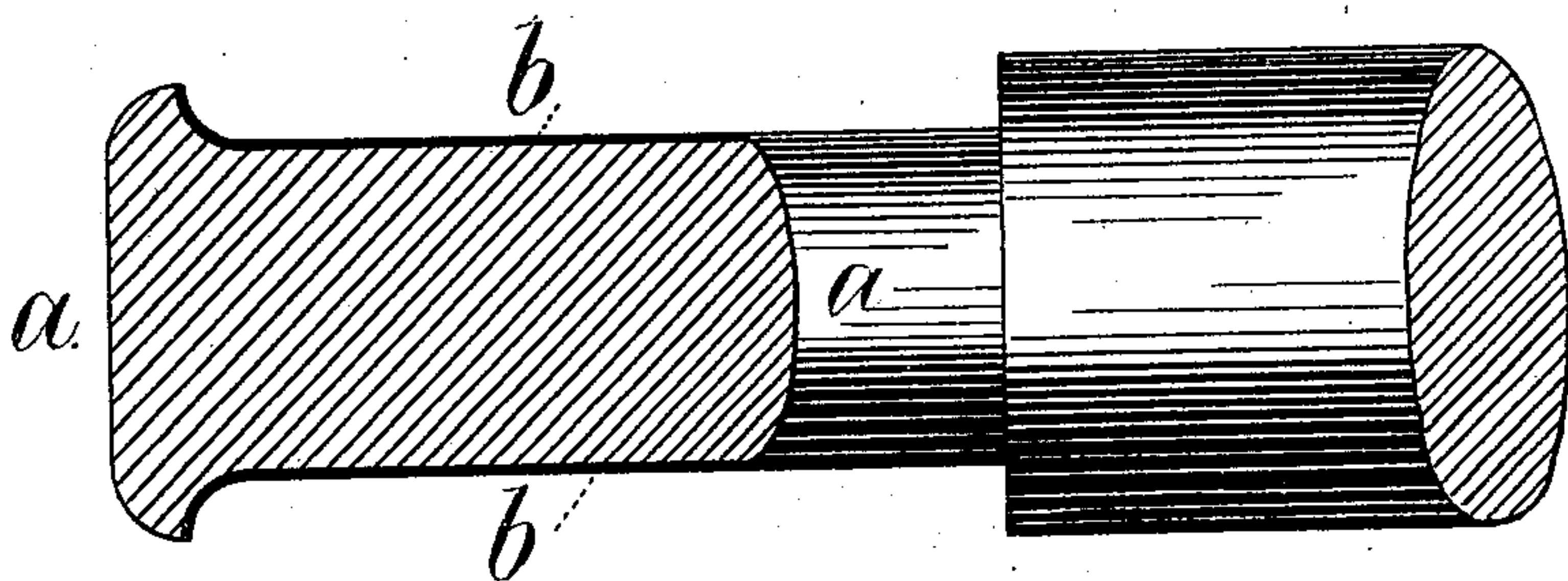


H. WAKEMAN.  
Journals for Car-Axles, Shafting, &c.  
No. 200,492.      Patented Feb. 19, 1878.



*Inventor.*

*Harwood Wakeman.*

*Witnesses*

*Chas. H. Smith*  
*Geo. T. Pinckney*

*For* *Lemuel W. Ferrell*  
*att'y.*

# UNITED STATES PATENT OFFICE.

HARWOOD WAKEMAN, OF NEW YORK, N. Y.

## IMPROVEMENT IN JOURNALS FOR CAR-AXLES, SHAFTING, &c.

Specification forming part of Letters Patent No. **200,492**, dated February 19, 1878; application filed September 10, 1877.

*To all whom it may concern:*

Be it known that I, HARWOOD WAKEMAN, of the city and State of New York, have invented an Improvement in Journals for Car-Axles, Shafting, &c., of which the following is a specification:

Boxes and bearings for shafting, axles, &c., have been made of soft metal, such as lead, tin, or Babbitt metal, and in some instances the interior surfaces of brass boxes have been coated with tin and other soft metal.

My invention is for preventing or lessening friction, by filling up the pores of the iron or steel of the journal itself.

In all kinds of iron and steel the metal is more or less porous, as demonstrated by a magnifying-glass or microscope, and hence there are numerous edges at the ends of the pores, that act as scrapers or cutters against the box. These are lessened in their action by lubricating material; but as such pores remain in the iron or steel, they cut the box and produce the friction and heat in cases where the lubricating material ceases to act.

My present invention consists in an axle or journal of iron or steel, coated with lead, tin, or similar soft metal, by fusion in the presence of a suitable flux, so that the coating metal flows into the pores of the iron or steel, and, filling the same, produces an anti-friction surface, that prevents the box or bearing being cut by the irregularities of the journal.

It is to be understood that the journal or shaft is to be turned with care, and in some cases it may be polished previous to applying the coat of tin or lead; and that the journal is to be in a heated condition, and may be cleaned by an acid; and a flux, such as muriate of zinc, is to be applied, and then the lead or tin is poured upon the same, and the manipulation continued until the lead or other soft metal is thoroughly incorporated into the pores of the iron or steel journal, and the surplus metal

may be removed by wiping the surface with a cloth.

In the drawing I have represented one end of an axle partially in section, *a* being the journal, and *b* the surface thereof, formed by the coating of lead or similar metal. This coating of lead or other similar material is not to be sufficiently thick to be compressed or displaced by the weight acting to press the box and journal together.

Under all circumstances the pressure and the movement of the journal tend to consolidate the soft metal within the pores of the iron or steel, and to lessen friction and wear, and prevent the journal cutting the box or the box cutting the journal.

The lead or tin also prevents the journal becoming rusty in cases of exposure to atmospheric influences.

I am aware that boxes have been lined with Babbitt metal; and that, in some instances, a sleeve of brass or similar metal has been applied to pins of sheaves and similar articles; but such sleeves were either separate or cast in a mold upon the pin.

In my journal the pores are filled, and only a thin surface-coat of soft metal incorporated with the iron or steel to fill the inequalities; for if it were otherwise the soft metal would loosen and become detached from the journal by the pressures.

I claim as my invention—

The journal of steel, iron, or other hard metal, having the pores or inequalities of the surface filled with lead or similar soft metal, substantially as and for the purposes set forth.

Signed by me this 4th day of September, A. D. 1877.

HARWOOD WAKEMAN.

Witnesses:

GEO. T. PINCKNEY,  
CHAS. H. SMITH.