

(No Model.)

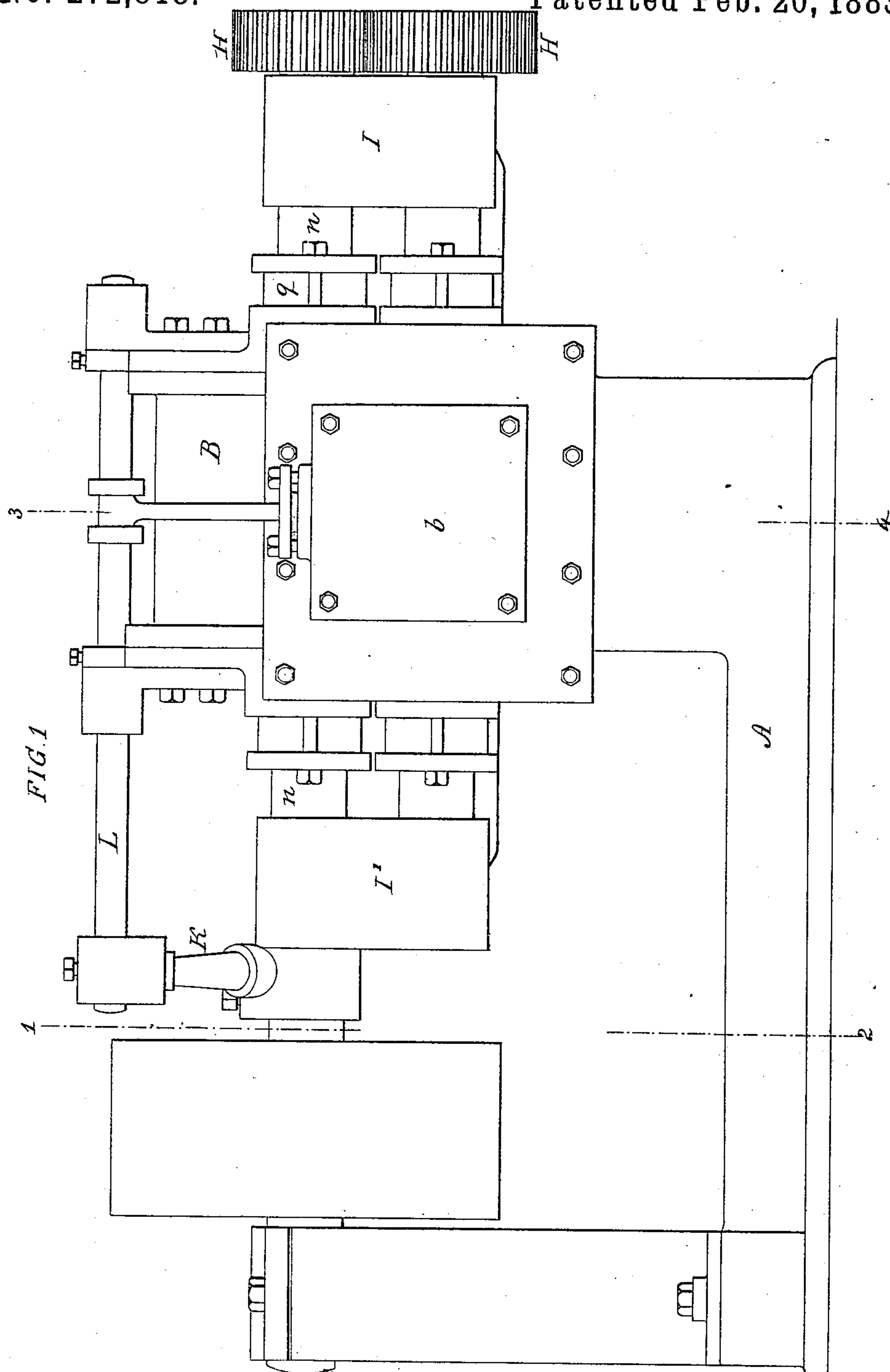
T. & J. W. WILBRAHAM.

4 Sheets—Sheet 1.

ROTARY ENGINE.

No. 272,818.

Patented Feb. 20, 1883.



WITNESSES:

Harry Drury  
Hamilton D. Turner.

INVENTOR:

Thomas and J. W. Wilbraham  
by their attys.  
Howson and sons

(No Model.)

T. & J. W. WILBRAHAM.

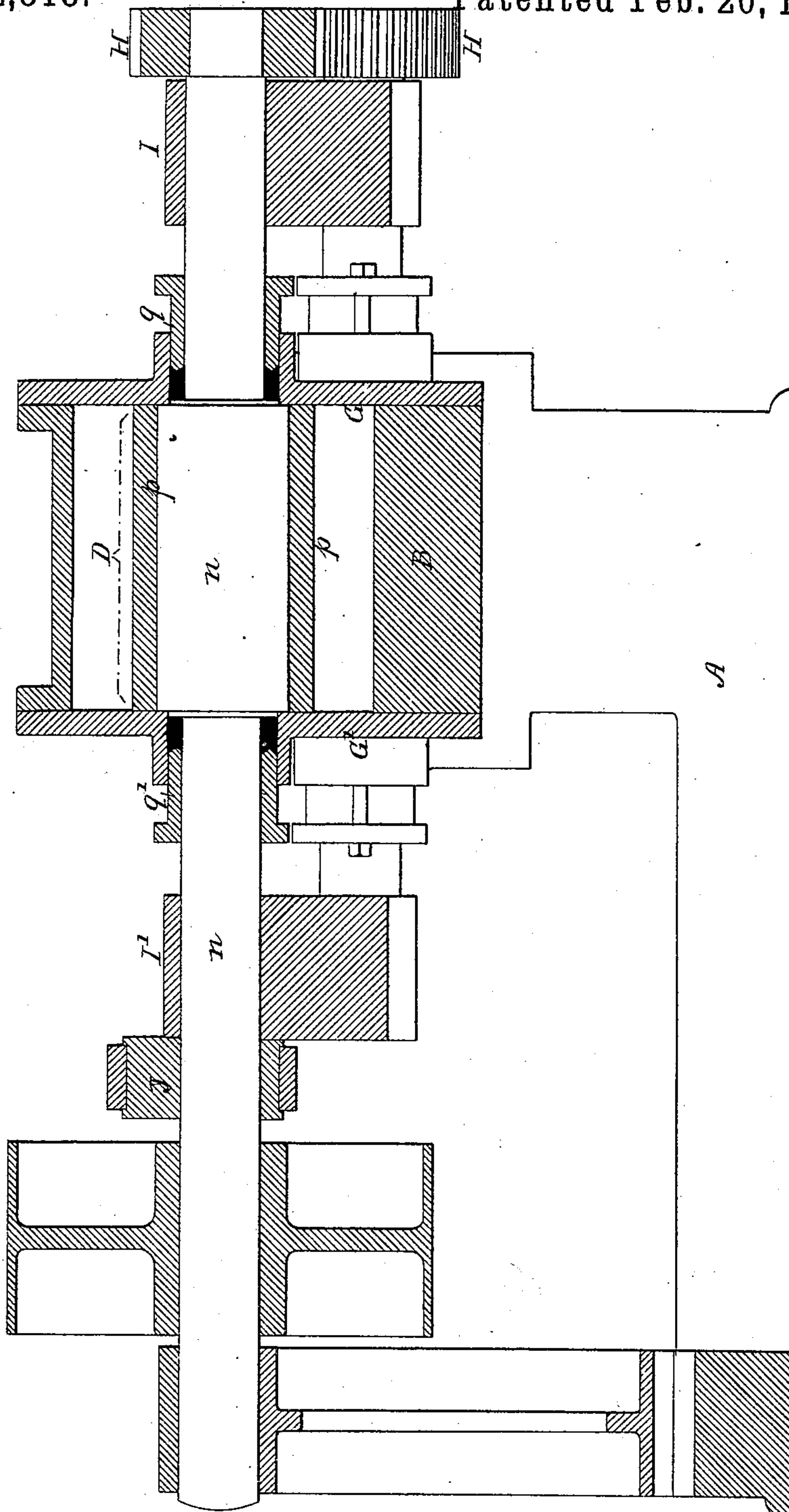
4 Sheets—Sheet 2.

ROTARY ENGINE.

No. 272,818.

Patented Feb. 20, 1883.

FIG. 2.



WITNESSES:

Harry Drury  
Hamilton D. Turner.

INVENTOR:

T. and J. W. Wilbraham  
by their attys  
Howson and Sons

(No Model.)

4 Sheets--Sheet 3.

T. & J. W. WILBRAHAM.

ROTARY ENGINE.

No. 272,818

Patented Feb. 20, 1883.

FIG. 3.

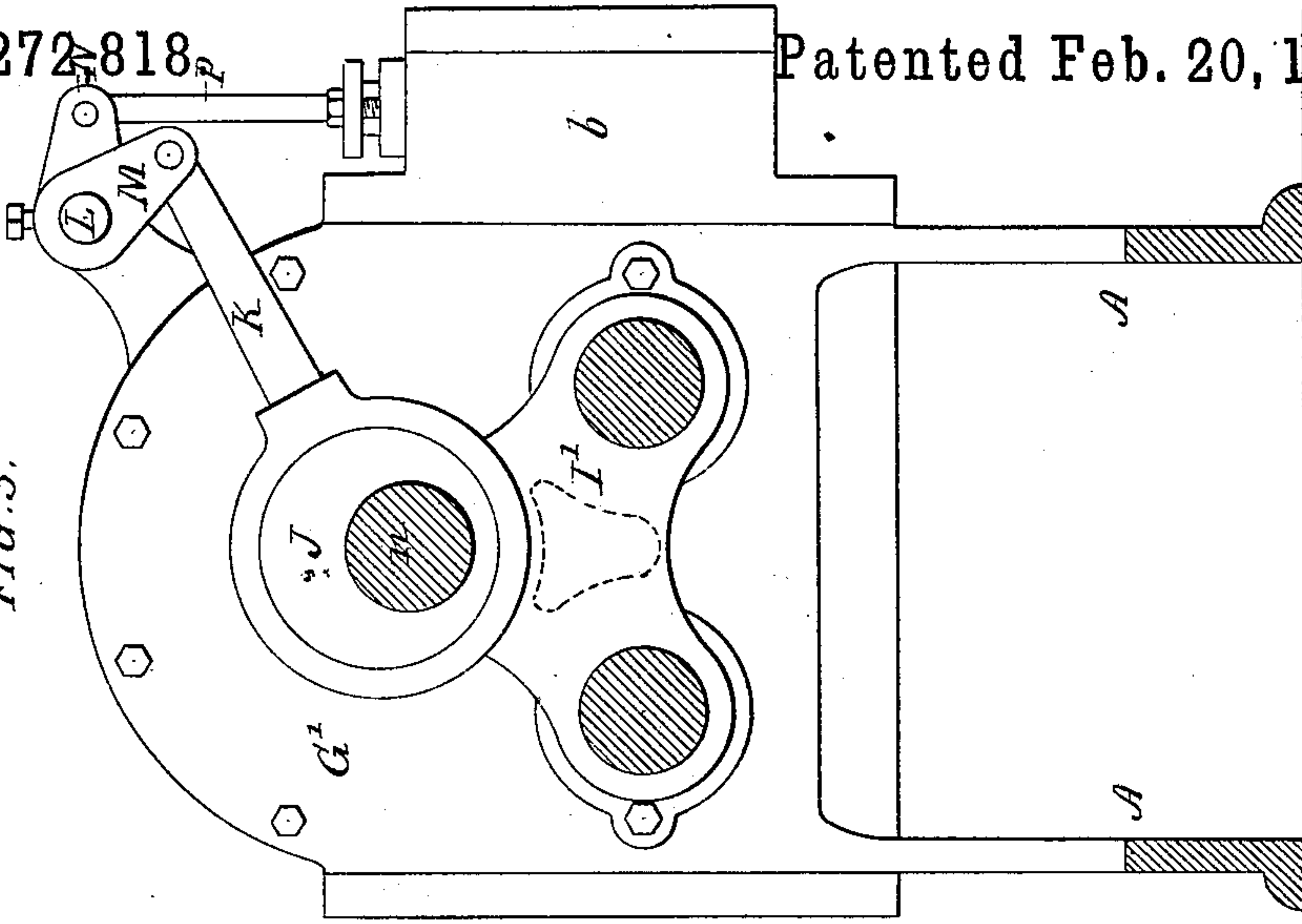
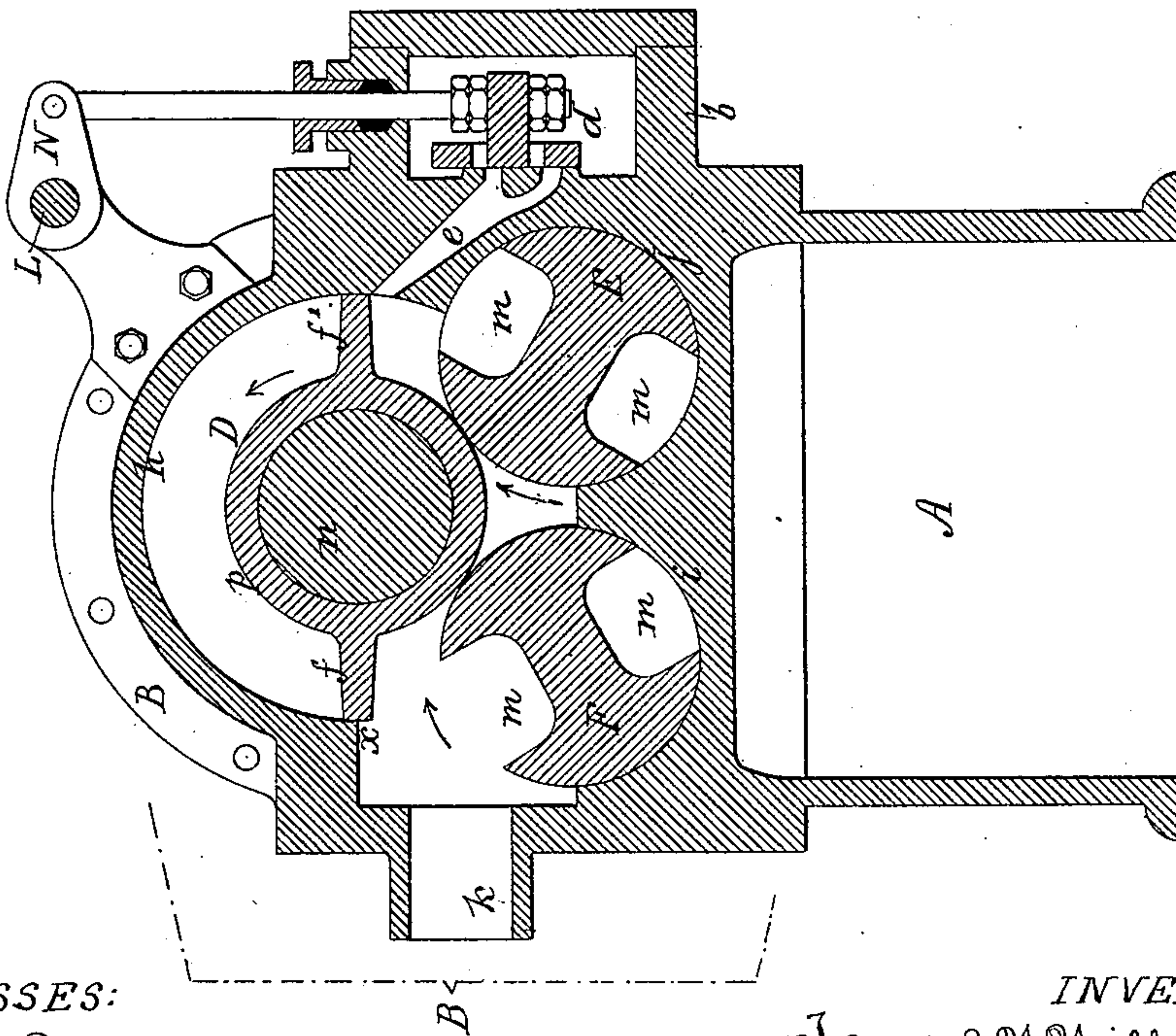


FIG. 4



WITNESSES:

Harry Drury  
Hamilton D. Turner.

INVENTOR:

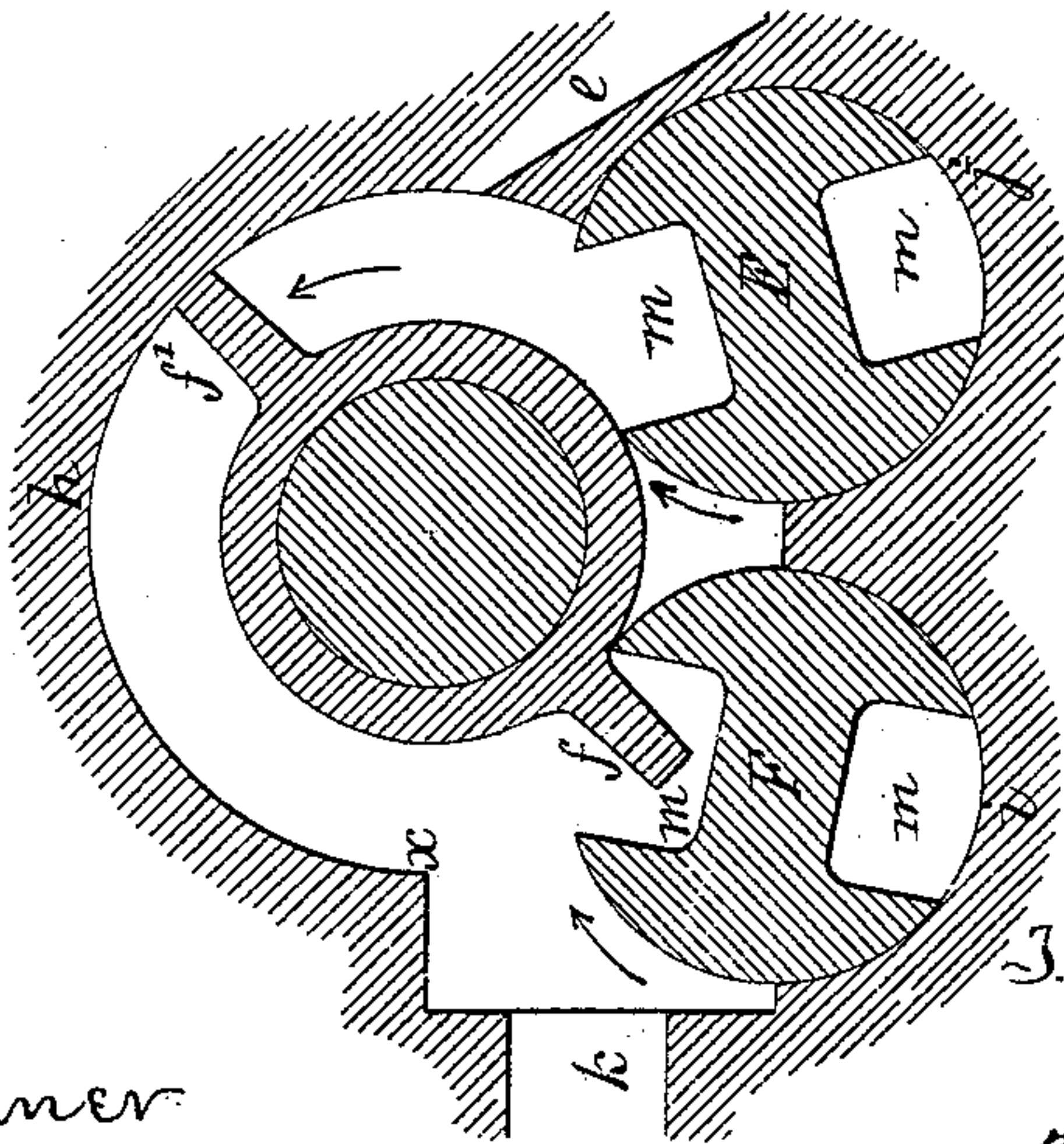
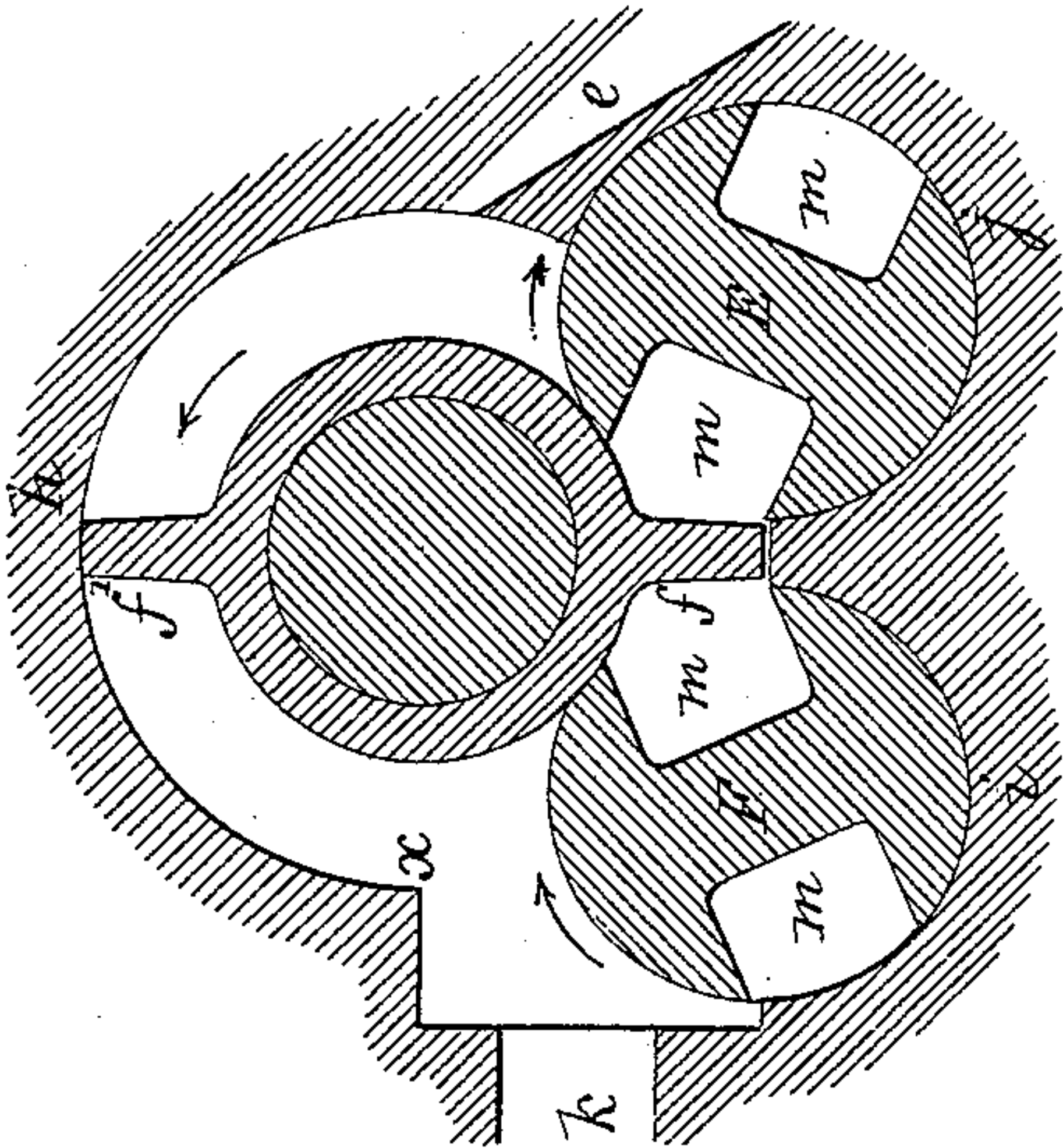
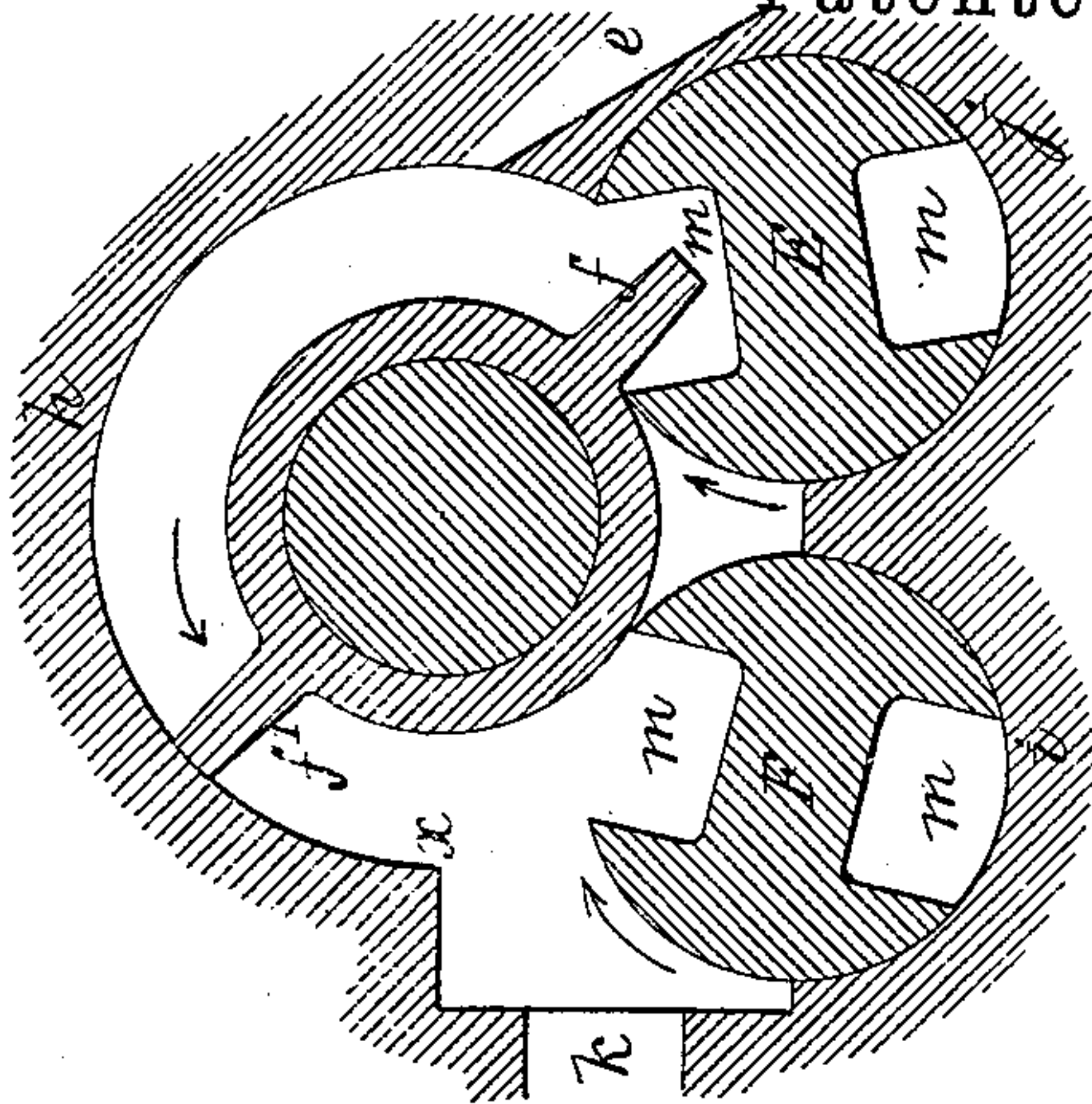
T. and J. W. Wilbraham  
by their attys.  
Howson and Fox



T. & J. W. WILBRAHAM.  
ROTARY ENGINE.

No. 272,818.

Patented Feb. 20, 1883.



Harry Drury  
Hamilton D. Turner

J. and J. W. Wilbraham  
by their attys.  
Howson and sons



# UNITED STATES PATENT OFFICE.

THOMAS WILBRAHAM AND JOHN W. WILBRAHAM, OF PHILADELPHIA, PA.,  
ASSIGNORS TO THEMSELVES AND JAMES WILBRAHAM, OF SAME PLACE.

## ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 272,818, dated February 20, 1883.

Application filed September 16, 1882. (No model.)

*To all whom it may concern:*

Be it known that we, THOMAS WILBRAHAM and JOHN W. WILBRAHAM, both citizens of the United States, and residents of Philadelphia, Pennsylvania, have invented certain Improvements in Rotary Engines, of which the following is a specification.

Our invention consists of a rotary engine in which a winged roller and two recessed rollers, all of the said rollers being of the same diameter and geared together, are combined with a casing having seats or bearings for the rollers, an inlet for the steam, and an outlet for the exhaust, all substantially as described hereinafter.

Our invention further consists of the combination of the system of rollers and the casing with a valve for preventing unnecessary waste of steam.

In the accompanying drawings, Figure 1, Sheet 1, is a front view of our improved rotary engine; Fig. 2, Sheet 2, a longitudinal vertical section; Fig. 3, Sheet 3, a transverse vertical section on the line 1 2, Fig. 1; Fig. 4, a transverse vertical section on the line 3 4, Fig. 1; and Figs. 5, 6, and 7, Sheet 4, diagrams illustrating the operation of our invention.

A is the base-plate of the engine, and B the casing forming the chamber, within which the winged roller D and recessed rollers E and F revolve, this casing, which is preferably cast in one piece with the base, being furnished at one end with a cover, G, and at the opposite end with a cover, G', through stuffing-boxes, on which covers pass the journals of the several rollers, the said journals being geared together by cog-wheels H, so that all three rollers, which are of the same diameter, will revolve at the same speed.

Within the casing B are three segmental seats, *h*, *i*, and *j*, the first for the wings *ff'* of the roller D, the second for the roller E, and the third for the roller F. The extent of these seats, the points where they terminate, and their relation to each other and to the several rollers will be readily understood without description by referring to Fig. 4. While the wings of the roller D and the rollers E and F revolve in contact with their respective seats, and the ends of the several rollers are in con-

tact with the faced inner sides of the covers G & G', the contact is not of such a character as to prevent the rollers from turning as freely as a shaft does in a properly-prepared bearing. The roller D is always in contact with the rollers E and F; but there is no friction at these points of contact, as all the rollers are of the same diameter and revolve at the same speed in the direction of the arrows. Hence the winged roller may bear hard enough against the other rollers to prevent the passage of steam between them.

Attached to or forming part of the casing B is a steam-chest, *b*, communicating with the steam-space of a boiler, and this steam-chest contains a valve, *d*, adapted to a valve-seat in which are two ports communicating through a passage, *e*, with the interior of the casing B, the latter having an outlet, *k*, for the exhaust.

Before we describe the detailed construction of other parts of the engine it will be well to explain the operation of the rollers in the casing, reference being had to Figs. 4, 5, 6, and 7. Discarding the valve for the time being, and supposing that there is a free entrance to the casing through the passage *e* for the steam, the latter, cut off, as it is, from the outlet, must, when the parts are as shown in Fig. 4, exert its pressure on the wing *f'* of the roller D and cause the latter to turn in the direction of its arrow, and the other rollers must revolve in the directions pointed out. When the rollers have completed each one-eighth of a revolution they will be in the position shown in Fig. 5, the steam still acting on the wing *f'*, for all avenues to the outlet are still closed. In Fig. 6 the rollers have each completed one-fourth of a revolution and in Fig. 7 three-eighths of a revolution, the steam continuing to act on the wing *f'* until the latter passes the point *x* in the casing, and the other wing, *f*, has passed the steam-inlet, when the steam temporarily trapped in the space above the roller D will be exhausted, and steam from the valve-chest will act on the wing *f*. During the rotation of the rollers one of the recesses *m* in each of the rollers E and F always presents itself for the reception of that wing of the roller D which has to pass either of the said rollers E or F, and, as will be seen by reference to the diagrams



on Sheet 4, these recesses *m* do not prevent such confinement of the steam as will cause it to act on one or other of the wings of the roller D. The engine will thus be driven without the aid of the valve; but the latter is always preferred as a means of preventing waste of steam.

We prefer to so construct and so operate the valve that steam will be admitted to the passage *e* just as one of the wings of the roller D has passed the outlet of said passage and to cut off the steam when the roller has made from one-third to one-half of a revolution.

For facility of manufacture the roller D is made in two parts—namely, the shaft *n* and tube *p*, on which are the wings *f f'*, and which is secured to the shaft. This shaft *n* is the driving-shaft of the engine, and passes in one direction through a stuffing-box, *q*, on the cover G, and through a bearing, I, through which also pass the journals at one end of the lower rollers, and the journals of all the rollers being geared together by the cog-wheels H, as before remarked. Another bearing, I', receives the opposite journals of the lower rollers and the opposite end of the shaft *n*. These bearings serve to relieve the stuffing-box bearings from severe duty, tend to maintain the three rollers in their proper relative position, and insure general steadiness in the action of the engine. The bearings are far enough from the covers of the casing to permit the withdrawal of the stuffing-boxes, and the bearings I I' may be either cast one on each cover, or they may be secured thereto or to the base of the engine. In the present instance a bearing for the three journals is cast on each cover, the connection between which and the bearing is indicated by dotted lines in Fig. 3.

The valve is operated by an eccentric, J, on the driving-shaft, through the medium of the eccentric-rod K, arm M, rock-shaft L, and arm N, the latter being connected to the valve-spindle. It should be understood, however, that we do not desire to restrict ourselves to any specific kind of valve, or to the mechanism for actuating the same, as different kinds of valves and different operating appliances will readily suggest themselves to expert engineers.

We claim as our invention—

1. The combination, in a rotary steam-engine, of the roller D and its two wings, the two rollers E and F, each having two recesses, and all the rollers being geared together, with a casing having one segmental seat or bearing, *h*, for both wings, and bearings for the said rollers E and F, with which the said wings are always free from contact, all substantially as set forth.

2. The combination, in a rotary engine, of the winged roller D, the two recessed rollers E and F, and the casing B, having seats for the several rollers, with a valve for regulating the admission of steam to the casing, and automatic mechanism for operating the valve, substantially as set forth.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

THOMAS WILBRAHAM.  
JOHN W. WILBRAHAM.

Witnesses:

HARRY DRURY,  
HARRY SMITH.