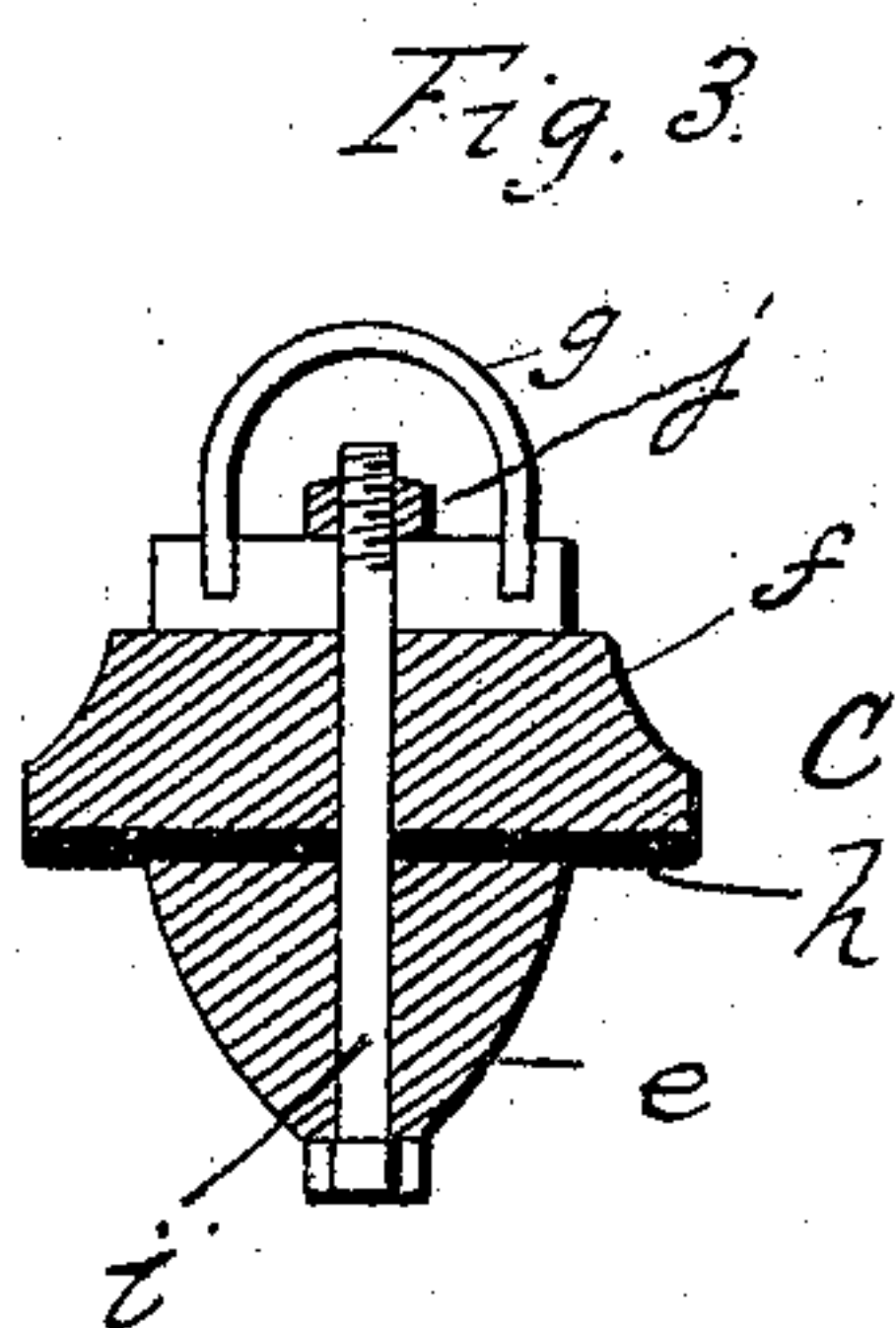
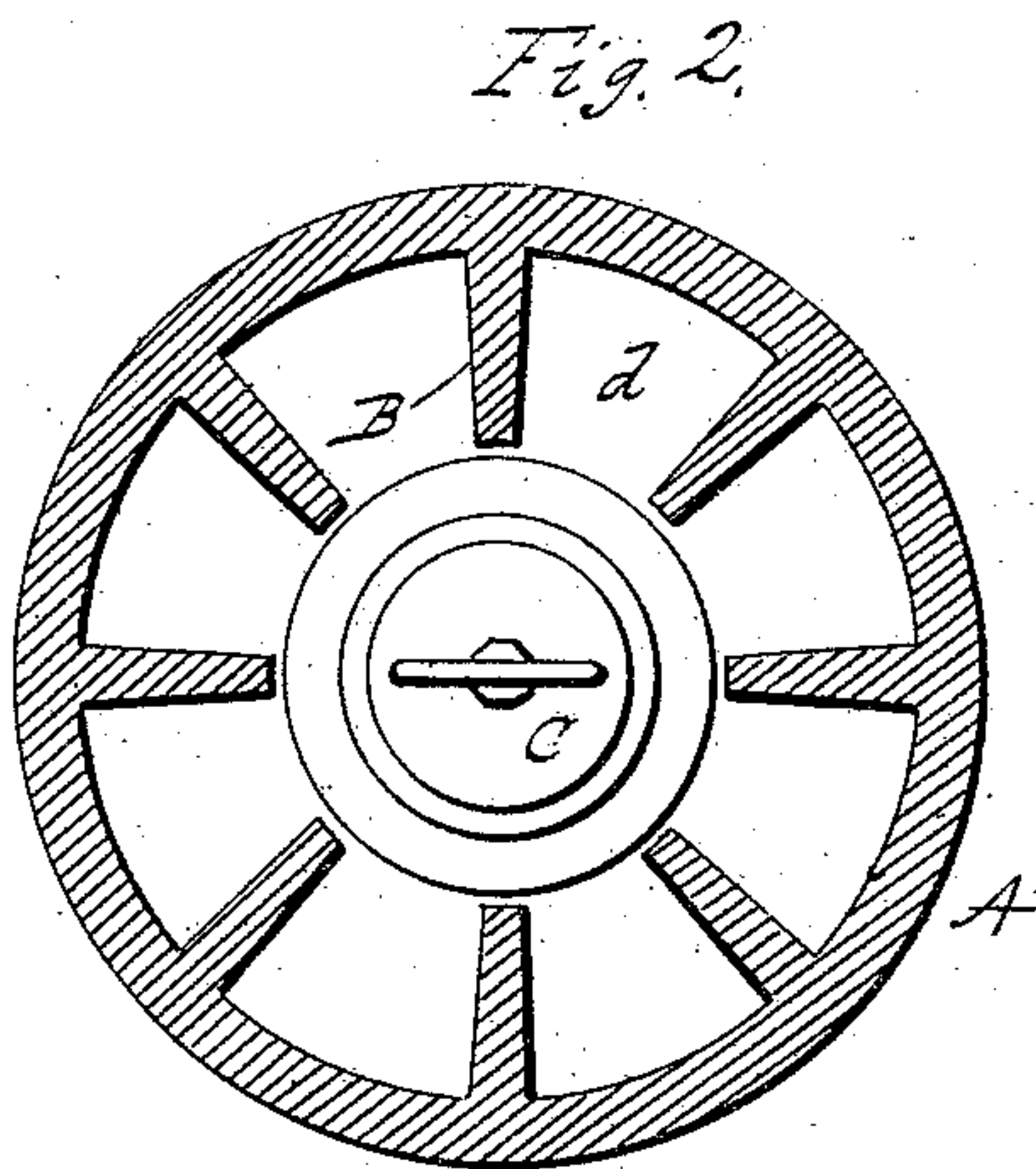
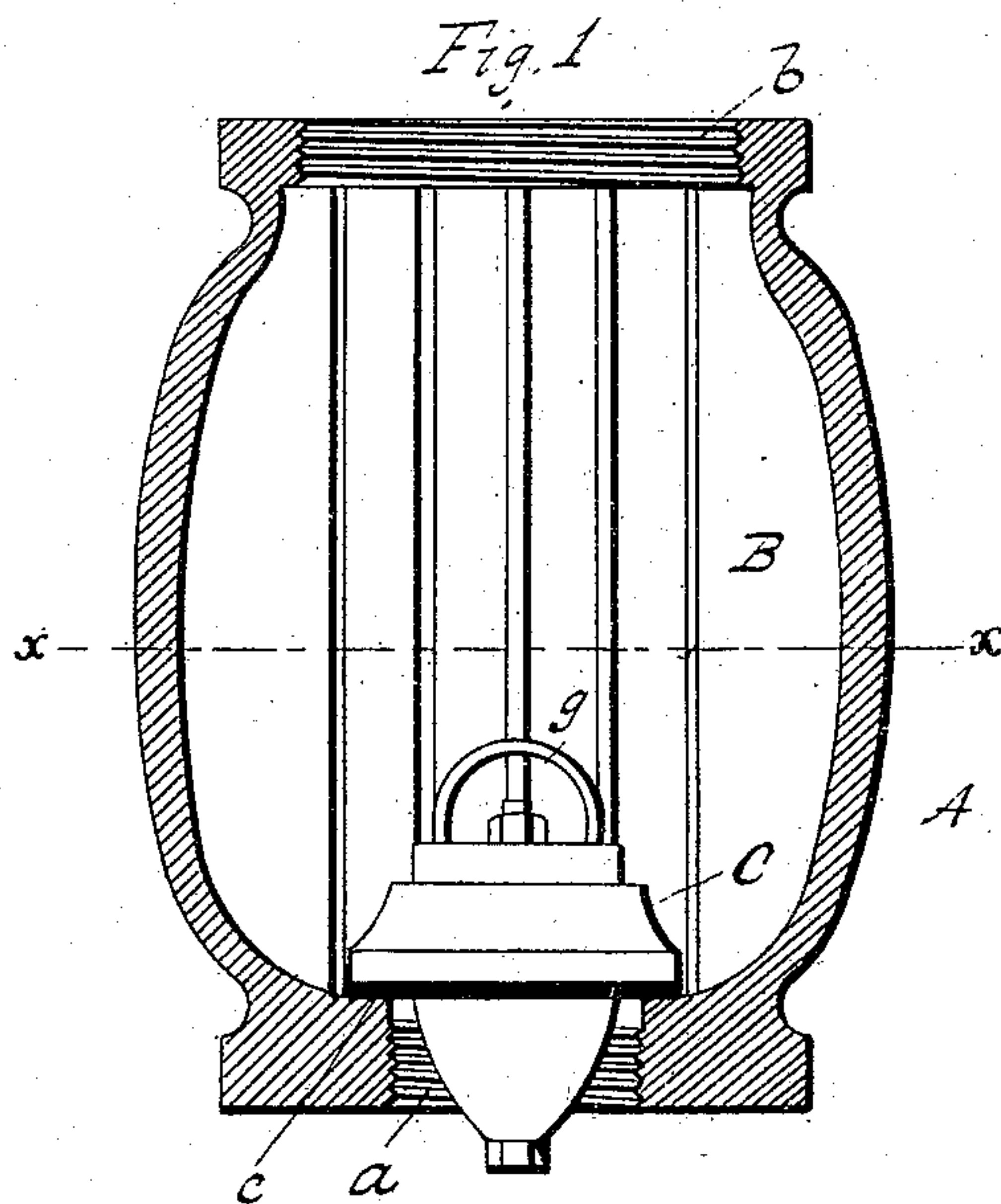


(No Model.)

E. E. FRIZELL.  
PUMP.

No. 543,338.

Patented July 23, 1895.



Witnesses:  
*H. Raeder*  
*N. F. Matthews*

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Attorney



# UNITED STATES PATENT OFFICE.

EDWARD E. FRIZELL, OF LARNED, KANSAS.

## PUMP.

SPECIFICATION forming part of Letters Patent No. 543,338, dated July 23, 1895.

Application filed February 12, 1895. Serial No. 538,077. (No model.)

*To all whom it may concern:*

Be it known that I, EDWARD E. FRIZELL, a citizen of the United States, residing at Larned, in the county of Pawnee and State of Kansas, have invented certain new and useful Improvements in Pumps; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in pumps, and more particularly to the check-valves and valve-casings thereof; and it consists in the peculiar construction, novel combination, and adaptation of parts hereinafter described, and particularly pointed out in the claim appended.

In the accompanying drawings, Figure 1 is a vertical diametrical section of my improved valve-casing with the valve in elevation upon its seat. Fig. 2 is a transverse section taken in the plane indicated by the line  $x x$  of Fig. 1, and Fig. 3 is a diametrical section of the valve removed from its casing.

Referring by letter to said drawings, A indicates my improved valve-casing, which is provided at one end with an interiorly-threaded opening  $a$  for the connection of a supply-pipe (not illustrated) and at its opposite end with a similarly-threaded opening  $b$  for the connection of a cylinder or discharge-pipe, (not illustrated,) and is also provided around the opening  $a$  with a valve-seat  $c$ , and B indicates the longitudinal radially-disposed interior ribs of said casing A. These ribs B, which are formed integral with the casing A and extend inwardly from the same toward a common center, as shown in Fig. 2, are designed and adapted to form passages  $d$ , by which the water may pass the check-valve (presently described) and are also designed and adapted to guide the check-valve in its movements and hold the same in its proper operative position, so as to enable it to promptly resume its seat at the termination of the upstroke of the pump-piston, (not illustrated,) for a purpose hereinafter set forth.

C indicates my improved check-valve, which is arranged in the casing within the circle formed by the inner edges of the ribs B and is designed to normally rest upon the seat  $c$ , as shown in Fig. 1. This check-valve C, as

better shown in Fig. 3, comprises a lower metallic section  $e$  of such diameter that it is adapted to extend into the opening  $a$  of the casing, an upper metallic section  $f$  of greater diameter than the opening  $a$  of the casing and having a flat under side and also having a bail  $g$  on its upper side, a disk  $h$  of leather, rubber, or other packing material interposed between the sections  $e f$  and covering the extended portion of the lower side of the latter, and a longitudinal central bolt  $i$ , taking through the sections  $e f$  and the disk  $h$  and headed at its lower end and having its upper end threaded for the engagement of a securing-nut  $j$ , as shown. The upper section  $f$  of the valve C, while larger in diameter than the induction-opening  $a$  of the casing A, is smaller than the eduction-opening  $b$ , and it will therefore be seen that when a hook or other instrument is introduced through the opening  $b$  and engaged with the bail  $c$  of the valve the valve may be readily drawn out of the valve-casing and out of the pump, in the manner described in my Letters Patent dated December 18, 1894, No. 531,175. When the valve is thus removed from the casing A and the pump, the sections  $e f$  may be separated without the aid of any implement other than a wrench for unscrewing the nut  $j$ , and the packing-disk  $h$  may be readily removed from between the sections  $e f$  and a new packing-disk may as readily be placed and secured in position, after which the valve may be inserted into the pump and conveniently lowered to its place in the casing A.

The valve-sections  $e$  and  $f$  are made of such size and weight that in practice on the upstroke of the pump-piston (not illustrated) the valve will only rise sufficiently to permit the water from the supply-pipe to enter the spaces  $d$  between the casing-ribs B. This and the fact that the valve is guided and held in its proper operative position by the ribs B will enable the valve to promptly resume its seat at the termination of the upstroke of the piston and prevent any of the water raised into the casing from escaping back into the supply-pipe and will also prevent the valve from being buoyed up by the water.

The ribs B, as better shown in Fig. 1 of the drawings, extend from the valve-seat  $c$  at the lower end of the casing A to the opening  $b$  at



the upper end of said casing, which opening *b* is larger in diameter than the space within the ribs *B*, so that a cylinder or pipe screwed into said opening will not interfere with the valve *C* being withdrawn from the casing. 5 The ribs *B*, by reason of their extending the full length of the casing *A*, also serve to assist in the removal of the valve *C* from the casing, as they guide the valve through the opening *b* when it is raised and prevent it 10 from catching or lodging against the inwardly-directed flange at the upper end of the casing.

Having described my invention, what I 15 claim is—

In a pump the valve casing described having the induction opening *a*, at its lower end, the valve seat *c*, surrounding the upper inner end of said opening *a*, and the opening *b*, at 20 its upper end larger in diameter than the opening *a*, and also having the interior, longitudinal, radially-disposed guide-ribs *B*, forming the passages or spaces *d*, and extending

from the valve seat *c*, to the opening *b*, at the upper end of the casing; said ribs being of 25 such a width that the space within their inner edges is smaller in diameter than the opening *b*, in combination with the removable check valve arranged between the guide ribs *B*, and comprising the portion *f*, larger in di- 30 ameter than the opening *a*, of the casing and provided with a vertical edge *f*<sup>2</sup>, engaging the inner edges of the ribs *B*, the packing *h*, on the under side of the portion *f*, the lower metallic section *e*, sufficiently small to enter the 35 opening *a*, the bail *g*, connected with the portion *f*, the bolt taking through the portions *e*, and *f*, and the packing *h*, and the nut mounted on the bolt, substantially as specified.

In testimony whereof I affix my signature 40 in presence of two witnesses.

EDWARD E. FRIZELL.

Witnesses:

DANTE C. BABBITT,  
E. G. SEELY.