No. 751,667. PATENTED FEB. 9, 1904.

J. B. MICHAEL.

THROTTLE VALVE.

APPLICATION FILED MAY 25, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 2.

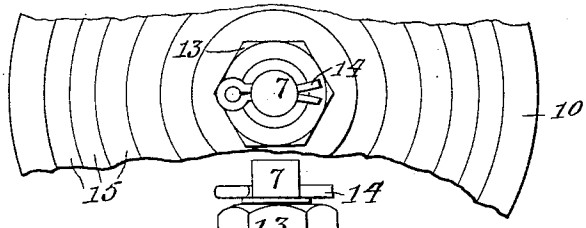
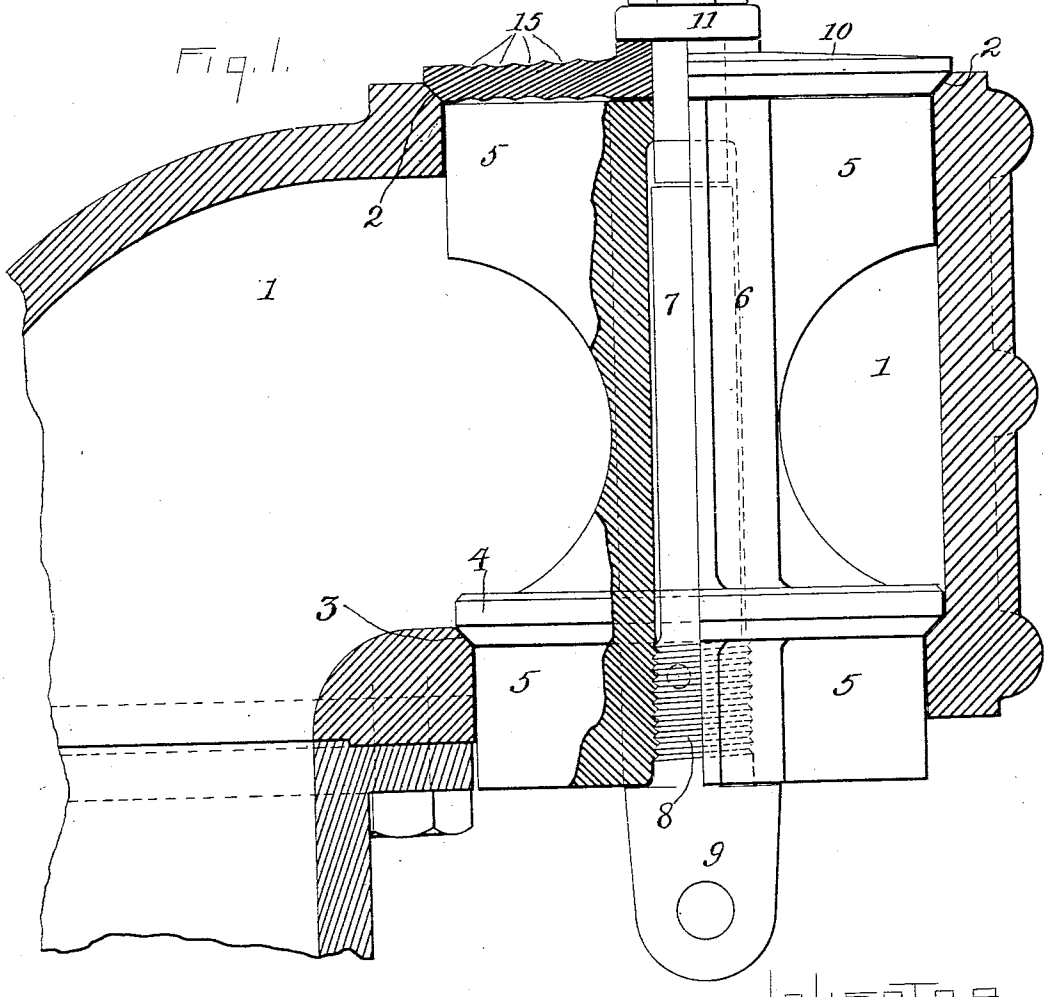


Fig. 1.



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

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THROTTLE VALVE.

APPLICATION FILED MAY 25, 1903.

NO MODEL. 2 SHEETS—SHEET 2.

Fig. 5.

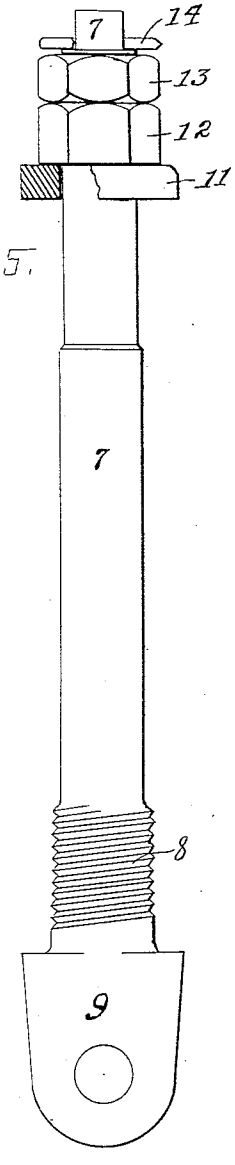


Fig. 3.

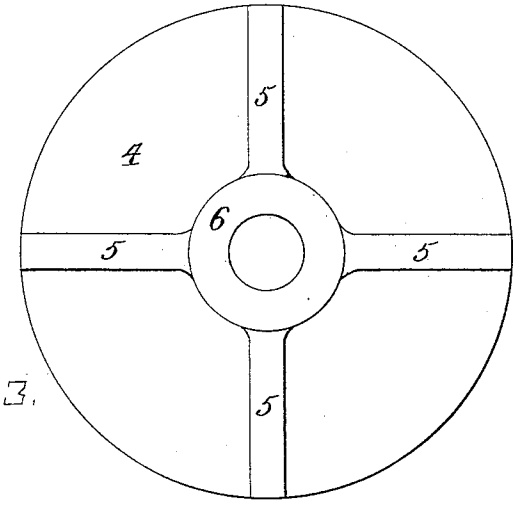
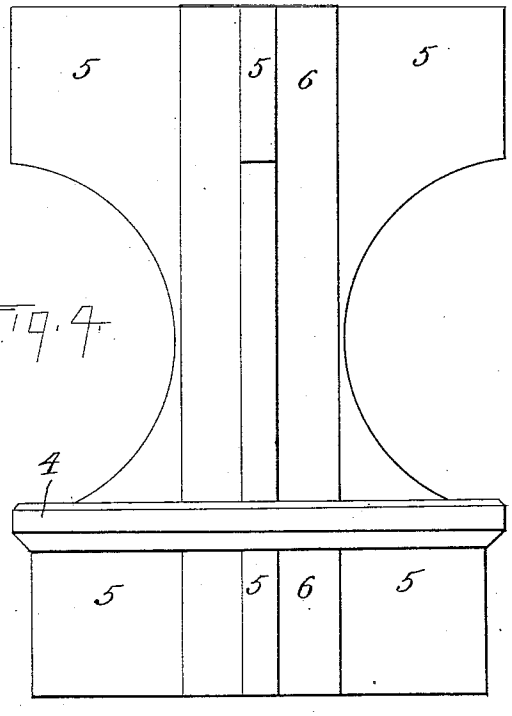


Fig. 4.



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No. 751,667. Patented February 9, 1904.

UNITED STATES PATENT OFFICE.

JOHN BAKER MICHAEL, OF KNOXVILLE, TENNESSEE.

THROTTLE-VALVE.

SPECIFICATION forming part of Letters Patent No. 751,667, dated February 9, 1904.

Application filed May 25, 1903. Serial No. 158,580. (No model.)

To all whom it may concern:

Be it known that I, JOHN BAKER MICHAEL, a citizen of the United States, residing at Knoxville, in the county of Knox and State of Tennessee, have invented a new and useful Improvement in Throttle-Valves, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to throttle-valves for steam-engines; and it consists in certain modifications and improvements of the construction made the subject-matter of Letters Patent of the United States No. 723,894, granted to me March 31, 1903, for an improvement in throttle-valves.

In the present structure I have reduced the number of parts and simplified the work of manufacture.

In the accompanying drawings, Figure 1 is a vertical transverse section through the throttle-box with my improved throttle-valve in position. Fig. 2 is a plan of a portion of the valve. Figs. 3 and 4 are respectively a plan and an elevation of the body of the valve. Fig. 5 is a detail view of the central shaft of the valve.

Referring to the drawings, 1 indicates the throttle-box, which is of usual construction and has the two valve-seats 2 and 3 formed therein in any desired manner. On the seat 3 is a valve-disk 4. This is preferably integral with the radial guide-wings 5 and central barrel 6, which, together with said disks, constitute the "body" of the valve. Between the lateral edges of the guide-wings 5 and the wall of the box there is a slight clearance. About one sixty-fourth of an inch will answer.

The valve-shaft 7 extends from below upward through the barrel 6 of the valve-body. A portion of said shaft, as 8, may be screw-threaded into the interior of said barrel. At its lower end said shaft has a head 9, by which connection is made with the usual valve-operating mechanism. The upper face of said head may be made to bear against the face of said barrel.

A valve-disk 10 surrounds the upper portion of said shaft 7 and is bound firmly to the upper end of the barrel 6 by means of a washer 11 and lock-nuts 12 and 13, and above the lock-nuts a cotter-pin 14 may extend through said shaft.

The barrel 6 extends a little (about one thirty-second of an inch) above the upper edges of the upper wings 5 in order that there may be a clearance between the upper edges of said wings and the inner face of the disk 10 to permit the firm binding of said disk 10 to the upper end of said barrel and to permit the flexing of said disk, as hereinafter described. To further facilitate such binding, the end of said barrel and the corresponding area of the inner face of said disk should be accurately ground.

The relative dimensions of the parts are such as that when the valve-disk 4 is on the seat 3 the disk 10 will in the absence of steam-pressure rest slightly above the seat 2. A clearance of about one sixty-fourth of an inch between the disk 10 and its seat will answer. Thus room is made for the downward springing or flexing of the rim of said disk 10 in the manner described in my Letters Patent above mentioned. The disk 10 is made flexible by means of concentric corrugations 15 or in any other suitable manner, as described in said Letters Patent, and the downward pressure of the steam upon the outer surface of said flexible disk bends the latter sufficiently to bring its periphery to its seat.

The clearance between the inner face of the disk 10 and the upper edges of the guide-wings 5 should be enough greater than the clearance between the seat 2 and the edge of the disk 10 to permit said edge to rest upon said seat while the inner face of said disk is still clear of said wings and the lower disk is on its seat; but said wings may support said disk 10 if the latter is bent downward between the seat 2 and the upper end of the barrel 6 by unusual steam-pressure, and said wings may also support the outer edges of said disk 10 when the latter is depressed during the initial portion of the lifting of the entire valve for the admission of steam.

I claim as my invention—

1. In a throttle-valve, the combination with a throttle-box having ports, of a valve located in said box and adapted to close said ports, said valve comprising two relatively fixed disks,

one of which is flexible, and guide-wings adjacent to and normally clearing said flexible disk and extending along the wall of said box with a slight clearance.

2. In a throttle-valve, the combination with a throttle-box having ports, of a valve located in said box and adapted to close said ports, said valve comprising two relatively fixed disks, one of which is flexible, a connection between said disks, and guide-wings located upon said connection between said disks adjacent to and normally clearing said flexible disk and extending along the wall of said box with a slight clearance.

3. In a throttle-valve, the combination with a throttle-box having ports, of a valve located in said box and adapted to close said ports, said valve comprising two relatively fixed disks, one of which is annularly corrugated, and guide-wings adjacent to and normally clearing said flexible disk and extending along the wall of said box with a slight clearance.

4. In a throttle-valve, the combination with a throttle-box having ports, of a valve located in said box and adapted to close said ports, said valve comprising two relatively fixed disks, one of which is annularly corrugated, a connection between said disks, and guide-wings located upon said connection between said disks adjacent to and normally clearing said flexible disks and extending along the wall of said box with a slight clearance.

5. In a throttle-valve, the combination with a throttle-box having ports, of a valve located in said box and adapted to close said ports, said valve comprising two relatively fixed disks, one of which is flexible, a connection between said disks, and guide-wings supported by said connection adjacent to and normally clearing said flexible disk and extending along the wall of said box with a slight clearance.

6. In a throttle-valve, the combination with a throttle-box having ports, of a valve located in said box and adapted to close said ports, said valve comprising two relatively fixed disks, one of which is annularly corrugated, and a connection between said disks, and guide-wings supported by said connection adjacent to and normally clearing said flexible disk and extending along the wall of said box with a slight clearance.

7. In a throttle-valve, the combination with a throttle-box having ports, of a valve located in said box and adapted to close said ports, said valve comprising an integral body consisting of a disk, barrel, and radial guide-wings extending from the upper end of said barrel laterally almost to the inner face of the wall of said box, and a flexible disk secured to the end of said barrel slightly above said wings.

8. In a throttle-valve, the combination with a throttle-box having ports, of a valve located in said box and adapted to close said ports, said valve comprising an integral body consisting of a disk, barrel, and radial guide-wings extending laterally from the upper portion of said barrel almost to the inner face of the wall of said box, a flexible disk applied to the end of said barrel slightly above said wings, and a shaft extending axially through said flexible disk into said barrel.

9. In a throttle-valve, the combination with a throttle-box having ports, of a valve located in said box and adapted to close said ports, said valve comprising an integral body consisting of a disk, barrel, and radial guide-wings extending laterally from the upper portion of said barrel almost to the inner face of the wall of the box, a flexible disk applied to the end of said barrel slightly above said wings, and a shaft extending axially through said flexible disk and said barrel.

10. In a throttle-valve, the combination with a throttle-box having ports, of a valve located in said box and adapted to close said ports, said valve comprising an integral body consisting of a disk, barrel, and radial guide-wings extending laterally from the upper portion of said barrel almost to the inner face of the wall of the box, a flexible disk applied to the end of said barrel slightly above said wings, and a shaft extending axially through said flexible disk and said barrel and having a portion screw-threaded into said barrel.

In testimony whereof I have signed my name, in presence of two witnesses, this 20th day of May, in the year 1903.

JOHN BAKER MICHAEL.

Witnesses:
S. H. TURNER,
W. W. HAMMOND.