T. E. MURRAY, JR., AND J. B. MURRAY.

METHOD OF TRUING ELONGATED PROJECTILE SHELLS.

APPLICATION FILED OCT. 25, 1918.

1,303,577.

Patented May 13, 1919.

2 SHEETS—SHEET 1.

Fig: 1.

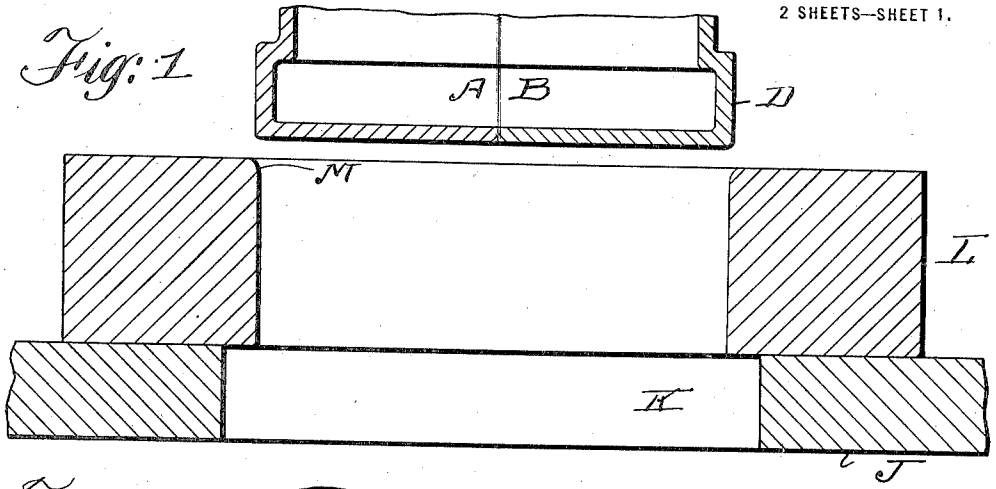


Fig: 2.

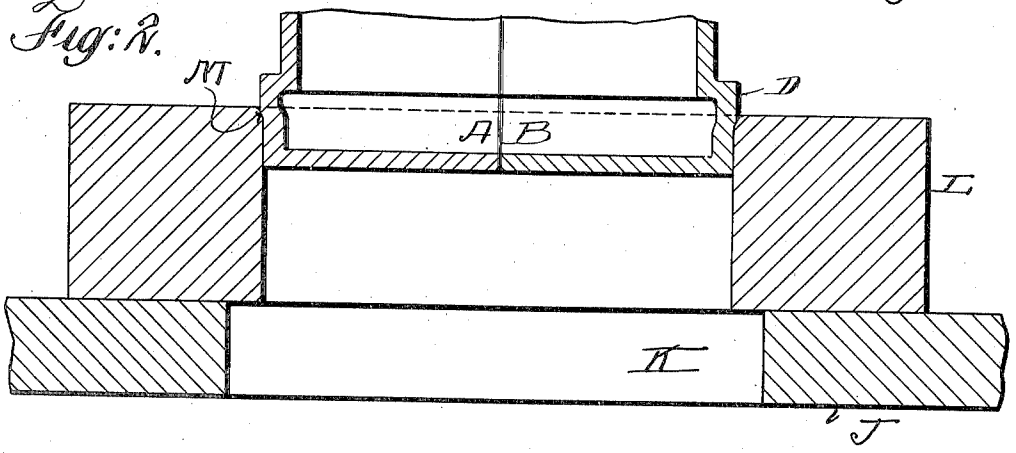
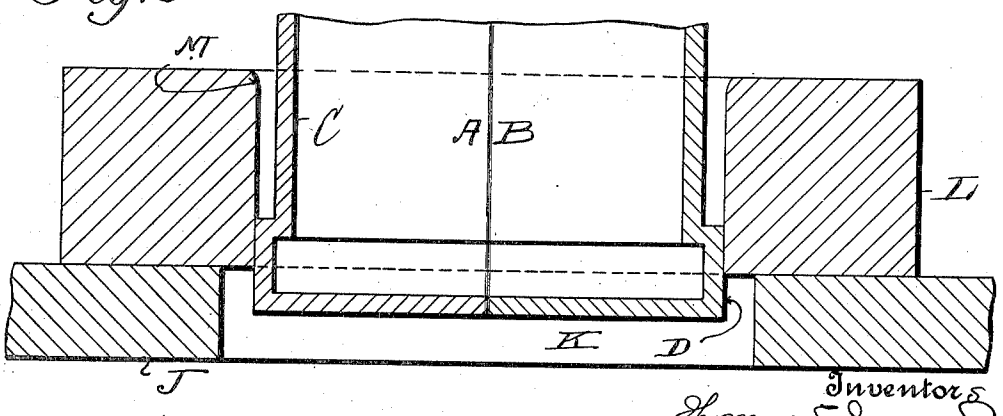


Fig: 3



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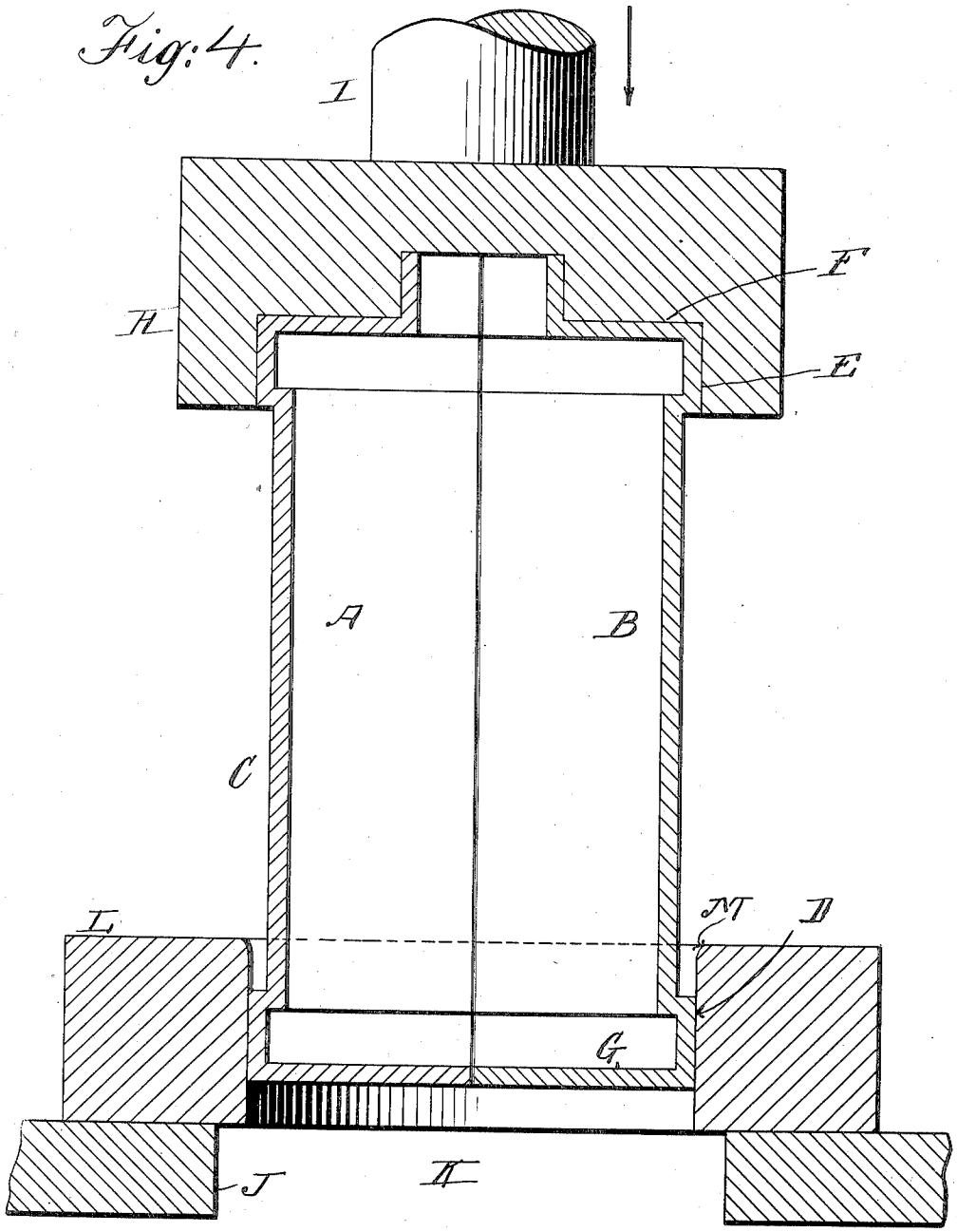
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2 SHEETS—SHEET 2.

Fig: 4.



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UNITED STATES PATENT OFFICE.

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METHOD OF TRUING ELONGATED PROJECTILE-SHELLS.

1,303,577. Specification of Letters Patent. **Patented May 13, 1919.**

Application filed October 25, 1918. Serial No. 259,623.

To all whom it may concern:

Be it known that we, THOMAS E. MURRAY, Jr., and JOSEPH B. MURRAY, citizens of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented a certain new and useful Improvement in Methods of Truing Elongated Projectile-Shells, of which the following is a specification.

The invention is a method of truing an elongated cylindrical projectile shell in order to cause said shell to fit the bore of the gun or mortar wherefrom it is fired.

The accompanying drawings are all vertical cross sections of the apparatus wherein our method is carried into effect. In Figure 1 the rib on one end of the projectile is shown above and ready to be downwardly forced through the truing die. In Fig. 2 said rib has partly entered the die. In Fig. 3 the truing operation on the rib is completed and the rib is leaving the die. In Fig. 4 the rib on the lower end of the projectile is shown in the truing die, and the mode of holding the upper end of the projectile in a downwardly moving head is also shown.

Similar letters of reference indicate like parts.

The particular type of elongated projectile shell herein illustrated is a trench bomb adapted to be thrown by a smooth bore trench mortar. As here represented, it is made of struck up sheet metal in two interchangeable half sections A, B electrically welded at their registering edges, and comprises a body portion C and integral therewith two ribs D, E located in proximity to the end walls F, G. These ribs are to fit the bore of the gun or mortar, the remaining peripheral surface of the shell being out of contact with the bore surface. As a consequence, the contact area between said shell and the bore surface is largely decreased and hence only the circumferential surface of the ribs is required to be made truly circular.

This is of considerable economical importance, since when the shell sections are rapidly struck up from sheet metal and afterward electrically welded together, as described, any slight eccentricities or other departures from a truly circular cross section which may occur require to be corrected in order to insure accuracy of flight. If the entire circumferential periphery of the shell is in contact with the bore surface then it is obvious that the correction or truing must take place over that whole periphery.

In the manufacture of elongated cylindrical shells, this is commonly done in the lathe, but the operation adds materially to the cost of the shell, and besides any error in centering is apt to produce eccentricity of the shell itself by the removal of metal more at one place than another, so that the shell will not pass the usual test requirements and in addition is weakened over the area where the metal is of reduced thickness.

On the other hand, if the circumferential contact area of the shell is reduced to that of a rib—or, as here shown, two similar ribs—then the truing operation is not only much more easily and accurately performed, but, as we find by actual tests and manufacture of said shells in large quantities, can be carried out with rapidity and accuracy by the method and apparatus which are herein disclosed.

One end of the shell, including preferably the rib E in proximity thereto, is seated in a recess formed in a head H carried by a rod I and capable of being vertically and downwardly moved by any suitable mechanism, not here shown. Supported on any suitable bed or table J and above an opening K therein is a die L having a truly circular opening, the upper edge M of which is slightly beveled. The diameter of said die opening is to correspond to the diameter of the finally trued rib E. The shell, supported as described, is moved downwardly directly over and concentric with the die L, as shown in Fig. 1. The downward movement of said shell continuing causes the rib D to enter the circular opening in die L, as shown in Fig. 2, and to become slightly reduced in diameter and to take the exact circular shape of said opening. The reduced diameter is to be selected to fit the bore of the gun or mortar from which the shell is to be fired. The shell still continuing downwardly may pass entirely through the die, or its movement may be arrested at any desired point therein after the truing of rib D is effected.

The head H is then raised to withdraw the trued rib D from the die, the upper end of the shell is released from said head and the shell is inverted so as to seat the rib D in the recess in said head, and so bring the

rib E in position above the die. The ensuing downward movement of the shell forces the rib E into the die and trues said rib in the manner already described.

The ribs thus trued are precisely similar in diameter and exactly circular and, therefore, fit accurately the gun bore for which the projectile is designed, without any lathe work or similar truing operation being required.

We claim:

The method of truing an elongated projectile shell to cause the same to fit a gun bore, which consists first in forming on said projectile a surrounding circumferential rib slightly larger in diameter than the final desired diameter of said rib after truing, and then forcing said rib into a truly circular die concentric with the longitudinal axis of said shell and of a diameter corresponding to the rib diameter finally desired.

In testimony whereof we have affixed our signatures in presence of two witnesses.

THOMAS E. MURRAY, JR.
JOSEPH B. MURRAY.

Witnesses:
GERTRUDE T. PORTER,
MAY T. MCGARRY.