No. 695,276. Patented Mar. 11, 1902.

B. CANNON.

MARINE PROPELLER.

(Application filed May 31, 1901.)

(No Model.) 2 Sheets—Sheet 1.

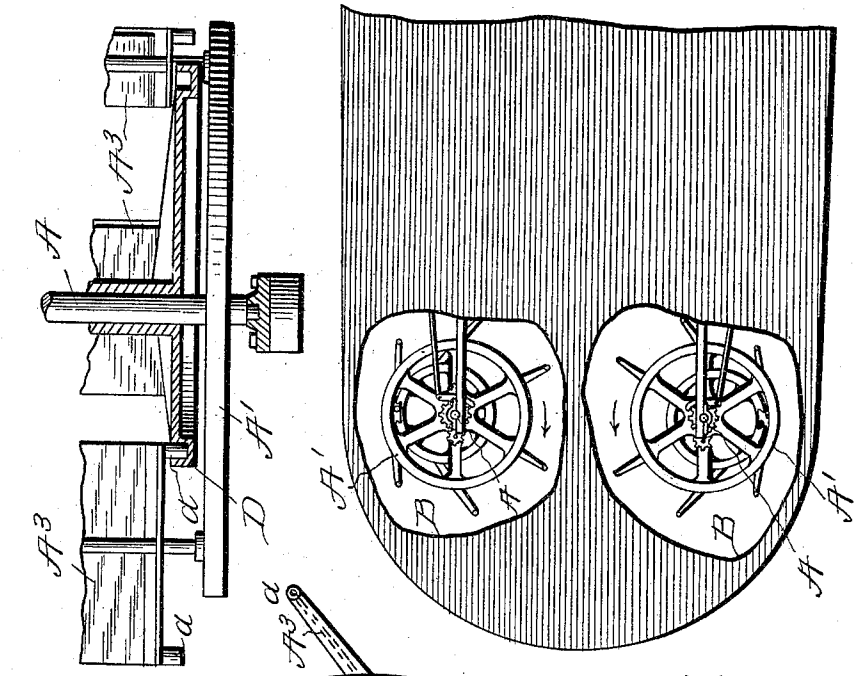


Fig. 5.

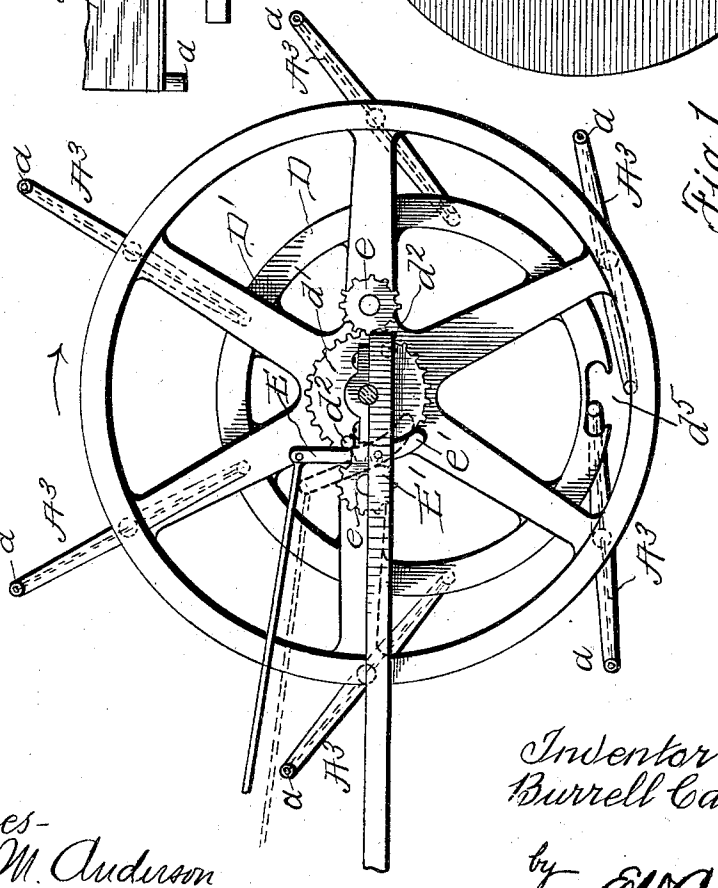


Fig. 2.

Fig. 1.

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Fig. 4.

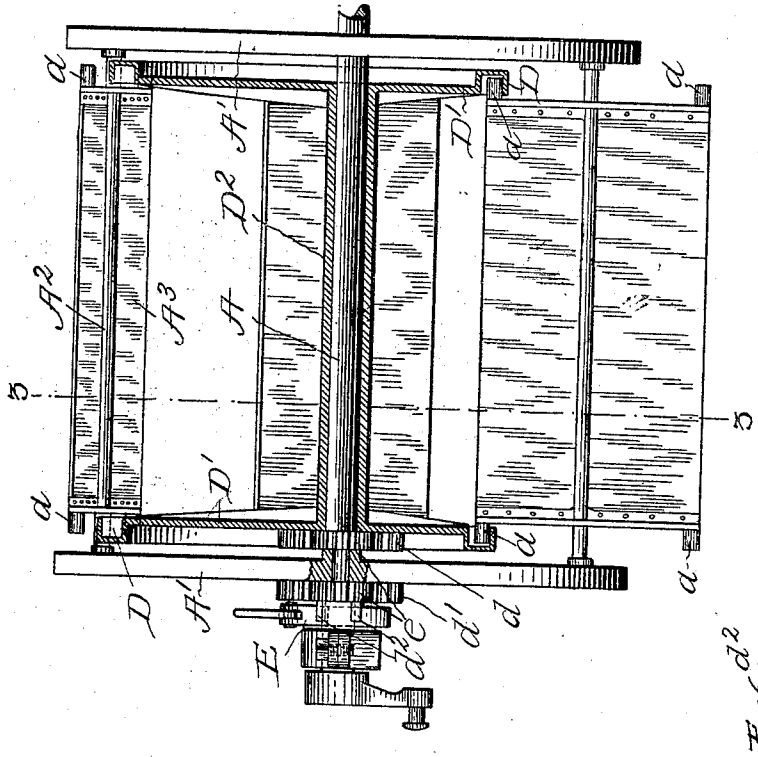


Fig. 6.

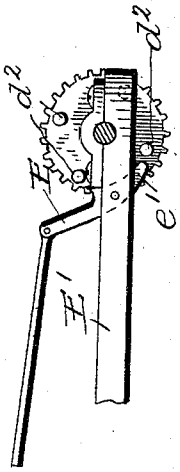
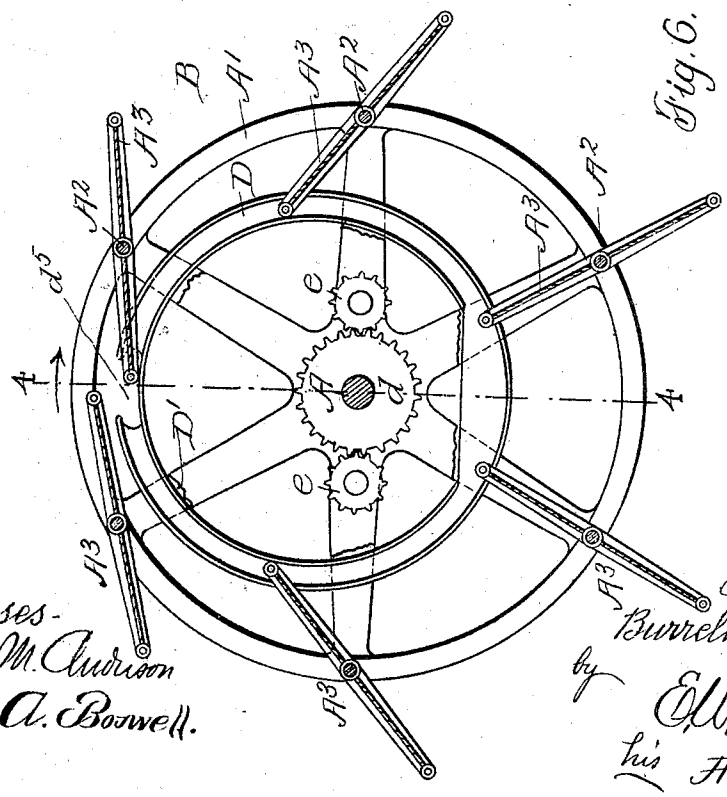


Fig. 5.



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UNITED STATES PATENT OFFICE.

BURRELL CANNON, OF PITTSBURG, TEXAS.

MARINE PROPELLER.

SPECIFICATION forming part of Letters Patent No. 695,276, dated March 11, 1902.

Application filed May 31, 1901. Serial No. 62,509. (No model.)

To all whom it may concern:

Be it known that I, BURRELL CANNON, a citizen of the United States, and a resident of Pittsburg, in the county of Camp and State of Texas, have made a certain new and useful Invention in Marine Propellers; and I declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

This invention has relation to marine propellers, and has for its object the provision of a novel form of submerged motor wheel or propeller operating upon a novel principle, with the result of greater mechanical efficiency and speed, and providing for a reversal of the action of the wheel for propulsion in opposite directions or for turning the boat without changing the direction of rotation of the power-shaft.

With this object in view the invention consists in the novel construction and combination of parts, all as hereinafter described, and pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a plan view of my propeller-wheel as applied. Fig. 2 is a side elevation of my wheel, catch-lever E being shown as disengaged from projection d^2 in dotted lines. Fig. 3 is a section on the line 3 3, Fig. 4. Fig. 4 is a partial section on the line 4 4, Fig. 3. Fig. 5 is a fragmentary view, partly in section, illustrating the step-bearing for the lower end of the wheel-shaft; and Fig. 6 is a detail view of catch-lever E and gear d'.

Referring to the drawings, the letter A designates the propeller or motor shaft, shown as having a vertical arrangement, being stepped into suitable bearings at its lower end, and B is the motor-wheel keyed to this shaft and turning therewith, any suitable power being employed. This motor-wheel consists of the opposite heads A' A', connected by shaft A, and near their peripheries having journaled therein transverse shafts A^2, six being shown. Upon these shafts are fixed, intermediately of their width, the propeller-blades A^3, one upon each shaft. These blades, which are preferably of rectangular form, are of substantially the same width as the distance between the heads and carry laterally-projecting rollers a upon both sides and at each extremity or at the corners thereof, such rollers working in annular guideways D at each side, forming a part of lateral heads D', arranged between the heads of the motor-wheel and connected by sleeve D^2, loosely journaled upon shaft A. One of the heads D' is provided with spur-gear d, fast thereto and concentric with shaft A, and upon the outside of head A', upon this side of the wheel, is a similar spur-gear d', loosely journaled upon shaft A.

E is a catch-lever carried by a stationary beam or support and having an engagement with diametrically opposite lugs d^2 of spur-gear d' for the purpose of holding the heads D' and their guideways stationary in diametrically opposite positions. To effect this result, opposite pairs of pinions e are provided upon opposite sides of head A and meshing with spur-gears d d' at diametrically opposite points, the shafts of said pinions having bearings in head A' and being carried around therewith. In this way upon rotation of head A' the pinions e are carried around bodily, the outer pair of said pinions being caused to move in opposite directions through their engagement with stationary spur-gear d, and the inner pair of pinions, being also caused to move in opposite directions, will exercise diametrically opposite pulls upon spur-gear d', which will balance and hold such gear stationary and likewise the heads D' and guideways D.

The catch-lever E is intermediately pivoted to stationary beam or support E', an operating-rod being connected to one arm of said lever and arranged to be operated from the pilot-house. The other arm of said lever has an inward cam extension e', which is thrown in the path of the lug d^2, just released when said lever is operated, to return the catch-lever to normal position to receive and hold the opposite lug d^2 as it comes in engagement therewith, a shoulder d^3 being provided in each lever for this purpose.

The purpose of the reversal of the guideways D will now be explained. The propeller blades or wings A^3 are actuated by their rollers a, working in the guideways D to as-

sume radial positions with respect to the shaft A when in full operative position to exercise their utmost force and to be gradually withdrawn from and caused to approach to such position as they are carried around with such shaft. At opposite points upon the wheel from the points in which the blades are in radial position they are caused to assume a tangential position with respect to the guideways D', when the reactive force or resistance of the water will cause their forward end portions to rise, an opening d^5 being provided in the walls of the guideways for this purpose to release the rollers a, and as the blades are carried still farther around their rear end portions are caused to fall by the same resistance of the water, the rollers a falling into openings d^5 into position in the guideways, where they remain until such rear portions become in turn the forward portions of the blade and are ready to rise. On the downstroke of the blades as they are gradually assuming full operative position the rollers a are pressed tightly against the inner peripheral walls of the guideways. When such wings or blades assume full operative position, such rollers have a tendency to move forwardly, the guideways being made wider at these points to admit of a slight forward movement of the rollers and to prevent binding of the rollers in the guideways, and upon the upstroke of the blades the rollers are caused to press tightly against the outer peripheral walls of the guideways, these results being caused by the inequality of the pressure of the water against the inner and outer arms of the blades, which are thus of lever character.

The motor-wheels are preferably arranged in pairs with their shafts in vertical position at the stern of the boat, the lower ends of such shafts being stepped into suitable bearings, and by means of the catch-levers E and the mechanism operating in connection therewith the pilot from his position in the pilot-house can instantly change the action of the wheel from forward propulsion to backward propulsion or turn the boat without reversal of the power-shaft or of the engine. The motor-wheels may also be arranged with their shafts in a transverse position with relation to the boat.

In my motor-wheel each blade in every position thereof, except when rising or falling to reverse its action at one single point on the circumference of the wheel when it is presented substantially edgewise to the water, which exercises little or no resistance thereagainst, is exercising a positive propulsive force to send the water backwardly or forwardly, as the case may be.

The catch-lugs d^3 upon spur-gear d' may be multiplied to hold the guideways D at points intermediate of the diametrically opposite positions shown to propel the water to one side at any inclination for turning the boat.

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

1. In a propeller or motor-wheel, the centrally-pivoted blades, and an eccentric revoluble feathering-wheel arranged to detachably engage the end portions of said blades, and adjustable to vary or reverse the action of said blades, substantially as specified.

2. In a propeller or motor-wheel, the centrally-pivoted blades, having the end projections, and an eccentric revoluble cam or guide way arranged to detachably engage said blade projections to feather the blades, and adjustable to vary or reverse the action of said blades, substantially as specified.

3. In a propeller or motor-wheel, the centrally-pivoted blades, an eccentric revoluble feathering-wheel arranged to detachably engage the end portions of said blades, and means for adjusting said wheel to vary or reverse the action of said blades, substantially as specified.

4. In a propeller or motor-wheel, the opposite revoluble heads, the blades centrally pivoted across the periphery of said heads, and an eccentric revoluble feathering-wheel arranged to detachably engage said blades and adjustable to vary or reverse the action thereof, substantially as specified.

5. In a propeller or motor-wheel, the revoluble heads, the blades centrally pivoted across the periphery of said heads, and having the end projections, an eccentric revoluble cam or guide way arranged to detachably engage the blade projections to feather the blades, and means for adjusting said guideway to vary or reverse the action of said blades, substantially as specified.

6. In a propeller or motor-wheel, the opposite revoluble heads, the blades centrally pivoted across the peripheries of said heads, and having the end projections, the eccentric revoluble cam or guide way between said heads arranged to detachably engage the blade projections, and adjustable to vary or reverse the action of said blades, substantially as specified.

7. In a propeller or motor-wheel, the centrally-pivoted blades, and a revoluble feathering device detachably engaging the end portions of said blades, and adjustable to vary or reverse the action of said blades, substantially as specified.

8. In a propeller or motor-wheel, the centrally-pivoted blades having the end projections, a revoluble feathering device detachably engaging said projections, and means for adjusting said device to vary or reverse the action of the blades, substantially as specified.

9. A submerged motor-wheel, having the pivoted blades arranged across the periphery of said wheel, and having end projections, and the endless eccentric cam or guide ways, having a sleeve connection loosely journaled upon the wheel-shaft, and engaging the end projections of said blades to vary their adjustment, substantially as specified.

10. A submerged motor-wheel, having the pivoted blades arranged across the periphery of said wheel, and having lateral projections or rollers, the endless eccentric cam or guide ways having a sleeve connection loosely journaled upon the wheel-shaft, and engaging the lateral projections of said blades to vary their adjustment, means for adjusting said guideways to vary or reverse the propulsive force of said blades, and for holding said guideways stationary as adjusted, substantially as specified.

11. A submerged motor-wheel, having the pivoted blades arranged across the periphery of said wheel, and having lateral projections or rollers at both sides and at both end portions, the annular eccentric cam or guide way having a sleeve connection loosely journaled upon the wheel-shaft, and engaging the lateral projections of said blades to vary their adjustment, the spur-gear carried by the guideways, the spur-gear loose upon the wheel-shaft and having lateral projections, the double pairs of pinions in mesh with said spur-gears, and carried by the motor-wheel, and the stationary catch device arranged to engage the projections of said spur-gear, substantially as specified.

12. The combination with a motor-wheel, having the adjustable blades, of the eccentric endless cam or guide way engaging said blades to vary their adjustment, the spur-wheel carried by said guideway, the spur-wheel loose upon the motor-shaft, and having lateral projections, the double pairs of pinions in mesh with said spur-wheels, and carried by the motor-wheel, and the stationary catch device arranged to engage the spur-wheel projections, substantially as specified.

13. In a submerged motor-wheel, the opposite heads having the pivoted blades extending between their peripheral portions, and having end projections or rollers, the internal annular eccentric guide or cam way, engaging the end projections of said blades to vary their adjustment, and to reverse their presentation in the course of a single rotation of the wheel, said guideways being arranged to intermittently engage opposite projections of each blade upon successive rotations of the wheel, substantially as specified.

14. In a submerged motor-wheel, the opposite heads, having the pivoted blades extending between their peripheral portions, and having lateral projections or rollers, at both sides and at both end portions, the internal, annular, eccentric guide or cam ways having a sleeve connection loosely journaled upon the motor-shaft, and engaging the lateral projections or rollers of the blades to vary their adjustment, and to reverse their presentation in the course of a single rotation of the wheel, said guideways being arranged to intermittently engage opposite end projections of each blade upon successive rotations of the wheel, and having each an opening to release one such projection, and reëngage the other, substantially as specified.

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

B. CANNON.

Witnesses:
HERBERT C. EMERY,
GEORGE M. ANDERSON.