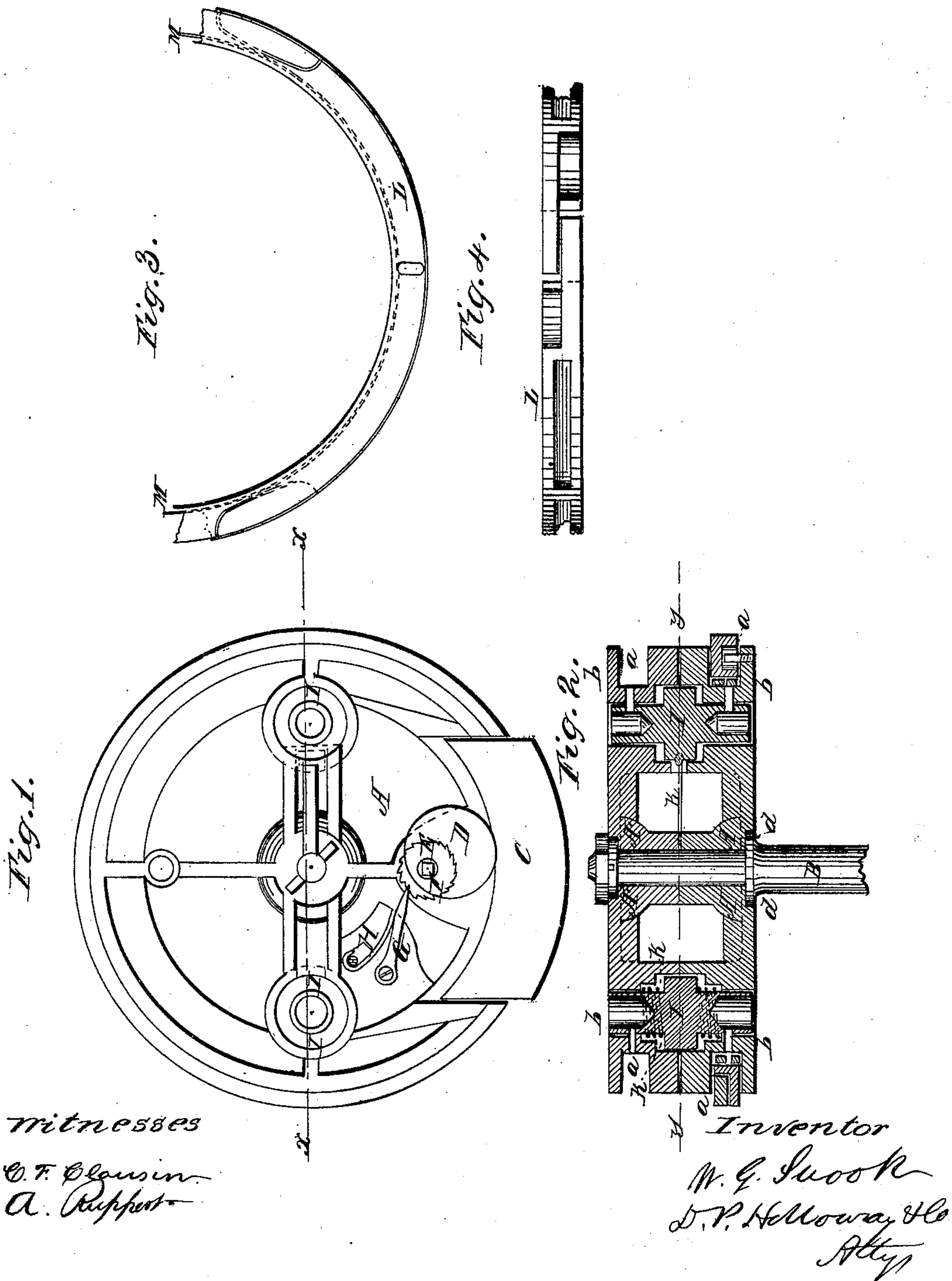


W. G. Snook.

Steam Engine Piston.

N<sup>o</sup> 90,884.

Patented Jan. 1, 1869.





# United States Patent Office.

WILLIAM G. SNOOK, OF CORNING, NEW YORK, ASSIGNOR TO HIMSELF, A. H. GORTON, AND O. C. PATCHELL, OF SAME PLACE.

Letters Patent No. 90,884, dated June 1, 1869.

## IMPROVEMENT IN STEAM-ENGINE 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, WILLIAM G. SNOOK, of Corning, county of Steuben, and State of New York, have invented a new and useful Improvement in Pistons; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being to the accompanying drawings, forming a part of this specification.

This invention relates to pistons for steam-engines; and

It consists in the construction, combination, and arrangement of the parts of which it is composed, as will be more fully described hereinafter.

Figure 1 is a section on line *y y* of fig. 2.

Figure 2 is a sectional elevation on line *x x* of fig. 1.

Figure 3 is a detached view of a section or portion of one of the packing-rings.

Figure 4 is a side view, showing the periphery of the same.

Corresponding letters in the several figures refer to corresponding parts.

A A' represent the body, or spider of the piston, it being formed in two sections, or parts, which meet each other at the line *y y* of fig. 2.

That portion of the piston represented by A, is made to fit upon the piston-rod B, and to abut against a collar, *d*, upon said rod. That portion of said spider, or piston-head which is represented by A', is then to be slipped on to said rod, in which position the two are held, by nuts, upon the outer end of said rod, one of which acts as a jam-nut.

The two divisions of the spider above referred to, are each furnished with a recess, *a*, in their peripheries, for the reception of the packing-rings L.

B is the piston-rod, which may be of any size and material adapted to the labor to be performed by it.

C represents a section, or piece of metal, which is to have a recess formed in its outer segmental surface, which recess is to be filled with what is known as Babbitt's metal, or, it may be, with any other suitably soft metal. This section, or slide is to be fitted into a recess, formed between the sections, or parts of the spider, by cutting away a portion of each, equal to one-half the thickness of the slide, or section C, and for a distance equal to the length of such slide, or section. This section, or slide, thus arranged, it will be seen, is capable of being slid out and in, in the recess formed within the sections of the spider, its office being to enable the engineer always to keep his piston centrally located within the cylinder, by providing the means of raising the piston therein at any time, when, in consequence of its having worn away, it shall fall below the centre thereof.

D represents a cam, or eccentric, which is to be

formed upon, or attached to the shaft F, and so arranged, with reference thereto, and to the slide, or section C, that as the full side of the cam is brought into contact with said slide, the same will be forced outward, and the piston raised within the cylinder.

E represents a concentric wheel, which is to be secured to the shaft F, by the side of eccentric D, and is to have, upon its outer surface, serrations, which constitute it a ratchet-wheel, for the reception of the end of the dog G.

F represents the shaft above alluded to, and to which the cam, or eccentric and ratchet-wheel, are to be secured. One end of this shaft may be stepped in a socket, formed in the interior surface of one section of the spider, while the other end is to pass through the opposite section, and have its bearings therein.

That portion of this shaft which projects beyond the surface of that section of the spider through which it passes, is to be squared, or otherwise prepared, for the reception of a wrench, or crank, with which to turn the same, so that, at any time that it may be desirable to raise the piston within the cylinder, it may be done, by removing the cylinder-head, and, through the medium of a wrench, or crank, turning this shaft; or, if preferred, an aperture may be formed in the cylinder-head, through which such crank, or wrench may be inserted, and thus the shaft be turned, without removing the cylinder-head, it being only necessary to provide such aperture with some suitable cover, or stopper, to prevent the escape of steam from the cylinder.

G represents a dog, which is to be pivoted to the interior surface of the piston, and so arranged, that when in position, its outer end will rest upon the wheel F.

H represents a spring, which is to be pivoted to the spider, and so arranged, as to bear upon the dog G, and thus keep its outer end in contact with the ratchet-wheel.

I I represent valves, which consist of a central disk, having a cylindrical projection upon each of its sides, the disks fitting into recesses in the sections A A' of the spider, as clearly shown in fig. 2 of the drawings.

The cylindrical portions, or stems of these valves, are each of sufficient length to extend through the sections of the spider, and of sufficient diameter to admit of having formed within them, recesses, which extend from their outer ends inward, to nearly the point where they join the disk.

Through the cylindrical portions of these valves, and at a distance about midway from the end thereof, to the point where they join the disks, apertures are to be formed, which apertures register with the passages *b b*, which allows of the passage of the steam from the cylinder to the recesses *a* in the sections of the spider. The arrangement of these valves, and their steam-passages, is to be such, that when the steam is admitted



to the cylinder, upon either side of the piston, it will enter the cavity in the ends of the valves, which are upon the side of the piston where such steam is admitted, and force such valves against their seats in the opposite section of such spiders, and, at the same time, cause the apertures in their stems to register with passages *a* in the spider, which will cause the sectional packing-ring in that section to be set out into steam-tight contact with the cylinder, while, at the same time, or during its passage in that direction, the aperture in the opposite end of such valve will be brought opposite the passage in the opposite section of the spider, thus permitting the steam to escape from under the rings in the last-named section of the spider.

K represents a spring, which may be a spiral one, and surround the stems of the valves, as shown in fig. 2; or it may be a flat or disk-spring, as shown in the same figure, and have a projecting rim upon its periphery, which rim may enter a slot, formed in the disk-portion of the valves. The former method of arranging these springs, is the one to which I give the preference; in either case they are to be so arranged, that when not acted upon by the pressure of the steam, the valve will be held in a central position, and the disk will not bear upon either of its seats.

L represents segments, or sections of packing-rings, which are made to fit into the grooves, or recesses in the sections of the spider A A'. These segments, or sections are constructed with lap-joints, so as to prevent the passage of steam from one side thereof, to the other. They are also provided with cavities, or

recesses in their peripheries, for the reception of soft metal, to prevent their rapid wear.

M represents a coil of wire, or, it may be, a spiral spring, which is to be placed in the recess in the sections of the spider, and under the sectional packing-rings, for the purpose of holding them out, and in contact with the cylinder, when the steam has been exhausted from under such rings.

Having thus described my invention,

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

1. The construction of the hollow-stemmed valves I, substantially as shown and described.

2. The combination and arrangement of the hollow-stemmed double-vented valves I, sections A A' of the spider, and the spring K, substantially as shown and described.

3. The combination of the eccentric D, the ratchet-wheel F, and movable section of piston C, substantially as shown and described.

4. The arrangement of the springs K, with reference to the valves I, substantially as shown and described.

5. The arrangement of the apertures in the stems of valves I, with reference to the passages in the sections of the spider, leading to the recesses *a* beneath the packing-rings, substantially as shown and described.

Witnesses:

WILLIAM G. SNOOK.

J. H. WOLCOTT,

A. S. KENDALL.