July 24, 1962 R. M. CUTTS 3,045,379

CHOKE ATTACHMENT FOR SHOTGUNS

Filed May 25, 1959 2 Sheets-Sheet 1

Fig. 1.

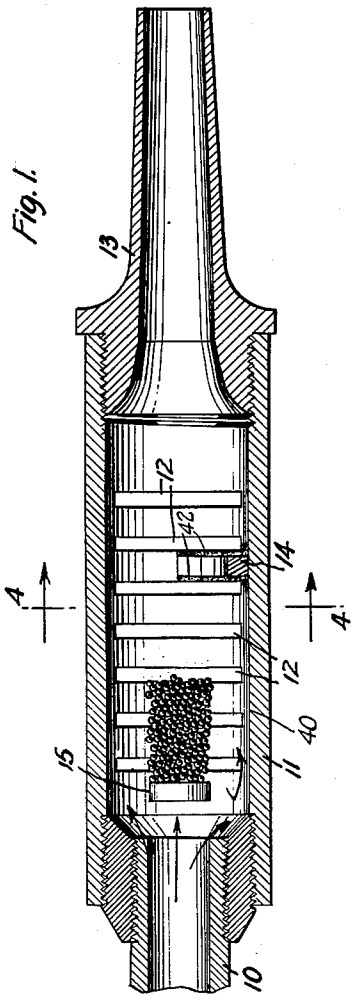


Fig. 2.

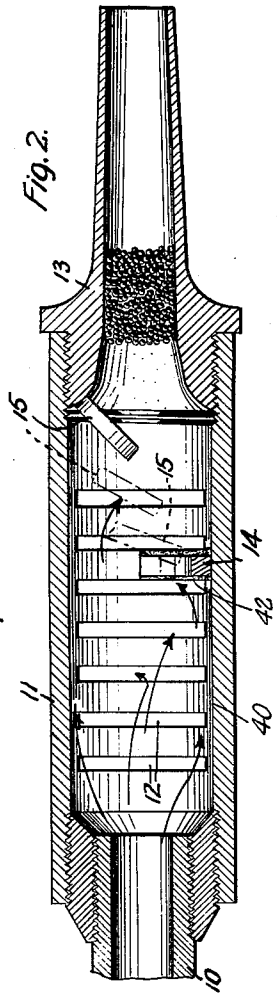


Fig. 3.

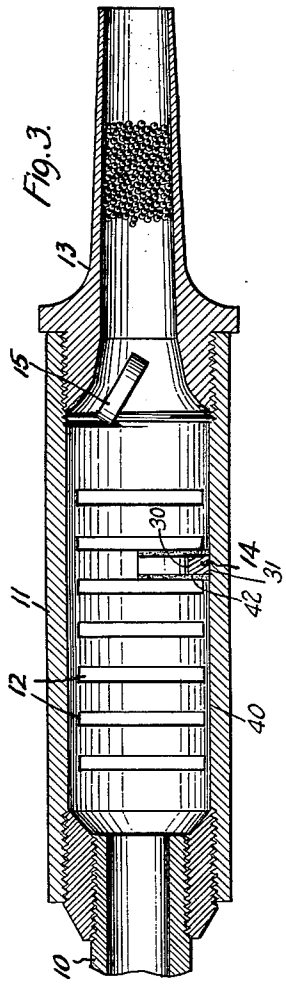


Fig. 4.

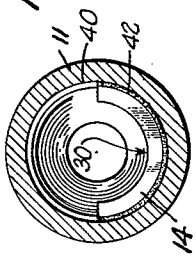
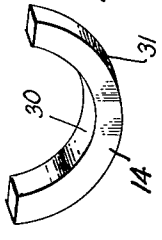


Fig. 5.



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Fig. 6.

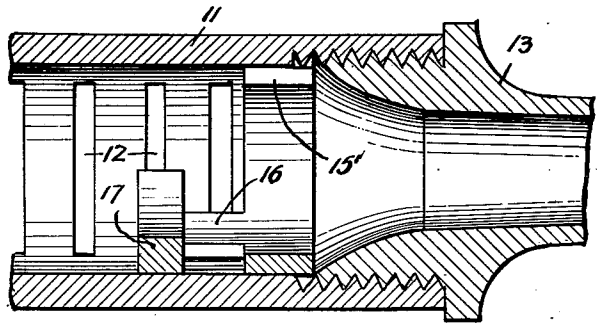


Fig. 7.

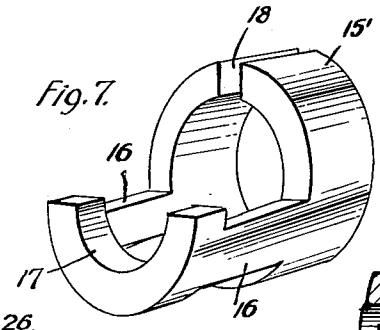
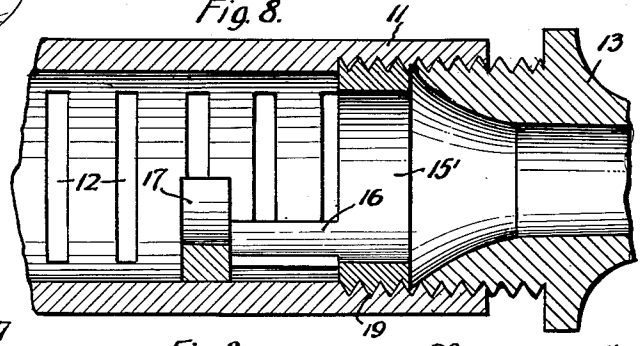


Fig. 8.



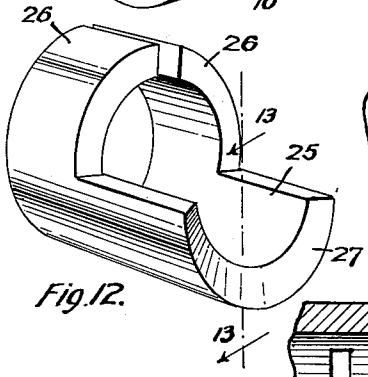


Fig. 12.

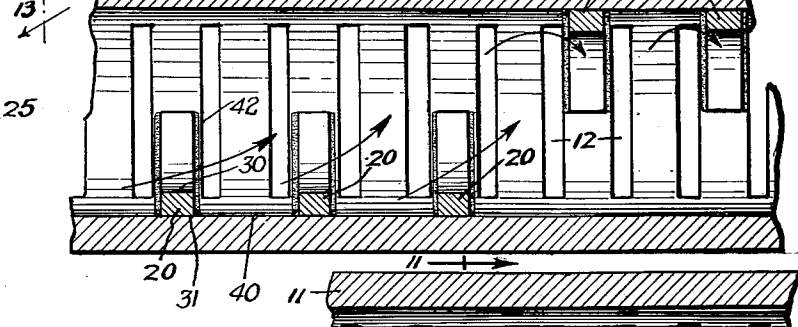
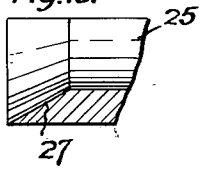


Fig. 9.

Fig. 13.



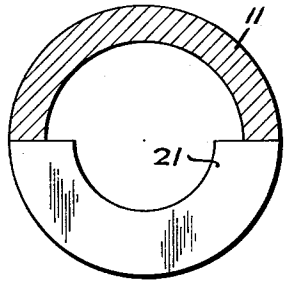


Fig. 11.

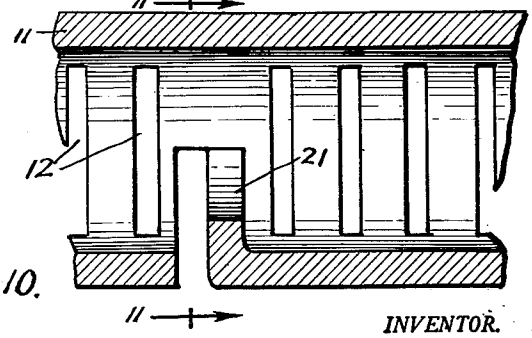


Fig. 10.

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3,045,379

CHOKE ATTACHMENT FOR SHOTGUNS

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Filed May 25, 1959, Ser. No. 815,662
2 Claims. (Cl. 42—79)

In the operation of shotguns it has often been the practice to apply to the muzzle thereof a straight laterally ported tube having an internal diameter greater than the bore of the shotgun to which it is affixed, which constitutes an expansion chamber to disperse gases as the shot column passes through the tube and into the choke affixed to the outer end thereof. These chambers may take any number of different forms, some provided with spaced slots, openings and the like to permit rapid dispersal of the gases of propulsion as soon as they have left the muzzle of the gun in order to better control the shot column as it passes into the choke tube, as well as to reduce recoil.

Such devices have met with considerable success and are extensively used, however, these tubes, expansion chambers, etc. do not function as well as formerly due to the change and improvement in the loading of shotgun shells.

Formerly the powder wad or wads of the shotshell were more lightly constructed than those in use at present, and the turbulent action of the gases within the expansion chamber when being exhausted through the ports thereof resulted in disintegration or partial disintegration, and expansion of the wad laterally. Naturally, when the wad was disintegrated or partially disintegrated, it was disposed of because it lost forward velocity and had no deleterious effect upon the shot column. However, in those instances where disintegration or partial disintegration did not occur and the wad was expanded to a size greater than the internal diameter of the forward choke, it is obvious that due to this increased diameter of the wad it was retarded in its movement in a forward direction by the smaller diameter of the choke tube. This resulted in a decreased velocity of the powder wad in a forward direction so that it never caught up to the shot column, "pancaking" the rear end of the latter and thus upsetting the said column once it had been rectified by the choke.

Powder wads as used at present are made of either highly compressed fiber or of plastic materials which are practically indestructible, and the above explained desirable gas actions upon the powder wads are insufficient to bring about disintegration or destruction of these wads.

The present invention contemplates the use of means of simple nature for bringing about action of the propellant gases in the expansion chamber upon the powder wads whereby the above mentioned disadvantageous effects of these wads upon the rear of the shot column are obviated.

An important object of the invention is to provide means within the expansion chamber whereby the propellant gases are utilized to bring about a deflection of the powder wads laterally of the chamber and the shot column, and to dispose the powder wads in such position that they will trail the shot column without disadvantageously affecting the corrected diameter of the shot column at its rear end after it has been established by the choke member.

These desirable results are attained by the use of structures hereinafter fully described and claimed, and specifically illustrated in the drawings, wherein:

FIG. 1 is a longitudinal sectional view of a conventional expansion chamber and choke member applied to the muzzle of a shotgun and illustrating a preferred embodiment of my invention applied thereto,

FIG. 2 is a view similar to FIG. 1 and illustrating the several positions assumed by the powder wad as the shot column passes through the chamber,

FIG. 3 is a view similar to FIG. 1 and showing substantially the final position assumed by the shot wad in trailing the shot column through the choke member,

FIG. 4 is a transverse sectional view taken substantially on line 4—4 of FIG. 1,

FIG. 5 is a detail perspective view of the abutment or wall member utilized in carrying out the invention,

FIG. 6 is an enlarged fragmentary longitudinal sectional view taken through the forward end of the expansion chamber and the rear end of the choke member and illustrating the application to the chamber of a modified form of the invention,

FIG. 7 is a perspective view illustrating the form of the invention as shown in FIG. 6,

FIG. 8 is a view similar to FIG. 6 and showing a further modification of the invention,

FIG. 9 is a fragmentary longitudinal sectional view taken through a conventional ported expansion chamber and showing a further modification of the invention,

FIG. 10 is a view similar to FIG. 9 and showing a still further embodiment of the invention,

FIG. 11 is a transverse sectional view taken substantially upon line 11—11 of FIG. 10,

FIG. 12 is a perspective view of a further modification of the invention, and

FIG. 13 is a fragmental section taken longitudinally through the bottom of the device shown in FIG. 12.

In the preferred embodiment of the invention, the shotgun muzzle indicated at **10** has attached thereto in any desired manner the inner end of an expansion chamber or tube **11**, the sides of which may be ported or provided with spaced slots or openings **12** throughout substantially its length to permit rapid dispersion of the gases of propulsion for the accomplishment of results well known in the art. The outer or forward end of the chamber **11** has a conventional choke member **13** attached thereto in any desired manner, threads being shown in the present instance.

In the present embodiment of the invention I provide within this expansion chamber a wall or abutment member represented generally at **14** disposed transversely of said chamber and which projects inwardly from the inner periphery **40** of the chamber a suitable distance beyond the muzzle of the gun and partway around and conforming to said inner periphery and between adjacent discharge ports or openings **12**. With reference to FIGS. 1 to 5 inclusive, it will be observed that lengthwise this abutment or wall is of substantially semi-circular construction having its inner and outer edges **30—31** conforming to the inner surface **40** curvature of the tube **11** and is formed of suitable metal of ample strength to withstand the pressures to which it will be subjected when in use, and may be attached firmly in any desired manner, as by welding **42**, to the interior of the expansion chamber at that portion of the latter preferably where no ports exist. In the present instance, this wall or abutment member is shown as secured to the bottom or closed wall of the expansion chamber but it will be understood that it may be located at any other desired position therein. It will also be observed that the thickness or height of this wall or abutment is such as not to be impinged by the shot column as it passes through the chamber and into the choke member, the distance between the inner edge **30** and the outer edge **31** of wall **14** being less than one-half the distance from the axis of the tube to the inner periphery **40** thereof. With the wall or abutment thus located, it is obvious that the propellant gases, having been liberated in the expansion chamber and mov-

ing forwardly faster than the shot column, taking the course indicated by the arrows, strike the rearward face of the abutment or wall **14** and will be diverted inwardly of the chamber as shown by the arrows so as to bring about lateral pressure upon the powder wad **15** which is closely following the shot column. It will be understood that this action of the gases diverted by the wall or abutment is insufficient to disturb the relatively heavy shot column in its forward movement, however, it has very material diverting effect upon the lighter following powder wad, causing it to be deflected off-center in its forward movement toward the choke tube. Also, the action of the gases diverted by the abutment or wall **14** in conjunction with other gases which are moving in substantially a forward direction, causes the powder wad to tilt as it moves forwardly within the chamber or tube as shown in FIGS. 2 and 3 of the drawings. This tilting effect on the powder wad has a further result of causing a portion of the propellant gases which are driving the wad in a forward direction to escape around the sides of the wad thereby reducing its forward velocity. This velocity is further reduced by the fact that the wad having been deflected off-center impinges on the rearward edge of the choke **13** causing it to take a position substantially as that illustrated in FIG. 3 of the drawings. It is obvious that these actions upon the powder wad result in materially reducing its velocity in a forward direction so that it trails the heavier, faster moving shot column by a substantial distance, thereby preventing the objectionable "pancaking" effect upon the shot column after it has once been rectified to the desired dimension by the choke.

It will be understood that in those instances where a plurality of powder wads are used, the effects are the same as described above, however, for the sake of simplicity only one wad has been shown in the present illustration.

While in the present discolsure expansion chambers having perforated wall sections are closed, it will be understood that the inventive idea is equally applicable to imperforate chambers or tubes and will perform in precisely the same manner in diverting and tilting the powder wad when passing through the member.

In FIGS. 6 and 7 of the drawing, there is illustrated a modified form of the invention, wherein the expansion tube **11** is provided with an insert readily applicable thereto to provide the abutment or gas diffusion wall as has heretofore been described. In this form of the invention, a collar indicated at **15'**, conforming substantially to the inner diameter of the tube **11**, is provided with spaced rearwardly projecting arms or supports **16**, the collar snugly fitting within the tube. The rearward ends of the arms or supporting members **16** carry an upwardly projecting wall or abutment **17** extending partially around the inner circumference of the tube and snugly engaging the inner wall thereof, thus providing the abutment against which the propellant gases engage and operate in the manner heretofore described. In this form of the invention, the collar **15'** and its integral supporting arms **16** may be formed of light metal with the collar split longitudinally as at **18** so that it may snugly fit within the expansion chamber with an expansion fit, the forward end of the collar abutting the rear or inner end of the choke member **13** and being thus securely held in place.

In other instances, such as shown in FIG. 8, the collar may be so designed as to threadedly engage within the forward end of the expansion chamber and to firmly affix itself thereto as indicated at **19**. In all other respects, the collar and its abutment wall and arms are the same as the structures shown in FIGS. 6 and 7.

In FIG. 9 of the drawings a further modification of the invention is illustrated, wherein a plurality of abutments or walls **20**, of the type illustrated in FIGS. 1 to 5 inclusive, are shown. In this form of the invention the abutments will be disposed between ports **12** in alternate or staggered relationship in the length of the expansion tube. By arranging the abutment walls in this manner, it is apparent that the forward and rapidly moving gases within the chamber will be diverted alternately in opposite directions toward the axis of the tube, thus bringing about various lateral movements of the powder wad, as well as twisting and turning of the same as it travels in the direction of the choke. Moreover, the plurality of walls bringing about this diversion of the gas flow will obviously reduce the forward speed of the powder wad.

FIGS. 10 and 11 show a still further modification of the invention, wherein the wall or abutment, indicated at **21**, is formed in the wall of the expansion tube itself. This wall is formed by cutting an incision partway around the tube and bending the edge of the cutaway portion inwardly so that it extends into the tube and constitutes the desired abutment or wall for inwardly deflecting the forwardly moving gases in the accomplishment of the results heretofore detailed.

FIGS. 1 to 11 inclusive of the drawings illustrate the abutments having their operative faces or walls disposed at substantially right angles to the axis of the expansion tube, but it will be understood that such faces or walls may be inclined or beveled in the manner shown and described in connection with FIGS. 12 and 13.

FIGS. 12 and 13 of the drawing show a further modification of the invention, wherein an imperforate segmental sleeve **25** having arcuate expansible arms **26** at one end thereof conforms to the inner circumference of the gun barrel. It will be understood that the sleeve and the arms will be slightly greater than the internal diameter of the gun barrel so that when forced into the same the expansive pressure of the arms **26** will frictionally engage with the inner walls of the barrel. The sleeve **25** may have a beveled surface **27** at its inner end, the inclination of which may vary in accordance with requirements, but may assume the angle such as is shown in FIG. 13. The angularity of this wall is inwardly and forwardly of the expansion chamber as will be understood, and it is obvious that the gases of propulsion striking this inclined wall will be diverted inwardly toward the axis of the sleeve and against the rear end of the shot column, thus deflecting the powder wad in the manner heretofore described in connection with the other forms of the invention. It will be apparent that the imperforate sleeve portion **25** will cover portions of those ports **12** in the expansion tube **11** which it overlies. The gases of propulsion striking this inclined surface will have the effect of forcing the sleeve into tight frictional engagement with the inner circumference of the expansion tube, thus tending to maintain the sleeve in the desired and proper position. It is apparent also that a substantially semi-cylindrical imperforate sleeve, such as is shown in FIG. 12, without the arms **26** may equally as effectively be utilized in the accomplishment of the desired results. Such a sleeve would be inserted in the expansion chamber and affixed at the proper position therein by any of the methods heretofore disclosed.

From the foregoing it is apparent that I have provided means of simple nature for application to the expansion chamber to bring about the beneficial results here fully explained and emphasized in retarding the forward advance of the powder wads as well as moving them off-center within the chamber and in a tilted manner in passing through the choke member.

I claim:

1. An attachment for shotguns comprising a cylindrical expansion tube open at both ends, a choke member at one end of said tube, an arcuate abutment member having outer and inner edges concentric with said tube disposed transversely within said tube inwardly from the ends thereof and with its outer edge affixed to the inner periphery of said tube, the distance between the outer and inner edges of said abutment member being

less than one-half the distance from the axis of the tube to the inner periphery thereof.

2. An attachment for shotguns comprising a cylindrical expansion tube open at both ends, a choke member at one end of said tube, an arcuate abutment member having outer and inner edges concentric with said tube disposed transversely therein inwardly from the tube ends and with its outer edge affixed to the inner periphery of said tube, the distance between the inner and outer edges of said abutment member being less than one-half the distance from the axis of the tube to the inner periphery thereof, and the ends of said abutment member terminating at diametrically opposite points within said tube.

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