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L. LYNDON

WATER WHEEL GATE

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Fig. 1.

Fig. 8.

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Witnesses:
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WATER-WHEEL GATE.

To all whom it may concern:

Be it known that I, LAMAR LYNODON, a


A citizen of the United States, and resident of New York, in the county and State of

5 New York, have invented certain new and useful Improvements in Water-Wheel Gates, of which the following is a specification.

My invention relates to improvements in

10 the construction of the so called "wicket gates" for water wheels.

It is well known that, unless the wicket gates are all machined at the inner points and the surfaces where contact is made be-

15 tween adjacent gates are prepared so thoroughly as to secure a perfect contact, and, further, the operating mechanism com-

prising the connecting links and pivots is made with great accuracy, there will be no

20 uniform and complete shutting off of the water flow, which should be the case when the gates are closed. If one gate point is

slightly longer than that of some other gate, or if the thickness of all of the gates is not

25 exactly the same, such longer, or thicker, gates will make contact before all other gates around the periphery of the water wheel can close, and no further movement of the operating mechanism can take place

because the mechanical limit of motion will have been reached. On the other hand, the

30 machining of each gate and accurate adjustments of the various operating parts of the mechanism form a too costly operation and, in ordinary, commercial types of water wheels the use of such means is not even considered. As a result, a great lack of

35 operating efficiency is prevailing in practice, it being customary to place the gates

in position, work the shifting ring until various high spots of the gate bodies and

40 extra long points of various other gates have been located, then chip and file the

gates, until some semblance to complete closure of all the gates is effected. As a

45 matter of fact, however, this process of adjusting inequalities in the gates being far from satisfactory, there is always a considerable leakage through the wicket gates

as they are made today, which results in a continuous loss of water through water wheels which are delivering no power, i.

50 e. when the gates are supposedly tightly closed. Furthermore, this leakage flow is

usually great enough to keep a water wheel, which is attached to an electric generator,

continuously in motion, even after gate closure, and, in such a case, it becomes necessary to provide some extraneous means for bringing the water wheel, and its attached generator to rest. In some instances, mechanical brakes have been used for this purpose, in other cases, generator fields are fully excited, so that induced eddy currents will act as an electro-magnetic brake and finally stop the rotation of the unit.

My invention is designed to eliminate all chipping and filing, all adjustment of the various parts of the operating mechanism, and applies to any type of wicket gate. An important feature of my invention is that it

not only eliminates the necessity for such mechanical and adjusting operations, but, at the same time, eliminates all water losses as well as the need of extraneous apparatus for bringing to rest units that have been taken out of service. Other useful features of my invention will be made apparent from the detailed description thereof.

Referring to the accompanying drawings:

Figure 1 is a section of a standard water wheel, showing the arrangement of wicket gates and the operating mechanism thereof.

Figure 2 is a detail view of two adjacent wicket gates.

Referring particularly to Figure 1, wherein the full lines indicate the general arrangement of the parts when the wicket gates are closed, and the dotted lines, when these gates are open, 1 is a section of the water wheel casing, 2 is one of the wicket gates, mounted therein on a pivot 3, the ends of the gates being attached to the shifting ring 4 by means of links, of which 5 is the one corresponding to the gate 2. The gates are provided with deflectors, such as 6, to give proper direction to the flow of water.

A connecting or shift rod 7 serves to move the shifting ring 4 and thereby open or close the gates. The gates are made of cast iron, steel, or other suitable metal. Approximately along the line where the point of one gate makes contact with the adjacent gate, at closure, the metal in the body of the gate is grooved out through the entire width of the gates and the space thus formed is then filled with some soft material, such as babbitt metal, as indicated at 8 on Figure 1 and, by the same notation, in the detail Figure 2. The inserted soft metal or other soft material capable of resisting the action of water has just enough plasticity to allow
the gate point to cut into it and make a tight
contact between two consecutive gates.

When the water wheel is assembled, it
only becomes necessary to close the gates as
nearly as possible, and then strike with a
hammer or mallet those of the gate points
which make contact with adjacent gates be-
fore contact is made and closure effected all
around the periphery of the wheel, the ham-
mering of such gate points and the slight,
but sufficient, plasticity of the soft material
under them allowing other gates to close,
this simple operation being continued until
all the gates are tightly closed. This con-
dition of tight closure will be attained even
if the so called gate point by which is meant
the thinner end of the gate, is not truly
straight from one edge to the other of the
gate.

While the soft material inserted in
the gate body is preferably some metal, such as
lead or babbitt, I do not limit my invention
to soft metals, any material which fulfills
the conditions of permitting a gate point to
be driven into it without injury to the gate
and which will withstand the action of the
water flow, being obviously within the scope
of my invention. For instance, certain
kinds of wood, if driven into dove tail
formed slots made in the gate body, would
meet the requirements. Nor does my inven-
tion preclude other ways of driving the
gate points into the soft material than ham-
mering, since the same result would be ob-
tained by cutting out of the inserted soft
material enough to form a seat for receiv-
ing the adjacent gate point.

Having fully described my invention, I
claim:

1. A wicket gate for water wheels, made
of a comparatively hard material and pro-
vided with a strip of softer material, which
strip is inset in a portion of said wicket gate
and forms the seat for one end of the next
adjacent gate cooperating therewith.

2. A wicket gate for water wheels, hav-
ing a portion made of a material capable of
resisting the action of the flow of water and
of sufficient plasticity to allow the surface
of said portion to become slightly depressed
under impact.

3. A wicket gate for water wheels, made
of comparatively hard material and having
a strip of softer material inset therein, said
inset material being of sufficient plasticity
to permit the harder material of an adjacent
gate to be forced into the softer strip.

4. In a water wheel, wicket gates, each
gate having a strip of comparatively soft
material inset therein and of sufficient plas-
ticity to allow the tightening of contact be-
tween consecutive gates all around the per-
iphery of said water wheel by forcing gate
ends into said strips of soft material.

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