

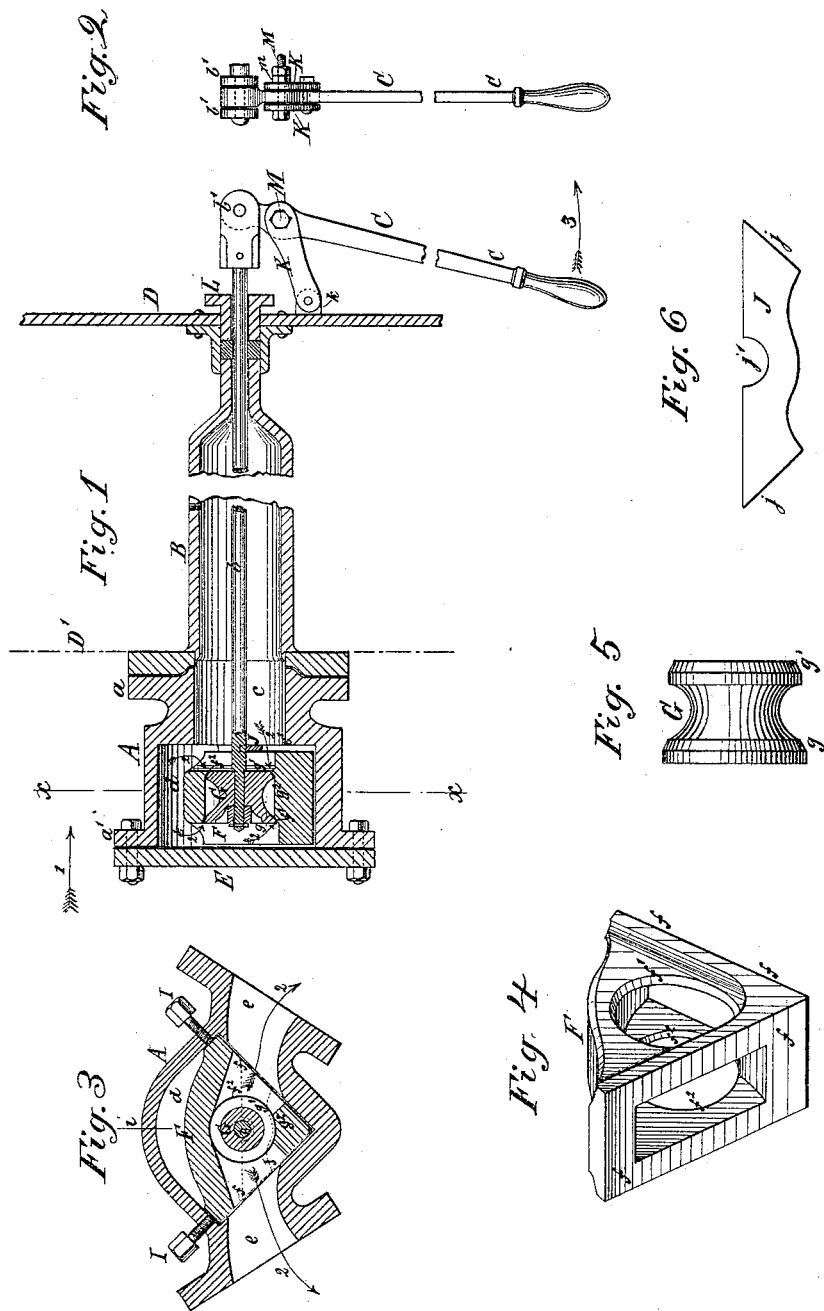
(No Model.)

MANUEL DE MA. CAMPOS.

LOCOMOTIVE STEAM VALVE.

No. 344,171.

Patented June 22, 1886.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

MANUEL DE MA. CAMPOS, OF CARDENAS, CUBA.

## LOCOMOTIVE STEAM-VALVE.

SPECIFICATION forming part of Letters Patent No. 344,171, dated June 22, 1886.

Application filed March 11, 1886. Serial No. 194,800. (No model.)

*To all whom it may concern:*

Be it known that I, MANUEL DE MA. CAMPOS, a citizen of Spain, and a resident of Cardenas, Cuba, have invented certain new and useful

Improvements in Locomotive Steam-Valves, of which the following is a specification.

My invention relates to balanced valves for admitting and regulating the admission of steam from the boiler to the cylinders of a locomotive-engine, but applicable also to other engines, whether stationary, portable, or marine.

The invention comprises the combination, with a duplex or balanced circular valve or cone-valve and the valve-casing, of a separate removable valve-seat and means of tightly securing the same in the casing, whereby the inspection, adjustment, insertion, and removal of the valve are greatly facilitated; also, the means of relieving the valve of the downward pressure and one-sided wear due to the weight of the valve-rod; also, the means of retaining the valve in any position partly or wholly open or closed without the use of the ordinary latch-lever and ratchet-bar or segment.

The invention will be hereinafter fully described, and then specifically pointed out in the claims, reference being had to the accompanying drawings, in which—

Figure 1 represents a longitudinal sectional elevation of my improved steam-valve, with valve-rod and operating-lever attached, the parts being shown in position as when the valve is fully closed. Fig. 2 is a rear or edge view of the operating-lever. Fig. 3 is a cross-section on the line *xx* of Fig. 1, seen in direction of arrow 1. Fig. 4 is a detail perspective view, from the outside, of the detachable valve seat or piece in which the cones of the duplex valve tighten against corresponding seats or surfaces. Fig. 5 is a detail side view of the duplex cone-valve, seen from the same side as in Fig. 1. Fig. 6 is a detail front view of the guide-piece and support for the valve-rod. Figs. 4, 5, and 6 are drawn to a larger scale than the other figures.

A is the valve-casing, arranged as usual in the smoke-chamber at the front end of the boiler. In Fig. 1 it is shown in position, connected to the so-called "dry-tube," B, which leads the steam to the casing A, and in which

is situated the bar or rod *b*, by which the valve is connected to the operating-lever C on the rear end plate, D, of the boiler. The dotted line *D'* indicates the outline of the front end plate in the smoke-chamber of the boiler.

The casing A has at its inner end a flange, *a*, for securing it to the boiler and dry-tube, and at its outer or front end a flange, *a'*, for securing to it the cover E. The rear portion of the casing A has interiorly, adjoining the dry-tube, a round bore or inlet, *c*, and in front thereof a valve-chamber, *d*, whose opposite sides are planed and meet at an angle of about ninety degrees, forming a longitudinal V-groove in the bottom of the chamber, from the inclined sides of which issue transversely the flanged channels *e*, through which, and the usual steam-pipes connected to them, steam is admitted to the cylinders in the direction of arrows 2 when the lever C is moved in direction of arrow 3, to open the steam-valve.

F is the valve-seat, a separate hollow casting having planed and inclined sides *f* meeting below at exactly the same angle as the inclined sides of the valve-chamber *d*, so as to fit and be readily fastened steam-tight against the latter. Through the inclined sides *f* of the hollow valve-piece F are openings communicating with the transverse channels *e*, and through its end walls are openings *f'* *f'*, forming contact surfaces or seats fitted to receive tightly the corresponding respectively larger and smaller valve-surfaces, *g* *g'*, of the ordinary double-cone valve, G.

The seat-piece F is kept tightly to its place in the casing A by lateral set-screws I through the upper casting, as shown in Fig. 3, or by a set-screw placed at *i* centrally; or it may be tightened by wedges between it and the casing, where the screws I are shown; but the set-screws are preferable, for obvious reasons.

It will be seen with reference to Figs. 1 and 3 that the lower portion of the piece F has, in the direction of the sliding movement of the valve G, a solid portion, *g*<sup>2</sup>, on which the weight of the valve may be supported when moving. In order, however, that this shall not support also the weight of the rod *b*, (which is considerable, and would cause much extra wear of the valve,) I support the forward end of the said rod in a suitable semicircular

groove,  $j'$ , upon a bar or bridge, J, having inclined end edges,  $j$ , underneath, by which it fits exactly, and is supported on the inclined sides of the chamber  $d$ , being held in place in the direction of the valve movement by simply being jammed between the inner end surface of the seat-piece F and the shoulder  $c'$ , formed at the junction of the valve-chamber  $d$  and bore  $c$ . The end of the valve-rod  $b$  has a diametrically-reduced portion, which passes through a hole in the axis of the valve G, the latter being secured on the rod by a nut,  $n$ , on the threaded end of the reduced portion. A pin may be inserted crosswise through a hole in the end of the rod, as shown in Fig. 1, to prevent the nut from accidentally getting loose. It is evident that by this construction it is an easy matter to inspect, fit, clean, adjust, remove, and replace the valve G, seat E, and guide-bar J without, as heretofore, removing the casing A and the steam-pipes attached to it and to the cylinders, as all the parts are conveniently accessible and removable by simply taking off the end cover, E, the pin, and nut  $n$ , and loosening the set-screws I. The outer surface (at  $g$ ) of the valve G being slightly larger than the inner surface, (at  $g'$ ), the tendency of the steam-pressure is that desired to keep the valve against its seats when closed; otherwise the valve is balanced, inasmuch as the steam in the chamber  $d$  presses on both ends of the valve in opposite directions.

To retain the valve in position at any degree of opening without the use of the ordinary latch-lever, (which does not allow of retaining it in any other position than those determined by the location of the notches in the segment bar or rack,) I have provided the following simple device: The hand-lever C, pivoted to a jaw,  $V$ , upon the end of the rod  $b$ , is fulcrumed by a bolt, M, to and between the outer ends of two links, K, which are pivoted with their inner ends to a stationary lug,  $k$ , at the end of the boiler. On the bolt M are suitable washers and jam-nuts,  $m$ , by tightening which the lever C may be clamped between the links K with friction sufficient to retain it, and thereby the valve G, in any position desired, while the pivoting of the links to the lug  $k$  allows of moving the lever on its fulcrum without causing the rod  $b$  to bind in its stuffing-box L when sliding.

Having thus described my invention, I claim

as new and desire to secure by Letters Patent— 55

1. The combination, with a casing, A, having a valve-chamber,  $d$ , with two oppositely-inclined sides, and with a valve, G, of a separate detachable hollow piece, F, formed to fit steam-tight in the angle between the said inclined sides, the said piece serving as seat to the said valve, and forming the steam communication between the inlets and outlets of the casing. 60

2. The combination of the casing A, having two opposite sides of its valve-chamber  $d$  converging downward at an angle, the valve-seat F, having suitable steam-passages and converging sides to fit in the said angle, and the set-screws I, threaded through the said casing A, to press and secure the said valve-seat F firmly in the said angle. 65 70

3. In combination with the casing A, provided with valve-seat, and the rod  $b$ , having the valve G secured upon it, the bar J, having guide-groove  $j'$ , and placed in the said casing to support the said valve-rod, for the purpose set forth. 75

4. In combination with the casing A, having steam-passage  $c$ , valve-chamber  $d$ , with two opposite sides converging downward at an angle, a shoulder,  $c'$ , at the junction between said passage and chamber, and a removable valve-seat, F, fitting the said angle, and with the valve G and valve-rod  $b$ , the bar J, having its end edges beveled at  $j$ , to fit and rest in the said angle, and a guide-groove,  $j'$ , to support the said valve-rod, and being clamped in position laterally between the said valve-seat F and shoulder  $c'$ , for the purpose set forth. 80 85

5. In combination with a steam-balanced valve, G, and its valve-rod  $b$ , and with the valve-lever C, pivoted to the outer end of the said rod  $b$ , the links K, pivoted at their inner ends to a stationary lug,  $k$ , and at their outer ends to the fulcrum-pin M of the said lever C, and means, substantially as described, for clamping the said levers more or less tightly between the said links, for the purpose of retaining the valve in position, as set forth. 90 95 100

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 1st day of March, 1886.

MANUEL DE MA. CAMPOS.

Witnesses:

J. H. WASHINGTON,  
F. J. LAUREN.