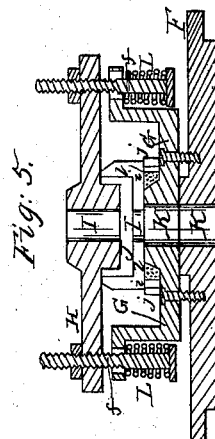
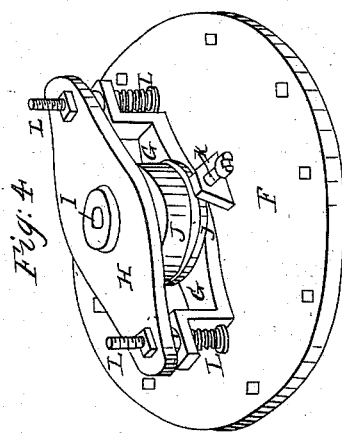
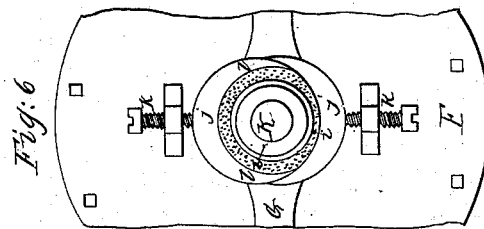
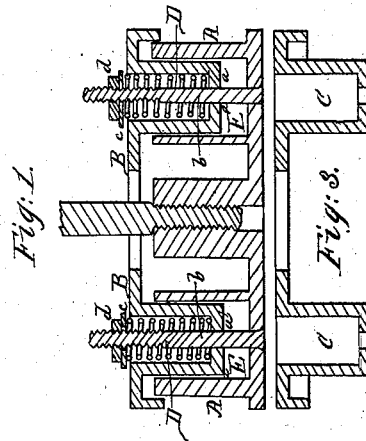
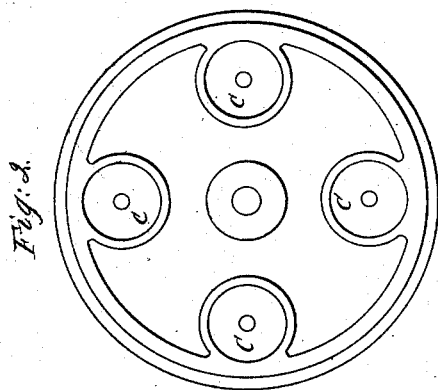


No. 3,186.

PATENTED JULY 20, 1843.

E. K. & C. EVERSOLE.  
STEAM ENGINE.



# UNITED STATES PATENT OFFICE.

E. K. EVERSOLE AND C. EVERSOLE, OF ST. LOUIS, MISSOURI.

## PISTON AND STUFFING-BOX OF STEAM-ENGINES.

Specification of Letters Patent No. 3,186, dated July 20, 1843.

*To all whom it may concern:*

Be it known that we, ELIJAH K. EVERSOLE and CYRUS EVERSOLE, of St. Louis, in the county of St. Louis and State of Missouri, have invented certain new and useful Improvements in the Manner of Constructing Steam-Engines; and we do hereby declare that the following is a full and exact description thereof.

Our first improvement is in the manner of constructing the piston so as to give to it a degree of elasticity independent of that existing in the ordinary hemp, or other elastic packing; by means of which improvement we are enabled to run an engine on the western waters for seven or eight days without its being necessary to take off the cylinder head for the purpose of repacking, a labor which has usually to be performed about once in every twenty-four hours.

Our second improvement consists in the manner in which we construct the stuffing box of the cylinder-head through which the piston passes. It is well known to all engineers of the class of steam-boats used on the western waters, that it is not possible to keep the piston rod at all times in a line with the axis of the cylinder. The form of such a boat is continually varying, from its own unavoidable motion; from the loading and unloading of it; and from a variety of other circumstances. The inevitable result of this change of form is that the piston rod, as the piston descends, is made to bear with a varying and undue force against one, or the other, side of the stuffing box, and is not only cramped in its motion, but produces friction, wear and leakage, to a very injurious extent. By means of what we denominate a vibrating stuffing box, to be presently described, we obviate this difficulty altogether.

In the accompanying drawing, Figure 1, is a section through the axis of the piston, A, A, being its main body, and B, its cap, or follower. Fig. 2, is a top view of main body of the piston, the cap, or follower, being removed; and Fig. 3, is a vertical section through the follower alone; in this, there are formed four, six, or more, cylindrical cavities C, C, which are to receive the spiral springs D, D, that bear against their bottoms, a, a. The cylinders, C, C, with their contained springs, are received within cylindrical cavities E, E, formed for

that purpose in the main body of the piston; b, b, are screw bolts which are made fast to the bottom of the piston, and receive washers c, c, at their upper ends, upon which the nuts d, d, are screwed down. The spiral springs are of such length as to rise above the top of the follower B, and may be pressed upon with any required degree of force by the nuts d, d. The piston is to be packed in the usual manner, while the follower is borne up by the spiral springs; and it may then be tightened in my required degree by screwing down the nuts; but this is never to be done to such extent as to bring the follower into contact with the piston, it being necessary to retain the elastic action of the springs. By this arrangement of the piston, we obtain a close, elastic, and durable packing, and obviate that great loss of power which results from the mode of packing now in general use; in this mode it is necessary to screw up the follower perfectly tight, to prevent its leaking, and insure its continued action for a space of twenty four hours. When a piston is thus screwed up, on the present plan, its friction is so great that it requires nearly double the weight upon the wheel to move it, that is required upon our improved plan; and it may be very fairly estimated that during one half the time between the periods of packing, as ordinarily performed, this increased friction continues to a great extent, while during a large portion of the other half there is a loss of steam from the unavoidable wear of the packing. The compensation resulting from the elasticity of the spiral springs will, on the contrary, under our arrangement cause it to operate with nearly perfect equality, for seven, or eight, days.

Fig. 4, is a perspective view of our improved stuffing box; and Fig. 5, a vertical section through the middle thereof. F, is the cap of the cylinder.

G, is a stand of metal which may be secured to the cap by screws, or otherwise.

H, is the top plate of the stuffing box, which has an opening I, through it adapted to the size of the piston.

J, is a box for containing the packing, the hole I, through which is also adapted to the size of the piston. The bottom of the box J, is ground perfectly flat, as is also that part of the stand G, upon which it bears.

The hole K, in the stand G, and in the cylinder head is made larger than is necessary for the passing of the piston—say an inch, more or less—as the box J, is to have a sliding, lateral motion on the stand. It is necessary, also, that a like freedom of motion laterally, should be given to the top plate, H, which makes part of the stuffing box. The plate H, is attached to the stand G, by screw bolts *f, f*, the heads *g, g*, of which bear against the spiral springs L, L; the bolts *f, f*, pass through the holes *h, h*, much larger than themselves in the stand G, so as to admit of the same lateral motion in the cap H, as is allowed to the box J.

The projecting neck *i, i*, of the stand G, is surrounded by an elastic packing, which is kept in place in the following manner; *j, j*, Fig. 5, is a divided ring which is borne up by set screws, *k, k*, against a portion of elastic packing *l, l*; and the box J, with its appendages, is thus enabled to slide easily on its seat without the danger of abrading the metal. By this arrangement of the stuffing box of the piston rod, as great an allowance may be made for the deviation of the cylinder in the line of its axis, as is likely to occur under ordinary circumstances, and the cramping, wear, and leakage, so frequent and injurious in this part

of the engine, are effectually guarded against.

Having thus, fully described the nature of our improvements in the steam engine, and shown the operation of the same, what we claim therein as new, and desire to secure by Letters Patent, is—

1. The manner in which we construct our elastic piston, by securing the main body thereof and the follower together, by means of screw bolts passing through spiral springs, under an arrangement of parts substantially the same with that herein described, so that the follower shall have a yielding motion to and fro, in the manner, and for the purpose, above made known.

2. We claim the constructing of the stuffing box of the piston rod, so as to allow of a lateral motion to the same, so far as to compensate for any ordinary deviation of the cylinder from its correct position, such lateral motion being attained by an arrangement of the respective parts substantially as above set forth.

ELIJAH K. EVERSOLE.  
CYRUS EVERSOLE.

Witnesses:

SAMUEL MANNING,  
I. B. EVERSOLE.