

# United States Patent Office.

FRANCIS B. TORREY, OF BATH, MAINE.

Letters Patent No. 113,114, dated March 28, 1871.

## IMPROVEMENT IN THE MANUFACTURE OF COMPOSITION-ROLLER BUSHINGS.

The Schedule referred to in these Letters Patent and making part of the same.

### *To whom it may concern:*

Be it known that I, FRANCIS B. TORREY, of Bath, in the county of Sagadahoc and State of Maine, have invented certain new and useful Improvements in the Process of Manufacturing Composition-Rollers for the Bushings of Pulley and other Blocks, of which the following is a specification.

Roller-bushings have heretofore usually been made of brass or other metal too yielding and soft to endure the severe pressure and strain to which such bushings are often subjected.

It is my object to produce a roll for the purpose, which shall not be liable to these objections, and to this end I proceed as follows:

I take a composition metal, composed in the main of copper and tin, say, ninety parts of copper and ten parts of tin, with a small quantity of zinc, if preferred.

These proportions may be varied, though the above will give excellent results. The zinc is not necessary, and should in any event be used only in minute quantities.

This composition I cast, in the usual manner, into solid cylindrical rods or bolts, of a diameter varying in accordance with the diameter required for the finished roll.

The rod or bolt in this state is too porous, and is unfit to be made into rolls, being liable to yield to pressure, to flatten, and to spread out.

In order to harden it, therefore, I take the cast rod or bolt, before cutting it into lengths, and compress it by hammering; that is to say, I have a drop, in the bottom face of which is formed a half cylindrical groove or recess, and beneath the drop is an anvil or die, with a corresponding half cylindrical groove or recess, the two recesses, when the drop rests upon the die, forming a cylindrical space of the dimensions required for the finished roll.

The bar or bolt is placed in the die, and is there hammered by the drop until it is completely hardened and compressed. The metal is hammered cold, and not when in a heated state.

The bolt, as fast as any one portion of it is suffi-

ciently hardened, is fed along by hand or otherwise, until it has been subjected throughout the whole or any desired part of its length to the compressing operation.

In this way the metal is compressed into the shape required for the completed roll, and a better finish is given to the roll than could otherwise be so readily obtained.

Besides the mode herein indicated of hardening the metal, any other process of compression may be employed, in contradistinction to the operation of drawing metal.

Brass and other like metals are drawn in a hot state, but the operation is not at all adapted to the composition metal hereinbefore specified, which, when heated, is too rotten, and not sufficiently coherent to be drawn properly, and, therefore, it is, on the contrary, hammered in a cold state, to compress and consolidate its particles, so as to obtain a good wearing-surface.

Drawing through a die or between rolls does not harden by compressing, properly speaking, but draws the metal out, and flattens or stretches and extends it; and, as just stated, as the drawing operation requires heated metal, it cannot be employed upon this composition metal, which is not fit to be so treated, but must be manipulated and worked when cold.

After hammering, the bolt is cut up into lengths suitable for the rollers required for any particular style and size of bushing.

Having now described my invention and the manner in which the same is or may be carried into effect,

What I claim, and desire to secure by Letters Patent, is—

The manufacture of composition-rollers for bushings of pulley and other blocks, substantially in the manner and by the means herein described.

In testimony whereof I have signed my name to this specification before two subscribing witnesses.

FRANCIS B. TORREY.

Witnesses:

M. BAILEY,  
EDM. F. BROWN.