(No Model.)

A. F. SPARKS.

WATER WHEEL.

No. 531,879. Patented Jan. 1, 1895.

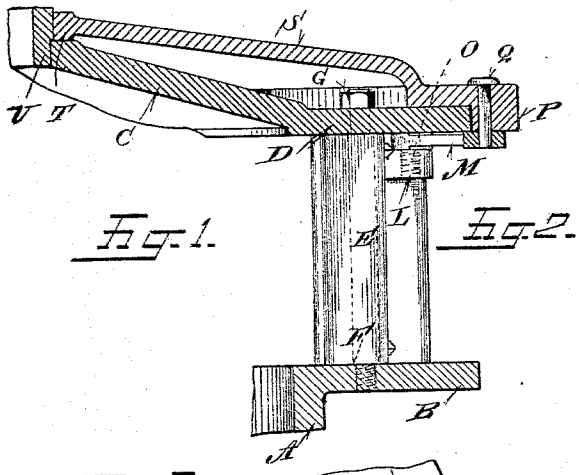

Fig. 1.

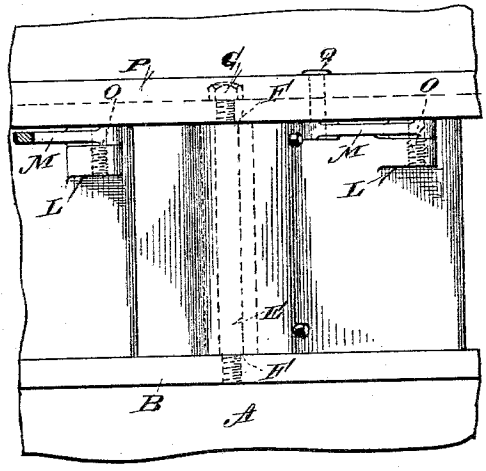

Fig. 2.

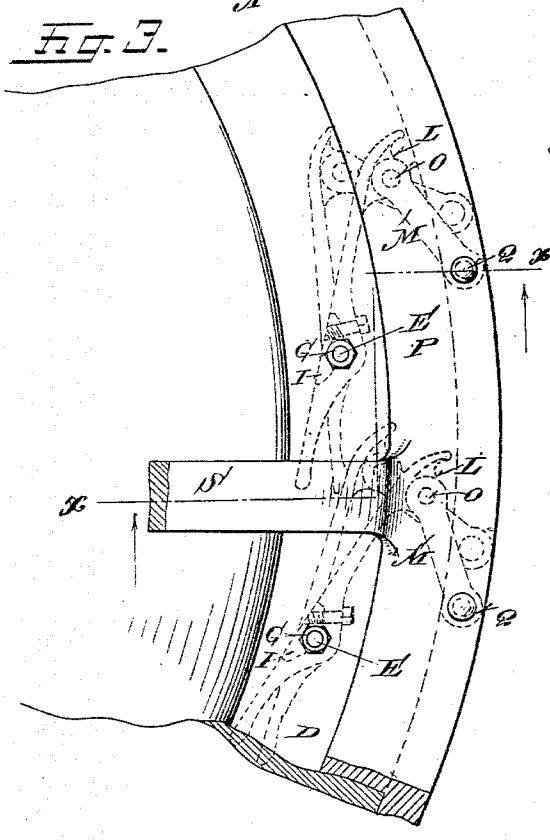

Fig. 3.

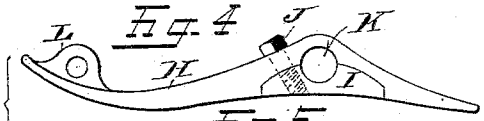

Fig. 4.

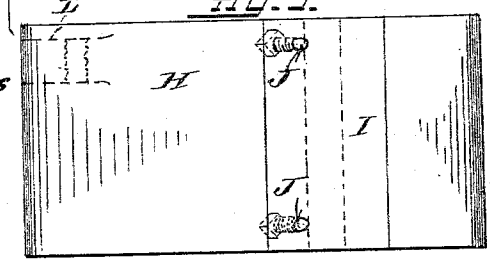

Fig. 5.

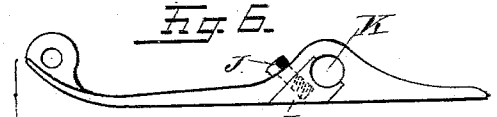

Fig. 6.

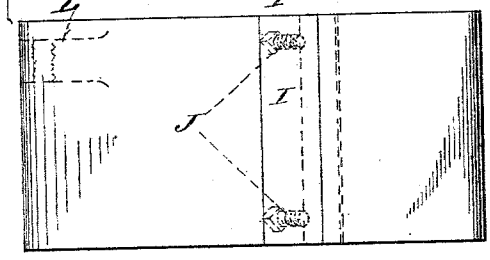

Fig. 7.

Witnesses
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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. 531,879, dated January 1, 1895.

Application filed January 2, 1894. Serial No. 495,289. (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.

This invention relates to certain new and useful improvements in water-wheels, and the invention is designed to be used in wheels of both the vertical and horizontal kind, that is to say, wheels in which the main shaft is vertical and wheels in which the main shaft is horizontal, or in any position.

These improvements have reference to the gates by which the water is admitted into or shut off from the wheel proper, and one object of the invention is to do away with the use of separate columns for securing the cylinder plate and the crown plate and separate bolts or studs upon which the gates are usually pivoted, and instead thereof to use only a single set of studs or columns which shall perform the function of connecting said plates and of supporting said gates, the construction of the gates being such that they may be mounted upon the studs or posts or removed from them while the studs or posts are connected with the said plates.

In carrying out the first object of my invention I construct the gates with a removable or separable section or portion adjacent to the bearing of the gate in which the stud or post fits, so that access may be had to this bearing so as to fit the gates to the posts or studs and to remove them. The form of this removable or separable section may be varied and the means of attaching it to the body of the plate may also vary.

In the accompanying drawings on which like reference letters indicate corresponding parts, Figure 1, represents a vertical sectional view of a portion of a water wheel casing with my improvements applied thereto; Fig. 2, a side elevation of what is shown in Fig. 1; Fig. 3, a plan view of what is shown in Fig. 1; Fig. 4, a detail plan view of the gate; Fig. 5, an inside elevation of the gate; Fig. 6, a detail plan view of a modified form of a removable section; and Fig. 7, an inside elevation of the same.

The letter A designates a portion of the water wheel casing, and the letter B the plate, while at C is shown the crown of the casing and at D the crown plate. These upper and lower parts of the casing must be firmly and permanently secured together. In the ordinary mode of construction the common way is to connect them together by a number of columns and then a separate set of posts are provided and passed through the plates D and B to form pivots upon which the gates turn. A common source of trouble arises from the posts or pivots working loose and up above the lower plate and frequently out of the upper plate. In this way the gates become loose and work into the interior of the casing when they are caught by the wheel which results in serious injury, if not the destruction of the wheel, besides the stoppage of machinery, loss of time in ascertaining and overcoming the difficulty, and expense for repairs and in the stoppage of the mill or other machinery operated by the wheel. As above intimated I do away with this double set of columns and posts and make one set perform the joint work of connecting the plates and of supporting the gates. One of these posts is shown at E and it is reduced at either end so as to form shoulders F, one end being screwed into one plate, say the plate B, and the other end projecting through the other plate, say the plate D, where it is provided with a nut G. Thus the plates are held together. The next thing is to apply the gates to these posts. This I accomplish by constructing the gates H with a removable or opening section I held to the plate proper in any convenient manner and of any desired form. I have shown two forms. (See Figs. 4 and 6.) A binding screw J passes through the gate and screws into a threaded opening in the removable or opening section. The bearing K in the gate for the post is partly formed, by preference, in the removable section. It will be seen that by removing the section both it and the gate proper can be placed against the post E by giving access to the bearing of the plate. When the parts are applied to the post the

screw J or other fastening device is to be operated from the outer side to render it easy of access.

I do not wish to be understood as limiting myself to any particular form or shape of removable or opening section nor to any particular fastening device, though the forms shown are practicable, as I have ascertained in the practical application of the invention.

The gates may be operated in any convenient manner. I have shown and will now describe one way. It will be seen that at one end the gate on the outside is provided with a lug L to which is pivoted a link M by a pin O, the other end of the link being pivoted to the operating ring P by a pin Q. This ring rests upon the plate D and has arms or spiders S which connect with a hub T fitted to turn upon the wheel-shaft-box U. Thus the operating ring P is kept in place and made rotatable so as to actuate the links M and open or close the gates and hold them in adjusted positions as may be desired. I do not show any mechanism for actuating the operating ring because that forms no part of this invention and because such mechanism may vary. It should also be understood that in case the wheel shaft is horizontal the operating ring P will be supported upon the plate D or otherwise, as may be desired.

Thus it will be observed that by this invention separate sets of columns and gate posts, with their incidental expense and the liability of the latter to displacement are done away with and instead thereof the cost of production decreased, the dislodgment of the gate posts prevented, a single set of posts made to do the entire work and the gates made capable of being attached to and detached from the posts without removing them, while the gates are easily operated by mechanism entirely accessible and operating with little friction and great leverage over the gates.

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 pivoted gates and the plates of the casing and posts securing them together, of pivoted gates each having a recess, and a removable or opening section fitting within the recess, the recess and said section being on the inner side of the gates, and the section substantially flush with the gates exteriorly, and a fastening device accessible from the outside for the purpose set forth.

2. In a water wheel, the combination with the plates of the casing and posts securing them together, of pivoted gates each having a pivot-bearing and a recess about and leading into the bearing, and a removable or opening section fitting within the recess and having a bearing surface to complete the gate bearing, and a device to fasten the section to the gate.

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

ALBERT F. SPARKS.

Witnesses:
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