

(No Model.)

2 Sheets—Sheet 1.

E. LESLIE.
SLIDE VALVE.

No. 428,847.

Patented May 27, 1890.

Fig. 1.

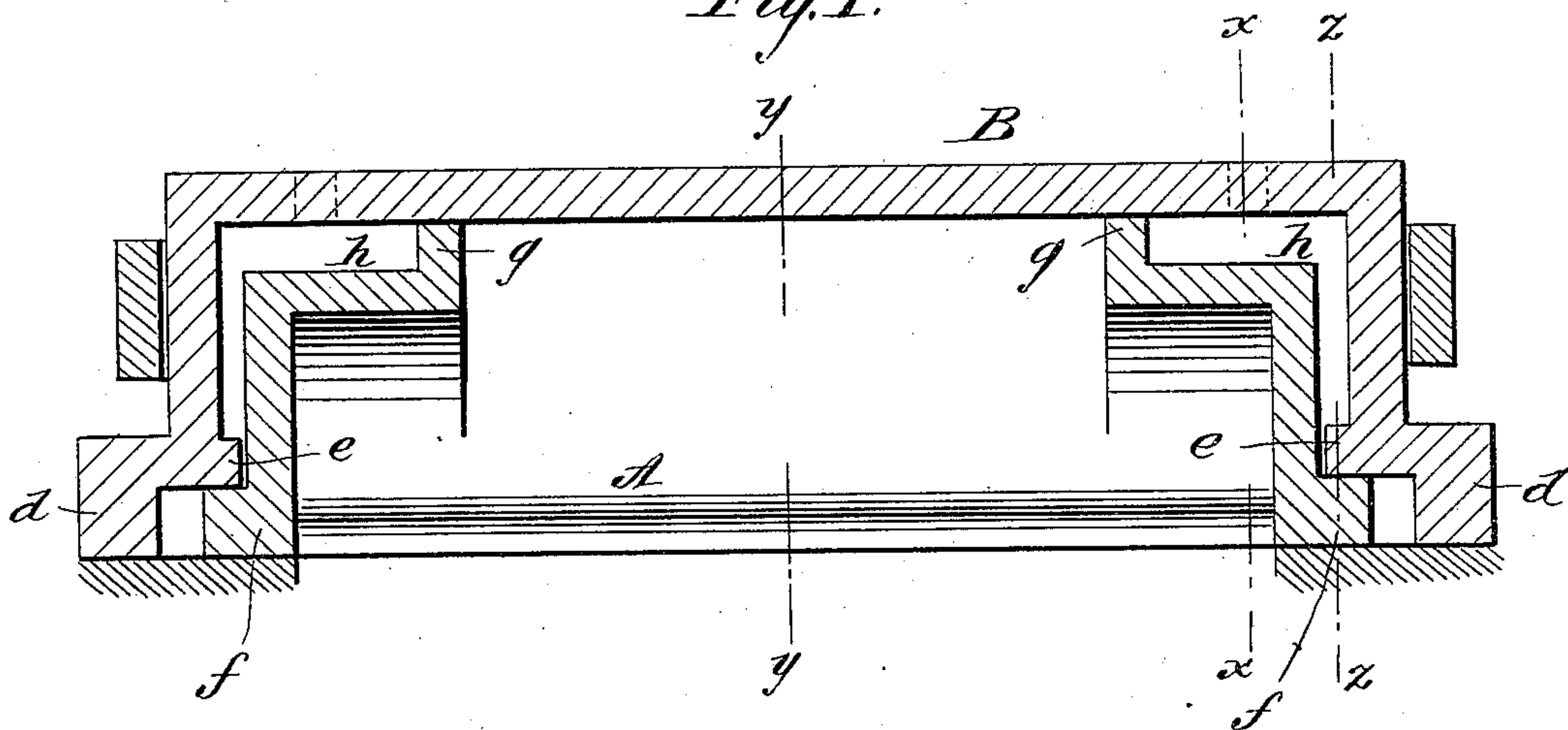
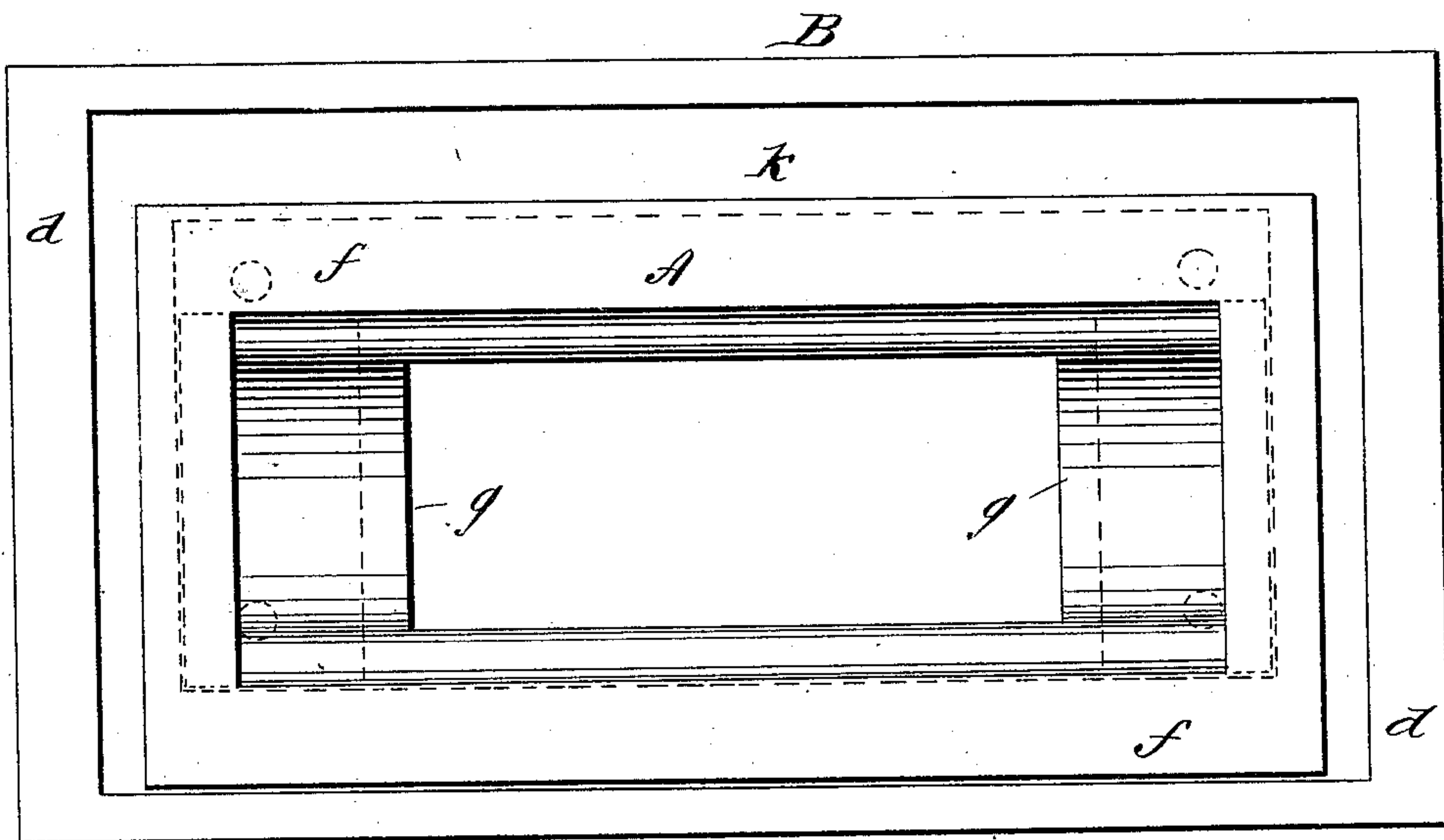


Fig. 2.



WITNESSES:

Don Twitchell
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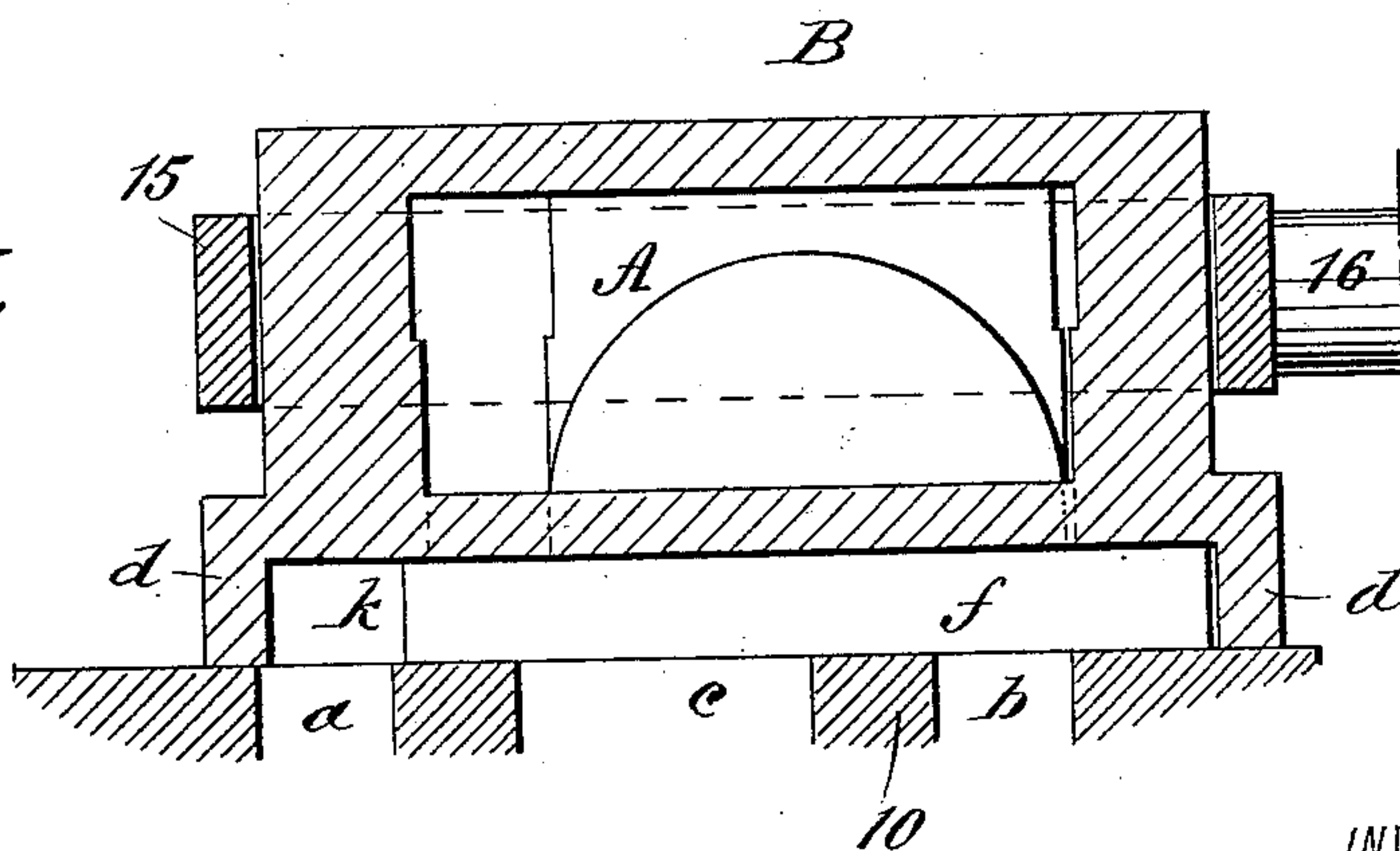
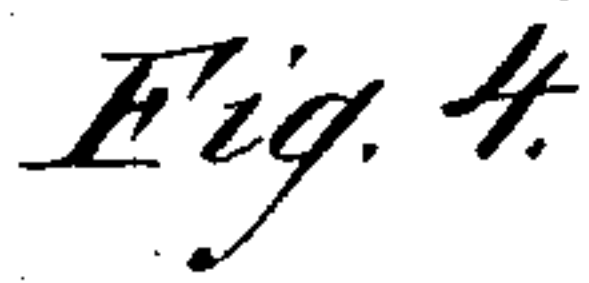
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2 Sheets—Sheet 2.

No. 428,847.

Patented May 27, 1890.



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UNITED STATES PATENT OFFICE.

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SLIDE-VALVE.

SPECIFICATION forming part of Letters Patent No. 428,847, dated May 27, 1890.

Application filed July 22, 1889. Renewed April 26, 1890. Serial No. 349,615. (No model.)

To all whom it may concern:

Be it known that I, EDWARD LESLIE, of Orangeville, in the county of Dufferin, Province of Ontario, and Dominion of Canada, have
5 invented a new and Improved Slide-Valve, of which the following is a full, clear, and exact description.

This invention relates to that class of slide-valves wherein the inlet of the motive agent
10 is controlled by an outer valve-section and the exhaust is controlled by an inner valve-section, the main objects of the invention being to provide for an extremely rapid reciprocation of the valve without any danger of
15 its becoming unseated; to provide a uniform pressure at all times upon the outer faces of the several sides of the inner valve-section, which faces are subjected to pressure direct from the steam-chest, and to provide for a
20 uniform pressure upon the outer faces of the lower flange of the inner valve-section, said lower-flange faces receiving their pressure at times from the expanding steam within the cylinder and at other times direct from the
25 steam-chest.

To the ends above set forth the invention consists of an outer valve-section formed to rest upon the valve-seat and an inner valve-section having an open top, which also rests
30 upon the valve-seat and is formed with a flange that fits closely against the under side of the top of the outer valve-section.

The invention further consists of certain novel constructions, arrangements, and combinations to be hereinafter described, and
35 specifically pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures and letters of refer-
40 ence indicate corresponding parts in all the views.

Figure 1 is a central longitudinal sectional view of my improved slide-valve. Fig. 2 is an inverted plan view of the valve. Fig. 3
45 is a cross-sectional view on line *x x* of Fig. 1. Fig. 4 is a sectional view on line *y y* of Fig. 1, the parts being represented as they appear just as the outer valve-section is about to start upon its travel to the left; and Fig. 5
50 is a sectional view on line *z z* of Fig. 1, the

parts being represented as they appear just as the outer valve-section reaches the inner valve-section and such inner valve-section is about to start upon its travel to the left.

In the drawings above referred to, 10 represents a valve-seat, which is formed with the usual induction and eduction ports *a* and *b* and the exhaust-port *c*. On the valve-seat 10 there is mounted to slide a valve 11, composed of an inner valve-section A and an
60 outer valve-section B, the outer valve-section B being formed with a downwardly-extending flange *d*, the lower face of which bears upon the valve-seat, a continuous bearing-
65 face *k*, and with inwardly-extending flanges *e*. The inner valve-section A also rests upon the valve-seat and is formed with a continuous downwardly-extending flange *f*, which is overlapped by the bearing-face *k* and the
70 flanges *e*.

The top proper of the valve-section A is cut away, and about this cut-away portion there is formed an upwardly-extending flange *g*, which fits closely against the under side of the top of the valve-section B, by which ar-
75 rangement it follows that the central portion of the said valve-section B is always in register with the exhaust-port *c*. Beyond the transverse portions of the flange *g* the ends of the body of the inner valve-section A are
80 carried outward toward the end walls of the outer valve-section, and these outwardly-extending portions, which are shown at *h*, are by preference arched. By this arrangement I provide a free communicating space about
85 the upper portions of the defining-walls of the inner valve-section and communication between the interior of the steam-chest, and this surrounding space is established by means of corner apertures *i*, that are formed in the top
90 of the outer valve-section, the flange *g* being within the line of the said corner apertures.

The outer valve-section flanges *e* (which, as before stated, overlap the lower flange *f* of the inner valve-section A) serve as guides for the
95 inner valve-section, the inner faces of said flanges *e* abutting closely against the outer faces of the end walls of the said inner valve-section, and as the flanges *f* do not extend to the inner faces of the flange *d* it follows that
100

a free communication is established about the flange *f*. A yoke 15 is fitted upon the outer valve-section, and to this yoke there is connected a valve-stem 16.

5 When the valve 11 is in the position in which it is shown in Fig. 3, it is at or near the end of its right-hand stroke, and the motive agent is passing from the steam-chest through the open port *a* into the left-hand end of the
10 cylinder, the piston at this time moving toward the right. When it is desired to cut off, the valve-stem is thrown toward the left, so that the forward end of the valve will pass over the port *a* and cut it off from communi-
15 cation with the steam-chest. During this motion of the outer valve-section B the inner valve-section A remains stationary, and the motive agent in the right-hand end of the piston is free to exhaust through the entirely-
20 open port *b*, the interior of the valve-section A, and the exhaust-port *c*.

Almost immediately after the entrance to the port *a* is closed the right-hand end of the valve-section B will come in contact with the
25 valve-section A, as shown in Fig. 4, and any continued onward movement of the valve-stem 16 will carry the valve 11 to a position such that the port *b* will be opened to establish communication between the steam-chest
30 and the right-hand end of the cylinder, the inner and outer valve-sections remaining in contact until the piston has moved to the end of its stroke. By this arrangement a complete exhaust is secured.

35 Heretofore in valves of the class to which this invention relates—that is, those embodying an inner section, which controls the exhaust, and an outer section, which controls the inlet, of the motive agent—considerable
40 difficulty has been experienced, owing to the liability of the valve to rise from its seat; but this difficulty I entirely overcome by establishing a free communication between the under side of the central portion of the top
45 of the outer valve-section and the surrounding atmosphere by way of the exhaust-port through the inner valve-section. The inner valve-section A is firmly held to its seat by the pressure of the steam, which is free to enter
50 the space between the upper portion of the inner valve and the outer valve by way of the apertures *i*.

As before stated, there are spaces between the outer end faces of the flange *f* and the
55 inner faces of the end flanges *d*, which spaces are shown best at *o* in Fig. 1. By means of these spaces *o* a free communication about the outer faces of the flange *f* is secured, the steam passing from the left of the inner valve-
60 section to the right of said section as the outer valve-section moves from the position in which it is shown in Fig. 3 to the position in which it is shown in Fig. 4, whereby a

cushioning of the parts is secured and all undue shock or jar prevented, a similar cushioning being secured between the upper bearing-faces of the two valve-sections by forming one or both of such sections with cut-away portions *p*, through which the steam
65 passes as the bearing-faces of the two valve-sections approach.
70

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

1. A slide-valve comprising an outer valve-
75 section and an inner valve-section having an open top, substantially as described.

2. A valve comprising an outer valve-section and an inner valve-section having an open top, and an upwardly-extending flange
80 that abuts against the under side of the outer valve-section, substantially as described.

3. A valve comprising an outer valve-section formed with inwardly-extending flanges, and an inner valve-section having an open
85 top and a flange which abuts against the under side of the outer valve-section, and an outwardly-extending flange that is overlapped by the inwardly-extending flanges of the outer valve-section, substantially as described.
90

4. A slide-valve comprising an outer valve-section operated by the valve-stem and formed with corner apertures, and an inner valve-section having an open top and formed with
95 a flange which abuts against the under side of the top of the outer valve-section within the line of the corner apertures, substantially as described.

5. A slide-valve comprising an outer valve-section having a continuous bearing-face *k*,
100 inwardly-extending flanges *e*, and a flange *d*, and an inner valve-section having an open top, an upwardly-extending flange which abuts against the under side of the top of the outer valve-section, and a surrounding flange
105 *f*, that is overlapped by the bearing-face *k*, and the inwardly-extending flanges of the outer valve-section, spaces *o* being left between the flanges *f* and *d*, substantially as described.
110

6. A slide-valve comprising an outer valve-section and an inner valve-section, between
115 which sections there is a chamber that is at all times in free communication with the motive agent, substantially as described.

7. A slide-valve comprising an outer valve-section actuated by the valve-gear and an inner valve-section having an open top, where-
120 by a portion of the top of the outer valve-section will at all times register with the exhaust-port through the inner valve-section.

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Witnesses:

EDWARD KENT, Jr.,
C. SEDGWICK.