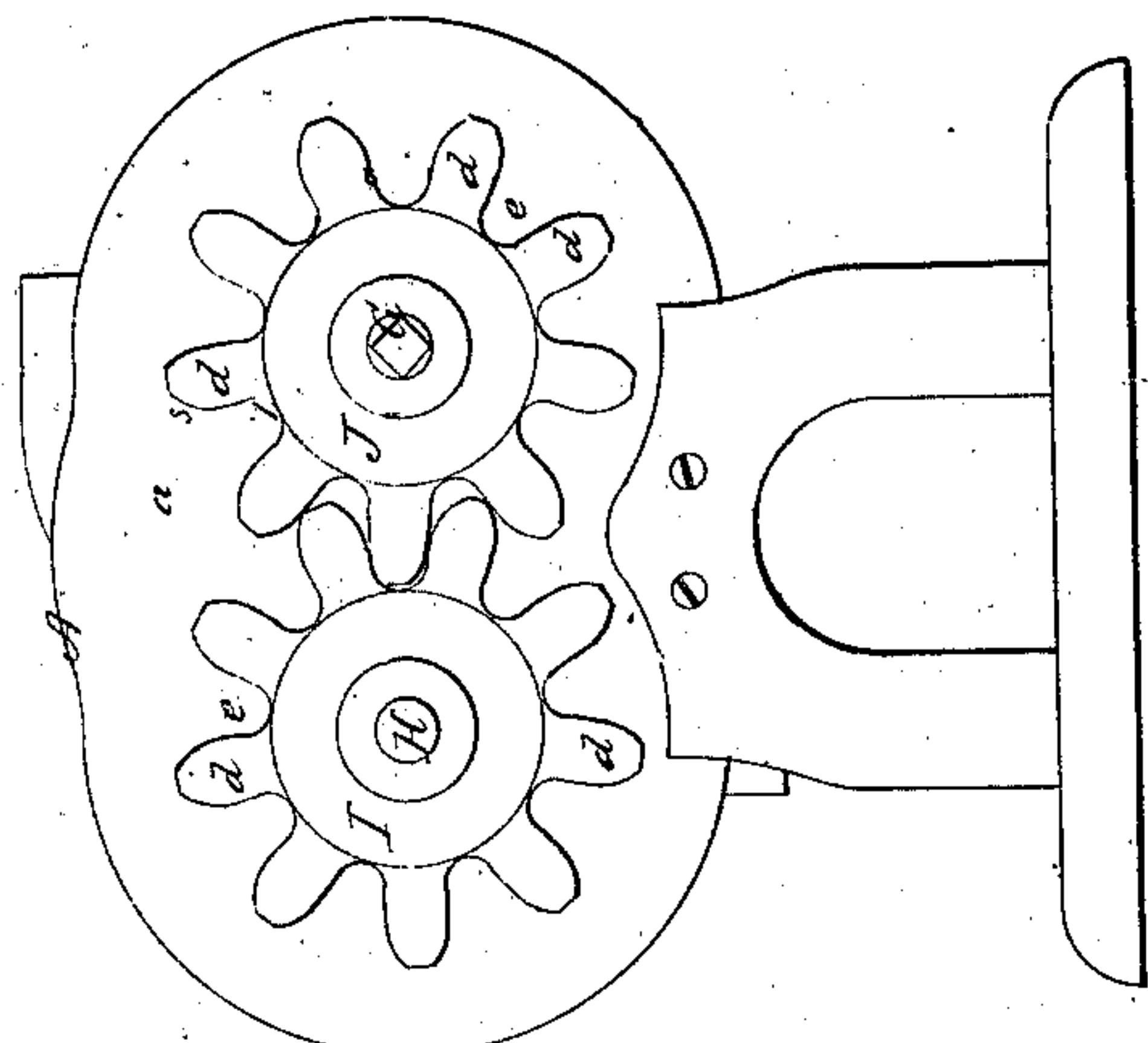


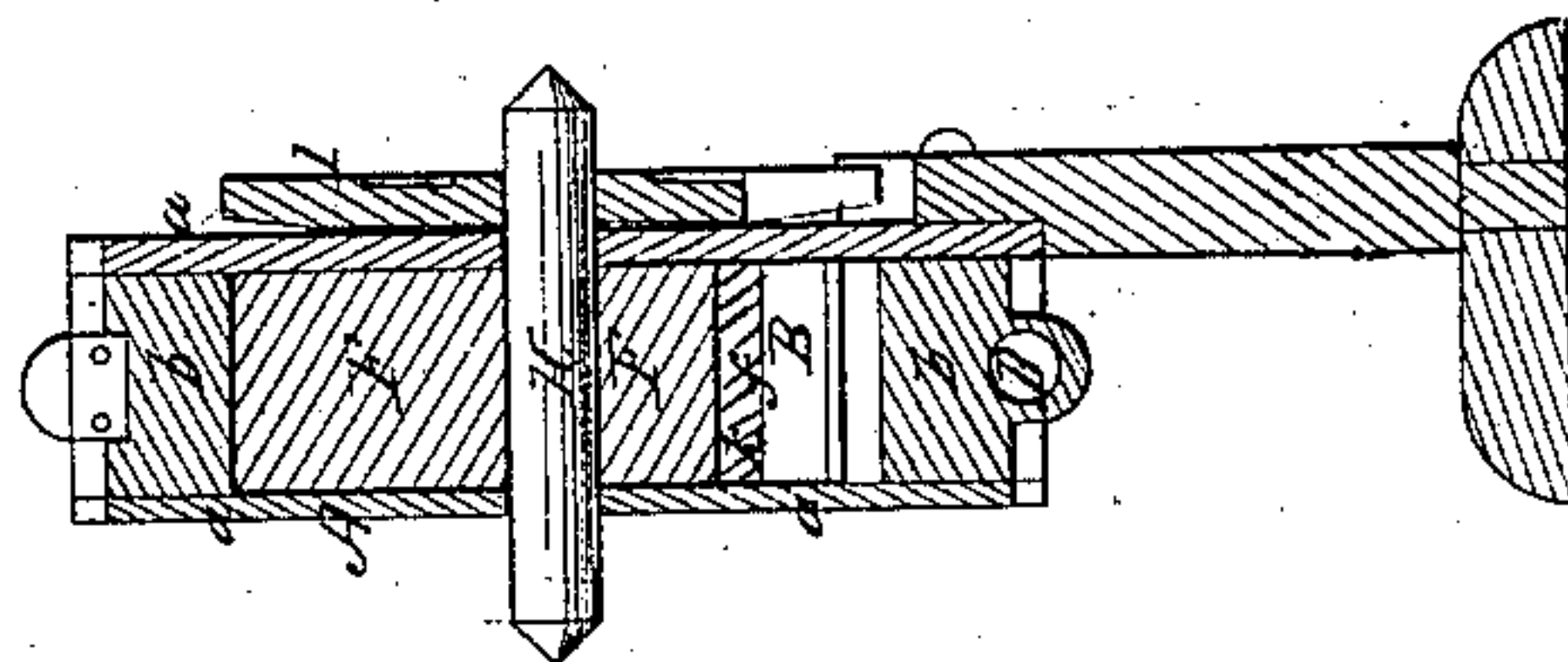
*J. A. Bazin,*  
*Rotary Pump,*

*N<sup>o</sup> 65,992,*

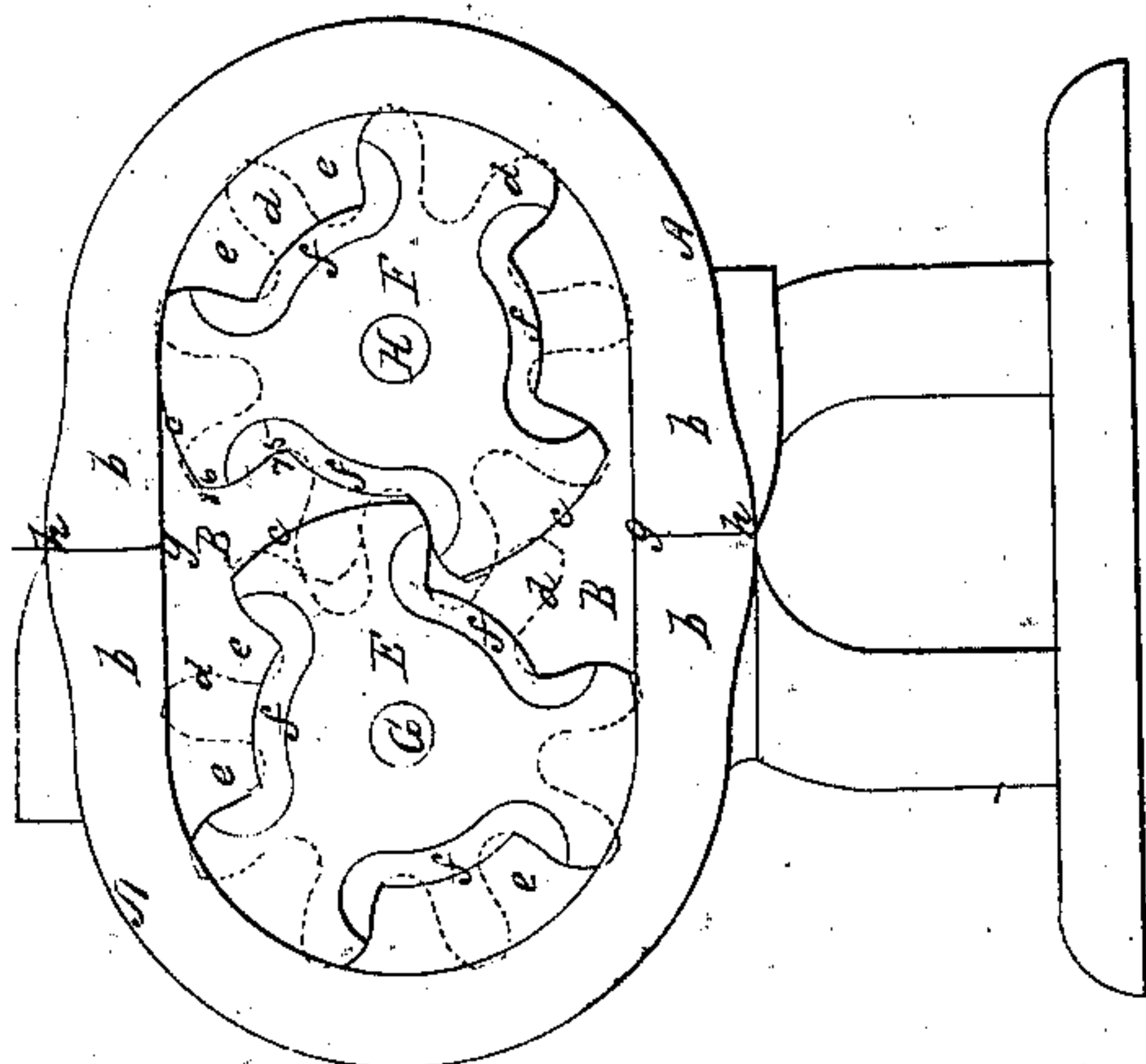
*Patented June 25, 1867.*



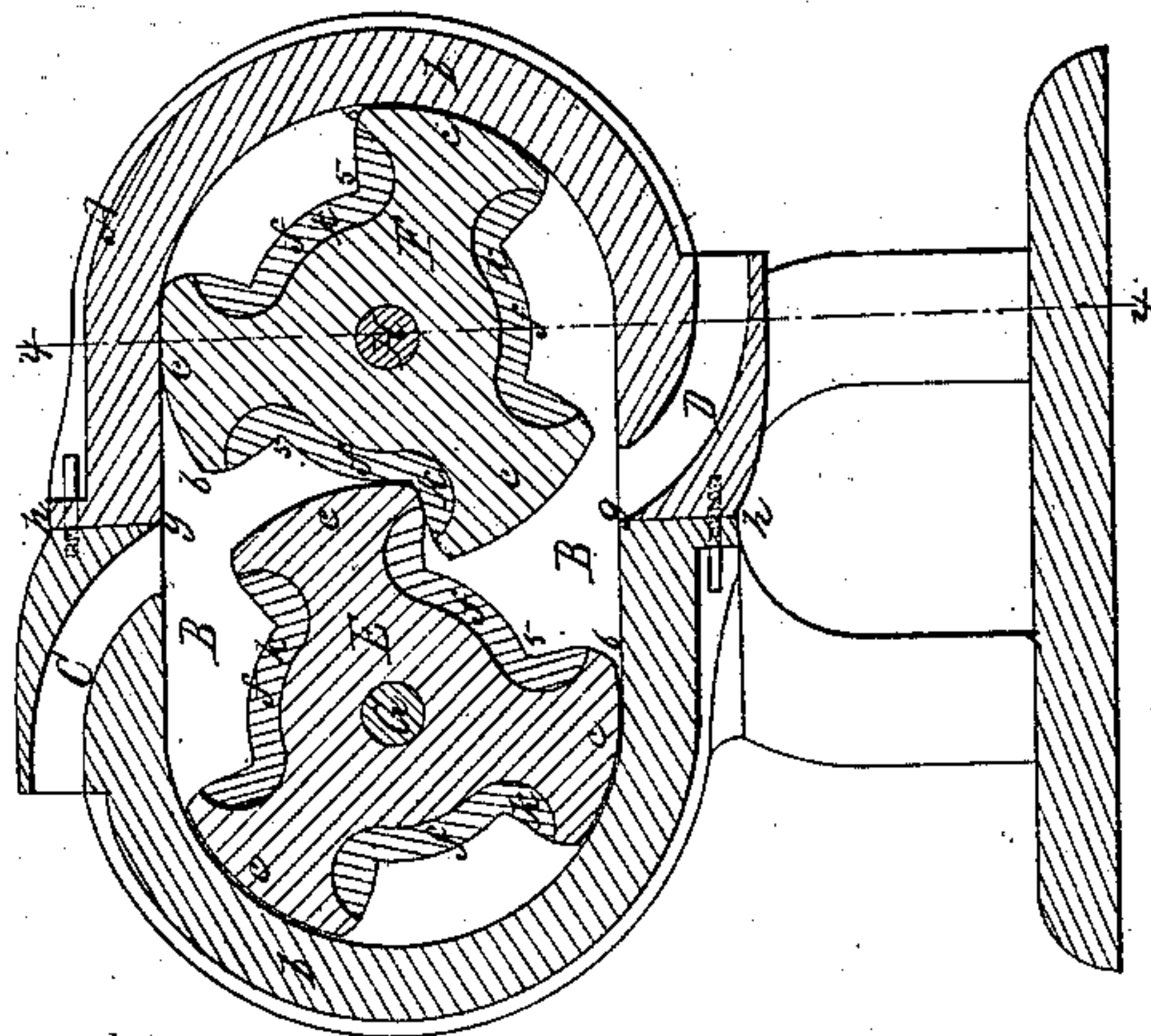
*Fig. 3*



*Fig. 4*



*Fig. 1*



*Fig. 2*

*Witnesses;*  
*N. W. P. Starnes*  
*C. H. Starnes*

*Inventor;*  
*James Amory Bazin*



# United States Patent Office.

JAMES AMIRAUX BAZIN, OF CANTON, MASSACHUSETTS.

*Letters Patent No. 65,992, dated June 25, 1867.*

## IMPROVEMENT IN ROTARY PUMPS.

*The Schedule referred to in these Letters Patent and making part of the same.*

### TO ALL WHOM IT MAY CONCERN:

Be it known that I, JAMES AMIRAUX BAZIN, of Canton, in the county of Norfolk, and State of Massachusetts, have invented certain Improvements in Rotary Pumps and Engines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is an elevation of a rotary pump of my improved construction, the front of the exterior of the casing being removed to show the parts within.

Figure 2 is a central vertical section through the same.

Figure 3 is a rear elevation of the outside of the pump representing the external gearing.

Figure 4 is a section on the line  $xx$  of fig. 2.

In the rotary pump of the ordinary construction the water is drawn in at or near the bottom of the casing and discharged at or near its top, and foreign substances, such as small stones, etc., are frequently taken in and thrown over between the wings of the pistons, and thus destroy the pump. The form of these wings is such that when they come in contact with each other or the interior of the casing, the extent of the bearing surface between them is so small that when gritty substances are drawn into the pump they soon cause the parts to be worn away and the pump to leak, beside which, a portion of the water raised flows into the space between the wings in contact and is carried back or returned to the bottom. Furthermore, the pistons of the pump above referred to are not packed in such manner that the surfaces between the wings will yield as required and still maintain a tight joint, and the casing of this pump has heretofore been made in one piece, by which construction, when the surfaces of the parts are worn away and the pump leaks, there is no possibility of repairing them. To remove the above-mentioned difficulties is the object of my improved pump.

My invention consists in the construction and arrangement of a spring-cushion for packing the pistons at the points between them where there is the greatest difficulty of maintaining close joints.

To enable others skilled in the art to understand and use my invention, I will proceed to describe the manner in which I have carried it out.

In the said drawings, A is the shell or casing, of metal or other suitable material, formed of two side-pieces,  $a$ , which enclose two central pieces,  $b$ , and when snugly fitted and secured together form a hollow chamber, B, the top of which communicates with a passage, C, through which the water is drawn into the pump, the water being discharged therefrom through the passage D at its bottom. EF are pistons placed upon the shafts GH, which have their bearings in and project outside of the casing A. IJ are external gears, to which power is applied through the shafts to revolve the pistons when used for raising water, the pistons being driven by steam applied directly to them when the apparatus is employed as a rotary engine. These pistons are of the form shown in figs. 1 and 2, the curvature of the portion from 5 to 6 of the wings  $c$  corresponding to that from 7 to 8 of the cogs  $d$  of the external gearing, (the degree of the curvature of this portion 5 to 6 approaching nearer to a radial line than would be the case were there a much greater number of cogs,) the space occupied by each wing  $c$  being equal to that occupied by two cogs  $d$  and the space  $e$  between them, as seen in red, fig. 1, the number and form of the wings being that best adapted to insure the wing of one piston snugly filling the space between two contiguous wings of the other piston, by which construction none of the water is carried back or returned to the top of the casing, and foreign substances that may enter are carried around inside and discharged at the suction-passages below, thus preventing any liability of breakage, which frequently occurs in the pump of the ordinary construction. In order to make as extended a bearing surface as possible between the pistons and the inside of the casing, I make the diameter of the outside of the wings  $c$  a little less than the outside diameter of the cogs, and thereby avoid any sharp corners into which gravel or dirt might otherwise collect.  $f$  is a packing of rubber, sheet metal, or other suitable material, that possesses sufficient elasticity to yield and expand as required, in order to maintain a tight joint at all times, the said rubber or elastic material being faced with a block of hard wood or other suitable material, so fitted as to be easily slipped in front of the elastic material  $f$ . This hard surface,  $k$ , when brought in contact with the wing of the piston, presses upon the elastic  $f$ , which yields and expands, thereby maintaining a tight joint, while the hard surface protects the rubber or other elastic material from wear.

The mechanism above described may be used to advantage as a fan-blower for creating a draught, and may also be used as a water-meter, and if from any cause the interior surfaces become worn so as to cause leakage, the pieces *a b* of the casing may be detached, and the surfaces in contact from *g* to *h*, after being carefully planed, may be reunited, when the bearing surfaces of the wings of the pistons will snugly fit the interior of the casing.

In the foregoing description I have referred to a certain fixed proportion of the cogs of the external gearing to the wings of the pistons, but as it is evident that the number of cogs taken as the width of each wing must be one more than the number of spaces between the cogs, each wing must consist of an odd number of equal divisions laid off on the pitch line of the cog-wheel, and thus that the proportion between the cogs and the wings may be a multiple of any other odd number, without departing from the principle above stated.

What I claim as my invention, and desire to secure by Letters Patent, is—

The packing *f k*, constructed as described, and arranged between the wings of the pistons, substantially as set forth.

JAMES AMIRAUX BAZIN.

Witnesses:

N. W. STEARNS,

P. E. TESCHEMACHER.