F. B. WARNER.

MANUFACTURE OF BARRELS FOR SHOTGUNS AND RIFLES.

APPLICATION FILED MAR. 11, 1915.

1,167,233. Patented Jan. 4, 1916.

Fig. 2,

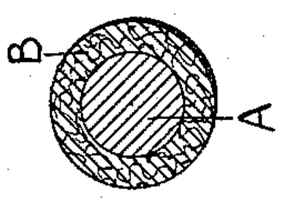


Fig. 4.

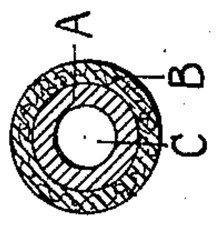


Fig. 1,

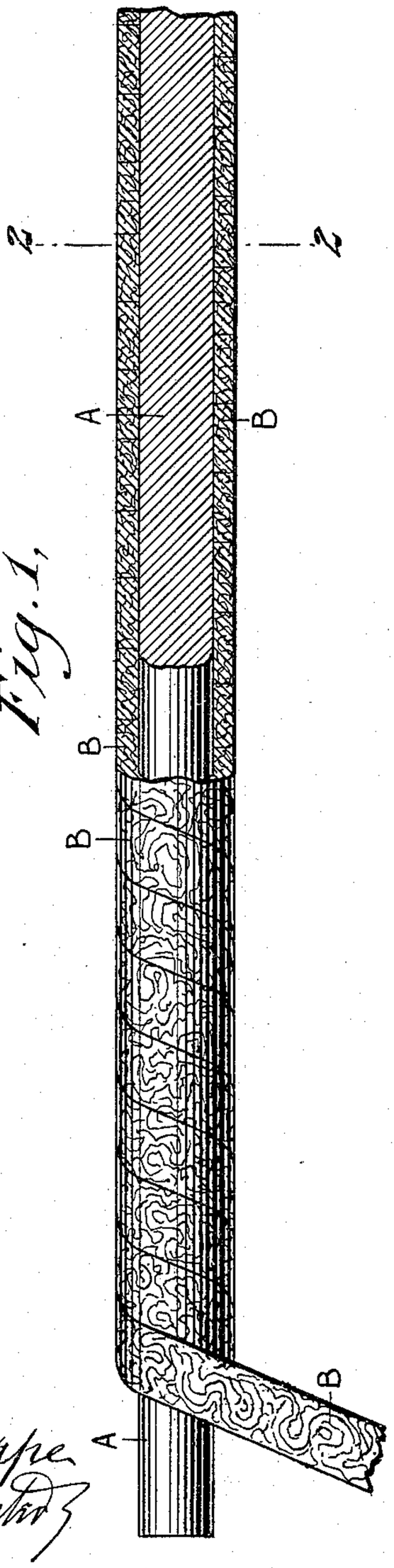
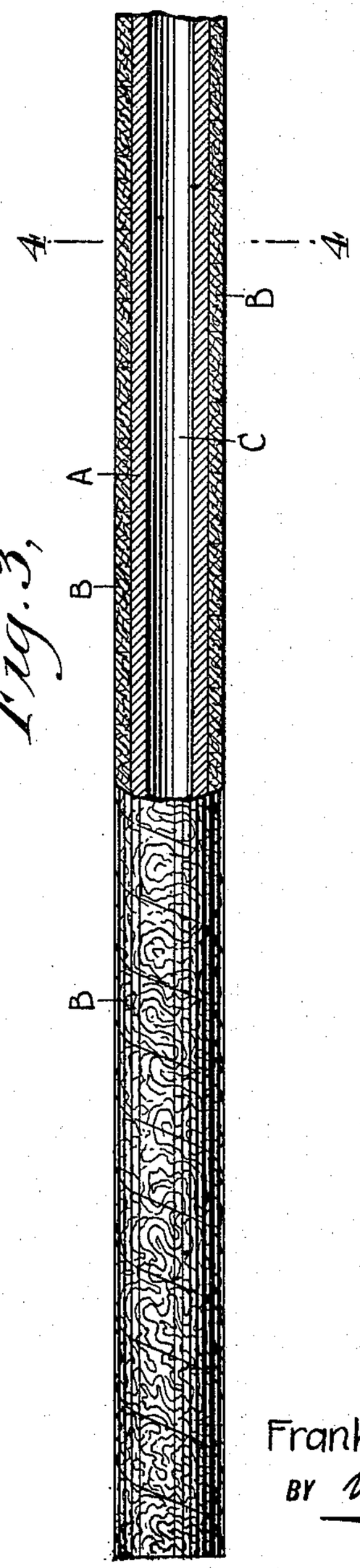


Fig. 3,



WITNESSES

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MANUFACTURE OF BARRELS FOR SHOTGUNS AND RIFLES.

1,167,233. Specification of Letters Patent. Patented Jan. 4, 1916.

Application filed March 11, 1915. Serial No. 13,599.

To all whom it may concern:

Be it known that I, FRANKLIN B. WARNER, a citizen of the United States, and a resident of the city of New York, borough of Manhattan, in the county and State of New York, have invented new and useful Improvements in Manufacture of Barrels for Shotguns and Rifles, of which the following is a full, clear, and exact description.

An object of the invention is to provide certain new and useful improvements in the manufacture of barrels for shotguns and rifles, whereby a highly ornamental Damascus barrel is produced and the barrel is not liable to become pitted through the action of nitric or other acids incident to the use of smokeless or nitro powders in the shells fired by the gun or rifle.

Another object is to render the barrel capable of withstanding heavy strains incident to the firing of the shells.

In order to produce the desired result, use is made of a solid steel bar around which is spirally wound a ribbon of steel and iron to form a covering for the bar, the latter then being bored to provide the bore of the barrel in the solid steel bar, and then the ribbon is turned down in a lathe or other machine to the desired exterior size of the barrel.

In detail, I proceed as follows, special reference being had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a side elevation with parts in section of a steel bar around which is spirally wound a ribbon formed of steel and iron; Fig. 2 is a cross section of the same on the line 2—2 of Fig. 1; Fig. 3 is a side elevation with parts in section of the finished barrel; and Fig. 4 is a cross section of the same, on the line 4—4 of Fig. 3.

It is a well known fact that a composite steel and iron shotgun barrel manufactured by the use of pieces of iron and steel welded together, drawn into a ribbon and wound over a mandrel into barrel form, is capable of withstanding a higher internal pressure and provides a greater elasticity than a barrel manufactured from a plain steel bar, drilled and reamed to form the bore. A composite barrel, however, has two principal defects, namely, the edges of the ribbon are frequently at some point not firmly welded together and hence the barrel is weak and liable to burst, and, second, the acids, incident to the burning of nitro powder in the barrel, tend to form minute pits on the wall of the bore, and especially more so on the iron portion of the ribbon than on the steel portions thereof. In a plain barrel, that is, one formed from a single piece of steel, the wall of the bore is not liable to become pitted by the action of the acid as any action of the acid is uniform along the entire wall of the bore, but a barrel formed of a single piece of steel lacks elasticity and contains hard spots, carbon streaks or flaws and hence is liable to burst without warning. The above-mentioned defects are completely overcome by my invention presently to be described in detail. For the bore portion of the barrel use is made of a bar A of steel of a quality sufficiently hard to greatly resist the action of nitric acid and of a homogeneous texture that any action of the nitric acid is uniform throughout the wall of the bore of the barrel. The diameter of the bar A exceeds somewhat the diameter of the bore and is less than the diameter of the finished barrel. Around the barrel A is wound spirally a ribbon B formed of strips of steel and iron twisted and welded together, the winding taking place while both the bar A and the ribbon B are hot. During the winding operation care is taken to cause the edges of the successive convolutions of the ribbon to meet and after the winding is completed the meeting edges are firmly hammered together. The bar A is next bored and reamed in a suitable machine to form a bore C of the desired size and then the reinforcing covering of the barrel formed by the ribbon B is turned down in a lathe to the desired outside diameter of the barrel. In practice, one-half of the thickness of the wall of the barrel is formed by the steel bar A and the other half by the ribbon covering, as will be readily understood by reference to Figs. 3 and 4.

It will be noticed that the ribbon B forms a reinforcing covering for the bored steel bar A and thus bad places in the bar are completely covered and reinforced, notably, flaws, hard spots, carbon streaks and the like. It will also be noticed that the grain of the steel of the ribbon runs spirally around the barrel, and in the bar A it extends longitudinally thus providing an exceedingly strong and durable barrel, not liable to burst under a heavy strain. From the foregoing it will be seen that the Damascus

cover protects the weak spots of the plain steel barrel and the latter protects the weak spots of the Damascus covering, and thus one counteracts the deficiencies of the other. For instance, if one minute spot in the Damascus covering should not be thoroughly welded and thus form a crevice, then the interior sleeve formed by the plain steel bore portion with the grain running in the opposite direction covers up such spot and keeps the gas from working into the crevice and opening it up. It will be noticed that a barrel manufactured in the manner described is exceedingly strong and durable and has a highly ornamental appearance.

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

1. The herein described method for producing barrels for shotguns and rifles, which consists in spirally winding a steel and iron ribbon around a solid bar of steel, then boring and reaming the steel bar to form the desired bore of the barrel and then turning the ribbon down to the desired exterior diameter of the barrel.

2. The herein described method for producing barrels for shotguns and rifles, which consists in spirally winding a hot steel and iron ribbon around a solid bar of steel, then hammering the abutting edges of the ribbon together, then boring and reaming the steel bar to form the desired bore of the barrel, and then turning the ribbon down to the desired exterior diameter of the barrel.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FRANKLIN BROCKWAY WARNER.

Witnesses:

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THEODORE LEMELL.