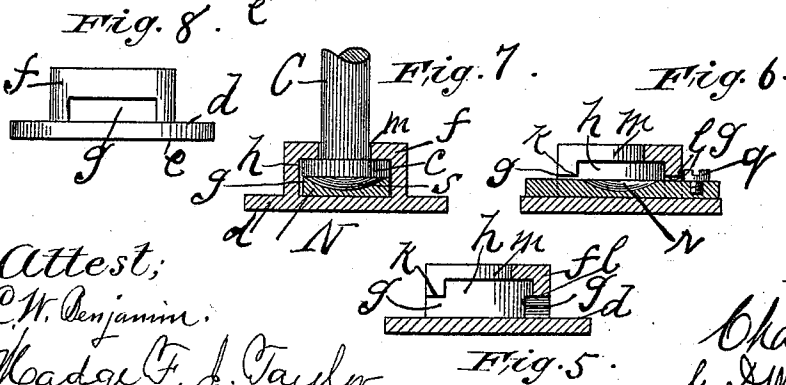
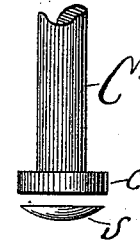
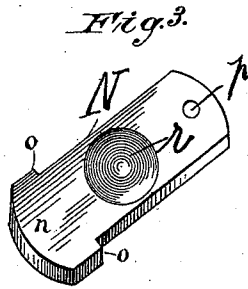
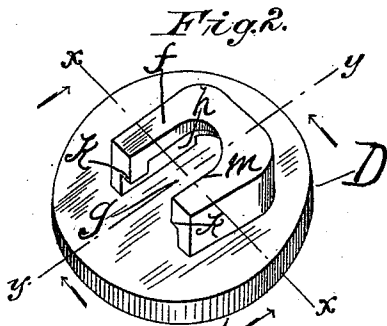
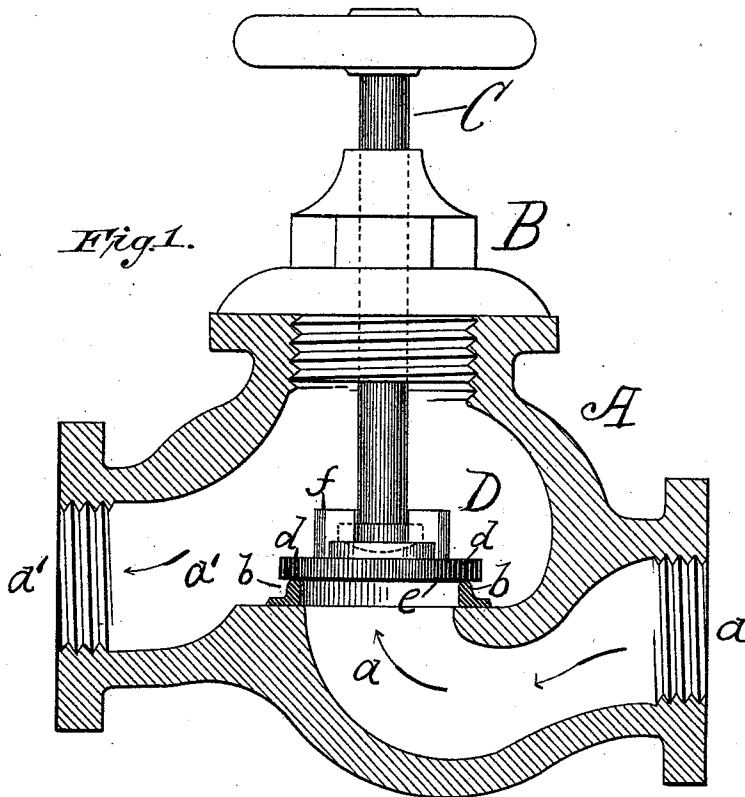


(No Model.)

C. S. BAVIER.  
VALVE.

No. 529,692.

Patented Nov. 27, 1894.



Attest:  
C. W. Benjamin.  
Wedge F. J. Taylor.

Inventor:  
Charles S. Bavier  
by J. Walter Brown  
his Attorney.

# UNITED STATES PATENT OFFICE.

CHARLES S. BAVIER, OF NEW YORK, N. Y.

## VALVE.

SPECIFICATION forming part of Letters Patent No. 529,692, dated November 27, 1894.

Application filed January 22, 1892. Serial No. 418,908. (No model.)

*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, of which the following is a specification.

My invention relates to improvements in valves and particularly the disks and spindles thereof, and the object of the improvement is to so form the disk and spindle that the disk can be readily put on, secured, and removed from the spindle, and also that the disk when on the spindle may have a universal rocking motion so that it will compensate for irregularities in the valve-seat.

My invention consists, therefore, in the first place, in a universal compensating valve-disk, and in the second place in the details of the construction, as hereinafter explained.

Referring now to the drawings which accompany the specification to aid the description, Figure 1 is a part section, part elevation of a valve with my spindle and disk. The position of the spindle-flange in the disk is represented by rectangular dotted lines. Fig. 2 is a perspective view of the disk, without the spindle. Fig. 3 is a perspective view of the key or feather, which locks the spindle in the disk. Fig. 4 is an elevation of the spindle and rocking-washer. Fig. 5 is a section of the disk on the line  $y-y$  of Fig. 2. Fig. 6 is a section of the disk on the sameline as Fig. 5, but also showing a section of the key in place in the disk. Fig. 7 is a section of the disk on the line  $x-x$  of Fig. 2 but showing the spindle, rocking-washer and key. Fig. 8 is an elevation of the disk as seen from behind.

Fig. 1 shows my spindle and disk applied to a globe valve, but they can be used in a variety of valves. A is the valve body having the inlet port,  $a$ , and outlet port,  $a'$ .  $b, b$  is the seat which may be of any suitable kind and construction as is common in valves, and this seat will preferably be placed eccentrically as respects the valve spindle C, for thereby the valve disk will touch the seat  $b, b$ , on a different circle each time it is lowered, because said disk turns freely upon the spindle as will be hereinafter explained, and therefore moves a little each time it is raised

from the seat. B is the bonnet with stuffing box, through which in the ordinary manner passes the spindle, C. Said spindle C has on its lower end the circular flange,  $c$ , preferably formed integral with the spindle, C, and serving to interlock the said spindle with the disk, D, in the manner hereinafter explained. Said disk, D, is constructed in the following manner, namely: It has a circular flat bearing-plate,  $d$ , of somewhat greater diameter than the diameter of the seat  $b, b$ . and the under face,  $e$ , of said plate  $d$  is made plane and true, and also hard and indexical. I therefore prefer to use a quite hard metal for the plate  $d$ . On the side of the said plate,  $d$ , opposite to the bearing face,  $e$ , is formed a boss,  $f$ . Said boss  $f$  and plate,  $d$ , are readily cast integral, and said boss,  $f$ , has a mortise or channel  $g, g$  which is of a width and height to readily admit the flange,  $c$ , of the spindle, C, and preferably extends diametrically through and through the boss, as shown in Figs. 2, 5, and 6. Instead of casting the plate  $d$  and boss  $f$  integral, said parts  $d$  and  $f$  may be formed separately, and then the boss  $f$ , may be readily mortised, chambered and slotted as hereinafter described, and united to the plate  $d$  by rivets or bolts, but the two parts can be cast integral, and the mortise, chamber and slot be afterward easily formed in a manner well known to those skilled in the art. Immediately above the mortise  $g, g$  and opening therefrom is formed in the boss a chamber  $h$ . The chamber  $h$  is preferably circular in shape, of a diameter equal to the width of the mortise  $g, g$  and high enough to permit the flange,  $c$ , to pass clear up into the chamber, but said chamber,  $h$ , is evidently shorter in the direction of the length of mortise  $g, g$  than is said mortise  $g, g$ . so that near the front end of the said mortise  $g, g$  are formed shoulders  $k, k$  separating the front part of the mortise from the chamber; and if said mortise  $g, g$  extends through and through the boss  $f$ , there will be similar shoulders  $l, l$  separating the rear part of said mortise from the chamber,  $h$ , over the middle part of the chamber,  $h$ , a long slot,  $m$ , is cut through the metal of the boss,  $f$ , up to the top thereof. Said slot,  $m$ , is narrower than the chamber,  $h$ , and of a width to easily admit the spindle, C, but prevent the flange,  $c$ , from passing up through,

and said slot, *m*, extends from near the rear face of the boss, *f*, forward and clear through the front face of the same, and at its front part said slot, *m*, is cut down through to the mortise *g. g.* Now it is evident from the foregoing description that the flange, *c*, can be slipped under the shoulders *k. k.* and slid back until said flange comes under the chamber, *h*, the spindle *C*, at the same time sliding back through the slot, *m*. Then the flange, *c*, can be lifted up into the chamber, *h*, leaving a clear channel beneath for the passage of the key, *N*. Said key *N* is a flat strip of metal of thickness and width such that it can pass easily through the mortise *g. g.* under the flange *c*, and of a length equal to the diameter of the plate, *d*. The front end of the key *N*, is fashioned into a broader head, *n*, with shoulders *o. o.* to prevent the key *N*, from passing clear through the mortise *g. g.* and near the rear end of said key is a threaded hole, *p*, to receive a threaded stop pin, *q*, which will bear against the back face of the boss, *f*, and prevent withdrawing the key. See Fig. 6. At about the middle length of the key, *N*, and so as to be directly under the flange, *c*, there is fashioned in the said key, *N*, a depression *r*, which in shape is a segment of a hollow sphere. Said depression *r*, is intended to receive the rocking washer, *s*, which is formed as a solid spherical segment coinciding with the surface of the depression *r*, and with flat upper face, and of a size to fit the depression *r*, in the key, *N*. Said washer *s*, is of such thickness that when it is in the depression in the key, *N*, the upper surface of the washer will be flush with the upper surface of the key. By means of a flat key, *N*, without the depression *r*, and washer *s*, I can lock the spindle *C*, in the disk *D*, and by reason of the loose fit of the spindle *C*, and flange, *c*, in the boss, *f*, the disk *D* will have a universal rocking motion, but I prefer to use the rocking washer, *s*, in the manner described. Now the flange, *c*, being in the boss, *f*, as hereinbefore described, the key, *N*, with the washer *s*, is slid through the mortise, *g. g.* from front to rear, until stopped by the shoulders, *o. o.* Then said washer, *s*, is directly under the flange, *c*. Now the stop screw *q*, is threaded into the hole, *p*, in the key, *N*, so that the said key cannot be withdrawn, and the spindle and disk will be inseparably connected together for the spindle can only be taken out of the disk by lowering the flange, *c*, down into the mortise, *g. g.* and below the shoulders, *k. k.* but the key, *N*, does not permit the flange *c*, to be so lowered; also by reason of the easy fit of the spindle, *C*, and flange, *c*, in the boss,

*f*, the disk, *D*, can rock universally on the spindle, *C*, and the washer *s*, will turn in the depression, *r*, as the disk rocks, so as to always give a good true bearing for the flange, *c*. Thus there is formed a universal joint, like a ball and socket joint, so that the disk, *D*, can compensate for irregularities in the form of the seat, *b. b.* Evidently in place of the boss, *f*, on the disk, *D*, said disk may be made somewhat thicker, and the boss be dispensed with. Then the said mortise, *g. g.* chamber, *h*, and slot, *m*, will be formed in the disk; also it is evident that I can cause the screw, *q*, to enter a threaded hole, in the plate, *d*, so as to fix the key *N*, and then I can dispense with the head, *n*, and also when I thus engage the stop screw into the plate, *d*, I can cut the slot, *m*, through to the rear face of the boss, *f*, all these changes being obvious and not varying the essential nature of the improvement.

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

1. A valve disk having a mortise to admit the end of the spindle, an upper chamber opening into said mortise and of less diameter in one direction than said mortise, and a slot from said chamber up through the substance of said disk, substantially as described.

2. The combination of a flanged spindle, a disk, a mortise in said disk adapted to admit said flange, an upper chamber communicating with said mortise but of less dimensions in one direction and adapted to receive and retain said flange, and a key adapted to fit said mortise below said flange, substantially as described.

3. The combination with a disk and a flanged spindle adapted to a movable fit therein, of a key adapted to fit in the disk below the spindle and provided with a depression and a rocking washer adapted to fit in said depression beneath said spindle, substantially as described.

4. The combination with a flanged valve spindle, of a disk provided with a mortise, chamber *h* communicating therewith, shoulders *k* at one side of said chamber, slot *m* leading up from said chamber, recessed key *N* and rocking washer *S*, substantially as described.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 9th day of October, 1891.

CHARLES S. BAVIER.

Witnesses:

BERNARD J. ISECKE,  
JOHN C. WALL.