(No Model.)

LE GRAND SKINNER.

SLIDE VALVE FOR STEAM ENGINES.

No. 287,878. Patented Nov. 6, 1883.

Fig. 1.

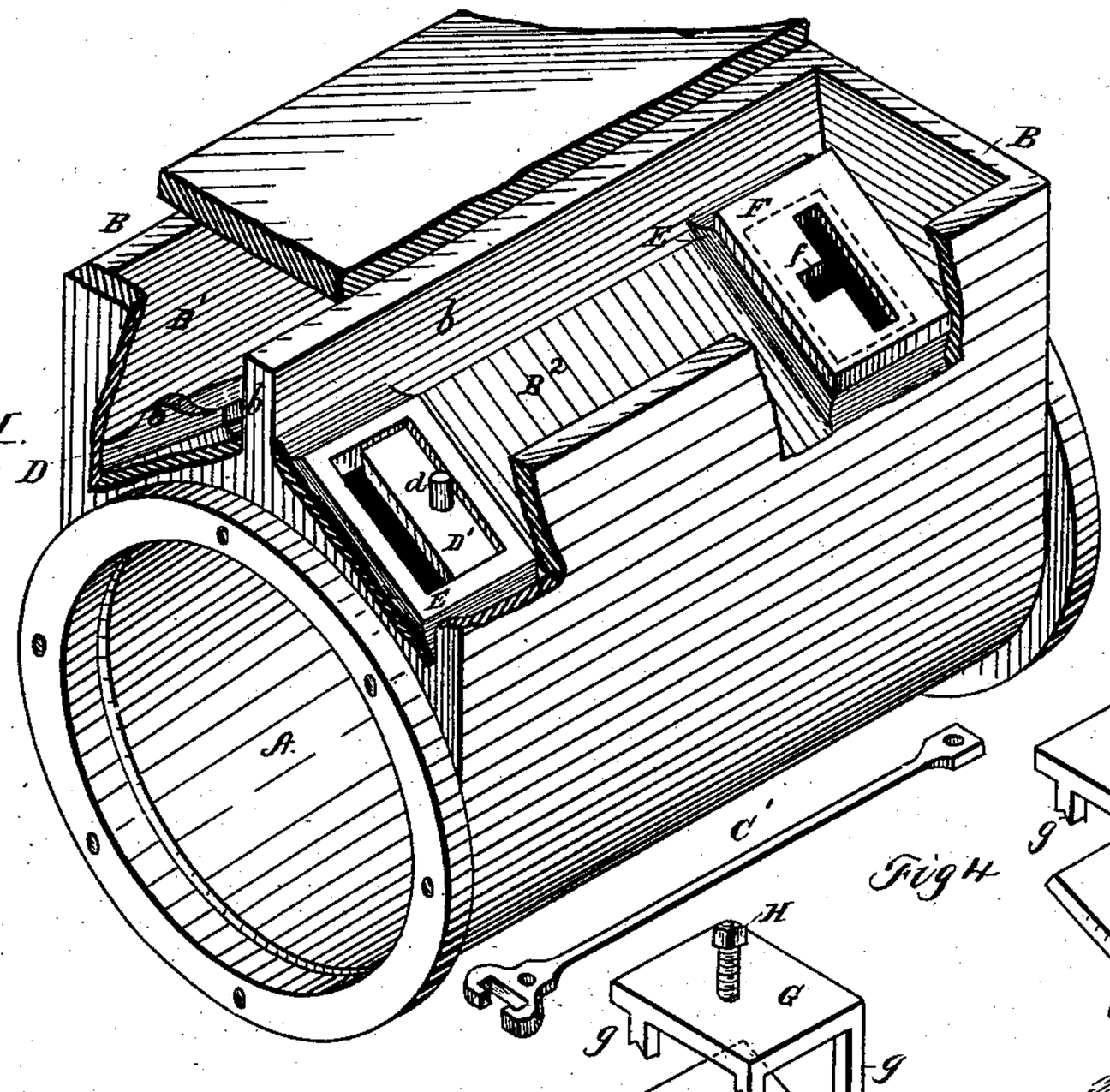


Fig. 4.

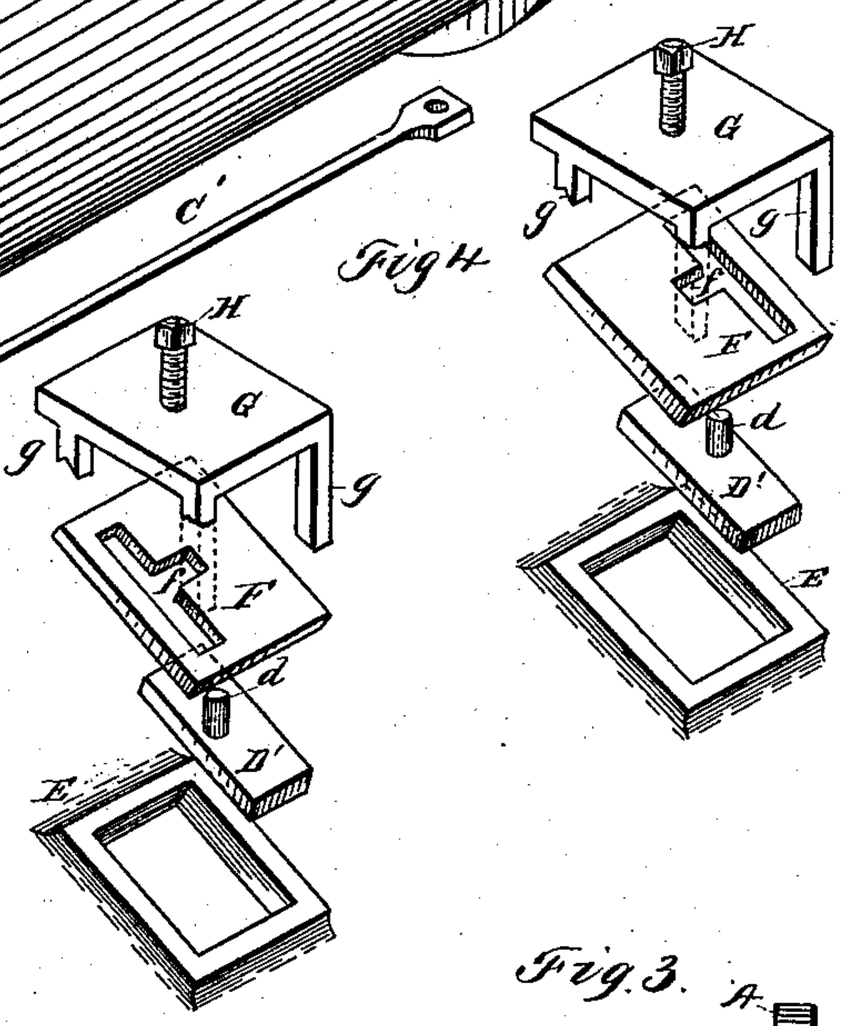


Fig. 2.

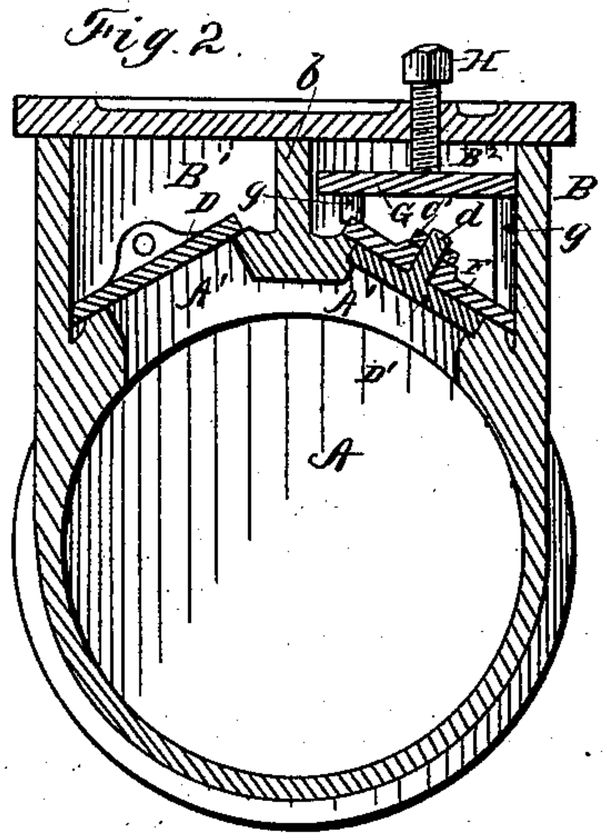
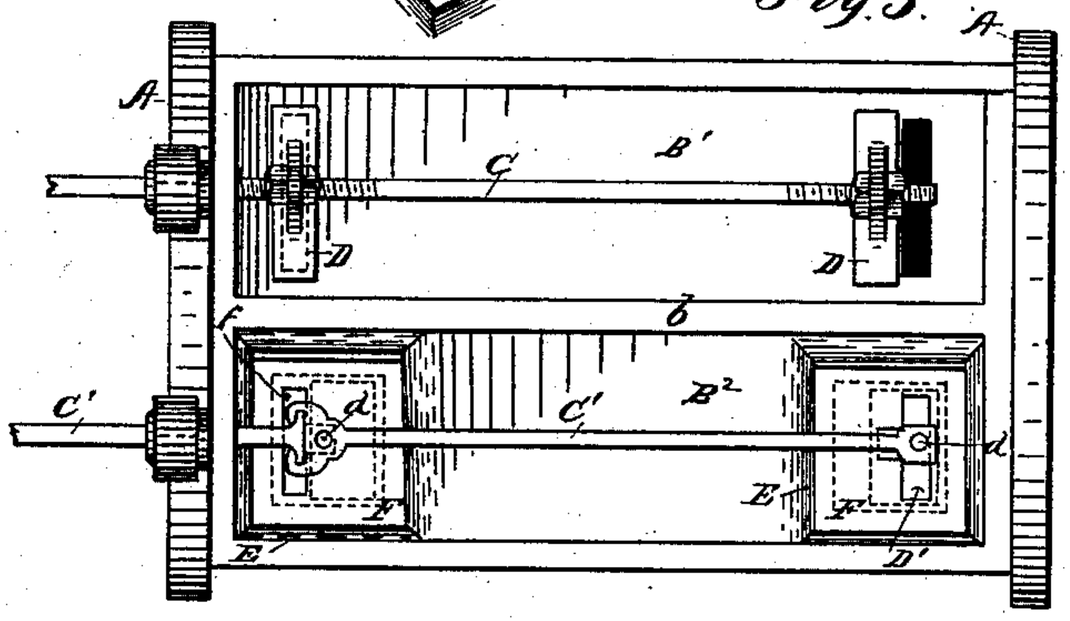


Fig. 3.



Witnesses

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UNITED STATES PATENT OFFICE.

LE GRAND SKINNER, OF ERIE, PENNSYLVANIA.

SLIDE-VALVE FOR STEAM-ENGINES.

SPECIFICATION forming part of Letters Patent No. 287,878, dated November 6, 1883.

Application filed October 5, 1882. (No model.)

To all whom it may concern:

Be it known that I, LE GRAND SKINNER, a citizen of the United States, residing at Erie, in the county of Erie and State of Pennsylvania, have invented certain new and useful Improvements in Slide-Valves for Steam-Engines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to steam-engines; and it consists in certain improvements in the construction, arrangement, and operation of the supply and exhaust valves, as will hereinafter be fully set forth.

The primary object of this invention is to so arrange the valves as to shorten the passages as much as possible, and thus bring the clearance-spaces down to a minimum area, and thereby save a considerable consumption of steam, for it is well known that whatever steam is necessary to fill the clearance-spaces is lost, and therefore by reducing the length of the passages so much is taken from the space which has to be filled with steam and less steam is consumed.

There are many secondary objects accomplished by my construction, which will appear hereinafter.

In the construction by which I accomplish the object above named the steam-chest extends the whole length of the cylinder, and is divided into two compartments, one of which is for the live steam and the other for the exhaust, said compartments running lengthwise of the steam-chest. Each compartment is provided with two valves—one at each end—and the seats of the valves in one compartment are set at an angle to those in the other compartment, so that the valve-seats are at right angles, or about so, to the radii of the cylinder, which pass through the middle of the seats. By observing the arrangement shown in Fig. 2 of the drawings, it will be seen that by the arrangement just described the steam-passages A′ A′ are shorter than can be made by any other construction that can be made, except with a curved valve-seat.

The invention is illustrated in the accompanying drawings as follows:

Figure 1 is a perspective view, showing an engine-cylinder constructed in the manner above described, parts being broken away to show the construction more perfectly. Fig. 2 is a vertical cross-section through the cylinder and steam-chest. Fig. 3 is a plan view, looking down into the steam-chest. Fig. 4 is a perspective view of the exhaust-valves and their surrounding parts, separated one from the other, but kept in relative position, except the rod C′, which is out of position.

A is the cylinder. A′ A′ are the steam-passages. B is the steam-chest, and B′ B² its compartments, *b* being the partition. C C′ are the valve-rods. D D are the live-steam valves located in the live-steam chamber B′. D′ D′ are the exhaust-valves. The other parts shown will be referred to in proper connection hereinafter.

The construction and arrangement of the steam-chest and valve-seats are clearly shown, and from the description before given will be understood.

The live-steam valves D D are simple plates upon the rod C, and can be clearly understood from the drawings. The pressure in this chamber being toward the cylinder, the construction of the valves can be the simplest possible. The pressure upon the exhaust-valves D′ D′ is from the cylinder, and special provision has to be made for their seating. The exhaust-openings E in the cylinder are large, and a rabbet or other similar means is provided for the valves D′, which set therein, to keep them from falling into the cylinder. These valves seat upon a cap or cover, F, which lies upon the openings E. In Fig. 1, in the foreground, the valve D′ alone is seen in the opening E, and in the background the cover F is shown upon the opening. The covers F are provided with openings *f*, which are, in fact, the exhaust-ports. They each have a notch on one side for the pins *d* on the backs of the valves to move into when the valves are moved off of the openings or ports. The caps F are kept upon the openings E by stools G, the legs *g* of which rest upon the four corners of the plates, and said legs having the proper difference in length, as seen, the tops of the stools lie parallel with the cover of the steam-chest, and set-screws H, passing through said cover and impinging upon the tops of the stools, hold the caps F firmly upon the openings E. The valves D′ are free

to be moved below the plates, the under sides of which, as before stated, form the seats of these valves. The pins *d* on the backs of the valves D′ stick up through the plates F, and the valve-rod C′ connects therewith, as is clearly seen in Fig. 3. One of the advantages of this construction is, that the valve-seats can be replaced when worn without disturbing the cylinder. The plates F can be used in the live-steam chamber just as well as where shown; but in that case the valve would be on top, as the pressure is in the opposite direction. In place of the stools G and the screws H, the plates F can be secured in place by various other means, which will readily suggest themselves to a mechanic.

What I claim as new is—

1. In a steam-engine cylinder, the combination of a steam-chamber having exhaust-ports, slotted plates covering said ports, and reciprocating valves below said slotted plates and connected to the reciprocating rod by pins passing through the slotted plates.

2. In a steam-engine cylinder, the combination of a steam-chest having a partition which divides said chest into inlet and exhaust chambers, having, respectively, inlet and exhaust ports, reciprocating valves in the inlet-chamber held in place by the pressure of the steam, reciprocating valves in the exhaust-chamber held in place by slotted plates, which form seats for said valves, and a cover for said chambers, substantially as described.

3. In a steam-engine valve-chamber, the combination, substantially as shown, of the reciprocating valve D′, the removable valve-seating plate F, covering the port or passage E, and the stool G, and set-screw H, for securing said plate upon said opening.

4. In a steam-engine valve-chamber, the combination, substantially as shown, of the port-openings E E, removable valve-seating plates F F, with ports *f f*, covering and secured upon the openings E E, the valves D′ D′, with pins *d d*, and the valve-rod C′.

In testimony whereof I affix my signature in presence of two witnesses.

LE GRAND SKINNER.

Witnesses:
JNO. K. HALLOCK,
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