accompanying drawing, in which is illustrated an embodiment thereof. In this drawing,—

Figure 1 is a side elevation of a gun

equipped with my improvement. Fig. 2 is a sectional view of the silencer, a fragment of the gun barrel to which the same is attached only being illustrated, the parts being shown on a much larger scale. Fig. 3 60 is a detail view of the innermost tube of the silencer, shown on the same scale as in Fig. 2. Fig. 4 is a fragmentary view of the inner and finer convolutions of wire mesh employed in connection, and surrounding 65 the tube shown in Fig. 3. Fig. 5 is a similar view of the coarser mesh employed near the outer extremity of the silencer and forward of the mesh convolutions of the construction shown in Fig. 4. Fig. 6 is a frag- 70 mentary detail view of the material forming the convolutions annularly arranged outwardly from and surrounding the convolutions formed by the forms of mesh material shown in Figs. 4 and 5. Fig. 7 illustrates 75 the silencer as applied to the outer extremity of an exhaust pipe, as that of an explosive engine.

The same reference characters indicate the same parts in all the views. 80

Referring first to the form of construction shown in Figs. 1 and 2, let the numeral 5 designate the silencer considered in its entirety and composed of an inner tube 6; a spiral spring 7 located within the tube; 85 a series of layers 8 of relatively fine wire mesh material surrounding the tube 6 and extending from a rear head 10 of the silencer forwardly to a point 9; while between the point 9 and the forward extremity 12 90 of the silencer, a number of layers 13 of coarser wire mesh material are located, but arranged around and outside of the tube 6 in substantially the same manner as the layers 8. 95

Outside of the layers 8 and 13 of the wire mesh material, is a series of layers 14 of woven material and preferably consisting of asbestos or other similar non-combustible woven fabric. 100

Outside of the outermost of the layers 14 of the fabric is located a perforated casing 15, which is threaded to the outer edge of the rear head 10 of the device, as shown at 16. The tube 6 has a rearwardly extending 105 non-perforated or non-slotted part 17, which fits over and around the forward extremity of the gun barrel 18, but secured thereto by a fastening screw 19. The forward extremity 12 of the silencer forms a 110

part of the outer shell of the structure, and fits closely around the forward extremity of the tube 6, as shown at 20.

The spaces of the convolutions of the spiral spring 7 within the tube 6 progressively increase from the rear extremity to the forward extremity of the silencer.

The comparative mesh of the layers 8, 13 and 14 which are located between the tube 6 and the casing 15, is illustrated in Figs. 4, 5 and 6, in which Fig. 4 indicates the mesh of the layers 8; Fig. 5 the mesh of the layers 13 and Fig. 6 the mesh of the layers 14.

Assuming that the silencer is attached to the muzzle of the gun barrel 8 (see Fig. 1), as the gun is fired, any air which may be therein and the gases or products of combustion, as soon as they leave the muzzle of the gun, will immediately begin to escape, first through the spaces between the convolutions of the spiral spring 7, thence through the perforations or elongated openings of the tube 6, thence through the layers 8 of the relatively fine wire mesh material in the rear of the point 9 (see Fig. 2) and thence through the layers 14 of relatively coarser fibrous material, and thence out through the perforations of the casing 15, to the atmosphere. Forward of the point 9, the air and gases under the reduced pressure incident to their escape as just explained, will pass out through the larger spaces between the convolutions of the spiral spring, thence through the layers 13 and thence through the fibrous layers 14 near the forward extremity of the silencer. By virtue of this result, the pressure of the air and gases is sufficiently reduced, owing to the provision made for their escape through the silencer, that the exit of the remainder from the forward opening 21 of the silencer causes practically no report.

In the form of the device shown in Fig. 7 the construction is substantially the same except that there is a threaded connection between the rear head 22 of the silencer and the outer extremity of the tube or pipe 23, while the rear extremity 24 of the perforated tube 25 is also threaded upon the pipe extremity 23. In this form of construction, a spiral spring 26 is arranged in substantially the same manner as in the other form. This is also true of the layers 27 and 28 of the wire mesh material and fibrous layers 29 of coarser mesh, the meshes of the layers 27, 28 and 29 being as illustrated in Figs. 4, 5 and 6, respectively. The outer perforated casing 30 is substantially the same as in the other form of construction, except that it is larger at the base and tapers forwardly, thus reducing the thickness of the layers of mesh material surrounding the tube 25 to a corresponding degree. Furthermore, in the form of construction shown in Fig. 7, an

auxiliary tube 31 is centrally arranged within the spiral spring at the outer extremity of the silencer, being secured to the forward extremity 32 of the tube 25 by means of screw threads and a lock nut 33. The rear portion of this tube 31 tapers rearwardly, so that the pressure which enters this portion of the tube is allowed to expand as it enters the forward or larger tube portion. This tube is so arranged and supported within the central portion of the silencer that it catches a portion of the compressed air and gases and removes them without the necessity of passing them through the various layers of the annular wall of the silencer. By virtue of the construction and arrangement of the tube 31, the normal pressure of the portion of the air and gases which enter this tube is considerably diminished.

It is believed that the invention will be fully understood from the foregoing description, hence additional explanation in detail is not deemed necessary.

Having thus described my invention, what I claim is,—

1. A silencer composed of a central perforated tube, layers of relatively fine mesh material surrounding the tube and layers of coarser mesh material surrounding the first named layers, and an outer perforated casing, the forward portion of the mesh layers adjacent the tube being of coarser mesh than the corresponding layers in the rear.

2. A silencer composed of a central perforated tube, layers of relatively fine mesh material surrounding the tube and layers of coarser mesh material surrounding the first named layers, and an outer perforated casing, the forward portion of the mesh layers adjacent the tube being of coarser mesh than the corresponding layers in the rear, the outer layers of coarser mesh material surrounding those nearer the inner tube being composed of non-combustible material.

3. A silencer composed of a central tube, a spiral spring fitting within the tube, layers of relatively fine mesh material surrounding the tube, layers of coarser mesh material surrounding the first named mesh layers and an outer perforated casing inclosing the mesh layers.

4. A silencer composed of a central tube of relatively fine mesh material surrounding a spiral spring fitting within the tube, layers the tube, layers of coarser mesh material surrounding the first named mesh layers and an outer perforated casing inclosing the mesh layers, the convolutions of the spiral spring being separated and the spaces between said convolutions progressively increasing from the rear toward the front substantially as described.

5. The combination with a gun barrel or other tubular device adapted for the passage

of gas and products of combustion under pressure, of a silencer comprising an inner perforated tube whose rear extremity is secured to the muzzle of the gun barrel or
5 other similar device, a spiral spring within the tube and having its convolutions spaced, layers of mesh material annularly arranged around the tube and varying as to the size of the openings therein, and an outer perforated casing surrounding the mesh layers,
10 substantially as described.

6. A silencer having a central opening and walls composed of a series of annularly arranged layers of material open to the passage of gas under pressure, the aggregate
15 area of the escape openings progressively increasing outwardly from the central opening, a tube centrally suspended in the rear portion of the opening and having its forward portion tapered toward its rear extremity, which is smallest.
20

7. A silencer having a central opening and walls composed of a series of annularly arranged layers of material open to the passage of gas under pressure, the aggregate
25 area of the escape openings progressively increasing outwardly from the central opening, a tube centrally suspended in the rear portion of the opening and having its forward portion tapered toward its rear extremity, which is smallest, the said central
30 opening being also provided with a spiral spring extending the entire length thereof and surrounding the aforesaid tube, substantially as described.

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

HANS HUMM.

Witnesses:

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A. EBERT O'BRIEN.