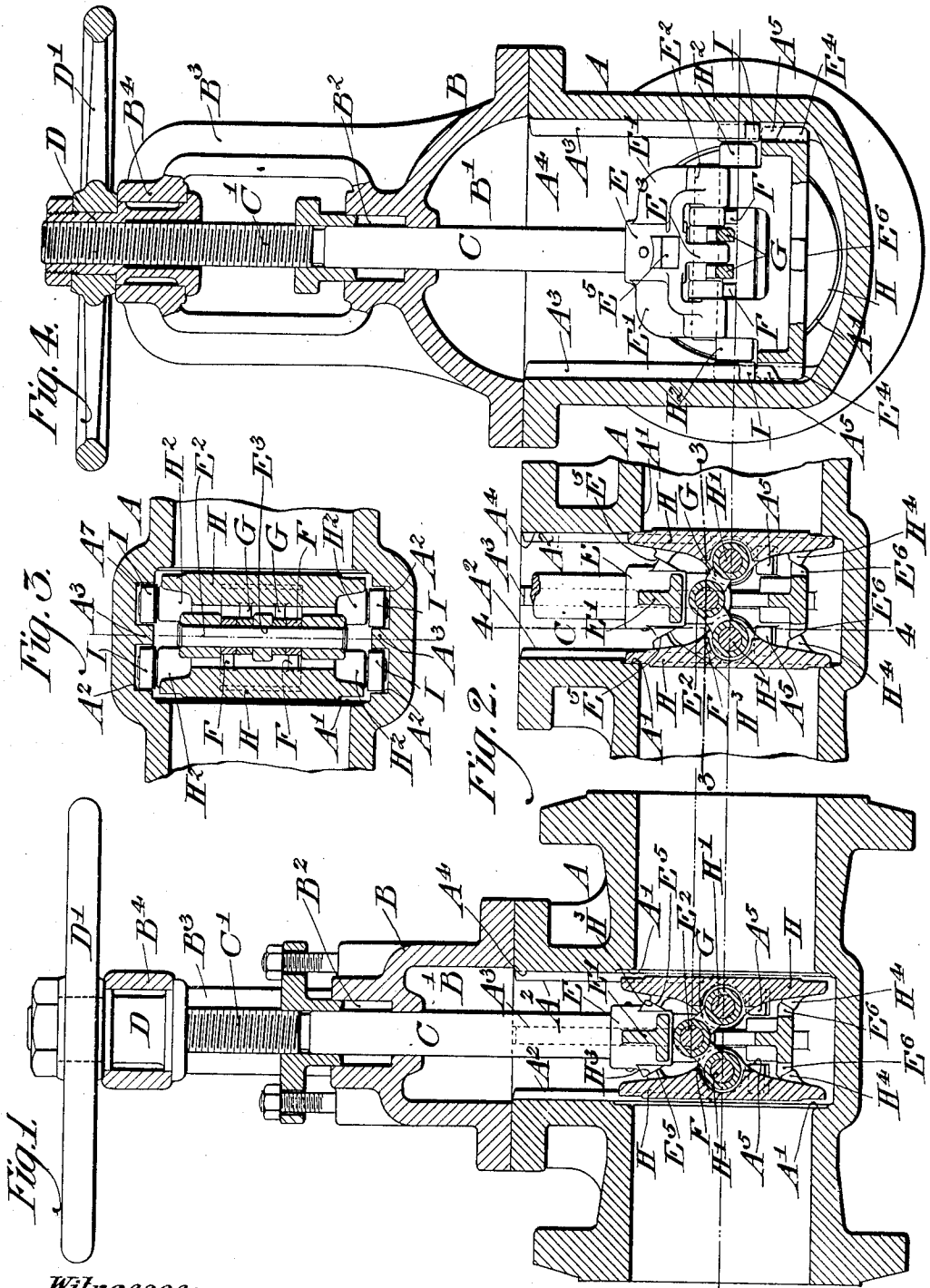


L. SCHUTTE.
GATE VALVE.

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Witnesses:
[Signature]
[Signature]

Inventor:
Louis Schutte
 by his atty.
James J. Chamber

UNITED STATES PATENT OFFICE.

LOUIS SCHUTTE, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO SCHUTTE AND KOERTING COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

GATE-VALVE.

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To all whom it may concern:

Be it known that I, LOUIS SCHUTTE, a citizen of the United States of America, residing in the city and county of Philadelphia, in the State of Pennsylvania, have invented a certain new and useful Improvement in Gate-Valves, of which the following is a true and exact description, reference being had to the accompanying drawings, which form a part thereof.

My invention relates to gate valves and has for its object to provide a valve of this character of high efficiency and great simplicity of construction and operation.

The nature of my improvements will be best understood as described in connection with the drawings in which they are illustrated and in which

Figure 1 is a sectional longitudinal elevation through a valve casing and valve embodying my invention. Fig. 2 shows the same valve seated. Fig. 3 is a horizontal section on the line 3—3 of Fig. 2 and Fig. 4 is a vertical section on the line 4—4 of Fig. 2.

A indicates the casing, which is formed with oppositely disposed valve seats A' , A' , and in the part lying between and above the valve seats with guide channels A^2 , A^2 , separated as shown by a vertical guide web A^3 , said channels and guide web being formed in the space lying between and on both sides of the valve seats and continued up into the space A^4 , provided for the retraction of the valve. The casing is also provided, as shown, with guides A^5 , A^5 , which form in effect a continuation of the channel guides A^2 , and are provided for the purpose of directing the valves outward against their seats when they are forced down to positions opposite the seats.

B, is the cap of the valve extending over and somewhat prolonging the chamber A^4 , as indicated at B' , a stuffing box B^2 , being provided for the valve stem and supporting arms B^3 , extending upward and supporting the annular hub B^4 .

C, is the valve stem, the unthreaded portion of which extends through the stuffing box B^2 , while the threaded portion C' , is engaged with the threaded hub D' , rotatably supported in the annular bearing B^4 and having secured to it the hand wheel D' . The stem C, has secured to its lower end the valve supporting head E, which as shown is provided with laterally and downwardly extending arms E' , E' , and also with a downwardly extending arm E^3 , these arms supporting the bearing shaft E^2 , and the arms E' , being continued down below the bearing shaft and laterally extended to form guides E^4 , E^4 , which engage the ribs A^3 , A^3 . The head E is provided on each side with the inclined bearing surface indicated at E^5 , and E^6 .

F, F, and G, G, are lever arms pivoted on the bearing shaft or pin E^2 , and extending on opposite sides of

the head E, their outer ends being pivotally connected with the bearing pins H' , H' , of the oppositely disposed valves, said valves being formed with inclined shoulders H^3 , H^4 , which rest against the inclined shoulders E^5 , E^6 , of the head E. The valves as shown are also formed with laterally extending hubs H^2 , to which are secured the bearing rolls I, I, which work in the guideways A^2 , and when the valves are in proper position contact with the guides A^5 .

In Fig. 1 the valves are shown in the position in which they are lowered until they face their seats in the casing, the guide rollers I being just in contact with the guideways A^5 , a further downward movement of the stem C, and head E, forces the rollers I against the guideways A^5 , which lie practically perpendicular to the valve seats and the valves therefore move outward against their seats, their supporting levers F, and G, acting as toggle levers as the head E, is thrust downward. The upward movement of the head E and stem C, withdraws the valves from contact with their seats, permitting the levers F and G to move downward to a sufficient extent, and by means of the guideways A^2 A^2 and the guide rolls I to positively withdraw the valves and keep them in withdrawn position while they are moved up into the chamber A^4 . The alinement of the valves is preserved in my construction by the contacting faces or shoulders E^3 , E^3 , E^5 , H^4 , the inclination of these parts being such as shown in Figs. 1 and 2, that while the contacting shoulders do not interfere with the proper movement of the valve they practically do insure that it shall always preserve substantial alinement with the valve faces. It will be observed, moreover, that the rolls I, carried by each valve, and the pivotal connections between the valve and its toggle arms are substantially midway between the top and bottom edges of the valve, so that they act on the center of the valve and therefore do not tend by their action to move the valve out of substantial parallelism with itself.

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

1. A gate valve casing having oppositely disposed seats in combination with a valve stem located between and extending transversely to said seats and movable in the direction of its length, said casing having guide surfaces at opposite sides of the seats extending substantially parallel to the valve passage, arms pivotally secured to said stem and extending on each side thereof, a valve pivotally secured to the arms at each side of the stem, each valve having guide contacting surfaces arranged to engage said casing guide surfaces when the valve stem is moved in to the valve closing position and direct the valve toward its seat without tending to rotate it.

2. A gate valve casing having oppositely disposed seats and a set of guide surfaces for holding the valves in retracted position while moving toward and away from their

- operative positions, and a set of guide surfaces for directing the valves towards said seats in combination with the valve stem, arms pivotally secured to said stem and extending on each side thereof, and a valve pivotally secured to said arms on each side of the stem, each valve having guide contacting surfaces arranged to engage casing guide surfaces of each set and guide the valve in its determined path.
3. A gate valve casing having oppositely disposed seats in combination with a valve stem located between and extending transversely to said seats and movable in the direction of its length, said casing having guide surfaces at opposite sides of the seats extending transversely to said stem, arms pivotally secured to said stem and extending on each side thereof, a valve pivotally secured to the arms at each side of the stem, each valve having guide contacting surfaces concentric with the pivotal connection between the valve and arms, arranged to engage said casing guide surfaces when the valve stem is moved in to the valve closing position and direct the valve toward its seat without tending to rotate it.
4. A gate valve casing having oppositely disposed seats and guides for directing the valves, in combination with a valve stem, a head secured to said stem, having inclined shoulders E³, E⁴, arms F, G, pivoted on the head, valves H, H, pivotally secured to said arms on opposite sides of the head, said valves having inclined shoulders H³, H⁴, contacting with the shoulders E³, E⁴, and guide rollers I, I, secured to the valves and acting in connection with the guides of the casing.
5. A gate valve casing having oppositely disposed seats and guides A², A², A³, A³, for directing the valves, in combination with a valve stem, a head secured to said stem, having guide lugs E⁴, E⁴, and inclined shoulders E⁵, E⁶, arms F, G, pivoted on the head, valves H, H, pivotally secured to said arms on opposite sides of the head, said valves having inclined shoulders H³, H⁴, contacting with the shoulders E⁵, E⁶, and guide rollers I, I, secured to the valves and acting in connection with the guides of the casing.
6. A gate valve casing having oppositely disposed seats in combination with a valve stem located between and extending transversely to said seats and movable in the direction of its length, said casing having a set of guide surfaces at opposite sides of the seats extending transversely to said stem, and a set of guide surfaces also at opposite sides of said seats and extending parallel to the stem, arms pivotally secured to said stem and extending on each side thereof, a valve pivotally secured to the arms at each side of the stem, each valve having guide contacting surfaces arranged to engage said transversely extending casing guide surfaces when the valve stem is moved into the valve closing position and direct the valve toward its seat without tending to rotate it, said guide contacting surfaces being also arranged to engage said parallel extending guide surfaces to hold the valve retracted when away from its operative position.
7. A gate valve casing, having oppositely disposed seats and guides for directing the valves towards said seats, in combination with a valve stem, arms pivotally secured to said stem and extending on each side thereof, valves, one for each seat each pivotally connected midway between an opposite pair of its edges to said arms and guiding portions carried by each valve in substantial alinement with the pivotal connection between the valve and said arms for engaging said guides.
8. A gate valve casing having oppositely disposed seats, guides extending parallel to the valve stem for holding the valves in retracted position while moving toward and away from their operative positions and for guiding the valve stem head and the guides for directing the valves toward their seats, in combination with a valve stem, a head carried by the stem, arms pivotally secured to said head and extending on each side thereof, valves pivotally secured to said arms, one on each side of the stem, said valves and valve stem head having guide contacting surfaces arranged to engage the guides in the casing.
9. A gate valve casing having oppositely disposed seats in combination with a valve stem located between said valve seats and extending transversely to the valve passage and movable in the direction of its length, said casing having at opposite sides of the valve seats a set of guide surfaces extending parallel to the stem, and another set of guide surfaces extending substantially parallel to the valve passage, a shaft carried by and extending transversely to the valve stem, valves, one for each seat, and an arm or arms connecting each valve to said shaft, each arm having one end pivotally connected to the shaft and the other end pivotally connected to the corresponding valve, each valve having guide contacting surfaces engaging casing guide surfaces of both sets.

LOUIS SCHUTTE.

Witnesses:

ARNOLD KATZ,
D. STEWART.