

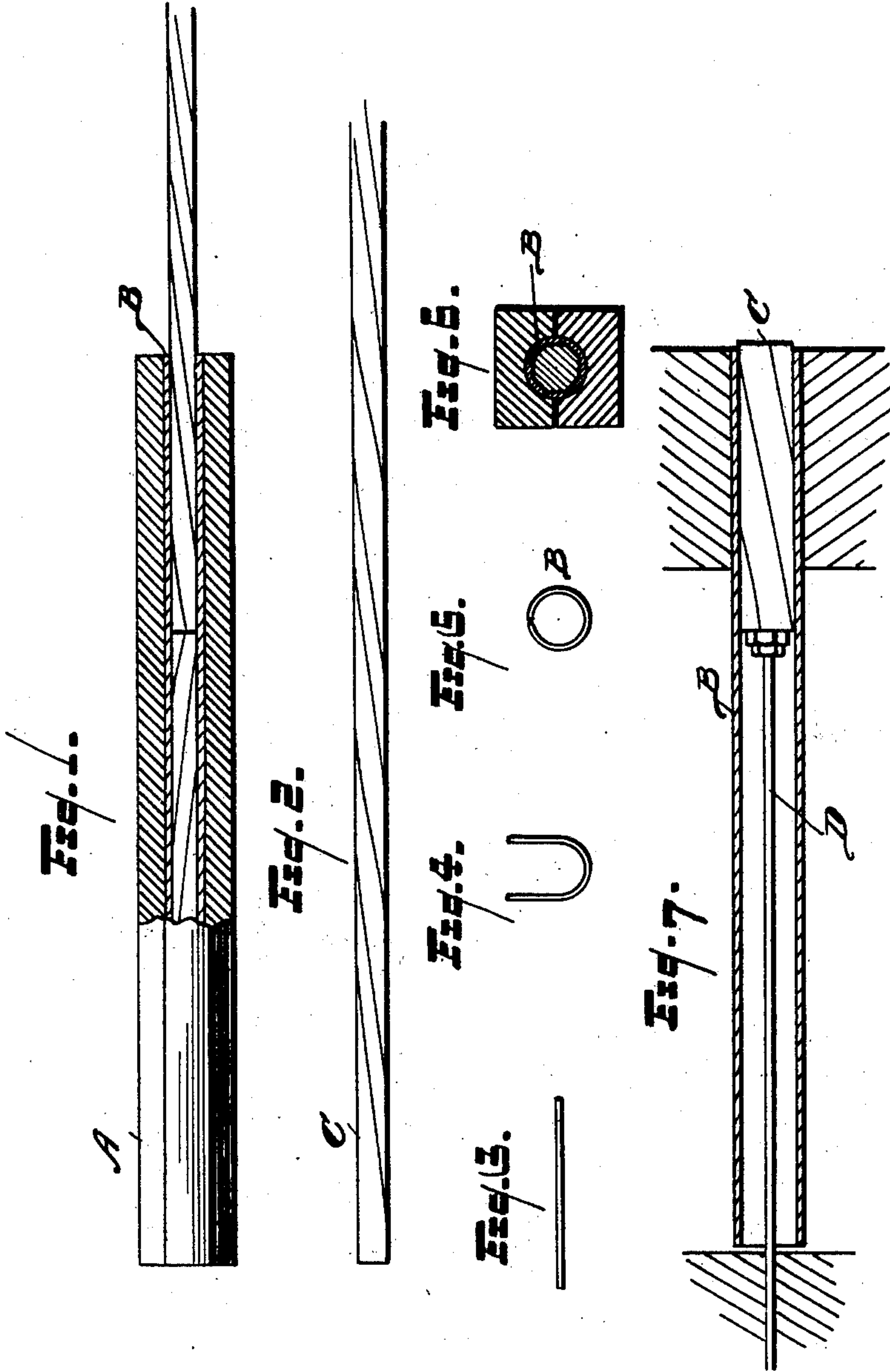
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C. J. & C. HAMILTON.  
METHOD OF RIFLING GUN BARRELS.

(Application filed Mar. 13, 1899.)

(No Model.)



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# UNITED STATES PATENT OFFICE.

CLARENCE J. HAMILTON AND COELLO HAMILTON, OF PLYMOUTH,  
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## METHOD OF RIFLING GUN-BARRELS.

SPECIFICATION forming part of Letters Patent No. 660,725, dated October 30, 1900.

Application filed March 13, 1899. Serial No. 708,847. (No model.)

*To all whom it may concern:*

Be it known that we, CLARENCE J. HAMILTON and COELLO HAMILTON, citizens of the United States, residing at Plymouth, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Methods of Rifling Gun-Barrels; and we 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 pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

Our invention relates to improvements in firearm construction; and it consists in a new method of making and rifling barrels for firearms.

Our invention is shown in the accompanying drawings, in which—

Figure 1 is a longitudinal sectional view of a rifle-barrel made by our improved method or process, showing a portion of the mandrel. Fig. 2 is a longitudinal view of the steel mandrel around which the rifle-barrel is formed. Fig. 3 is an end view of the sheet of metal from which the rifle-barrel is formed in making the cheaper form. Fig. 4 is a similar view showing the second step in forming this barrel. Fig. 5 is a similar view showing the third step, in which the tube is formed. Fig. 6 is a similar view showing the fourth step, in which the barrel is pressed onto the mandrel. Fig. 7 is a sectional view of a long barrel and portions of a press, showing the means for forming the barrels of any desired length with a press of limited power.

In the drawings we have illustrated the forming of rifle-barrels out of seamless tubing and similar barrels from a strip of sheet metal by folding and pressing the metal around the mandrel in the process of manufacturing the barrel. The object of the construction in each case is to make a rifle-barrel without using the expensive operation of boring and rifling. For ordinary purposes the barrel formed from the strip of sheet metal, as shown and hereinafter described, is sufficient; but the difference between forming it from the strip of metal with a seam and from seamless tubing only involves the slight difference in expense between the use of seam-

less tubing, either of brass or steel, and the use of the sheet metal formed into a tube in the process of manufacturing the barrel.

In the manufacture of these barrels we preferably make the barrel of two parts and of an inner and outer tube. The inner tube is rifled and the outer tube shrunk over it to give the necessary tensile strength to the barrel. While this is the preferred form used, the barrel may be formed of a single tube of sufficient thickness to provide the proper strength; but such a construction necessitates greater power than that of the press we prefer to use. Also by using the barrel made in two parts we can use different metal for the inner tube, and metal more suitable for molding around the mandrel, while the metal for the outer tube may be used that is more especially adapted to give strength than to be formed over the mandrel.

In the drawings, Fig. 1 shows a longitudinal sectional view of a barrel, portions being cut away to show the form of the mandrel as well as the manner of constructing the barrel of the two portions.

In the said drawings, A represents the outer barrel, which consists of a tube of any suitable metal and of any desired thickness or tensile strength.

B represents the inner tube of the rifle-barrel. This tubing in the gun now manufactured by us we prefer to make of brass, the tube formed over the mandrel being what is denominated "soft" brass. In forming this tube into a rifle-barrel we first insert the octagon spiral mandrel C, the maximum diameter of the mandrel being approximately of the diameter of the tube. The tube carrying the spiral mandrel is then placed under the press in dies suitably formed and arranged to give the pressure of the parts equally around the tube, details of which will be shown in a subsequent application. Sufficient power is provided in the press to force the soft brass which the tube is made onto the mandrel with such power as to form it onto the mandrel and at the same time to harden or temper the brass. Any required degree of hardness can be secured by increasing the power of the press. When the press releases the tube, the hardened parts will spring back sufficiently to



allow the mandrel to be withdrawn. In operating the press we employ suitable means for withdrawing the mandrel, giving to it suitable rotating movement to correspond with the rifling.

In Figs. 3, 4, and 5 we have illustrated the formation of the interior barrel from a strip of sheet metal by the method used by us in the manufacture of air-gun barrels. The use of this construction is to avoid the expense of drawn tubing and is employed in the manufacture of cheap barrels, being originally designed by us for the manufacture of a so-called "dollar" rifle. The forming of the tube is by a process employed in which the two edges of the metal are first turned up and then by a second action of the press forced into the tubular form. After the tube is thus formed in forcing it onto the mandrel the edges are brought together with such power as to practically do away with the seam.

While barrels of considerable length can be formed from the mandrel with a single operation of the press, in making barrels of greater length we have found it of some advantage to form the barrel by a series of operations of the press, forming only a limited portion of the barrel at one stroke. This operation we have illustrated in Fig. 7. The mandrel as there illustrated is formed on the outer or free end of the rod D, so that the first stroke of the press will form the outer end of the barrel over the mandrel. With each stroke of the press the tube is brought forward nearly the length of the spiral mandrel, being rotated as it is moved to correspond with the rifling. To provide for making even and uniform rifling, the impressions made at each stroke should overlap. Suitable automatic machinery is employed for moving and rotating the tubing as the press operates. Any other suitable form of mechanism may be employed for performing this operation, and we do not limit ourselves to that shown herein, as the same is shown merely to illustrate the method employed by us in the manufacture of these barrels, and such machinery will be made the subject of subsequent applications. In forming the rifling in short barrels it is not necessary in all cases to use the inner and outer tubing; but sufficient pressure can be given to the barrel to form it over the mandrel.

While we have expressed herein our preference for the soft metal for forming these barrels, we do not limit ourselves thereto, but the same may be formed of any metal capable of the manipulation in these processes. The barrel may also be formed by drawing it over the mandrel instead of pressing it thereon, as before described.

We are aware that it is not a new idea to form the metal around a mandrel adapted to give the rifling to the barrel; but the efforts

heretofore made have been to force a short spiral mandrel through a block and then insert a longer mandrel and draw out the block to the desired length or to wrap the metal around the mandrel in strips, hammering it to the form of the mandrel as the wrapping proceeds. We are also aware that barrels so formed have afterward been rolled or pressed; but such method does not involve the idea of reducing the diameter of a plain tube by shrinking it directly over a mandrel and by pressure applied to the outside of the tube.

What we claim is—

1. The herein-described method of rifling barrels consisting of compressing a plain tube onto a suitable mandrel of less diameter than the inside of the tube, substantially as described.

2. The herein-described method of rifling barrels consisting of compressing a plain tube onto a mandrel adapted to give to the interior of the barrel suitable rifling by applying pressure to the outside of said tube, substantially as described.

3. The herein-described method of rifling barrels consisting of compressing a plain tube of soft metal onto a suitable mandrel under sufficient pressure to harden the metal and form a tempered inner surface to the barrel, substantially as described.

4. The herein-described method of rifling gun-barrels consisting of first forming a tube from sheet metal around a suitable mandrel of less diameter than the inside of the tube, and then compressing the tube so formed to the mandrel by pressure applied to the outside of the tube, substantially as described.

5. The herein-described method of rifling barrels, consisting of compressing a portion of a plain tube onto a suitable mandrel, then moving the tube so as to bring another portion of the tube over the mandrel and repeating the operation, substantially as described.

6. The herein-described method of rifling barrels, consisting of compressing a plain tube onto a suitable mandrel of less diameter than the inside of the tube and then shrinking an outer tube or tubes over the first-named tube, substantially as described.

7. The herein-described method of rifling barrels, consisting of compressing a plain tube onto a suitable mandrel of less diameter than the inside of the tube and then placing the rifled tube so formed within an outer tube or tubes, substantially as described.

In testimony whereof we sign this specification in the presence of two witnesses.

CLARENCE J. HAMILTON.  
COELLO HAMILTON.

Witnesses:

S. E. THOMAS,  
C. H. FISK.