To all whom it may concern:

Be it known that I, GILBERT U. BURDETT, major, Ordnance Department, U. S. A., a citizen of the United States, stationed at Washington, D. C., have invented an Improvement in Ruptured-Shell Extractors, of which the following is a specification.

The invention described herein may be used by the Government, or any of its officers or employees in prosecution of work for the Government, or by any other person in the United States, without payment of any royalty thereon.

This invention relates to improvements in devices for extracting ruptured cartridge cases from machine guns and refers more particularly to ruptured shell extractors for the Browning machine gun of the heavy type.

It is a well known fact that cartridge cases are subject to rupture when the adjustable “head space” between the shoulder on the cartridge chamber and the forward face of the breech bolt is not properly adjusted, that is, when there is too much clearance between the rear face of the barrel and the adjacent face of the breech bolt in its forward position. When this condition exists the face of the bolt does not adequately support the head of the cartridge, consequently, upon firing, the cartridge case becomes elongated, causing a fracture in the wall thereof, allowing the extractor of the machine gun to pull the head from the case, leaving the forward portion of the shell tightly wedged in the cartridge chamber.

It is the object of my invention to provide a simple and inexpensive tool for quickly and effectively performing the function of removing a ruptured cartridge case from the cartridge chamber of a machine gun under the foregoing condition.

With this and other objects in view, my invention comprises the new and useful details of construction and arrangement, which will be fully described herein, illustrated in the annexed drawing, and pointed out more specifically in the appended claims.

In the drawings:

Figure 1 is a side elevation of my extractor inserted in position to extract a ruptured cartridge case from the cartridge chamber of a machine gun, the gun being shown in fragmentary longitudinal cross section.

Fig. 2 is a top plan view of my extractor shown partially in cross section to more clearly illustrate the elements of the device.

Referring now to the drawings, it will be seen that my device comprises a plunger rod 5 having an enlarged rounded head 6 on its forward end, the rod being screw-threaded into a recessed base 7. About rod 5 is carried a loosely fitting sleeve 8 preferably slotted longitudinally to form a plurality of spring expansion fingers 8', each having a rearwardly tapered ramp 9 on its forward end, the said ramps terminating at the rear to form arcuate shoulders 10. The inner face of the expansion members are preferably rounded slightly as at 11, while the rear portion of the head 6 is provided with a fillet 12 to coat with the rounded portions 11 to hold the expansion members 75 in their expanded condition, as will be pointed out herein.

Base 7 is flattened and transversely perforated on its rear end to form an eye 13, adapting the base to be pivoted by pin 14 between the ears 17 carried by the extractor lever 16. Lever 16 is provided with an actuating handle 17' on one side and terminates in a cam tooth 18 on the opposite side.

Fig. 1 illustrates the method of applying my tool to its operating position, wherein the cover B of the machine gun A is raised and the breech bolt C moved to its rear position. A ruptured cartridge case D is shown within the cartridge chamber of the gun barrel E, the head thereof having been removed by the extractor of the machine gun. The plunger rod 5, base 7 and sleeve 8 are inserted in the cartridge chamber of the barrel, the ramps 9 serving to contract the spring expansion fingers 8' so that they will readily enter the restricted neck of the cartridge case, head 6 of the plunger rod serving to center the device. When the tool has been inserted sufficiently far, shoulders 10 on the spring expansion fingers will travel past the end of the cartridge, whereupon the fingers will be free to expand and the shoulders will engage the forward end of the cartridge case. The lever 16 will then be positioned substantially as is shown in the illustration with the cam tooth 18 engaging the front face of the barrel extension F and
the handle 17' in position to be grasped by the operator. In order to facilitate the insertion of the tool, lever 16 is provided with a bent portion forming an enlarged butt 19 in position to receive the impact of the breech bolt C when thrust forward by hand, thus to drive the tool into place.

It will be readily seen that the operation of removing the shell comprises the rotation of handle 17' about pivoting pin 14, the cam tooth 18 acting as a sliding fulcrum whereby the base 7 and plunger 5 is withdrawn from the bore of the barrel in a straight line, the fillet 12 on head 6 traveling rearwardly toward the expansion fingers 8' on the loose sleeve 8 until the fillet engages the rounded portions 11 of the fingers, mechanically expanding the fingers in an obvious manner. Further withdrawal of the plunger will cause the head to force the expansion elements outward with the plunger, thus removing the broken shell engaged by the shoulders 10 of the expansion fingers.

It has been found in practice that it is only necessary to start the shell from its wedged position, so that when the tool has been swung to a position substantially as shown in dotted lines in Fig. 1, the tool can then be removed by grasping the cam and withdrawing the device and shell from the cartridge chamber by hand.

For convenience, I have provided handle 17' with a sharpened end 20 adapted to be used as a screwdriver in connection with other parts of the gun.

From the foregoing description it will be readily seen that I have provided a simple and inexpensive tool for quickly and effectively removing a ruptured cartridge case from the cartridge chamber of a machine gun.

Having thus described my invention, what I claim as new and desire to protect by Letters Patent is:

1. A ruptured shell extractor comprising expansion members, a plunger, an extractor lever pivoted to the plunger, a cam tooth at one end of said lever and an actuating handle extending from said lever positioned to rotate the extractor lever upon the cam tooth as a fulcrum whereby said plunger and expansion members are withdrawn in a straight line from the cartridge chamber.

2. A device for extracting ruptured shells from firearms comprising an expansion sleeve, a plunger, a plunger base secured to said plunger, an extractor lever pivoted to said plunger base having a bent portion forming an enlarged butt for receiving impact from the bolt of the fire arm and an actuating handle extending from said lever.

GILBERT U. BURDETT.