

No. 611,994.

Patented Oct. 4, 1898.

J. L. COOK.
VALVE.

(Application filed June 17, 1897.)

(No Model.)

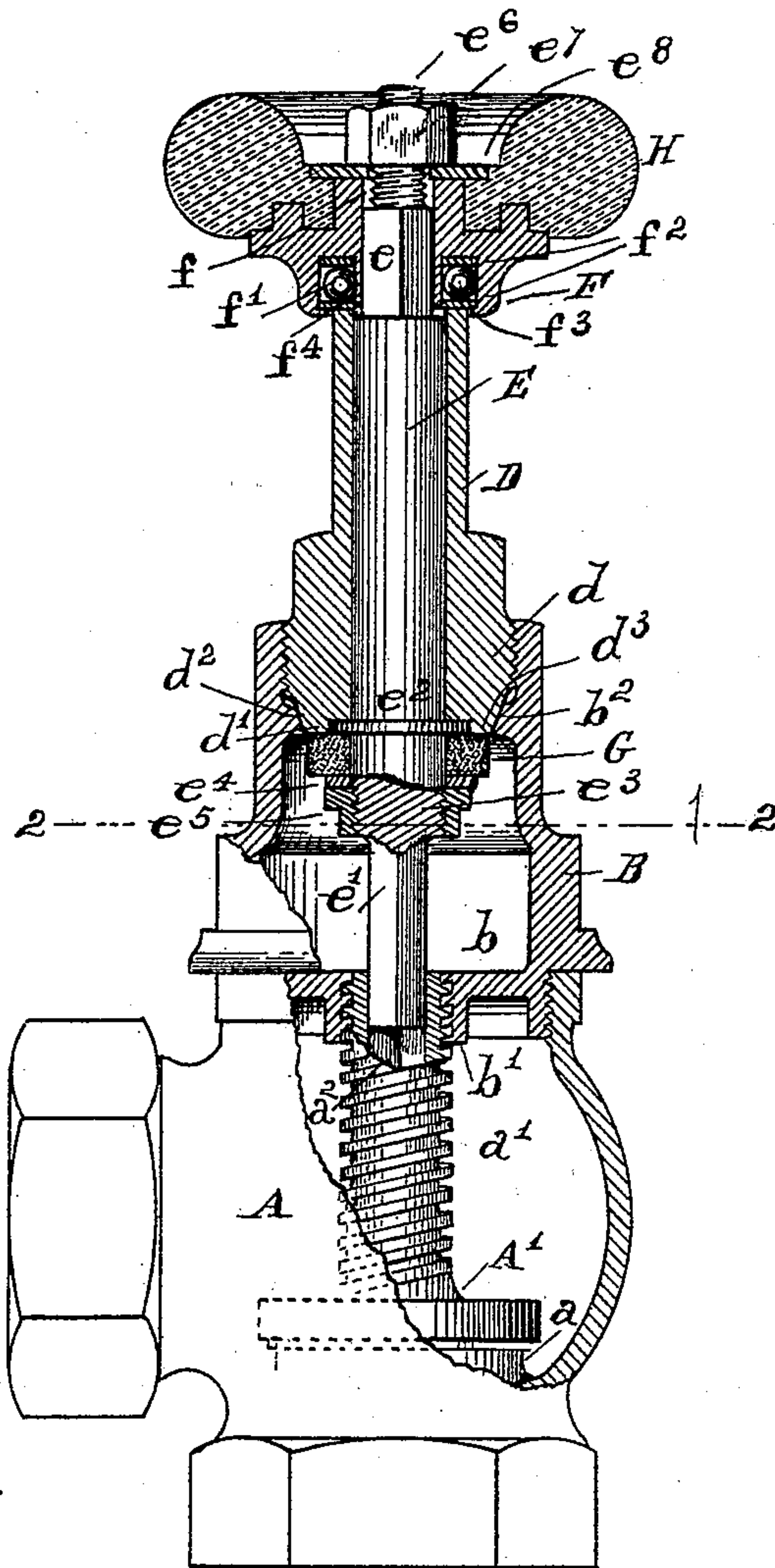


FIG. 1.

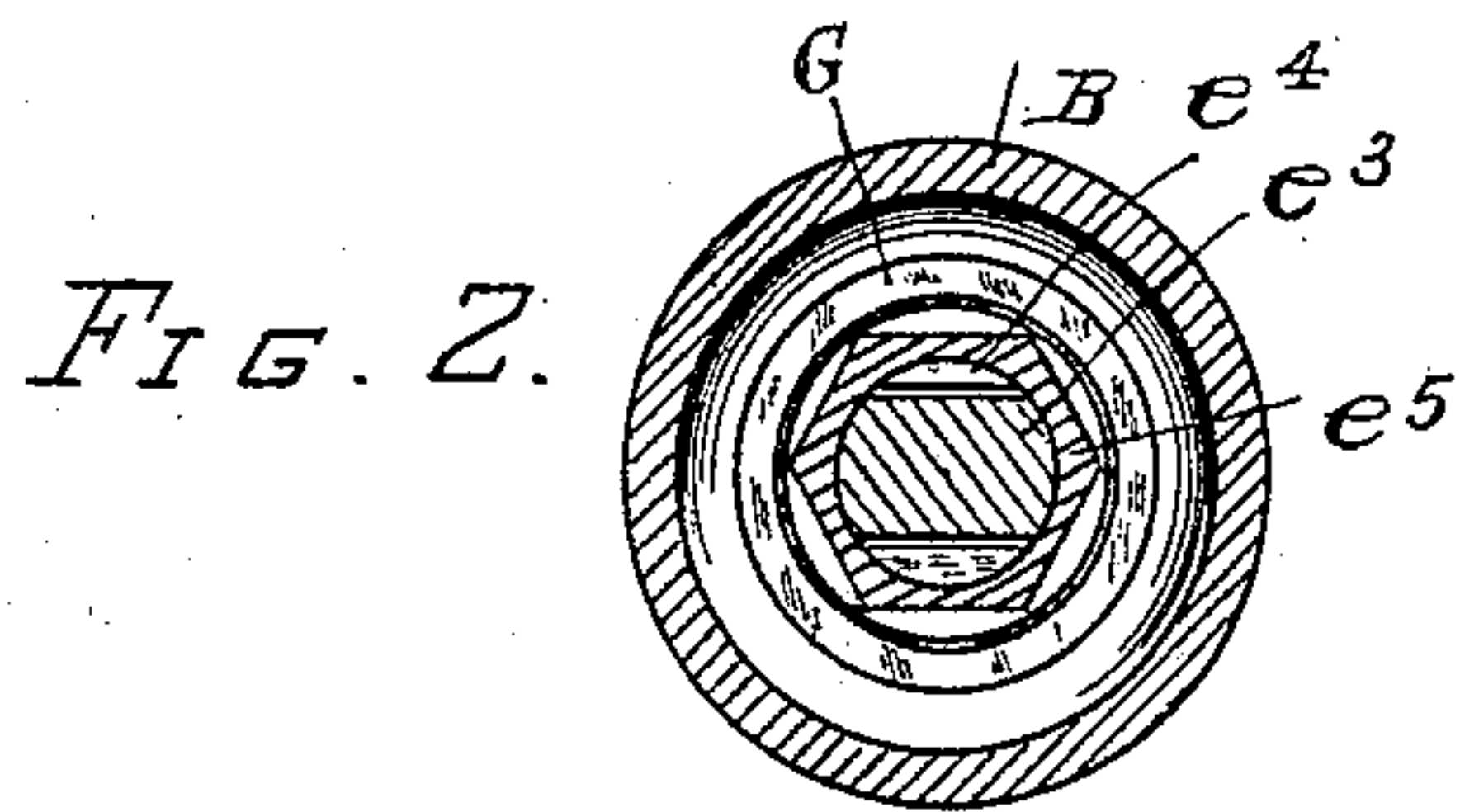


FIG. 2.

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UNITED STATES PATENT OFFICE.

JAMES L. COOK, OF SPRINGFIELD, ILLINOIS.

VALVE.

SPECIFICATION forming part of Letters Patent No. 611,994, dated October 4, 1898.

Application filed June 17, 1897. Serial No. 641,154. (No model.)

To all whom it may concern:

Be it known that I, JAMES L. COOK, a citizen of the United States, residing at Springfield, in the county of Sangamon and State of Illinois, have invented certain new and useful Improvements in Valves, of which the following is such a full, clear, and exact description as will enable others skilled in the art to which it appertains to make and use my said invention.

My invention relates to valves of that class which are operated by a handle external to the valve and connected with a rotatable stem.

The purposes of my invention are to provide simple and effective means adapted to reduce to the minimum the friction between the parts in turning the valve-stem to open or close the valve; to provide a new and useful valve-handle having ball-bearings, said handle being so constructed and arranged as to be applicable to and usable with different kinds of valves; to provide a sleeve of novel and improved form adapted to support the valve-handle, also adapted to form a steam-tight joint on a seat within the valve-bonnet, and to provide improved means for connecting with the valve-stem packing-rings or disks—such, for example, as are in common use and are known to the trade as “Jenkins disks”—in such manner that the disk will form a steam-tight joint with said sleeve, so as to prevent the escape of steam around the valve-stem.

With these ends in view my invention consists in the novel features of construction and combinations of parts shown in the annexed drawings, to which reference is hereby made, and hereinafter particularly described, and set forth in the claims.

Referring to the drawings, Figure 1 is a vertical axial section through a valve and shows my improvements as applied thereto, and Fig. 2 is a horizontal transverse section through the valve on the line 2 of Fig. 1 and shows in detail the means for connecting the Jenkins disk with the valve-stem.

Similar letters of reference designate like parts in both of the views.

In the drawings I have shown my improvements as applied to a radiator-valve; but they may obviously be applied to other and different valves without departing from the spirit

of or sacrificing any of the advantages of my invention.

The valve-body A, which may be of any usual or convenient form, has an internal seat a , on which the valve A' seats.

The valve-bonnet B screws into the body A and has near its lower end a diaphragm b , provided with an internally-screw-threaded hub b' , in which the screw-threaded stem a' of the valve A' fits. It also has in its upper part an annular inclined seat b^2 , on which the inclined bearing-surface of the sleeve D fits, so as to form therewith a steam-tight joint. The sleeve D surrounds the valve-stem and is enlarged in its lower part, so as to form a combined integral nut and screw d , screwing into the upper end of the valve-bonnet in the usual well-known manner.

The stem E is cylindrical in its central part and has near its upper end a squared part e , which fits in a square socket f in the socket-plate F. It also has near its lower end a squared part e' , which fits in a longitudinal square socket a^2 in the screw-threaded stem a' .

At the lower extremity of the cylindrical part of the stem E is an integral collar e^2 , which fits in a recess d' in the lower part of the sleeve D. Between the lower squared part e' and the collar e^2 the stem is in cross-section approximately a flattened ellipse in form and is screw-threaded, as at e^3 . A washer e^4 and a nut e^5 fit on the part e^3 and serve to press and keep the disk G firmly against the under side of the collar e^2 , so as to make a steam-tight joint therewith in order to prevent leakage of steam around the valve-stem. Owing to the flattened elliptical form of the part e^3 the valve-stem cannot turn in the disk, but, on the contrary, the disk must turn with the stem, thus causing the upper surface of the disk to wear evenly and also preventing the sticking of the disk on its seat on the lower end of the sleeve D. The lower part of the sleeve D has an inclined surface d^2 , ground to fit on the seat b^2 , and the lower end d^3 of the stem D is a true surface on which the upper surface of the disk G seats, so as to form a steam-tight joint.

In the lower part of the socket-plate F is an annular channel f' , adapted to accommodate bearing plates or rings f^2 , of hardened

steel, and balls f^3 , interposed and filling the space between said plates.

In the preferable form of socket-plate that edge of the plate which is perimetral to the annular channel f' is spun down, so as to form an internally-projecting ledge f^4 , which serves to keep the bearing-rings f^2 and the balls f^3 in the channel f' in such manner that the lower ring and the balls may turn freely without binding in the channel and in such manner as to prevent displacement and loss of the rings and the balls. I do not, however, restrict my claims to this precise means for retaining the rings and the balls in the channel, since it is obvious that any other suitable means may be employed, it being only essential that the rings and the balls shall be retained in the channel, so as to permit the balls and the lower ring to turn freely therein.

The hand-wheel in its preferable form consists of two parts connected together—viz., a metal socket-plate F and an annular wooden handpiece H. The hand-wheel may, however, be made in a single piece without departing from my invention, it being essential only that the hand-wheel shall contain ball-bearings, substantially as hereinafter set forth.

The upper end e^6 of the stem E is screw-threaded, and a nut e^7 fits thereon. A washer e^8 rests on the upper end of the socket-plate F and under the nut e^7 , and the nut binding on the washer serves to connect the socket-plate with the handpiece H, and when the nut is screwed down it draws on the stem, so as to bind the parts together and cause the disk G to press evenly against its seat at the lower end of the sleeve D.

In assembling the parts the stem a' is screwed into the hub b' . The bonnet is then screwed into the upper end of the valve-body. The disk G is then placed on the valve-stem and secured thereon by the washer e^4 and the nut e^3 . The lower squared end of the valve-stem is then inserted in the socket a^2 in the screw-stem a' . The sleeve D is then placed on the valve-stem and screwed down into the upper end of the valve-bonnet until the inclined surface d^2 rests firmly on the seat b^2 . The hand-wheel, with the socket-plate connected therewith and housing the bearing rings and balls, substantially as described, is then placed on the upper squared end of the valve-stem, so that the under side of the lower bearing-ring rests on the upper end of the sleeve D, and the nut e^7 is then placed on the screw e^6 and screwed down, so as to bring the upper surface of the disk in close contact with the true bearing-surface d^3 at the lower end of the sleeve D.

In practical use the valve A' may be raised or lowered by turning the hand-wheel H to the left or to the right, as the case may be. When the handle is turned in either direc-

tion, the balls f^3 roll in contact with the rings f^2 , thus reducing the friction and permitting the handle and the stem to turn much easier than would be the case if the bearing of the socket-plate was directly against the upper end of the sleeve D.

By employing a ball-bearing between the handle and the sleeve, in connection with means such as I have already described for vertically adjusting the valve-stem, I am enabled to produce a valve in which the stem may be adjusted to bring the disk in close contact with its seat and in which the stem may be easily turned when the disk is on its seat.

The upper end of the sleeve D extends slightly above the upper end of the cylindrical part of the valve-stem E in order that the lower bearing-ring f^2 may bear squarely on and rest in stationary contact with the upper end of the sleeve, so as to prevent wear on the end of the sleeve and so that the weight of the socket-plate and connected parts and the weight and the thrust of the valve-stem and connected parts may be borne on the upper end of the sleeve, and also in order that in case of wear of the disk or other parts the valve-stem and connected parts may not gravitate or move downward, so as to cause the disk to leave its seat on the lower end of the sleeve.

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

1. A socket-plate having a socket, an annular channel, and bearing plates and balls within said channel; in combination with a valve-body, a valve within the said valve-body, a valve-stem fitting in the socket in said socket-plate and adapted to operate the valve in said valve-body, and a handpiece adapted to turn said socket-plate, as set forth.

2. A valve-stem having its upper part and its lower part squared, also having a collar, and contiguous to said collar a flattened part and a disk, a washer and a nut fitting on the flattened part of said stem; in combination with a valve-body, a valve in said valve-body in the stem of which the squared lower end of said valve-stem fits, a valve-bonnet on said valve-body, a sleeve fitting in said valve-bonnet and having at its lower end a true surface on which said disk seats, and a hand-wheel connected with the squared upper end of said stem and abutting against said sleeve as set forth.

In witness whereof I have hereunto subscribed my name, in the presence of two witnesses, at Springfield, Illinois, this 14th day of June, A. D. 1897.

JAMES L. COOK.

Witnesses:

B. H. BRAINERD,
S. C. DARWIN.