

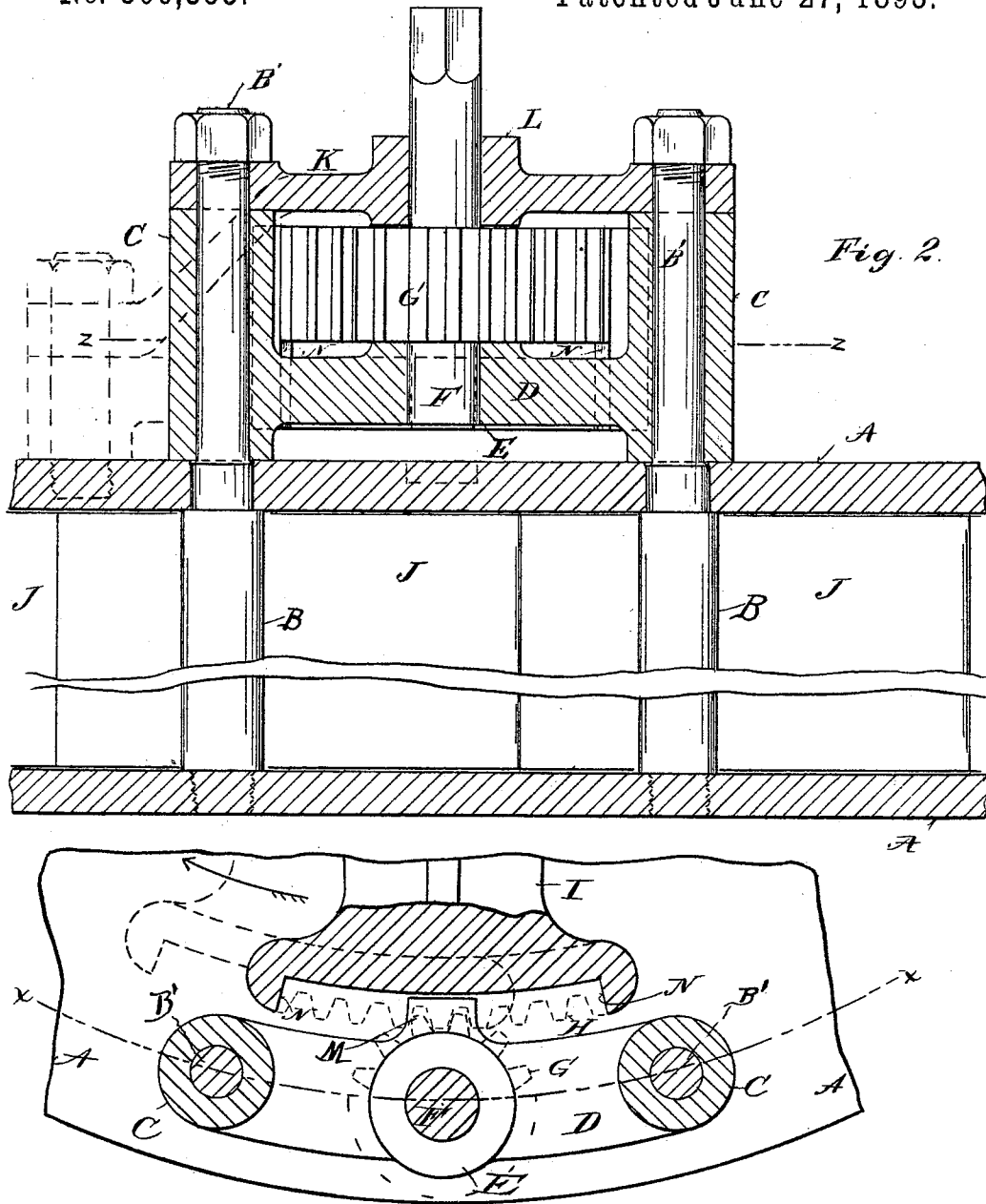
(No Model.)

2 Sheets—Sheet 1.

A. F. SPARKS.  
WATER WHEEL.

No. 500,355.

Patented June 27, 1893.



WITNESSES:  
*H. M. Plaisted.*  
*F. B. Ernest.*

*Fig. 1.*

INVENTOR  
*Albert F. Sparks,*

BY *H. A. Toulmin,*  
HIS ATTORNEY.

(No Model.)

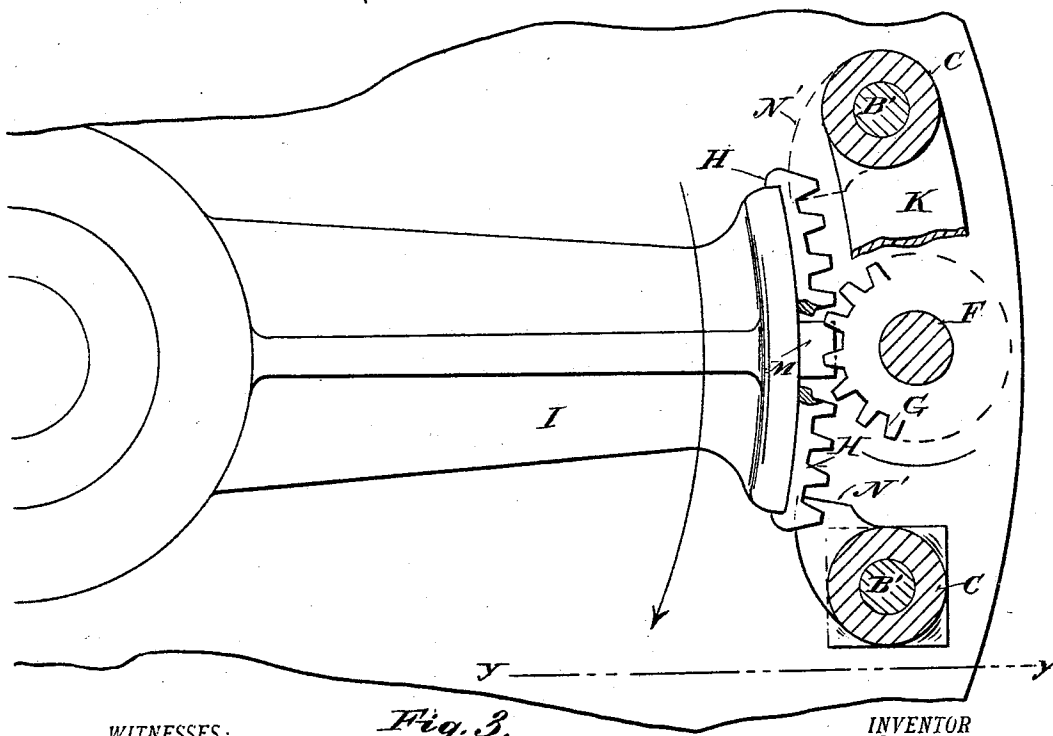
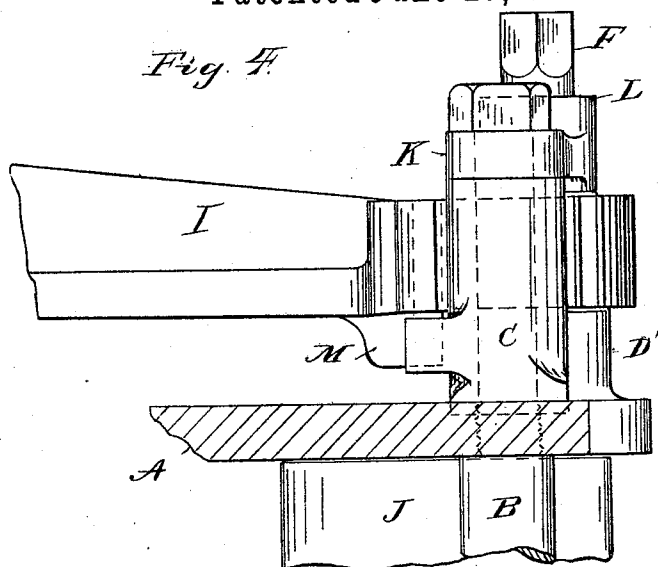
2 Sheets—Sheet 2.

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*Fig. 4.*



*Fig. 3.*

WITNESSES:

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*F. B. Ernest*

INVENTOR

*Albert F. Sparks,*

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# UNITED STATES PATENT OFFICE.

ALBERT F. SPARKS, OF SPRINGFIELD, OHIO, ASSIGNOR TO THE JAMES  
LEFFEL & COMPANY, OF SAME PLACE.

## WATER-WHEEL.

SPECIFICATION forming part of Letters Patent No. 500,355, dated June 27, 1893.

Application filed July 22, 1892. Serial No. 440,863. (No model.)

*To all whom it may concern:*

Be it known that I, ALBERT F. SPARKS, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Water-Wheels, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to certain new and useful improvements in water wheels, the peculiarities of which will be hereinafter fully described and particularly pointed out in the claims.

My improvements have reference to the provision of a firm support for the operating pinion of the gate mechanism of a water wheel, by the prolongation through one of the guide rims of the casing, of columns or posts connecting or supporting said rims or plates; have reference to a bracket bearing or pinion support, mounted on said prolongation; have reference to a stop projection or lug to limit the opening of the gates; and have reference to other points of detail hereinafter described and claimed.

In the accompanying drawings on which like reference letters indicate corresponding parts: Figure 1, represents a plan view of the casing, the end of two columns extending there-through, a pinion support mounted thereon, and a pinion and rack arm indicated; the section being on line *z z* Fig. 2; Fig. 2, a vertical sectional view through Fig. 1, on the line *xx*; Fig. 3, a similar view to Fig. 1, showing a modification of the limiting stop lug; and Fig. 4, a section on the line *y y*, of Fig. 3.

The letters A A designate the guide rims or plates of a water wheel casing, the letters B the posts or connecting columns which support and maintain said rims in position, the same being ordinarily screw-threaded into the lower of said rims. In the ordinary form these columns extend enough beyond the upper guide rim to receive a nut, but in my form herein shown and illustrated, the columns are prolonged as at B', above the upper gate rim to serve as a firm and rigid support for a bracket-bearing or pinion-support, consisting of sleeves C, connected by a bridge D having an opening or bearing at E for the shaft F, of

the operative pinion G mounted thereon, and meshing with a rack plate H carried by an operative arm I connected by the ordinary or any suitable mechanism (not shown), with the gates J, between said guide rims. The cap piece K bridges and connects the two sleeve portions C and is provided with an upper bearing at L, for the pinion shaft, as seen in Fig. 2. The ends of the prolonged columns are screw-threaded, and nuts maintain the cap piece in position. A rigid support for the pinion is thus provided. The posts being firmly held by the guide rims, through extensions or prolongations B', are maintained in a steady upright position, without any possible chance of becoming loose by the operation of the pinion and its mechanism. This is a point of great practical importance, the supports for the pinion which have been previously used, having a liability to work loose in time. Furthermore the prolonged posts or columns require no additional holes to be bored through the upper guide rim for the attachment of the pinion bracket ordinarily used, whereby a simplicity of construction and cheapness is secured, as well as efficiency.

I have shown in Fig. 2, by dotted lines, a modification of the bracket bearing in which but one post is prolonged for insertion in the sleeve C, the other end of the pinion support being bolted, or otherwise secured, at some other point, as indicated by dotted lines. I wish to claim this prolonged post or column and pinion support, whether one or more columns are used to mount the said support.

Referring to Figs. 3 and 4, it will be seen that the bridge portion D connecting the sleeves C, is dispensed with, and merely the cap piece K used to connect the sleeves. The end of the pinion shaft is mounted in a boss D' of the guide rim, or in a socket in the guide rim itself, as shown by dotted lines, Fig. 2. An upper and lower bearing for the pinion shaft is thus provided while the rigidity of the same is effected by the columns B' as above.

Referring to Fig. 1, a projecting lug M from the bridge D is shown. This is engaged by the end walls N of a recess, the length of which recess limits the movement of the rack plate. The dotted lines show the position of the plate

when the arm is thrown in the direction of the arrow and brings one end wall against the corresponding side of the lug M. In some wheels the plate is operated in the other direction; in this case the end wall on the left will engage with the lug. A nicety of adjustment of the gates is thus effected without danger of fracture of the parts.

In Fig. 3, the lug M is shown attached to the arm itself, and the stop wall or surface is formed by the lug N' on the sleeve C, the latter being square at its base and mounted in a socket in the rim, or otherwise prevented from turning with the lug M. The latter is below the rack plate, as shown by these figures. In Figs. 1 and 2, the recess with the end walls thereof, are likewise below the pinion and rack. In Fig. 3 the corresponding lug N' for the reverse motion of the pinion is shown dotted on the opposite sleeve C.

I do not limit myself to the exact construction herein shown and described.

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

1. In a water wheel, the combination with the casing, of columns or posts extending through said casing from plate to plate, two adjacent columns being prolonged through

one of said plates, a bracket-bearing forming a pinion-support, mounted on said extended columns, of sleeves connected by a bridge portion forming a lower bearing for the pinion shaft, a cap-piece forming the upper bearing and bolted down upon said sleeves, substantially as shown and for the purpose described.

2. In a water wheel, the combination with the top and bottom guide rims of the casing, of posts extending through said guide-rims some posts being prolonged beyond the top rim, a bracket piece mounted on two adjacent prolonged posts and consisting of a sleeve for each post, and a connecting bridge-portion provided with a lug opposite a shaft bearing therein, and a cap-piece mounted above said sleeve and having a corresponding shaft bearing, a shaft mounted in said bearings, a pinion thereon, a rack meshing with said pinion and carried by an operative arm having one or more bearing faces adapted to engage with said lug and limit the motion of said arm, substantially as and for the purpose described.

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

ALBERT F. SPARKS.

Witnesses:

OLIVER H. MILLER,  
WARREN M. MCNAIR.