

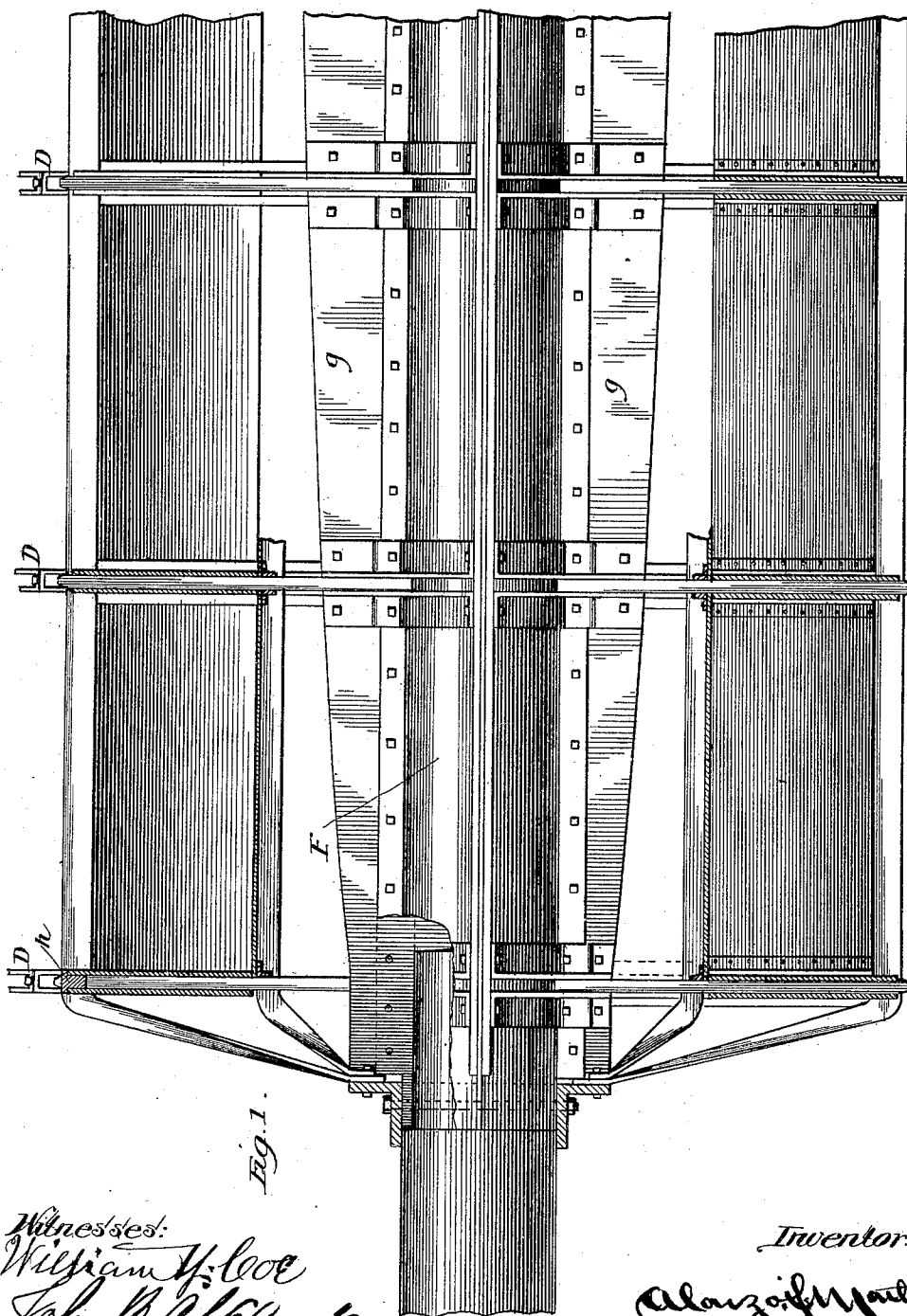
(No Model.)

3 Sheets—Sheet 1.

A. C. MATHER.  
WATER POWER.

No. 473,941.

Patented May 3, 1892.



Witnesses:  
William H. Coe  
John B. Alexander

Inventor:  
Alanson Mather

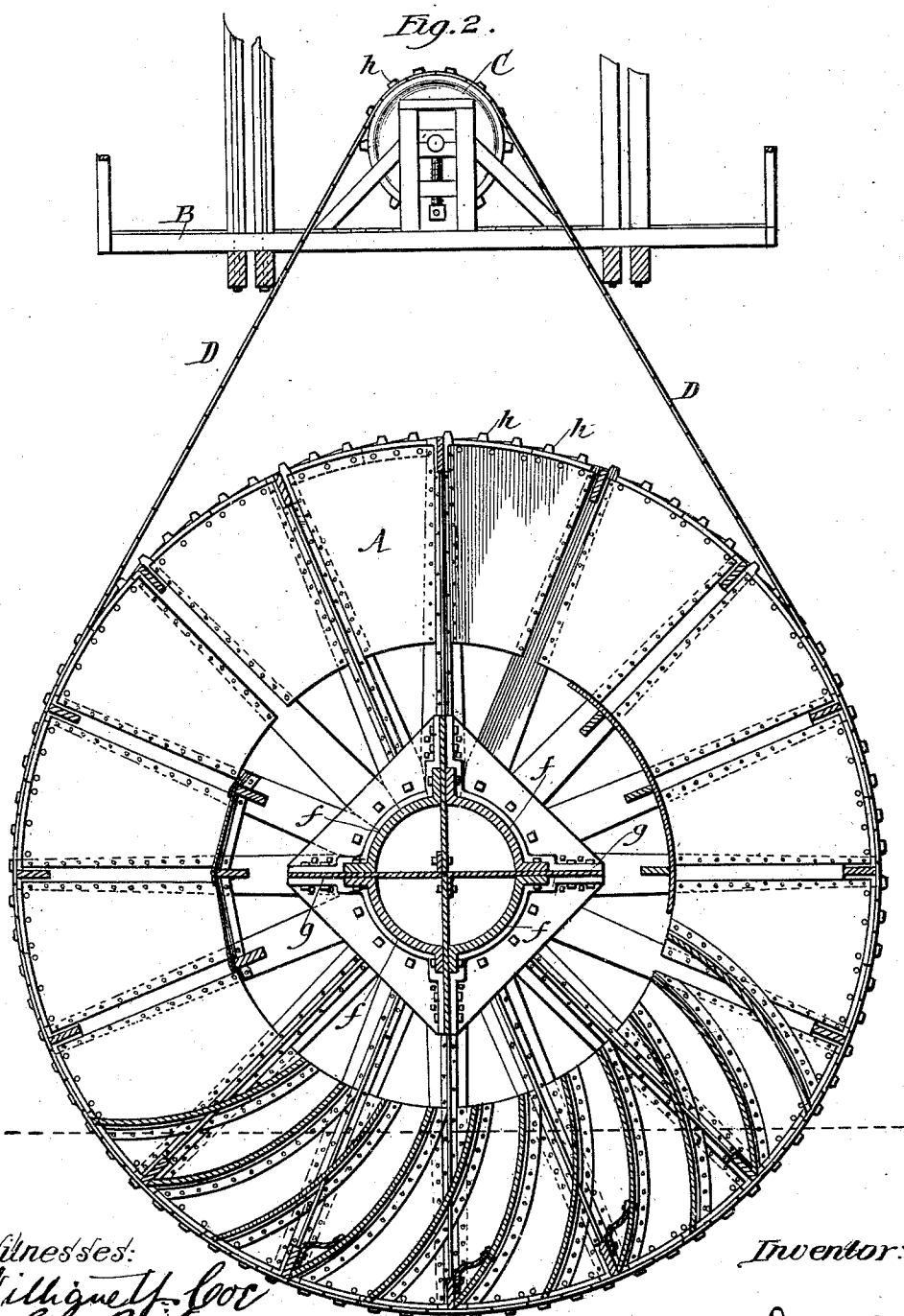
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William H. Coe  
John B. Mather.

Inventor:

Alonzo Mather

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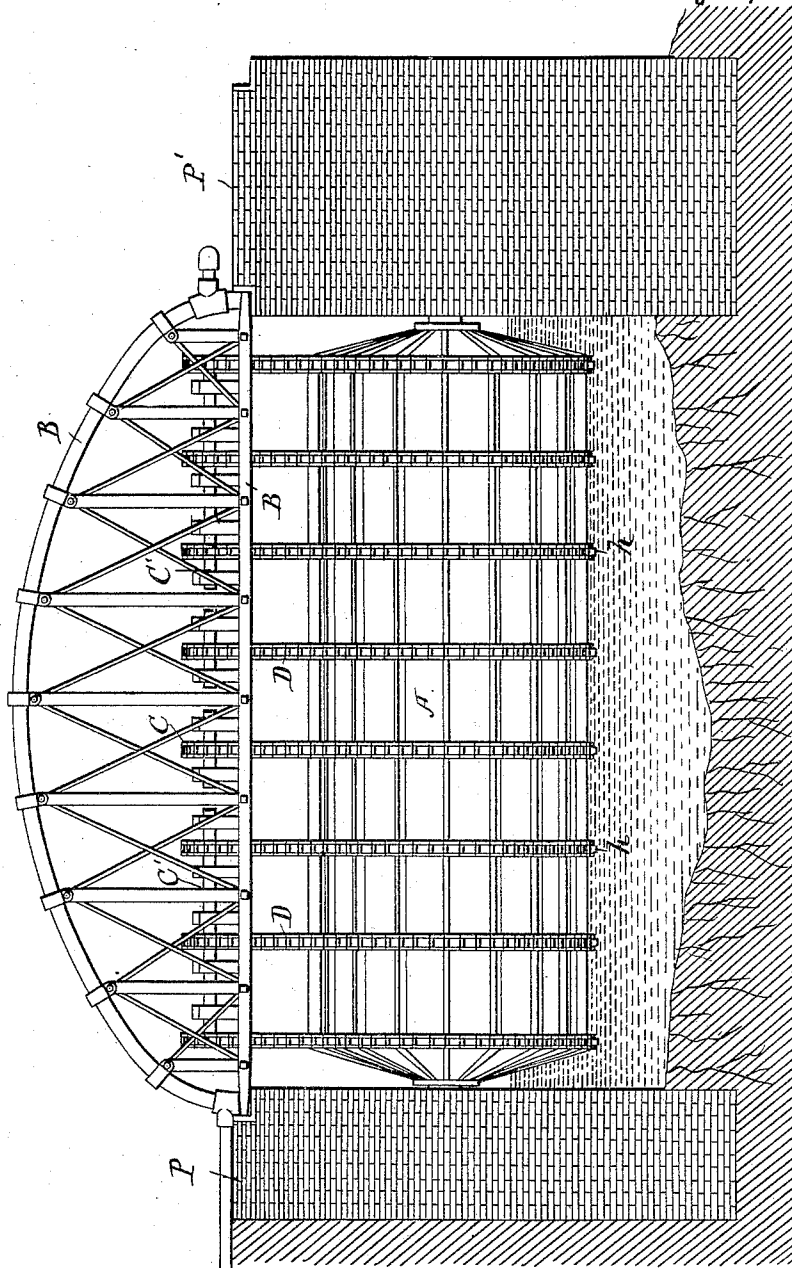
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Fig. 3.



WITNESSES

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# UNITED STATES PATENT OFFICE.

ALONZO C. MATHER, OF CHICAGO, ILLINOIS.

## WATER-POWER.

SPECIFICATION forming part of Letters Patent No. 473,941, dated May 3, 1892.

Application filed November 1, 1890. Serial No. 370,056. (No model.)

*To all whom it may concern:*

Be it known that I, ALONZO C. MATHER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Water-Power, of which the following is a specification, reference being had to the accompanying drawings, of which—

Figure 1 is a partial side view showing portions in section. Fig. 2 is an end view showing parts in section, and Fig. 3 is a side view showing the power in operative position.

My present invention is in the nature of an improvement upon certain features of my application filed June 14, 1889, Serial No. 314,293; and it has for its object to provide better means of taking the power off of a very large, long, heavy, and slow-moving water-wheel, and at the same time in a measure supporting the wheel at its center and along its length.

My devices are so arranged that additional working power may be applied at the part of the wheel where the current is the swiftest, as it is a well-known fact that the current in all rivers is swifter near their centers than near the banks, and in the use of a long heavy slow-moving water-wheel unless this is regulated there will be a constant tendency of the wheel to twist. In carrying out this part of my invention I overcome these objections by applying to the circumference of the wheel a number of rows of sprockets, which are distributed along the surface of the wheel at ten or twelve feet apart or otherwise, according to the requirements of each particular case, and connected with each series of sprockets is a link belt, which runs over one of a series of small sprocket-wheels secured to a shaft mounted above the water-wheel, as upon a bridge preferably supported on the piers between which the wheel operates. This shaft carrying the small sprocket-wheels can be connected to an air-compressor, dynamo, or other working machine in any desired way and need not be illustrated herein, one arrangement being shown in my former application. By this arrangement of sprockets and link belts distributed along the surface of the wheel it will be seen that the force of the current is applied more directly to the belts, and thence to the shaft, and the tendency of the wheel to twist is obviated. Furthermore, the link belts, pass-

ing around the wheel at its center and at proper distances at each side therefrom, tend to support the wheel and prevent it sagging, and also aid in preventing the tendency to twist due to the uneven flow of the current at different parts of the wheel. Further, when the wheel is mounted, as described in my former patent, so that it can be raised or lowered, according to the height of the water at various seasons of the year, the length of the belts can likewise be regulated by simply adding to or removing therefrom one or more of the links of each belt.

In order to further make a strong contact-wheel which will not be liable to sag at the center or become twisted or distorted by the force of the current, I make the shaft of a number of longitudinal sections plated together, and between the edges of these sections I place stiffening ribs or irons, and these irons are made tapering from their centers toward their ends in order to properly support the wheel, the width of the irons at the various points being a matter of mathematical calculation, varying according to the weight and length of the wheel.

In the accompanying drawings, A represents a water-wheel, which may be variously constructed, and is shown in the present instance as an undershot wheel having blades A' preferably curved in the manner shown, although this forms no particular feature of my present invention. This wheel A is shown as mounted between two piers P P', which piers support a bridge B above the wheel. Mounted on the bridge is a shaft C', to which are attached a number of small sprocket-wheels C, around which pass the link belts D, the belts also passing around the outside of the water-wheel at various distances apart, the wheel being furnished with a number of sprockets *h*, secured on the circumference thereof, with which the belts engage. The shaft F of the wheel is made up of a number of segments, four being shown in the present instance, and these segments are provided with flanges *f*, and between these flanges are placed the metal stiffening-bars *g*, which bars are made tapering from the center toward their edges, as clearly illustrated in Fig. 1. The shaft C' on the bridge may be a single shaft substantially the length of the wheel, or

may be made up of separate sections and supported in suitable bearings on the bridge.

What I claim is—

- 5 1. The combination, with the piers supporting the bridge, of a water-wheel suspended between the piers, a shaft on the bridge, and a series of link belts surrounding the wheel and connected to the shaft upon the bridge, substantially as described.
- 10 2. The combination, with the piers supporting the bridge, of a shaft supported on the bridge, a water-wheel suspended between the

piers, the shaft of the water-wheel being made in segments and provided with stiffening-pieces between the segments tapering from 15 the center toward the ends of the wheels, and a series of link belts surrounding the wheel and connected with the shaft on the bridge, substantially as described.

ALONZO C. MATHER.

Witnesses:

WILLIAM Y. COE,  
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