(No Model.)

W. T. WILLARD.

THROTTLE VALVE.

No. 363,872. Patented May 31, 1887.

Fig. 1.

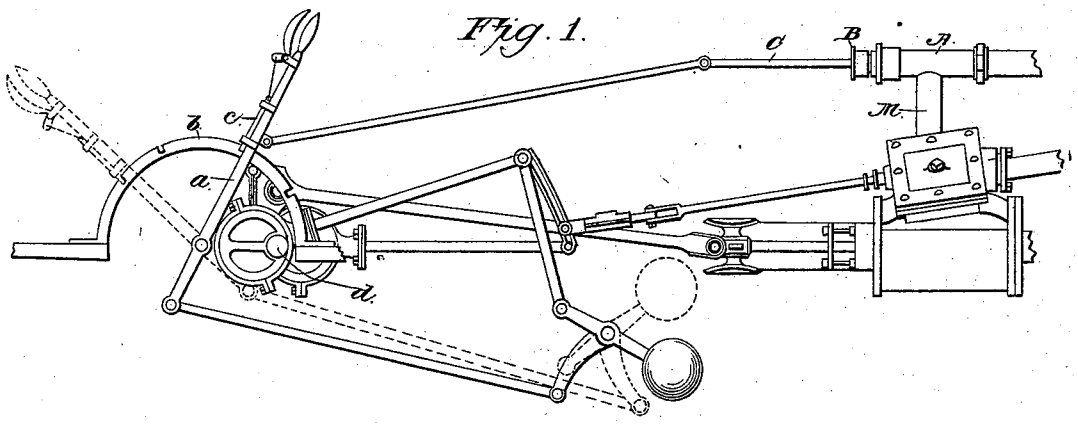


Fig. 2.

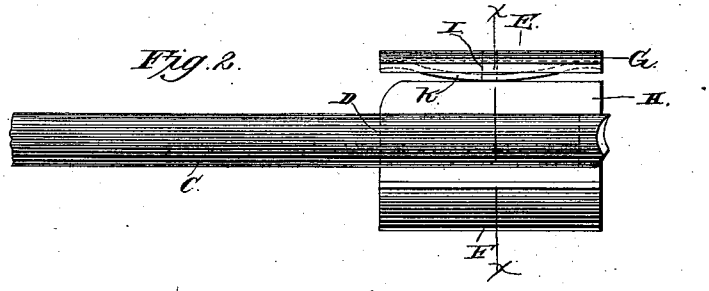


Fig. 3.

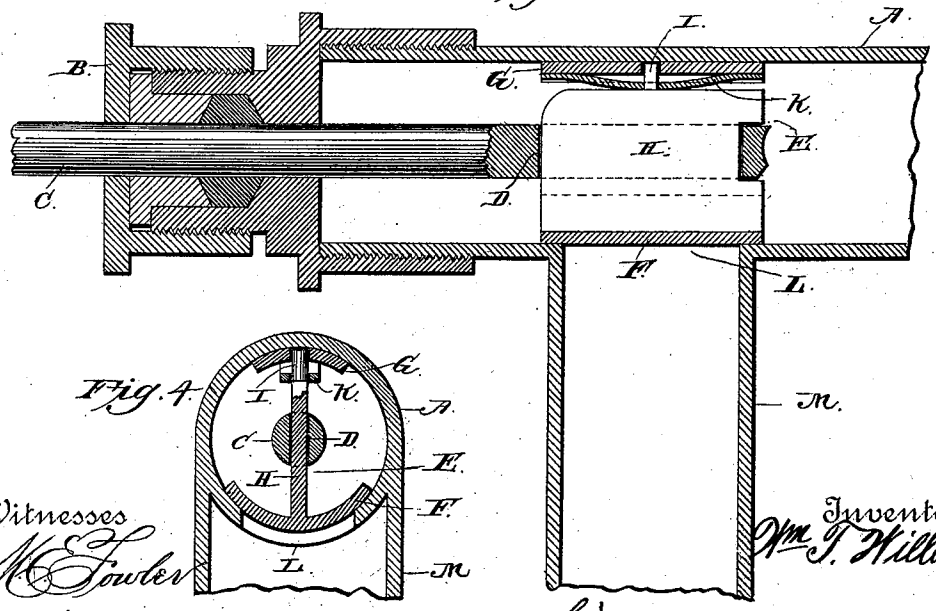


Fig. 4.

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UNITED STATES PATENT OFFICE.

WILLIAM T. WILLARD, OF HAMPSHIRE, ILLINOIS.

THROTTLE-VALVE.

SPECIFICATION forming part of Letters Patent No. 363,872, dated May 31, 1887.

Application filed February 10, 1887. Serial No. 227,159. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM T. WILLARD, a citizen of the United States, residing at Hampshire, in the county of Kane and State of Illinois, have invented a new and useful Improvement in Throttle-Valves for Steam-Engines, of which the following is a specification.

My invention relates to an improvement in throttle-valves for steam-engines; and it consists in the peculiar construction and combination of devices that will be more fully set forth hereinafter, and particularly pointed out in the claims.

In the drawings, Figure 1 is an elevation of the link-motion of a steam-engine with my improved throttle-valve attached thereto. Fig. 2 is a detached elevation of the throttle-valve. Fig. 3 is a vertical longitudinal sectional view of the same. Fig. 4 is a vertical transverse sectional view taken on the line *x x* of Fig. 2.

A represents the valve-case, which comprises an ordinary T-coupling, such as is in common use for coupling pipes. To one end of the valve-case is screwed a stuffing-box, B, through which extends a valve rod, C. The inner end of the valve-rod is provided with a transverse longitudinal slot, D.

E represents a shoe comprising separable sections F and G, each of which forms a portion of a cylinder. From the lower section, F, projects a web, H, which forms a key that is adapted to enter the slot in the rod C, and from the upper side of the said web or key projects a stud, I, which enters a central opening made in the upper section, G. A flat curved spring, K, is placed on the upper side of the key or web, and bears against the under side of the upper section, G, and serves to normally press the sections F and G from each other, so as to cause the shoe to fit snugly in the cylindrical bore of the valve-case. The said spring K is provided with a central opening, through which the stud I projects, and thereby the said spring is secured firmly in place in the shoe. This shoe is adapted to work over the central opening, L, of the valve-case, which communicates with the pipe M, that leads to the steam-chest of the engine. The end of the valve-case which is opposite the stuffing-box communicates with the boiler of the engine.

It will be observed by reference to Figs. 3 and 4 that the sides of the shoe are open from end to end thereof, so that the steam which enters the valve-case from the boiler is free to pass through the reciprocating shoe. This prevents the steam from pressing against either end of the shoe, and enables the latter to be easily moved lengthwise in the case, so as to either entirely close the opening L or to open the same to the desired extent, according to the quantity of steam which it is desired to feed to the engine.

Ordinarily reversing engines are provided with two operating-levers, one attached to the throttle-valve and the other attached to the link-motion. I propose to employ only one lever to operate both the throttle-valve and the link-motion, and thus enable the engine to be stopped, started, or reversed by a single movement on the part of the engineer, and to this end I connect the operating-rod of the throttle-valve to the lever *a*, which is connected to the link-motion, as shown in Fig. 1. The said lever *a* works against a segment-plate, *b*, and is provided with the usual locking bolt or detent, *c*, to engage the notches of the segment-plate, and thereby lock the operating-lever at any desired point.

As shown at Fig. 1, the lever *a* is at its initial position and the shoe of the throttle-valve is over the discharge-opening of the valve K, thus closing communication between the boiler and the steam-chest of the engine. When the lever is in this position, the link is moved so that the slide-pin attached to the valve-stem of the engine is directly in the center of the link, and thereby no motion is communicated to the side valve of the engine from the shaft *d* thereof, and consequently the engine is at rest. By moving the lever *a* in either direction the throttle-valve will be opened to admit steam to the steam-chest, and at the same time the link will be moved so as to move the slide-valve so that one port of the steam-chest will be uncovered, and thereby the engine will be started.

The link-motion shown in Fig. 1 is of the usual form employed in locomotive steam-engines, and consequently is not more fully described herein, as it is well known to persons skilled in this art.

Having thus described my invention, I claim—

1. In a throttle-valve, the combination of the

case having the opening L and the endwise movable shoe in the said case adapted to close or open the said opening, said shoe comprising the cylindrical section F, bearing against one side of the valve-case, and having the key or web H, provided on its outer edge with the stud I, the section G, bearing against the opposite side of the case and having the central opening to receive the stud, and the flat spring K, bearing between the opposing sides of the key or web and of the section G, and having an opening through which the stud projects, substantially as described.

2. In a throttle-valve, the combination of the case having the opening L, the rod arranged to reciprocate longitudinally in the case, and having the opening D, the cylindrical section F, bearing against one side of the bore of the valve-case, and having the web or key extending through the opening in the rod, and provided on its outer edge with the stud I, the section G, secured on the said stud and bearing against the opposite side of the bore of the valve-case, and the spring bearing between the key or web and the section G, for the purpose set forth, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

WILLIAM T. WILLARD.

Witnesses:
C. W. TERWILLIGER,
DAVID W. SHOLES.