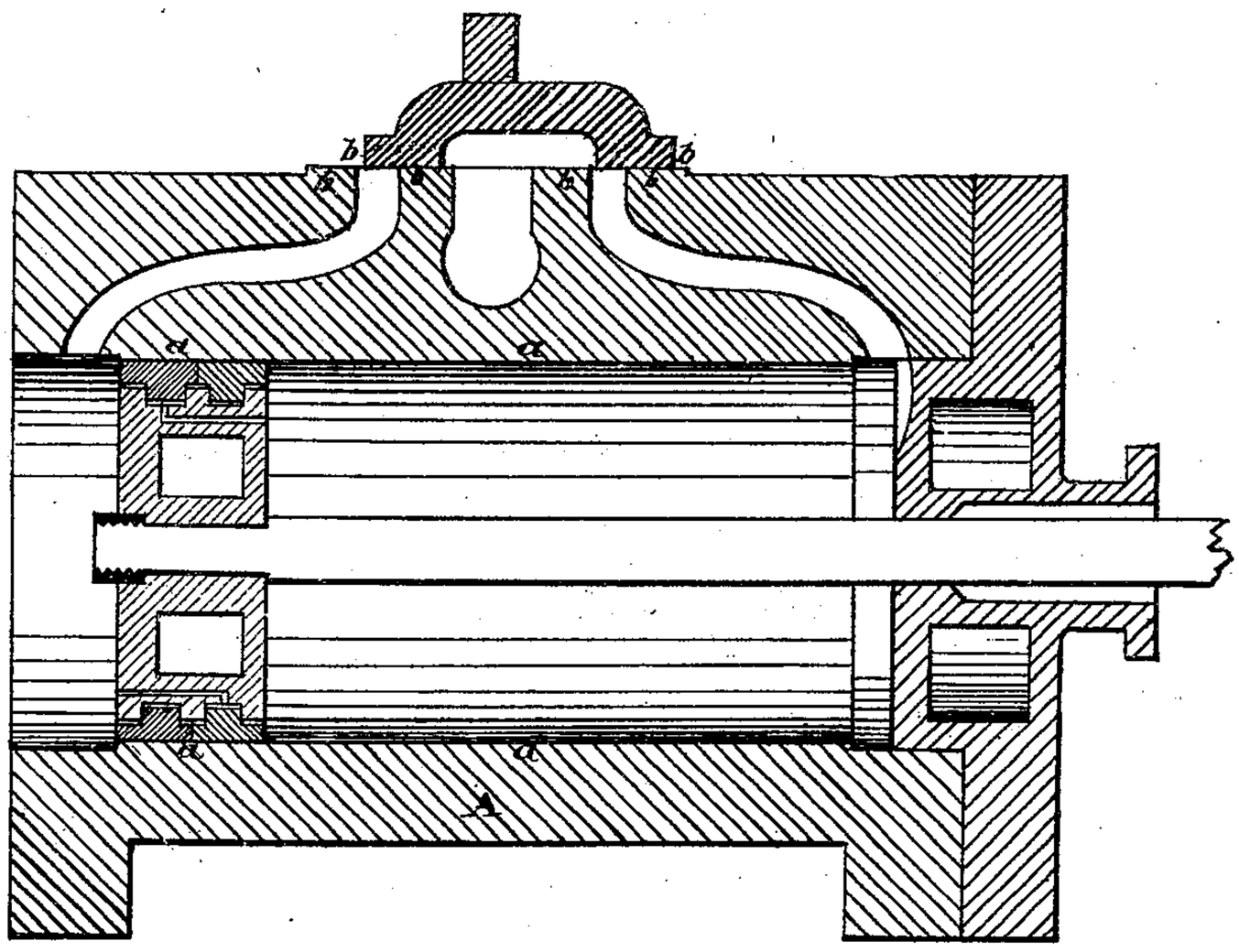
T. Ross,

Reciprocating Engine.

No. 110,681. Patented Jan. 3. 1871.



WITNESSES;
Jos L. Coombs
Chas L. Coombs.

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Atty.

United States Patent Office.

THOMAS ROSS, OF RUTLAND, VERMONT.

Letters Patent No. 110,681, dated January 3, 1871.

IMPROVEMENT IN STEAM-ENGINES.

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

I, THOMAS ROSS, of Rutland, county of Rutland, and State of Vermont, have invented certain Improvements in Steam and other Enginery, of which the following is a specification.

My invention consists in hardening the interior valve and valve-seat of cylinders of steam and other engines, by casting them upon metal chills, thereby rendering them extremely hard and dense, insuring durability, and greatly reducing the friction of the parts.

It consists, further, in the construction of the packing-rings of the piston, by which it is greatly simplified in its parts, and rendered more efficient in its operation.

To enable others skilled in the art to make and use my invention, I will proceed to describe it, together with my mode of carrying it into effect, reference being had to the drawing accompanying this specification, of which—

A, in fig. 1, represents a cylinder of the ordinary form of construction, upon which the common slide-valve B is used.

The light shading at *a a a* and *b b* represents that portion of the cylinder casting which is chilled, *a a a* being the interior or bore of the cylinder, and *b b*, the valve and valve-seat.

I prefer to confine the chilling process to that part of the bore of the cylinder and the valve-seats upon which the piston and valve respectively travel, and the working-face of the valve, leaving the remainder of the casting in its natural condition of softness.

It is necessary that provision be made in the construction of the chill which forms the core for the interior or bore of the cylinder, so as to allow for the contraction of the cylinder-casting in cooling. This I accomplish in making said chill or core in four parts, some of which are small segments of the circle, showing a section of wedge-form, with its base toward the center of the core, and being forced inward by the contraction of the cylinder-casting will relieve the whole core.

It would, perhaps, be desirable, when casting large cylinders, to have the number of pieces forming this chill increased; or a core may be used, consisting of a cylinder with a longitudinal opening for a single wedge-shaped segment, which will be pressed inward by the contraction of the casting.

A steam-engine cylinder thus cast, and of a proper quality of iron, will be much more durable, and the hard surfaces of the working-parts will also greatly reduce the amount of friction in working

In boring such a cylinder, which to many may seem entirely impracticable, it is only necessary to have a strong and rigid apparatus, with cutting-tools of the kind and form usually used for turning chilled rolls, and giving the boring-bar a very low rate of speed, giving the cutting-tool about twelve inches of travel per minute. In some cases emery-wheels might be advantageously used for grinding them out.

This invention is applicable to the cylinders and valve-seats of engines, whether water, air, steam, or any other vapor is used as a motor, and also to the cylinders and valve-seats of pumps.

Having thus described my invention,

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

1. A cylinder for an engine or pump, having its working surfaces hardened by chilling, substantially as described.

2. In combination with an engine with chilled working surfaces, as described, a valve, with its working face hardened by chilling, substantially as described.

THOS. ROSS.

Witnesses:

R. BARRETT,

C. CLARK.