

T. Sault,

Steam Balanced Valve,

Patented Aug. 28, 1866.

N^o 57,579.

Fig. 1

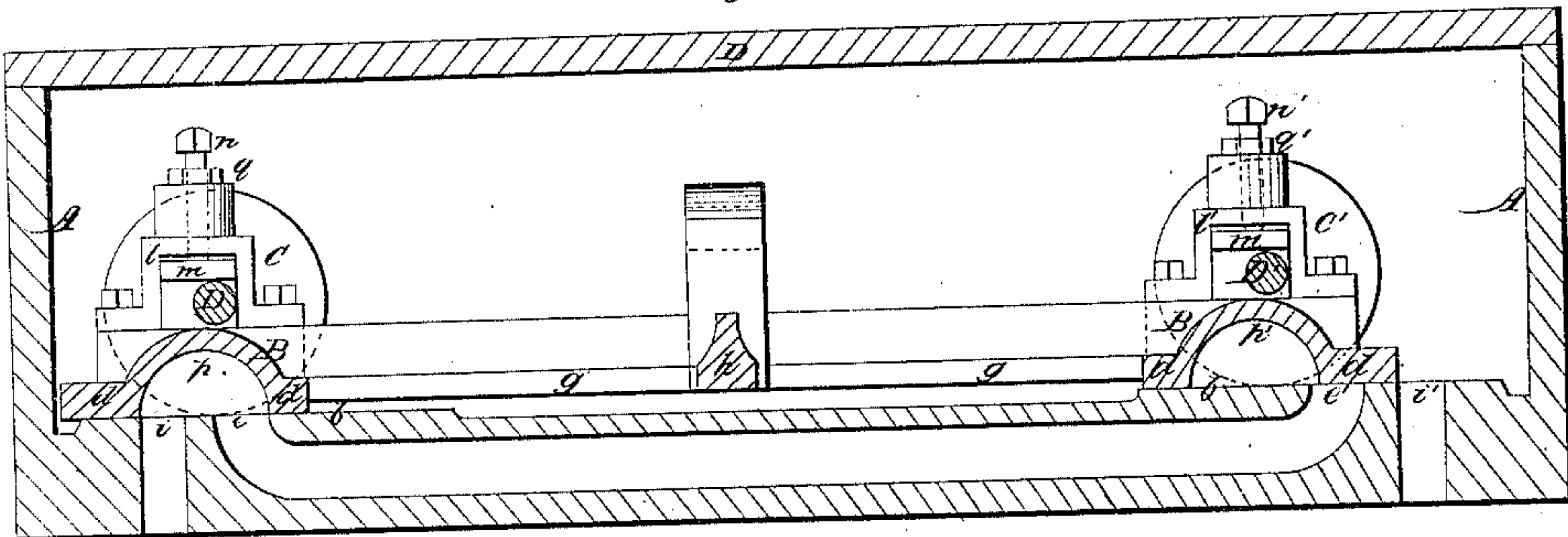
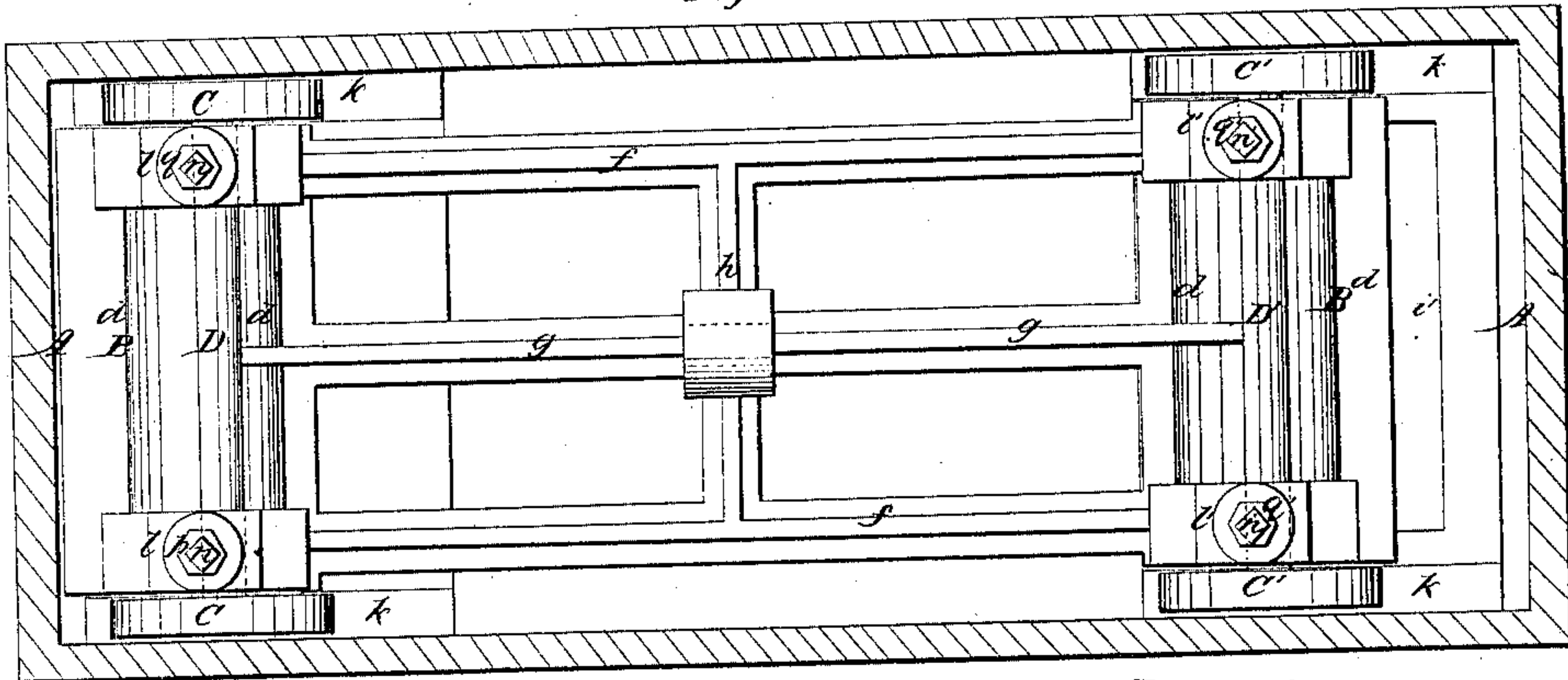


Fig. 2.



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Witnesses:

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THOMAS SAULT, OF NEW HAVEN, CONNECTICUT.

IMPROVEMENT IN STEAM-ENGINE SLIDE-VALVES.

Specification forming part of Letters Patent No. 57,579, dated August 28, 1866.

To all whom it may concern:

Be it known that I, THOMAS SAULT, of the city of New Haven, in the county of New Haven and State of Connecticut, have invented a new and useful improvement in the application of rollers to slide-valves of steam-engines to relieve their faces and seats of friction; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a longitudinal vertical section of a valve-chest, valve-seat, and slide-valve, illustrating my invention. Fig. 2 exhibits a horizontal section of the valve-chest and a plan of the valve and seat.

Similar letters of reference indicate corresponding parts in both figures.

This invention consists in a novel mode of supporting the valve upon the rollers and adjusting it relatively thereto, whereby the pressure of the steam upon the back of the valve is transferred to the rollers, and the face of the valve and seat are relieved of all appreciable friction.

To enable others skilled in the art to apply my invention to use, I will proceed to describe it with reference to the drawings.

A is the valve-chest, and *b* the valve-seat. *i i'* are the steam-ports leading to the cylinder, and *e e'* the exhaust-ports leading to the exhaust-pipe.

B is the slide-valve, having two cavities, *p p'*, to bring the steam-ports into communication with the exhaust-ports, and having the operating parts *d* around these cavities suitably faced to cover and lap the ports and fit the valve-seat, but having the other parts, *f g h*, in the form of a skeleton frame, which merely connects the operating parts. These parts *f g h* are surrounded by the steam, so that the pressure acts upon them in all directions alike.

C C and C' C' are two pairs of hardened-steel rollers, running on ways *k k*, faced with hardened steel at the sides of and parallel with the valve-seat. These rollers are firmly secured to opposite ends of hardened-steel axles D D', which are arranged one across each operating part *d* of the valve, and each of which passes through two bridge-pieces or yokes, *l l* or *l' l'*, secured on the back of the valve.

These bridge-pieces or yokes are arranged close to the sides of the valve above the operating parts *d d*. Within the said bridge-pieces or yokes there are fitted flat hardened-steel saddle-plates *m m'*, which are adjustable perpendicularly to the face and seat of the valve by means of set-screws *n n'*, screwing through the tops of the bridge-pieces, the under or inner faces of the said plates being parallel with the face and seat of the valve. *q q'* are jam-nuts fitted to the said set-screws on the top or back of the bridge-pieces *l l*.

The operating parts of the valves around the cavities *p p'* and the seat *b* having been faced in the usual manner, perfectly smooth, the valve is fitted and adjusted to its seat in the following manner: A sheet of tissue-paper is first laid smoothly upon the seat, and the valve, having had the rollers attached, is placed upon it, the set-screws *n n'* having been first screwed back from the saddle-plate. The valve is next pressed and held firmly down upon the paper by means of set-screws inserted through strong plates or bars, temporarily secured across the back of the valve-chest before the bonnet-plate D is put on. While the valve is thus held against the seat the screws *n n'* are all screwed down to bring the saddle-plates to a firm bearing upon the axles of the rollers and bring all of the rollers to firm bearings on the ways *k k*, and then secured by the jam-nuts *p p'*. The temporarily-applied bars and set-screws just above spoken of are then removed from the valve-chest and valve, and the paper taken from under the valve, and the cover or bonnet of the valve-chest put on.

When the valve is in operation it is so suspended from the axles D D' of the rollers C C' by means of the bridge-pieces *l l'*, saddle-plates *m m'*, and set-screws *n n'*, that it works just in steam-tight contact with the seat, but without any appreciable friction thereon. As the valve moves back and forth the pressure of the saddle-plates *m m'* upon the axles D D' produces the rotary motion of the latter, and so causes the rollers C C' to roll upon the ways *k k*; but in this movement of the rollers and axles there is no rubbing friction, as not only is the friction of the rollers upon the ways *k k* of the rolling kind, but so is the friction of the saddle-plates upon the axles D D', and hence there is no appreciable resistance to the move-

ment of the valve, whatever the pressure of steam on the back of it. The points of suspension of the valves from the axles being close to the rollers, there is no springing of the axles produced by the pressure of the steam on the valve.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A valve suspended from the axles of the rollers, substantially in the manner and for the purpose herein set forth.

2. The adjustable saddle-plates *m m'*, adjusting-screws *n n'*, and bridge-pieces *l l'*, in combination with the slide-valve, rollers, and axle, substantially as described, for the purpose specified.

THOMAS SAULT.

Witnesses:

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