2 Sheets. Sheet 1.

F. B. Scott,

Paddle Wheel.

No. 39,248. Patented July 14, 1863.

FIG. I.

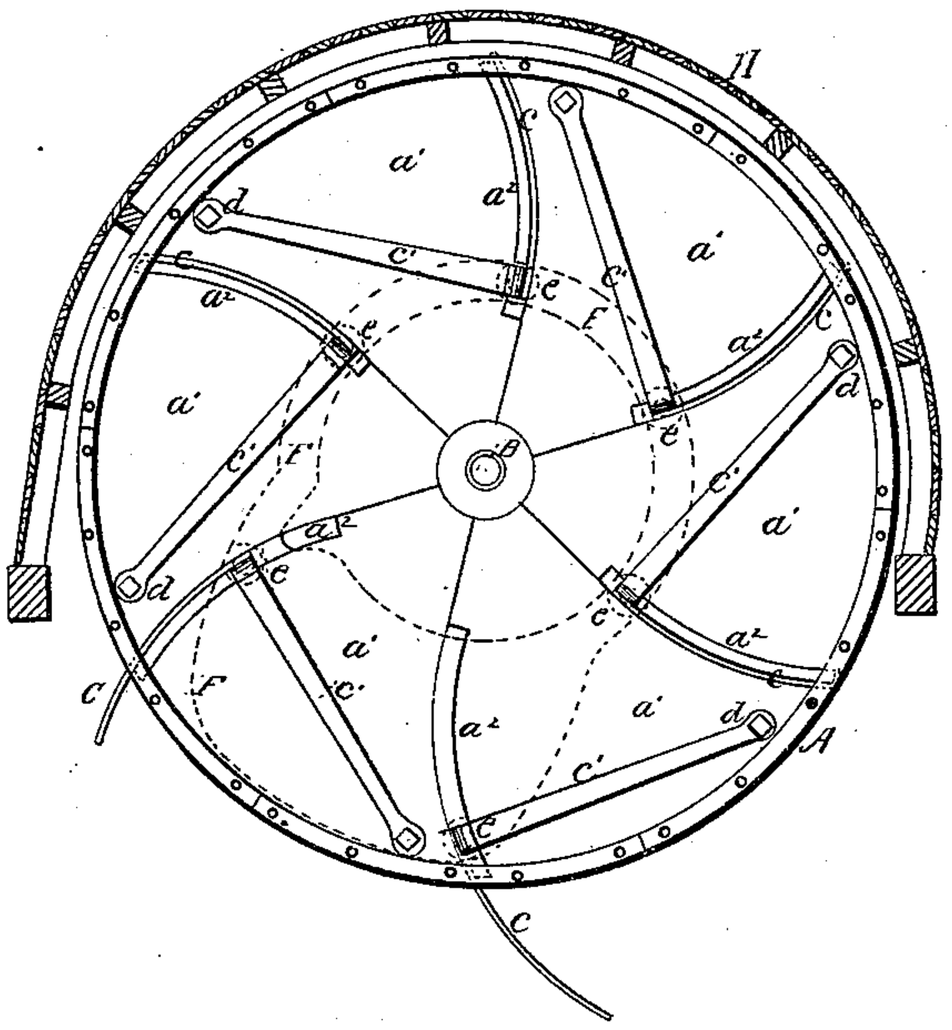
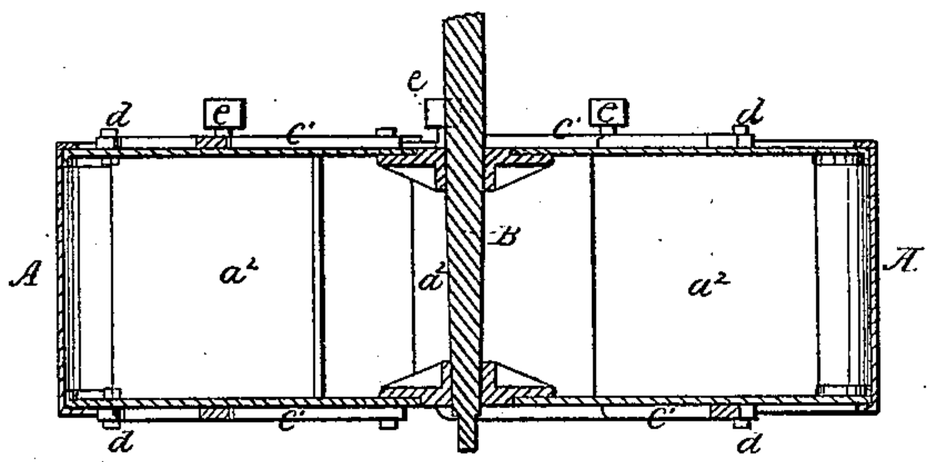


FIG. II.



Witnesses:

H. O. Forbush

E. B. Forbush

Inventor:

Francis B. Scott.

2 Sheets. Sheet 2.

F. B. Scott,

Paddle Wheel.

No. 39,248. Patented July 14, 1863.

FIG. II.

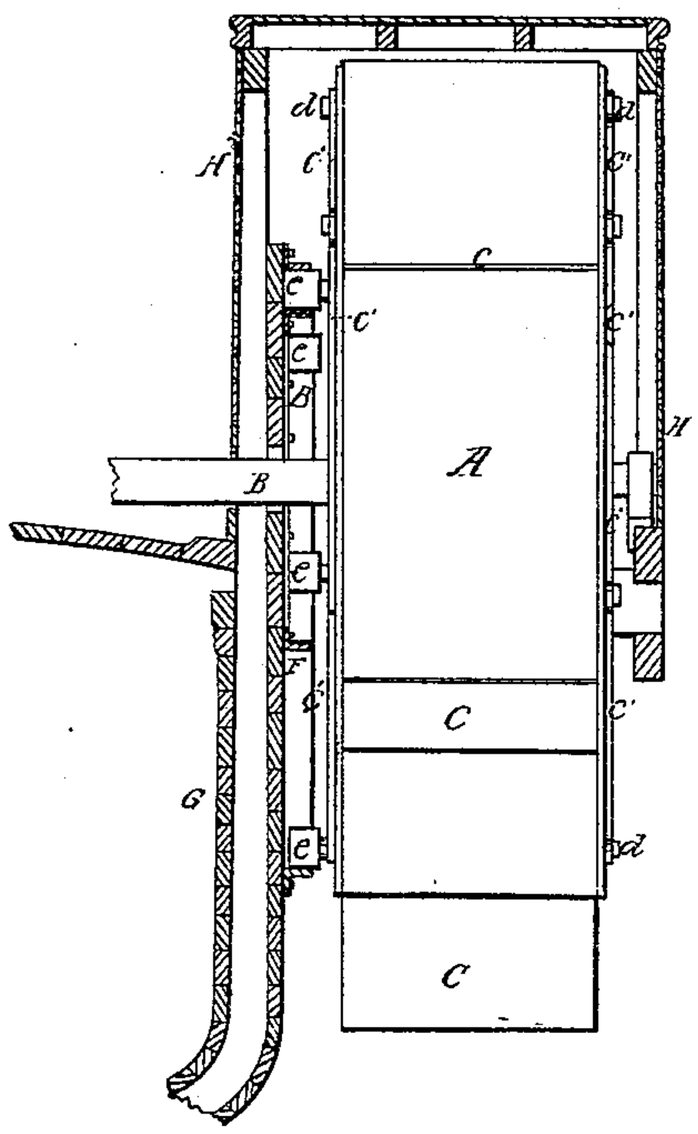


FIG. V

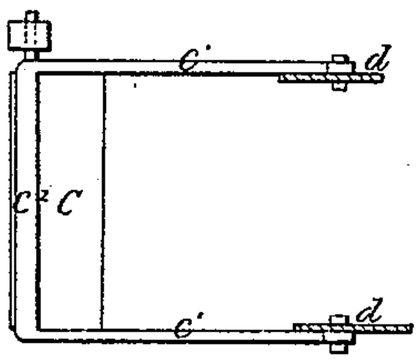


FIG. IV.

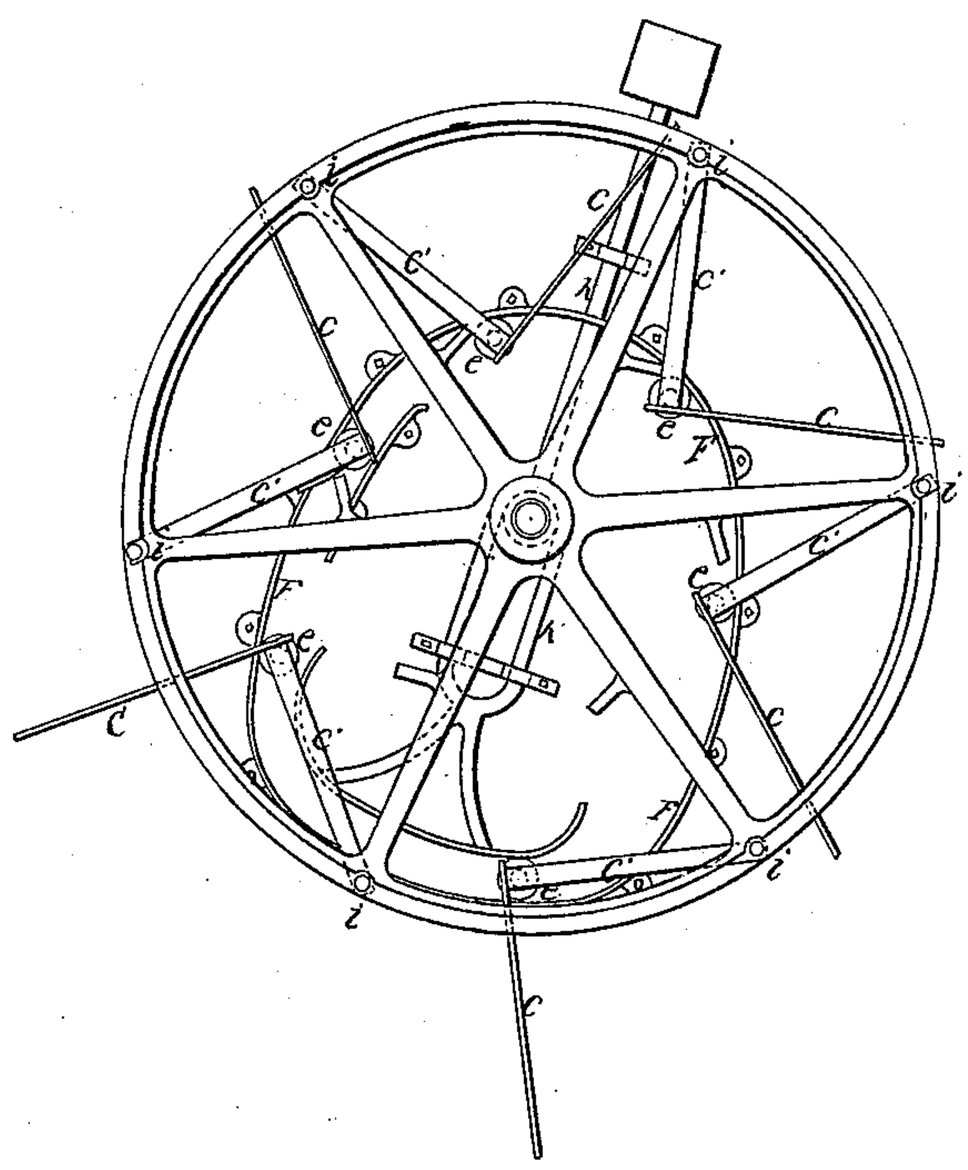
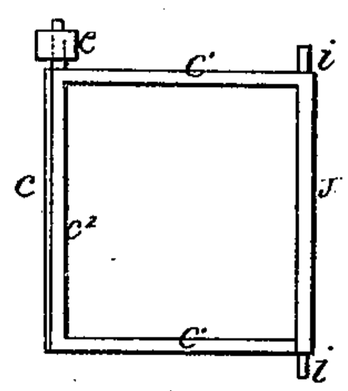


FIG. VI.



Witnesses:

W. H. Forbush

C. B. Forbush

Inventor:

Francis B. Scott.

UNITED STATES PATENT OFFICE.

FRANCIS B. SCOTT, OF BUFFALO, NEW YORK.

IMPROVED PADDLE-WHEEL.

Specification forming part of Letters Patent No. **39,248**, dated July 14, 1863.

To all whom it may concern:

Be it known that I, FRANCIS B. SCOTT, of the city of Buffalo, and State of New York, have invented a new and Improved Paddle-Wheel; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure I is a side elevation of a paddle-wheel with curved buckets. Fig. II is an end elevation of the same. Fig. III is a section. Fig. IV is a side elevation of said wheel with straight buckets. Fig. V is a plan of the curved bucket. Fig. VI is a plan of the straight bucket.

Letters of like name and kind refer to like parts in each of the figures.

The nature of my invention relates, first, to making a paddle-wheel for propelling boats upon the water in such a manner that the buckets or propelling-blades will be thrown outwardly beyond the periphery of the wheel in that part of its revolution when the buckets will take a propelling hold upon the water, and be drawn within the wheel at such points in its revolution when the buckets are passing through the air; second, in making the wheel with divisions, which divisions can be made water-tight compartments or otherwise, between which divisions or compartments the buckets withdraw when passing through the air, and emerge therefrom when passing through the water.

A represents a paddle-wheel of any required diameter, which may be made solid, of wood, with slots or openings running from the periphery toward the center for the buckets to work through, or it may be made of boiler-iron or other suitable material, with water-tight compartments, which are shown at a', Fig. I. The slots or spaces between the divisions or compartments through which the blades work are shown at a^2. These slots or spaces are just large enough to allow the blades to work free and easy through them, leaving no spare room for obstructions to get in.

B represents the axle or shaft upon which the wheel revolves, and which has appropriate journal-bearings, as in a common manner.

The blade or bucket is shown at C. It is connected to a bucket-frame, which consists of the arms c' and the cross-piece c^2, which are shown in Fig. V. These arms are hinged to the sides of the wheel, as shown at d in Figs. I, III, and V, so that the arms working upon their hinges will allow the blades to work in and out of the slots as the wheel revolves. The arms work on the outside of the wheel and closely thereto, so that no solid substance can get in between the arms and the wheel.

In Fig. I a curved blade is shown, and in Fig. IV a straight blade is shown. Either form may be used, as may be preferred. The straight blade may be made of spring-metal, so that the blade itself will yield if it strikes a solid substance. Upon the end of the cross-piece c^2 is placed a friction-roller, e, which works in a cam, F, in order to throw the blades outwardly and draw them in at the proper points in the revolution of the wheel. The cam F is so formed and placed as to throw the blade out in such portion of the revolution of the wheel as will cause the blade to take a propelling hold upon the water, and draw the blade into the wheel when passing through the air. It is so shaped that it will throw the blade out when the blade comes round to the water, but it allows the blade to draw back into its slot in case it strikes an obstruction. The weight of the blade is sufficient to keep it in the water when there are no obstructions in the way. The cam forces the blade back into the wheel as the blade leaves the water. The cam may be made of cast or wrought iron, and connected by ordinary means to the vessel within the wheel-house. A section of the wheel-house is shown at H, and a section of the vessel or boat is shown at G.

In Fig. IV is represented a skeleton wheel. The arms of the blades are hinged or pivoted to the rim of the wheel, as shown at i, Fig. IV, by means of the cross-piece J, shown in Fig. VI. A portion of the cam in this form of the wheel is connected to a weighted and vertically-moving lever, k, so that in case the blade should strike a solid substance while passing through the water—such as a log, cake of ice, or other solid body—the cam, or that part of it which is connected to the lever, will yield and allow the blade to draw back in the wheel until the obstruction is passed, a

thus prevent any great strain or injury to the blade or wheel. When the obstruction is passed, the weighted lever will drop that part of the cam down to its place again. In the other form of bucket, Fig. I, there is no upper bearing to the cam at that part of it when the bucket is in the water. Consequently I depend upon its weight and shape to keep it in the water and at the same time leave it entirely free to yield to obstructions.

The advantages of a wheel constructed as herein described are numerous.

First. The blades, being thrown out from the periphery of the wheel when they take hold of the water, permit the use of a wheel of smaller diameter (and hence a smaller wheel-house) with equal propelling advantage, as though a wheel of ordinary construction had a diameter equal to the uttermost throw of the blades.

Second. The blades are less liable to be broken or injured than ordinary blades, because if they strike a solid substance they will give back or withdraw into the body of the wheel until the obstruction is passed.

Third. This wheel is admirably adapted to flat-bottomed boats, for canal, river, and all shallow-water navigation, as the blade will not be injured by striking the ground or the sloping banks of a canal. The wheel can be so placed as to allow the blades to dip as low or lower than the bottom of the boat. They take a deeper hold upon the water than ordinary blades, and feather themselves in a very easy manner.

Fourth. The wheel may be run to the depth of its axle in the water, and, when made of solid wood or of boiler-iron in water-tight compartments, it has a buoyant power sufficient, or nearly so, to sustain its own weight. The skeleton wheel shown in Fig. IV may also run to the depth of its axle in the water, but its blades are more liable to encounter obstructions from floating logs, ice, timber, &c.

Fifth. It is impossible to clog the blades by "tow-lines" or other obstructions when used for canal-boats, or by the rigging of disabled vessels floating in the water in case of a battle between gunboats.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The bucket *c*, attached to the arm *c'* at any given angle thereto, the arms being hinged to the wheel near the periphery thereof, and geared by an eccentric, which is supported by the boat, for the purposes and substantially as described.

2. Making the wheel with compartments *a'*, leaving an open space, a^2, between each, through which space the bucket advances and recedes, for the purposes set forth, and shown in the drawings.

FRANCIS B. SCOTT.

Witnesses:

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E. B. FORBUSH.