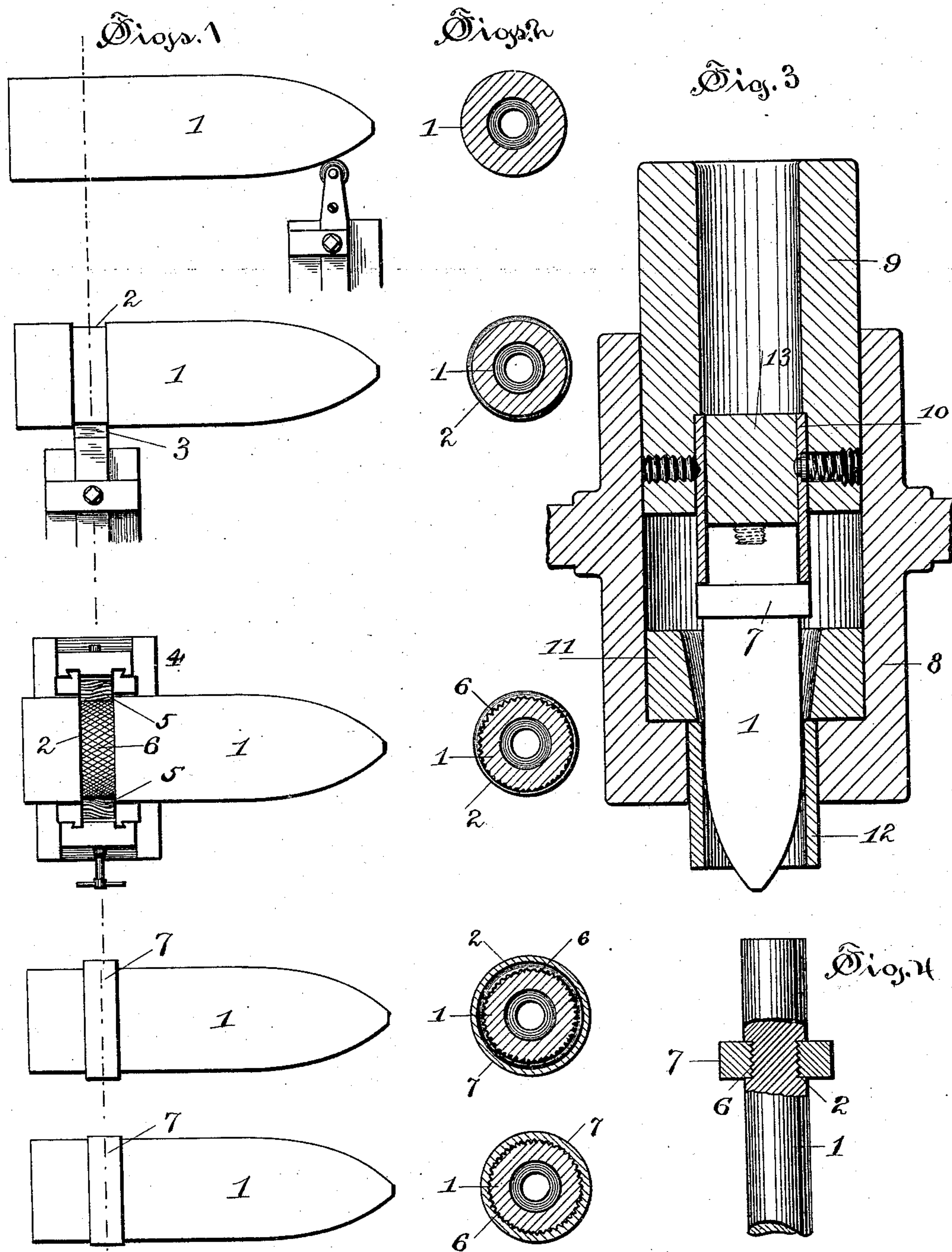


(No Model.)

W. S. LOVELAND & E. C. HENN.
PROCESS OF SECURING COLLARS UPON BLANKS.

No. 471,129.

Patented Mar. 22, 1892.



Witnesses:
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UNITED STATES PATENT OFFICE.

WALTER S. LOVELAND AND EDWIN C. HENN, OF BLOOMFIELD, CONNECTICUT.

PROCESS OF SECURING COLLARS UPON BLANKS.

SPECIFICATION forming part of Letters Patent No. 471,129, dated March 22, 1892.

Application filed August 17, 1891. Serial No. 402,874. (No model.)

To all whom it may concern:

Be it known that we, WALTER S. LOVELAND and EDWIN C. HENN, citizens of the United States, residing at Bloomfield, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in the Process of Securing Collars Upon Blanks, of which the following is a full, clear, and exact specification.

The invention relates to a process of securing collars or bands upon blanks and to the peculiar blank produced by the process.

The object of the invention is to provide a process by which bands, collars, or shoulders of one material may be formed upon blanks of the same or a different material for projectiles, axles, spindles, or bars without cutting away a quantity of material, as in reducing the stock from the original size of the collar to the desired size, the process being such that a homogeneous collar is most firmly secured to the blank by a cheap and quickly-performed operation which hardens the metal of the collar, increasing its efficiency.

Referring to the accompanying drawings, Figure 1 is a side view of a blank designed for a projectile, illustrating the different steps of the process. Fig. 2 is a transverse section near the butts of the same. Fig. 3 is a central vertical section of the apparatus for securing the collars in place upon the blanks. Fig. 4 is a side view with part in section to show the nature of the attachment of the collar, this blank, however, being in the form of a spindle.

In the views, where the invention is more particularly illustrated in connection with the operation of making projectiles which are of hard metal, as iron or steel, with a projecting band of softer metal, as copper, secured on the exterior near the butt, 1 indicates a cylindrical blank cast, forged, drawn, turned, or otherwise shaped, of iron, steel, or any other kind of metal. This blank is put in a lathe, and on the exterior a groove 2 is turned in the usual manner by any common form of cutting-tool 3. The bottom of the groove is then subjected to the action of a knurling-tool 4, bearing a pair of rotary knurlers 5 upon opposite sides of the blank, which cut a double spiral knurl 6, or two knurls in opposite directions. This peculiar manner of

knurling cuts the material of the blank in the bottom of the groove into diamond-shaped pyramids, which are of particular importance, as their sharp edges and corners more uniformly and deeply penetrate into the metal of the collar, and so more firmly hold it in place when pressed thereon. A drawn or otherwise formed homogeneous band or collar 7 of the same or a different metal than the blank, of equal width with but thicker than the depth of the groove 2, and with an internal diameter sufficiently large to easily slip along the blank, is placed over the groove 2, and the blank, with this collar, is inserted in a press and forced through a tapering die that compresses and contracts the metal of the collar uniformly and evenly into the groove. This press consists of a strong shell 8, cast or otherwise formed of any desirable metal, having suitable means of support, and bearing a reciprocating hollow plunger 9, preferably adapted to receive removable bushings 10, of different internal diameters to hold blanks of various sizes. Beneath the plunger is located a tapering die 11, the large end of the opening in which is greater than the original size of the collar to be pressed into place, while the smaller end of the opening is of the size of the collar after compression. A guiding-sleeve 12 may be loosely placed at the end to center the blank while passing through the die, and a friction-block 13 may be provided temporarily to hold in place the blank or a part to which the blank may be attached. The blank, with the collar in position, is placed in the plunger with the collar bearing against the lower end. Hydraulic or other heavy pressure is then applied to the outer end of the plunger, thrusting it inward and forcing the blank and collar through the tapering die, which uniformly and evenly compresses and contracts the metal of the collar into the groove, so that the sharp edges of the peculiar knurling penetrate the metal of the collar and hold it most firmly from turning or moving around, while the edges of the grooves prevent the collar from slipping longitudinally upon the blank.

The steps of this process are simple, cheap, and readily performed, and a collar of the same or different metal, harder or softer than the blank, can be tightly secured in place in

such manner that it is almost impossible to tear it therefrom. The tapering die in compressing the homogeneous collar uniformly compacts the metal without any possible chance of wrinkling or seaming, and also hardens and toughens the metal, making it more difficult to be removed after it has been set in place. This process is particularly applicable to the formation of blanks for projectiles which require a thin collar of soft metal to be most rigidly secured around the butt to fill in the grooves of the ordnance in which it is to be used without any possibility that the collar will tear off when the gun is discharged. It is also of great advantage in forming rigid collars upon the blanks for shafts, axles, spindles, and the like, as the collar can be formed without cutting down the stock from the full size of the collar to the size of the spindle, and it also permits a drawn blank of cheap metal to be provided with a hard-metal collar without heating the parts. Of course the blanks to which the collars are secured by this process may be turned to various shapes and used for many different purposes.

We claim as our invention—

1. The process of securing collars upon blanks, which consists in forming a groove in

the surface of the blank and roughening the bottom of said groove, slipping a homogeneous collar upon the blank to the groove, and forcing the blank and collar through a die of smaller diameter than the diameter of the collar, substantially as specified.

2. The process of securing collars upon blanks, which consists in forming a groove in the surface of the blank and knurling the bottom of said groove, slipping a collar upon the blank to the groove, and forcing the blank and collar through a tapering die, substantially as specified.

3. A device for application to axles, spindles, projectiles, or the like, said device comprehending a groove in the surface of the article, the bottom of the groove being in form a double spiral knurl, a homogeneous collar of a smaller interior diameter than the exterior of the article, said collar setting in said groove, with the points of the double spiral knurl projecting into the interior surface of the collar, substantially as described.

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