

J. M. MARSHALL.
 Furnace Doors for Steam-Engines, Locomotives, &c.

No. 197,044.

Patented Nov. 13, 1877.

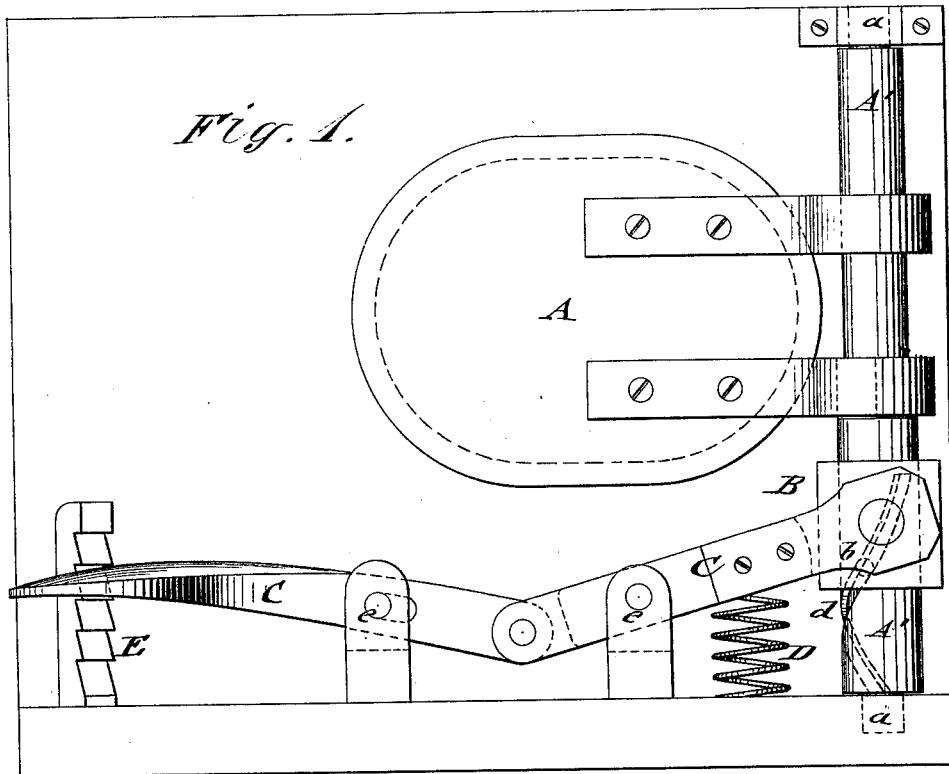
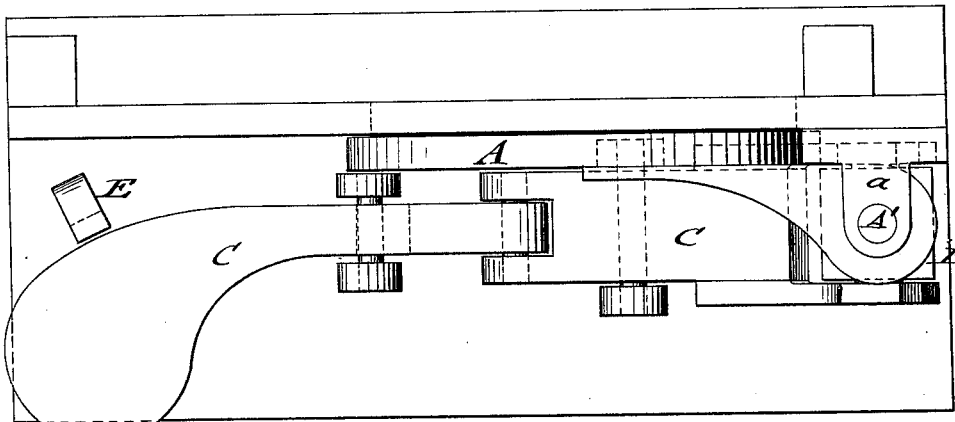


Fig. 2.



WITNESSES:

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INVENTOR:

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UNITED STATES PATENT OFFICE.

JAMES M. MARSHALL, OF KNOXVILLE, TENNESSEE.

IMPROVEMENT IN FURNACE-DOORS FOR STEAM-ENGINES, LOCOMOTIVES, &c.

Specification forming part of Letters Patent No. **197,044**, dated November 13, 1877; application filed August 3, 1877.

To all whom it may concern:

Be it known that I, JAMES M. MARSHALL, of Knoxville, in the county of Knox and State of Tennessee, have invented a new and Improved Furnace-Door, of which the following is a specification:

In the accompanying drawing, Figure 1 represents a front elevation of a furnace with my improved door, and Fig. 2 a plan view of the same.

Similar letters of reference indicate corresponding parts.

This invention relates to an improved furnace-door for locomotives, portable or stationary engines, and other purposes, by which the engineer is relieved entirely from the duty of opening the door, so that he can give all his attention to the track and engine.

The construction of the furnace-door is such that the same is merely thrown open for a length of time sufficient to throw in the fuel, and automatically closed when the fuel is in the furnace, or, if desired, retained open for a certain width, so that thereby the fire is kept up more regularly, and the pressure of steam prevented from changing in the boiler by the air entering to the furnace every time the door is opened for receiving coal.

The invention consists of a furnace-door that is opened and closed by means of a jointed and spring-acted treadle depressed by the foot of the fireman, the treadle working a slide-block and moving a spiral groove of the shaft or pivot-rod of the door. A rack serves to retain the treadle and door when a steady air-draft or full open door is required.

Referring to the drawing, A represents a furnace-door of a locomotive or other engine, which is hung to a vertical shaft, A', turning in suitable top and bottom bearings *a*.

A slide-block, B, that is operated by a jointed treadle, C, engages, by means of a pin or lug, *b*, the spiral groove *d* of shaft A', so as to open or close the door by the downward or upward motion imparted to the slide-block.

The treadle C is made of two sections, which swing on separate fulcrums *e e*, one section

being pivoted to the slide-block B, and acted upon by a strong spiral or other spring, D, that forces the slide-block in upward direction, the other section being hinged to the opposite end of the spring-acted section, and enlarged to form a substantial rest for the foot. By depressing the outer enlarged treadle-section, the spring-acted section and slide-block are carried down, and the furnace door swung into open position. By releasing the treadle the spring throws the slide-block upward and closes instantly the door.

The fireman may thus, on arriving with a shovelful of coal, open the door by stepping on the treadle. After the coal or wood is thrown in, the door is instantly closed by the spring as soon as he takes his foot from the treadle and steps back to get another shovel of coal. This keeps up a regular heat in the furnace, as the air is not allowed to enter and cool off the top layer of coal, which cooling lowers the pressure in the boiler, and requires several minutes to regain the same.

When it is desired to keep up a draft of air to the fire for reducing the pressure of steam in the boiler, or other purpose, the door is kept open from three inches to the entire width of the door by throwing the enlarged part of the treadle with the foot into a toothed rack, E, secured to the floor. In this manner the fire is kept up with greater regularity and convenience, and thereby greater speed and a saving of fuel obtained.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

The combination of a swinging furnace-door turned by a spirally-grooved shaft and slide-block with a compound and spring-acted treadle, and with a fixed and toothed rack for holding the door open at any width, substantially as set forth.

J. M. MARSHALL.

Witnesses:

W. C. JONES,
CHARLES BAUM.