DEVICES FOR MEASURING AND TRIMMING GUN CARTRIDGE CASINGS

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Fig. 1

Fig. 2

Fig. 3

Fig. 4

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This invention relates to a gun cartridge casing measuring and trimming device more particularly for use in reloading used cartridges for further firing. The working pressure of present high-power rifle cartridges averages 50,000 p.s.i. and high power small arms cartridges averages 25,000 p.s.i. These extremely high pressures on the wall of the cartridge shell often result in an elongation of the shell so that when the shell is reloaded the cartridge will be longer than the tolerances of the gun chamber permit. This elongation may restrict the forward movement of the casing as it approaches its firing position in cartridge chamber and thus create a wedging action on the projectile and the forward extremity of the casing. This creates an extremely dangerous condition due to the tremendous increase of pressure necessary to dislodge the restricted projectile when the cartridge is fired.

The principal object of this invention is to provide a simple, easily-used device in which a fired cartridge casing may be placed and which will quickly and accurately trim away the excess length, if any, therefrom to permit accurate reloading of the cartridge.

It is, of course, necessary to measure or caliper the length of a used cartridge casing to determine if the length is correct for accurate reloading. This is usually done by means of calipers or tolerance gauges and if excess length appears, the casing is then trimmed to the correct length by any available means.

Another object of this invention is to combine the measuring step with the trimming step and provide a trimming device with an accurate micrometer arrangement which can be preset for the proper length of a cartridge casing, in which used casings may be inserted and preset to the exact preset length so that the casing will be simultaneously measured and trimmed in one operation and with a single device.

Other objects and advantages reside in the detail construction of the invention, which is designed for simplicity, economy, and efficiency. These will become more apparent from the following description.

In the following detailed description of the invention, reference is made to the accompanying drawings which form a part hereof. Like numerals refer to like parts in all views of the drawing and throughout the description.

In the drawing:

FIG. 1 is a side elevational view of the combined shell casing measuring and trimming device;

FIG. 2 is a top plan view thereof;

FIG. 3 is an end view; and

FIG. 4 is a cross section therethrough taken on the line 4—4, FIG. 1.

In the drawing a typical rifle shell casing is illustrated at 10. The invention comprises a base plate 11 supporting a pair of parallel, spaced-apart guide ways 12 which in turn support a head stock 13, a casing supporting block 14 and a casing stop block 15. The guide ways 12 are joined along their bottom edges by means of a unitary spacing web 41 which maintains them in parallel spaced relation. The head stock 13 rests upon the ways 12, at the forward extremity of the latter, and is provided with a longitudinal tenon portion 16 which extends downwardly between the ways 12 and is rigidly secured thereto by means of horizontal, laterally extending screws 17.

The head stock rotatably supports a trimmer shaft 18 above the ways 12 with its axis positioned parallel to and intermediate of the ways. Milling teeth 19 are formed on the forward extremity and a hand crank 20 is threaded on the rear extremity of the trimmer shaft. A jam nut 21 is threaded against the crank 20 to lock the latter in the desired longitudinal position on the trimmer shaft. The hand crank is provided with the eccentrically positioned handle 22 by means of which the shaft may be manually rotated.

The casing supporting block 14 is slidable mounted on the ways 12 and can be lifted from and replaced on the ways. The block 14 is provided with a longitudinally and downwardly extending tenon 24 which can be inserted between the ways 12 to accurately guide the block 23 in longitudinal alignment therewith as it is moved longitudinally thereof. The casing supporting block 14 supports a casing guide sleeve 23 in axial alignment with the axis of the trimmer shaft 18. The sleeve 23 is secured to the block 14, in any desired manner such as by means of vertical attachment screws 25 extending axially through the block and threaded into the guide sleeve, and is interchangeable to receive casings of differing lengths and differing diameters.

The stop block 15 is formed on a supporting base 25 portion 26 which slidably rests on the ways 12 and which is guided longitudinally of the ways by a tenon portion 27 extending snugly downwardly between the ways.

A micrometer shaft 28 is journaled at its rear extremity in the tenon portion 16 of the head stock 13 and at its forward extremity in a front end wall 29 extending between the forward extremities of the ways 12. The micrometer shaft is provided with micrometer threads 30 and is threaded through the tenon portion 27 of the stop block 15 so that rotation of the shaft 28 causes the block to travel longitudinally of the ways 12. The forward extremity of the micrometer shaft 28 is reduced in diameter and the reduced portion passes axially through and projects beyond a scale disc which is secured against the front end wall 29 by suitable screws 32. A finger knob 33 containing a pointer 34 is fixedly mounted on the projecting extremity of the shaft 28 by means of a suitable set screw 35. The rear extremity of the shaft 28 is also reduced in diameter and threaded to receive a locking nut 36 which, when tightened against the tenon portion 16 of the head stock 13 tends to exert tension in the micrometer shaft 28 to show the finger knob 33 against the scale disc 31 to lock the micrometer shaft in any desired preset position.

A supporting ledge 37 is formed on the outside of one of the ways 12 to fixedly support a measuring scale 38 thereon. The zero (0) position of the measuring scale 38 is transversely aligned with the tops of the milling teeth 19 when the cutter shaft is completely inserted in the head stock 13. The measuring scale is preferably divided into inches and tenths of inches and it indicates the distance between the rear face of the stop block 15, indicated at 15; and the tops of the milling teeth 19. An indicating arrow 44 is stamped in the side of the base 26 to direct the operator's attention to the face 15' of the stop block.

The scale disc 31, or a scale plate 39 mounted thereon, carries annular vernier scale markings 40 upon which the pointer 34 indicates. The pitch of the threads on the micrometer shaft 28 is 10 to the inch. Therefore, each revolution of the knob 33 moves the face 15' of the stop block 15' of an inch along the measuring scale 38. The annular vernier scale markings 40 are divided to indicate intervals of 0.0005 of an inch of movement of the stop block face 15'.

Let us assume that the device is to be used to measure and trim rifle casings the correct length of which should
be 2.2154". The locking nut 36 is loosened and the micrometer shaft is rotated to bring the face 15' of the stop block 15 to the 2.2000" indication on the measuring scale 12 and the knob 33 is then rotated forwardly to bring the pointer 34 to the .0154 indication on the annular vernier scale 40. The locking nut 36 is now tightened to lock the micrometer shaft against rotation.

The trimmer shaft 18 is now withdrawn into the head stock 13 and the guide sleeve 23 is lifted from place. A used cartridge shell casing 10 is now inserted in the guide sleeve and the latter with its supporting block 14 are replaced on the ways 12 forwardly of the stop block 15. The trimmer shaft is now rotated and pushed forwardly to slide the sleeve 23, and its contained casing 10, forwardly until it contacts the face 15' of the stop block 15 which stops further longitudinal movement of the casing. If the casing is of the correct length the milling teeth 19 will rotate against the end thereof without any cutting action. If the casing has an excess length, the teeth will exert a cutting action to quickly remove the excess length.

The casing is prevented from rotating in the guide sleeve 23 by frictional contact with the sleeve. The spacing web 41 is preferably provided with a chip hole 42 through which the removed material may be discharged and mounting holes 43 are provided in the base plate 10 by means of which the sleeve can be secured to a supporting surface.

While a specific form of the improvement has been described and illustrated herein, it is to be understood that the same may be varied, within the scope of the appended claims, without departing from the spirit of the invention.

Having thus described the invention, what is claimed and desired secured by Letters Patent is:

1. A cartridge casing measuring and trimming device comprising:
   (a) a pair of horizontal, parallel, spaced-apart ways;
   (b) a head stock mounted on and arising from the rear extremities of said ways;
   (c) a horizontal trimmer shaft journalled in said head stock, above, parallel to, and intermediate said ways;
   (d) milling teeth formed on the forward extremity of said trimmer shaft;
   (e) a shell casing supporting means supported from said ways and adapted to support a casing forwardly of and in alignment with said trimmer shaft;
   (f) stop means supported by said ways forwardly of said casing supporting means to be contacted by said shell casing for limiting the forward movement of the latter;
   (g) means for rotating said trimmer shaft to cause said milling teeth to trim away one extremity of said shell casing;
   (h) a threaded shaft journalled between and parallel to said ways, said stop means being threaded on said threaded shaft; and
   (i) means for rotating said threaded shaft to cause said stop means to travel along said ways.

2. A cartridge casing measuring and trimming device as described in claim 1 having:
   (a) a measuring scale fixedly mounted on one of said ways alongside the path of movement of said stop means for measuring the amount of movement of the latter.

3. A cartridge casing measuring and trimming device as described in claim 2 having:
   (a) an annular scale about one extremity of said threaded shaft;
   (b) and a pointer fixed on said latter extremity for indicating positions on said annular scale to determine the degree of rotation of said shaft.

4. A cartridge casing measuring and trimming device as described in claim 1 having:
   (a) means for locking said threaded shaft against rotation when desired.

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