J. C. BRITCHER.

WICKET GATE FOR WATER WHEELS.

APPLICATION FILED NOV. 20, 1919.

1,357,440.

Patented Nov. 2, 1920.

2 SHEETS—SHEET 1.

Fig. 1.

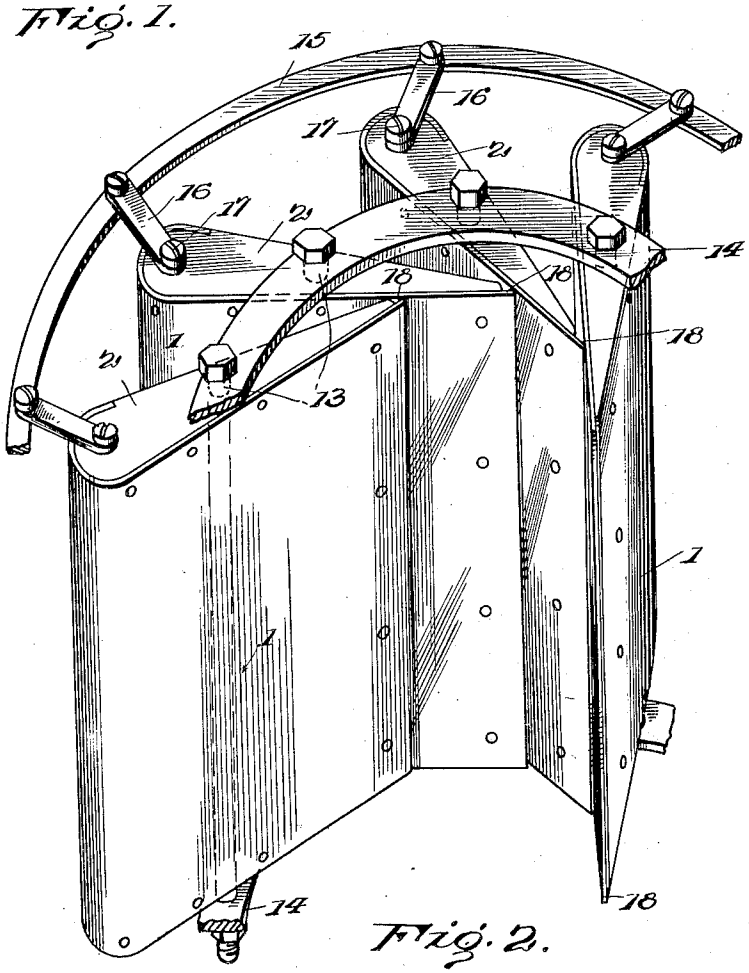
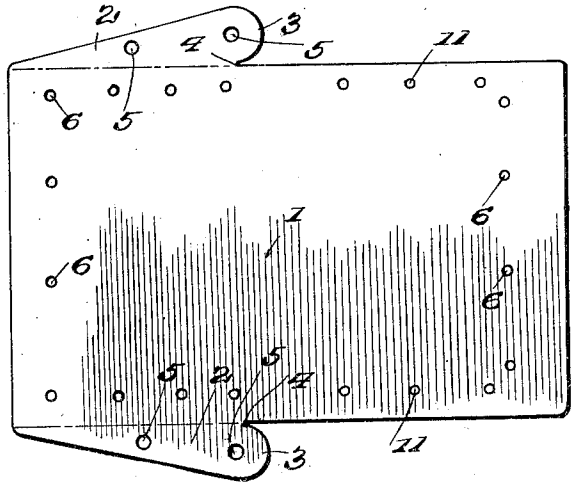


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

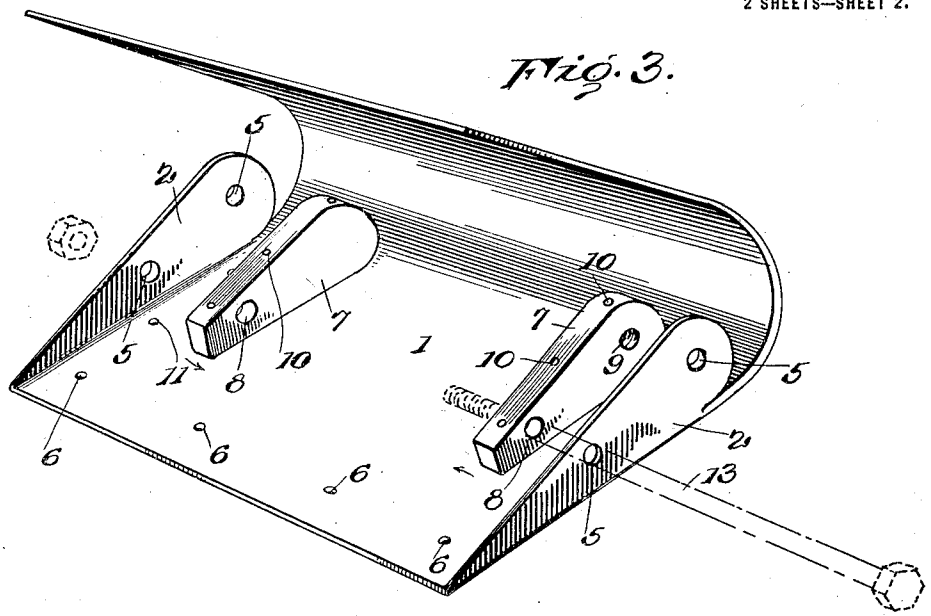


Fig. 4.

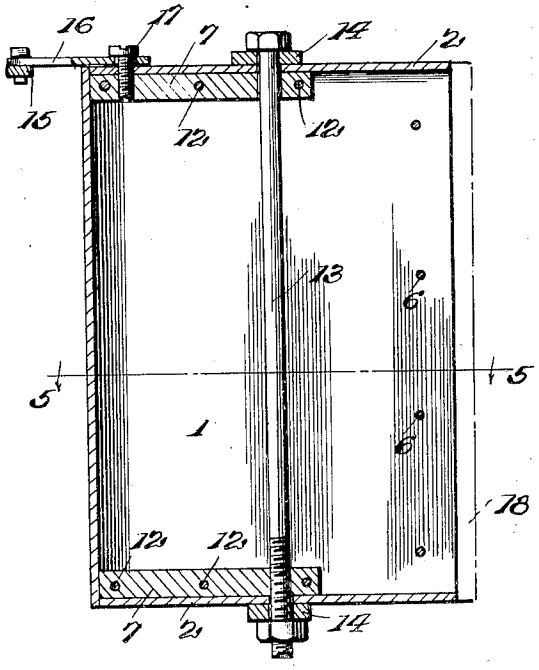
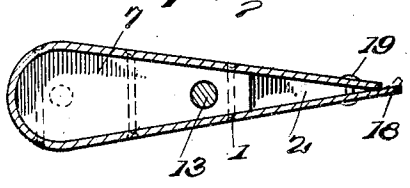


Fig. 5.



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UNITED STATES PATENT OFFICE.

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WICKET-GATE FOR WATER-WHEELS.

1,357,440. Specification of Letters Patent. Patented Nov. 2, 1920.

Application filed November 20, 1919. Serial No. 339,405.

To all whom it may concern:

Be it known that I, JOHN C. BRITCHER, a citizen of the United States, residing at York, in the county of York and State of Pennsylvania, have invented certain new and useful Improvements in Wicket-Gates for Water Wheels, of which the following is a specification.

This invention relates to the means for controlling the flow of water or other fluid to a turbine or other motor wheel. The invention is intended more particularly for application to water wheels but may, of course, be used in connection with other forms of fluid driven rotary motors. It is customary in constructing and setting up water wheels to surround the same with a series of wickets or gates which are pivotally mounted and turnable about their pivots so that in one extreme position the edge of one wicket or gate will bear against the face of an adjacent wicket and thereby cut off the flow of water or other driving fluid while in another extreme position the gates will stand radially or substantially parallel and thereby admit a full flow of water or other fluid to the motor wheel. The wickets can, of course, be set at any intermediate position as circumstances may demand. The wickets, as now generally constructed, are cast of solid metal and are, therefore, very heavy and expensive and the edge of the wicket is frequently so rough that it will not make a good contact with the surface of the adjacent wicket and must be filed or otherwise cut away so as to make a good contact with the face of the adjacent wicket. This operation is laborious, time-consuming and expensive and is, furthermore, frequently unsatisfactory for the reason that the face of the adjacent wicket is apt to be rough so that an imperfect joint or contact will be formed notwithstanding that a perfectly straight smooth edge be produced upon the contacting wicket. It is the object of my invention to provide a wicket which will be light, easily and cheaply produced, and which may be readily adjusted so as to provide a perfectly tight joint or contact with the face of an adjacent wicket. I attain this object, and such other objects as will incidentally hereinafter appear, in such a structure as is illustrated in the accompanying drawings and hereinafter fully set forth.

In the drawings—

Figure 1 is a perspective view of several wickets or gates in operative relation;

Fig. 2 is a plan view of a blank from which a gate may be formed;

Fig. 3 is an enlarged perspective view of a partly formed gate or wicket;

Fig. 4 is a longitudinal section through a completed gate;

Fig. 5 is a section on the line 5—5 of Fig. 4.

In carrying out my invention, I first produce a blank of malleable iron or steel which need be only thick enough to withstand the force of water striking against the same when in use. The blank 1 is shown in Fig. 2 and consists of a rectangular body provided at one end on each side edge with a tongue or tab 2 having its outer edge disposed obliquely with respect to the side edge of the body of the blank so that the tab or tongue tapers toward the adjacent end of the blank body, the said obliquely disposed edge meeting the blank at the corner of the same. The inner end of the tab or tongue, or that end more remote from the corner of the blank is semi-circular, as shown at 3, and at the junction of the blank body with the said semi-circular end of the tongue I form a square shoulder 4 which is equal in extent to the thickness of the blank and is preferably so disposed that it will extend partly into the body of the blank. The provision of this square shoulder 4 permits the blank to be so folded, in the formation of the wicket, that there will be no projections on the outer surface of the wicket but the edge of the wall of the wicket will lie flush with the outer surface of the tab or tongue 2. Openings 5 are formed through each tab or tongue 2 and similar openings 6 are provided through the blank body near each end edge of the same and it is to be noted that the inner or semi-circular ends of the tabs or tongues are not located in a plane passing through the transverse center of the blank but are between said center and that end of the blank into which the tongues merge. The purpose of this arrangement will presently appear. The described blank having been produced, the tongues or tabs 2 are folded along lines coinciding with the side edges of the blank body and thereby assume the position shown in Fig. 3. Reinforcing blocks 7 are then placed in posi-

tion upon the blank body at the inner sides of the upstanding tabs or tongues and these reinforcing blocks are similar in shape to the tabs or tongues so that the edges of the blocks will lie flush with the edges of the tongues. The reinforcing blocks are provided near their narrower ends with openings 8 and one of the blocks is provided with an additional opening 9 near its arcuate end. These blocks may be of the same material as the blank but should be somewhat thicker in order that they will firmly support the sides and ends of the completed gate and prevent collapse of the same. While malleable iron or steel will answer the purposes of my construction, brass or copper may be used and may sometimes be preferred. When iron or steel is used, the wicket should be galvanized or otherwise treated so as to resist the corrosive action of the water. It will be noted that openings 10 are formed through the reinforcing blocks 7 and openings 11 are provided in the blank adjacent the side edges thereof to register with said openings 10. The reinforcing blocks having been placed in position as indicated in Fig. 3, the portion of the blank extending beyond the said tongues or tabs 2 is bent up and over, as indicated in Fig. 3, so that it may be caused to engage around or bear against the arcuate end edges and the inclined side edges of the tabs or tongues. When it has been folded into this position, rivets or fastening pins 12 are inserted through the blank and the blocks 7 so as to secure the parts firmly together. The pivot rod of the gate, shown at 13, may be inserted through the outer openings 5 of the tabs or tongues and the openings 8 in the blocks 7 nearer the smaller ends of said blocks to pivotally secure the wicket between the supporting rings 14 in the usual manner. The operating ring 15 is connected with the several gates by links 16 which are secured to the gates by screws 17 inserted through that opening 5 of the tabs or tongues 2 which is located nearer the semicircular end thereof and into the corresponding opening 9 of the adjacent reinforcing block. Inasmuch as the extreme length of the tabs or tongues 2 is less than half the extreme length of the blank body, when the blank is folded to complete the gate the free end edge of the blank will project beyond the opposite end edge of the blank, as shown most clearly at 18 in Fig. 5. Inasmuch as the material is malleable or ductile this projecting free edge may be readily bent, as indicated by the dotted lines in Fig. 5, to accommodate the relative positions of adjacent wickets and thereby be brought into proper contact with the face of an adjacent wicket so that all the wickets may be swung to fully closed position and a tight joint effected throughout the series. Rivets 19 are inserted through the openings 6 to secure the edges of the blank together and, if desired, the joints formed by the meeting surfaces of the several parts may be brazed or otherwise filled so that the wicket will be made fluid-tight.

It will be readily noted from the foregoing description, taken in connection with the accompanying drawings, that I have provided a hollow wicket which may be cheaply and rapidly produced and which will obviously be very light in weight. The wicket may be very easily operated also by reason of its light weight, and as it has a bendable or foldable projecting lip or edge a fluid-tight joint between adjacent wickets may be very readily attained and leakage of the driving fluid, when the gates are in closed position, will be thereby effectually prevented.

Having thus described the invention, what is claimed as new is:

1. A wicket for fluid-driven motors comprising end walls of substantially triangular form, and side walls fitting flush upon the edges of said triangular end walls with the side edge of one side wall projecting beyond the adjacent edge of the meeting side wall.

2. A wicket for fluid-driven motors provided at one edge with a bendable longitudinal lip.

3. A wicket for fluid-driven motors comprising end walls of substantially triangular form, and side walls fitting upon the edges of the end walls flush with the outer surfaces of said walls, one side wall being integral with the end walls and the other side wall being integral with the first-mentioned side wall, the end walls filling the entire space between the side walls.

4. A hollow wicket of bendable material having end walls of substantially triangular form, and side walls bearing upon the edges of the end walls and inclosing the same, and reinforcing blocks secured against the inner sides of the end walls and corresponding in shape and dimensions to the end walls.

5. A blank for wickets consisting of a rectangular body and tongues on the side edges of the body at one end thereof, the length of said tongues being less than one-half the length of the body and the outer edges of the tongues being inclined toward the sides and the adjacent end of the body, the said tongues being foldable upon lines coinciding with the side edges of the body.

In testimony whereof I affix my signature.

JOHN C. BRITCHER. [L. S.]