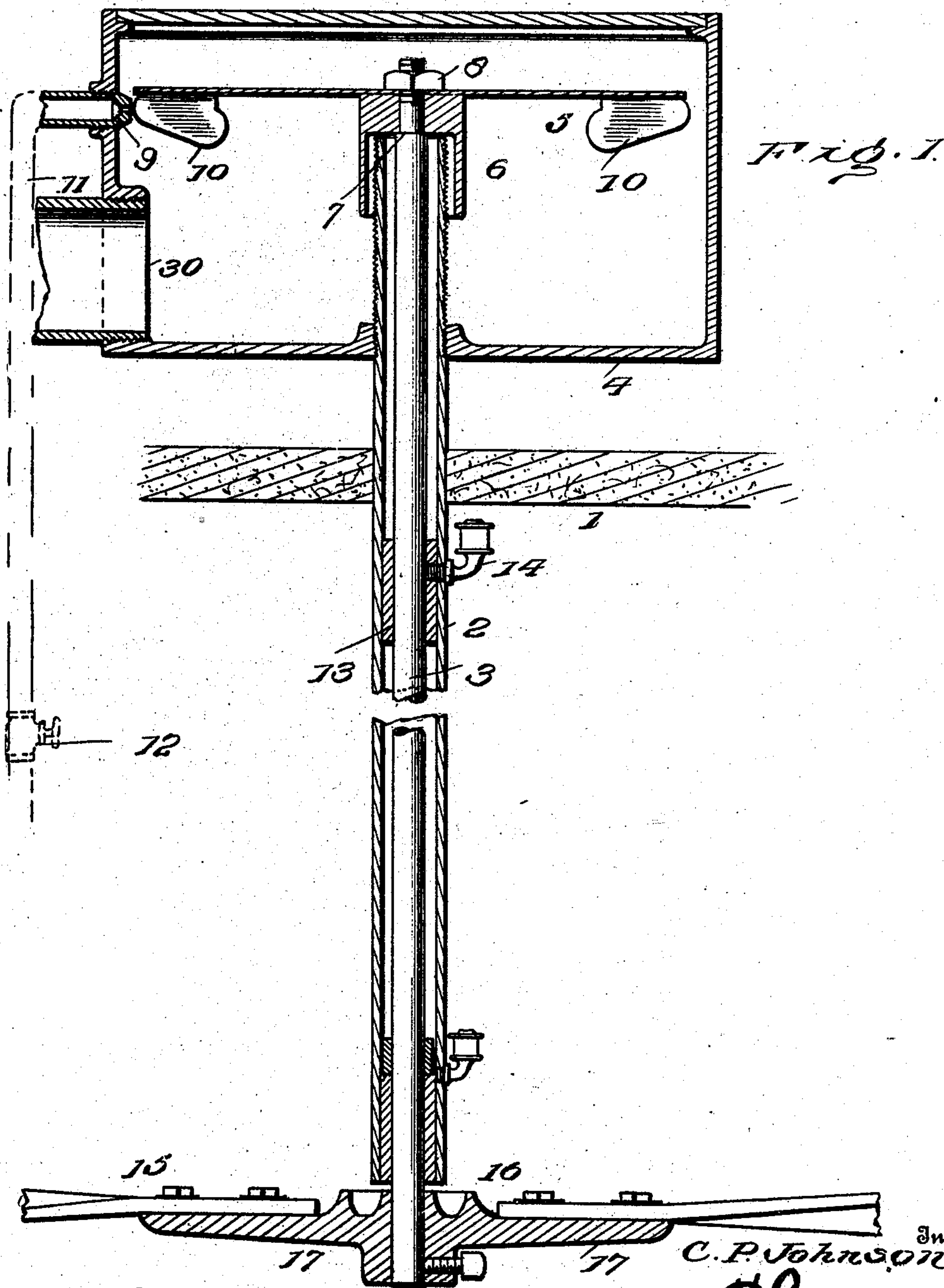


No. 894,795.

PATENTED JULY 28, 1908.

C. P. JOHNSON.  
HYDRAULIC MOTOR.  
APPLICATION FILED MAR. 1, 1907.

2 SHEETS—SHEET 1.



Witnesses  
*Johnnie*  
*H. W. Woodson*

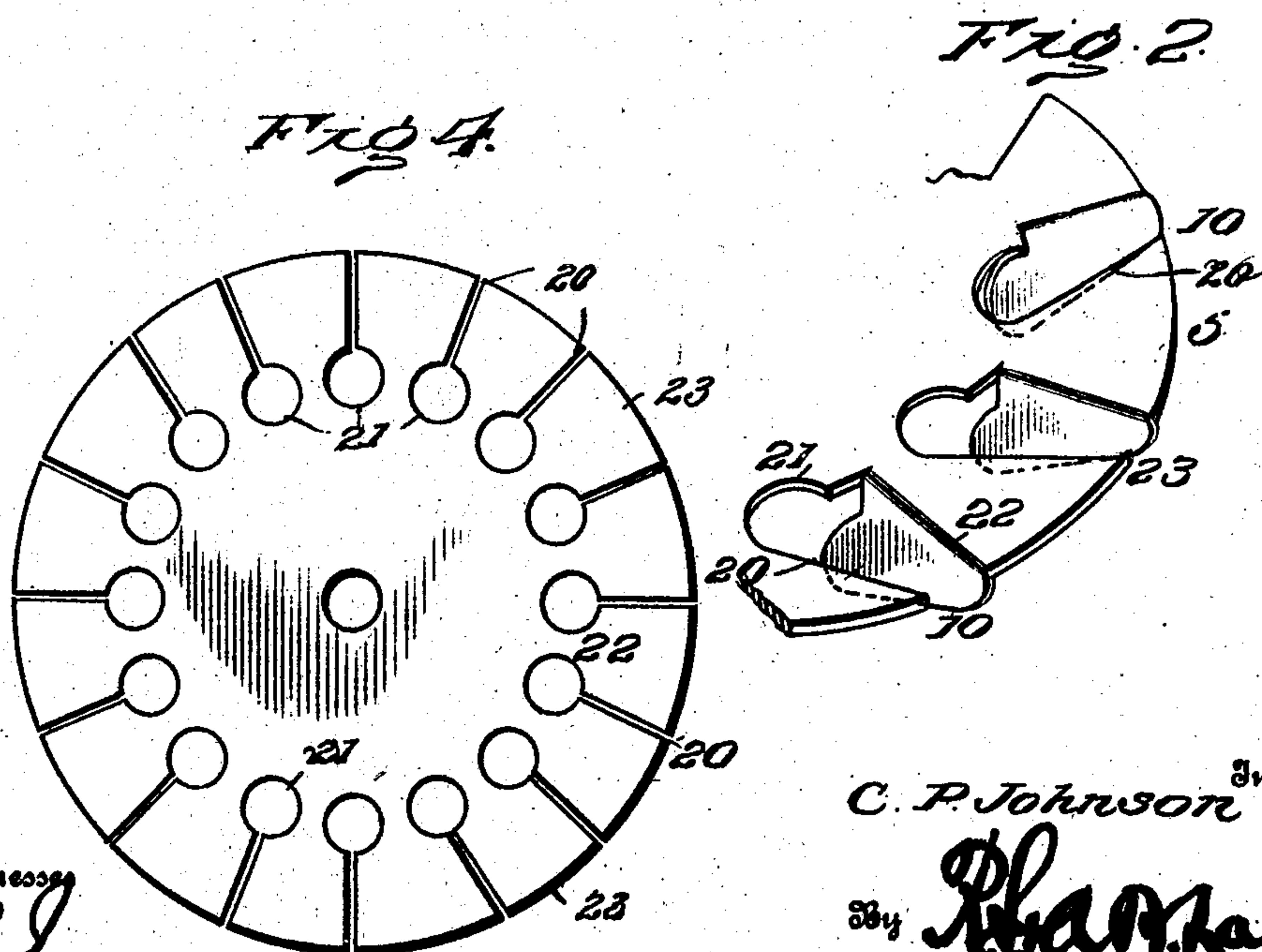
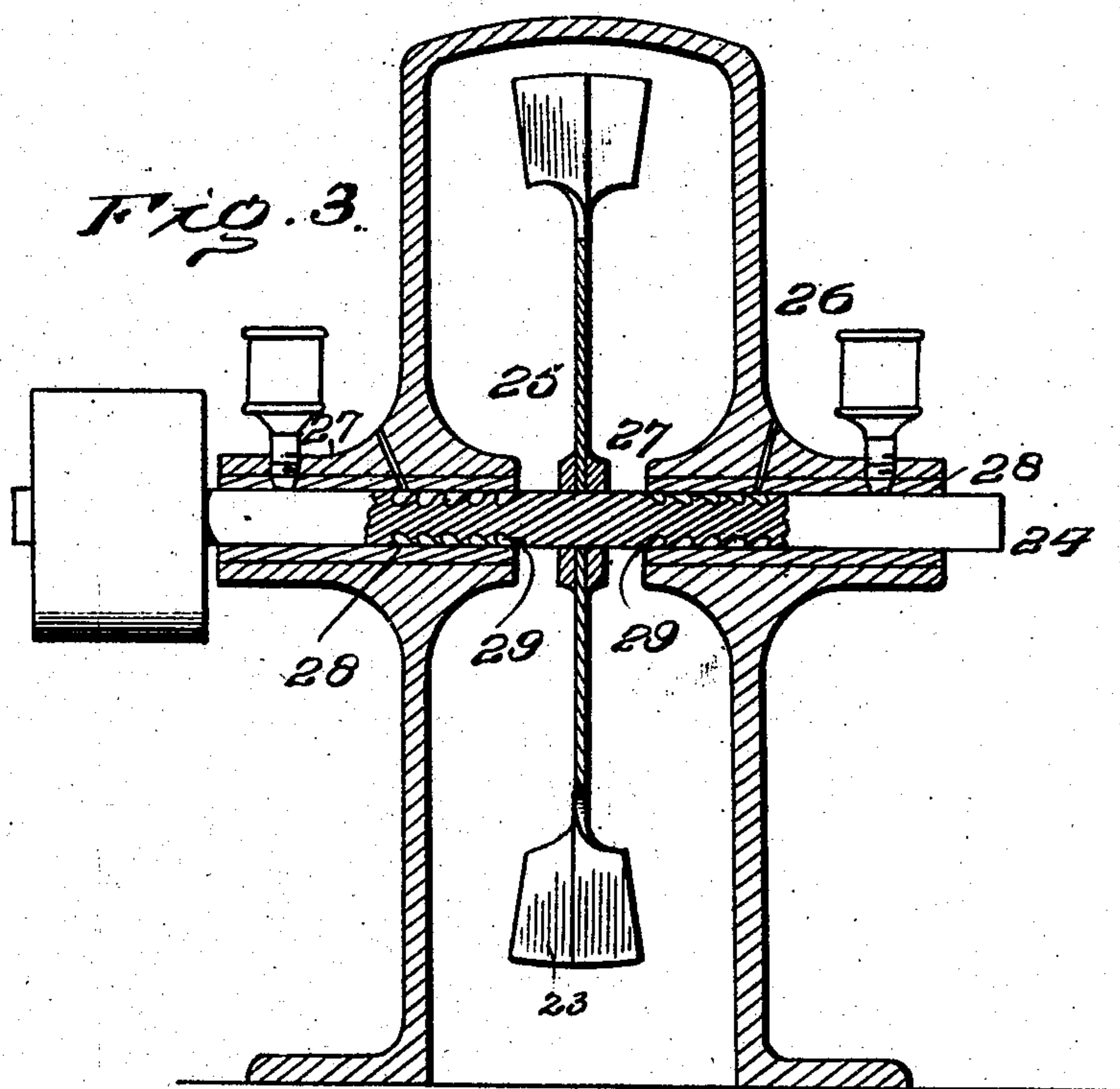
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2 SHEETS—SHEET 2.



Witness  
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# UNITED STATES PATENT OFFICE.

CHRIS P. JOHNSON, OF SACRAMENTO, CALIFORNIA.

## HYDRAULIC MOTOR.

No. 894,795.

Specification of Letters Patent.

Patented July 28, 1908.

Application filed March 1, 1907. Serial No. 359,997.

*To all whom it may concern:*

Be it known that I, CHRIS P. JOHNSON, citizen of the United States, residing at Sacramento, in the county of Sacramento and State of California, have invented certain new and useful Improvements in Hydraulic Motors, of which the following is a specification.

The present invention relates to certain new and useful improvements in hydraulic motors and more particularly to that type of water wheels which are commonly designated impact wheels and which are provided with blades against which a jet of water is thrown.

The object of the invention is to design a wheel of this character which is of simple and durable construction and is efficient in its operation.

For a full description of the invention and the merits thereof and also to acquire a knowledge of the details of construction and the means for effecting the result, reference is to be had to the following description and accompanying drawings, in which:

Figure 1 is a vertical sectional view showing the motor utilized for driving a fan. Fig. 2 is a detail view of a portion of the wheel. Fig. 3 is a vertical sectional view showing a slight modification. Fig. 4 is a plan view of the blank from which the wheel in the modified construction is formed.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

The invention is illustrated in Fig. 1 as being utilized for operating a fan, the motor being located above the ceiling so as to be concealed from view.

The ceiling or like overhead support or covering is indicated at 1 and a tubing 2 passes therethrough and provides a support for the shaft 3 which receives the motor wheel and the fan wheel. The tubing 2 may be of any make such as commonly used for conveying water or gas and supports the casing 4 of the motor and in which is arranged the motor wheel 5 attached to the upper end of the shaft 3 in such a manner as to rotate therewith. A guard 6 of cup form is secured to the upper end of the shaft 3 and encircles the upper portion of the tube 2 so as to prevent any of the motive medium entering the upper end of the tube 2 and passing there-through into the room or apartment in which

the fan is located. The upper end of the shaft 3 is reduced, the reduced end portion projecting above the upper extremity of the tube 2 and the shoulder 7 formed at the base of said reduced end supporting the cup shaped guard 6 and the motor wheel 5, the projecting portion of the reduced end being threaded to receive a nut 8 by means of which the guard and motor wheel are clamped and securely held in place. The casing 4 may be secured to the tube 2 in any manner and is preferably threaded thereon to admit of ready adjustment and convenient removal. The nozzle 9 enters a side of the casing 4 and is arranged to deliver a jet against the buckets 10 of the motor wheel so as to impart rotation thereto. The nozzle is coupled to the delivery end of a pipe 11 which is connected with the water main or other convenient source of supply for the motive medium, the latter being controlled by a suitable valve 12 conveniently located in the length of the pipe 11.

The shaft 3 is of less diameter than the bore or opening of the tube 2 and rotates in bearings 13 of brass or like material arranged within the tube 2. A suitable lubricant is supplied to the bearings 13 by means of oil cups 14 which have connection with openings provided in a side of the tube and bearings. The motor wheel, as stated, is secured to the upper end of the shaft, whereas the fan is attached to the lower end of said shaft below the tube 2. The fan may be of any approved type and in the present instance comprises a hub 16 formed with arms 17 to which the blades 15 are secured. If found desirable the hub 16 may be provided in its upper face with an annular groove 18 for catching the waste oil from the bearings 13.

The motor wheel is preferably constructed of sheet material such as steel, the blank being of circular formation and having slits extended inward from its edge and terminating in openings 21 between which narrow portions 22 are formed and which enable the setting of the parts 23 between the slits 20 at an angle to the plane of motion of the fan by having said parts 22 twisted to a greater or less extent according to the pitch of the blades 10 or 23. By having the openings 21 formed wholly to one side of the slits 20, the blades come upon one side of the plane of the body of the wheel, whereas by having the openings 21 project upon opposite sides of the slits 20, portions of the blades extend



upon opposite sides of the plane of the body of the wheel. The blades 10 of the motor wheel are arranged wholly to one side of the plane of the body of the wheel and project  
5 downward therefrom, thereby preventing any of the water or fluid motive medium passing above the motor wheel.

In the form of motor wheel shown in Figs. 3 and 4, the openings 21 extend equidistant  
10 of the opposite sides of the slits 20, hence the blades 23 have portions projecting a like distance from opposite sides of the body of the motor wheel. The openings 21 enable sufficient metal to be removed to reduce the parts  
15 22, whereby said parts may be readily twisted to cause the blades to set at an angle to the plane of motion of the wheel.

As indicated in Fig. 3, the shaft 24 to which the motor wheel 25 is attached is  
20 mounted in the sides of a casing 26 having a suitable inlet and a corresponding discharge. The sides of the casing are thickened at a central point, as indicated at 27, to provide extended bearings for the shaft 24 and the  
25 brasses 28 lining the said bearings. Portions of the shaft 24 upon the opposite sides of the motor wheel 25 are provided with a spiral groove 29, said groove forming in effect a thread, the one upon one side being right  
30 handed, whereas the other upon the opposite side of the motor wheel is left handed. The spiral grooves or threads 29 serve in the rotation of the shaft 24 to hold the fluid within the casing and to force any fluid back into  
35 the casing that may tend to escape outward through the bearing 27. The spiral grooves 29 terminate, preferably, just inside of the bearings 27. The inner walls of the spiral grooves are under cut, or made concave,  
40 whereas the outer walls are convex. This construction insures confining liquid and fluid and forcing the same into the casing. An opening 30 is formed in the outer portion of each bearing 27 and extends through the  
45 brass or lining 28 and communicates with the outer portion of the spiral groove 29 and is intended to admit air into the casing which is of advantage in the operation of the motor

wheel. The air is drawn into the opening 30 and forced into the casing by the walls or  
50 thread formed by the spiral groove. An oil cup 31 is also fitted to the outer portion of each bearing and supplies the latter with lubricant. The brass 28 may be of any construction such as commonly provided for  
55 lining bearings and may consist of a single tube and comprise two or more sections and is adapted to be secured within the bearing 27 by any suitable means, it being understood that each bearing 27 is provided with a  
60 brass or lining 28 and that both bearings are similarly constructed and equipped.

The motor wheel 25 is preferably constructed of a single plate or disk of steel,  
65 although any metal or material may be utilized, it being observed that by pressing the buckets therefrom in the manner stated, joints are obviated and the necessity for independent fastening means is wholly overcome, besides enabling the wheel to be of  
70 light construction, durable and capable of occupying a minimum amount of space, with the result that a comparatively small casing is required.

The discharge opening of the motor casing  
75 is considerably larger than the inlet opening to provide a ready and unobstructed discharge of the spent water. This is indicated at 30 in Fig. 1.

Having thus described the invention, what  
80 is claimed as new is:

In combination, a vertically arranged tube, a shaft mounted in said tube and having its upper end reduced and threaded, a casing supported by the tube, and a motor wheel  
85 and cup shaped guard secured to the reduced end of the shaft, said guard encircling the upper end of the tube to prevent entrance of the motive fluid therein.

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

CHRIS P. JOHNSON. [L. S.]

Witnesses:

N. CLAUDE GREGORY,  
H. L. CULVER.