No. 663,599. Patented Dec. 11, 1900.

J. S. CHAMBERS.

THROTTLE VALVE.

(Application filed Aug. 29, 1900.)

(No Model.)

Fig. 1.

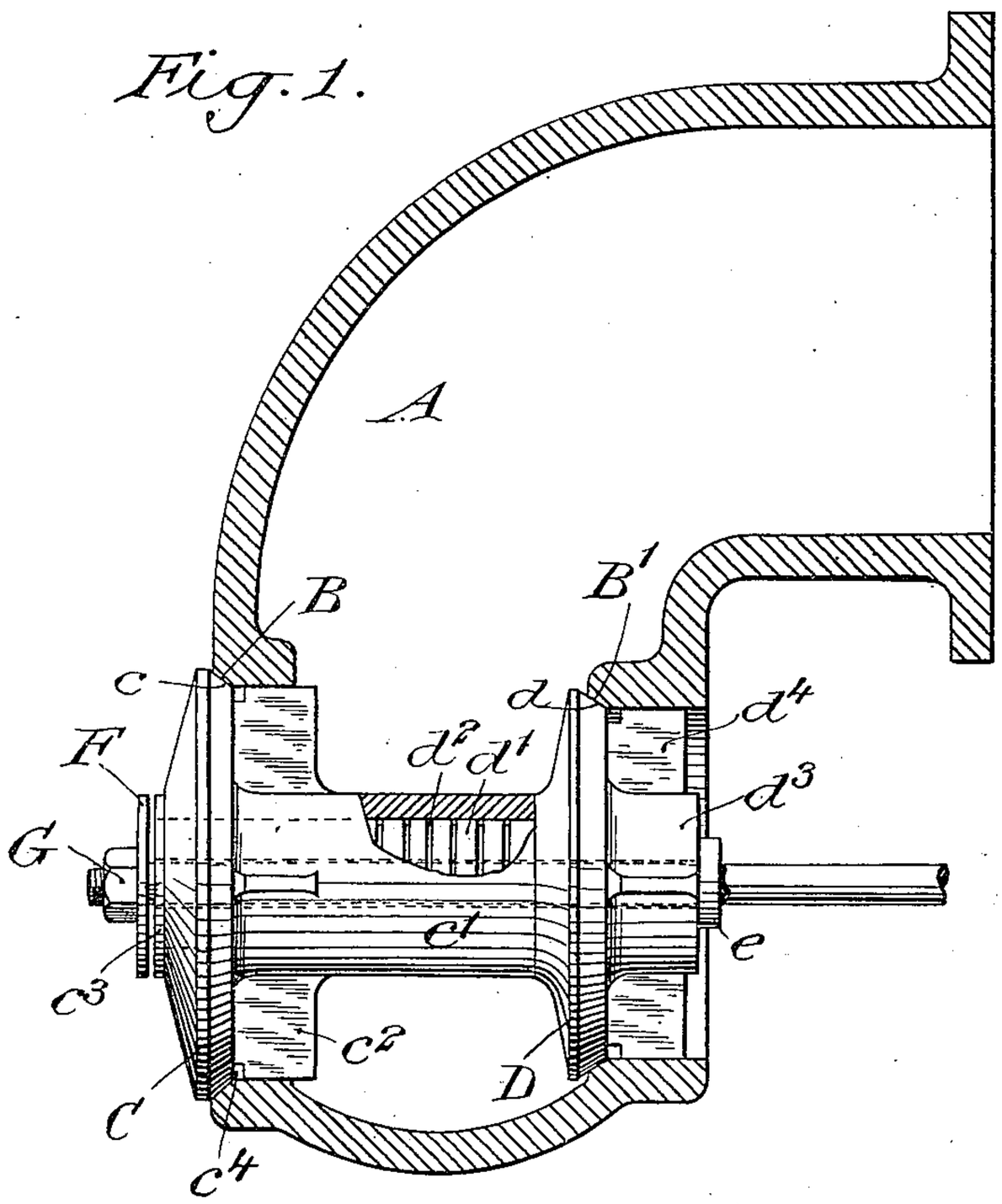


Fig. 2.

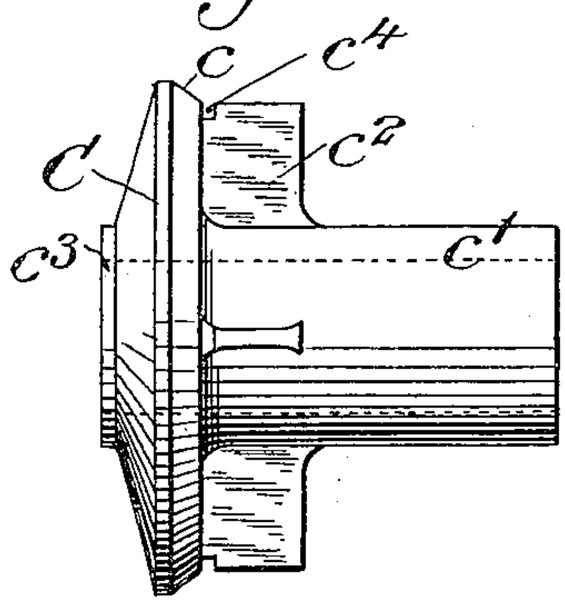


Fig. 3

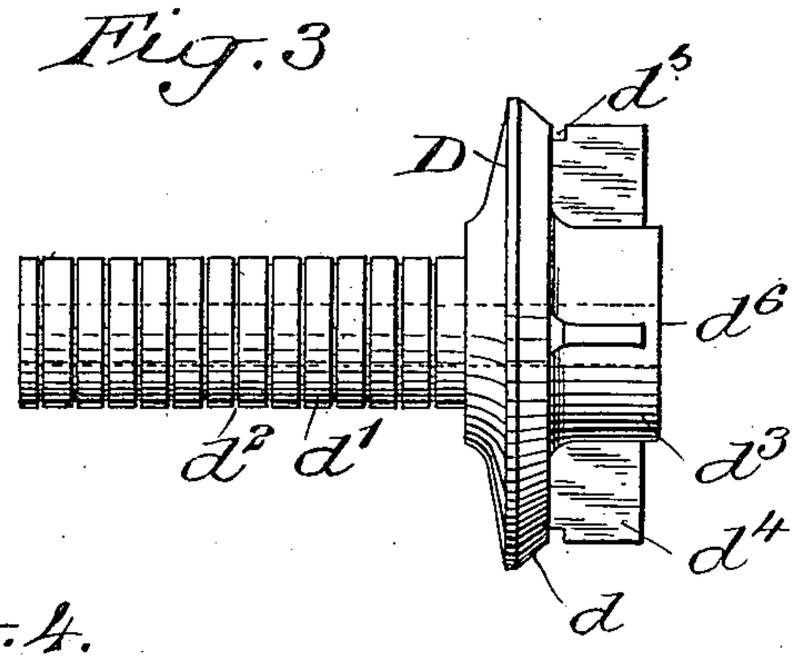
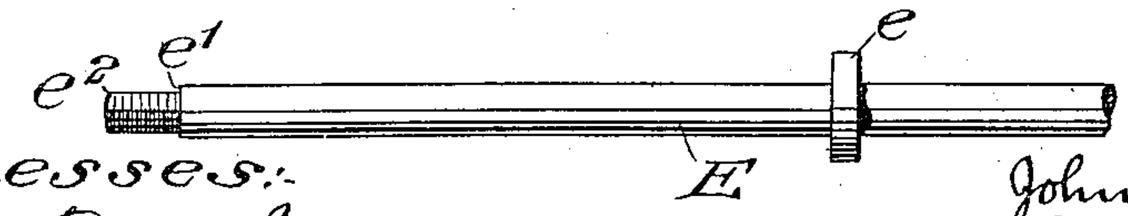


Fig. 4.



Witnesses:-
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

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THROTTLE-VALVE.

SPECIFICATION forming part of Letters Patent No. 663,599, dated December 11, 1900.

Application filed August 29, 1900. Serial No. 28,373. (No model.)

To all whom it may concern:

Be it known that I, JOHN S. CHAMBERS, a citizen of the United States, and a resident of Elizabeth, in the county of Union and State of New Jersey, have invented a new and useful Throttle-Valve for Steam-Engines, of which the following is a specification.

My invention relates to a throttle-valve for steam-engines, with the object in view of providing a simple and effective two-part throttle capable of automatically compensating for any defects in workmanship and for change of parts under expansion and contraction, thereby insuring a perfect seating of the two valve-disks, while at the same time permitting them to be operated simultaneously, as though they were rigidly connected. It has been found desirable in valves of this character to admit the steam simultaneously through both valve-seats in order to prevent the cutting out of one valve-seat more than another and to leave the valve-disks free to change their positions in a rotary direction relative to the seats, so as to provide, in effect, a self-grinding valve; and it is to the accomplishment of these desirable results that my present invention is directed.

In the accompanying drawings, Figure 1 represents the valve-box or portion of the so-called "dry pipe," in which the throttle-valve is seated, in section, the valve being shown partially broken away and in closed position. Fig. 2 is a view in detail of the upper or female section of the valve. Fig. 3 is a view of the lower or male section of the valve, and Fig. 4 is a view in detail of the valve-stem.

A represents a portion of the dry pipe in which the valve is seated, it being assumed that the same is located within a throttle-box, as is usual.

The valve-seat for the upper or female member of the valve is denoted by B, and the seat for the lower or male member is denoted by B′. The female member consists of a disk C, provided with a tapered face c, adapted to engage the tapered seat B. From the lower face of the disk C there projects a tubular neck c', and in proximity to the under face of the disk there are laterally-projecting wings c^2 for the purpose of directing the movement of the valve toward and away from its seat. The upper face of the disk C is preferably inclined and provided centrally with a shallow hub c^3, corresponding in diameter to the tubular extension c'. The bore within the tubular extension c' is intended to receive with a sliding fit the barrel extension on the male member, and the said bore is continued through the disk C and hub portion c^3. The male member comprises a disk D, having an extreme diameter corresponding to the diameter of the opening through the valve-seat B and with a tapered face b, adapted to engage the tapered seat B′ on the valve-box. From the upper face of the disk D there projects a barrel d', provided on its exterior with annular water-grooves d^2 for the purpose of making a steam-tight joint between it and the exterior of the extension c' on the female section. The barrel d' is intended to extend through the tubular extension c', disk C, and hub c^3 of the female section and project a slight distance above the hub c^3—in practice about one thirty-second of an inch. From the lower face of the disk D there projects a hub portion d^3, provided with laterally-projecting wings d^4 for the purpose of directing the reciprocatory movement of the disk D toward and away from its seat. The wings c^2 of the female section and d^4 of the male section are cut away at their upper corners, as denoted by c^4 and d^5, for the purpose of leaving the face of the valve free to seat and to prevent the possibility of steam cushioning at these points.

The valve-stem (denoted as a whole by E) is provided with a fixed collar e in position to engage the lower end of the hub d^3, the stem itself being fitted with an easy sliding or rotary fit to a bore d^6, extending longitudinally through the hub d^3, disk D, and barrel d' of the male section, which when the parts are assembled carries the stem also through the female section, and at its upper end the stem is provided with a small shoulder e' for receiving a washer F, fitted to slip over the upper threaded end e^2. The washer F is held in position and the parts held in their assembled adjustment by a nut G, screwed onto the threaded end e^2 of the stem into engagement with the washer F.

When the parts are assembled as shown in Fig. 1, the projecting end of the barrel d' of the male member will hold the washer F

normally a short distance away from the hub c^3 of the female section, thereby permitting the latter a limited sliding movement on the barrel d' of the male member to compensate for the expansion of the tubular projection c' of the female section or, what is found to be of more account, the expansion of the walls of the box A. In fact, it is found by experience that the expansion of the tubular projection c' in a longitudinal direction will not in any instance exceed that of the expansion of the box A, tending to carry the valve-seats farther apart. Hence the disk C will always be permitted to seat, and when the expansion of the box A is greater, as it ordinarily is, than the expansion of the tubular portion c' it will permit the said tubular extension, together with the valve-disk, to slide over the barrel d' until the hub c^3 engages the washer F—*i. e.*, a distance sufficient to compensate for any expansion that actually takes place. Again, any expansion of the barrel d' will take place freely through the interior of the tubular extension c', tending to carry the washer F a slight distance farther away from the hub c^3, but in no event affecting the perfect seating of the disk D. The normal or closed position of the parts will be that shown in Fig. 1, where the lower end of the tubular extension c' is engaged with the top of the disk D, so that when it is desired to open the valve for the admission of steam to the pipe or box A the lifting on the stem E will simultaneously lift both the disks D and C from their seats, while the return movement of the valve-stem will positively close the lower disk D to its seat, and the pressure on the outside of the disk C will promptly seat it. At the same time that these parts are simultaneously operated they are free to shift their positions in a rotary direction, as the male member is loosely mounted on the valve-stem and the female member loosely mounted on the male member.

The operation is quite similar in all respects to that of the valves in common use, so far as the operator is concerned, so that the introduction of the present structure in the place of that heretofore in common use will work no inconvenience, while the life of the valve and the perfectness of its seating will be material points in the saving of expense due to wear and tear.

What I claim is—

1. A throttle-valve comprising a male member and a female member, each provided with a valve-disk and resting normally in engagement with each other, the female member being under the control of the male member to be positively operated simultaneously with the male member to open the valve and the male member being loosely mounted on and under the control of the valve-stem to be positively closed, substantially as set forth.

2. The combination with valve-seats spaced apart, of a two-part valve, the one part being loosely secured to the valve-stem to be positively operated toward and away from its seat by the valve-stem and the other part being loosely mounted on the aforesaid part and having a bearing against the aforesaid part to be positively moved in one direction while being free to move independently of the first-named part in the opposite direction, substantially as set forth.

3. The combination with valve-seats spaced apart, of a two-part valve, one of the valve parts being provided with a barrel extending through the opposite part and projecting beyond the said part, a valve-stem extending through the said inner part and locked to the said part to operate it positively in each of two opposite directions, the said inner part being provided, on its exterior, with water-grooves to form a steam-tight joint while permitting the parts to move longitudinally relatively to one another, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 24th day of August, 1900.

JOHN S. CHAMBERS.

Witnesses:
FREDK. HAYNES,
GEORGE BARRY, Jr.