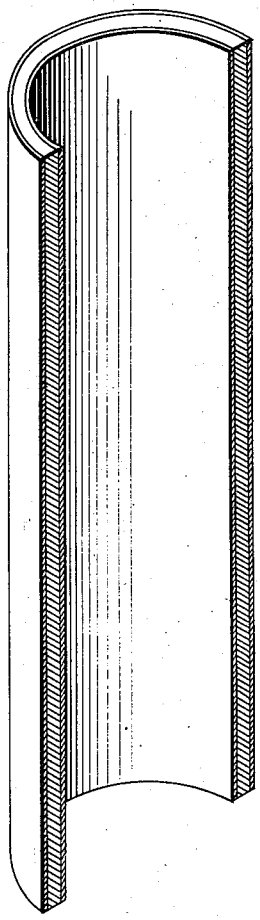
E. IVINS.

WORKING BARREL TUBE.

APPLICATION FILED MAY 10, 1921.

1,420,551. Patented June 20, 1922.



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UNITED STATES PATENT OFFICE.

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WORKING-BARREL TUBE.

1,420,551. Specification of Letters Patent. Patented June 20, 1922.

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To all whom it may concern:

Be it known that I, ELLWOOD IVINS, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Working-Barrel Tubes, of which the following is a specification.

The object of my invention is to provide a working barrel tube, of the type commonly employed in rock drills, pumps, and other implements, having superior interior smoothness and accuracy of surface, a further object being to provide means for greatly reducing the frictional contact between the inner surface of the tube and the moving element adapted to travel therein, and to provide a substantially self-lubricating tube.

In the manufacture of working barrel tubes, it is essential that the inside of the tube be extremely smooth and accurately surfaced. I have discovered that by coating the inside of the tube with a lining of a soft frictionless metal such as lead, tin, or alloys of lead and tin, I am able to obtain an extremely smooth surface which will wear true and which will function also as an anti-friction lining. A tube so coated I have illustrated in the attached drawing.

In forming my working barrel tube, I prefer to apply the soft metal to the surfaces of the tube blank or of the hollow billet from which the tube is to be formed. The application may be made by any one of a number of well known methods, such as for example immersing the hollow billet in a bath of the molten metal, or in a solution of a compound of lead, such as lead acetate, water and acetic acid, for a suitable length of time to give the desired coating to the billet. The working barrel tube is then formed in the usual manner, the billet being drawn over a fixed mandrel and through a fixed die, and this drawing being repeated over successively smaller mandrels and through successively smaller dies until the tube has attained the desired finished dimensions.

It has been found, upon completion of the tube, that there remains a thin coating of the lead or lead alloy, or other metal, both over the interior and exterior surfaces of the tube, the soft metal material filling the small depressions in the tube surface and leaving an absolutely smooth surface. When the plunger or other element which is adapted to travel or reciprocate in the working barrel is inserted and put into operation, the said plunger or other element quickly wears a true surface, which will remain substantially intact and whose anti-friction qualities will eliminate the necessity for the usual lubrication.

A tube made in accordance with this invention has been found to possess superior characteristics, not only in the smoothness and accuracy of the bore, but also in the wearing qualities.

It will be understood that, although it is preferred to form the tube coating in the manner specified above, I do not wish to limit the invention to any particular method of establishing the coating, which may be applied in any desired and practicable manner either before the drawing operations or afterward.

I claim:

1. As a new article of manufacture, a working barrel tube having upon the inner surface thereof a coating of a soft metal, substantially as and for the purpose set forth.

2. As a new article of manufacture, a working barrel tube having upon the inner surface thereof a soft metal coating comprising lead.

3. The method of finishing the interior surface of working barrel tubes, which consists of providing said surface with a coating of soft metal.

ELLWOOD IVINS.