

(No Model.)

W. SIMPKIN.
PISTON.

No. 396,004.

Patented Jan. 8, 1889.

Fig 1.

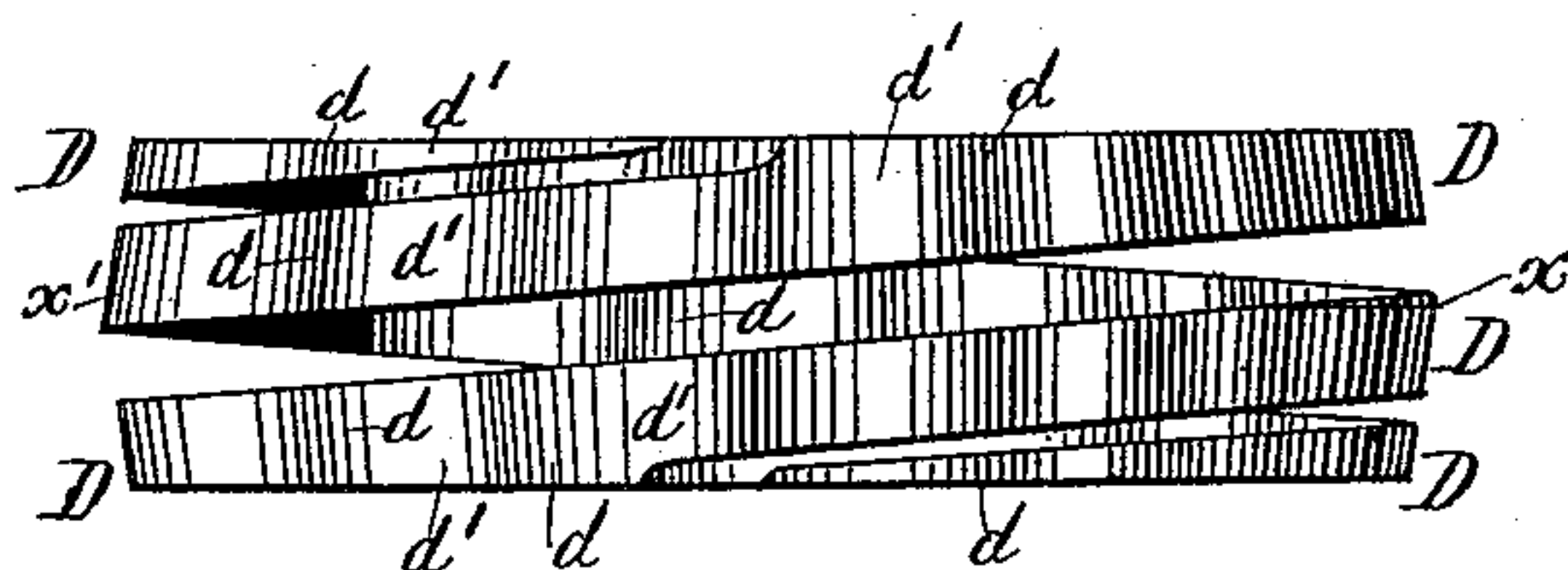


Fig 2.

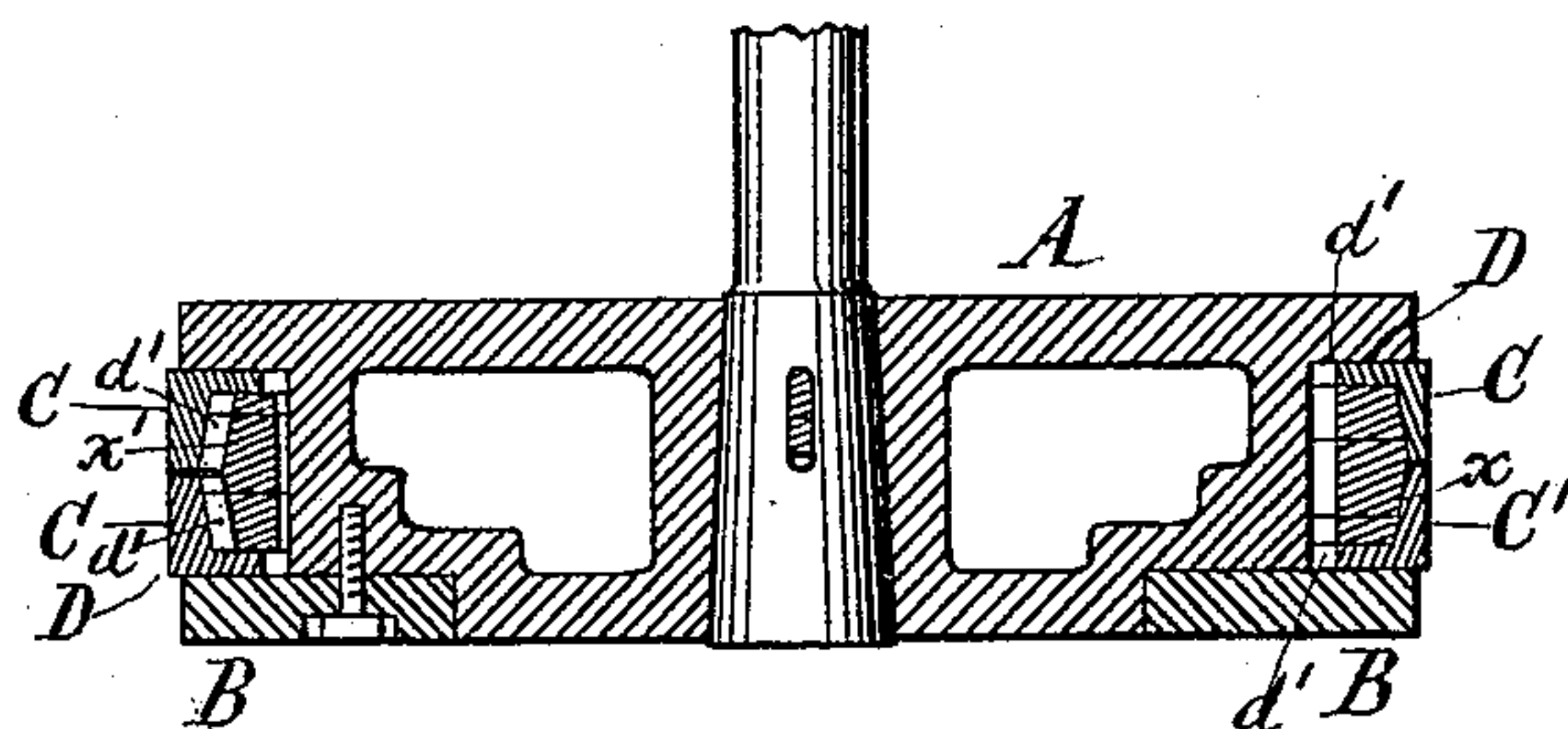
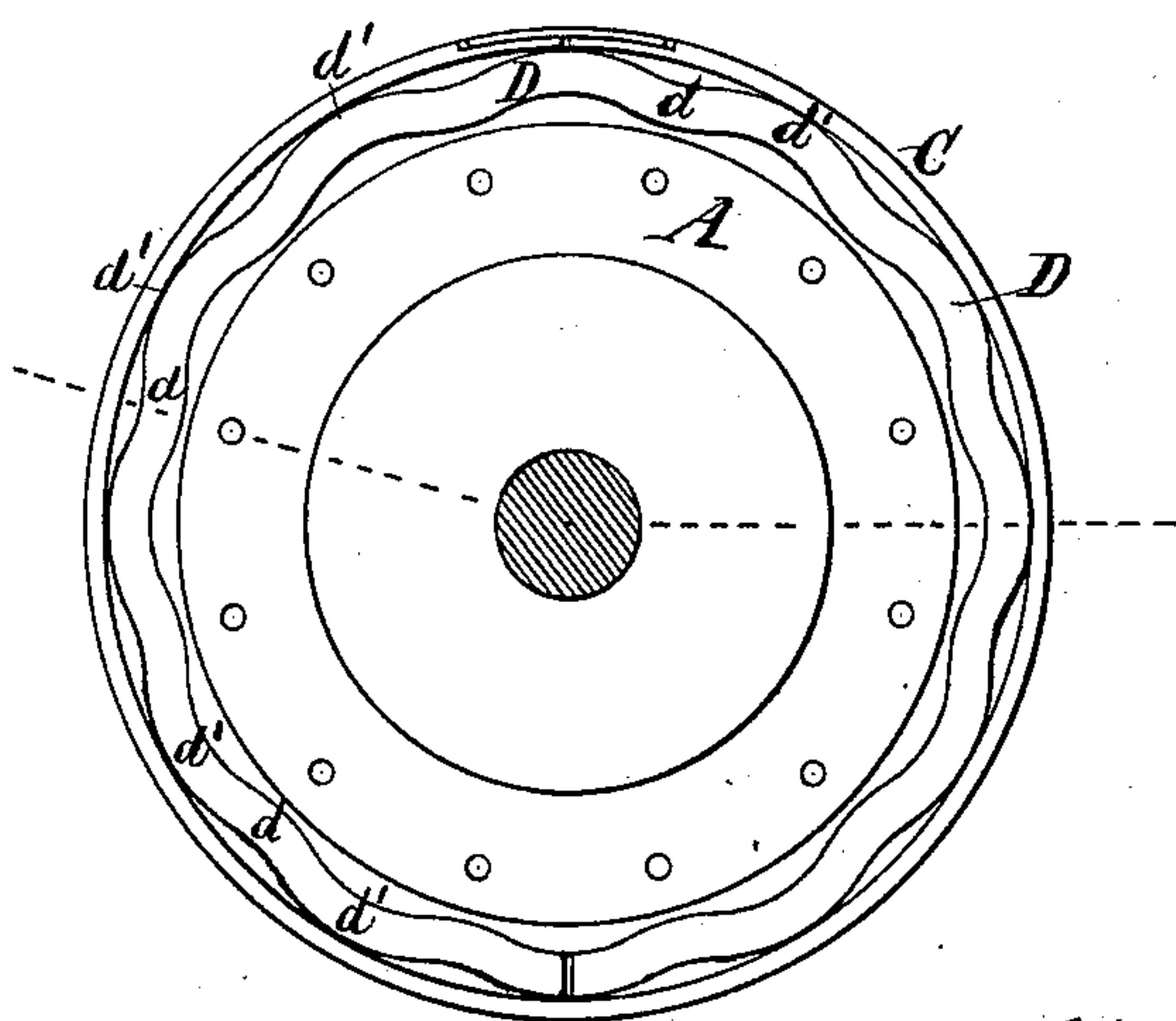


Fig 3.



Witnesses:
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UNITED STATES PATENT OFFICE.

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PISTON.

SPECIFICATION forming part of Letters Patent No. 396,004, dated January 8, 1889.

Application filed March 10, 1888. Serial No. 236,815. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM SIMPKIN, a citizen of the United States, residing at Richmond, in the county of Henrico and State of Virginia, have invented certain new and useful Improvements in Pistons; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to steam-pistons provided with expansible packing-rings; and it consists in constructing the helicoidal spring, of metal or other suitable material, employed for expanding the packing, with longitudinal corrugations or their equivalents on its bearing-surface, thus securing spaced points for contact against the packing-rings around the helicoidal winds of the metal strip or other material of which the spring is formed, the same forming two or more circles of contact-points in different planes at right angles, or nearly so, to the longitudinal axis of the piston, for acting against the separate sections of the ring-packing, this construction reducing the amount of frictional impact and giving increased strength and elasticity to the spring, while relieving this style of spring from the serious objection of becoming stuck, jammed, or bound, and thus rendered incapable of performing its proper functions and of requiring the piston to be taken out for the purpose of relieving the spring whenever it becomes "stuck" or "bound" in the packing-ring.

In the accompanying drawings, Figure 1 is an elevation of the improved helicoidal spring detached from the piston. Fig. 2 is a central section of the improved piston, its rod being shown in elevation; and Fig. 3 is an end view of the same, the follower and one of the packing-rings being removed.

In the accompanying drawings, A represents an ordinary piston-head, B its follower, and C C' its packing formed with two ring-sections. It is usual to employ for expanding the packing-rings C C' an uncorrugated helicoidal spring, D, of metal or other suitable material, within the packing-rings, between the rings C C' and the piston-head A,

and if this spring would always operate without becoming stuck, jammed, or bound in the piston-rings it would be a very desirable contrivance, because it expands in an outward or radial as well as in a longitudinal direction, thereby pressing the rings out against the surface of the bore of the steam-cylinder, as well as against the flange and follower of the piston-head; but it has been found that this spring as heretofore constructed would, under some circumstances, not operate, on account of its becoming bound in the piston-ring, due to the large amount of frictional impact surface presented by itself to the rings, and this surface being a continuous unbroken one. To overcome this difficulty I have constructed the spring D, which may be of metal or other suitable material, with corrugations, as $d d'$, longitudinal with the axis of the piston and upon each of its helical winds, as illustrated in the drawings. The spring thus formed with corrugations is stronger and more elastic than the plain-surfaced spring hereinbefore referred to, and at the same time it presents numerous spaced points, as d' , for coming in contact with the packing-rings, and thus is freed from a tendency to become stuck in the packing-rings by reason of too great frictional impact against the rings. The spring, as will be seen, being corrugated on two or all of its helicoidal winds, is enabled to present two or more circles of spaced points, as $x x'$, of contact, and thus both of the packing-rings C C' can be touched and acted upon alike by the one corrugated helicoidal spring, but in different planes.

Any desired number of packing-rings and a spring having any desired number of helicoidal winds, and corrugated, as described, may be employed.

I make no claim upon a spring packing-ring of helicoidal form which has its bearing-surface a continuous circle, and this whether the cross-sectional form of such spring is rectangular or semicircular and solid or hollow; neither do I claim a simple split packing-ring of cylindrical form and corrugated on its contact bearing-surface, such ring only being capable of bearing with its corrugations against a single circle of packing, and not with one series of corrugations upon one cir-

ele of packing in a given plane and with another series of its corrugations upon another circle of packing in a different plane, and such ring also not being expansible in a longitudinal direction against the flange and follower of the piston-head. My improved piston combines in the same structure the advantages of the helicoidal spring and the advantages of the corrugations of the simple split ring, and thus furnishes a new article of manufacture, possessing increased utility over either of the separate structures heretofore employed.

What I claim is—

15 1. The helicoidal spring D, formed with corrugations d d' on its bearing-surface for expanding piston-packing, said circles of corrugations being adapted for bearing on dif-

ferent circles of packing, substantially as described.

20 2. The combination, with a piston-head and its packing, of a helicoidal spring provided with longitudinal corrugations on its bearing-surface, the said corrugations forming circles of spaced impact points on the helicoidal winds of the strip of which the spring is formed, said corrugations being adapted for bearing on different circles of packing, substantially as and for the purpose described.

In testimony whereof I hereunto affix my signature in presence of two witnesses.

WILLIAM SIMPKIN.

Witnesses:

J. SAMUEL PARRISH,
JAMES L. ANDERSON.