

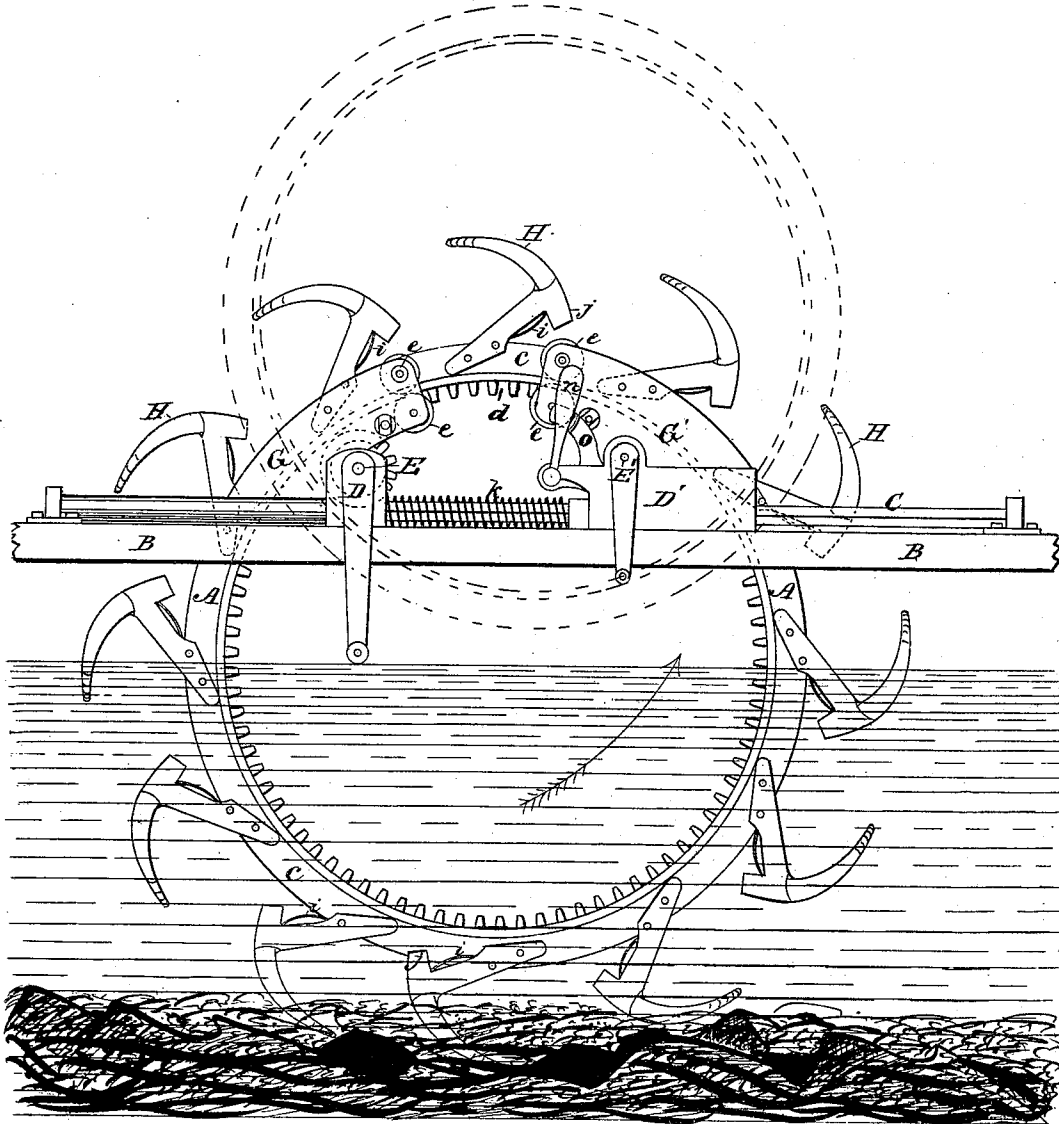
W. S. WOOTTON.
PROPELLING WHEELS.

2 Sheets—Sheet 1.

No. 179,385.

Patented June 27, 1876.

Fig. 1.



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INVENTOR:

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BY *[Signature]*

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Fig. 2.

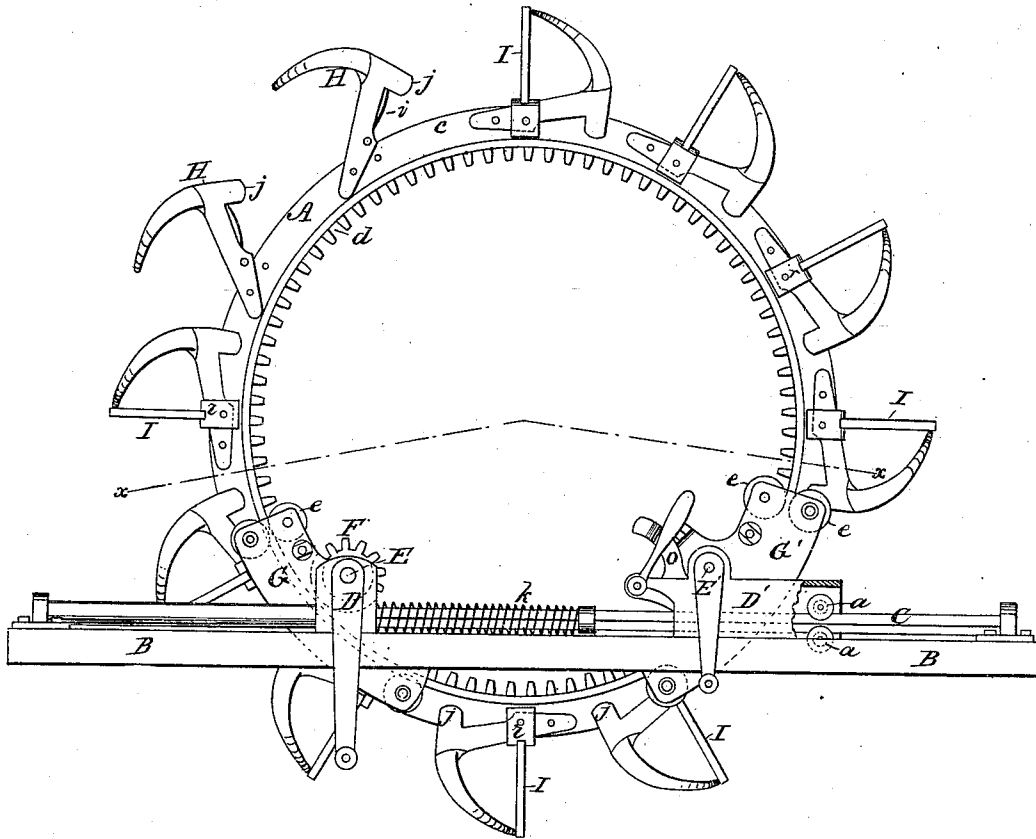


Fig. 3.

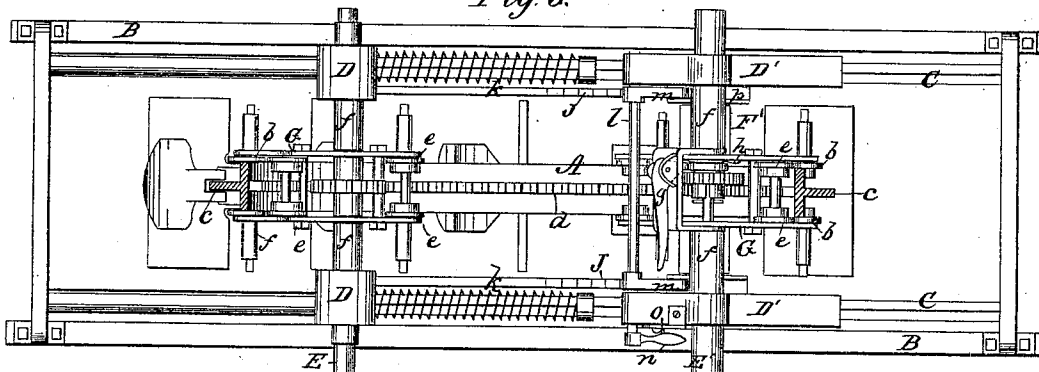
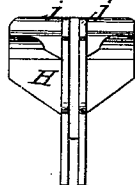


Fig. 4.



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UNITED STATES PATENT OFFICE.

WILLIAM S. WOOTTON, OF SCOTTSBURG, VIRGINIA.

IMPROVEMENT IN PROPELLING-WHEELS.

Specification forming part of Letters Patent No. 179,385, dated June 27, 1876; application filed June 13, 1876.

To all whom it may concern:

Be it known that I, WILLIAM S. WOOTTON, of Scottsburg, in the county of Halifax and State of Virginia, have invented a new and Improved Propeller-Wheel; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, forming part of this specification, in which—

Figure 1 is a side elevation, showing the improved wheel in position grappling the bed of the river, and free to adjust itself about axes E. Fig. 2 is a side elevation of the wheel in its elevated position, with paddles attached and adapted for use as a paddle-wheel. Fig. 3 is a section taken on the line *xx* of Fig. 2; Fig. 4, a detail of one of the grappling-arms.

My invention relates to a novel construction of propeller-wheel, designed more particularly to be used upon small boats on shallow rivers, but applicable also for general use. It belongs to that class of propeller-wheels which automatically adjust themselves to the irregularities of the bottom of the river, so that if a rock or sand-bar be struck by the wheel, it readily mounts and passes over the same.

The invention consists in a wheel having no central axis or radial arms, but constructed simply of a rim with an internal gear, which rim is supported in variable positions upon two eccentric axes, one of which is a stationary drive-shaft, that actuates the wheel through a pinion, and the other of which axes is laterally adjustable, and provided with clutch and adjusting mechanism, whereby the wheel may be maintained at any given position and rotated, or may be left free to its automatic adjustment to mount and pass over obstructions. The said wheel is provided with grappling-arms, which engage with the bed of the river, when the wheel is at its lowest point and operating with its automatic adjustment, and urge the boat along, and is also provided with paddles, which, when the wheel is in a fixed elevated position, propel the boat by the resistance of the water, and in a manner characterized by peculiar advantages, as will be hereinafter more fully described.

In the drawing, A represents the wheel mounted in the frame-work B, which frame-

work represents a portion of the timbers of the boat. Said wheel may be located in the center of the boat, at the stern, or they may be arranged in pairs upon opposite sides of the boat. C C are horizontal guides and supporting-rods, which are arranged parallel to each other upon opposite sides of the wheel, which rods carry the bearings D D' for the two axes E E', of which bearings D are stationary and D' laterally adjustable on rods C, friction-rollers *a* being arranged in the bearings to engage at the top and bottom of said rods. The wheel consists simply of a rim, T-shaped in cross-section, forming flanges *b b* *c*, and having an internal gear of cogs or teeth, *d*, with which gearing the pinion F' of drive-shaft E engages to actuate the wheel, and with which also the pinion F' of shaft E' engages to adjust the wheel in its different positions.

G G' are arc-shaped frames, curved to conform to the wheel, and provided with flanged friction-wheels *e*, which run upon opposite sides of the flanges *b b* of the wheel, and serve to hold the latter in proper position in the frame while being rotated, the flanges of the friction-wheel serving to prevent lateral displacement. Said frames are provided upon each side with tubular journals *f*, which extend through and revolve in bearings D D' upon the rods C, which arrangement permits the frames G G' to oscillate and adapt themselves to the different positions of the wheel. Through the tubular journals of the frames pass the shafts E E', which carry the pinions F F', of which pinions F is rigidly attached to its shaft, and constitutes the means by which the power is applied to the wheel, while F' is a loose pinion, to be either coupled with the shaft E', when it is desired to raise the wheel by rotating said shaft, or to be detached therefrom when the wheel is left to its automatic adjustment. This coupling mechanism consists of a pivoted elbow-lever, *g*, forked at the end, and loosely connected with pinion F', so that a deflection of the lever moves the pinion laterally on its shaft into or out of gear with the teeth of the wheel. The said pinion is provided with a slotted thimble, which receives a cross-pin on its shaft to effect the coupling, and it is held thus coupled by a

spring, *h*, located between the pinion and the frame *G'*.

From the above description it will be seen that the wheel is in the nature of a suspended wheel, having an adjustment about the drive-shaft *E* as a center, so as to rise and pass over obstructions, the frame *G'*, shaft *E'*, and bearing *D'* each automatically adapting themselves to said adjustment, and still supporting the wheel in such a free and easy relation as to allow its continuous rotation through the drive-shaft in all positions.

The advantage arising out of the adjustment of the wheel about a single stationary eccentric shaft *E* is, that in meeting obstructions the wheel recedes—not in a direct vertical line, nor in a horizontal line, but just between the two, upwardly, obliquely, and to the rear, in the most natural and easy manner.

This easy manner of passing over obstructions is an important advantage in connection with this form of wheel, for the reason that it is mainly designed to propel the boat by continuous contact with the bottom of shallow rivers through grappling-arms. These grappling-arms *H* consist of flukes attached to shanks, which are bifurcated at their ends and pivoted to the flange *c* of the wheel. These arms are also provided with springs *i*, which enable them to yield to the strain upon the wheel produced by a sudden concussion, and have also projections *j j*, which, when the flukes are in the bed of the river, exerting their traction, pass upon opposite sides of the flange *c* of the wheel, and prevent lateral displacement.

As the wheel rises and passes over irregularities of the bed of the river, the wheel will, at times, have a sudden fall as it leaves a projection of any kind, and to obviate strain upon the working parts I have arranged a set of springs, *k*, upon the guide-rods *C*, which form a cushion against which the movable bearings *D'* strike when the wheel falls, and by which the sudden descent of the wheel is broken.

When the wheel is to be used as a paddle-wheel it is provided with paddles *I*, which are attached to the flange *c* of the wheel, and the position of the wheel is changed from that of a suspended wheel, as shown in Fig. 1, to a supported wheel, as in Fig. 2, in which the center of the wheel is above the shafts. The wheel is elevated to this position simply by a rotation of the shaft *E'*, and is held to its adjustment by a ratchet-and-pawl mechanism, which consists of a horizontal rock-bar, *l*, journaled in extensions of the movable bearings, and provided with pawls *m m*, and a lever, *n*. When said shaft is rocked in one direction by lever *n*, the pawls are made to engage with ratchet-teeth on bars *J*, arranged parallel with guide-rods *C*, and by thus preventing the movement of the movable bearings outwardly prevents also the descent of the wheel.

As shown, the ends of these bars *J* are left free, and are adapted to be supported in guides *p p* of the bearings; but they may be rigidly fastened at both ends, if desired. The lever *n* is held in position by a spring-catch, *o*, or by a separate ratchet-wheel, if desired, and by means of the same the wheel may be adjusted variously in its elevated position.

When the paddles are employed it will not be necessary to remove the grappling-arms, as they are bent back and fastened in the rear of the paddles by the same bolt *r* which is employed for fastening on the paddles, but one bolt being necessary for this purpose, for the reason that the tip of the flukes of the grappling-arms bear against the paddles at a point near their outer edges, and thus relieve their attachment of a large portion of the strain.

The advantage arising out of the use of this wheel as a paddle-wheel in its elevated position is as follows: The wheel being of large diameter the curvature of its arc, or any given portion of its circumference, is comparatively small, and when in the elevated position it is adapted to shallower waters, a proportionally larger number of paddles are in the water, and the line of their draft being more nearly horizontal, they carry less dead water, and it thus secures to a certain extent the same results aimed at by "feathering" the paddles.

Having thus described my invention, what I claim as new is—

1. A propeller-wheel, consisting of a rim with an internal cog-gear, in combination with two eccentric shafts carrying pinions, one of which shafts is stationary and forms the drive-shaft, and the other of which is movable, for the purposes of adjustment, as described.

2. The combination, with the wheel *A*, having a cog-gearing and flanges or guideways, of a shaft, *E*, carrying a pinion, and a frame, *G*, carrying friction-wheels and journaled concentrically with shaft *E*, as and for the purpose described.

3. The combination, with the wheel and the guide and support rods *C*, of the adjustable bearing *D'*, as and for the purpose described.

4. The combination, with the rods *C* and the adjustable bearing *D'*, connected with and controlled in position by the position of the wheel, of the buffer or cushion springs *k*, substantially as and for the purpose described.

5. The combination of the wheel *A*, having gear *d*, with the movable shaft *E'*, the adjustable pinion *F'*, and the lever *g*, substantially as and for the purpose described.

6. The combination, with the wheel and the movable bearings *D'*, of the bars *J*, having ratchet-teeth, and the pawl mechanism *m n o*, as and for the purpose described.

7. The combination, with a propeller-wheel, of spring-seated grappling-arms, substantially as and for the purpose described.

8. The combination, with the wheel, having

flange *c*, of grappling-arms H, having projections *jj*, as and for the purpose described.

9. The combination, with the wheel having flange *c*, of the paddles I, and the bifurcated grappling-arms, having projections *jj*, fastened back by the same bolt that secures the paddles, and bearing at the tip of their flukes against the paddles, as and for the purpose described.

10. The propeller-wheel, consisting, essentially, of a T-shaped rim, having flanges *b b* *c*, and an internal gear, substantially as and for the purpose described.

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