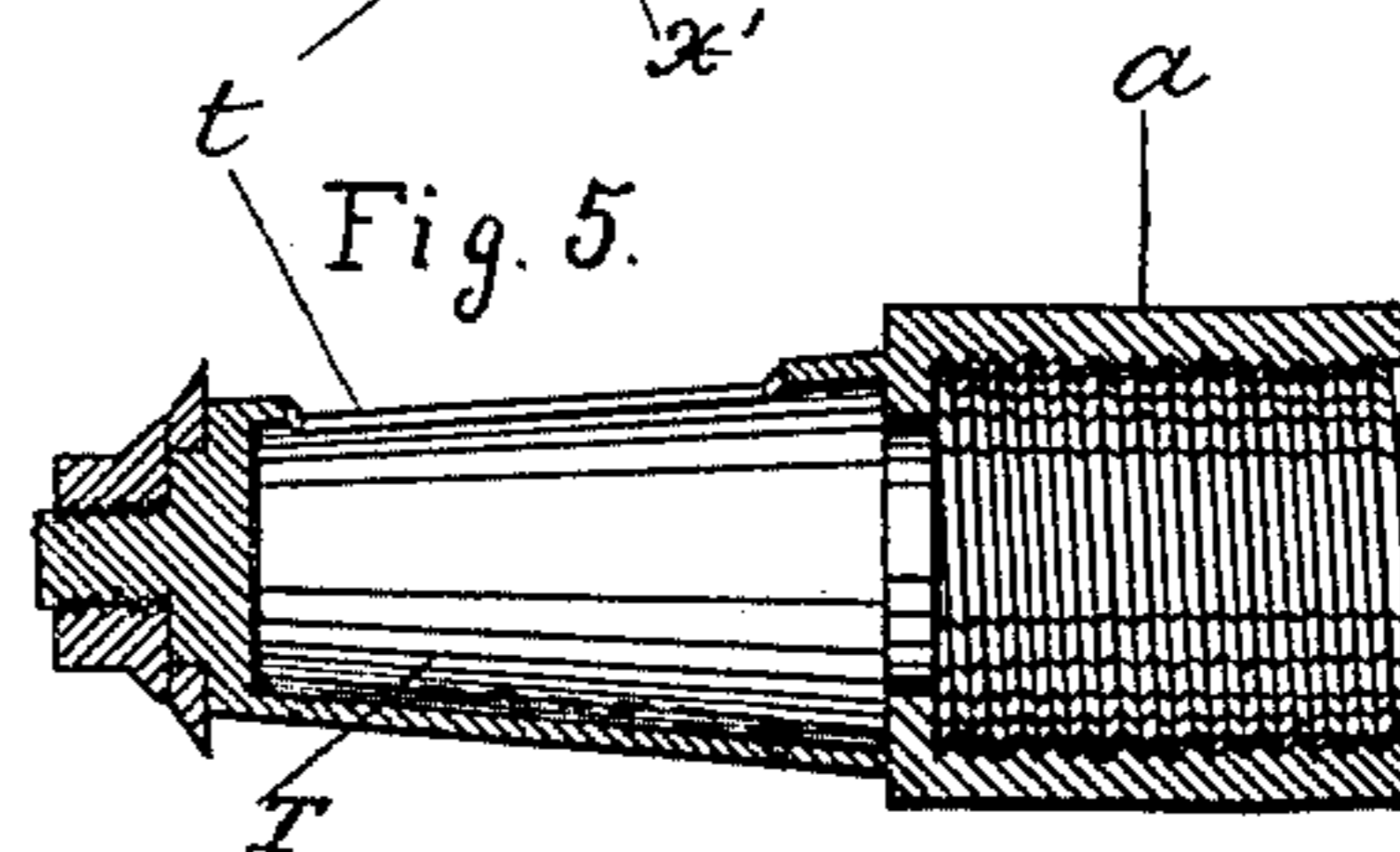
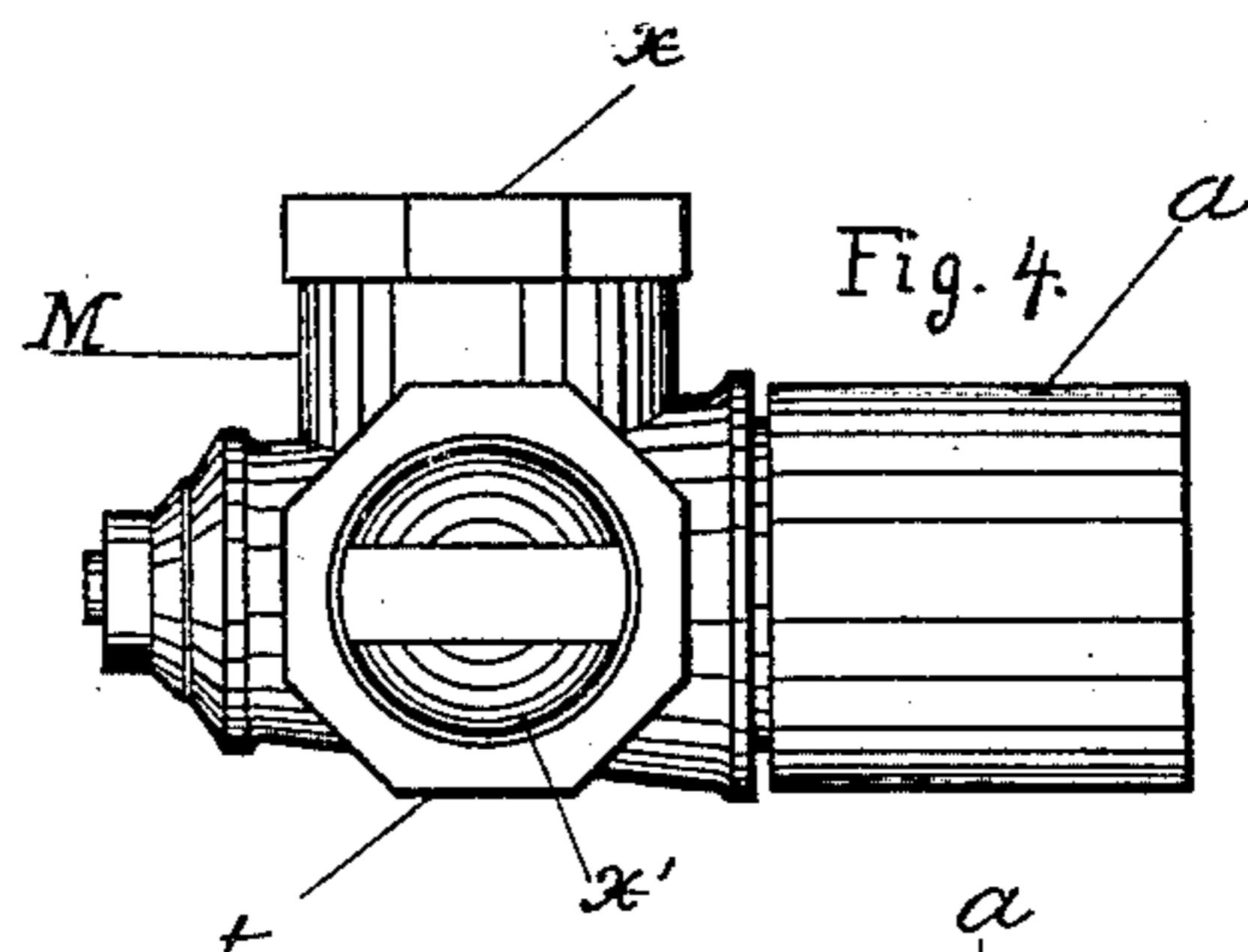
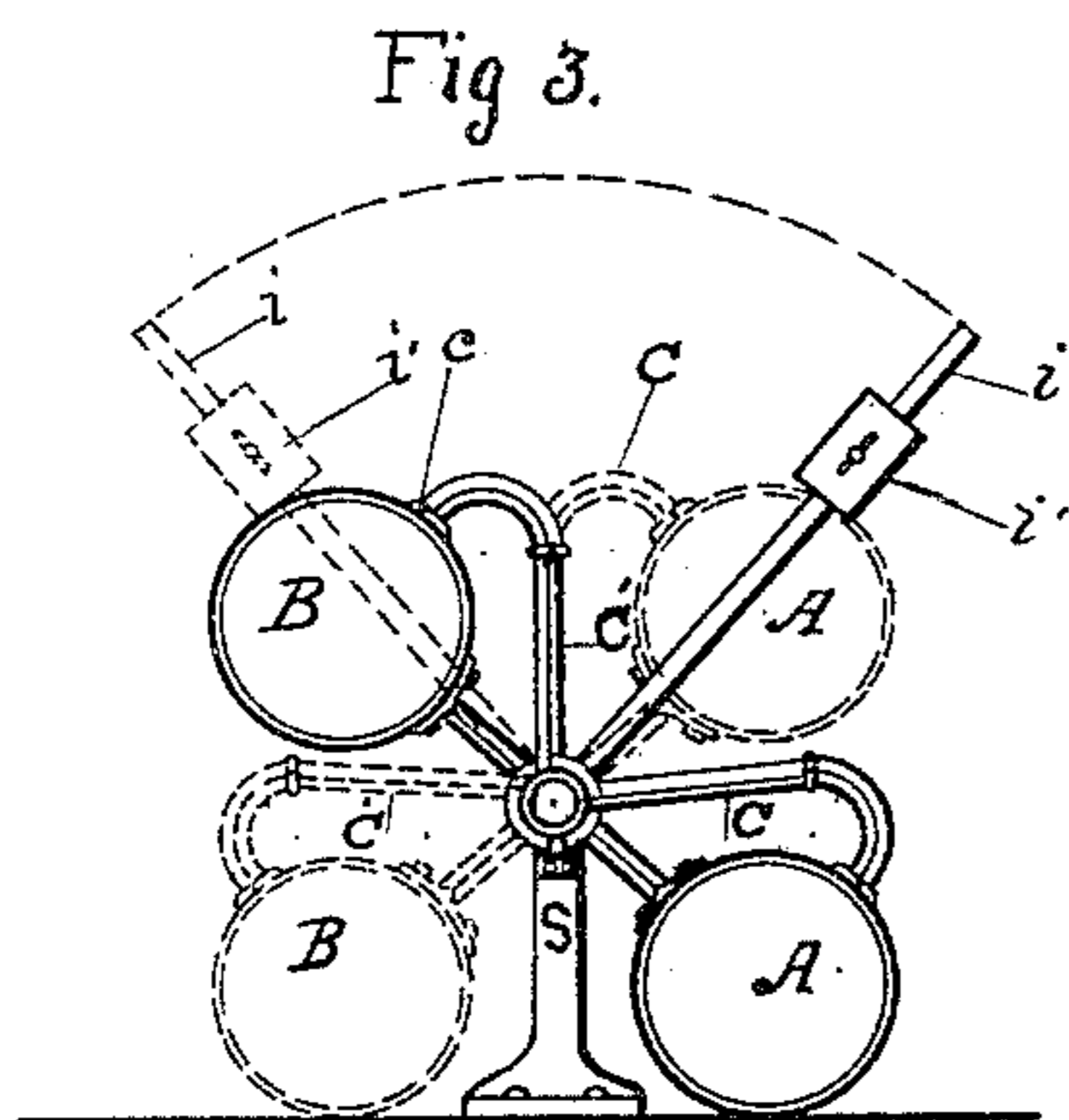
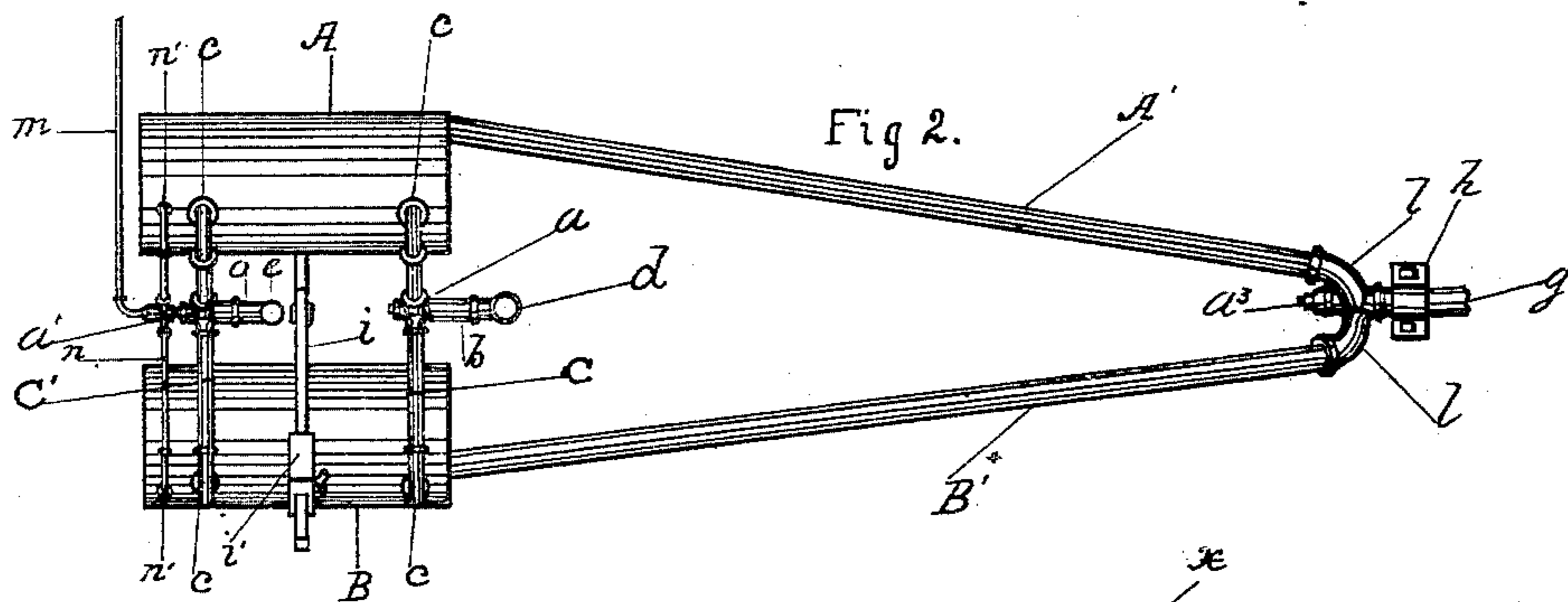
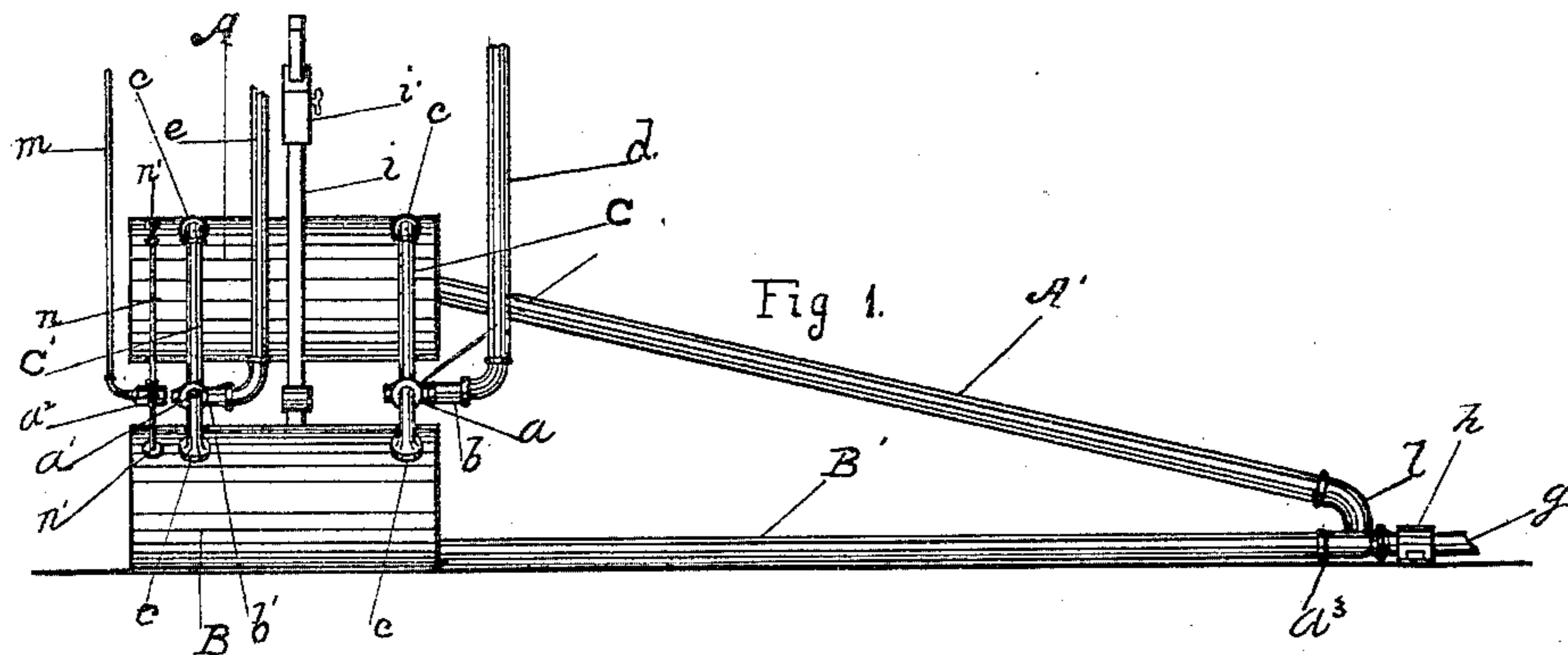


(No Model.)

F. E. & M. E. VAUGHN.
BOILER FEEDER.

No. 399,586.

Patented Mar. 12, 1889.



Witnesses
Wm. G. Needham
Joseph. Modlin

Inventor
Francis E. Vaughn
Marion E. Vaughn
By H. J. Dennis
Attorney

UNITED STATES PATENT OFFICE.

FRANCIS E. VAUGHN AND MARION E. VAUGHN, OF RICHMOND, INDIANA,
ASSIGNORS OF ONE-THIRD TO ALONZO B. RIGGS, OF SAME PLACE.

BOILER-FEEDER.

SPECIFICATION forming part of Letters Patent No. 399,586, dated March 12, 1889.

Application filed October 8, 1888. Serial No. 287,550. (No model.)

To all whom it may concern:

Be it known that we, FRANCIS E. VAUGHN and MARION E. VAUGHN, citizens of the United States of America, residing at Richmond, in the county of Wayne and State of Indiana, have invented certain new and useful Improvements in Boiler-Feeders, of which the following is a specification, reference being had therein to the accompanying drawings.

Our invention relates to that class of injectors used to force water into steam-boilers.

This invention relates to devices for automatically regulating the supply of water to boilers by means of two reservoirs, a tilting-frame, and steam and water pipes alternately opened by the rise or fall of said reservoirs.

The said invention consists in the construction and combination of parts hereinafter set forth and claimed.

In the drawings, Figure 1 is a side elevation showing the cylinders respectively at their highest and lowest points of traverse. Fig. 2 is a top plan view of the feeder. Fig. 3 is an end elevation showing the cylinders and the connecting-pipes in working position, and their reverse position in dotted lines. Fig. 4 is a side elevation of the valve, showing a top and side opening enlarged. Fig. 5 is a vertical longitudinal sectional view of the valve-stem enlarged.

In Fig. 1, A represents a cylinder or reservoir of any desired form and capacity, and B is a similar one, the two being rigidly connected by a suitable framing at such distance asunder as to allow the desired rise and fall of the cylinders. This framing is supported by a pillow-block or pedestal, s, Fig. 3, constructed in such manner as to allow the framing carrying the cylinders to partially revolve thereon, constituting a tilting device by which the cylinders are raised and lowered in the arc of a circle, as seen in Fig. 3.

CC are pipes curved vertically, attached to the upper surface of the cylinders at or near one end, and opening into the same for the admission of cold water by means of the supply-pipe d and elbow b, which are connected with a water-tank placed far enough above the cylinders to afford the requisite pressure for filling them. C' C' are similar curved

pipes, which are similarly connected with the cylinders at or near the opposite ends and opening into the same for the admission of steam from the boiler by means of the supply-pipe e and elbow b', which are suitably connected with the boiler.

The inner ends of the connecting-pipes C and C' are connected to and with the openings x and x' of the valve-seat M, Fig. 4, and the valve-seat turns with the framing supporting the cylinders as it is tilted around the valve-stem T, Fig. 5. The valve-stem T is a hollow tube opening into and communicating with the elbow b and water-pipe d. The valve-stem T is stationary, and is provided with an opening, t, Fig. 5, on its upper surface, by which the water is admitted through the opening x into the pipe C when the cylinder A is elevated, and by which the cylinder A is filled. When this is accomplished, the weight of the cylinder carries it down, closing the opening x by shutting off the opening t by the partial revolution of the valve-seat around the stem T until the opening x' is brought in line with the opening t, when the water passes into the connecting-pipe leading to cylinder B, which is elevated as A goes down, and the cylinder B is filled in like manner.

The pipe C' is provided with a similar valve-seat and valve-stem, similarly connected with the steam-supply pipe e and elbow e', which is arranged to operate reversely in such manner that when the water is admitted into cylinder A in its elevated position the steam is shut off, but when the cylinder A is down the steam is admitted as the water is shut off.

The cylinders A and B are provided with discharge-pipes A' and B', connected to the cylinders on a plane with their lower surface when down. These discharge-pipes are joined to an outlet-pipe, g, at their outer ends by means of elbows ll. The elbows at their junction form a sleeve which surrounds the outlet-pipe g, said pipe g having openings in its sides within the sleeve a³, which are brought in communication with the open ends of the elbows as the elbows and their sleeve are rotated around the outlet-pipe g, so as to allow the free escape from whichever cylinder is

down and closing the discharge of the cylinder which is up. The outlet-pipe *g* communicates with the boiler and discharges its contents directly into the same in manner as may
5 be desired, either on the same plane as the discharge-pipes *A' B'*, or by having the outer end curved downward.

In Figs. 1 and 2, *n* is an air-pipe connecting the cylinders *A* and *B*, and provided at its
10 center with an air-cock, *a'*, to allow the escape of steam or air as the cylinders to which it is attached are being filled or exhausted. The standard *i* rises vertically from the tilting-frame, and is carried from side to side by its
15 vibrations, and is provided near its upper end with a counterbalance-weight, *i'*, so arranged that its weight shall be a counterpoise to that one of the cylinders being filled, holding the cylinder being exhausted to its position
20 until the superior weight of the cylinder which is being filled carries it down, by which movement the weight *i'* is reversed and performs the same functions in connection with the other cylinder.

25 The air-cock *a'* is provided with an escape-pipe, *m*, which may occupy a vertical or horizontal position, as desired.

It will be seen that in the operation of our improved injector the cylinder which is down
30 and being emptied of its contents not only

has the force of the discharge increased by the initial pressure of the steam from the boiler, but the water in the cylinder is heated indefinitely by coming in contact with the steam, and by this means water more or less
35 heated is supplied to the boiler.

Having thus fully described our improved injector, what we claim as new, and desire to secure by Letters Patent, is—

A fixed valve-stem consisting of a tube
40 which communicates only with a source of water-supply, in combination with a valve-seat which turns on said valve-stem, a pair of water-pipes extending from opposite sides of said seat, a pair of reservoirs connected by said
45 pipes, another pair of pipes and a valve-seat, also connecting said reservoirs, another fixed tubular valve-stem which is connected to a source of steam-supply only and on which the
50 latter seat turns, a tilting-frame for said reservoirs, and outlet-pipes which extend from said reservoirs to the boiler, substantially as set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

FRANCIS E. VAUGHN.
MARION E. VAUGHN.

Witnesses:

W. T. DENNIS,
W. A. PEELLE.