

(No Model.)

2 Sheets—Sheet 1.

E. I. NICHOLS.
HYDRAULIC MOTOR.

No. 467,612.

Patented Jan. 26, 1892.

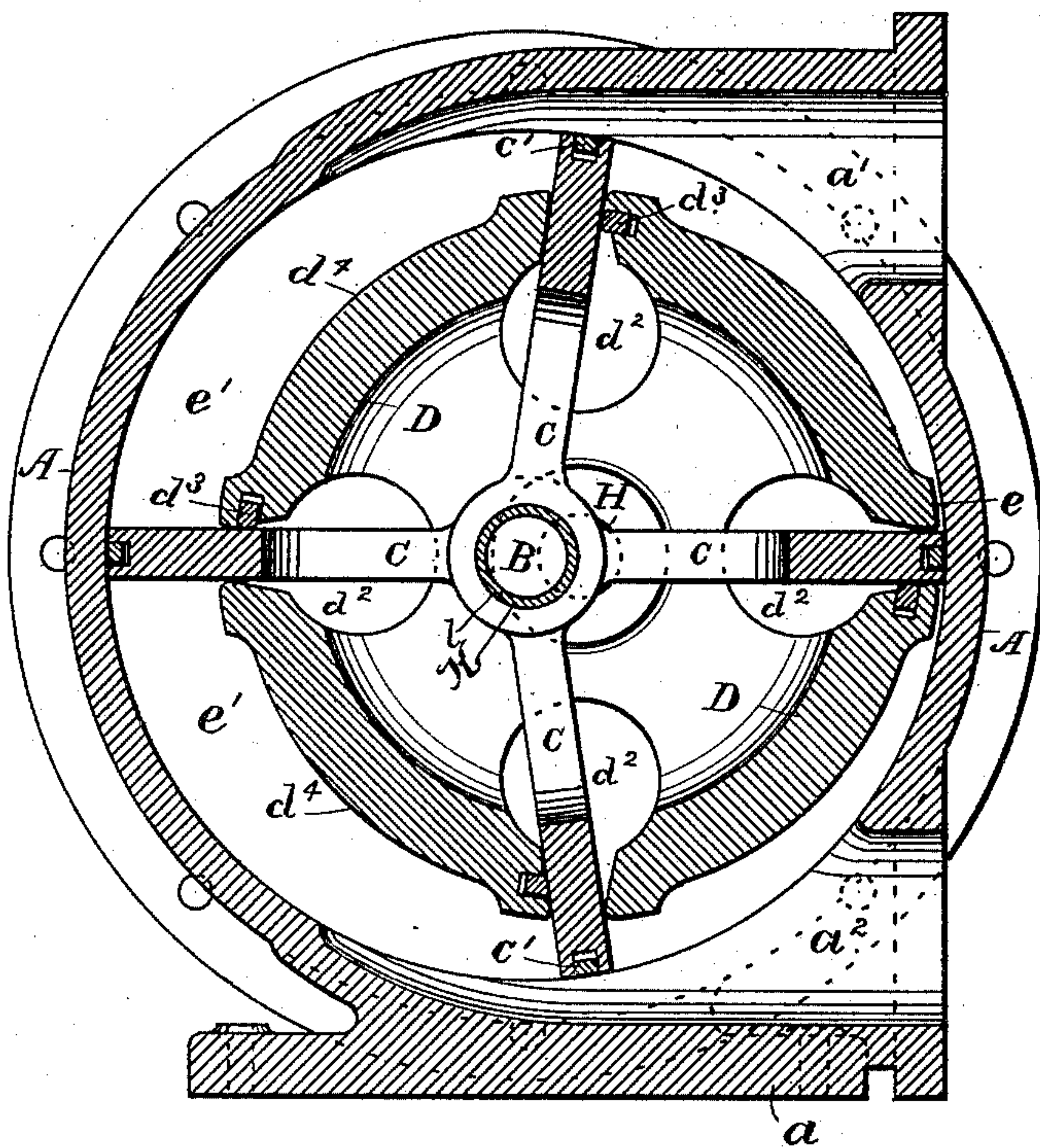
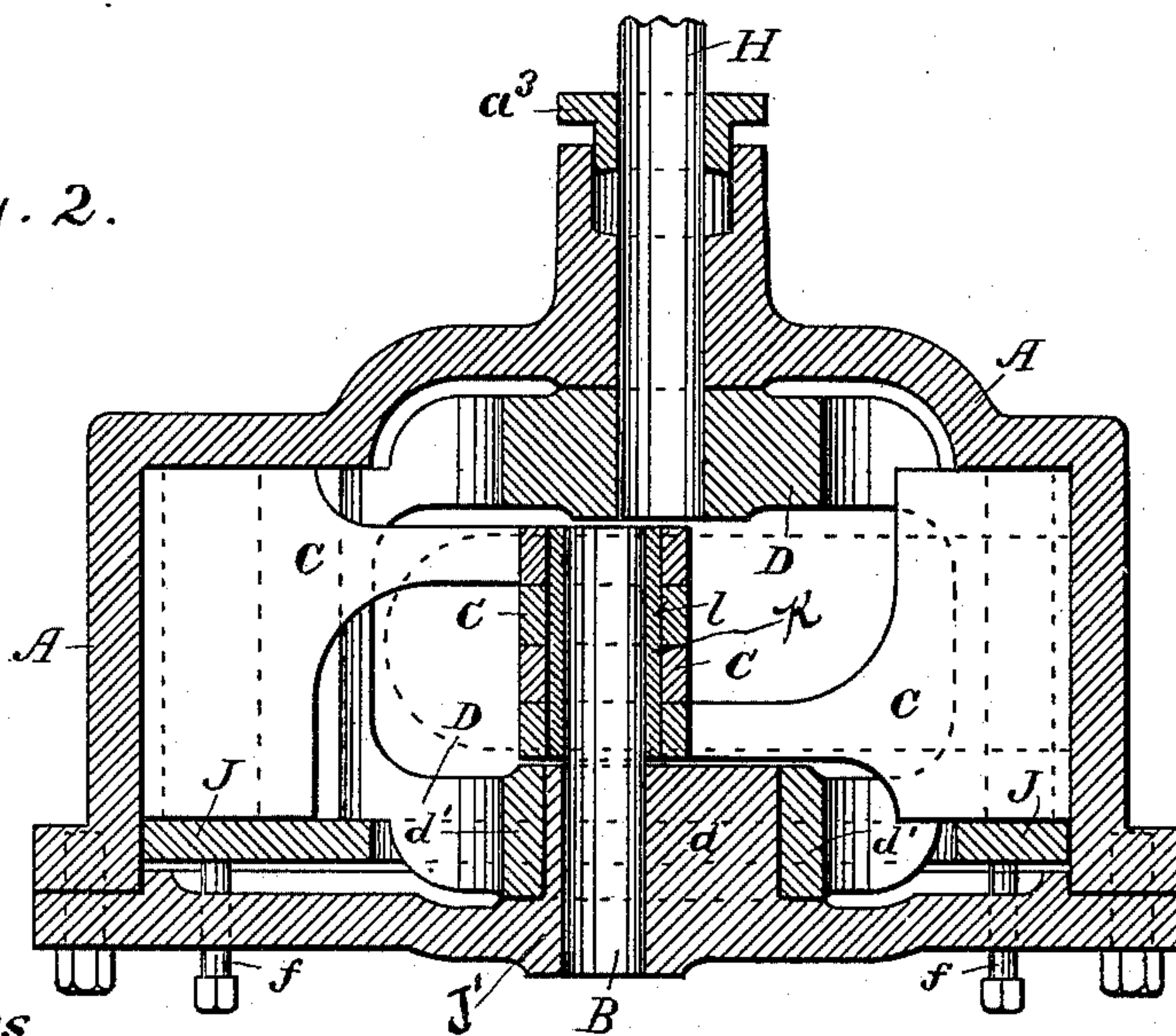


Fig. 1

Fig. 2.



Witnesses

F. B. Carpenter
J. B. Mahon

Inventor

Emory J. Nichols.

(No Model.)

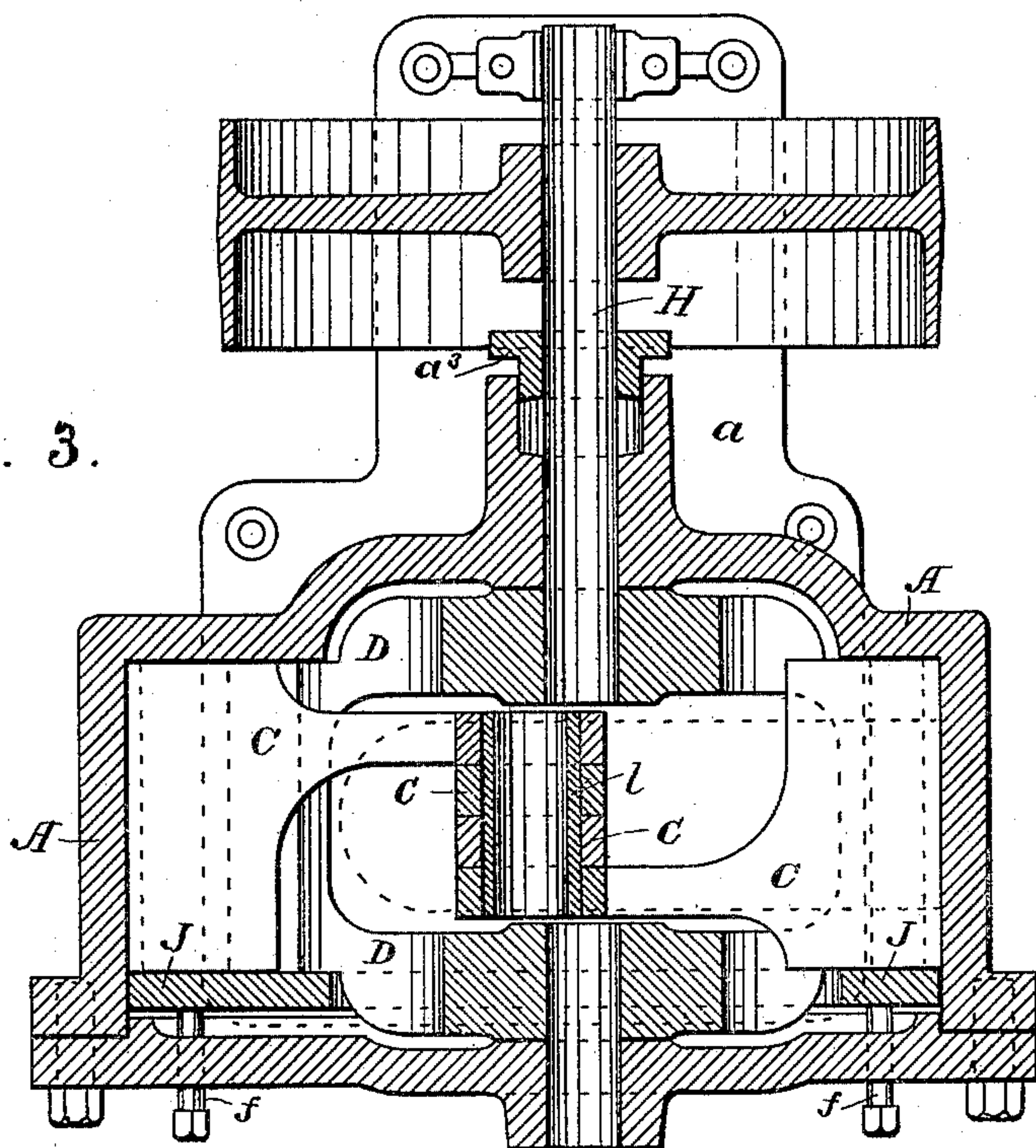
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Fig. 3.



Witnesses

F. B. Carpenter

J. B. Mahalan

Inventor

Emory I. Nichols.

UNITED STATES PATENT OFFICE.

EMORY I. NICHOLS, OF SAN FRANCISCO, CALIFORNIA.

HYDRAULIC MOTOR.

SPECIFICATION forming part of Letters Patent No. 467,612, dated January 26, 1892.

Application filed December 13, 1889. Serial No. 333,597. (No model.)

To all whom it may concern:

Be it known that I, EMORY I. NICHOLS, of the city and county of San Francisco, and State of California, have invented an Improvement in Hydraulic Motors; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to that class of hydraulic motors in which the pistons are hinged to a fixed center or shaft centrally located within the outer shell or casing.

My invention consists in a shell or casing having a water-inlet and a water-outlet, a rotary piston-carrier mounted within and having its periphery eccentric to the inner circumference of the shell, whereby on one side forms an abutment-contact and at the other side a water-space, with rotating pistons passing through the periphery of the piston-carrier and hinged to a fixed center, being centrally located in the outer shell, all of which I shall hereinafter fully describe, and point out in the claim.

The object of my invention is to overcome the centrifugal force of the pistons against the outer shell and provide a simple and effective hydraulic motor of this class.

Referring to the accompanying drawings for a more complete explanation of my invention, Figure 1 is a sectional side elevation of my hydraulic motor. Fig. 2 is a horizontal cross-section of the same, showing the piston-carrier with bearings at each end. Fig. 3 is a horizontal cross-section showing the same pistons and piston-carrier with the pistons hinged to a loose center or shaft.

A is the shell of the machine, having a base a , a water-inlet a' , a water-outlet a^2 , and the stuffing-gland a^3 . Within this shell is the fixed center B, the end of which is seated in the head J of the shell and is secured thereto suitably.

Around the fixed center and within the outer shell is the rotary piston-carrier D. In one end of the carrier is the shaft H, suitably secured, and at the other end, as shown in Fig. 2, it has a hollow bearing d' and rotates upon the projection d of the head J' and is eccentric to the fixed center B. The piston-carrier, as shown in Fig. 3, has only the bearing of the shaft H and is open at one end. The piston-carrier D is a hollow cylinder and is so mount-

ed that it forms an abutment-contact at one side, as shown at e , and a water-space at the other side, as shown at e' .

Mounted upon the fixed center B are the pistons C, which rotate thereon on the fixed center B, and in the hinged ends of the pistons C is the bushing or wearing-ring K. The pistons pass through the openings d^2 in the periphery of the piston-carrier D, suitable packing being provided, as at d^3 and at c' , or at any other points which may be found desirable.

Within the shell A is the ring J, which is held against the piston-carrier by the screws f and forms the packing for the side of the piston-carrier D.

The periphery of the piston-carrier could be made in the form of a true circle; but I prefer it with a smaller diameter between the pistons, as shown at d^4 , so as to admit the passage of any hard substance by the abutment e that might pass through the machine and fail to be discharged through the water-outlet a^2 on the first revolution of same.

The operation of the machine is as follows: Water entering the inlet a' directly into the water-space between the piston-carrier and the outer shell is confined between the contact-abutment on one side and pistons which pass through the carrier on the other side, so that, acting against the pistons, it rotates the pistons and carrier and discharges when the pistons have passed the outlet a^2 below. The pistons are withdrawn from and projected into the water-space by their rotating on the fixed center B, which is eccentric to the center of the piston-carrier D. It will thus be seen that the inward and outward movement of the pistons is caused by the fixed center and the piston-carrier being eccentric to each other.

Although I have shown in Fig. 4 of drawings the way the same pistons can be used in the same shell and with the same piston-carrier without using a fixed center, I prefer and claim the fixed center, as shown in Figs. 2 and 3 of drawings, whereby the pistons counter-balance each other and rotate on the fixed center, which takes the friction from the outer shell.

I am aware that rotary engines, blowers, and pumps have been used, in which sliding

pistons have been mounted in a rotary carrier within and eccentric to the outer shell, thus forming an abutment by contact with one side and a space at the other side, and I
5 do not, therefore, claim such, broadly.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

10 In a hydraulic motor and in combination, a case or shell having a removable head provided with a cylindrical projection *d*, a driving-shaft entering the opposite end of the

shell, a hollow eccentric piston-carrier secured at one end upon said shaft and having at the other end a loose bearing upon the projection 15 *d*, a center pin, and pistons pivoted upon said pin and projecting through slots in the piston-carrier, substantially as set forth.

In witness whereof I have hereunto set my hand.

EMORY I. NICHOLS.

Witnesses:

F. B. CARPENTER,
J. B. MAHOLM.