(No Model.) 2 Sheets—Sheet 1.

C. MEGOW.

FEATHERING PADDLE WHEEL.

No. 269,948. Patented Jan. 2, 1883.

Fig. 1.

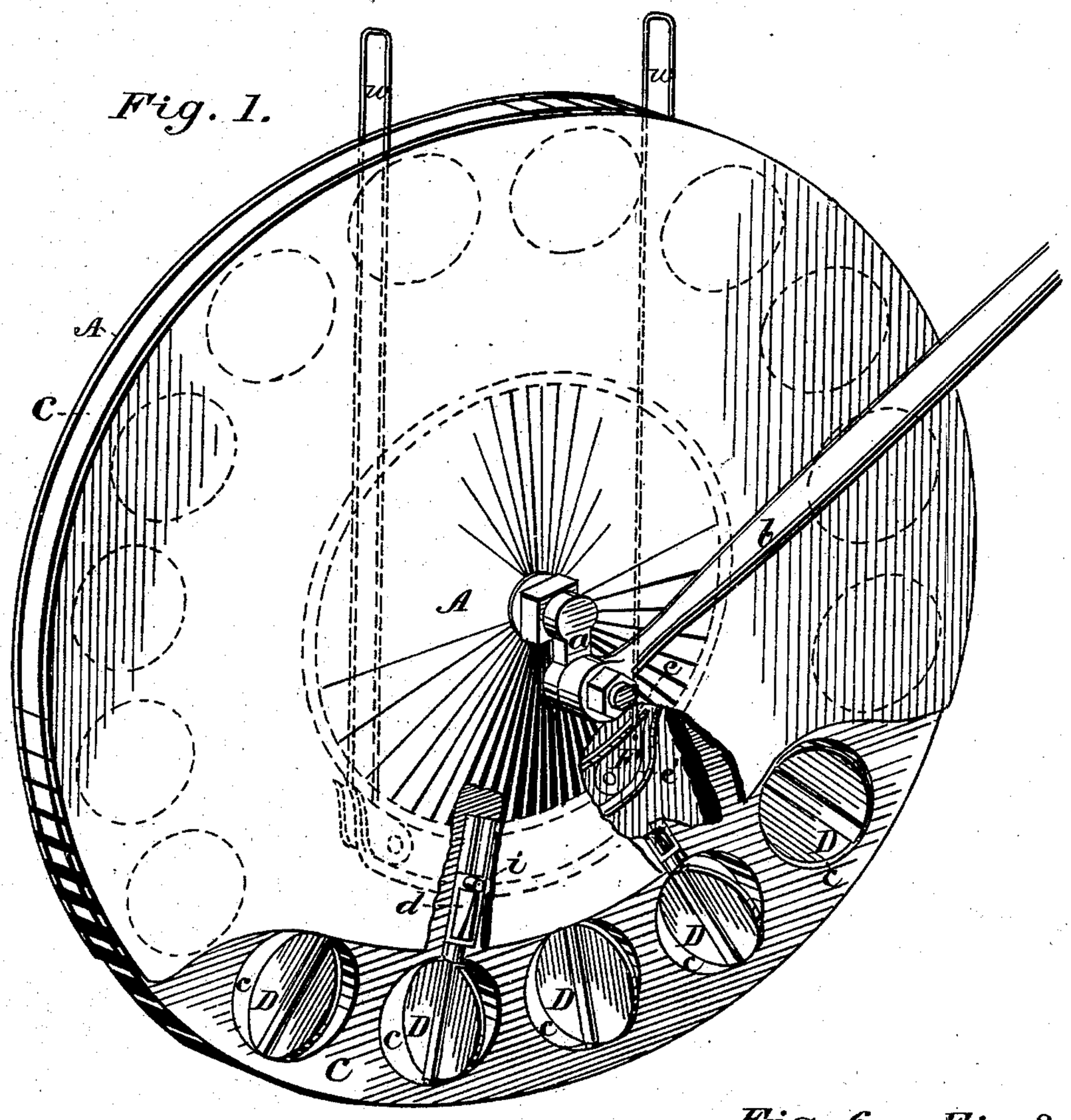

Fig. 5.

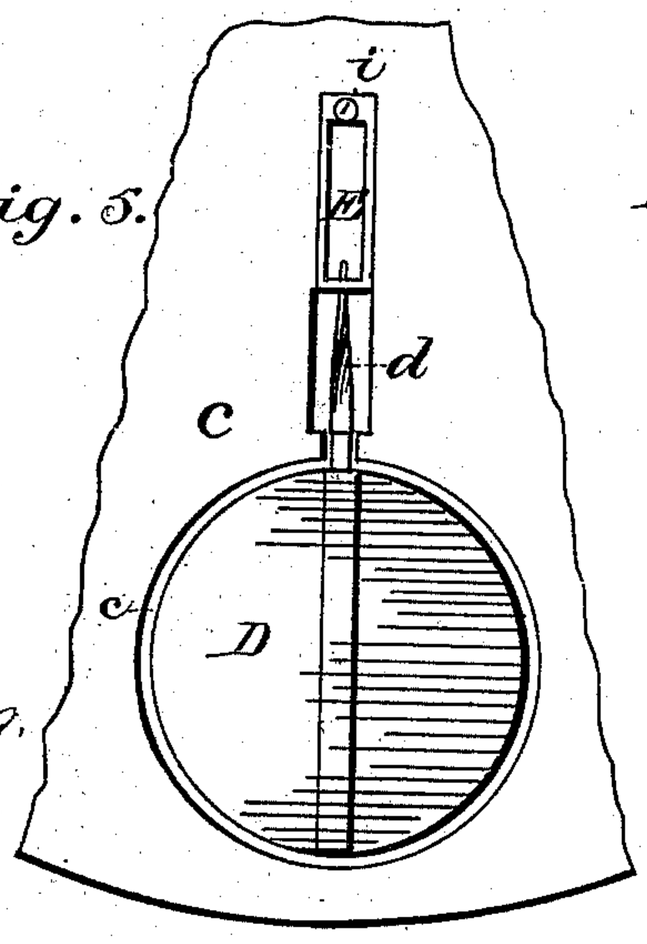

Fig. 6.

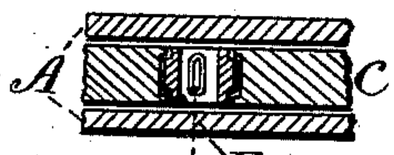

Fig. 7.

Fig. 8.

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

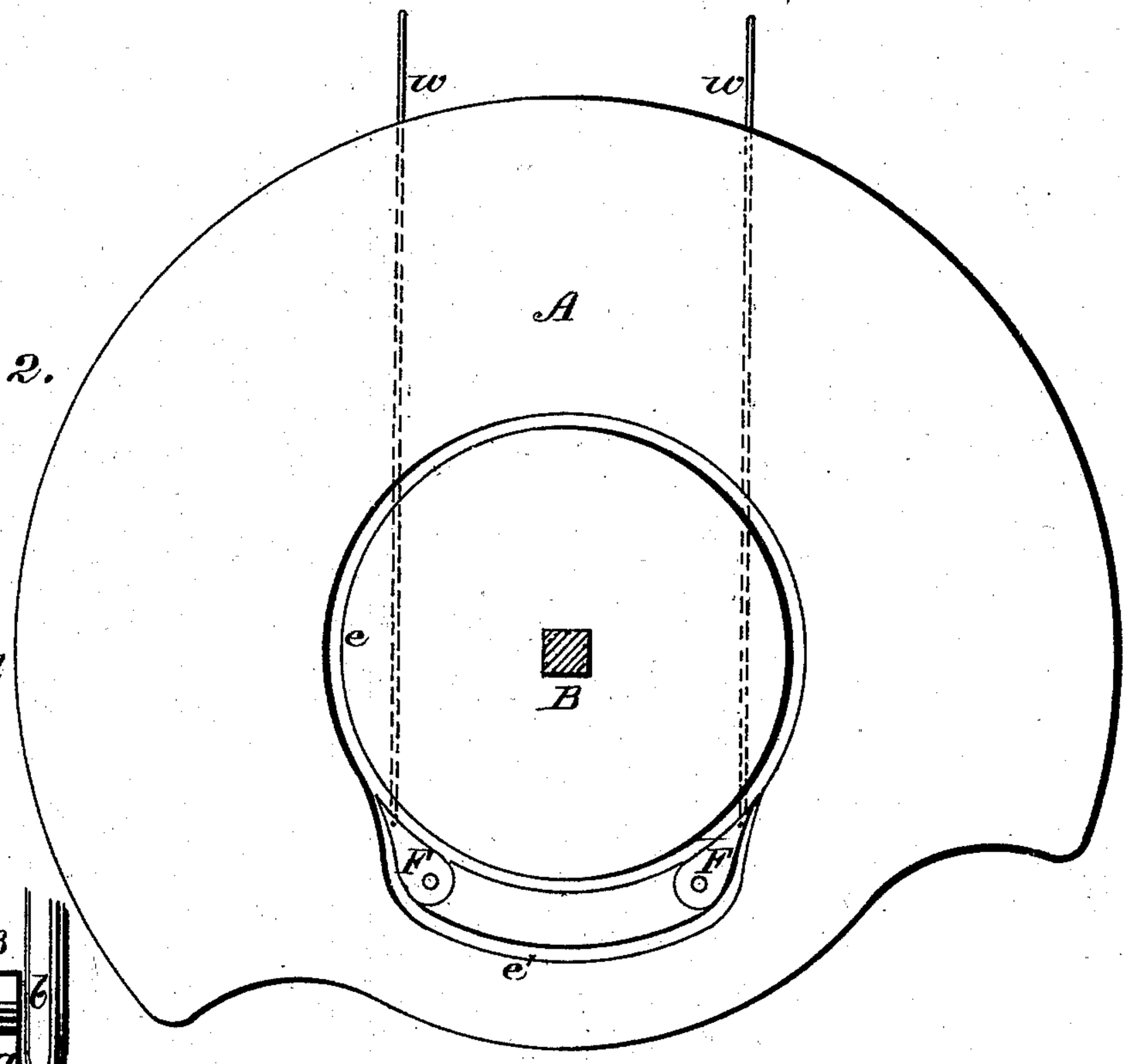


Fig. 2.

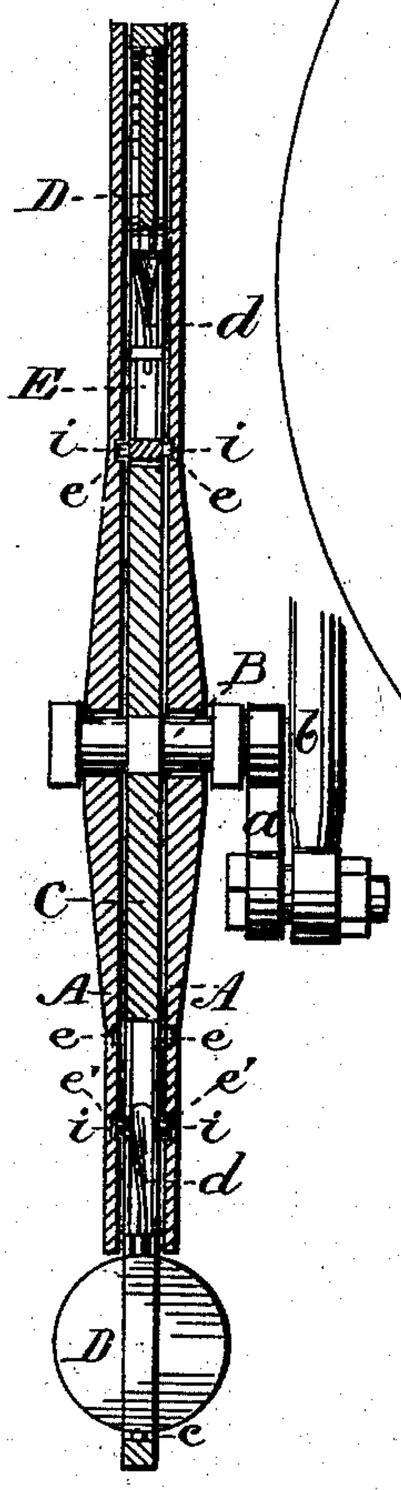
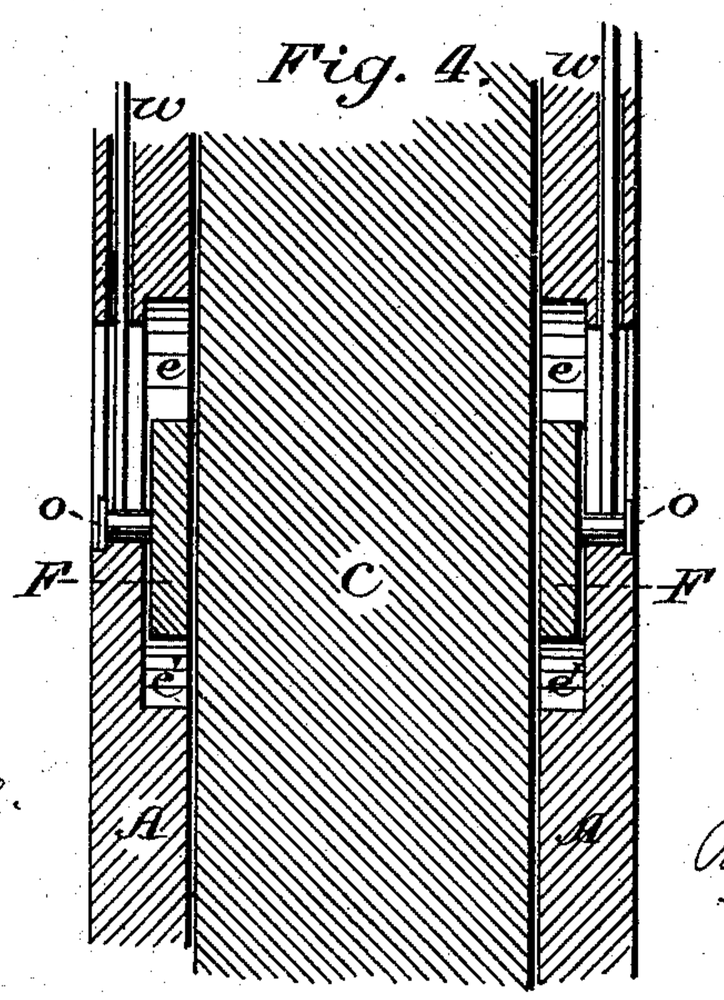


Fig. 4.



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UNITED STATES PATENT OFFICE.

CHARLES MEGOW, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR OF ONE-HALF TO JOHN L. MARKEL, OF SAME PLACE.

FEATHERING PADDLE-WHEEL.

SPECIFICATION forming part of Letters Patent No. 269,948, dated January 2, 1883.

Application filed September 25, 1882. (No model.)

To all whom it may concern:

Be it known that I, CHARLES MEGOW, of the city and county of San Francisco, State of California, have invented an Improved Propeller-Wheel; and I hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to a new and useful propeller-wheel; and it consists in a centrally-mounted revolving wheel, having around its outer circumference a number of swinging blades or fans having peculiar stems engaging with sliding frames set in the wheel. The wheel is mounted in a hollow casing, having a portion of its bottom cut away to permit the blades of the wheel to emerge therefrom and be exposed for a short distance. The inner surfaces of the casing have grooves in which pins or studs on the sliding frames travel, and these grooves are so made that by means of certain switching devices the pins are deflected from one groove to another to lower and elevate the frames, whereby the blades are turned at right angles with the wheel just after they emerge from the casing, and are again turned in line with the wheel before they re-enter the casing, all of which will hereinafter fully appear.

The object of my invention is to provide an effective propeller-wheel, which may with advantage be applied to steam-vessels, to which, on account of its simplicity, durability, and effectiveness, it is peculiarly adapted.

Referring to the accompanying drawings, Figure 1 is a perspective view. Fig. 2 is a vertical section taken at the diameter of the wheel. Fig. 3 is an elevation of the inside face of the casing A. Fig. 4 is an enlarged section through the switches. Fig. 5 is an enlarged elevation of a fan. Fig. 6 is a section through frame E. Figs. 7 and 8 are modifications of the stem *d*.

Let A represent a hollow casing, circular in form, with the exception of the lower part, which is cut away, as shown. This casing is completely inclosed, except where it is cut away below. Through its center is a shaft, B, which I have here shown as deriving revolution from a crank, *a*, and pitman *b*, Fig. 1.

Upon the shaft B, and within the casing, is the disk or wheel C, which, through the motion of the shaft, is caused to revolve in said casing. The wheel C being a perfect disk, a portion of its rim extends without the bottom of the casing, as in Fig. 1.

Around the wheel C, near its outer circumference, are made a series of apertures, *c*, in which circular fans or blades D are mounted. This is done by pivoting them vertically in any suitable manner, whereby they may be adapted to swing at right angles with the wheel C, or lie within its plane. An enlarged view of one of these blades is shown in Fig. 5. From its top a shank or stem, *d*, extends toward the center of the wheel C in a suitable opening cut out for it. This stem, as shown in Fig. 5, is a flat piece, and is so curved or turned that its ends stand at right angles with each other.

In the wheel C, suitably inclosed in guides, is a sliding frame, E. Through the bottom of this frame the stem *d* passes in a socket fitting closely its shape, which, in cross-section, is rectangular. The stem *d* is so turned that when the sliding frame E is raised to its limit the fan or blade D is closed—that is, it lies in the plane of the wheel; but when the sliding frame is depressed the stem *d* is turned by it to open its blade and cause it to stand at right angles with the wheel. It will be perceived, therefore, that by the elevation and depression of the sliding frame the swinging blade is closed and opened. Each blade has a stem, *d*, and a sliding frame, whereby each is operated.

The means I use to accomplish the movement of the sliding frames are as follows: Upon the inner surfaces of the sides of the casing A, I make grooves *e*, one in each surface, and having an equal radius. Upon the top of the sliding frames, extending on each side at right angles with the wheel, are pins or studs *i*, which fit into the oppositely-placed grooves *e* on each side. These grooves are far enough from the circumference of the wheel C to cause the sliding frames E, when their studs are fitted in them, to be raised to their limit, which, as before explained, keeps the blades closed. The grooves *e* being circular, the studs *i* travel at the same distance from the center, and thus if no further provision were made the blades would remain closed during the entire revolution of the wheel; but to provide for their open-

ing I have grooves *e'*. These are likewise made in the inner surfaces of the casing A and open out from the circular grooves *e* at a point about in the line of radius drawn from the center to the beginning of the cut-away portion of the casing A, and enter the main grooves again about in a line drawn from the center to the ending of said cut-away portion. These grooves *e'* make a rapid descent at each end, and continue in their middle portion on the same center as the grooves *e*. The effect of this is as follows: The studs *i*, when they successively reach the point where the lower grooves, *e'*, leave the main grooves, will be turned into said grooves *e'* by means I shall presently describe, and in following said grooves will be depressed, carrying down their sliding frames E and opening the blades D. This result is obtained (because of the position of the grooves *e'*) at the moment after each blade emerges from the casing A, and is free to swing open. After being open they remain so while the studs are traveling in the circular middle portion of grooves *e'*. When the other end is reached the studs travel up, raising frames E and closing the blades at the moment before they enter the casing A again. They then travel in the circular grooves *e*, the blades remaining closed in the casing. This operation is shown clearly in Fig. 2, where, in the upper portion, the blade may be seen in line, the studs traveling in the circular grooves *e*, while at the lower end the studs have been deflected into the lower grooves, *e'*, and the blade opened out.

I employ switching devices to change the travel of the studs as follows: These switches are marked F. There are four of them, two oppositely placed for each end of the grooves *e'*, and one for each surface of the casing. They consist of strips pivoted at their bases, and having their ends extending to the points of intersection of the grooves *e e'*. When the switches are lowered they close the grooves *e'*, as in Fig. 3, leaving the circular grooves *e* uninterrupted, in which case, as explained, the blades of the revolving wheel would not operate. When they are raised they close the grooves *e* and open grooves *e'*, so that the studs may be turned down and the blades opened, as described.

To operate the switches I have the wires *w*. These are connected with the switches through side pins, *o*, Fig. 4, and extend from each up through the casing, Fig. 1. They are joined together in pairs above, in order that each pair of switches may be operated simultaneously.

It will be seen that the wheel C may be reversed as well as driven forward, the operation being the same in either case.

Although I have here shown the stem *d* as being flat and turned as described, I do not confine myself to that particular form. I might use a round stem, as in Fig. 7, having suitably-turned ribs, operating in corresponding grooves in the sliding frame; or I might have, as in Fig. 8, a stem with a suitably-curved slot, in which a cross-pin in the sliding frame might travel. Any such form of stem would operate to produce the result desired. It will of course be seen that the switches F must not be made as long as the distance between the traveling studs *i* of each frame, in order to avoid having two sets of studs on the switch at the same time. If such were the case the switches could not be moved; but by making them shorter there is a moment between each set of studs when they are free to be moved.

The particular application of my device is as a propeller-wheel for steam-vessels. The casing A will be suitably located in the stern of the vessel in such manner that its cut-away portion will be down in the water. As each blade emerges from the casing into the water, and is rapidly turned at right angles, its effect is to propel the vessel or to back her, according to the direction of revolution of the wheel. In this application I find it desirable to so turn the stems *d* that each blade shall turn from the wheel on the side opposite that upon which its predecessor turns, in order to prevent the vessel from turning, as it would have a tendency to do if all the blades turned to the same side.

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

1. The centrally-mounted wheel C, means for revolving it, and the swinging blades or fans D, pivoted in the outer circumference of said wheel, and having spirally-turned stems *d*, in combination with the sliding frames E, with which the stems *d* engage, and a means for raising and lowering said sliding frames to close and open the swinging blades, all arranged and operating substantially as herein described.

2. The centrally-mounted wheel C, means for revolving it, and the swinging blades or fans D, pivoted in the outer circumference of said wheel, and having spirally-turned stems *d*, in combination with the sliding frames E, with which said stems engage, as described, said frames having oppositely-extending pins or studs *i*, and the hollow casing A, in which the wheel C revolves, said casing having a cut-away open bottom and circular grooves *e* upon its inner surfaces, in which the studs *i* travel, to hold the sliding frames up and keep closed the blades D, and short grooves *e'*, opening downwardly at each end from grooves *e*, and into which the studs *i* are deflected and travel, to depress and raise the sliding frames and open and close the blades D at the moment when they emerge from or enter casing A, all arranged and operating substantially as herein described.

3. The revolving wheel C, swinging blades or fans D in its rim, having spirally-turned stems *d*, and the sliding frames E, with which said stems engage, said frames having studs *i*, in combination with the means for raising and lowering said frames to turn the blades in

line with or at right angles to said wheel, consisting of the hollow opened bottom casing, A, inclosing said wheel, and having circular grooves *e* on its inner surfaces, and short grooves *e'*, opening downward at each end from grooves *e*, and the means for opening or closing said short grooves, for the purpose described, consisting of the pivoted switches F, operated by wires *w*, all arranged and operating substantially as and for the purpose herein set forth.

In witness whereof I hereunto set my hand.

CHARLES MEGOW.

Witnesses:
A. MAYERS,
J. H. BLOOD.