2 Sheets--Sheet 1.

O. M. STILLMAN.

Steam-Piston.

No. 167,860. Patented Sept. 21, 1875.

Fig. 1.

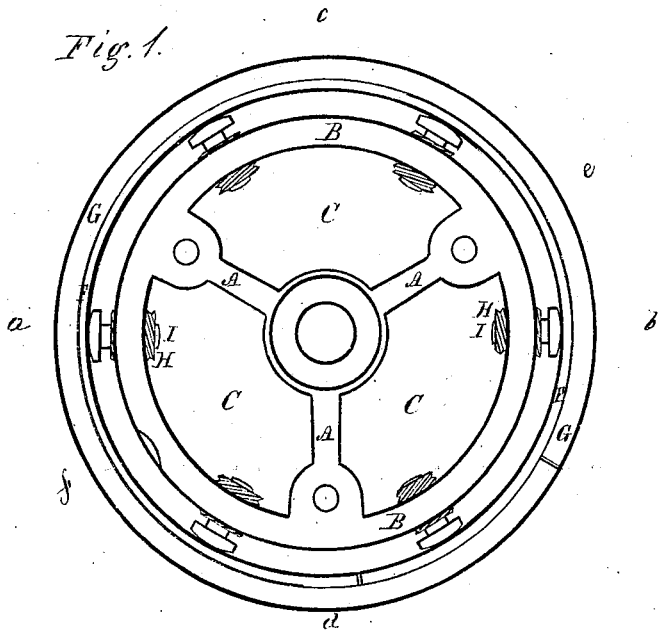
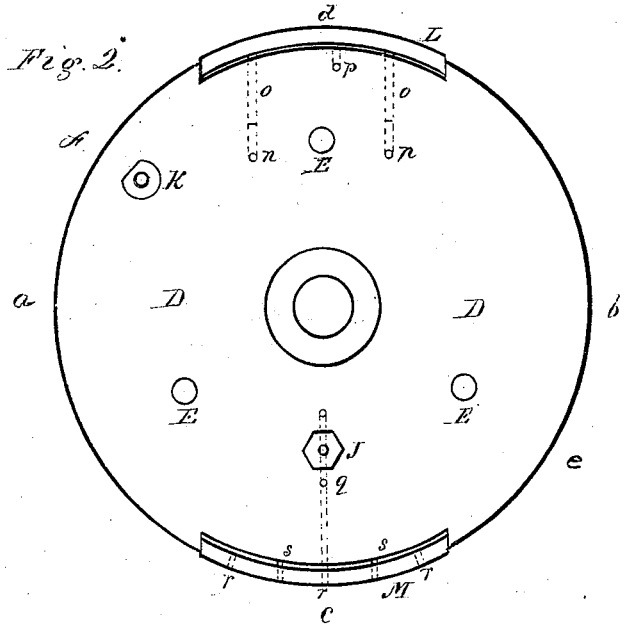


Fig. 2.



Witnesses.

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Orvennus M. Stillman

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2 Sheets--Sheet 2.

O. M. STILLMAN.

Steam-Piston.

No. 167,860. Patented Sept. 21, 1875.

Fig. 3.

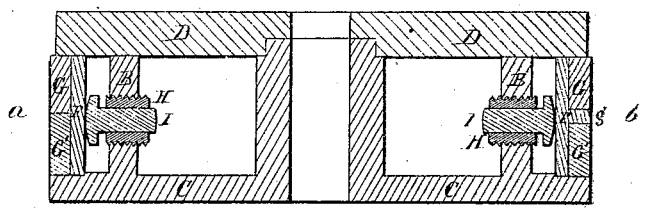


Fig. 4.

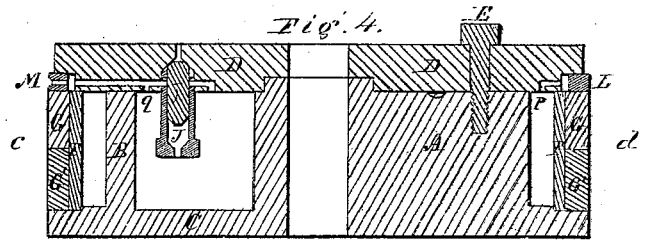
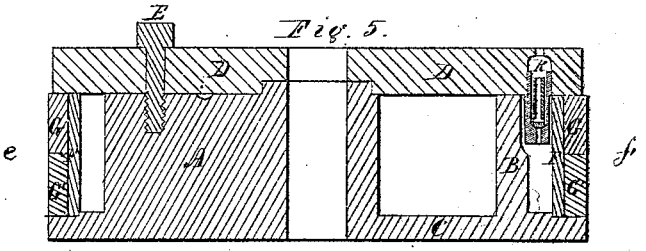


Fig. 5.



Witnesses.

John T. Peters

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Inventor,

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UNITED STATES PATENT OFFICE.

ORSEMUS M. STILLMAN, OF WESTERLY, RHODE ISLAND.

IMPROVEMENT IN STEAM-PISTONS.

Specification forming part of Letters Patent No. **167,860**, dated September 21, 1875; application filed March 29, 1875.

To all whom it may concern:

Be it known that I, ORSEMUS M. STILLMAN, of Westerly, in the county of Washington and State of Rhode Island, have invented certain new and useful Improvements in Steam-Pistons; and I do hereby declare that the following is a full, clear, and exact description thereof, whereby a person skilled in the art can make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

Like letters in the figures indicate the same parts.

The objects of my invention are to provide a means of centralizing the position of the piston-rod; to exert an equable and constant pressure upon the metallic packing of the piston to keep it sufficiently tight to prevent leakage without undue wear and friction; also, to sustain the piston in its position, so that it will not wear upon the under side against the interior surface of the cylinder.

My invention consists in certain devices for accomplishing the above objects, which will be hereinafter described.

Figure 1 is a view of the interior of the piston, with the cover removed so as to show the construction of the several interior parts. Fig. 2 is a view of the cover turned over downward from Fig. 1, or Fig. 1 may be considered as being detached from the cover and turned upward. Fig. 3 is a section upon the line *a b* of Figs. 1 and 2. Fig. 4 is a section upon the line *c d* of Figs. 1 and 2. Fig. 5 is a section upon the line *e f* of Figs. 1 and 2.

The frame of the piston, which is attached to the piston-rod, has radial arms A supporting the annular band B. These parts are attached to and form part of the bottom plate C, as shown in the drawing. The top plate or cover D is bolted to the arms A by the bolts E. The bottom plate C may also be attached in the same manner. F is an expansible ring, of the depth of the piston between the two plates C and D. G G′ are the metallic rings forming the packing, open upon one side in the usual manner, and held in place and prevented from rotating by means of the pin *g*, forming part of the ring F. H H, &c., are hollow screw-plugs, set in the annular ring B. In these fit the small plungers I I, &c., the outer ends of which rest against the ring F, and the enlarged heads come between the ring F and the screw-plugs H. J is a check-valve, which allows steam from the cylinder to enter within the central part of the piston and press against the inner ends of the plungers I, but prevents its escape, thereby keeping up a constant pressure of steam in the interior cavity of the piston while the engine is in operation. K is a check-valve, which allows any steam which may leak into the annular space between the rings B and F to escape, but prevents steam from entering, thus relieving the outer ends of the plungers I from steam-pressure.

As the cylinder is alternately filled and exhausted on each side of the piston, the operation of these valves is to keep up the pressure inside of the ring B, and to reduce it upon the outside, so that the plungers I are constantly pressed against the band F by the steam-pressure upon their inner ends. This presses the packing-rings G G′ against the interior surface of the cylinder with the proper force to produce the required tightness of the joint.

The screw-plugs H can be turned and adjusted so as to bring the piston-rod to its proper and central position, when the ends of the screw-plugs just touch the heads of the plungers I.

L is a device for relieving the top of the piston in a horizontal cylinder from pressure, and M is a device for admitting pressure from the steam in the piston under the edge of the piston to keep it raised off from the bottom of the cylinder. *n n* are apertures in the cover of the piston, communicating with the inner chamber of the piston to allow the steam therein contained to act upon the end of the small pins or pistons *o o* attached to L, and press it outward. *p* is an aperture communicating with the outside annular space in the piston to relieve the pressure between the part L and the cover D. The device L is thus kept in contact with the cylinder, and does not permit the steam to act downwardly upon the piston. *q* is an aperture communicating with the inner chamber of the piston to allow steam to enter between the part M and the cover D. *r r r* are apertures through M to allow the steam to pass through to fill the groove *t* upon

the under side of M. *s s* are pins to guide the motion of M and hold it in position.

This device admits the steam under the edge of the piston, and tends to raise it. The combined action of L and M is to suspend the piston itself, and prevent its scoring the bottom of the cylinder.

In the drawings only one cover of the piston is provided with check-valves to regulate the interior pressure. Both covers may, however, be furnished with these valves, although a single one answers the purpose.

What I claim as my invention is—

1. The screw-plugs H in the ring B, in combination with the plunger I, for the purpose of adjusting and centralizing the position of the piston-rod, substantially as herein described.

2. The combination of the plungers I with the inner and outer chambers of the piston and the check-valves J and K, for the purpose of pressing outwardly the band F, substantially as herein described.

3. The combination of the devices L *n o p* with the inner and outer chambers of the pistons, substantially as and for the purpose herein described.

4. The combination of the devices M *q r s t* with the inner or steam-pressure chamber of the piston, substantially as herein described.

ORSEMUS M. STILLMAN.

Witnesses:
PELEG NOYES,
FRANCIS SHEFFIELD.