

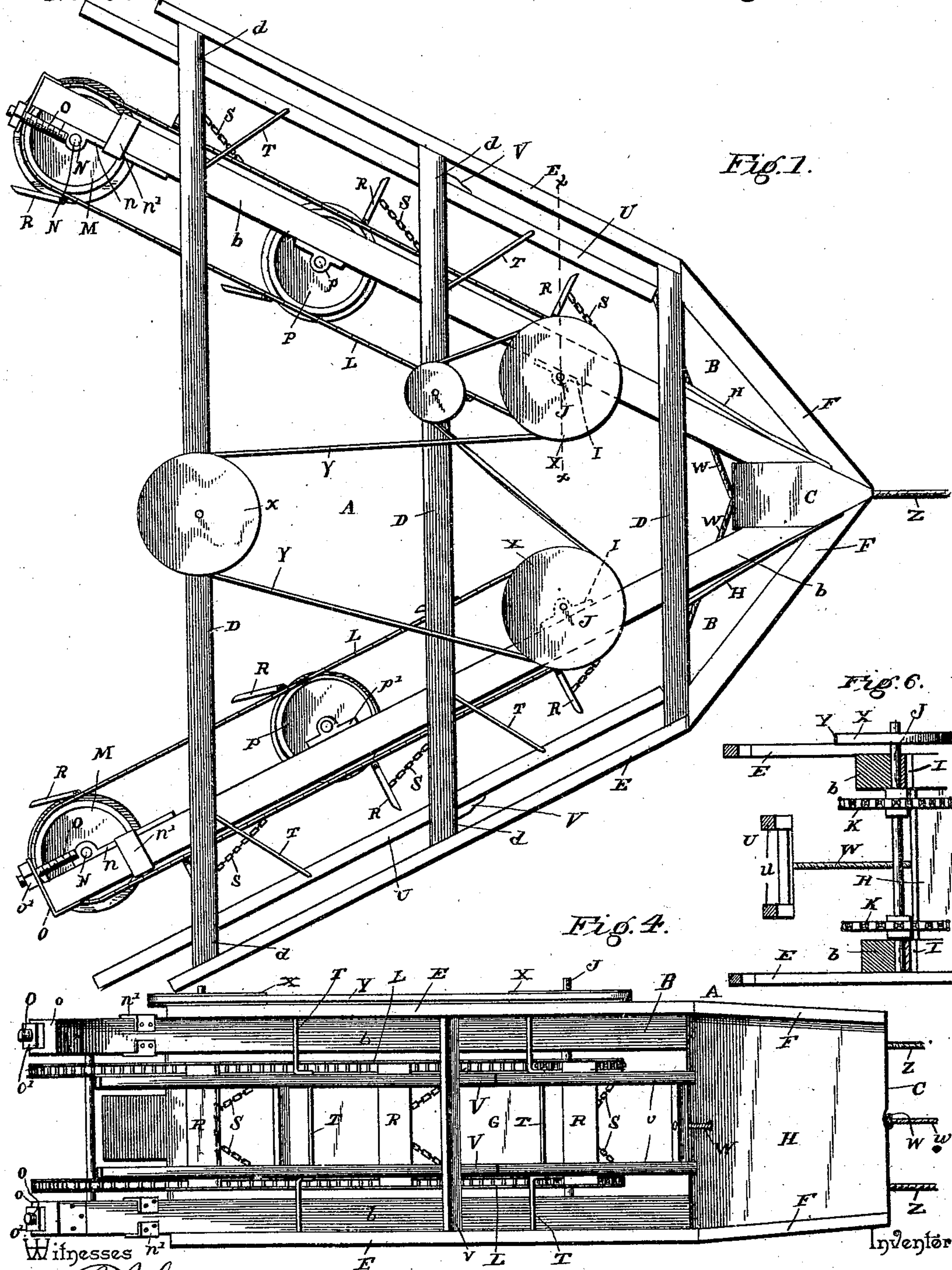
(No Model.)

2 Sheets—Sheet 1.

L. C. NEAL.
CURRENT MOTOR.

No. 502,931.

Patented Aug. 8, 1893.



Witnesses
M. Johnson
D. P. Wolhaupter

By his Attorneys,

C. Snow & Co.

(No Model.)

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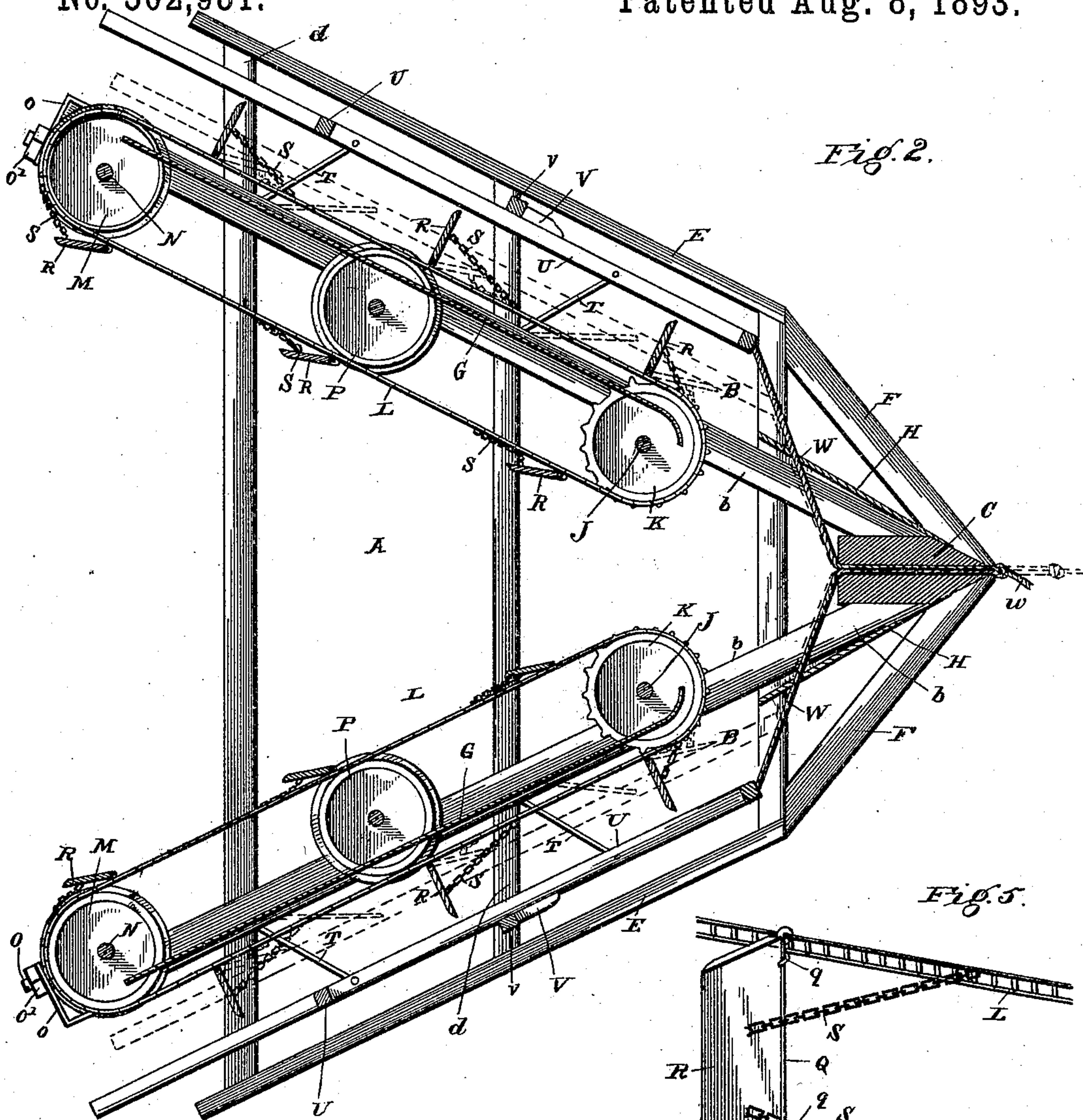


Fig. 2.

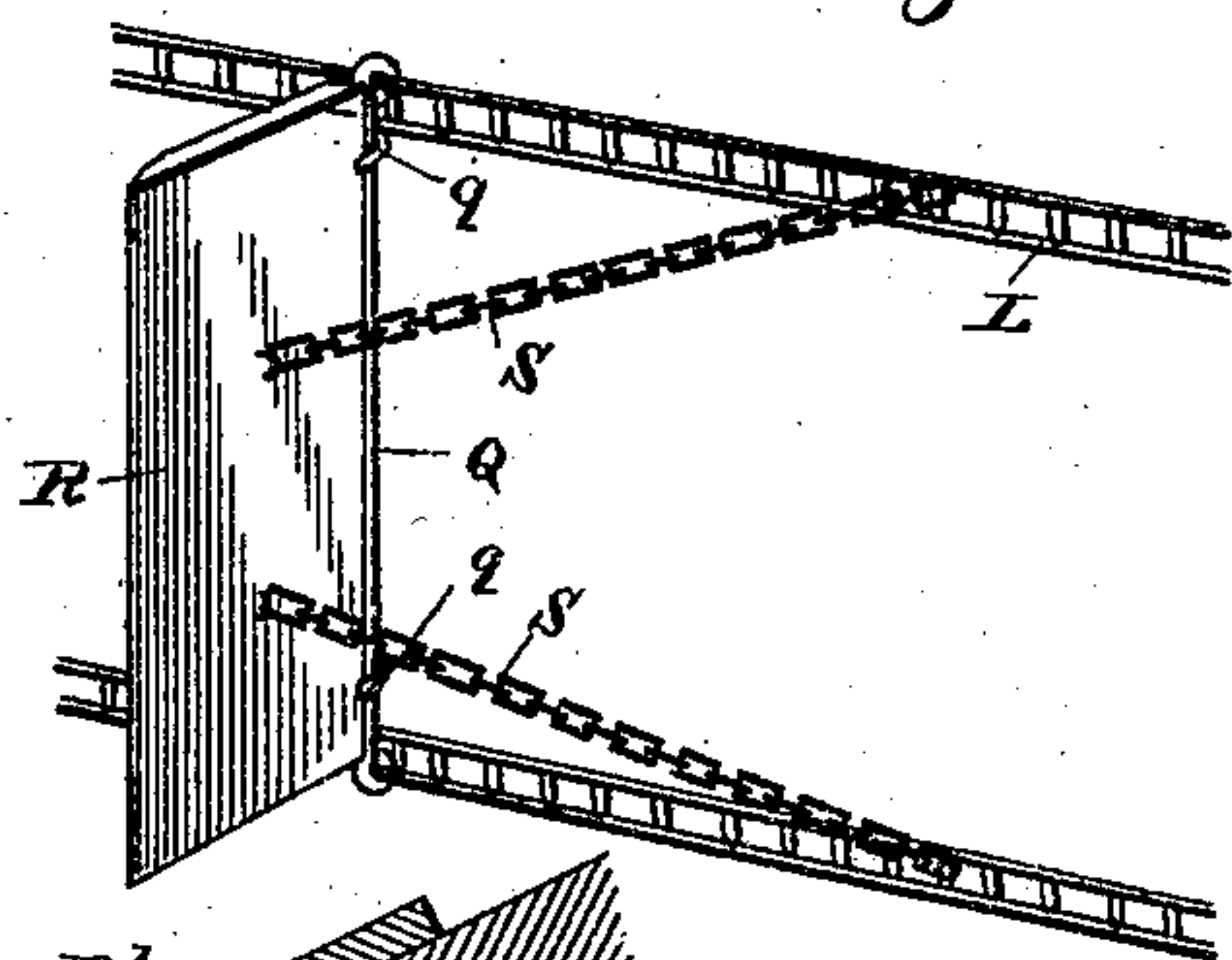


Fig. 5.

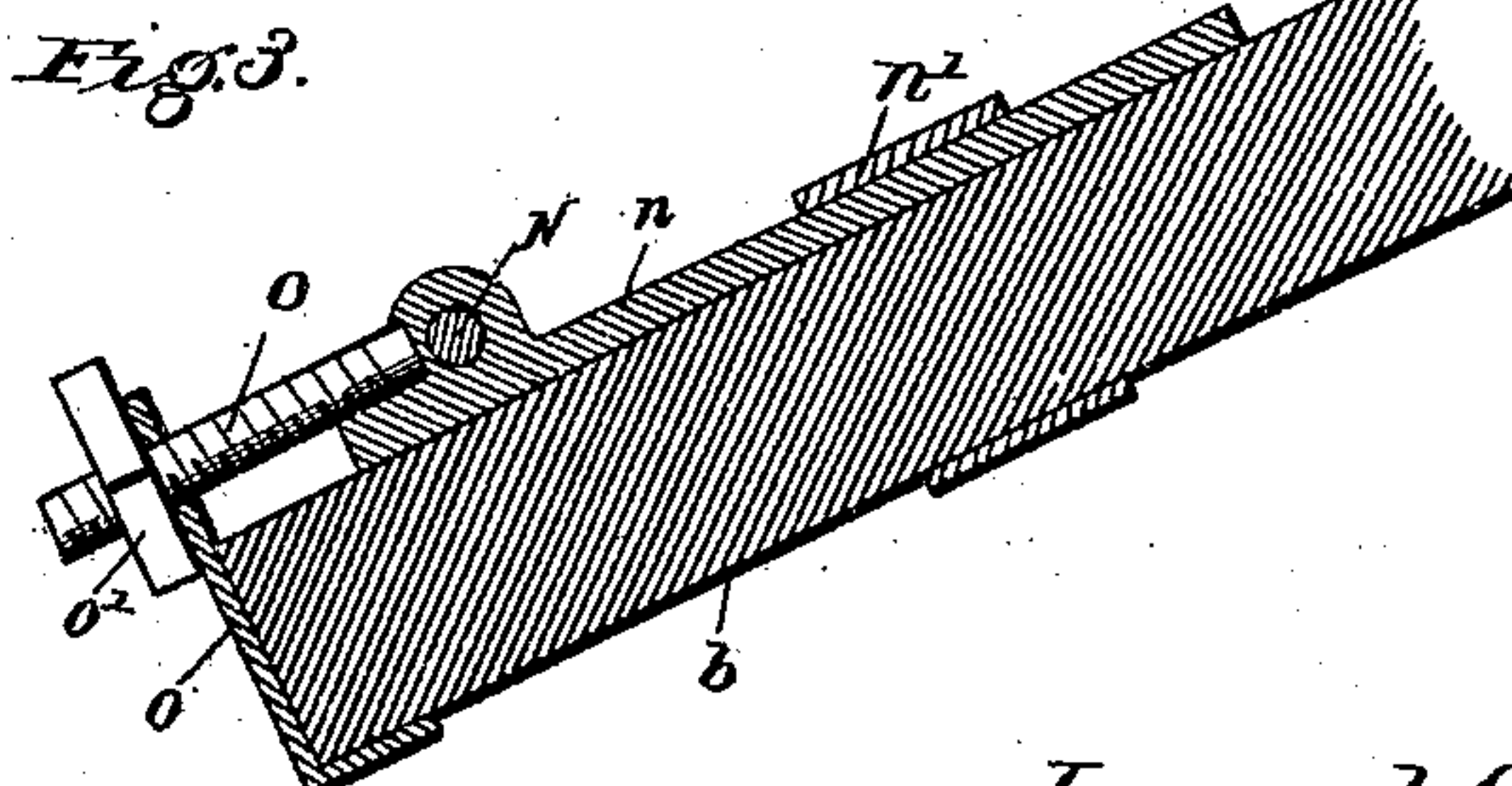


Fig. 3.

Witnesses

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UNITED STATES PATENT OFFICE.

LEMUEL C. NEAL, OF LEWISTON, IDAHO.

CURRENT-MOTOR.

SPECIFICATION forming part of Letters Patent No. 502,931, dated August 8, 1893.

Application filed January 21, 1893. Serial No. 459,213. (No model.)

To all whom it may concern:

Be it known that I, LEMUEL C. NEAL, a citizen of the United States, residing at Lewiston, in the county of Nez Perces and State of Idaho, have invented a new and useful Current-Motor, of which the following is a specification.

This invention relates to current motors; and it has for its object to provide certain improvements in that class of current motors such as set forth in my former Patent No. 471,564.

To this end the main and primary object of the invention is to provide an improved construction of motor frame, and the necessary appurtenances therefor, which shall secure efficient means for fully utilizing the running current of a stream, and thereby obtain the greatest amount of power therefrom.

With these and 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 current motor constructed in accordance with this invention. Fig. 2 is a horizontal central longitudinal sectional view thereof. Fig. 3 is a detail sectional view of one of the movable end journals. Fig. 4 is a view of one side of the motor. Fig. 5 is a detail in perspective of the attachment of one of the paddles to the endless chains. Fig. 6 is a detail sectional view on the line $x-x$ of Fig. 1.

Referring to the accompanying drawings, A represents a horizontal V-shaped frame comprising the opposite side frames B, suitably connected. The opposite side frames B, comprise the upper and lower parallel connected frame pieces b , which are connected at one end to the pointed bow piece C, which forms the apex or bow of the V-shaped frame, and from which diverge the opposite side frames B, each of which receives a portion of the current, which is divided by the bow C. The upper and lower frames pieces b , of the opposite side frames, are connected by the upper and lower series of cross-braces D, which securely brace the entire frame and are provided with the projecting ends d , extended beyond the outer sides of the diverging

frames B, and have connected to the extremities of such ends, the parallel side guard rails E, which serve to keep drift and floating matter off from the frames B, over which travel the paddle wheels to be described. Leading from the front ends of the side guard rails E, are the opposite diverging front guard rails F, which rails have their front ends connected to opposite sides of the bow piece C, so that the drift and other material which strikes the bow is deflected by the front guard rails onto the side guard rails, so as to be kept entirely off from the working parts of the motor until such drift and other material has passed beyond the motor.

The upper and lower frame pieces b , of the opposite diverging wheel frames B, are connected by the intermediate guard or fender boards G, onto the outside of which the water is directed by means of the opposite divider or bow boards H. The opposite divider or bow boards H, are secured to the front ends of the frames B, and lead from the bow piece C, to such a point that the divided current will pass to the paddles outside of the guard or fender boards G, and not inside of the frame so as to create a back pressure on the wheel devices, thus providing a construction of frame whereby the water inside is dead, and offers no appreciable resistance to the paddles as they pass back into their active positions outside of the frames B.

Journaled in suitable boxes I, inside of the opposite frames B, at the front ends of the guard or fender boards G, are the drive shafts J, which carry the opposite sprocket wheels K. The opposite sprocket wheels K, on each of the shafts J, receive the front ends of the opposite sprocket chains L, the other rear ends of which pass over the flanged end rollers M. The flanged end rollers M, are mounted on the adjustable shafts N, which have their upper and lower ends journaled in the movable boxes n . The movable boxes n , are mounted to slide on the inside of the rear ends of the frame pieces b , and under the guide clips n' , secured to such frame pieces, and connected to each of the boxes n , are the threaded shanks O, passing through perforated end brackets o , at the extreme ends of the frame pieces b , and receiving the adjusting nuts o' , which provide means for adjust-

ing the shafts N, in order to regulate the tension of the sprocket chains. The said sprocket chains L, are held steady in their movement, and off from the frames B, by means of the intermediate flanged guide rollers P. The intermediate flanged guide rollers P, are keyed onto the intermediate shafts p , the upper and lower ends of which are journaled in the boxes p' , secured in the upper and lower frame pieces b , at an intermediate point.

Connecting the opposite sprocket chains L, passing through each of the opposite frames B, are a series of regularly spaced hinge rods Q, which receive the opposite hinge eyes q , of the feathering paddles or blades R. The feathering paddles or blades R, thus pivotally attached to the parallel sprocket chains of each frame, have connected thereto the stay chains or ropes S, which are also connected to the sprocket chains, and provide means for holding the paddles firm in their outstanding positions and receiving the head of water, while at the same time allowing the paddles to fall back onto the chains and feather through the dead water inside of the frames. By this construction, it will be readily seen that when the paddles have been carried around the front sprocket wheels and reached the position in front of the guard or fender boards G, the water from the opposite divider boards H, catches such paddles and throws the same open, so that they will receive the full force of the water until the rear end rollers M, have been reached, and then the paddles feather back to their inactive positions.

Hinged at their inner ends or pivotally connected at such ends to the upper and lower frames b , of each opposite frame B, are the opposite pairs of U-shaped swinging wire frames T. The opposite swinging U-shaped wire frames T embrace the outer sides of the frames B, and carry the swinging paddle-closing frames U. The swinging paddle-closing frames U, comprise the parallel connected frame pieces u , which work inside of the extended ends d , of the cross braces D, and are of a length corresponding to and equaling the length of the endless chain paddle wheels, and when free to move away from the paddles, are limited in their outward movement or swing by means of the stops V, secured to the frame pieces U, and adapted to engage the vertical stop bars v , connecting the ends d , of the central cross braces. Secured to the front ends of the frames U, are the opposite operating ropes W, which pass through the divider boards H, and are connected to a single operating rope w , passing through the bow-piece and providing means for simultaneously operating the opposite paddle-closing or motor regulating frames.

It will be readily seen that as the operator draws on the ropes w , the swinging frames U, by reason of their swinging supports are drawn toward the frames B, so that the outstanding paddles are closed onto the sprocket

chains, and are thereby taken out of the current so that the motor necessarily stops, or by holding the frames U, slightly off from the sprocket chain, the paddles can be allowed to take a small quantity of water if so desired. It will also be observed that the opposite frames U, swing parallel to the frames B, so that all of the outstanding paddles are simultaneously closed or operated upon.

Secured to the upper ends of the shafts J, are the drive pulleys X, which by means of suitable belting Y, can be connected with any machinery to be driven from the motor.

The motor frame can be either built on a float or laid on the bottom of a stream, and is held in its proper position, in either event, by an anchoring cable Z, connected to the bow-piece C.

Changes in the form, proportion and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

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

1. In a current motor, a horizontal open V-shaped frame comprising opposite connected diverging side frames, imperforate guard or fender boards arranged longitudinally in each of the opposite side frames, opposite diverging divider or bow boards arranged on opposite sides of the apex of the frame to lead the water onto said guard or fender boards, and opposite endless chains moving through the opposite side frames and having feathering paddles or blades moving in rear of and over the guard or fender boards therein, substantially as set forth.

2. In a current motor, the combination of a horizontal V-shaped frame, opposite endless chain paddle wheels moving in opposite sides of the frame, horizontal cross-braces having extended ends projecting beyond the sides of the frame, and parallel guard rails secured to the extremities of said extended ends, substantially as set forth.

3. In a current motor, a V-shaped frame comprising opposite diverging side frames connected at their front ends by a pointed bow piece, guard or fender boards arranged in each of the opposite side frames, opposite divider or bow boards arranged on opposite sides of the bow piece and leading to said guard or fender boards, upper and lower horizontal cross-braces connecting the side frames and having extended ends projecting beyond the same, parallel side guard rails connected to the extremities of said extended ends, opposite diverging front guard rails connected to the bow-piece and the front ends of the side rails, and the opposite diverging endless chain paddle wheels substantially as set forth.

4. In a current motor, opposite diverging open wheel frames, stationary vertical drive shafts journaled inside of each frame near their meeting ends and carrying upper and

lower sprocket wheels, horizontally adjustable bearing boxes arranged at one end of said frames, vertical roller shafts journaled in said adjustable boxes and carrying flanged end rollers, parallel sprocket chains passing over said sprocket wheels and flanged end rollers, being supported in position by the flanges of the latter, intermediate flanged guide rollers arranged horizontally to support and guide said chains, feathering paddles or blades pivotally attached to said sprocket chains and having stay chains or ropes, and closing devices for said feathering paddles or blades, substantially as set forth.

5. In a current motor, a V-shaped frame, opposite endless chain paddle wheels arranged to work in opposite sides of said frame and carrying feathering paddles or blades, swinging paddle closing frames arranged to work outside of the opposite sides of said frame, and means for simultaneously controlling said paddle closing frames, substantially as set forth.

6. In a current motor, opposite horizontal diverging frames, the endless paddle chains moving through said frames, feathering paddles or blades attached to said chains, opposite rectangular swinging paddle closing frames adapted to move parallel with the diverging

frames onto and away from the outstanding paddles, and a single operating rope connected to the front ends of said swinging frames, substantially as set forth.

7. In a current motor, opposite horizontal diverging frames, the endless paddle chains moving through said frames, feathering paddles or blades attached to said chains, opposite pairs of U-shaped swinging wire frames pivotally connected to and embracing the opposite diverging frames, opposite rectangular swinging-paddle closing frames loosely connected to said opposite pairs of U-shaped wire frames and adapted to move parallel with said opposite diverging frames, said paddle closing frames being provided with stops upon their outer faces, suitably arranged vertical stop bars adapted to be engaged by said stops, and a single operating rope connected to the front ends of said paddle closing frames, substantially as set forth.

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

LEMUEL C. NEAL.

Witnesses:

EUGENE O'NEILL,
FRED. M. MANNING,
H. C. KETTENBACK.