

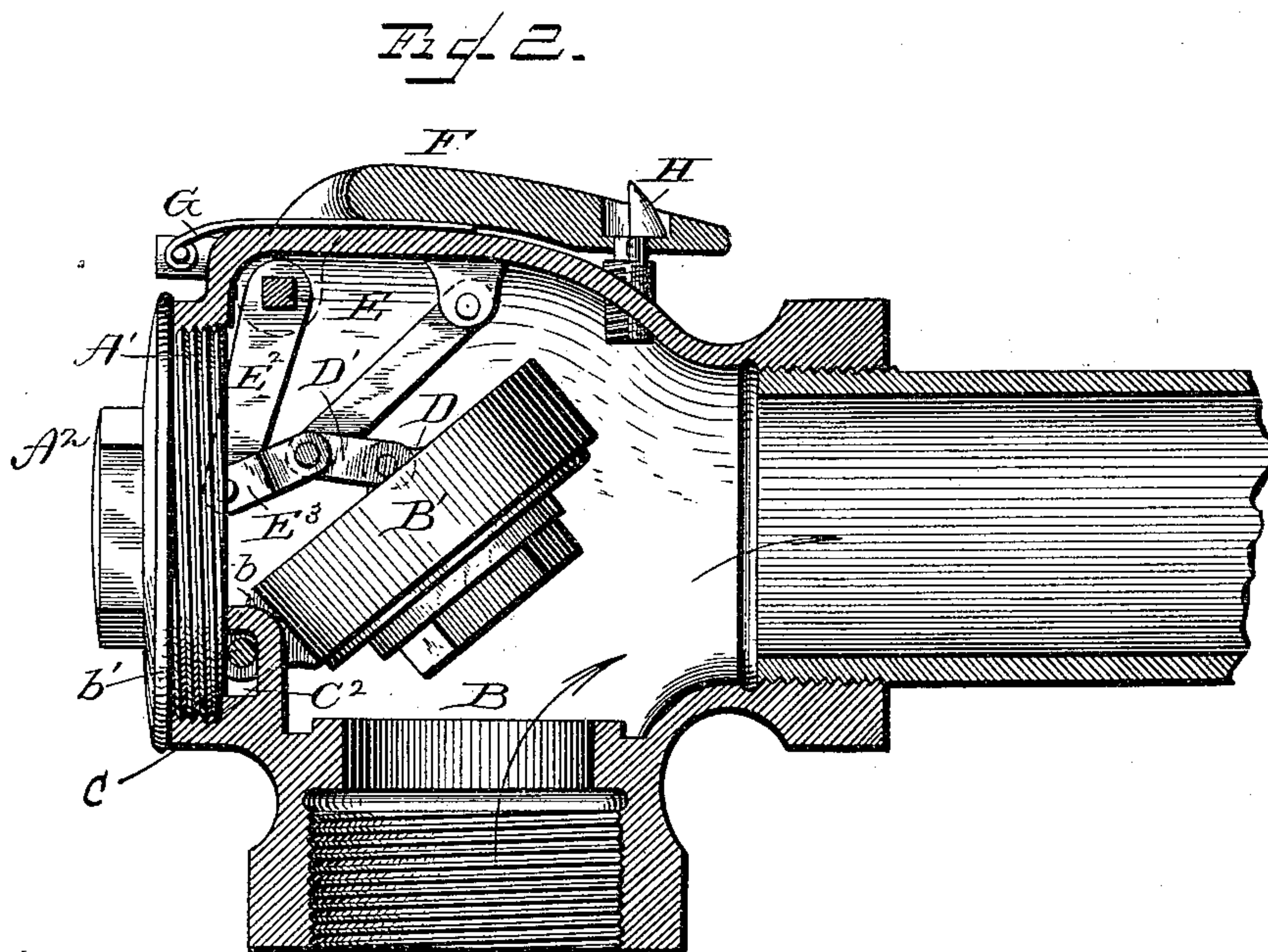
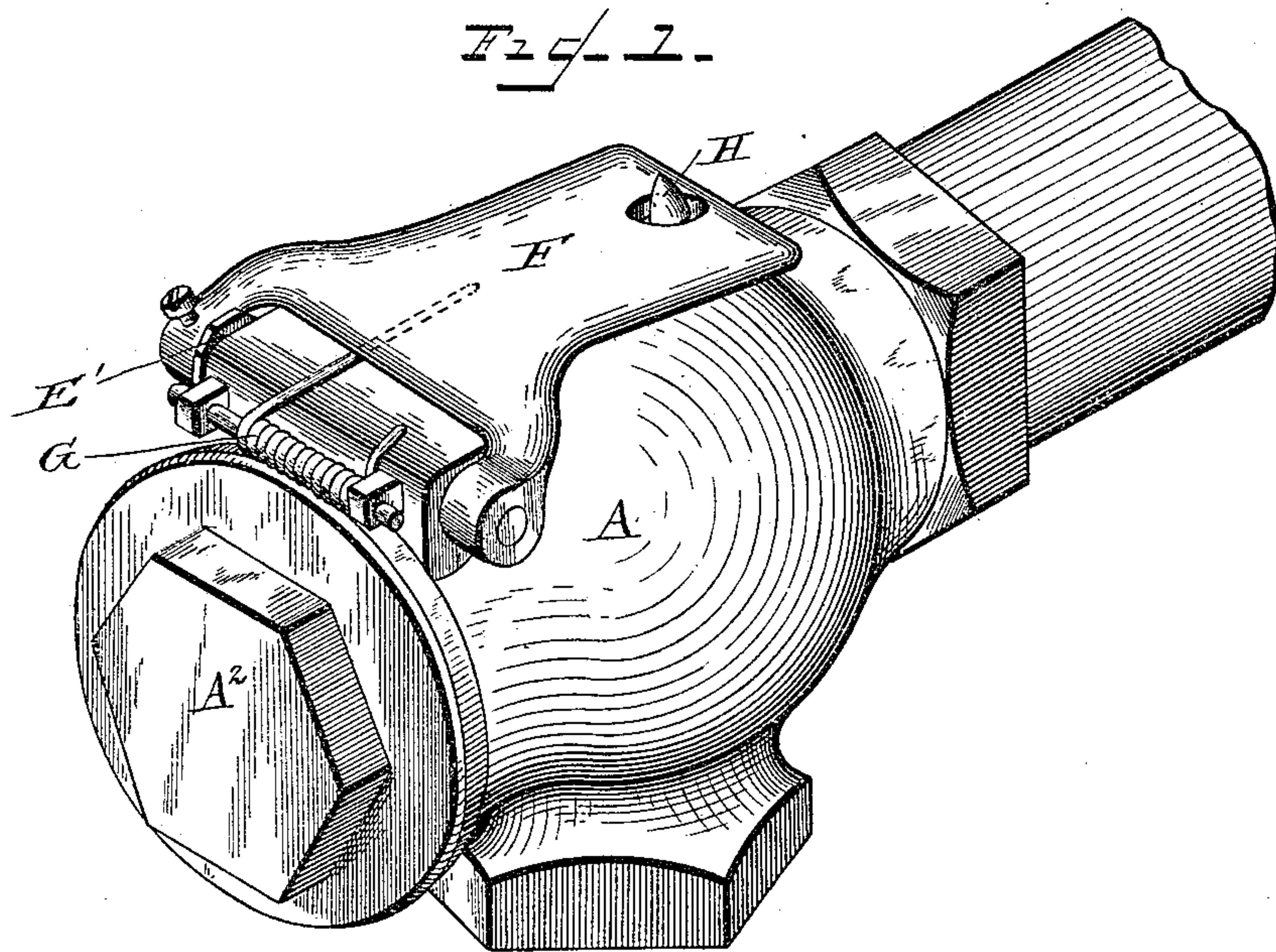
(No Model.)

2 Sheets—Sheet 1.

W. E. WOOD.
RADIATOR VALVE.

No. 405,861.

Patented June 25, 1889.



WITNESSES
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H. A. Smith

INVENTOR
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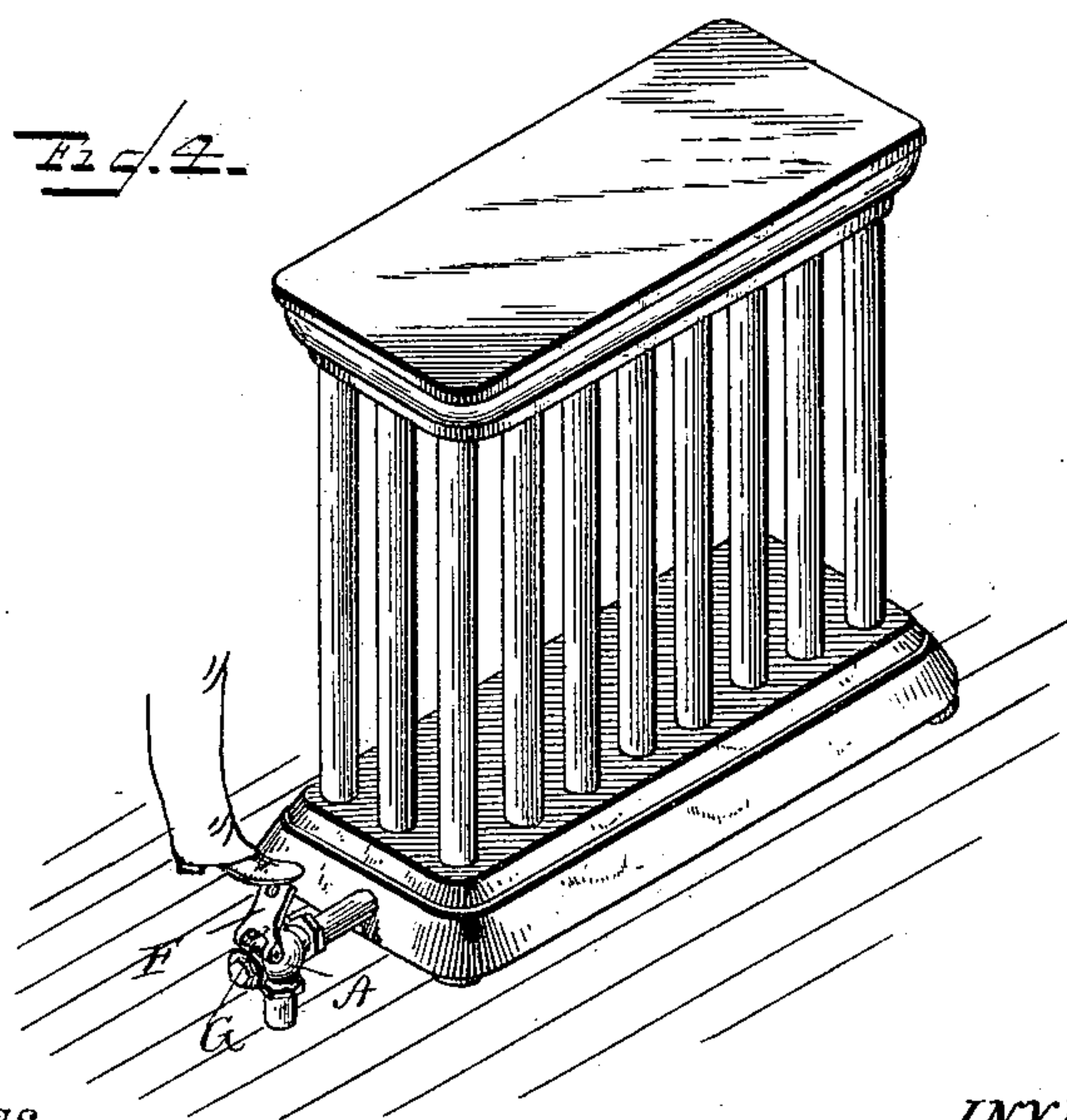
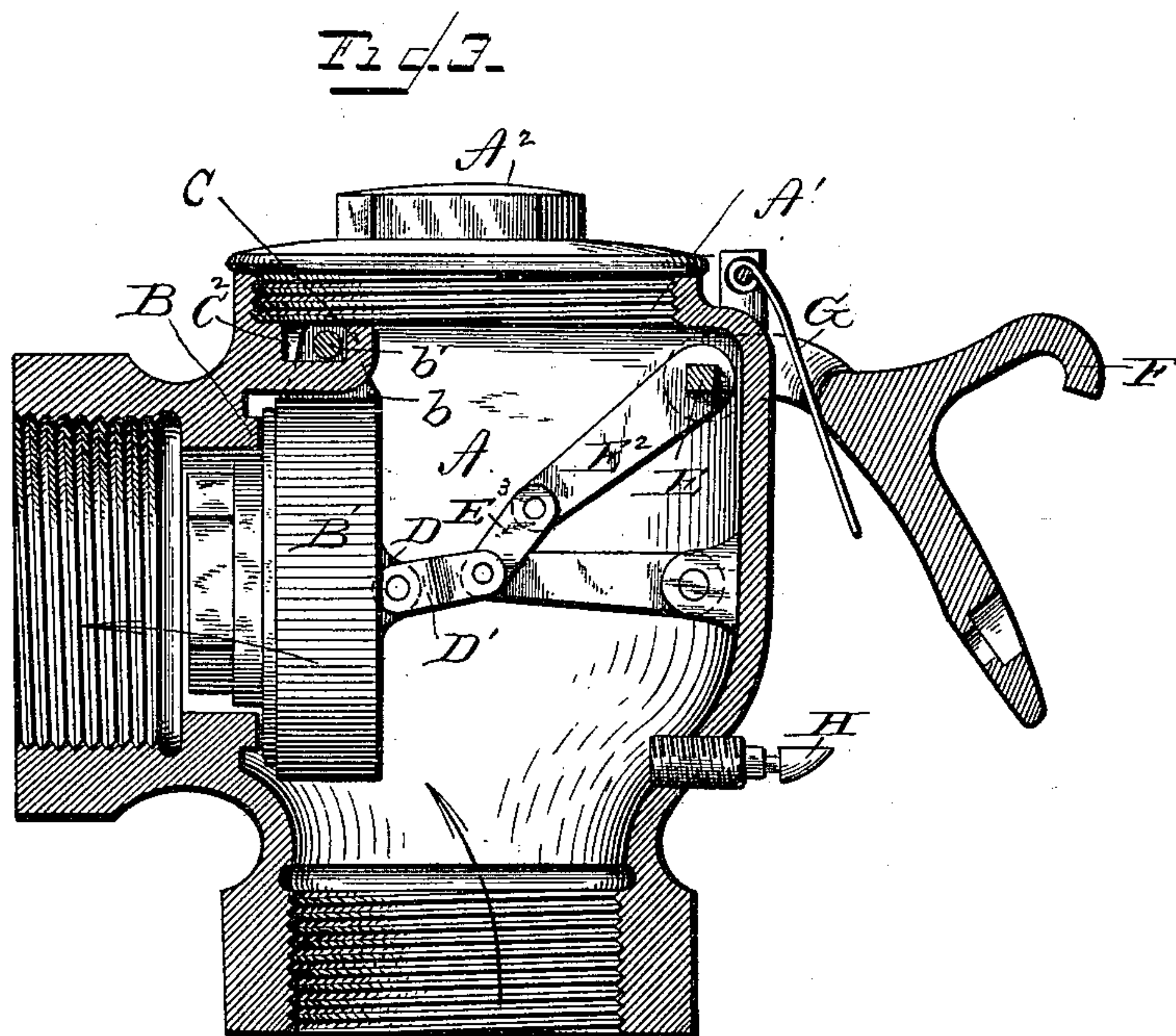
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UNITED STATES PATENT OFFICE.

WILLIAM E. WOOD, OF UTICA, NEW YORK.

RADIATOR-VALVE.

SPECIFICATION forming part of Letters Patent No. 405,861, dated June 25, 1889.

Application filed February 2, 1889. Serial No. 298,441. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM E. WOOD, a citizen of the United States, residing at Utica, in the county of Oneida and State of New York, have invented new and useful Improvements in Radiator-Valves; and I do hereby declare the following to be a full, clear, and exact description of said invention, reference being had to the accompanying drawings, and to the letters or figures of reference marked thereon, which form a part of this specification.

The invention relates to improvements in radiator-valves for heating purposes; and the object of the invention is to so construct a valve for steam or water heating that the steam or water may be turned on fully or shut off tightly from the radiator by a single movement externally applied and at the same time to insure a continued pressure of the disk on its seat to provide for contraction consequent to the cooling of the parts, and prevent the same from being accidentally left partially open.

My invention consists, first, in a novel manner of connecting the valve-disk with operating-levers acted upon by a spring-pressure to hold the valve to its seat through the levers, combined with means, also connected to the levers, for forcing the valve fully open by force or pressure, and in holding the same in its full-open position against the action of the spring-pressure; and the invention further consists in certain novel features in the construction and arrangement of parts, all as hereinafter fully described.

In the accompanying drawings, Figure 1 is a perspective view of the improved valve. Fig. 2 is a longitudinal sectional view of the same, with the valve-disk, levers, catch, and removable cap shown in full lines, with the valve shown open, and in which the valve is constructed to be closed against the pressure from the supply-pipe, and which construction is especially adapted for low-pressure work. Fig. 3 is a similar view with the valve shown closed, and in which case the valve-disk is seated with the pressure. Fig. 4 is a perspective view of a radiator with the improved valve shown applied, and showing the means for opening the valve by means of foot-pressure.

The valve body or casing A is made in any usual or preferred way to hold the mechanism, and having at one end or side an opening A' of suitable size, through which the parts hereinafter referred to may be admitted to and secured in position in the body, and which is closed by a cap or cover A².

The valve-seat B is formed in the usual or any preferred way to receive a valve-disk B', which may also be constructed in any preferred manner. At one side of the seat the valve-body is provided with a rib C, notched centrally and cut out at its rear or outer face to form a recess C², and the valve-disk B' is provided with a projecting lug b, having pins b' projecting from the side faces thereof, and at right angles thereto, and which pins engage the recesses C², above described, and form a hinge-connection between the valve-disk and the body, and by means of the elongated form given to the recesses permit the valve to seat itself evenly, and when the cap or cover A² is in place it engages the outer face of the rib and prevents the displacement or withdrawal of the disk from the recesses, while permitting a free movement within the proper limits.

Projecting from the back of the disk is a lug D, which has pivotally connected thereto the short arm of a toggle-lever D', the other arm of which lever is mounted in suitable bearings located in the valve-casing at a point opposite to the center of the valve-seat.

A rock-shaft E, passing from the outside of the casing or body through a suitable stuffing-box or suitable steam-tight joint E', has its inner end mounted in a suitable internal bearing formed in the body, and upon this rock-shaft E, within the body or casing, is rigidly secured a lever or rock-arm E², having its lower end connected through a short link E³ with the center joint of the toggle-lever D'.

A rocking arm or foot-piece F, having a forked or bifurcated end, has one of its arms secured to the shaft E, while its other arm is held in pivotal engagement with the casing or body by means of a screw-pin passing through it and engaging a bearing formed in the body in line with the center of the rock-shaft.

A spring G, of coil or other form, is mounted on the outside of the casing in such position

as to engage the rocking arm or foot-piece and act to force the same away from the body or casing, the relation of the rocking arm or foot-piece F to the lever or rock-arm E² being such that when said arm or foot-piece F is forced away from the casing by the action of the spring the rock-arm E² will act through the link E³ to straighten the toggle-link, and consequently force the valve-disk to its seat, and when the rocking arm or foot-piece F is forced toward the casing that the disk shall be drawn away from its seat and open the valve, or into a position as shown in Fig. 2. The rocking arm or foot-piece F is caught to hold the valve open by engaging a spring-catch H, mounted at a suitable point on the body of the casing.

By the construction and arrangement of parts above described it will be seen that the valve-disk is held to its seat by the action of the spring acting through levers to increase the effective force of the spring, and is forced open by external pressure being applied thereto, and held open positively; and it will also be seen that the valve is either forced fully open or closed and cannot stand at any intermediate point. It will also be seen that by applying the spring on the outside a steel spring may be employed to hold the valve closed, as it is not subjected to the action of the heating agent, which, when steam, will act to impair the effective force of the spring when brought into direct contact therewith.

By means of the toggle-levers, as shown and described, another great advantage is attained, as the spring acting thereon through the rocking lever and link serves, after the valve-lever has been released, to permit the spring acting thereon to continue its pressure on the joint of the toggle, to cause the toggle-lever to act on the disk with increased force, and consequently to provide for the contraction of parts incident to the same becoming cooled after the heating agent has been cut off, and prevent any leaking into the radiator, and thus prevent the collection of water of condensation in the radiator to be acted upon when admitting a full pressure of live steam, and consequently prevent the usual hammering or rattling so annoying where the radiator is allowed to fill with said water of condensation.

As shown in Figs. 1 and 2, the valve is shown as having been forced open and caught in position, and in Figs. 3 and 4 as closed and held by the action of the spring on the arm-link and levers.

The operation is as follows: The normal position of the valve would be as shown in Figs. 3 and 4—that is, held closed—and when

it is desired to open the same by pressing on the rocking arm or foot-piece, to force it toward the body, overcoming the tension of the spring and acting through the lever and link to raise the valve-disk from its seat, the foot-piece being forced toward the body or casing until it engages the spring-holding catch before described, and by such engagement to hold the valve open; but should the spring-catch not engage the foot-piece, or the same not be carried to the full limit of its throw, it would return to its normal position and not remain partially open.

When it is desired to close the valve, the foot is placed above the foot-piece and against the catch H. This releases the foot-piece, and as the foot is directly above the same the latter cannot snap up to its place, but will raise as the foot is removed and will act on the levers until the valve-disk is forced to its seat, as before stated.

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

1. In a steam or water valve, the valve-disk, the operating toggle-lever connected therewith, a rocking arm or foot-piece connected with the toggle-lever for forcing the valve open, a spring to act on the foot-piece to force the valve to its seat, and means for automatically engaging said rocking arm or foot-piece to hold the valve open to its full capacity, substantially as described.

2. In a steam or water valve, the combination of the valve-disk, the rocking arm or foot-piece, the toggle-levers connected to the valve, and the rocking arm or lever connected to the toggle-lever through a link-connection, substantially as described.

3. In a steam or water valve, the combination of the valve-disk, a toggle-lever connected to the valve-disk and to the casing to operate within the valve-body, and a spring for acting on the toggle-lever located outside the body or casing, substantially as described.

4. In a steam and water valve, the combination of the valve-disk, a toggle-lever connected to the valve-disk, a rock-shaft having a rocking arm connected thereto within the valve-body, a link connecting the rocking arm with the toggle-lever, and a spring located outside the valve-body to act on the rock-shaft to force the valve-disk to its seat, substantially as described.

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

WILLIAM E. WOOD.

Witnesses:

ALEX. MAHON,
H. J. ENNIS.