

(No Model.)

C. S. BAVIER.  
VALVE AND JOINT.

No. 517,914.

Patented Apr. 10, 1894.

Fig. 1.

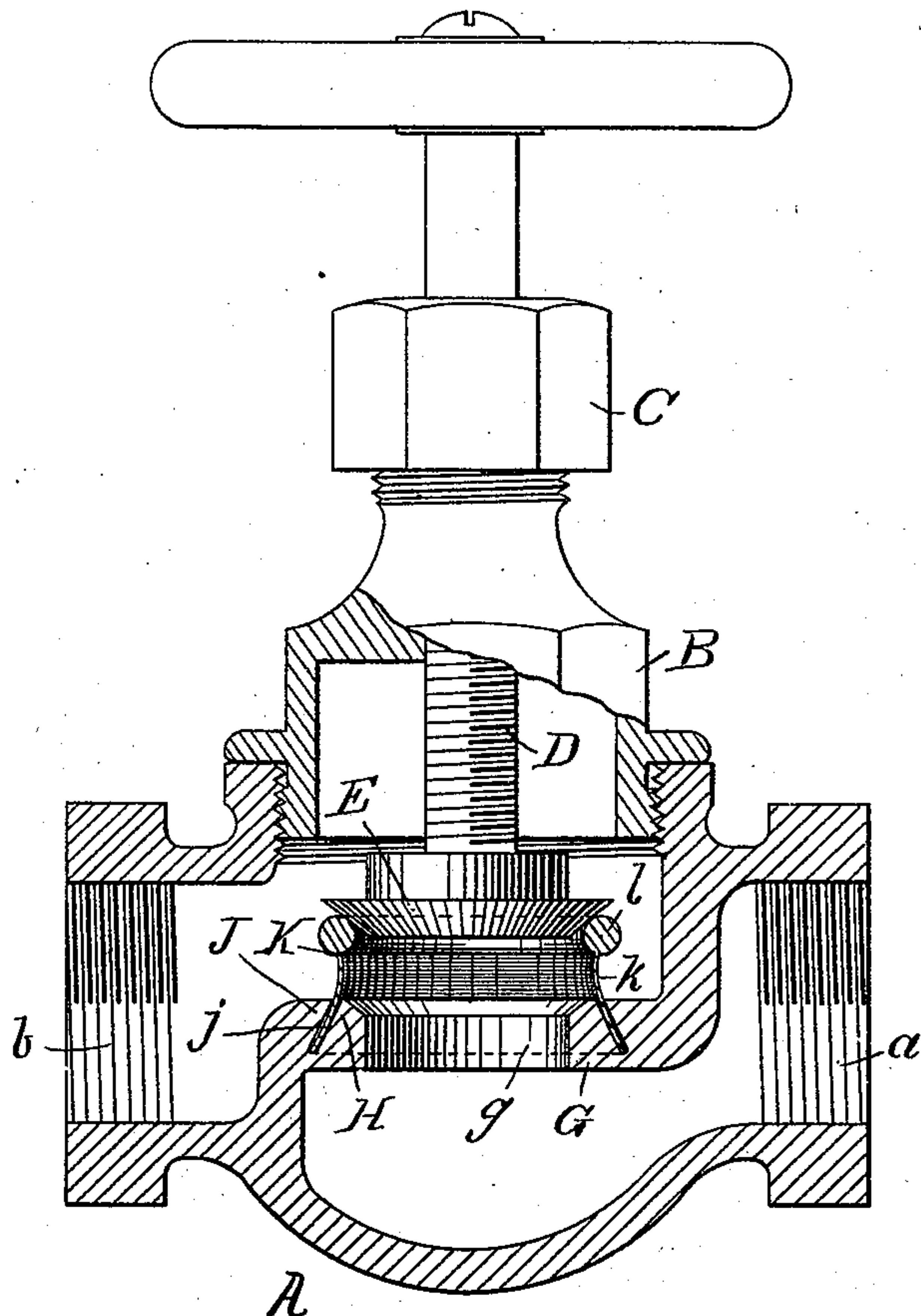


Fig. 2.

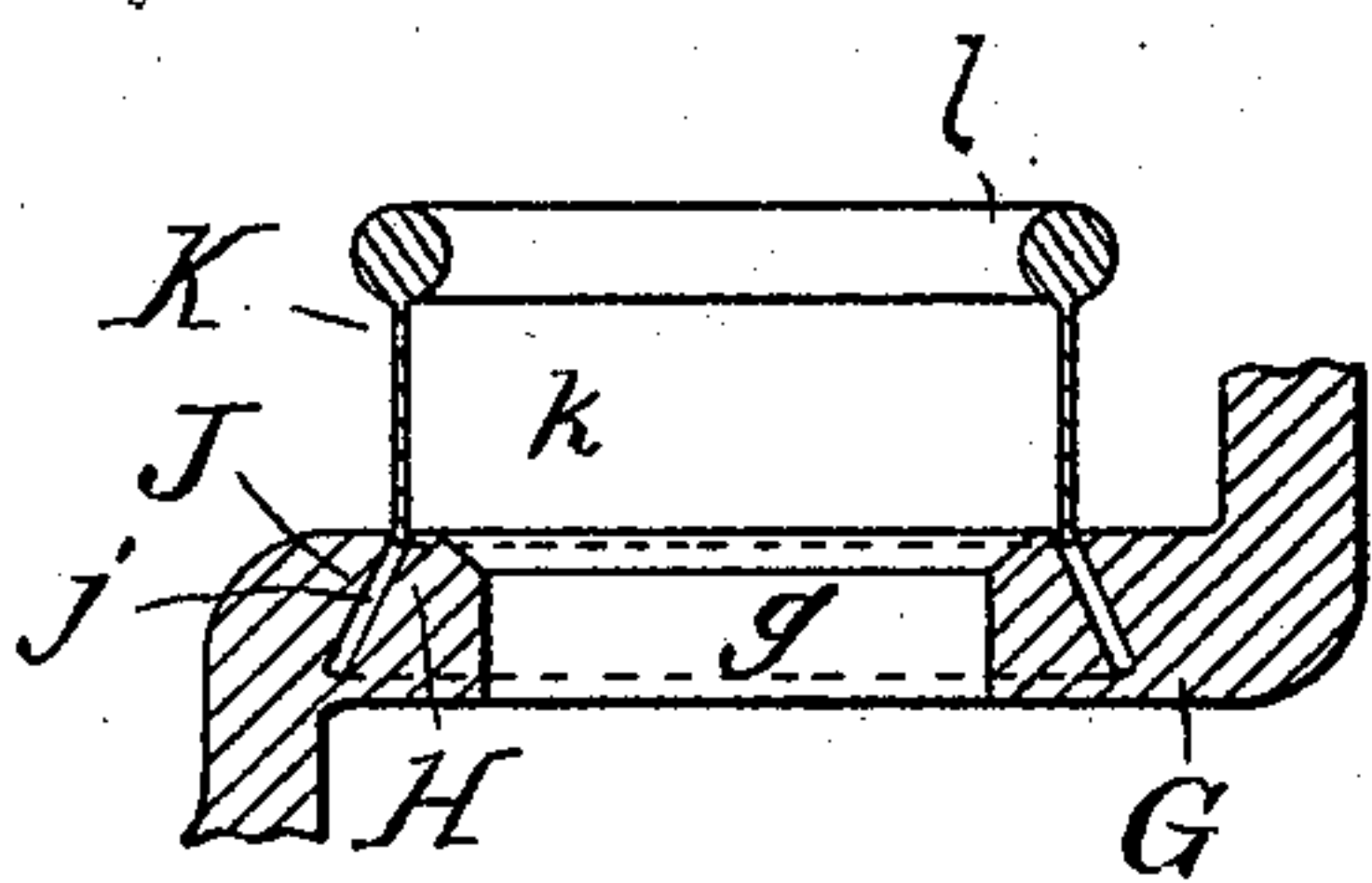


Fig. 3.

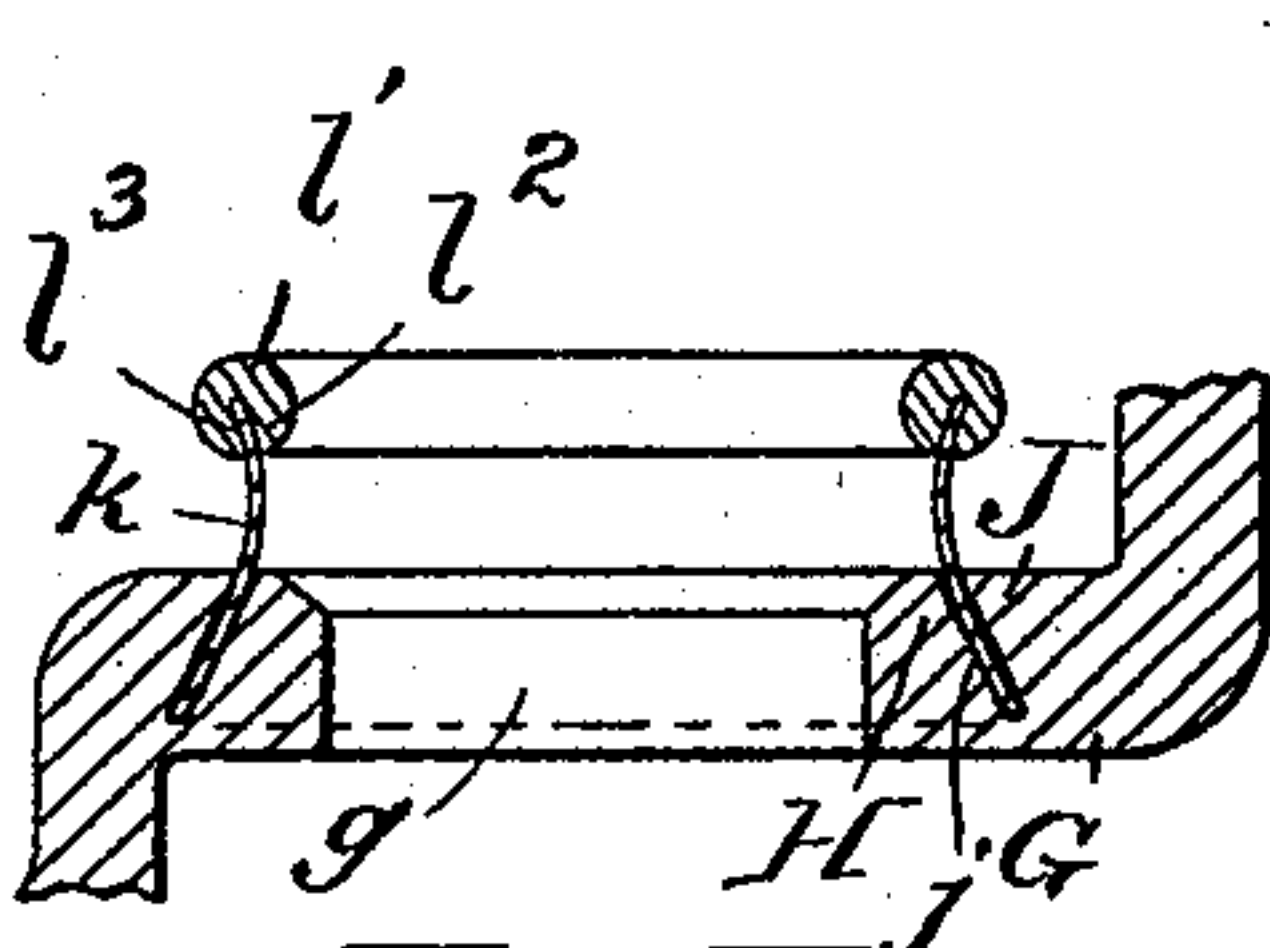


Fig. 4.

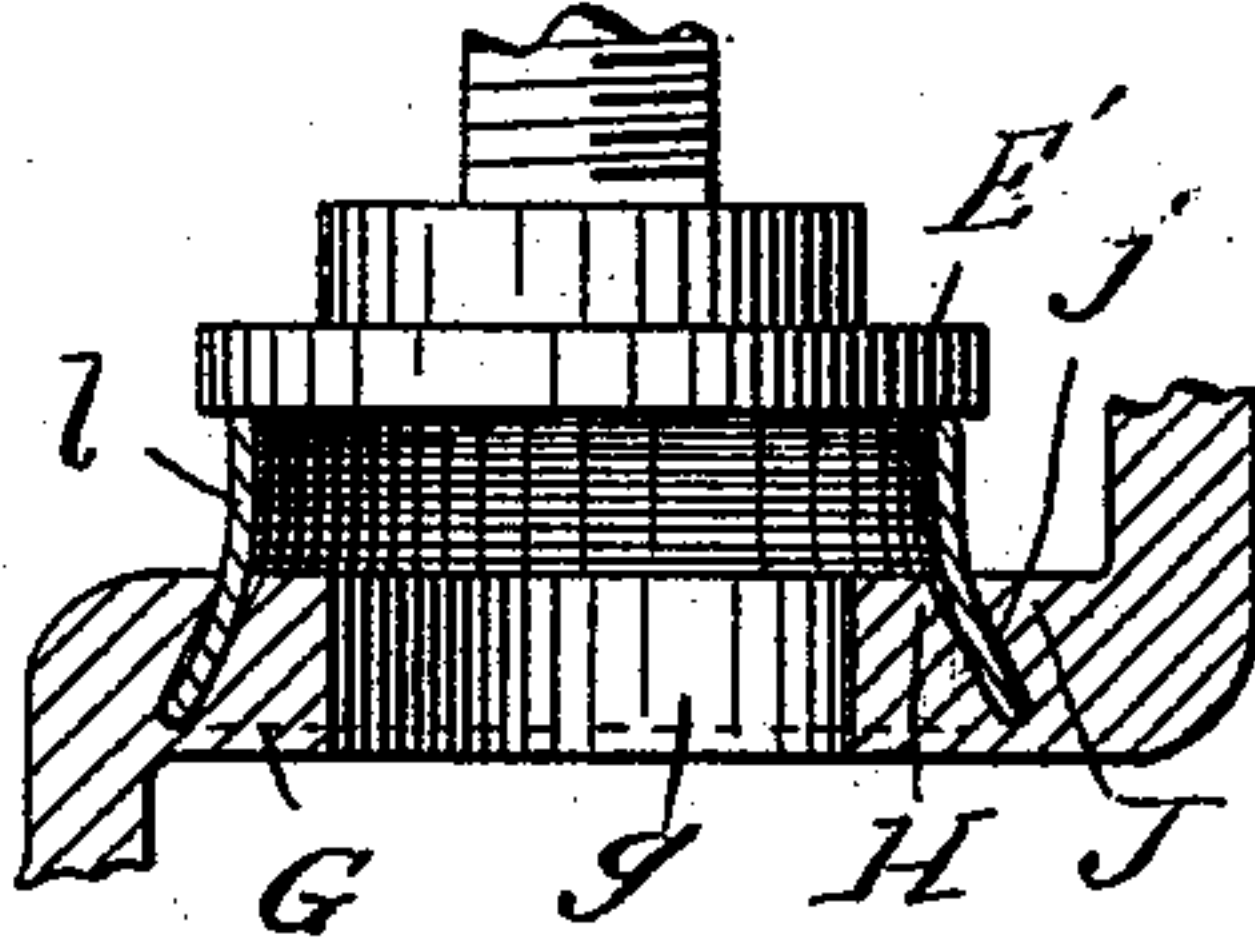
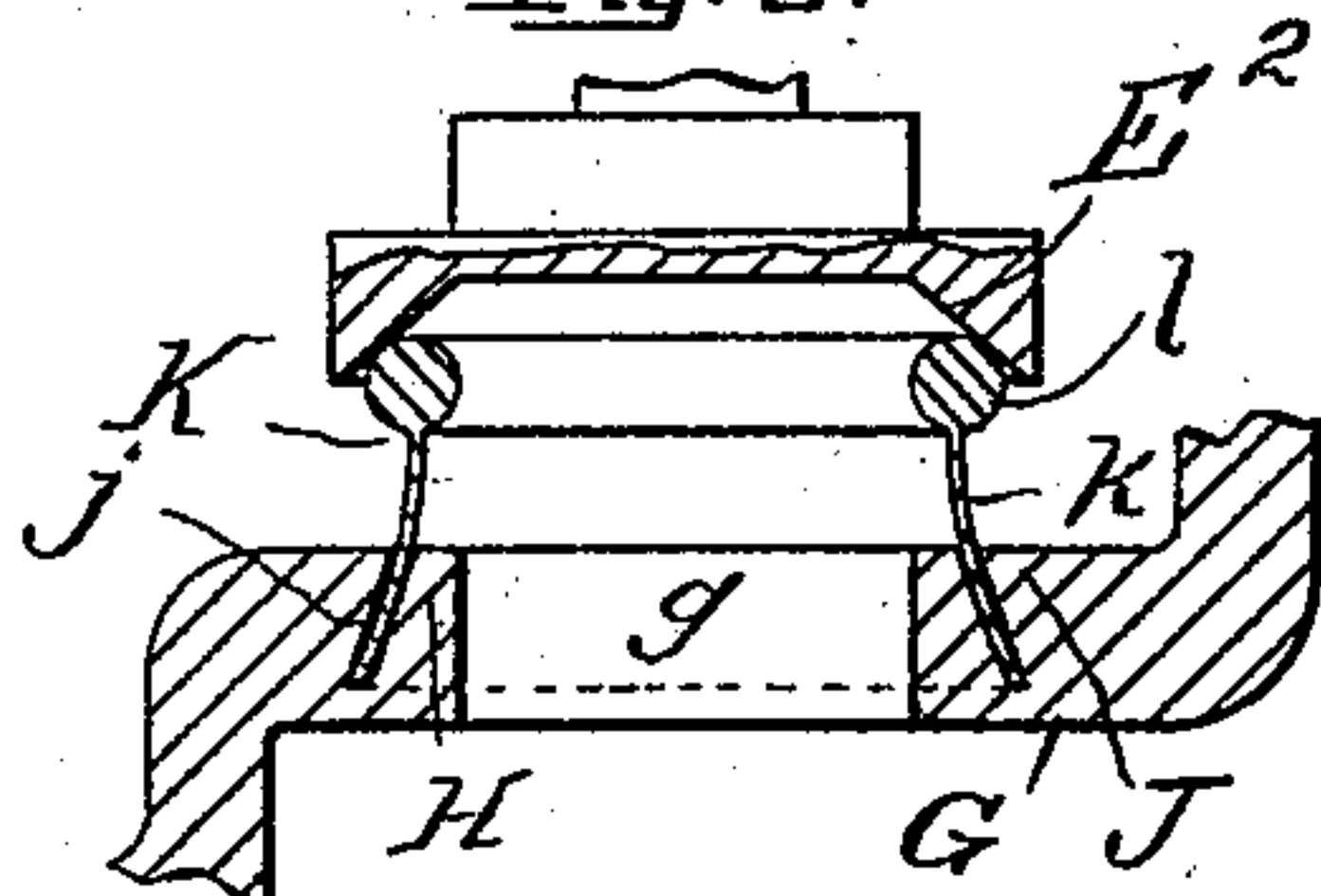


Fig. 5.



**WITNESSES:**

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# UNITED STATES PATENT OFFICE.

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## VALVE AND JOINT.

SPECIFICATION forming part of Letters Patent No. 517,914, dated April 10, 1894.

Application filed March 29, 1893. Serial No. 468,245. (No model.) Patented in England August 2, 1892, No. 13,964, and in France August 2, 1892, No. 223,423.

*To all whom it may concern:*

Be it known that I, CHARLES S. BAVIER, a citizen of the United States, and a resident of the city of New York, in the county and State of New York, have invented a certain new and useful Improvement in Valves and Joints, (for which I have obtained patents in Great Britain, No. 13,964, dated August 2, 1892, and in France, No. 223,423, dated August 2, 1892,) of which the following is a specification.

My invention relates to improvements in valves and joints, and particularly in that class thereof, wherein a ring-seat is expanded over a conical frustum in one compression surface. Valves and joints of the class referred to were described and claimed in United States Letters Patent No. 484,843, granted to me October 25, 1892. In said patent a tensional ring is shown which is set on a ductile ring below the top of the latter. But experience shows a certain tendency of the ductile ring to work up under these circumstances, and it is the object of my present invention to overcome this by so forming the tensional ring and combining it with the ductile ring that the pressure of the disk should come directly on the tensional ring and shall tend to keep the ductile ring down in the recess in the valve diaphragm.

Figure 1 is an elevation and section of a valve with my improved ring. Fig. 2 is a detail showing the ring before the same is expanded home. Fig. 3 is a detail of a ring whereof the web and the head are formed separately. Fig. 4 is a detail of the web without the head, used with a flat disk. Fig. 5 is a detail of a combined ring used with a re-entrant conical disk.

A, is the valve body with the inlet port, *a*, and outlet port, *b*, having the bonnet, B, stuffing-box C, valve stem, D, disk, E, all as is common in valves, and the disk, E, is loosely secured on the stem, D, in any suitable and known manner.

G, is the diaphragm, with the port, *g*, connecting the inlet and outlet sides of the valve. On said diaphragm, G, around said port, *g*, is formed the conical frustum, H, with a slope such that the resultant of pressures when a ring is being expanded home, as is herein-after described, will be against the sides and

not against the bottom of the ring, and that the ring shall be gently expanded and drawn without undue pressure on the diaphragm, G. Circumferential to said conical frustum, H, is a shoulder, J, having a slope substantially parallel to the shape of said conical frustum, and so as to form an annular groove, *j*, between said conical frustum and said shoulder.

K, is the ring, which is formed with a rather thin and ductile web, *k*, and a head, *l*, which latter is sufficiently thick to possess great tenacity and offer great resistance to stretching. Said head, *l*, is also somewhat elastic to permit of changing its shape without breaking. I find that copper possesses the required properties for both the web, *k*, and the head, *l*. Said head, *l*, may be formed integral with said web, *k*, as indicated in Figs. 1, 2 and 5, or may be formed separately and united thereto in any suitable manner as indicated in Fig. 3. To insert said ring, K, in the groove, *j*, the bonnet, B, with stem, D, and disk, E, being first removed, the lower edge of the web, *k*, being inserted in the groove, *j*, the bonnet with stem and disk is put on the valve body again, and the said disk, E, is run down by the threaded stem, D, into the head, *l*. Then by continuing to run down the disk, E, the web, *k*, will be forced down the cone, H, and home into the recess, *j*. Now suppose the disk, E, is by any means, as changes of temperature a little distorted, so that the line of contact between the said disk and the head, *l*, becomes an ellipse. Then will the extremities of said major axis distend the head, *l*, at those points, and elastic stresses will be set up in said head, *l*, which will draw the same in at the minor axis, thereby still maintaining a tight joint all around said disk, E. Similarly if the head, *l*, were distorted for any cause.

In Fig. 3 the head, *l'*, is represented as having a cone, *l''*, and an annular groove, *l'''*, in the under side, and the web, *k*, is secured to said head, *l'*, by having its upper edge expanded into said groove, *l'''*, in the same manner as its lower edge is expanded into the groove, *j'*. The ring, K, may be secured on the diaphragm by any suitable means instead of by the conical frustum, H, and shoulder J.

In Fig. 4 a ductile ring or web, *k*, is shown



without the head, *l*, and as used with a flat disk, *E'*. The conical frustum, *H*, shoulder, *J*, and groove are all as hereinbefore described. The said ring or web, *k*, will be forced home into the recess, *j*, by the action of the disk, *E'*, and the frustum, *H*, as will be well understood from the foregoing description.

In Fig. 5 the disk, *E*<sup>2</sup> is shown as a re-entrant cone, the concave surface of which will make a joint with the outside of the head, *l*. Evidently the arrangement is the equivalent of that shown in Fig. 1.

Now, having described my improvement, I claim as my invention—

1. A ring having a thinned ductile web and a thickened tensional head, as and for the purpose described.

2. The combination in valves and joints, of a cone on one member of the valve or joint, a recess around said cone, and a ring provided with a tensional head and a ductile web at-

tached thereto and adapted to be expanded over the cone into the recess, substantially as described.

3. The combination with a ring having a tensional head and ductile web attached thereto of the cone, *H*, adapted to enter and expand said ductile web and shoulder, *J*, as and for the purpose described.

4. A ring having a tensional head, and a ductile web formed of one integral piece of material, substantially as and for the purpose described.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 23d day of June, 1892.

CHARLES S. BAVIER.

Witnesses:

H. M. WILLIAMS,  
ARTHUR L. KENT.