(12) **United States Patent**
Mickolls et al.

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(54) **WATER WHEEL, HORIZONTAL**

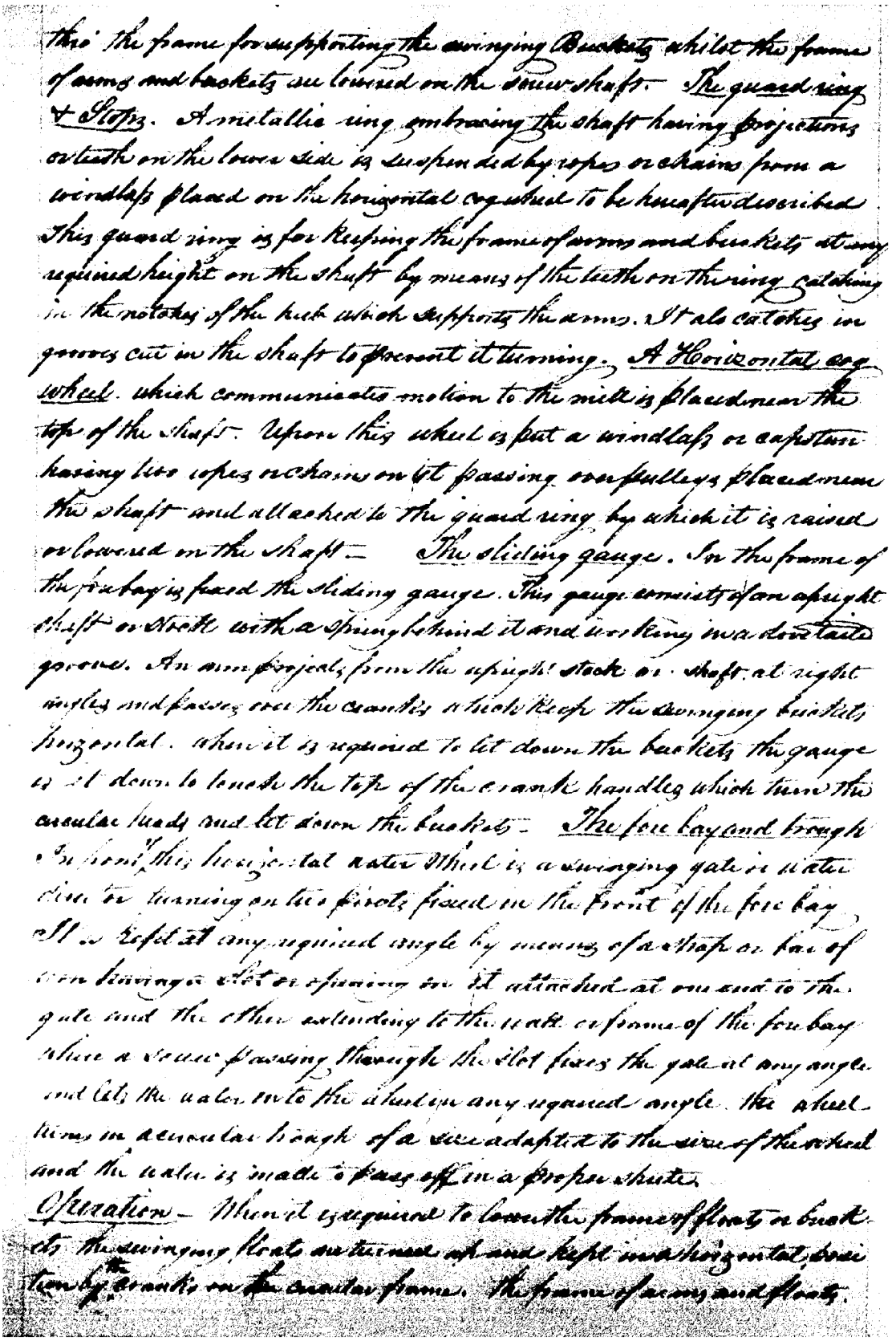
(76) Inventors: **John Mickolls; Solomon P. Wheeler**

John Nicholls & Solomon D. Wheeler. Bolivar Tenn.

Letters Patent

The Schedule referred to in these Letters Patent and making part of the same containing a description in the words of the said John Nicholls and Solomon D. Wheeler, themselves of their improvement in the horizontal current Water Wheel and inclined race Wheel

To all it may concern that we John Nicholls and Solomon D. Wheeler both of Bolivar Hardeman County State of Tennessee have made invented improvements in the Horizontal current Water Wheel and inclined race Wheel which are described as follows The first wheel which we shall describe consists of the Spiral screw shaft. The arms and revolving floats or buckets the guard ring & stops the windlass for raising and lowering the guard ring. the horizontal Cog wheel. the four bevil wheels and sliding gauge. The second Wheel which we shall describe consists of the shafts the arms and revolving buckets & the inclined race or spout for conducting the water. The first or current Wheel which The Spiral screw shaft. This is made of metal or wood of any convenient size. A screw right or left of any pitch is cut upon it from within a small distance of the bottom to any required length & it turns in sinks or gudgeons Like the shafts for water wheels The arms with the revolving floats or Buckets. Eight dovetail or Cog are Bolted down to a metallic ring or bevil having a female screw in it to work in the screw on the shaft and notches or steps made on the upper side to receive the projections or stops of the guard ring to be hereafter described. Upon the extremities of the arms are suspended the revolving floats by means of hinges. The floats are made fan shaped being narrowest near the shaft. A circular frame of wood or metal embraces all the arms on the upper side all around and forms a brace to the arms. upon this circular frame and near each arm is placed a crank having a shank with a circular head passing



the frame for supporting the swinging Buckets whilst the frame of arms and buckets are lowered on the inner shaft. The guard ring & Stops. A metallic ring embracing the shaft having projections or teeth on the lower side is suspended by ropes or chains from a windlass placed on the horizontal cog wheel to be hereafter described. This guard ring is for keeping the frame of arms and buckets at any required height on the shaft by means of the teeth on the ring catching in the notches of the hub which supports the arms. It also catches in grooves cut in the shaft to prevent it turning. A Horizontal cog wheel. which communicates motion to the mill is placed near the top of the shaft. Upon this wheel is put a windlass or capstan having two ropes or chains on it passing over pulleys placed near the shaft and attached to the guard ring by which it is raised or lowered on the shaft. The sliding gauge. On the frame of the fore bay is fixed the sliding gauge. This gauge consists of an upright shaft or stock with a spring behind it and working in a dovetailed groove. An arm projects from the upright stock or shaft at right angles and passes over the cranks which keep the swinging buckets horizontal. when it is required to let down the buckets the gauge is let down to touch the tops of the crank handles which turn the circular heads and let down the buckets. The fore bay and trough. In front of the horizontal water Wheel is a swinging gate in water tight to turning on two pivots fixed in the front of the fore bay. It is fixed at any required angle by means of a shaft or bar of iron having a slot or opening in it attached at one end to the gate and the other extending to the inside of the fore bay where a screw passing through the slot fixes the gate at any angle and lets the water into the wheel in any required angle. The wheel runs in a circular trough of a size adapted to the size of the wheel and the water is made to pass off in a proper shute.

Operation. When it is required to lower the frames of floats or buckets the swinging floats are turned up and kept in a horizontal position by cranks on the circular frame. The frame of arms and floats.

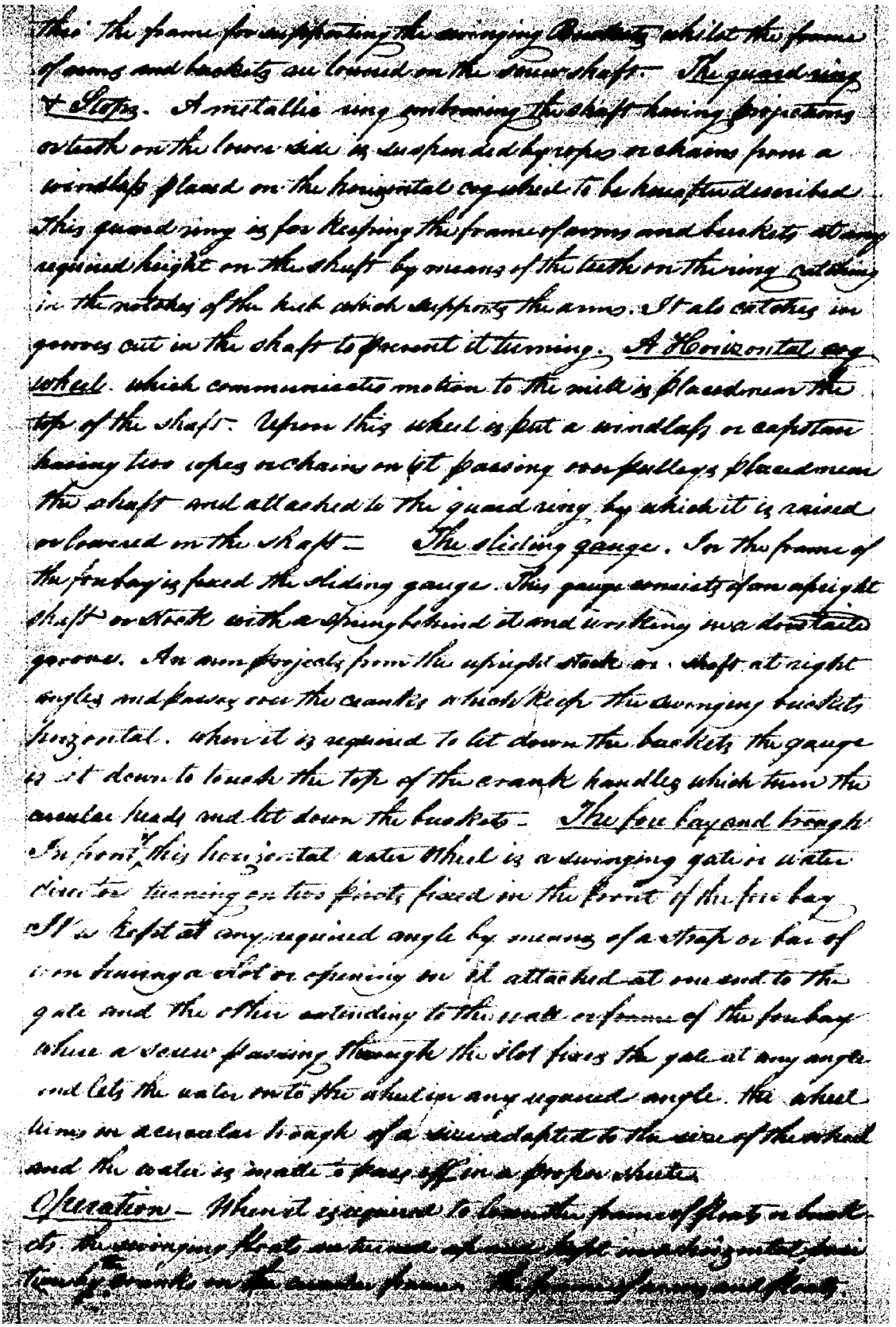
as they turned by hand on the screw shaft and secured to any required height. The guard ring is then let down by the windlass and the teeth in the ring catch into the notches of the ring or hub of the frame of arms and buckets. The swinging buckets are then let down by the gauge and the horizontal wheel set in motion the flood gate being first placed at a proper angle for letting on the water.

The invention here claimed in the before described horizontal water wheel is the mode of securing the screw shaft. the guard ring as before, and the mode of raising and lowering it and the mode in which the floats are supported by the cranks and the gauge to let them down. The second or inclined race which. The shape and form of this wheel are the same as other horizontal water wheels. the number of arms will be proportioned to the size of the wheel intended for — as — feet apart at their extremities — The swinging buckets or floats are attached by hinges to the ends of the arms. the buckets when down will be supported by these hinges against the frame of the same. also the upper edge of the bucket will set against the under side of the arm. The inclined race or spout is formed of wood or other materials. It must be elevated to an angle of 6 or 8 degrees more or less. to be contracted at bottom to nearly the width of the bucket. The top of the race or course to be wider. the water from the race is conducted in a circular segment trough of about 9 feet in length and the curve is adapted to the sweep of the wheel. The inclined plane is placed near the top of the circular trough on which inclined plane the buckets are raised and thrown into the circular trough.

Operation. The water descending down the inclined race acquires the necessary velocity and strikes the swinging buckets at nearly right angles. thus producing the greatest effect. The invention here claimed is the before described inclined race or spout and circular segment trough and the combination of the swinging buckets to act at nearly right angles with the water. also the inclined plane for raising and throwing the swinging buckets into the circular trough.

For a further illustration of our invention we refer to the models and drawings of the same deposited in the Patent Office.

In witness whereof we have hereunto subscribed



the frame for supporting the swinging Buckets while the frame of arms and buckets are lowered on the drum shaft. The guard ring & Stops. A metallic ring embracing the shaft having projections or teeth on the lower side is suspended by ropes or chains from a windlass placed on the horizontal cog wheel to be hereafter described. This guard ring is for keeping the frame of arms and buckets at any required height on the shaft by means of the teeth on the ring falling in the notches of the bush which supports the arms. It also catches in grooves cut in the shaft to prevent it turning. A Horizontal cog wheel. which communicates motion to the mill is placed near the top of the shaft. Upon this wheel is put a windlass or capstan having two ropes or chains on it passing over pulleys placed near the shaft and attached to the guard ring by which it is raised or lowered on the shaft. The sliding gauge. In the frame of the fore bay is fixed the sliding gauge. This gauge consists of an upright shaft or stock with a spring behind it and working in a dovetailed groove. An arm projects from the upright stock or shaft at right angles and passing over the cranks which keep the swinging buckets horizontal. when it is required to let down the buckets the gauge is set down to touch the top of the crank handles which turn the crank heads and let down the buckets. The fore bay and trough In front of this horizontal water Wheel is a swinging gate in water lines for turning on two pivots fixed in the front of the fore bay It is kept at any required angle by means of a strap or bar of iron having a slot or opening in it attached at one end to the gate and the other extending to the side or frame of the fore bay where a screw passing through the slot fixes the gate at any angle and lets the water on to the wheel in any required angle. the wheel runs in a circular trough of a size adapted to the size of the wheel and the water is made to pass off in a proper shute.

Operation. When it is required to lower the frames of shafts or buckets the swinging pivots are turned at right angles to their former position by cranks on the circular frames. The frame being unfastened

es then turned by hand on the screw shaft and lowered to any requi-
red height. The guard ring is then let down by the windlass and
the teeth in the ring catch into the notches of the ring on hub of the
frame of arms and buckets. The swinging buckets are then let down
by the gauge and the horizontal wheel set in motion the flood
gate being first placed at a proper angle for letting on the water.
The invention here claimed in the before described horizontal Water Wheel is the
Spiral screw shaft. The guard ring as described, and the mode of raising and lowering
it and the mode in which the floats are supported by the cranks and the
gauge to let them down. The second or inclined race called is the shape
and form of this wheel are the same as other horizontal water wheels. The num-
ber of arms will be proportioned to the size of the wheel calculated for — as
— feet apart at their extremities — The swinging buckets or floats
are attached by hinges to the ends of the arms. The buckets when down
will be supported by these hinges against the spout of the race. Also the
upper edge of the bucket will rest against the under side of the arm.
The inclined race or spout is formed of wood or other materials. It must
be elevated to an angle of 6 or 8 degrees more or less. It to be contracted at bot-
tom to nearly the width of the bucket. The top of the race or spout to be
wider. The water from the race is conducted in a circular segment trough
of about 8 feet in length and the same is adapted to the size of the wheel.
The inclined plane is placed near the top of the circular trough on which
inclined plane the swinging buckets are raised and turned into the circular trough.
Operation. The water descending down the inclined race acquires the ne-
cessary velocity and strike the swinging buckets at nearly right angles thus
producing the greatest effect The invention here claimed is the be-
fore described inclined race or spout and circular segment trough and
the combination of the swinging buckets to act at nearly right angles
with the water. also the inclined plane for raising and turning the
swinging buckets into the circular trough

For a further illustration of our invention we refer
to the models and drawings of the same deposited in the Patent
Office. In witness whereof we have hereunto subscribed

see memo before the witnesses
Wm Ellis } Witnesses to the signing
Wm S Council } of John Nicholls
John Nicholls
S.P. Wheeler
Joseph P. Atwood } Witnesses to the sign
Jesse Ardill } ing of P. & P. Wheeler
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