C. N. Petersen.

Piston Packing.

No. 86,316. Patented Jan. 26, 1869.

Fig. 2

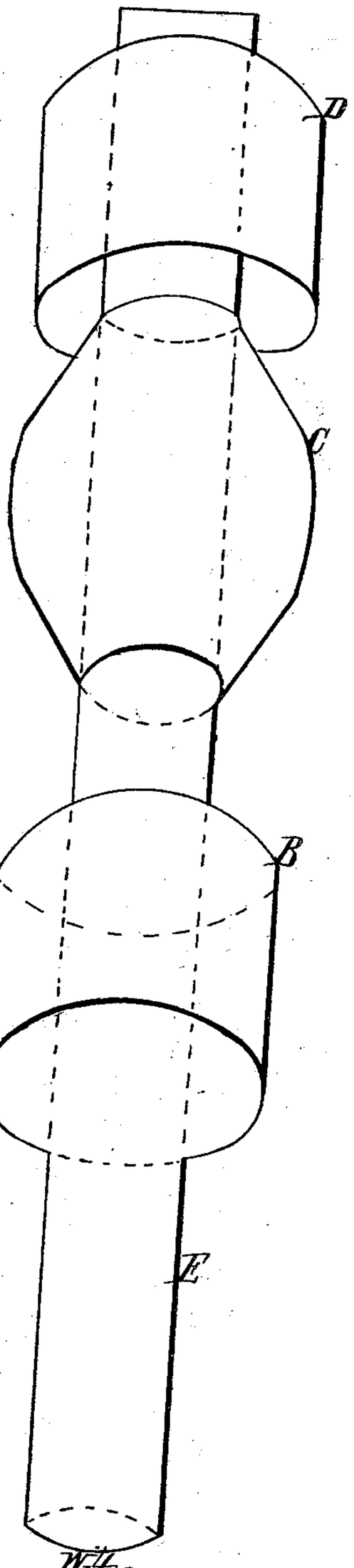


Fig. 3.

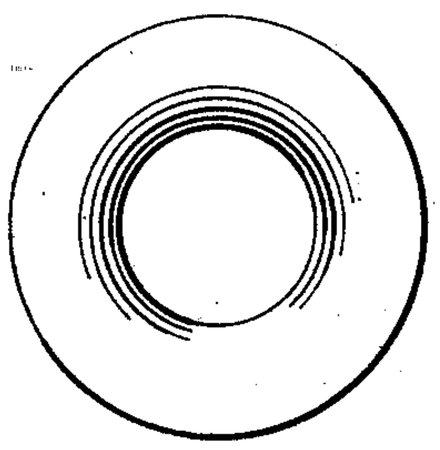


Fig. 4.

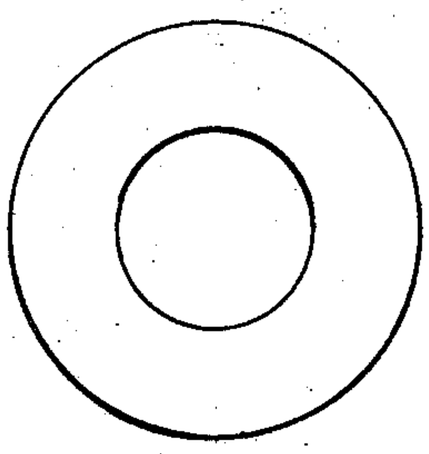
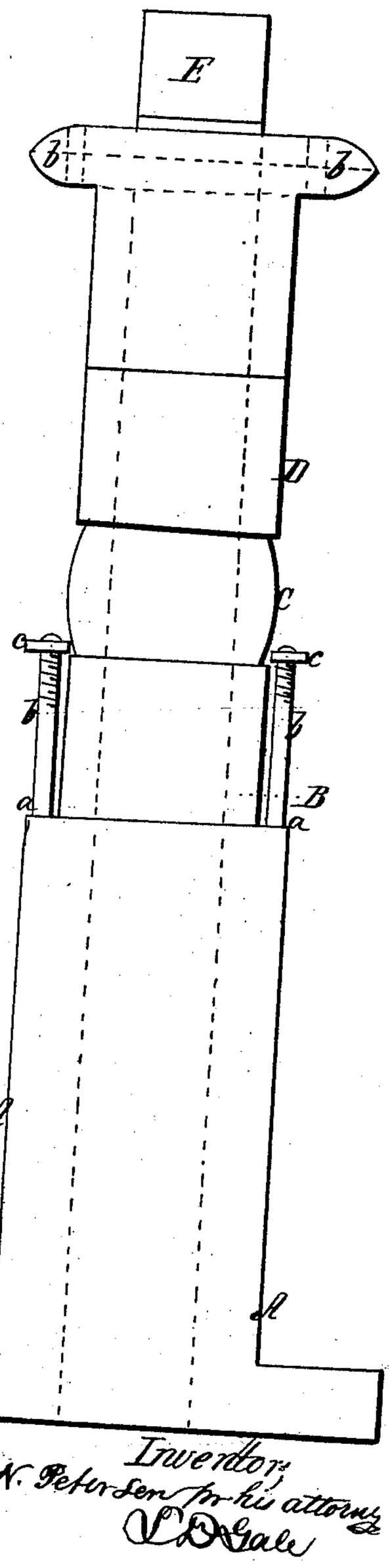


Fig. 1.



Witnesses;
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Inventor;
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L. D. Gale

United States Patent Office.

CHARLES N. PETERSEN, OF CHICAGO, ILLINOIS.

Letters Patent No. 86,316, *dated January* 26, 1869.

IMPROVEMENT IN WOODEN PACKING FOR PISTON-RODS AND OTHER ENGINERY.

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

Be it known that I, CHARLES N. PETERSEN, of the city of Chicago, county of Cook, and State of Illinois, have invented certain new and useful devices to be used as packings in certain friction-surfaces in steam-engines, pumps, and other equivalent packing-surfaces having pistons, piston-rods, and any equivalent working-parts; and I hereby declare that the following is a full and sufficient description thereof, reference being had to the annexed drawings, and references thereon, making a part of this description, in which—

Figure 1 represents an elevation of steam-cylinder, packing, and piston-rod.

Figure 2 represents the piston-rod, showing the three sections of the packing detached.

Figure 3 represents the concave end of one of the terminal pieces of the packing.

Figure 4 represents the plane end of one of the terminal pieces of the packing.

The middle piece of the said packing is a double cone, the ends of which are received into the concave ends of the terminal pieces D and B.

In the accompanying drawings—

Let A A represent a steam-cylinder, or a stuffing-box of a piston-rod, standing on its base, receiving the piston-rod E E, and the packing D C B, in three sections, through which the piston-rod passes.

The nature of the invention consists in the use of a prepared material for packing piston-rods, valve-stems, or their equivalents, in steam-engines.

That others skilled in the arts may make and use my invention, I proceed to describe it as follows:

Having selected suitable timber for the packing, the fibre of which has a certain degree of roughness, it is turned in a lathe, and made to fit exactly the bore of the stuffing-box, (or cylinder, as the case may be,) and bored to receive the piston-rod. It is divided into three sections, B, C, and D, fig. 1.

B and D are of the same form. The outer ends are a plane face, at right angles with the axis of the cylinder, fig. 4.

The inner ends are conical and concave, as seen in the concave end, fig. 3, to receive the two ends of the middle section, C, and these three pieces constitute the packing.

The packing is bored to fit very accurate to the piston-rod, or its equivalent, and both are pushed into the stuffing-box, or its equivalent, where it is held in place by the cap *b b*, screw-bolts *a a*, and nuts *c c*, and the piston-rod E plays through the packing easily when dry, but steam-tight when filled with steam.

The wood packing is specially adapted to piston-rods and valve-stems, and other parts of similar construction.

It may be also applied to the pistons, and to slide-rods and couplings, where motion is required, as connected with air or gas-pressure.

The preparation of the wood in substance, in the early part of my experiments, was made by boiling the timber in water, which acted to swell the parts without removing the incrusting-matter that fills its pores in the natural state, and did not impart the property of elasticity, so necessary to a good packing.

The next resort was to an iron cylinder, in which the packing-pieces were closely packed, and steam blown through for several hours consecutively.

This plan of treatment, though an improvement on the original, was found to be defective, from the uneven action of the steam. The outer portions of the wood were fully softened, elastic, and spongy, and the internal portions softened to some extent, but mostly confined to the surface. The incrusting vegetable matter was softened, but not removed.

Thirdly, the wood packing being fitted exactly to the parts of the stuffing-box where it was to be used, and the cap and bolts being loosened, steam is let on, and passed through the stuffing-box and packings, for two hours, or longer, when the packings being removed, are found to be uniformly acted on by the steam, which will have completely opened its pores, and dissolved the incrusting-matter of the wood, and made it porous, spongy, and elastic, and adapted it to the very mould where it is to be used.

Such is the preparation of the wood packing, in substance, for piston-rods and their equivalent, in steam-engines, which has occupied the mind of the inventor for many years.

The construction of the inner ends of B and D, to receive the double cone-piece C, (which three pieces are pressed together on their ends,) constitutes a tight packing, which requires little attention, and can scarcely get out of place, and will last from eighteen months to two years.

The working of this packing forms a glaze on the surface of the wood, being a mixture of the lubricating-oil used and the incrusting-matter of the wood, embedded into its porous surface, and this embedding-glaze saves a large amount of lubricating-oil, required in other packings, and causes the wood packing to be more durable than any other in existence.

It has been used eleven months, daily, without repairs, and continued to run as well as at first.

From experience, it is believed that it would last eighteen to twenty-four months, in a one hundred and twenty horse-engine, in which case the packing may be shortened one-tenth its length.

The elastic character of this packing renders clamping the piston-rod, so essential in keeping the packing in place in other kinds of packings, scarcely ever necessary in mine.

The cost of this packing, in a one hundred and twenty horse-engine, is about three dollars, while the cost of packing with hemp, metal, or soapstone, is twenty-three dollars, and must be renewed three times while the wood is renewed once.

The blocks constituting the three sections of the wood packing, that they may be removed without disturbing the machinery, are cut longitudinally and radially through the plane of the cylinder, into ten pieces, and each piece may be removed separately, and replaced, without otherwise disturbing the machinery.

This packing may be used with or without the sections.

The advantages of this packing over others in use, are—

First. That it costs three dollars for a one hundred and twenty horse-engine, while the others cost about twenty-three dollars.

Second. This packing will last twelve to twenty-four months, while that of heimp, metal, or soapstone, will last about one-third as long.

Third. The friction of the wood packing is much less than that of other packings, from the fact that the absorptive surface of the wood takes up and holds the lubricating-oil, or this, mingling with the incrusting-matter of the wood, forms a glaze on the surface, which is lasting, and requires less than half the amount of lubricating-oil used with other packings.

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

The construction and arrangement of the wooden packing for piston-rods and other enginery, substantially upon the principle and in the manner herein set forth.

Witnesses: CHARLES N. PETERSEN.

P. A. HOYNE,

M. D. RAPP.