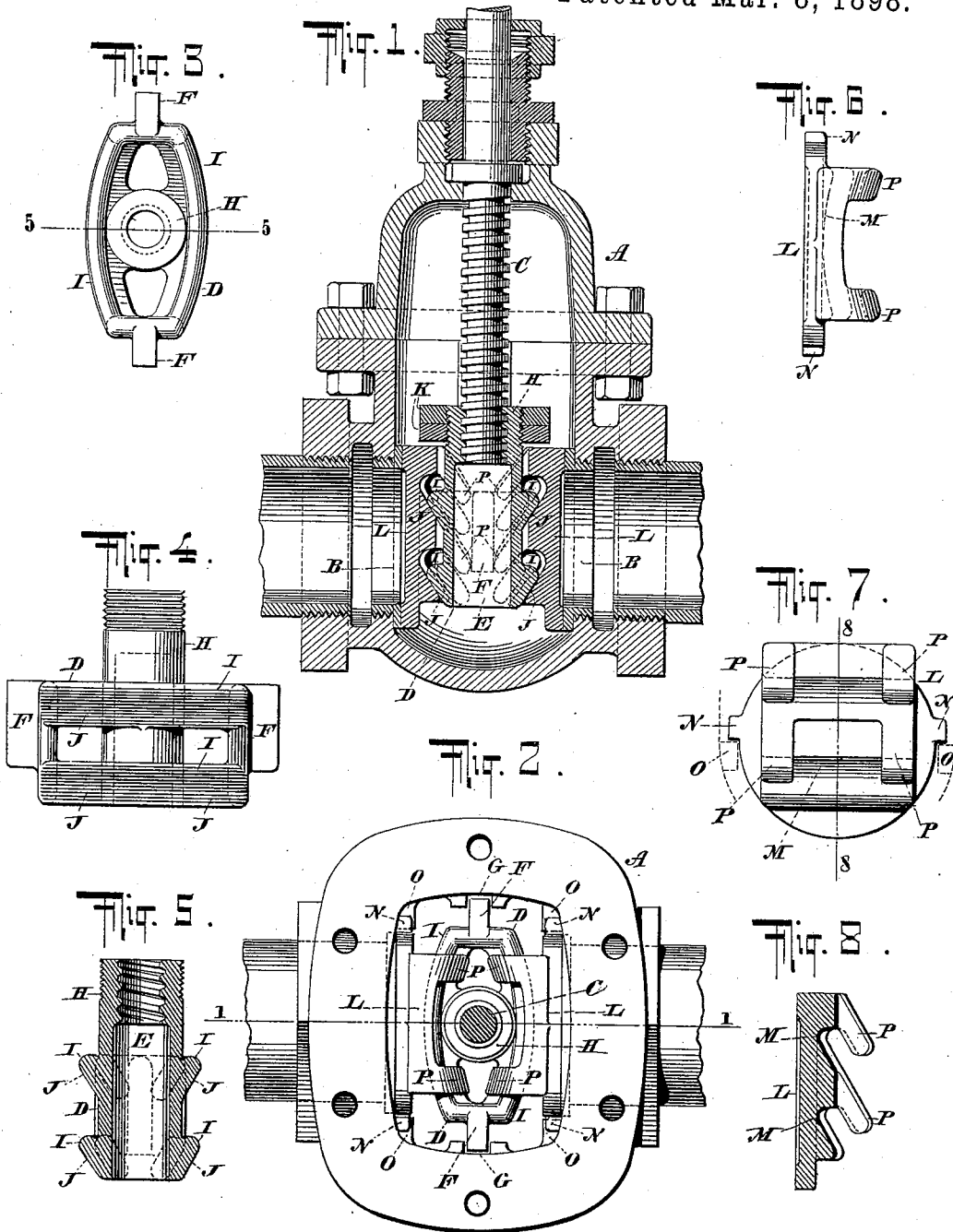


(No Model.)

C. SMITH.
GATE VALVE.

No. 600,181.

Patented Mar. 8, 1898.



WITNESSES:

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CHARLES SMITH, OF BELLEVILLE, NEW JERSEY.

GATE-VALVE.

SPECIFICATION forming part of Letters Patent No. 600,181, dated March 8, 1898.

Application filed July 31, 1897. Serial No. 646,582. (No model.)

To all whom it may concern:

Be it known that I, CHARLES SMITH, a citizen of the United States, and a resident of Belleville, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Gate-Valves, of which the following is a specification.

The invention relates to improvements in valves, and particularly to the class of valves known as "gate-valves;" and said invention consists in the novel features of construction and combinations of parts hereinafter described, and particularly pointed out in the claims.

In the drawings forming a part of this application I illustrate an embodiment of my invention in a gate-valve comprising a threaded valve-stem, a disk-nut adapted to travel on said stem during the axial motion of the latter, and valve-disks adapted to the seats of the valve-casing and containing recesses whose lower surfaces are inclined or wedge-shaped, and which recesses are adapted to correspondingly - formed lateral projections upon the opposite sides of the disk-nut, whereby upon the upward travel of the disk-nut the said projections thereon will elevate the valve-disks and during the downward travel of said nut the engaging wedge-shaped surfaces of said projections and the said recesses will firmly, evenly, and positively seat the valves.

The nature of the invention and the details of the construction by which it may be carried into effect will be fully understood from the description hereinafter presented, reference being had to the accompanying drawings, in which—

Figure 1 is a central vertical longitudinal section through a valve constructed in accordance with and embodying the invention. Fig. 2 is a top view of the lower portion of same, the dome or bonnet portion of the valve-casing and the ordinary nuts at the upper end of the disk-nut being omitted and the valve-stem being shown in transverse section. This figure indicates by the dotted line 1 1 the section on which Fig. 1 is taken. Fig. 3 is a detached top view of the disk-nut. Fig. 4 is a detached side elevation of same. Fig. 5 is a central vertical transverse section of same on the dotted line 5 5 of Fig. 3. Fig. 6 is a detached top view of one of the valve-disks.

Fig. 7 is a side view of the inner face of one of the valve-disks, and in this figure is indicated by dotted lines the projections or shoulders on the valve-casing by which said disk is arrested in its lower position; and Fig. 8 is a vertical transverse section through one of the valve-disks on the dotted line 8 8 of Fig. 7.

In the drawings, A designates the valve-casing, which is threaded in the customary manner at its opposite sides and provided with the valve-seats B B.

The valve-stem is lettered C and is threaded and adapted to have an axial rotation, but no vertical reciprocation, and said valve-stem C is of usual character. Upon the lower end of the valve-stem C is arranged the threaded disk-nut D, which contains the central bore E, threaded at its upper end to engage the valve-stem C, as indicated in Fig. 1, whereby upon the rotation axially of said valve-stem the said disk-nut D receives its vertical motion, traveling upward and downward upon said stem in accordance with the direction of motion imparted to the latter. The disk-nut D is elongated and its opposite sides are curved, as illustrated in Fig. 3. The ends of the disk-nut D are formed with the vertical flanges or ribs F, which enter the vertical grooves G, formed in the walls of the valve-chamber, the purpose of the flanges or ribs F and grooves G being to guide the disk-nut D and prevent the axial rotation of the same. The disk-nut D comprises the central tubular portion or sleeve H, the aforesaid flanges or ribs F, and the side projections I, the latter being on curved lines and in the general outline of an ellipse when viewed from above. The projections I extend from end to end of the sides of the disk-nut D, and their upper surfaces are practically horizontal, while their lower surfaces taper or incline inward toward the vertical longitudinal center of the said disk-nut, whereby said lower surfaces, which are lettered J, are rendered wedge-shaped. The upper portion of the sleeve H of the disk-nut extends above the projections I and is externally threaded at its upper end to receive the nuts K, one of the latter being a jam-nut.

The disk-nut D engages and acts upon the valve-disks L, which are adapted at their outer faces to the valve-seats B and at their

inner or facing sides conform to the curved outlines of the sides of the disk-nut D, and are provided with recesses M, adapted and conforming to the projections I, formed on said disk-nut.

The recesses M have their upper surfaces substantially horizontal and their lower surfaces inclined toward the sides of the disk-nut D on lines parallel with the wedge-shaped surfaces J of said projections I, whereby the lower surfaces of said recesses M are themselves rendered wedge-shaped and are adapted to be acted upon by the wedge-shaped surfaces J on said projections I. The recesses M of the valve-disk L extend horizontally on curved lines, substantially conforming to the curvature of the projections I on the disk-nut D, and in use the said disks L by means of said recesses M are freely hung upon the said projections I, the latter elevating said valve-disks when the disk-nut is elevated and driving said valve-disks against their seats B when the disk-nut is driven downward. Upon the opposite ends of the valve-disks L are formed the projections N, which when the valve-disks have reached their lower position will come into contact with the shoulders O, formed within the valve-casing A, said shoulders O coöperating with said projections N to arrest the valve-disks at the lower terminus of their movement.

The outer faces of the valve-disks L are substantially circular to conform to the circular outline of the valve-seats B; but at their inner faces said valve-disks L conform to the general curvature of the opposite sides of the disk-nut D, and at or adjacent to the opposite ends of said valve-disks L are formed the downwardly and inwardly inclined projecting fingers P, which start just above the recesses M and thence incline downward and inward on lines substantially conforming to the general inclination of the surfaces of said recesses. The purpose of the fingers P is to enable the more secure and efficient connection of the valve-disks L with the disk-nut D, and in use said fingers P pass inward over the projections I at the opposite sides of said disk-nut and enter the hollow interior of said nut between the sleeve H of the latter and the extreme ends of the nut. As shown in Fig. 3, provision is made in the opposite sides of the nut D and adjacent to the ends of the latter to receive the fingers P of the valve-disks L. In the assembling of the parts the fingers P are inserted over the projections I of the disk-nut, and said projections I enter the recesses M, formed in the inner faces of said valve-disks. The nuts K are then given their position, and the valve-disks are thus locked in place; but the disk-nut is free to have a limited vertical motion or play between the said valve-disks. The valve-disks, while prevented from leaving the disk-nut D, are freely connected with the said disk-nut and are adapted, owing to the form of their connection with said disk-nut, to yield to any ordinary irregu-

larities in the valve-seats or their edges which engage said seats.

During the upward motion of the disk-nut D, due to the axial rotation of the valve-stem C, the projections I on said disk-nut will elevate the valve-disks L, carrying the same upward without inclining them and drawing them slightly inward free from the valve-seats B by reason of the inclination of the fingers P on said valve-disks and in engagement with the projections I of the disk-nut. The inward motion toward one another of the valve-disks L is thus due to the fingers P. During the downward motion of the disk-nut D due to the reverse axial motion of the valve-stem the disks L are carried directly downward and then forcibly and evenly driven outward from one another and against the valve-seats B by means of the wedge-shaped projections I on the disk-nut acting against the wedge-shaped surfaces of the recesses M in said valve-disks.

The invention is not limited to a valve-stem C which is incapable of vertical reciprocation, since, if it is desired, the valve-stem C may in the usual manner be caused to reciprocate and carry the nut D upon its lower end in lieu of causing the said nut to travel upward and downward in the manner shown and above described. Valve-stems C, which have no vertical reciprocation, but only an axial motion, and valve-stems which have both an axial motion and vertical reciprocation are equally well known in the art, and hence I do not limit the present invention to the employment of any special character of valve-stem further than I may definitely point out in the claims; nor do I limit the invention to the use of both the upper and lower projections I and the upper and lower recesses M and the upper and lower fingers P upon the disk-nut and valve-disks. I prefer the duplication of these features and their arrangement as illustrated in the drawings; but if only one projection I were provided upon each side of the disk-nut D to engage one conforming recess in each valve-disk, and if the valve-disks were provided with only one set of the fingers P the valve thus constructed would be within the scope of my invention.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The valve comprising the casing having the valve-seats, the valve stem or spindle entering said casing, and the disk-nut engaged by said valve stem or spindle and being elongated transversely, said disk-nut having upon its opposite sides the oppositely-curved wedge-shaped projections I which extend from end to end of said nut and describe substantially an ellipse when viewed from above or below, combined with the valve-disks having the concave facing sides adapted to the convexity of said projections I and provided with the elongated recesses M conforming to and receiving said projections I and also with the fingers P which incline downwardly and inwardly and pass over said projections I into

the interior of the said disk-nut; substantially as set forth.

2. The valve comprising the casing having the valve-seats, the valve stem or spindle, and the disk-nut engaged by said valve stem or spindle and comprising the central sleeve portion and the parallel wedge-shaped portions I, I, which are separated from one another and describe substantially an ellipse when viewed from above or below, combined with the valve-disks having the concave facing sides adapted to the convexity of said portions I, I, and provided with the elongated recesses to receive said portions I, I, and also with the upper and lower fingers P, P, which extend over said portions I, I, and into the hollow interior of said disk-nut; substantially as set forth.

3. The valve comprising the casing having the valve-seats and grooves G, G, the valve stem or spindle, and the disk-nut, the latter consisting of the internally-threaded vertical sleeve portion H to receive the lower end of said valve stem or spindle, the laterally-elongated and oppositely curved or convex sides composed of the wedge-shaped bars I, I, the vertical flanges F, F, at the ends of said disk-nut, and end portions connecting the ends of said bars I, I, but leaving said bars intermediate their ends separated from one another, combined with the valve-disks having the

flat outer faces to engage said valve-seats and the concave facing sides formed with the recesses conforming to and fitting upon the convex bars I, I, and also formed with the downwardly and inwardly inclined fingers which pass over the bars I, I, and into the interior of said disk-nut; substantially as set forth.

4. The valve, comprising the casing having the valve-seats and threaded valve-stem, and the disk-nut having the internally-threaded sleeve H to engage said valve-stem and having the elongated curved sides provided with the projections I, I, whose lower surfaces incline downward and inward, combined with the valve-disks whose outer faces are adapted to the valve-seats and whose inner faces are formed with the elongated recesses M to receive said projections I and also with the fingers P which incline downwardly and inwardly and pass over said projections I, entering the hollow interior of the disk-nut intermediate said sleeve H and the end of the nut; substantially as set forth.

Signed at New York, in the county of New York and State of New York, this 30th day of July, A. D. 1897.

CHARLES SMITH.

Witnesses:

CHAS. C. GILL,
E. JOS. BELKNAP.