(No Model.) 2 Sheets—Sheet 1.

M. L. SNYDER, J. R. HOWELLS & E. BITTENBENDER.

PISTON.

No. 267,030. Patented Nov. 7, 1882.

Fig. 1.

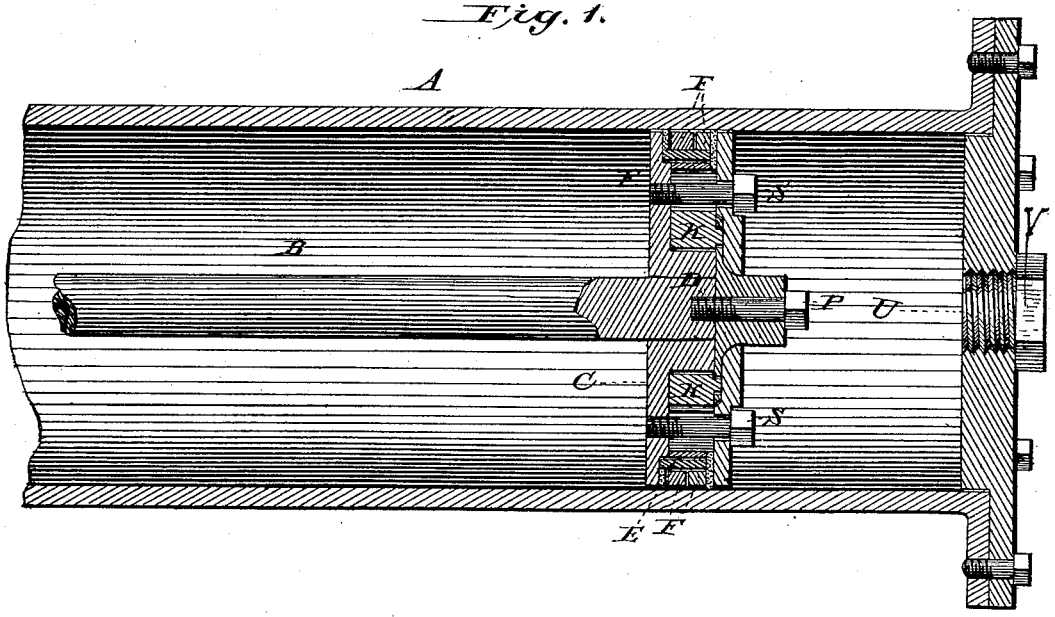


Fig. 2.

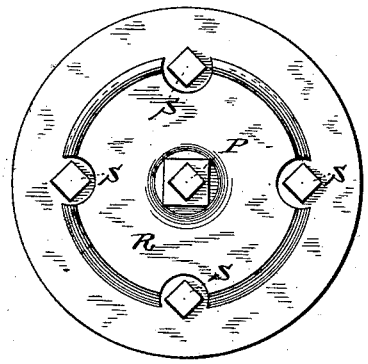


Fig. 3.

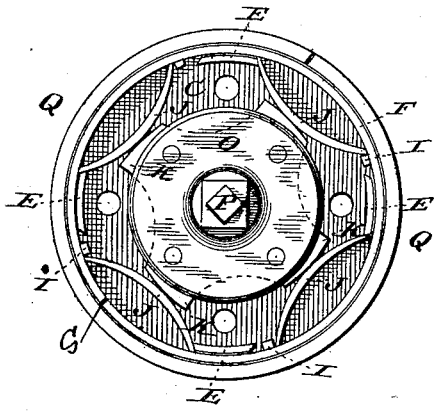
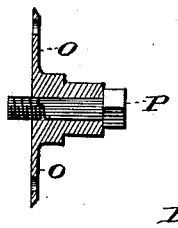


Fig. 10.



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(No Model.) 2 Sheets—Sheet 2.

M. L. SNYDER, J. R. HOWELLS & E. BITTENBENDER.

PISTON.

No. 267,030. Patented Nov. 7, 1882.

Fig. 4.

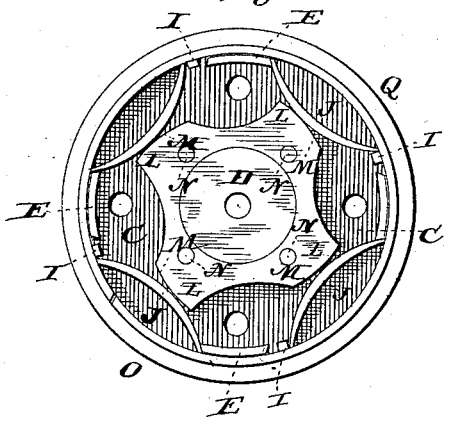


Fig. 5.

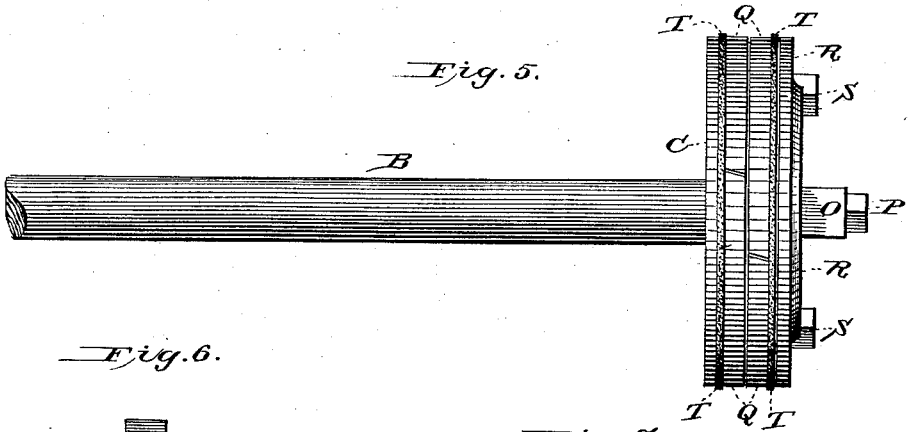


Fig. 6.

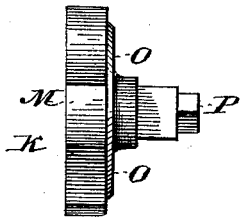


Fig. 7.

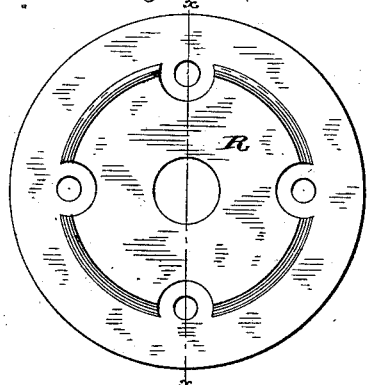


Fig. 8.

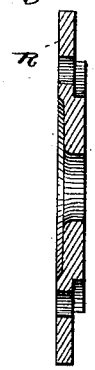
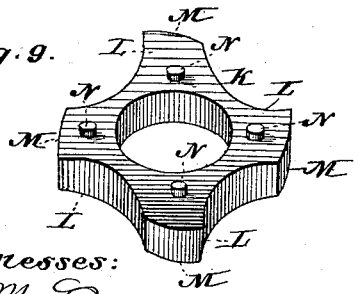


Fig. 9.



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UNITED STATES PATENT OFFICE.

MICHAEL L. SNYDER, JOHN R. HOWELLS, AND ELIAS BITTENBENDER, OF PLYMOUTH, PENNSYLVANIA.

PISTON.

SPECIFICATION forming part of Letters Patent No. 267,030, dated November 7, 1882.

Application filed July 7, 1882. (No model.)

To all whom it may concern:

Be it known that we, M. L. SNYDER, JOHN R. HOWELLS, and ELIAS BITTENBENDER, citizens of the United States of America, residing at Plymouth, in the county of Luzerne and State of Pennsylvania, have invented certain new and useful Improvements in Pistons; and we 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, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification, in which—

Figure 1 is a longitudinal section of a cylinder and piston. Fig. 2 is an end view of the piston. Fig. 3 is an end view of the piston with the covering-plate removed. Fig. 4 is an end view of the piston with plate and collar removed. Fig. 5 is a side elevation of the piston. Fig. 6 is a side elevation of the cam or spider and collar. Fig. 7 is a plan of the covering-plate. Fig. 8 is a section on the line *x x* of Fig. 7. Fig. 9 is a perspective of the cam or spider; and Fig. 10 is a cross-section of the collar, taken through its center.

The object of our invention is to improve that class of pistons in which the packing-rings are expanded by the operation of cams; and it consists in the construction of the cylinder, so that the cams may be reached and operated without moving the head of the cylinder; and it also consists in the construction and arrangement of the parts composing the piston, as will be hereinafter more particularly set forth and claimed.

In order to enable others skilled in the art to which our invention appertains to make and use it, we will now proceed to describe its construction and operation.

A represents the cylinder, and B the piston-rod, which may be made after any approved patterns, and provided with a head, C, which has a boss, D, through which the rod B passes, and four braces or lugs, E, located at equal intervals from each other and equal distances from the center of the head C, around the head near its outer edge. A flat annular spring, F, open at G, is secured to one of the lugs E in any suitable manner. On its inner side the spring is provided with four studs, I, against which and the lugs E the ends of the springs J abut when pressed outward by the cam or spider K. The cam or spider K surrounds the boss D, about which it has a free revolution, and is provided with four arms, L, which have eccentric faces M, for pressing against the springs J and forcing the spring F outward. Four more studs, N, are placed around the top of the cam or spider K, preferably one at the base of each arm L, and fitting down upon these studs a cap, O, is placed upon the cam or spider covering the end of the rod B and the boss D, and held to the end of the shaft by a clamping-screw, P, which passes through the raised center of the cap into the end of the rod. The raised center of the cap is made square to receive a wrench, by which, when the clamping-screw P is loosened, the cam or spider K is revolved sufficiently to press the springs J outward, thereby expanding the spring F and the packing-rings Q, which are of ordinary construction and encircle the springs F. A plate, R, with an opening in its center, passes over the screw P and raised part of the cap down upon the lugs E, where it is secured by any suitable number of screws S, passing through into the piston-head. Thus all the parts within the periphery of the piston-head are inclosed and held in place.

When desired, packing-rings T T may be interposed between the piston-head, plate R, and the packing-rings Q.

In order the more rapidly and easily to reach the clamping and cap screw and overcome the necessity of having to take the engine to the shop and remove the cylinder-head, an opening, U, is made in the head of the cylinder, immediately opposite the head of the clamping-screw, of sufficient size to admit a key-screw, loosening the clamping-screw, turning the cap, and then tightening the screw. The opening U may be closed in any suitable manner. I have shown a screw, V, which will be sufficient in ordinary cases. By this construction of cylinder and piston the packing may be tightened in a leaky piston within a few minutes and the engine resume its work.

Having thus described our invention, we

claim as new and desire to secure by Letters Patent—

The combination of the piston-rod with the head C, having the boss D, through which the piston-rod passes, and also having the four braces or lugs E, the cam or spider K, surrounding said boss D, the cap O, secured to said cam or spider, the annular spring F, open at G, and having the studs I on its inner surface, the springs J, braced against the studs I and lugs E, the packing-rings, the plate R, screws S, connecting the plate R and head C, and screw P, running through the cap O and screwing into the end of the piston-rod, substantially as and for the purpose shown and described.

In testimony whereof we affix our signatures in presence of two witnesses.

MICHAEL L. SNYDER.
JOHN R. HOWELLS.
ELIAS BITTENBENDER.

Witnesses:
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THOS. M. HOWELLS.