

(No Model.)

2 Sheets—Sheet 1.

F. B. COLE.
HYDRAULIC MOTOR.

No. 504,331.

Patented Sept. 5, 1893.

FIG. 1.

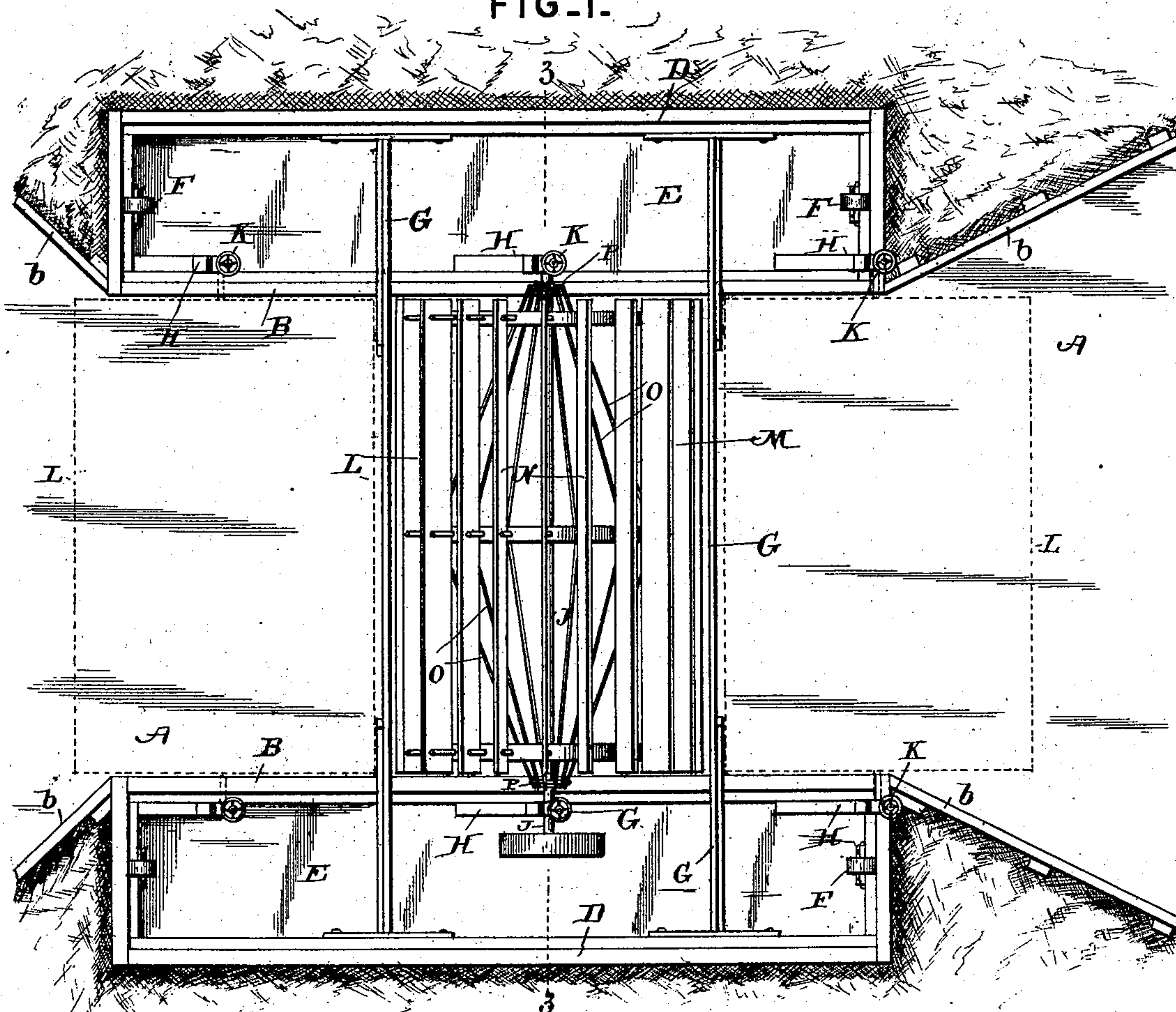
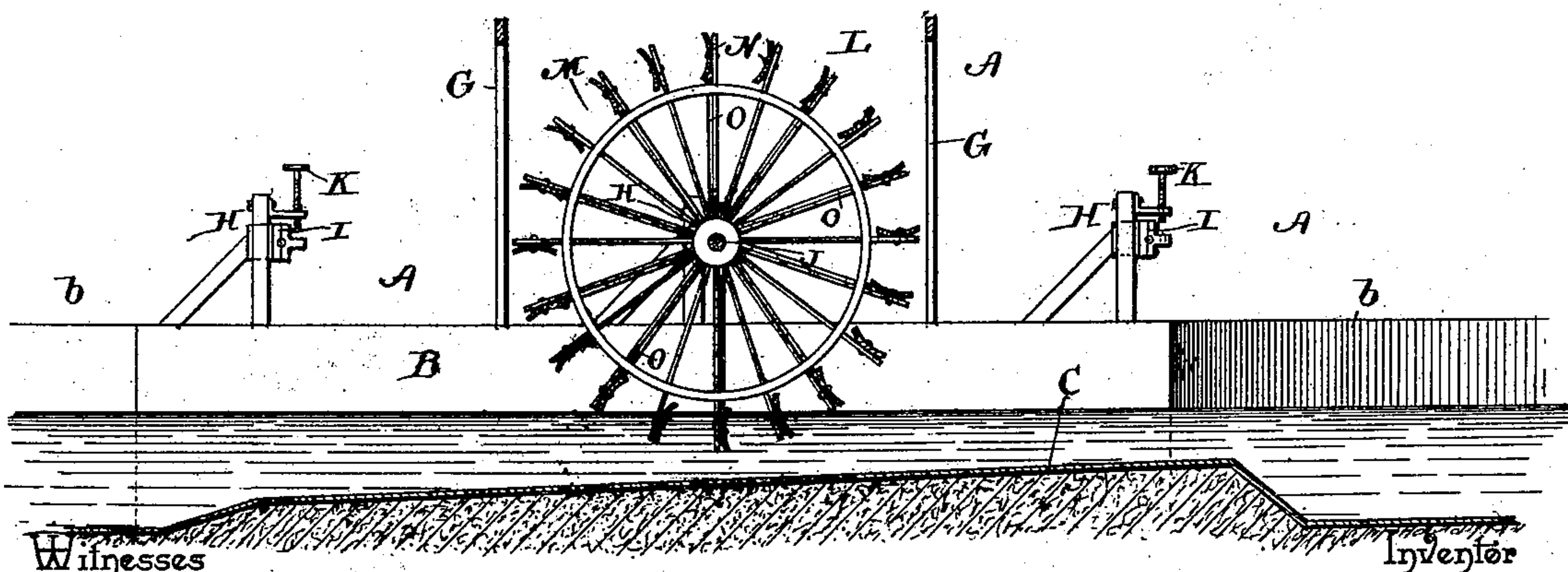


FIG. 2.



Witnesses

Inventor

Jas. H. McLathran
S. P. Kolhaupfer.

By His Attorneys,

Francis B. Cole

C. A. Snow & Co.

(No Model.)

2 Sheets—Sheet 2.

F. B. COLE.
HYDRAULIC MOTOR.

No. 504,331.

Patented Sept. 5, 1893.

FIG. 3.

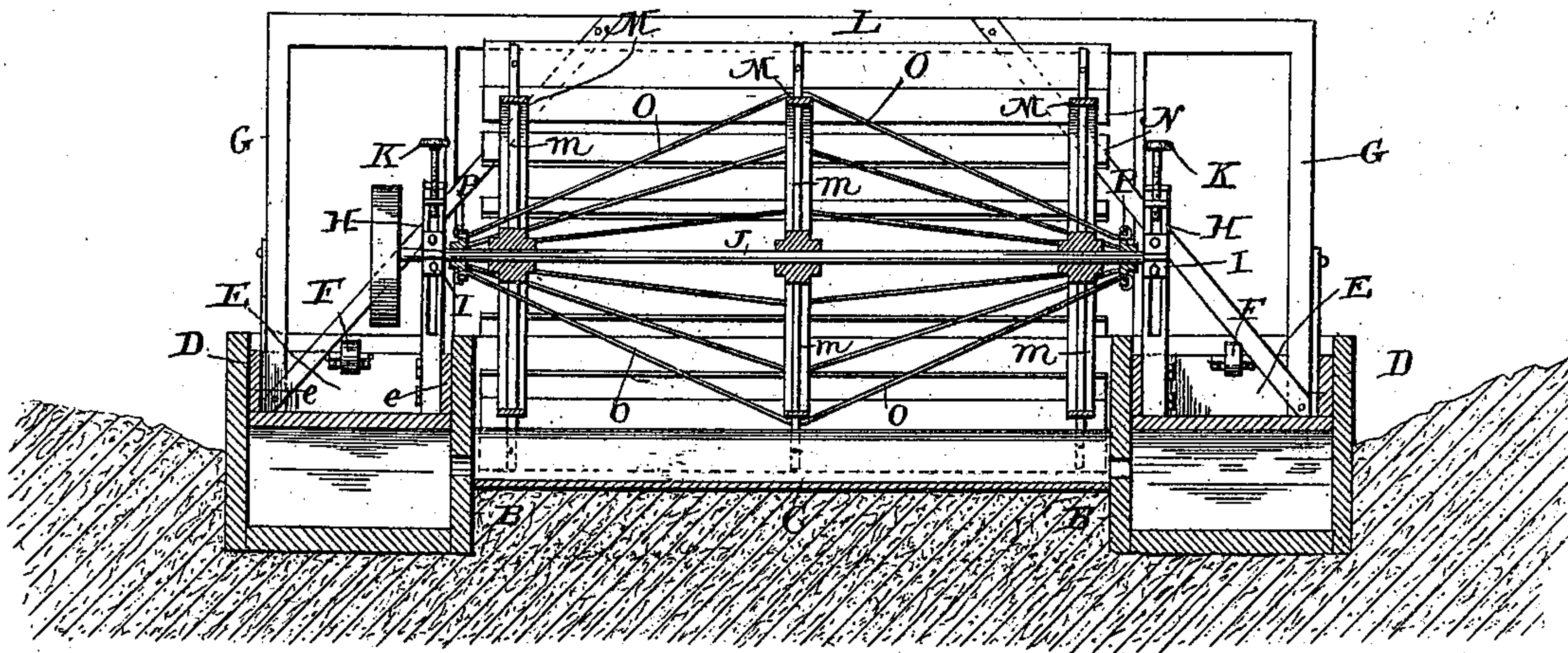


FIG. 4.

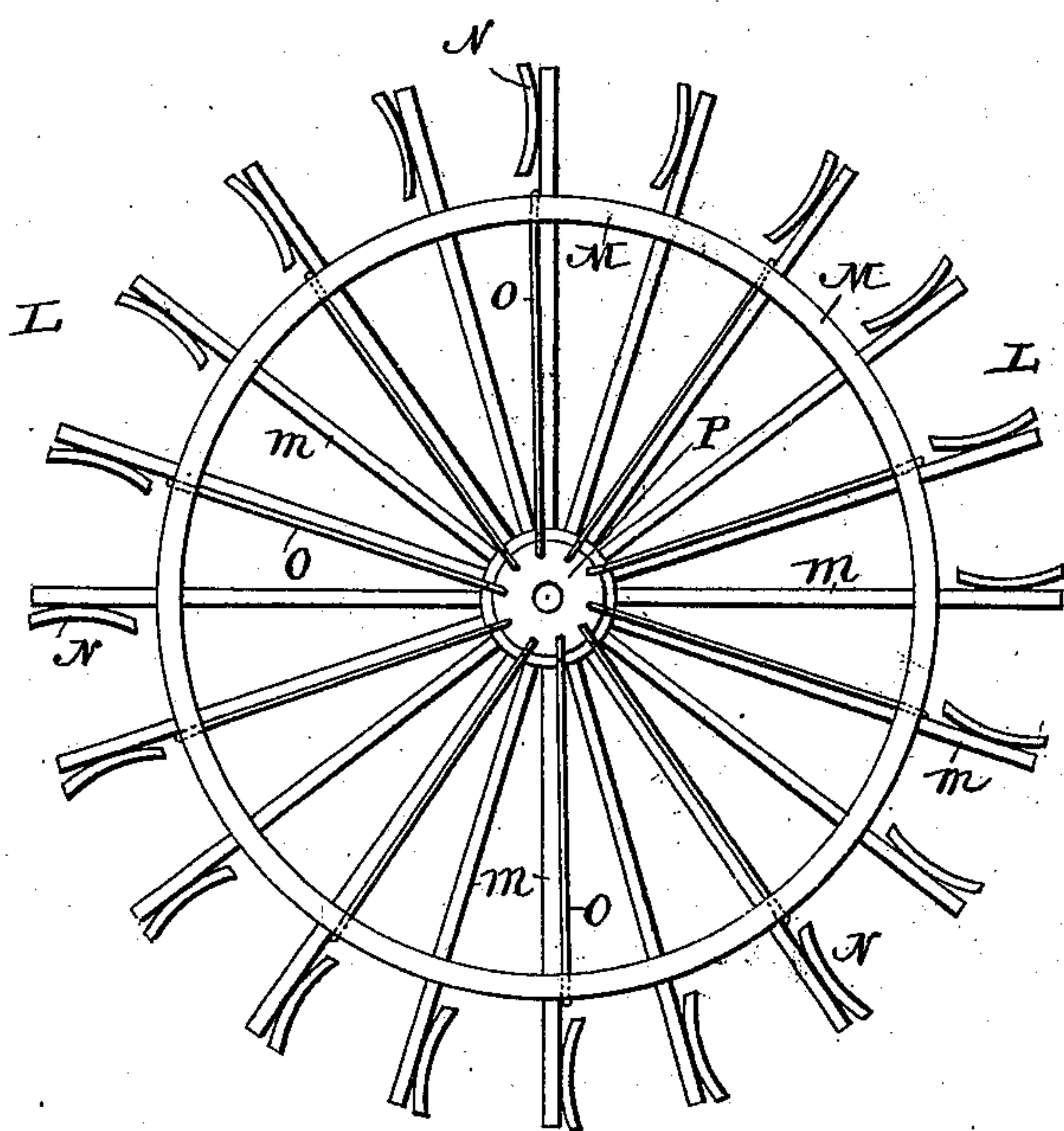
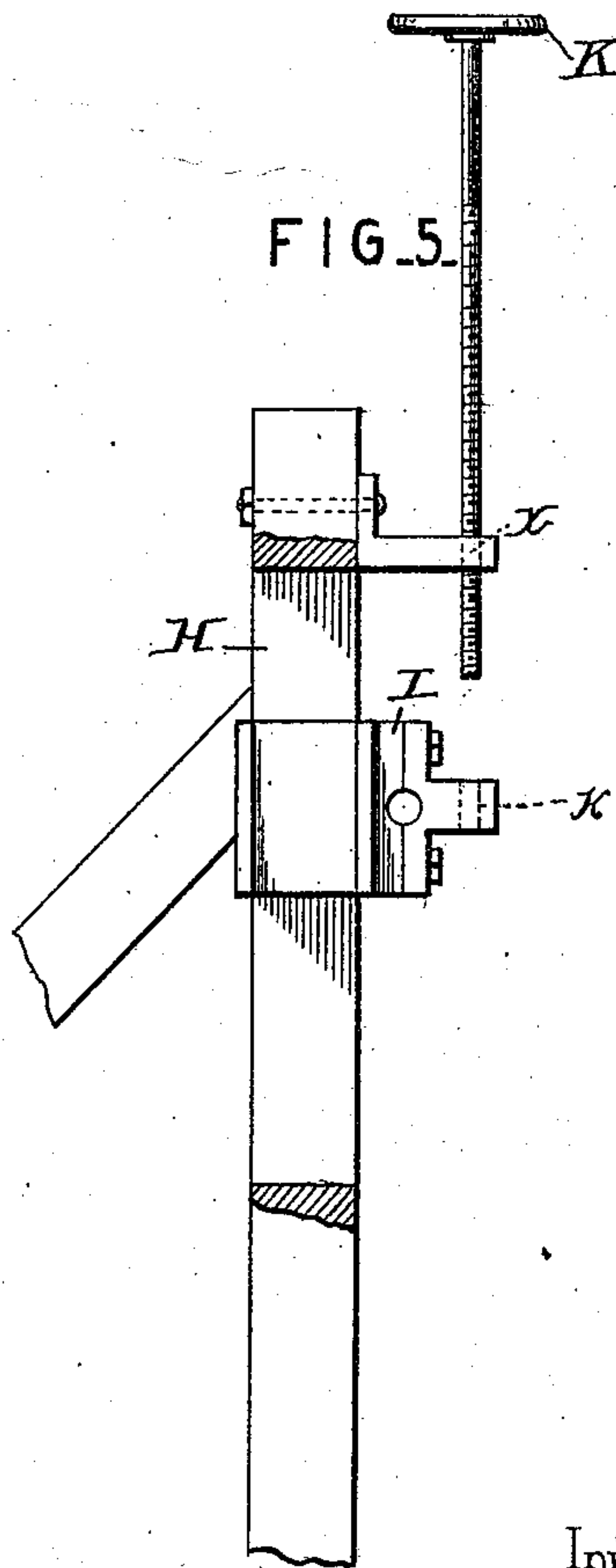


FIG. 5.



Witnesses

Jas. H. McKittrick
D. P. Volhaupt

By his Attorneys,

CA Snow & Co.

Inventor
Francis B. Cole

UNITED STATES PATENT OFFICE.

FRANCIS B. COLE, OF O'NEILL, NEBRASKA.

HYDRAULIC MOTOR.

SPECIFICATION forming part of Letters Patent No. 504,331, dated September 5, 1893.

Application filed September 6, 1892. Serial No. 445,168. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS B. COLE, a citizen of the United States, residing at O'Neill, in the county of Holt and State of Nebraska, have invented a new and useful Hydraulic Motor, of which the following is a specification.

This invention relates to hydraulic motors; and it has for its object to provide an improved motor, commonly termed current motor, adapted to utilize the power of running streams of water.

To this end the main and primary object of the present invention is to provide such a construction of motor whereby the power is utilized to its fullest extent, and in which the various parts comprising the motor accommodate themselves to the rise and fall of water, and which can be also adjusted at will.

With these and many other objects in view which will readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination and arrangement of parts hereinafter more fully described, illustrated and claimed.

In the accompanying drawings:—Figure 1 is a top plan view of a hydraulic motor constructed in accordance with the present invention. Fig. 2 is a vertical longitudinal sectional view of the same. Fig. 3 is a vertical transverse sectional view on the line 3—3 of Fig. 1. Fig. 4 is a detail elevation of one of the water wheels. Fig. 5 is a similar view of one of the bearings.

Referring to the accompanying drawings, A represents a water way or flume inclosed between the opposite dock-walls B. The said dock-walls B are set up in the bed of the stream in which the motor is used, and are provided with flared or outturned ends b leading to the banks of the stream and forming a flared mouth which contracts the water to the width of the flume or water way and thus utilizes the stream to its fullest capacity. The bottom of the flume or water way thus formed is provided with suitable flooring C slightly raised above the bed of the stream so that the depth of the flume will always be uniform and not varied by washing out of the bottom. The floor C is gradually sloped from the front to the rear end of the flume A, so

that the velocity of the water is slightly increased.

Arranged on opposite sides of the flume A and upon the outside of the dock-walls B are the opposite rectangular still or dead water boxes D, which are of course always filled with water from the stream, and therefore have the water therein at a depth corresponding to the depth of the stream. The said opposite dead water boxes D accommodate the elongated rectangular floats E, snugly registering with said boxes and having short upwardly extending walls e, so that the same can hold ballast, and also the end fender rollers or casters F which while allowing the floats to rise and fall with the rise and fall of the water in the stream and said boxes, at the same time always hold said floats in a horizontal position and prevent one end from tipping more than another. Suitable ballast may be employed to sink the floats any depth in which it is desired to have the water wheels work. The said opposite floats E are connected by the arch braces G spanning the water way or flume and rigidly connected at their ends to the floats so that the movement of the same will be uniform and simultaneous.

Secured at regular intervals to the inner walls of the floats E and rising above the dock-walls of the flume or water way, are the slotted bearing guides H. The said bearing guides H, accommodate the flanged bearing boxes I in which are journaled the ends of the water wheel shafts J. The said boxes I are free to move vertically in said slotted bearing guides, so that the water wheels will yield to any obstruction in the stream and rise up and allow such obstruction to pass. When any one of the wheels becomes impaired or broken, the same can be raised above the water in the water way or flume by means of the movable lifting screws K, adapted to be mounted at the upper ends of said bearing guides in the unthreaded perforated supports x and to engage said bearing boxes which are threaded as at k to receive such screws. It will of course be understood that the screws are only connected with the bearing boxes when it is desired to lift the same for the purposes desired.

As illustrated, the screws K when brought into use are first slipped through perforations or openings in the upper ends of the bearing guides and thus let down onto the boxes I, so
5 that the same can be rotated through the threaded perforations K in said bearing boxes. It will of course be apparent that after the screws have been screwed through the bearing boxes up to a point which allows the col-
10 lars at the upper ends of the screws to rest on the upper ends of the bearing guide, a continued rotation of the screws will elevate the bearing boxes and the wheels therewith. After the wheels are lowered into the water,
15 the screws are entirely removed from both the boxes and the bearing guides, the figures of the drawings illustrating the screws either about to be slipped out of the bearing guides or therein as will be apparent.

20 The waterwheels L mounted upon the shafts J may be arranged in any number desired within said flume or water way as will be at once apparent, and therefore the power multiplied, or when any one of the wheels is not
25 working, the power still kept up. Said wheels are supported in the same horizontal plane in the flume or water way, so that the declining floor is of special importance in carrying the water at an increased velocity to the farthest
30 wheel, thus avoiding the necessity of setting the wheels in different horizontal planes.

Suitable gearing connects the shafts with the machinery to be operated.

35 The wheels L comprise a series of spoked wheels M, fixedly secured to the shaft J, and having the spokes *m* thereof, extended beyond their peripheries to receive the multiplicity of horizontal concaved paddles or

blades N, which are designed to travel in close proximity to the floor of the flume or
40 water way, or as close thereto as the depth of the stream and the position of the floats allow. Diagonal truss rods O are connected to the rim of the central blade supporting
45 and bracing wheel M, and are connected at their outer ends to the bracing collars P secured to the shaft outside of the outer wheels M, thus providing a secure bracing of the entire water wheel. It will be readily seen that
50 the concaved blades present much more surface to the water and therefore secure much more power from shallow depth.

From the foregoing it is thought that the construction, operation and many advantages of the herein described wheel will be apparent
55 without further description.

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

A water wheel comprising the shaft, a series of regularly spaced spoked wheels hav-
60 ing the spokes thereof extending beyond their peripheries, horizontal concaved paddles or blades secured to the extended ends of the spokes, bracing collars secured to the shaft
65 near its ends, and diagonal truss rods connected to the rim of the central spoked wheel and the end bracing collars, substantially as set forth.

In testimony that I claim the foregoing as
70 my own I have hereto affixed my signature in the presence of two witnesses.

FRANCIS B. COLE.

Witnesses:

E. W. ADAMS,

S. MADDEN.