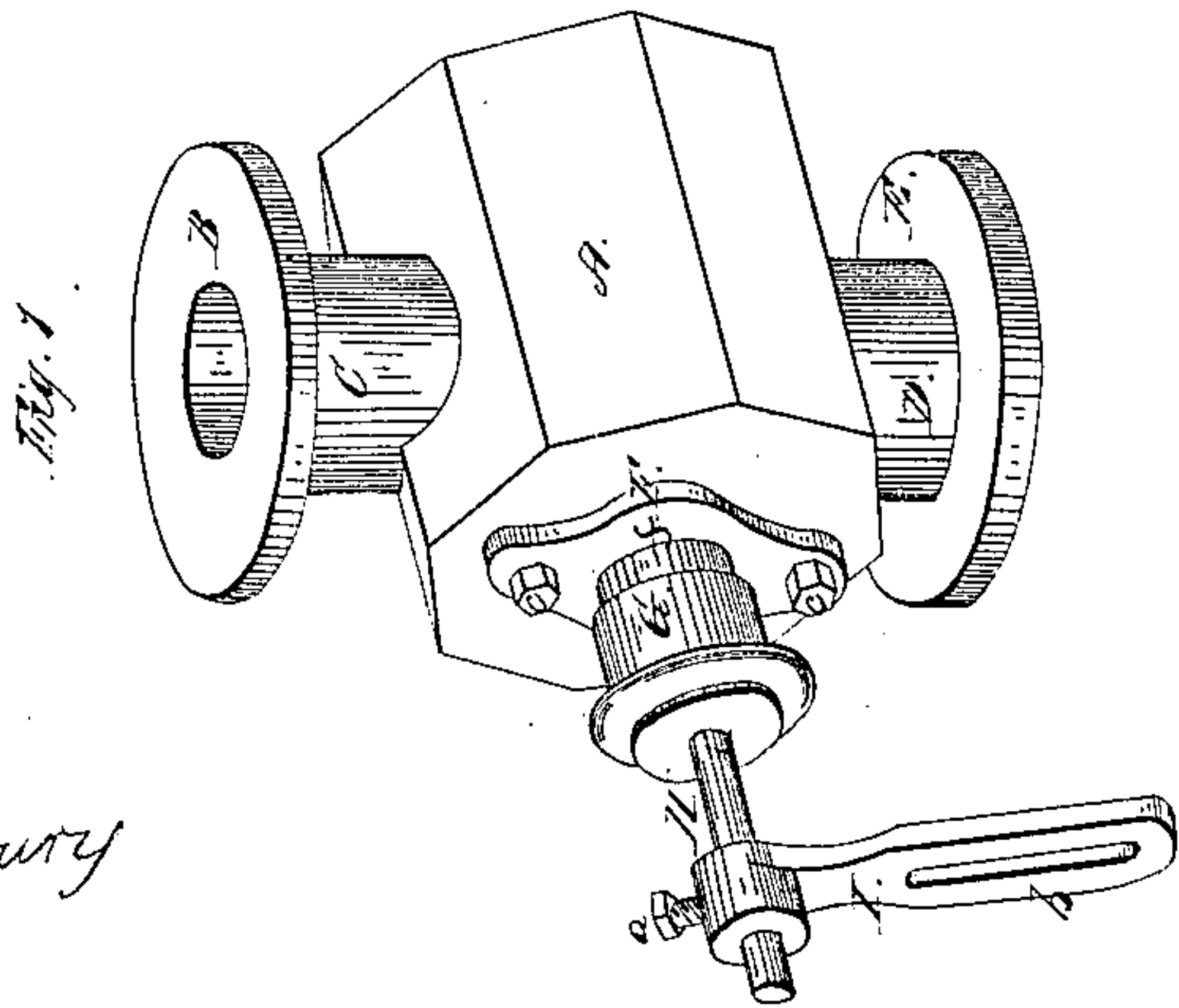
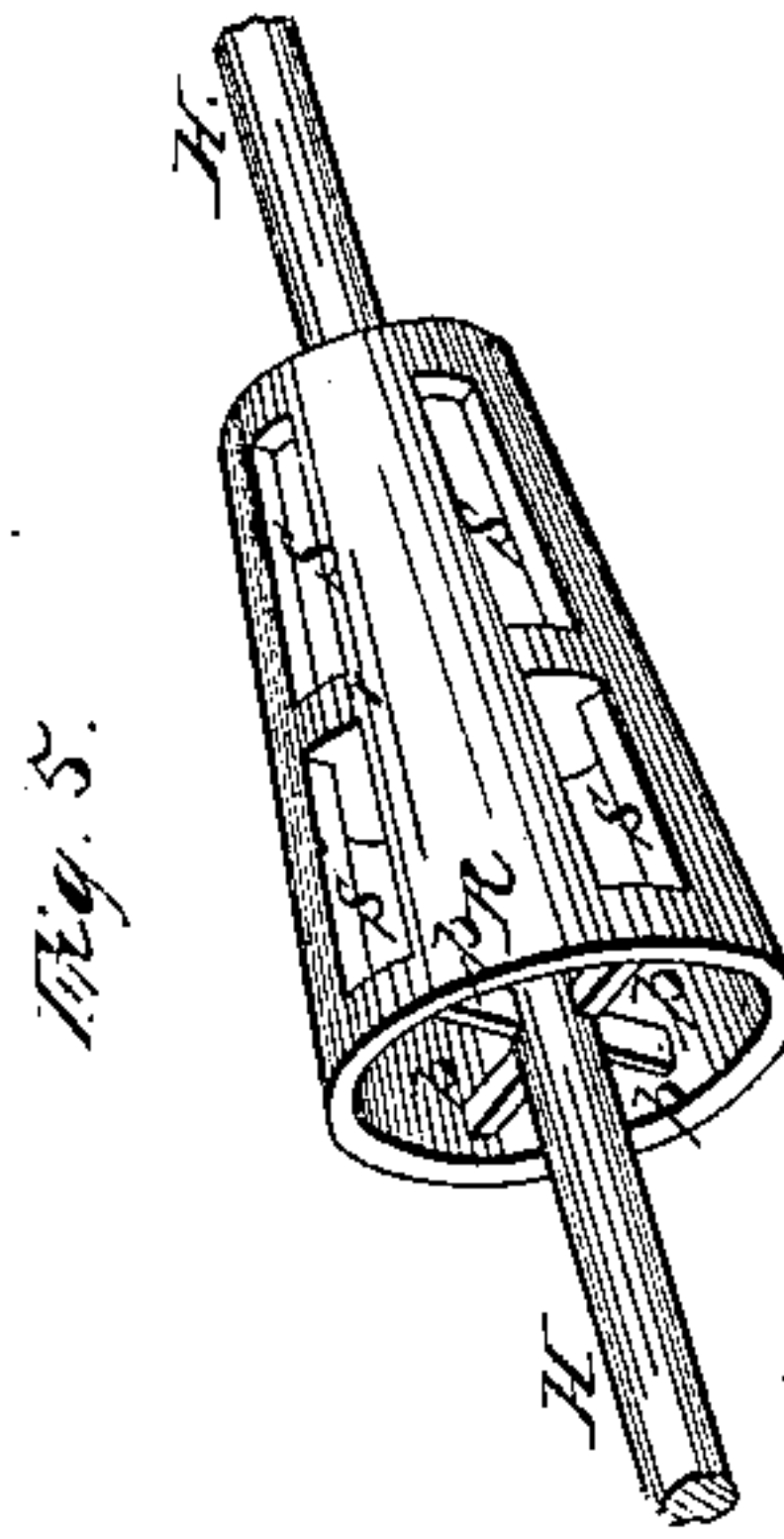
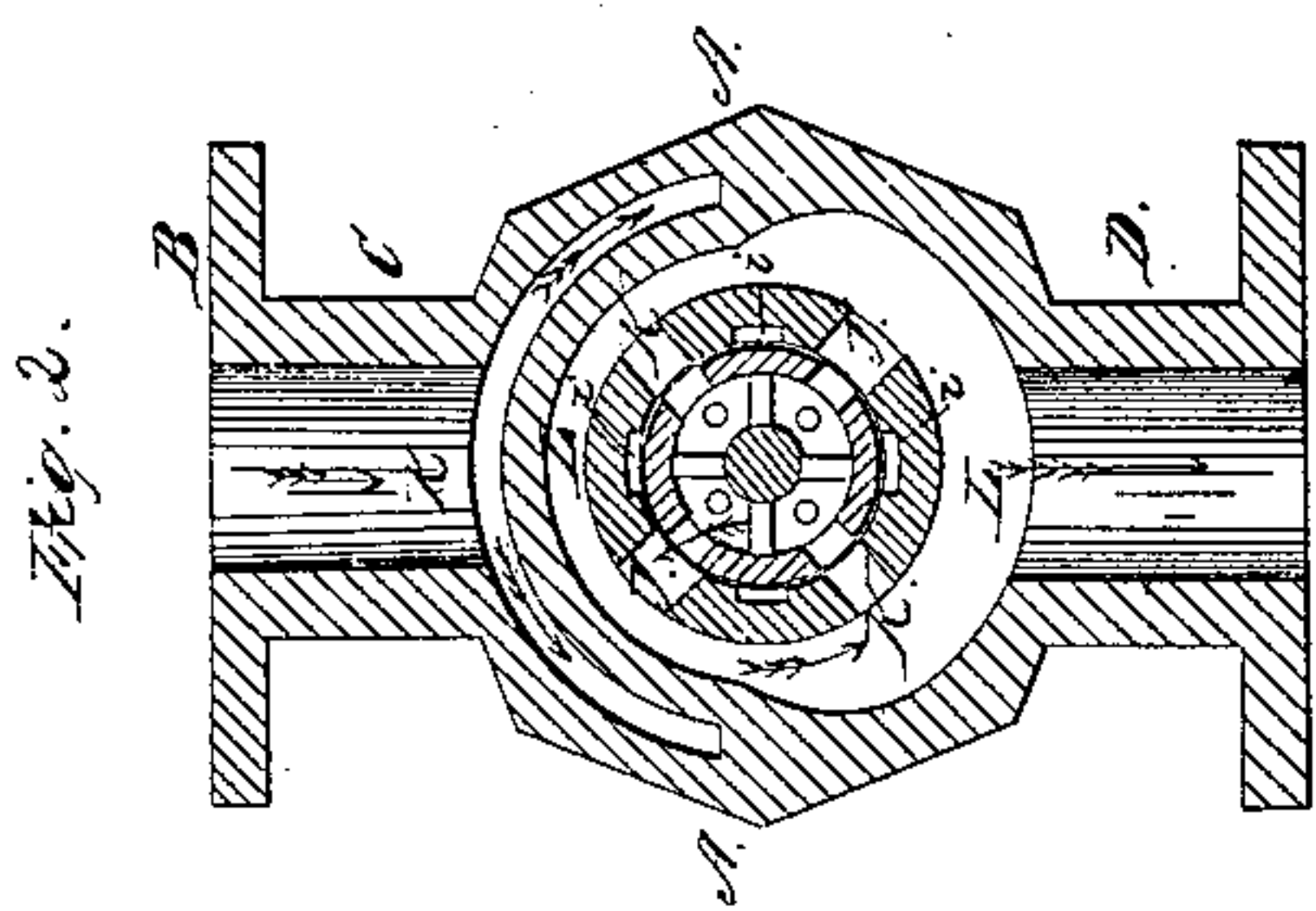
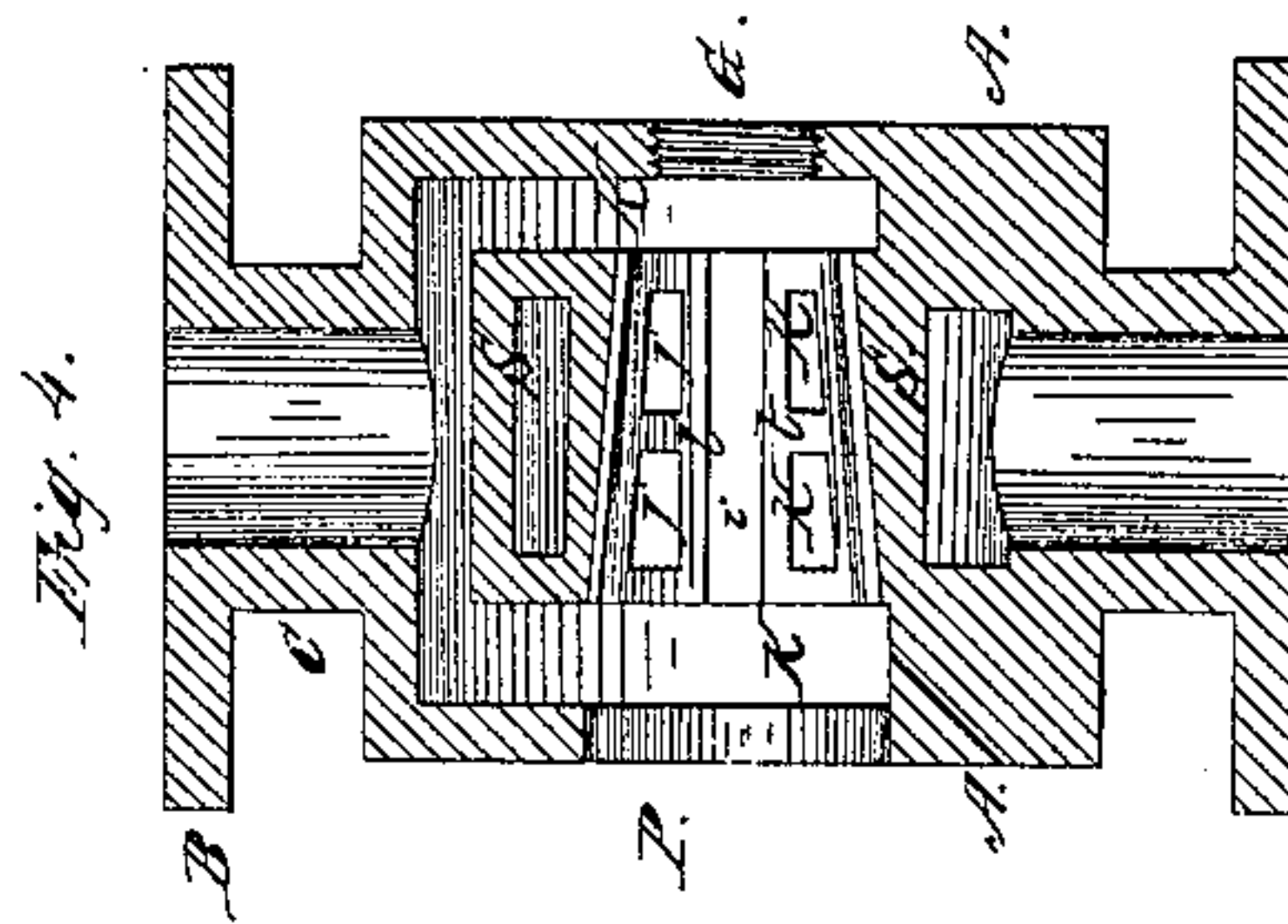
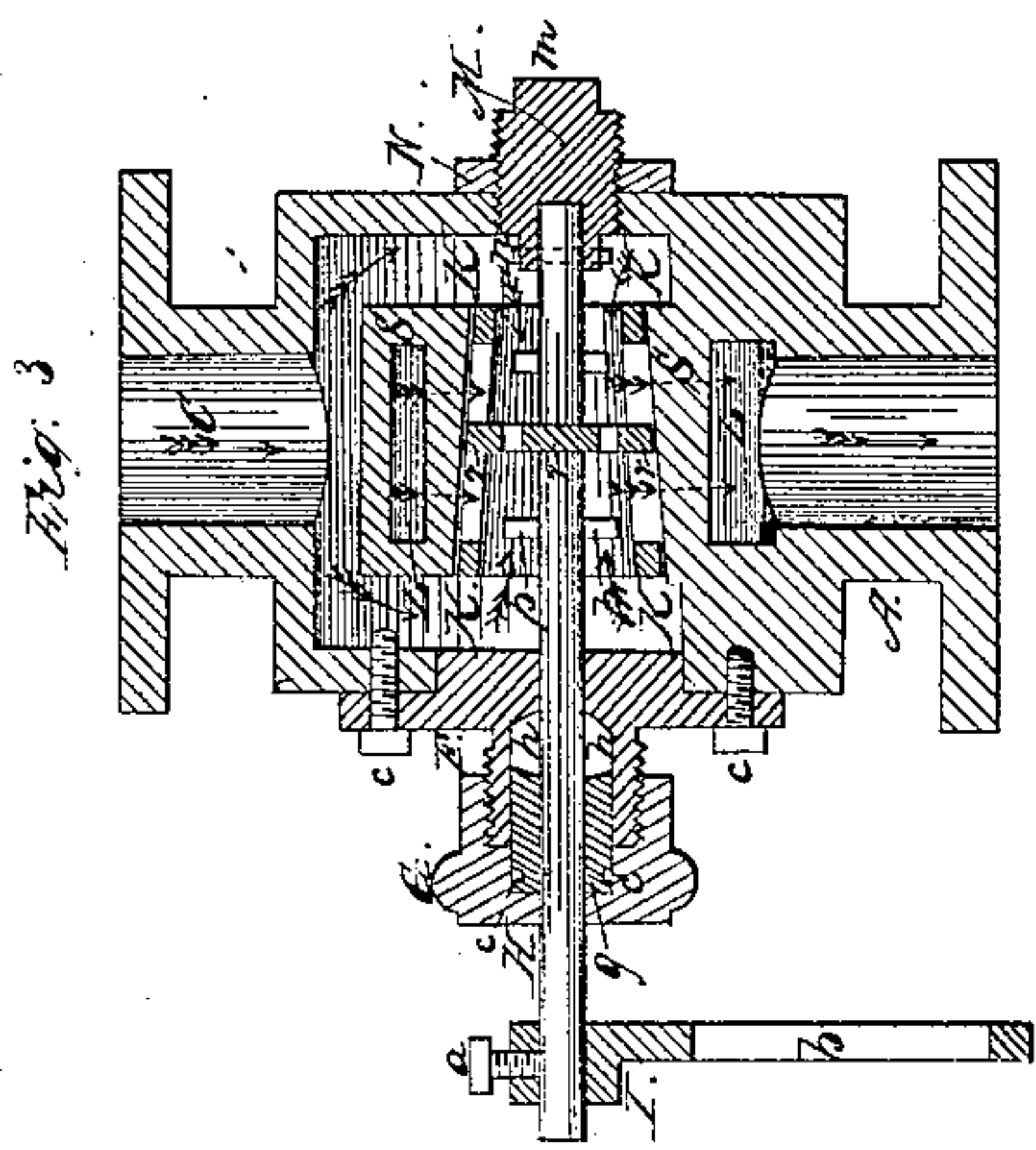


*T. S. La France,
Rotary Steam Valve.*

N^o 39,292.

Patented July 21, 1863.



Witnesses.

Chas. F. Pansbury
J. Cohen

Inventor,

T S La France

UNITED STATES PATENT OFFICE.

TRUCKSON S. LA FRANCE, OF ELMIRA, NEW YORK.

IMPROVEMENT IN GOVERNOR-VALVES.

Specification forming part of Letters Patent No. 39,292, dated July 21, 1863.

To all whom it may concern:

Be it known that I, TRUCKSON S. LA FRANCE, of Elmira, in the county of Chemung and State of New York, have invented an Improved Governor-Valve for Steam-Engines; and I do hereby declare the following to be a full and correct description of the same, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view of my improved valve. Fig. 2 is a vertical, central, transverse section of the same. Fig. 3 is a vertical, central, longitudinal section of the same. Fig. 4 is a similar section of the valve case or shell, the valve and its attachments being removed. Fig. 5 is a perspective view of the valve,

The same part is marked by the same letter of reference wherever it occurs.

The nature of my invention consists in the improvements, hereinafter more particularly described, in the form and construction of the valve and shell and in the mode of hanging, adjusting, and balancing it, whereby I secure a combination of strength, lightness, sensitiveness, and efficiency in governing not possessed in the same degree by any valve for the same or a similar purpose with which I am acquainted.

To enable others skilled in the art to make and use my improved valve, I will proceed to describe its construction and operation, referring to the drawings, in which—

A marks the shell or case of the valve; B, the flange around the neck C for connecting it to the steam-pipe from the boiler.

D and E mark a similar neck and flange for attaching and connecting the valve with the steam-chest.

F is a face-plate attached to the shell by the bolts *c*. This plate has a stuffing-box, *f*, on its outer side, which has a screw-thread cut upon it to receive the cap G, which screws down upon it. In the stuffing-box *f* slides the follower *g*, which is slightly dished at its inner end, as is also the bottom of the box *f*, the two leaving the space *h* for the reception of the packing. The notch *e* in the outer end of the follower *g* is for the purpose of facilitating its removal from the stuffing-box when, from any cause, it becomes jammed in it.

The arrangement of follower and cap here described causes the packing to bear equally

on all sides of the valve-stem, and makes an admirable steam-tight joint.

Through the cap G, follower *g*, and plate F passes the valve-stem H, on the outer end of which is the lever I, by which the stem is connected with the governor. This lever is attached to the stem by set-screw *a*, and has a slot, *b*, in it for giving it the proper attachment to the governor.

K marks the inlet-passage for the steam, by which it enters to the valve, and L the outlet-passage by which it flows to the steam-chest.

M is an adjustable screw center or journal-box which receives the inner end of the valve-stem H, which turns in it. A tangent-pin, *n*, in the inner end of the piece M, is received into a groove in the stem H, and holds it in connection with the center piece, M, without interfering with the free rotation of the stem. A square head, *m*, on the outer end of the piece M, allows it to be turned by a wrench for adjustment. The movement of the center M in or out of the shell adjusts the position of the valve in relation to its seat with the greatest accuracy and facility, as will hereinafter appear. A jam-nut, N, holds the piece M securely in any desired position, and also serves to hold packing when required to keep the thread of M steam tight. The center piece, M, as a journal-box for the valve-stem and as a means of adjusting the valve in its position with reference to the seat, is one of the important features of my present invention and of great practical value.

Supporting the valve-stem in a journal-box at the inner end, instead of letting it run free there in the usual manner is of great importance in securing smoothness of motion and avoiding the jamming and unequal wear which arise from any inequality in the pressure of the steam on either side of the valve where this construction is not followed. The shell, Fig. 4, has a large opening, P, on one side for the introduction of the valve, which is closed by the face-plate F. The threaded opening Q on the opposite side of the shell receives the center piece, M, which is screwed into it. The valve-seat S has eight ports, *j*, *k*, &c., in it, of which the four *j* are larger than the four *k*. The larger ports are on opposite sides to each other of the shell, and so also of the smaller ports. The object of this arrangement is to

secure greater sensitiveness in governing, as it is obvious that the larger ports will either open sooner or remain longer open than the smaller ports, and therefore the combination of the two will give the most perfectly graduated control over the flow of steam. These ports are divided by the partitions *t t*, &c., which maintain the circular form of the valve-seat *S* at that point and strengthen it to resist the undue expansion or distortion to which it would be liable under high pressure, and which would separate it from contact with the valve and allow the steam to pass without being under the control of the valve. Four recesses, *i i i i*, are made in the valve-seat, the object of which is to apply steam between the valve and the seat for the purpose of relieving friction and causing the valve to move with greater sensibility, in consequence of the almost perfect balance of pressure between its outer and inner sides.

R, Fig. 5, is a perspective view of the valve on a somewhat enlarged scale. It is the hollow frustum of a cone, strengthened by the studs *p* and the annular diaphragm *r*, the latter being perforated with holes *l*, to allow of the free passage of steam from end to end of the interior of the valve, in order to compensate for any deficiency in the supply of steam from either end to the ports of that end arising from any inequality in the shrinkage of the cores. The valve has eight ports, *s*, corresponding with the like number of similar ports in the seat. The studs *p* and diaphragm *r* keep the valve from springing when subjected to high pressure.

Operation: The operation is as follows: The steam enters the neck *C*, and, as indicated by the arrows, passes into inlet-passage *K* and

enters the valve *R* at both ends, filling the recesses *i* and enveloping and exerting an equal pressure on all sides of the valve. The valve being properly set with reference to the ports, and the stem attached in the usual manner to the governor, steam will be admitted in quantities precisely proportioned to the work to be done into the exitway *L*, whence it flows to the cylinder.

It will be obvious to the steam-engineer that this valve can be arranged to act as a cut-off, and I contemplate its use for that purpose.

An important effect of making the ports *j* and *k* of different sizes, as described, is that when the engine is doing light work under high pressure the smaller ports may remain entirely closed, and only a portion of the larger ports be opened, owing to the fact that the valve will have to travel farther in order to open both the larger and smaller ports at the same time.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. Making the ports in the valve-seats of different sizes when the same are arranged in the manner and for the purpose set forth.

2. The adjustable screw center-piece, *M*, constructed, arranged, and operating substantially as described.

3. Perforating the diaphragm-plate *r* for the purpose stated.

The above specification of my said invention signed and witnessed, at Washington this 26th day of June, A. D. 1863.

T. S. LA FRANCE.

Witnesses:

CHAS. F. STANSBURY,
E. EVANS, Jr.