L. B. GRAY.

VALVE.

APPLICATION FILED AUG. 29, 1910.

1,076,281. Patented Oct. 21, 1913.

Fig. 1.

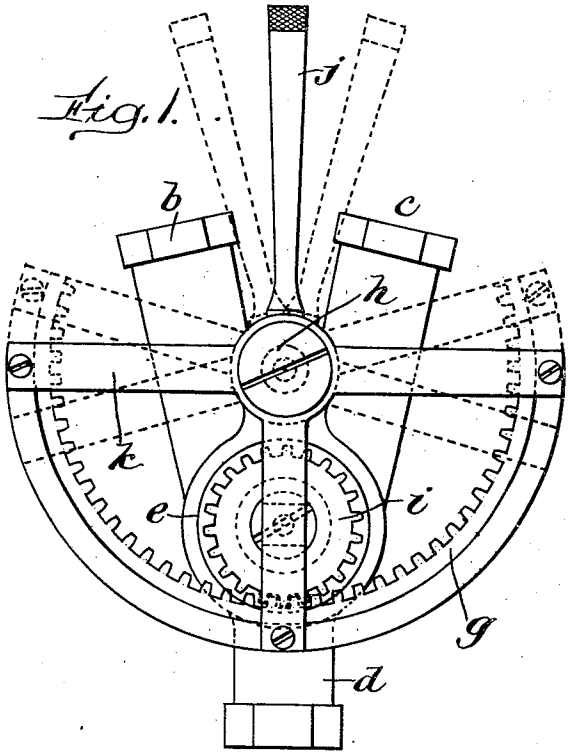


Fig. 2.

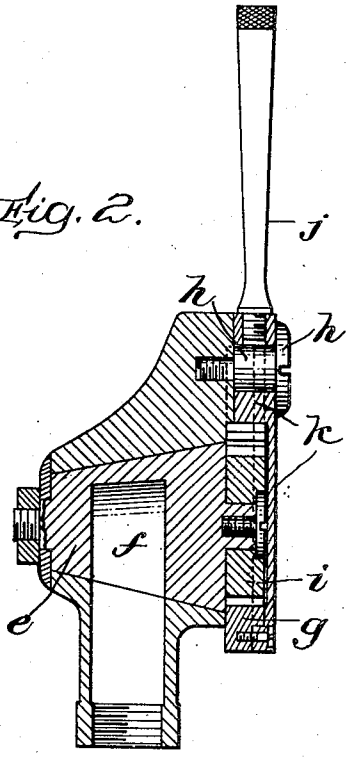
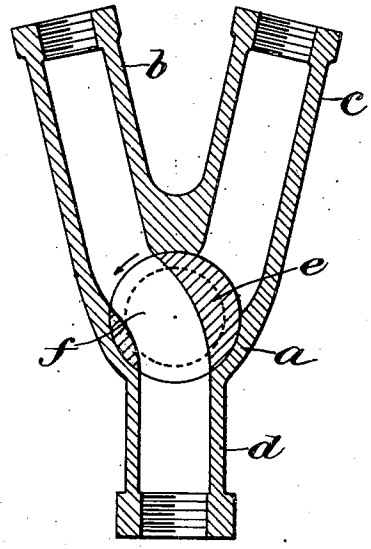


Fig. 3



Witnesses:
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UNITED STATES PATENT OFFICE.

LAWRENCE B. GRAY, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO HYDRAULIC VACUUM DREDGING COMPANY, OF WILMINGTON, DELAWARE, A CORPORATION OF DELAWARE.

VALVE.

1,076,281. Specification of Letters Patent. Patented Oct. 21, 1913.

Application filed August 29, 1910. Serial No. 579,412.

To all whom it may concern:

Be it known that I, LAWRENCE B. GRAY, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Valves, of which the following is a specification.

This invention relates to plural-way valves, and has for its object to provide a mode of operating the valve by which the valve member may be turned quickly from one extreme position to another in consequence of a relatively slight movement of the operating member, while the entire valve structure is made compact.

The manner in which I have carried the invention into practical form, and the preferred one of the types in which the essence of the invention may be embodied, are hereinafter described in detail and illustrated in the accompanying drawings.

In the drawings filed, which form a part of this application, Figure 1 represents a top plan view of a valve constructed according to my invention. Fig. 2 represents a vertical central section of the same. Fig. 3 represents a horizontal section of the tubular portion of the valve parallel with the front thereof.

The same letters of reference indicate the same parts in all the figures.

A new combination of the several parts forming the valve is embraced in the present invention.

The valve consists of a combination of simple parts of which *a* represents a tubular casing having two nearly parallel tubular branches *b* and *c* as inlets and *d* a tubular outlet, provided at their respective ends with an interior screw threaded portion, as shown in Figs. 2 and 3. In the tubular casing *a* and intersecting the passages in the tubular branches *b* and *c*, and outlet *d*, at their juncture is provided a tapered vertically disposed plug *e*, as shown in Fig. 2, contained in a conical opening formed through the casing *a* and adapted to be turned therein. The tapering plug *e* is provided with a channel *f*, of the same size as the passages in the branches and in the outlet, as shown in Fig. 3.

Now in order to turn the close fitting tapering plug *e* with ease and quickly, I secure to the large end of the plug a small gear pinion *i*, and mount upon a stud *h*, secured to a part of the valve casing, a spider or frame *k*, comprising radiating arms, to the outer ends of which is secured a segmental annular, or internal, cog-gear *g*, which meshes with the small pinion *i*. An operating handle *j* is provided for turning the said gears and thereby turning the tapering valve-plug *e* in a very easy and quick manner.

The operating devices embraced in the combination of the several parts forming this valve may be seen from Fig. 1, in which the full line position shows the parts when the solid part of the plug *e* extends across the tubular part *d*, and closes the valve, and the left-hand dotted-line position shows the parts in the relation illustrated in Fig. 3, and the right-hand dotted-line position the operating parts as they would be when the valve is so set as to connect branch *c* and outlet *d*.

It will be seen in Fig. 2 that the tapering plug *e* is provided at its lower end with a projecting screw threaded part and having a nut thereon, by means of which the tapering plug *e* may be held in close contact with the surrounding casing and tightened when the same becomes so much worn as not to fit tightly, whereby to prevent leakage of water or steam passing through the valve. In order to turn the tapering plug *e* enough to close one branch and open the other in this valve, I have provided mechanism through which a slight turn of the operating handle will turn the valve plug through a much larger angle. It will be seen and understood from the clear description of this valve mechanism, as stated in the foregoing, that a new combination of parts is the result.

I claim,—

1. The combination in a valve comprising a casing *a*, having two tubular inlet branches *b* and *c*, nearly parallel, and a tubular outlet *d*, a tapering plug valve *e*, extending across the passages of said inlet branches and the outlet at their intersection, and having a screw thread at its small end, means engaged with said small end bearing on the valve casing, a gear pinion *i*, secured upon and in contacting relation with the large end of said tapering valve, a pivot *h* on the casing, a spider *k* on said pivot, comprising arms to the ends of which are secured an annular gear segment *g*, meshing with the pinion *i*, and an operating handle

j, secured to the spider substantially as described.

2. The combination comprising a valve casing having intersecting branches, a plug valve contained in the casing at the intersection of the branches, a pinion secured to said plug valve, an internal gear meshing with said pinion and pivotally mounted on the casing at a point relatively close to the pinion, and an operating handle secured to the internal gear, the latter having a radius more than twice as great as that of the pinion, whereby the plug may be turned through a greater angle than the handle, substantially as described.

3. A plural-way cock comprising a valve casing having a number of branches, in combination with a valve member made in the form of a tapered or conical plug inserted endwise through one side of the casing, a pinion mounted upon the large end of said valve member, a gear segment meshing with said pinion, and a pivoted holder for said gear segment having a portion which extends across the pinion, and thereby assists in retaining the valve member in the casing.

In testimony whereof I have affixed my signature, in presence of two witnesses.

LAWRENCE B. GRAY.

Witnesses:
A. H. BROWN,
P. W. PEZZETTI.