

C. RUE & J. H. KNIGHT.

Improvement in Self-Facing Check-Valves.

No. 126,235.

Patented April 30, 1872.

Fig. 1.

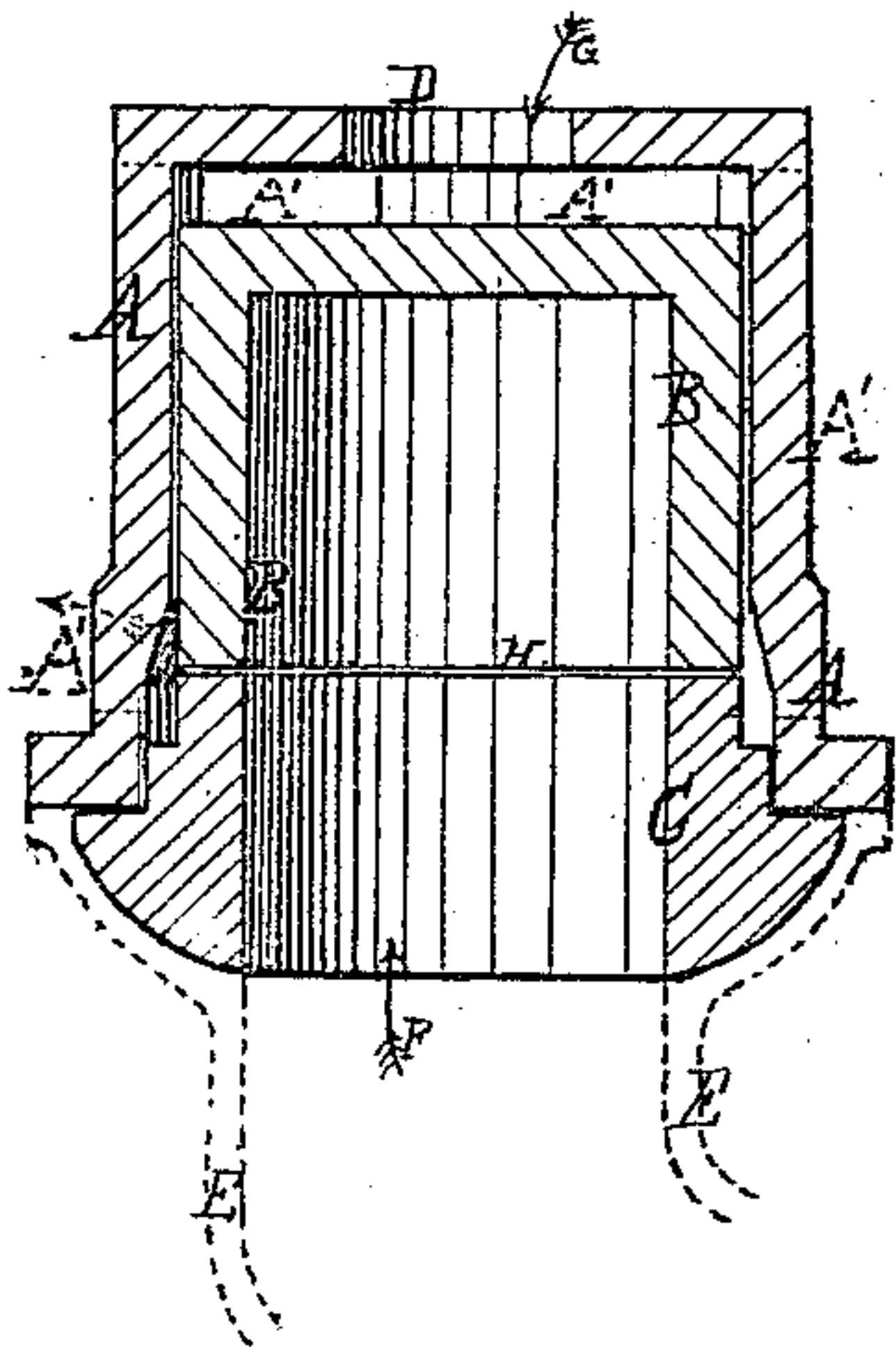
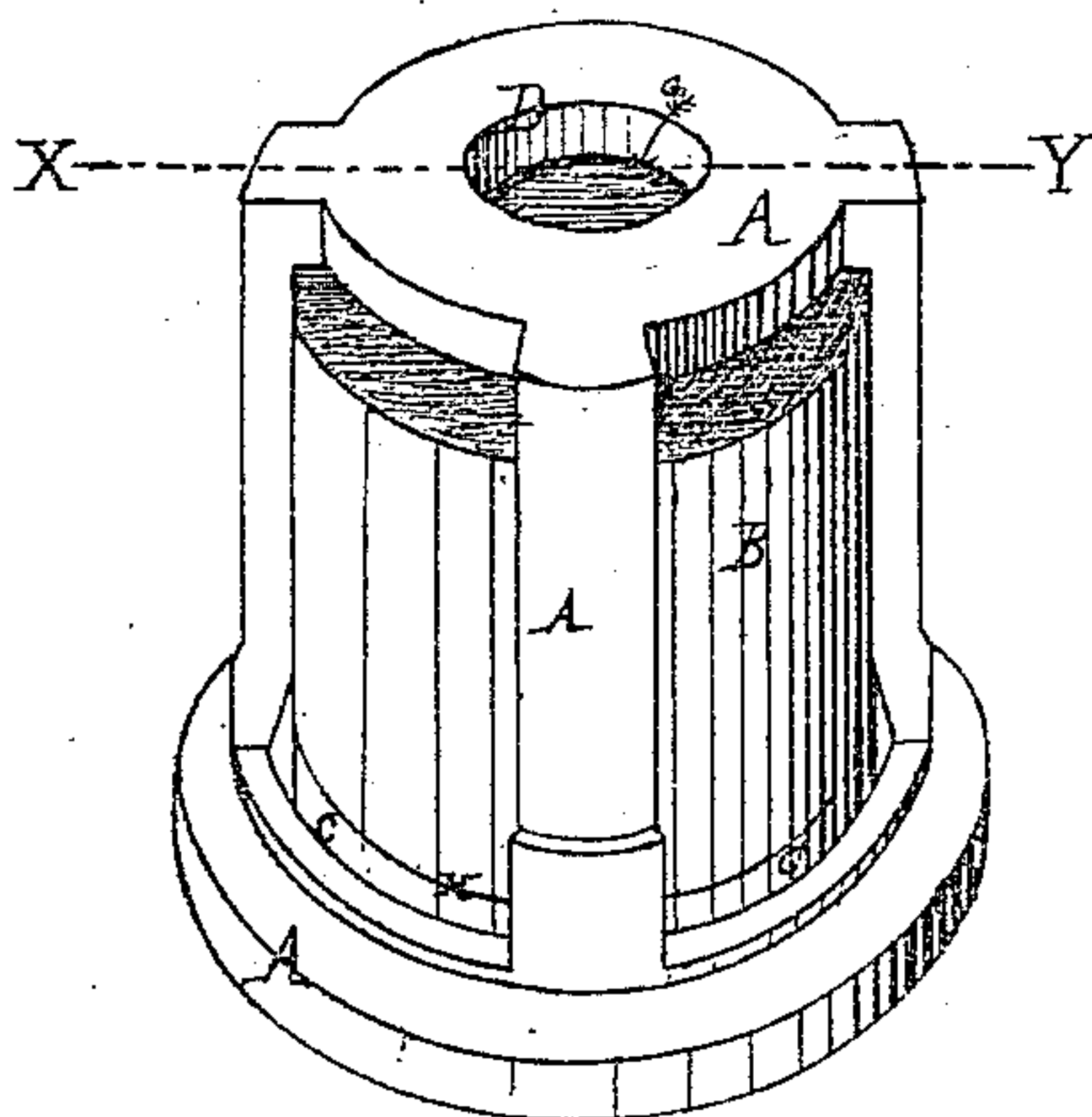


Fig. 2.



Witnesses.

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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN SELF-FACING CHECK-VALVES.

Specification forming part of Letters Patent No. 126,235, dated April 30, 1872.

To all whom it may concern:

Be it known that we, CHARLES RUE and JONAS H. KNIGHT, of Doylestown, Bucks county, Pennsylvania, have invented a new and useful Improvement in Self-Facing Check-Valves; and we do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the annexed drawing making a part hereof, in which—

Figure 1 is a vertical cross-section on the line X Y of Fig. 2. Fig. 2 is a perspective view of my improvement.

Our invention consists of the combination of a hard-metal check-valve with a soft-metal seat or base, or a soft-metal check-valve with a hard-metal seat or base, the effect of the combination being that the hard metal of the one part wears true the soft metal of the other part, forming a perfect and true joint.

To enable others skilled in the art to make and use our invention, we will describe its construction and mode of operation.

In the drawing, A is the cage. A' are the openings in the cage to allow the incoming water to enter the boiler; B, the check-valve; C, the seat or base, which is stationary and fixed; D, the opening to admit steam against the top of the check-valve B. The valve shown is a check-valve for introducing water into boilers, and is of the same construction as to the shape and design of the valve, cage, and seat as the ordinary brass valves in common use, the great defect with which valves has been that after running a short time the check-valve B has worn on the seat C unevenly, causing a leak of steam back to the pump, in which case the pump will not work, and the valve and pump become utterly worthless, forcing the engineer to rely wholly on the injector.

The operation of these valves is as follows: To the bottom of the seat or base C is attached a water-pipe, E, which throws the water up into the valve. The valve, being on the outside of the boiler, is connected, by a short pipe, with the outside shell of the boiler, and the said water-pipe E is connected with a pump, which forces the water into the valve. At every stroke of the pump the water is forced through the pipe E in the direction of the arrow F against the check-valve B, which is lifted

by the force of the water until it strikes the top of the cage A, and the inflowing water escapes at the point H through the openings A' in the cage A into the water inside of the boiler, and, as the force from the pump is only momentary, the check-valve B is only sustained for a short time, and is immediately forced down again by the pressure of the steam in the boiler, exerted through the opening D in the top of the cage A, in the the direction of the arrow G. The steam and water in the boiler are thus prevented from escaping so long as the lower face of the check-valve B is true and even. There is thus a constant wear of the lower face of check-valve B on the upper face of the stationary seat C at the point H, and in practice these faces, in the valves in common use, soon become so unevenly worn as to allow of the escape and leakage of the water and steam already in the boiler, which escape through the water-pipe into the pump and stop its working, causing great delay and danger, the only reliance in such case being the injector.

By employing a hard-metal check-valve, B, which we prefer, and a soft-metal seat or base, C, or a soft-metal check-valve, B, and a hard-metal seat or base, C, the hard metal wears the soft metal smooth, and the difficulty above named is entirely overcome; and the longer the valve is used the more perfect is the joint at H by the wearing of the lower face of check-valve B with the upper face of seat C.

It is evident that the cylindrical shape of the valve may be varied without materially changing the nature and object of the invention. Thus it may be made square, polygonal, &c. It will be perceived that neither a revolving, a sliding, a hinged, nor a ball valve, nor any other valve than of the character specifically described, can be regarded as comprehended in the present invention, the action of the metals in all these being different from the present, in which the two metals meet forcibly in line and mutually form a perfect fit, just as do male and female dies used in striking up a compressible material, insomuch that such dies and all other analogous processes are believed to present closer analogies to this invention than do valves of any other construction. As the valve and its seat are generally counter-

parts, and generally annular in shape, it is not regarded as essential to guard either from changing position by rotating or moving upon its axis, though this may be done by the use of guides in perfect harmony with the theory of the invention.

Having thus described our improvement, what we claim as new, and desire to secure by Letters Patent, is—

A cup-formed check-valve, the brim of which antagonises with a seat, when the valve and its seat are of different degrees of compressibility, substantially as described.

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Witnesses:

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