

(No Model.)

2 Sheets—Sheet 1.

A. M. GRANGER.

VALVE.

No. 382,524.

Patented May 8, 1888.

Fig. 1.

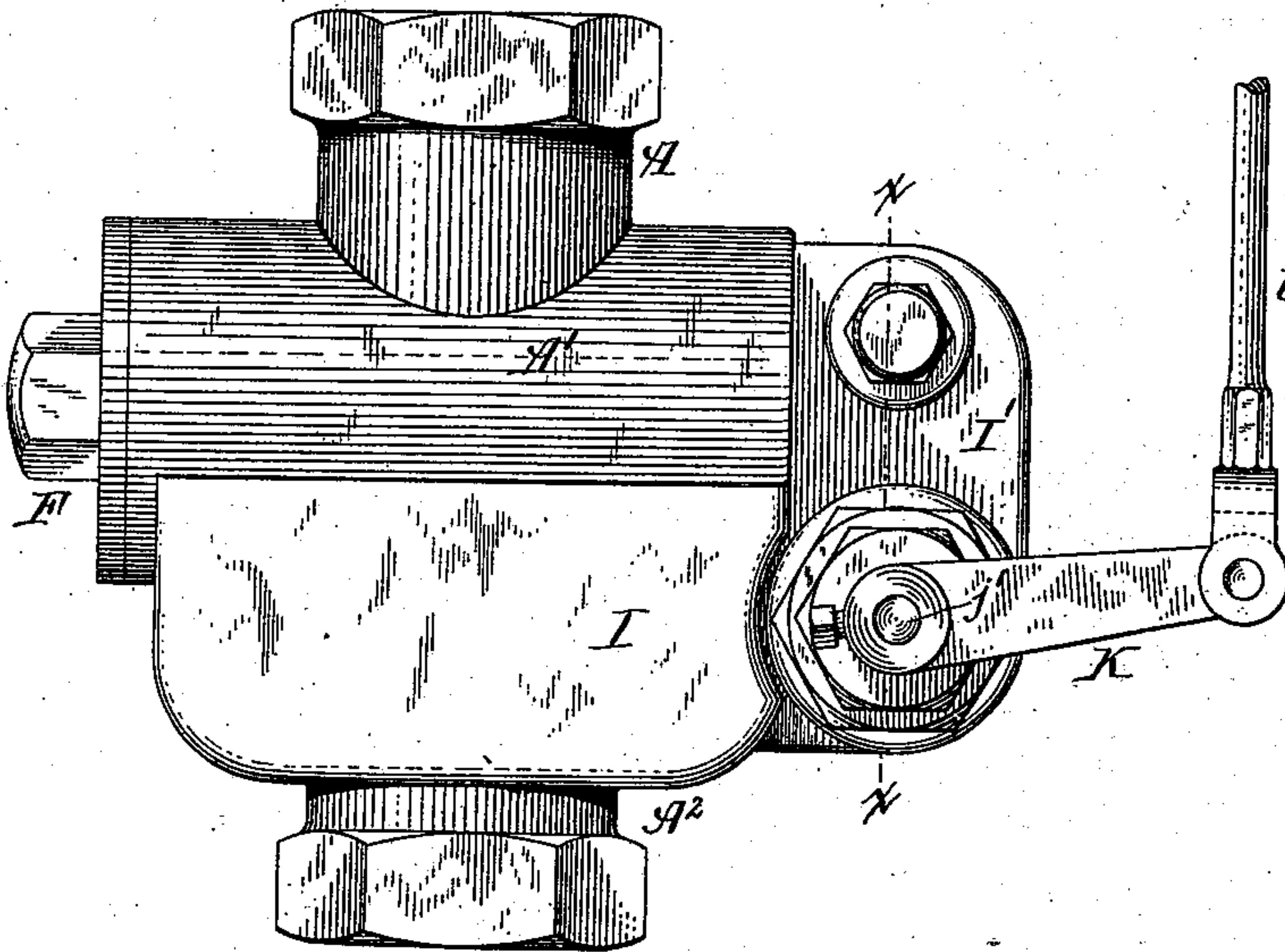


Fig. 2.

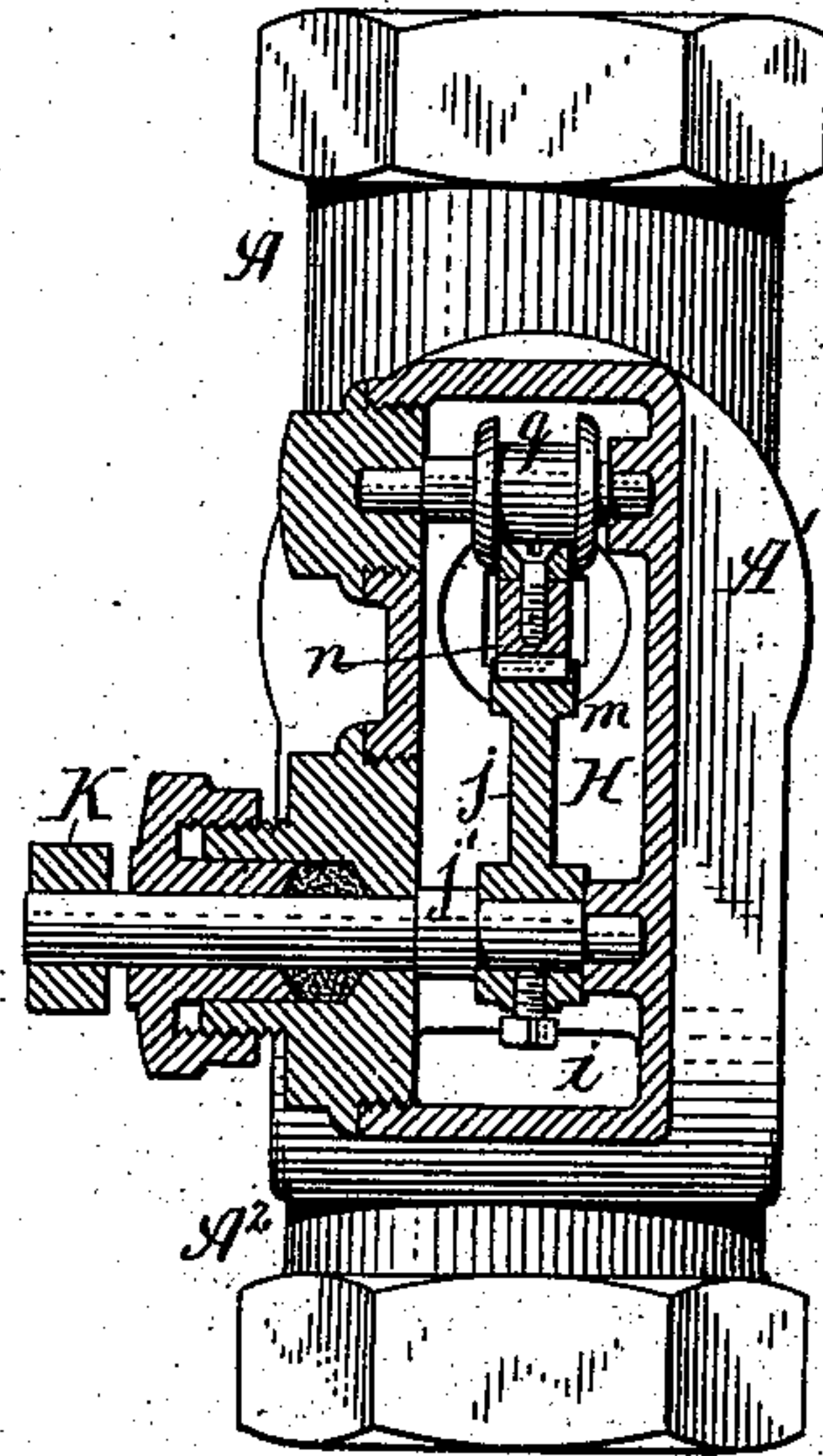


Fig. 3.

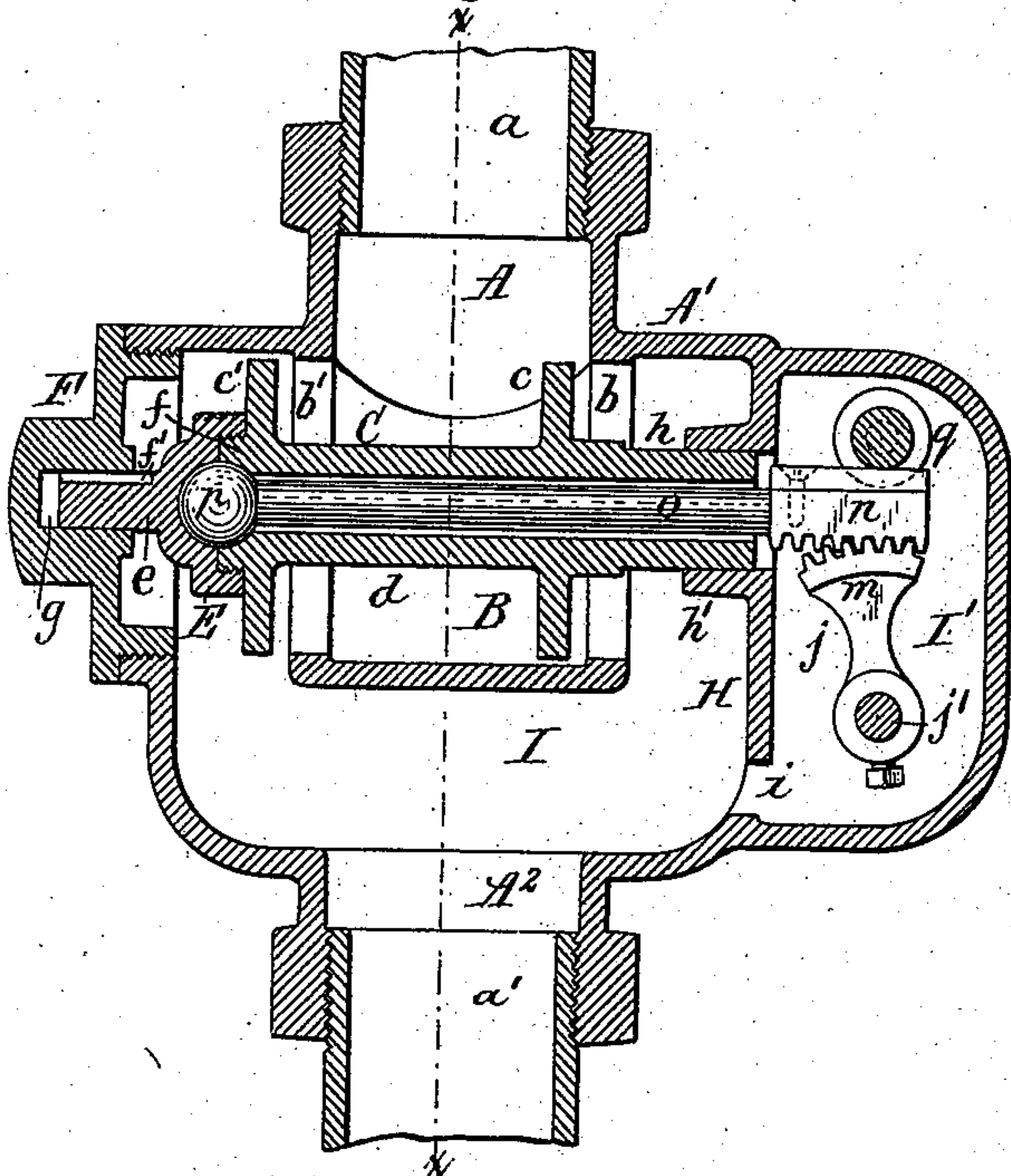
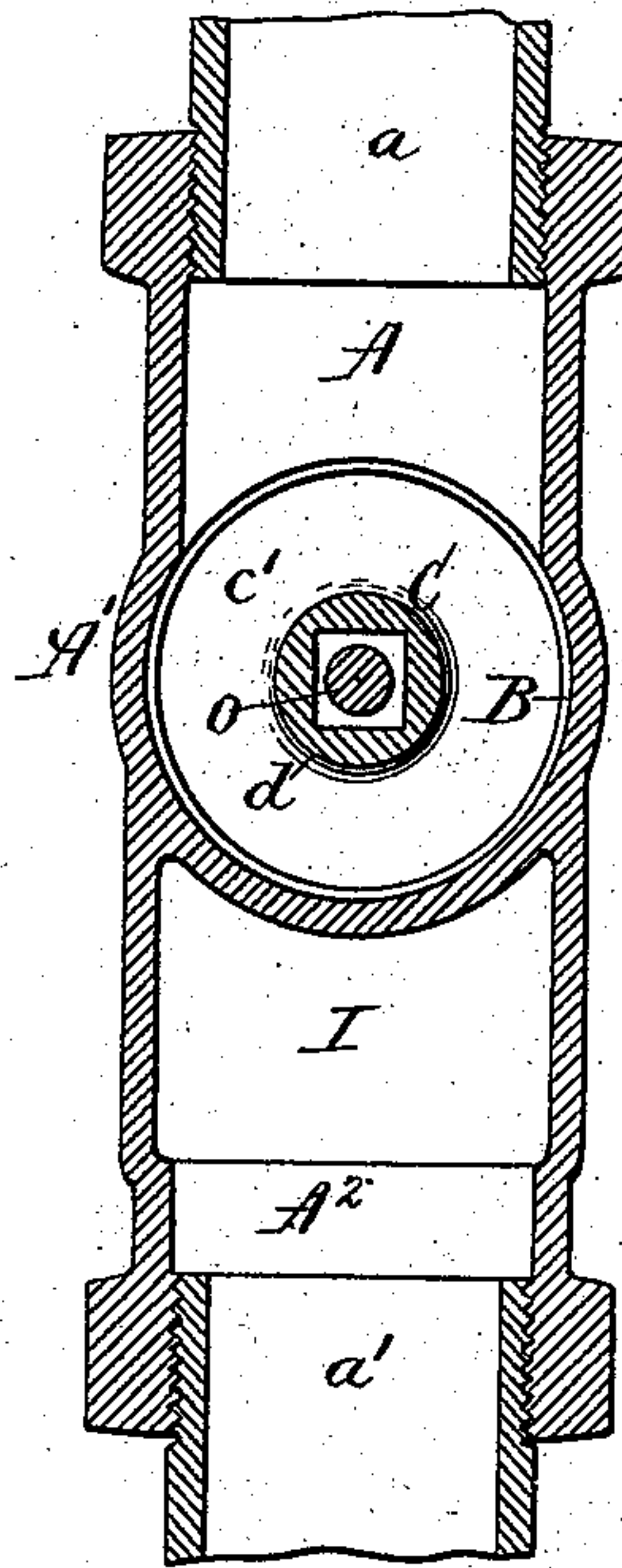


Fig. 4.



Chas. J. Buchheit.
Theo. L. Popp. } Witnesses.

A. M. Granger. Inventor.
By Wilhelm Bonnet.
Attorneys.

(No Model.)

2 Sheets—Sheet 2.

A. M. GRANGER.
VALVE.

No. 382,524.

Patented May 8, 1888.

Fig. 5.

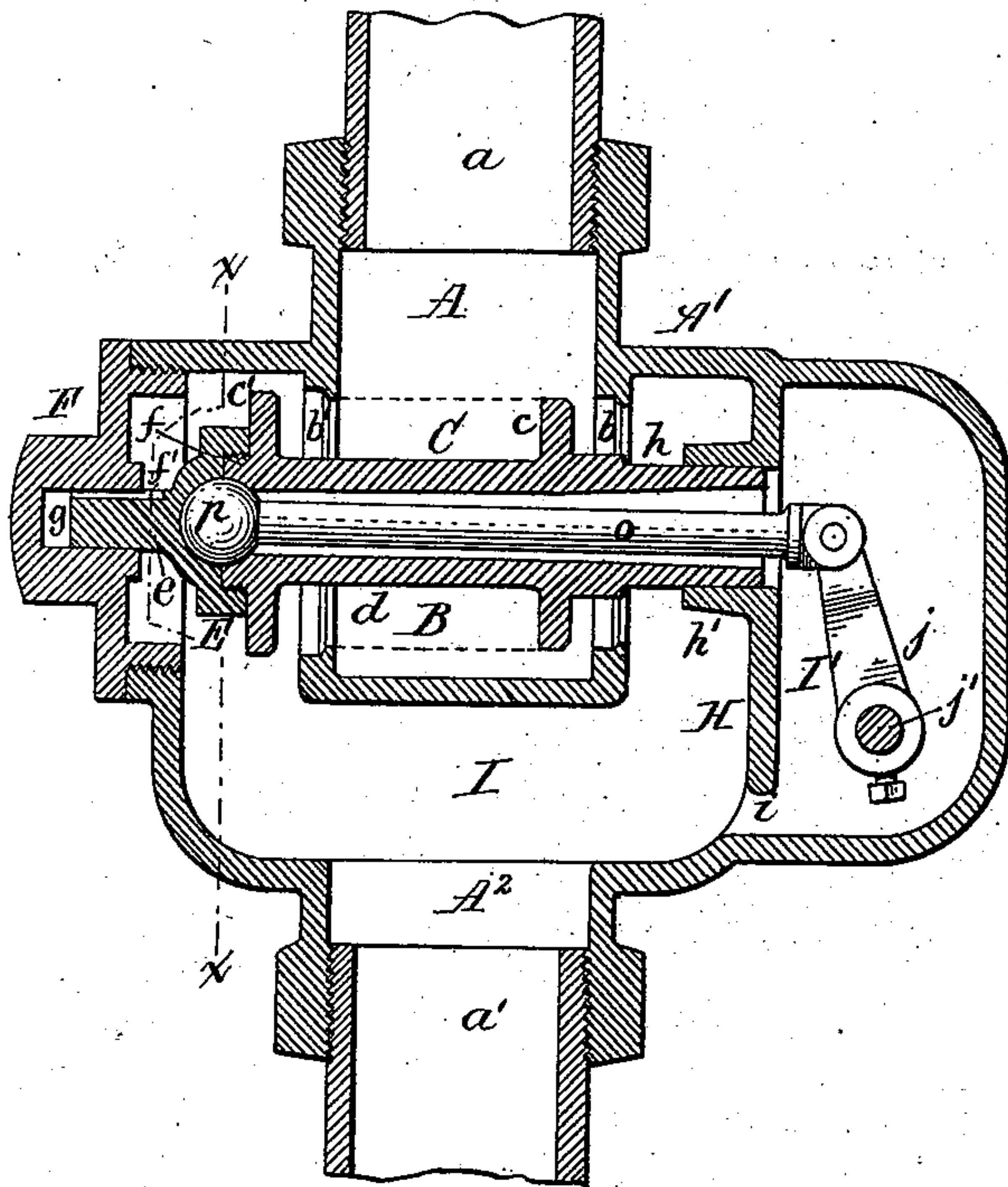
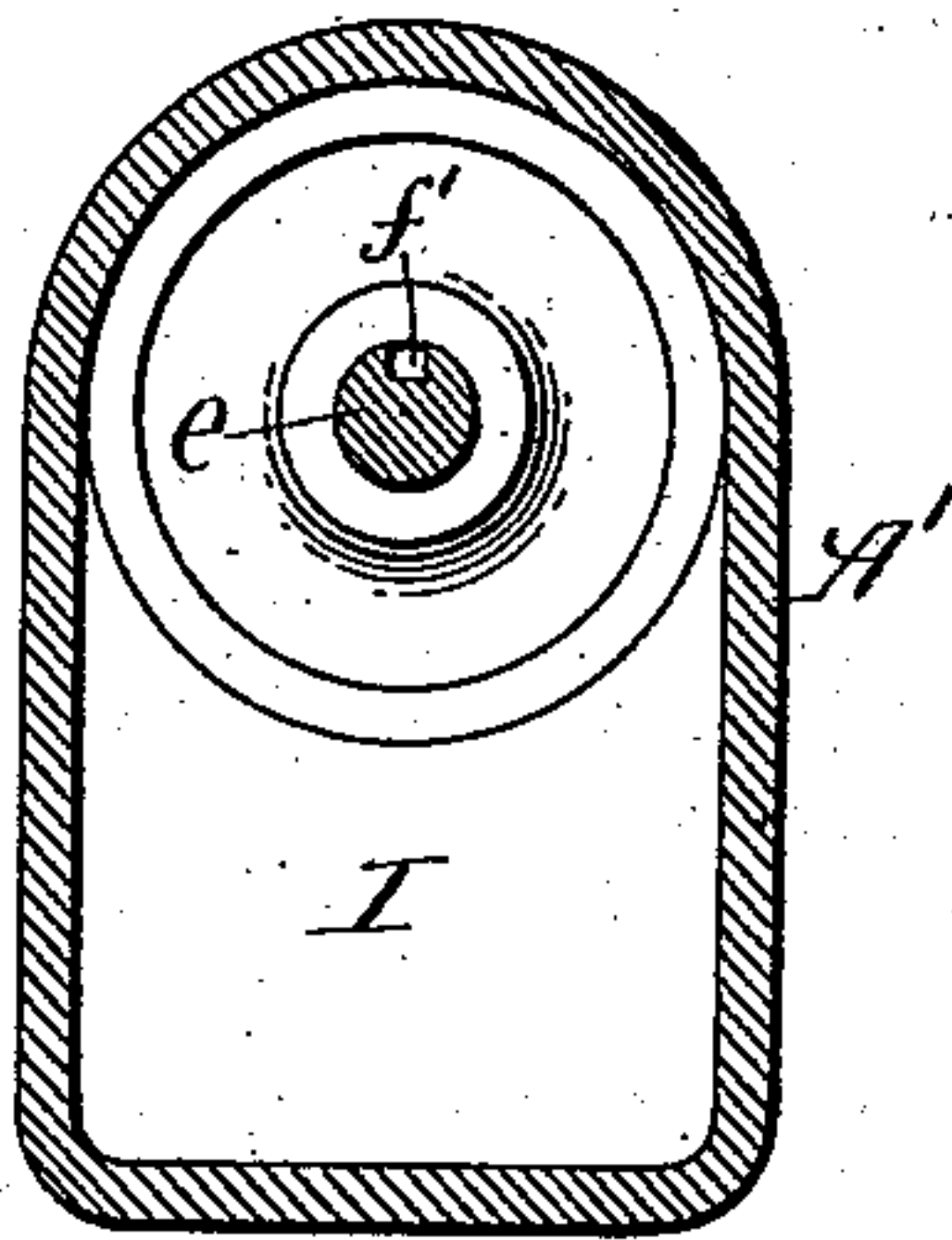


Fig. 6.



Chas. J. Buchheit
Theo. L. Popp } witnesses.

A. M. Granger Inventor.
By Wilhelm Pinner
Attorneys

UNITED STATES PATENT OFFICE.

ALMON M. GRANGER, OF GLENWOOD, MASSACHUSETTS, ASSIGNOR TO THE VOLKER & FELTHOUSEN MANUFACTURING COMPANY, OF BUFFALO, NEW YORK.

VALVE.

SPECIFICATION forming part of Letters Patent No. 382,524, dated May 8, 1888.

Application filed May 25, 1887. Serial No. 239,371. (No model.)

To all whom it may concern:

Be it known that I, ALMON M. GRANGER, of Glenwood, in the county of Middlesex and State of Massachusetts, have invented a new and useful Improvement in Valves, of which the following is a specification.

This invention relates to an improvement in that class of valves which are employed for controlling the flow of liquids and fluids through pipes and passages, particularly in connection with automatic devices whereby the position of the valve is controlled; and it has for its object to produce a valve in which the resistance to a change of position is reduced to a minimum, and which is consequently very sensitive and easily opened, and closed.

My invention consists of the improvements which will be hereinafter fully described, and pointed out in the claims.

In the accompanying drawings, consisting of two sheets, Figure 1 is a side elevation of my improved valve. Fig. 2 is a sectional elevation thereof, the section being taken in line *x x*, Fig. 1. Fig. 3 is a vertical longitudinal section of the valve. Fig. 4 is a cross-section in line *x x*, Fig. 3. Fig. 5 is a vertical longitudinal section showing a slightly-modified construction of the valve. Fig. 6 is a vertical cross-section in line *x x*, Fig. 5.

Like letters of reference refer to like parts in the several figures.

A represents the inlet-port of the valve, connecting with the inlet-pipe *a*; A', the valve-casing, and A² the outlet-port, connecting with the exit-pipe *a'*.

B represents a tubular passage arranged within the casing A' and communicating on one side with the inlet-port A.

b b' are two valve-seats formed in the tubular passage B on opposite sides of the inlet-port.

C represents the valve, arranged in the tubular passage B, and provided with two disks or heads, *c c'*, secured to or formed on a hollow stem, *d*, which is arranged axially in the tubular passage B and projects through both ends thereof.

e represents a guide-pin forming a continuation of the hollow stem *d*, and provided with

a head, E, which is provided with an internal screw-thread, by which it is connected with a screw-shank, *f*, formed centrally on the outer side of the valve-disk *c'*. The pin *e* slides in a cylindrical socket, *g*, which is formed in a removable head, F, secured in the adjacent end of the casing A'. The pin *e* is preferably provided with a longitudinal groove, *f'*, which allows of the free access and escape of the fluid to and from the socket *g*, so that the pin can freely move in the same.

h represents a cylindrical neck formed on the opposite end of the hollow stem *d* and moving in a cylindrical socket, *h'*, formed in a partition, H, of the valve-casing. The valve is guided in its opening and closing movements in the sockets *g h'* at opposite ends of the valve.

The partition H separates the main chamber I of the valve-casing from the smaller chamber, I', in which the actuating mechanism is arranged. The two chambers are preferably placed in communication by an opening, *i*, formed in the partition H.

j represents the actuating-arm, arranged in the chamber I' and mounted upon a shaft, *j'*, which receives its motion from an external arm, K, actuated by a rod, *l*, or any other suitable means. As shown in Figs. 2 and 3, the actuating-arm *j* is provided with a gear-segment, *m*, which meshes with a rack-bar, *n*. The latter is secured to the end of a rod, *o*, which extends through the bore of the hollow valve stem *d*, and is secured to the opposite end of the valve by a spherical head or knuckle, *p*, seated in a corresponding socket formed partly in the valve *c'* and partly in the head E, as clearly represented in Fig. 3. The rack-bar *n* is guided and held in engagement with the gear-segment *m* by a flanged roller, *q*, bearing against the rear side of the rack-bar.

In the modified construction represented in Fig. 5 the actuating-arm *j* is pivoted to the end of the rod *o* and the valve-disks are provided with beveled faces instead of the straight faces, as represented in Fig. 3.

The actuating-rod *o* permits the valve to move freely in its guides without bending or deflecting the valve, and as the valve is practically balanced but a slight pressure is re-

quired to change its position, so that it is very sensitive and follows the movements of the actuating mechanism instantaneously and with great nicety.

5 I claim as my invention—

1. The combination, with the valve-casing provided with an inlet-passage, A, and two valve-seats, *b b'*, on opposite sides of the inlet-passage, of a valve, C, composed of two disks, 10 *c c'*, and a hollow stem, *d*, and having a spherical socket, *f*, a valve-rod, *o*, passing through the hollow stem and provided with a spherical knuckle, *p*, and an actuating-arm connected with the valve-rod and arranged within the 15 inclosure of the valve-casing, substantially as set forth.

2. The combination, with the valve-casing having one of its heads provided with a socket, *g*, of the valve C, provided with a hollow stem, 20 *d*, an actuating-rod, *o*, arranged within the hollow valve-stem and provided with a spherical knuckle, *p*, and a head, E, secured to the end of the valve and provided with a guide-pin, *e*, which enters the socket *g*, the head E 25 and the adjacent portion of the valve being constructed with a spherical socket in which

the knuckle of the actuating-rod is seated, substantially as set forth.

3. The combination, with the valve C, provided with a hollow stem, *d*, and guide-pin *e*, 30 of the casing A', provided with sockets *g h'*, in which the valve is guided, an actuating-rod, *o*, arranged in the stem *d*, and an actuating-arm, *j*, substantially as set forth.

4. The combination, with the valve C, provided with the actuating-rod *o* and the inclosing-casing A', of the actuating-arm *j*, arranged 35 in said casing and provided with a gear-segment, *m*, and a rack-bar, *n*, secured to the rod *o*, substantially as set forth. 40

5. The combination, with the casing A', the valve C, and its guides, of the actuating-rod *o*, the actuating-arm *j*, provided with a gear-segment, *m*, the rack-bar *n*, secured to the rod 45 *o*, and the guide-roller *q*, bearing against said rack-bar, substantially as set forth.

Witness my hand this 9th day of May, 1887.

ALMON M. GRANGER.

Witnesses:

JNO. J. BONNER,
FRED. C. GEYER.