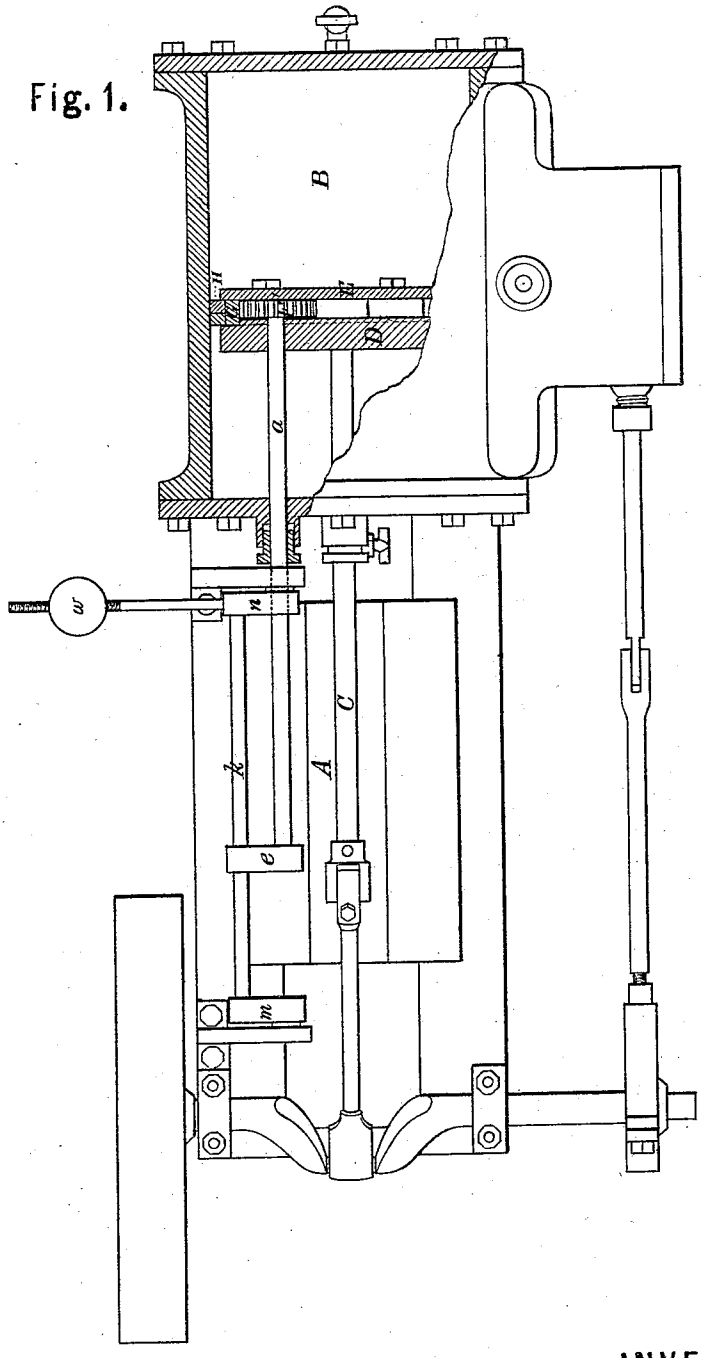
2 Sheets--Sheet 1.

J. H. TEAL.

Improvement in Piston Packing.

No. 125,857. Patented April 16, 1872.

Fig. 1.



WITNESSES.

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2 Sheets--Sheet 2.

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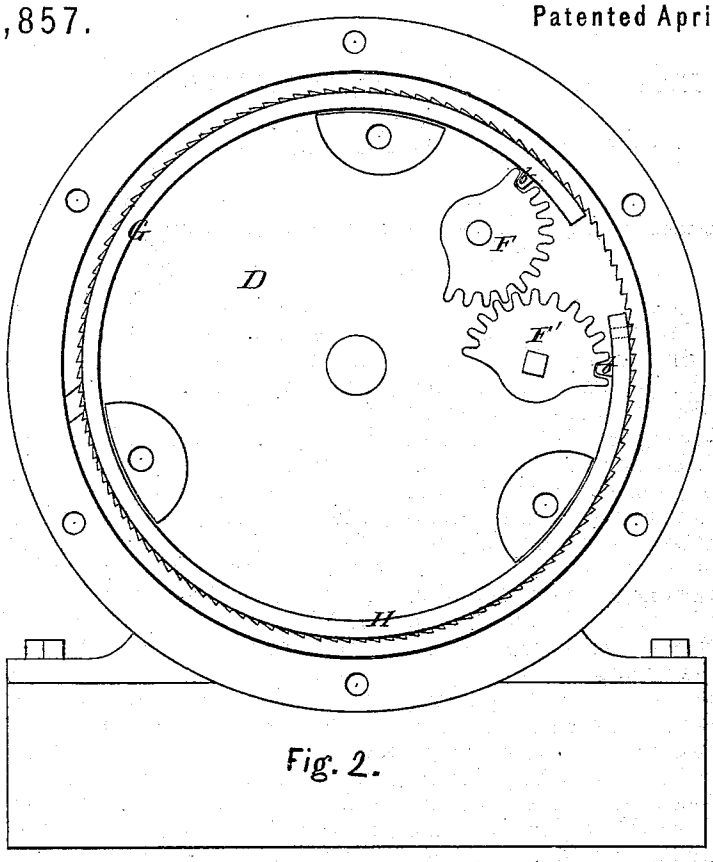
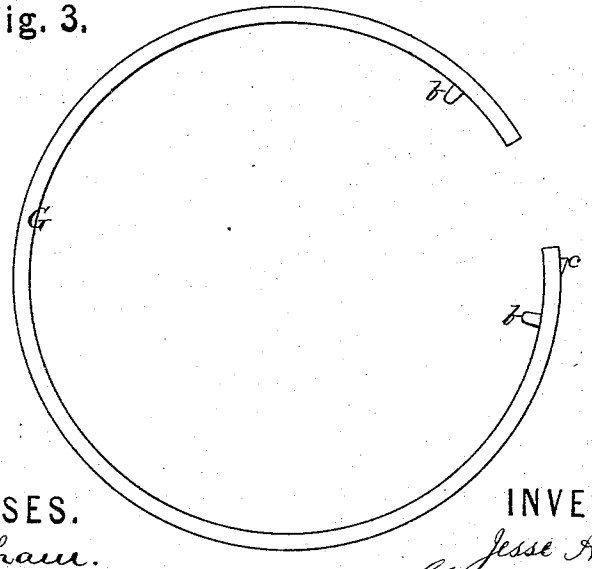


Fig. 2.

Fig. 3.



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UNITED STATES PATENT OFFICE.

JESSE H. TEAL, OF MEMPHIS, TENNESSEE.

IMPROVEMENT IN PISTON-PACKINGS.

Specification forming part of Letters Patent No. 125,857, dated April 16, 1872.

To all whom it may concern:

Be it known that I, JESSE H. TEAL, of Memphis, in the county of Shelby and State of Tennessee, have invented a new and valuable Improvement in Steam-Engines; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawing making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawing is a representation of a plan view, part horizontal section. Fig. 2 is a rear view with follower-plate removed. Fig. 3 is a view of the expansion ring.

This invention has relation to the packing of pistons which work in cylinders, as in steam, air, and water engines, air and water pumps, and other machines of like character. Its object is to obtain perfect control of the packing from the outside of the cylinder, enabling the engineer to adjust, tighten, or loosen the same while the piston is in full motion; and it consists, first, in connecting the piston-packing with the expanding ring by a ratchet and pawl or equivalent devices, so that a circular movement of the ring in one direction will carry the packing with it, while the packing will not move with the ring in the opposite direction; second, in providing the piston with pinions connecting with the expanding ring and with each other, and adapted to be moved by means of a rod passing through the cylinder-head parallel with the piston-rod; and, third, in providing this rod, governing the movement of the pinions, with a weighted arm nicely adjusted to the requirements of the engine, and adapted to act automatically as a cut off or governor.

In the accompanying drawing, the letter A designates the frame of an ordinary stationary steam-engine; B, its piston-cylinder; C, the piston-rod. D represents the spider or body of the piston; E, the follower-disk. Between the spider and the follower are placed the pinions or segment-pinions F F′, the former of which is secured to the body of the piston in such a manner that it will have a free rotary movement. The latter pinion is rigidly attached to the rod *a*, which passes through the body of the piston, and is capable of rotation upon its axis. G represents the expanding-ring, provided with studs or teeth *b b* on the inside of its ends for engagement with the pinions F F′, and with a spring-pawl or angular stud, *c*, on the outer surface for engagement with the ratchet of the packing. H designates the packing-ring or rings, cut in the usual manner, and provided on the inside with a series of ratchet-teeth, which should extend the entire length of the inner surface of each ring. The arrangement of mechanism for connecting the weighted arm with the rod *a* may be varied, but the mode described below will answer. The rod *a* is provided with a cross-head, *e*, rigidly attached to said rod, and arranged to slide on a second rod, *k*, provided with arms *m n*, respectively, pivoted to standards in such a manner that it shall have a vibratory motion only. The arm *n* is extended to receive a weight, *w*, which is just sufficient to govern automatically the movement of the packing—a matter easily determined for each engine by experiment and calculation, taking into consideration the limit of pressure required and the elastic force of the packing-ring.

I do not desire to confine myself to the construction or arrangement herein shown. These may be varied in many ways well understood by those skilled in the art, which will accomplish equally well the results I have secured.

By depressing the arm *n* the pinions F F′ will be rotated from each other, expanding the ring G, and forcing the packing-rings against the cylinder-wall. This pressure of the packing against the cylinder-wall will be relieved by raising the arm *n*, and thus rotating the rod *a* in the opposite direction, and the pinions F F′ toward each other, drawing in the expanding ring. Each movement of the expanding ring, greater in degree than the length of a tooth of the inner surface of the packing-ring, will serve to rotate the latter to an equivalent extent. It is evident, therefore, that the position of the packing-ring will be continually shifting, and unequal wear thereby prevented. If the arm *n* be raised to a sufficient height, the packing may be contracted enough for the steam to "blow through," bringing the engine instantly to a stand, to resume its motion with equal promptitude on the lowering of the regulating-arm.

The facility with which the packing may be

tightened or loosened enables the engineer to have full control of the speed of the engine, and to regulate the same through the packing at will. The weighted arm *n* has no longitudinal movement, and hence is easily operated, however rapid the movement of the engine. The weight is designed to be adjustable on the arm *n*, enabling the leverage to be increased or diminished according to the rate of speed at which the engine is required to move.

When applied to locomotives, a dead-brake may be secured by using sufficient power on the lever-arm to force the packing up hard against the cylinder-wall.

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

1. The combination, with a piston-packing, of governing devices, regulating automatically the steam pressure, substantially as specified.

2. The combination, with a piston-packing, of a rock-shaft, pinions, and studded expansion ring, substantially as specified.

3. The combination, with a serrated piston-packing of an expansion ring, provided with a stud or pawl for engagement therewith, substantially as specified.

4. The combination, with a serrated piston-packing and expansion ring engaging therewith, of a rock-shaft, and pinions engaging with the expansion ring, substantially as specified.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

J. H. TEAL.

Witnesses:
D. D. KANE,
GEO. E. UPHAM.