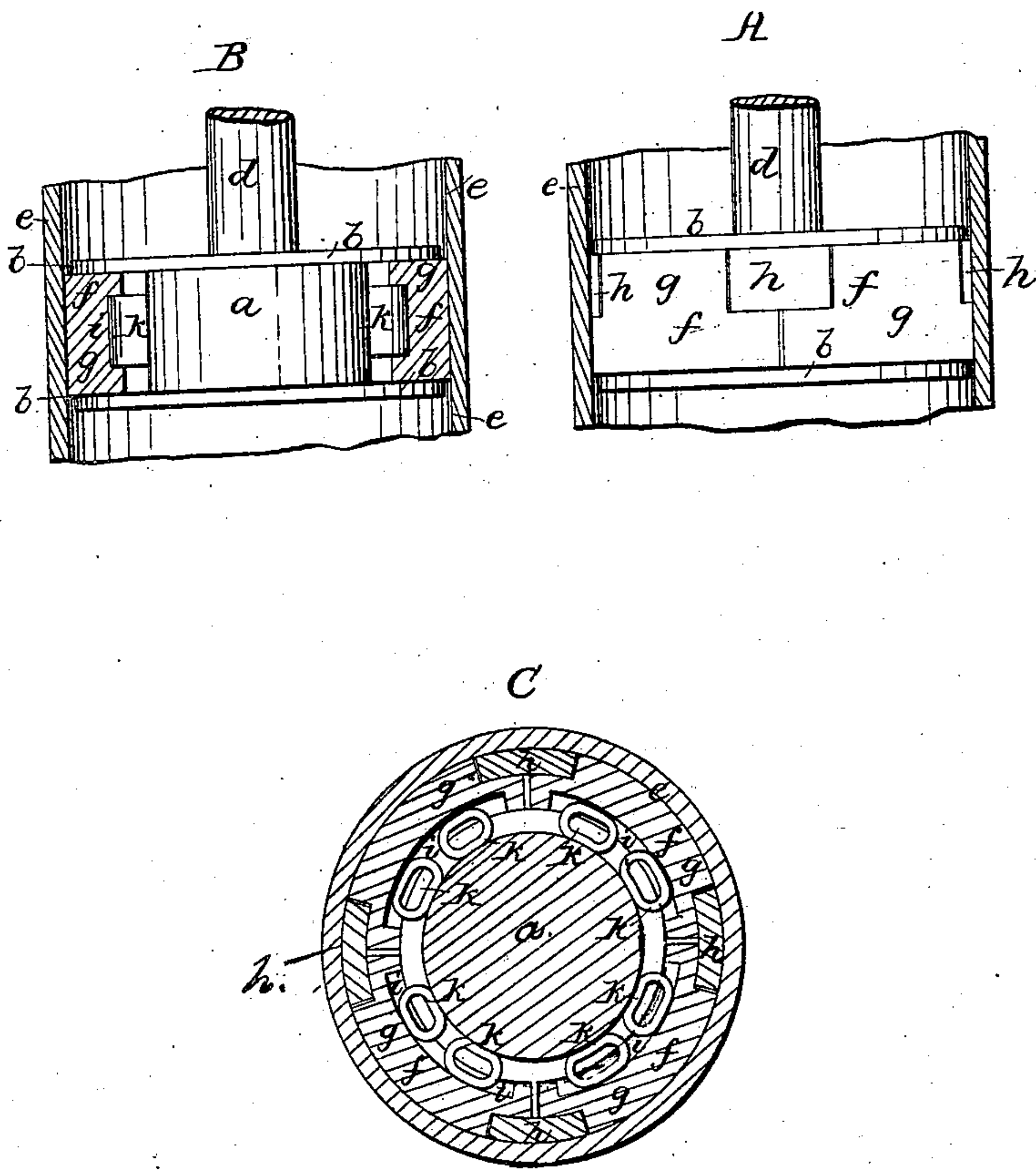


H. S. Hopkins,

Pump Piston,

No 76,635,

Patented Apr. 14, 1868.



Witnesses;
J. B. Fisher
M. W. Frothingham

Inventor;
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United States Patent Office.

HENRY S. HOPKINS, OF BOSTON, MASSACHUSETTS.

Letters Patent No. 76,635, dated April 14, 1868.

IMPROVEMENT IN PUMP-PISTONS.

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

TO ALL WHOM IT MAY CONCERN:

Be it known that I, HENRY S. HOPKINS, of Boston, in the county of Suffolk, and State of Massachusetts, have invented an Improvement in Pump-Boxes; and I do hereby declare that the following, taken in connection with the drawings which accompany and form part of this specification, is a description of my invention sufficient to enable those skilled in the art to practise it.

The invention relates to the construction of pump-boxes or pistons, and consists primarily in packing the box with a packing made of wooden segments, the joints between which are broken by blocks set loosely in matched recesses in the adjacent surfaces of adjacent segments, the segments being pressed outwardly by suitable springs inserted between the segments and the surface of the barrel of the box, and being kept from end movement by the flanges of the box.

The drawings represent a box embodying my invention.

A shows a side view of the box and its packing; B, a vertical section through the packing; C, a horizontal section through the packing. *a* denotes the barrel around which the packing is arranged; *b*, the flanges; *d*, the box or piston-rod; *e*, a portion of the pump-cylinder or chamber in which the box works. *f* denotes the packing. This packing is composed of a series of segment-shaped blocks, *g*, made of wood, with the abutting or adjacent edges matched, and forming, when brought together, a cylindrical tube of external diameter corresponding to or very nearly to the diameter of the flanges *b* and the chamber in which the box works. Each segment is mortised on its exterior surface at two of its corners, the adjacent mortises in each two segments brought together matching and forming a recess, into which a thin segmental block, *h*, is placed, the circumferential surface of this block corresponding with the cylindrical surface of the segments and the block by crossing from one segment to the other, breaking the joint between, as seen at A. Each segment *g* is pressed outwardly by a suitable spring or springs placed back of it, between the barrel *a* and the segment, and, by means of the segments and springs, the packing is kept at all times pressed closely against the surface of the chamber in which the box runs, the blocks *h* permitting the segments to expand without opening any joint by the side of the box, and the flanges keeping all the pieces in proper relative position. As a substitute for hemp or fibrous packing, I have found this construction to be very efficient and valuable, especially in pumping salt water. The wood does not rot as does hemp, and the wear of the surface is very slow and slight. The box is much better packed, needs comparatively no attention, is cheap, easily made, and very enduring.

To expand the segments, or to keep them pressed outwardly, I prefer to use rubber springs applied as follows: Each segment *g* has in its inner surface a recess, *i*, in which are loosely placed cylindrical or tubular pieces of rubber *k*, which are compressed by the segment when the box, after the segments are arranged between its flanges, is pressed into its chamber, and the springs then keeping the segment pressed outwardly against the surface of the chamber, as will be readily understood.

One long spring, horizontally placed, may serve for each segment, but I prefer to use two or more, as described. The springs are very enduring, never break, accommodate themselves to the surfaces against which they act, and are always efficient and reliable, being in all these respects much superior to any form of metal springs for the purpose here shown.

It will be obvious that the number of segments used may be varied according to size or other conditions in a piston-box. In a pump-box or piston of twenty-four inches' diameter, that I have in use, are thirteen main segment pieces, which number may be increased or diminished as boxes vary in size or diameter, and as may be found most practical in such variations.

In making and applying the segments, I water-soak the pieces after they are formed, fitting the last piece in accordance with the degree to which the whole circle of segments is expanded by the soaking.

I claim, in combination with the flanges *b b*, the segmental packing-pieces *g* pressed outwardly by springs, and the joint-blocks *h*, constructed and arranged to operate, substantially as set forth.

I also claim, in combination with the segments *g*, the rubber springs *k* placed loosely in the recesses *i*, and pressing the segments outwards, substantially as set forth.

HENRY S. HOPKINS.

Witnesses:

J. B. CROSBY,
FRANCIS GOULD.