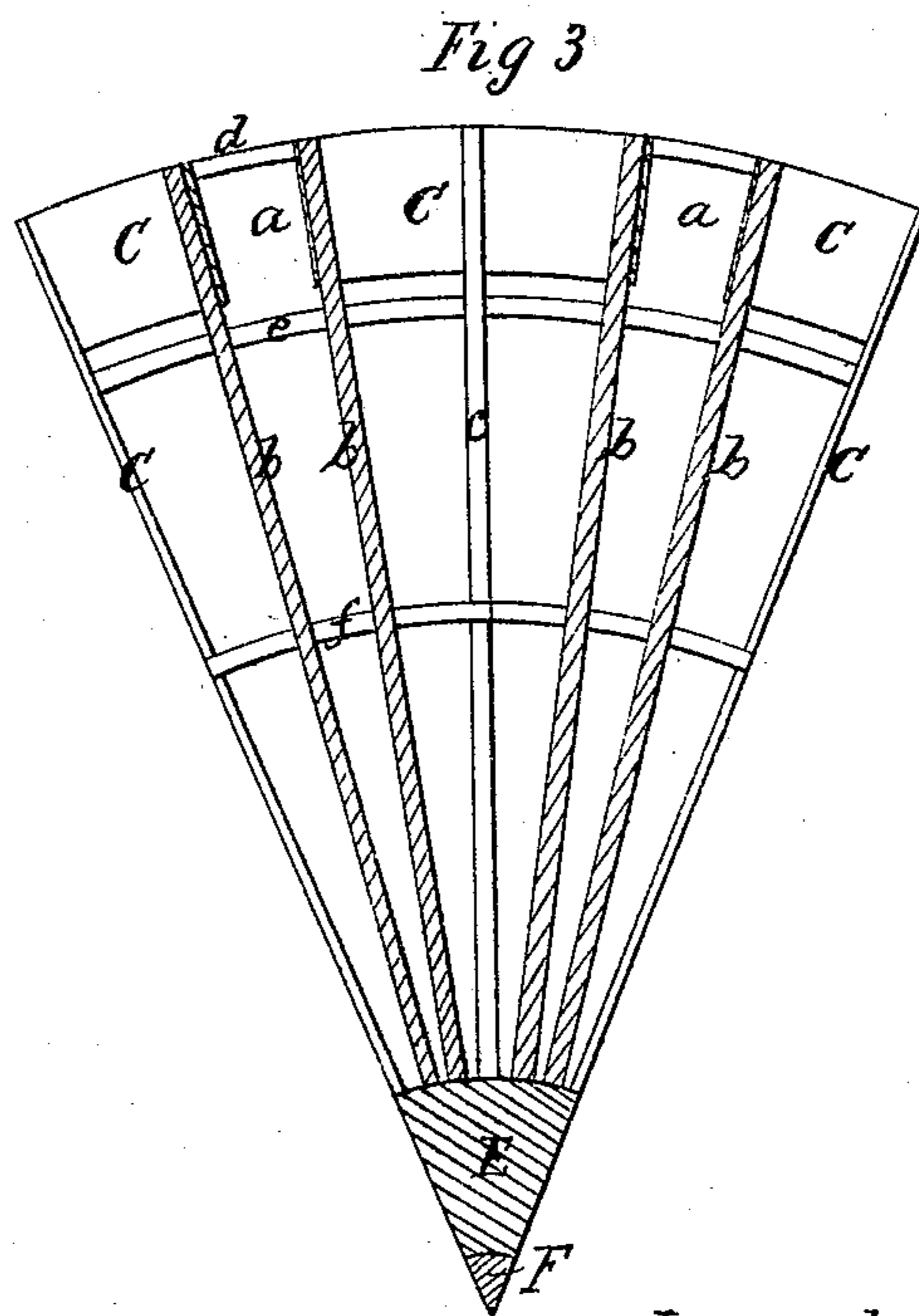
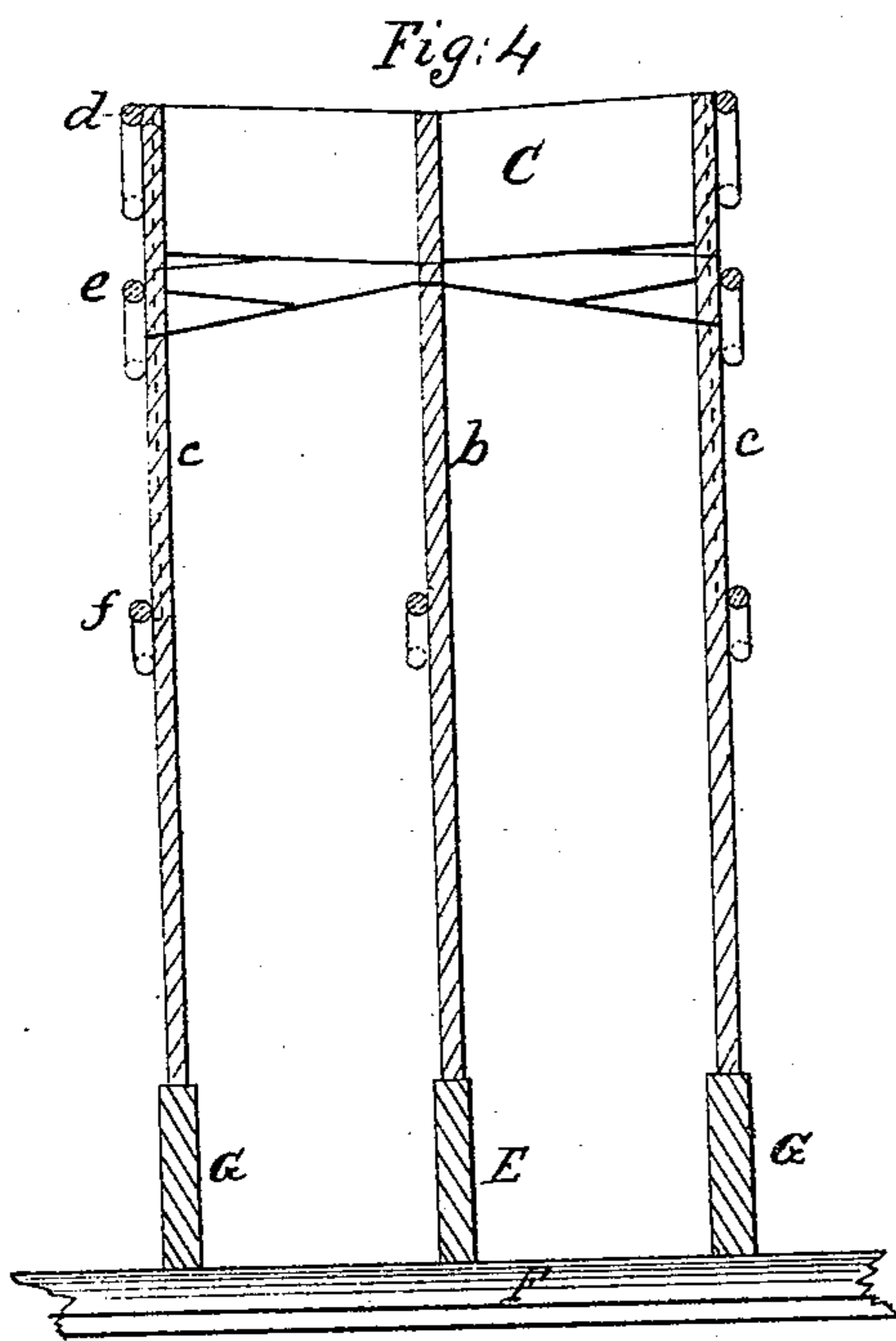
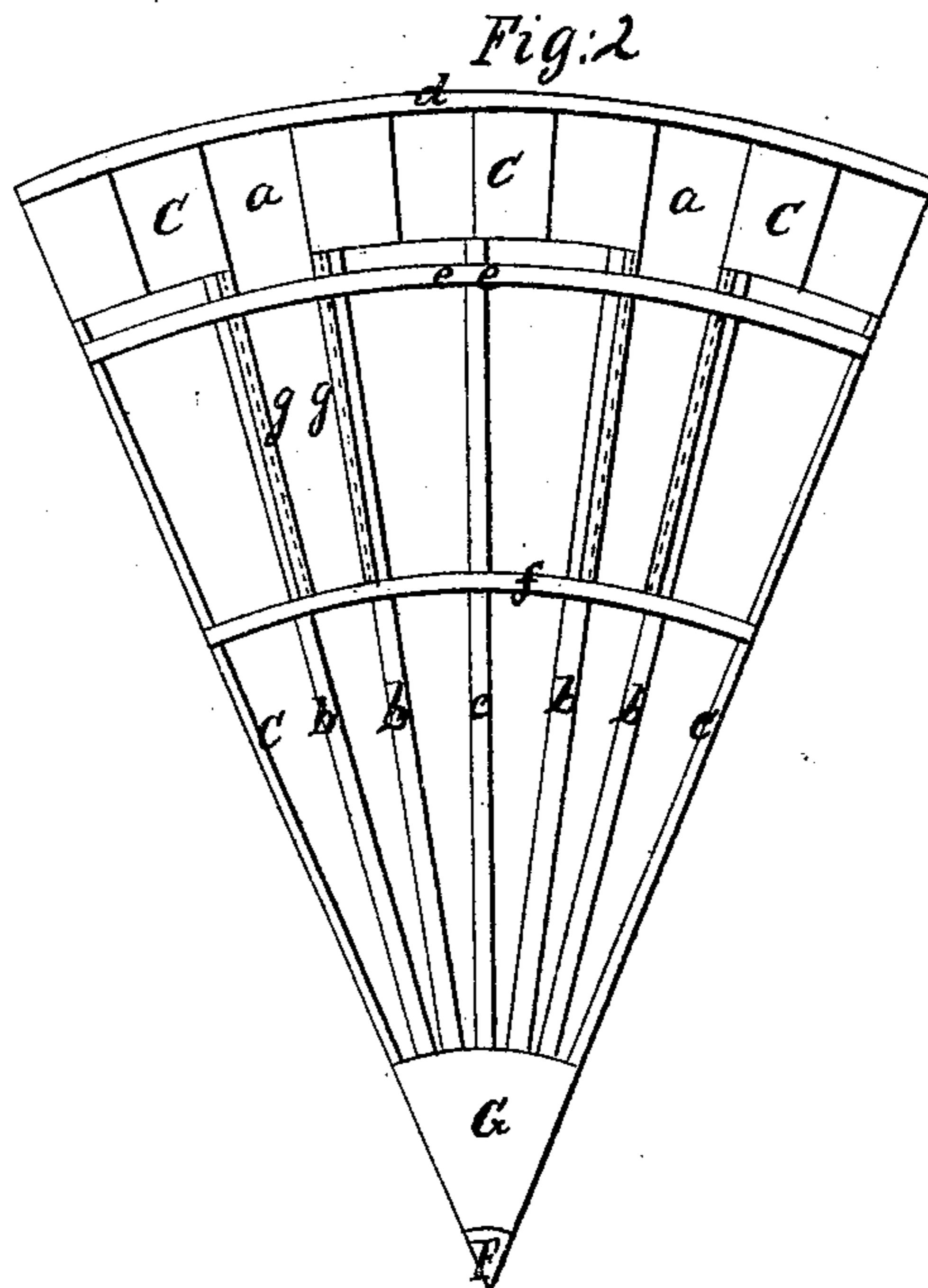
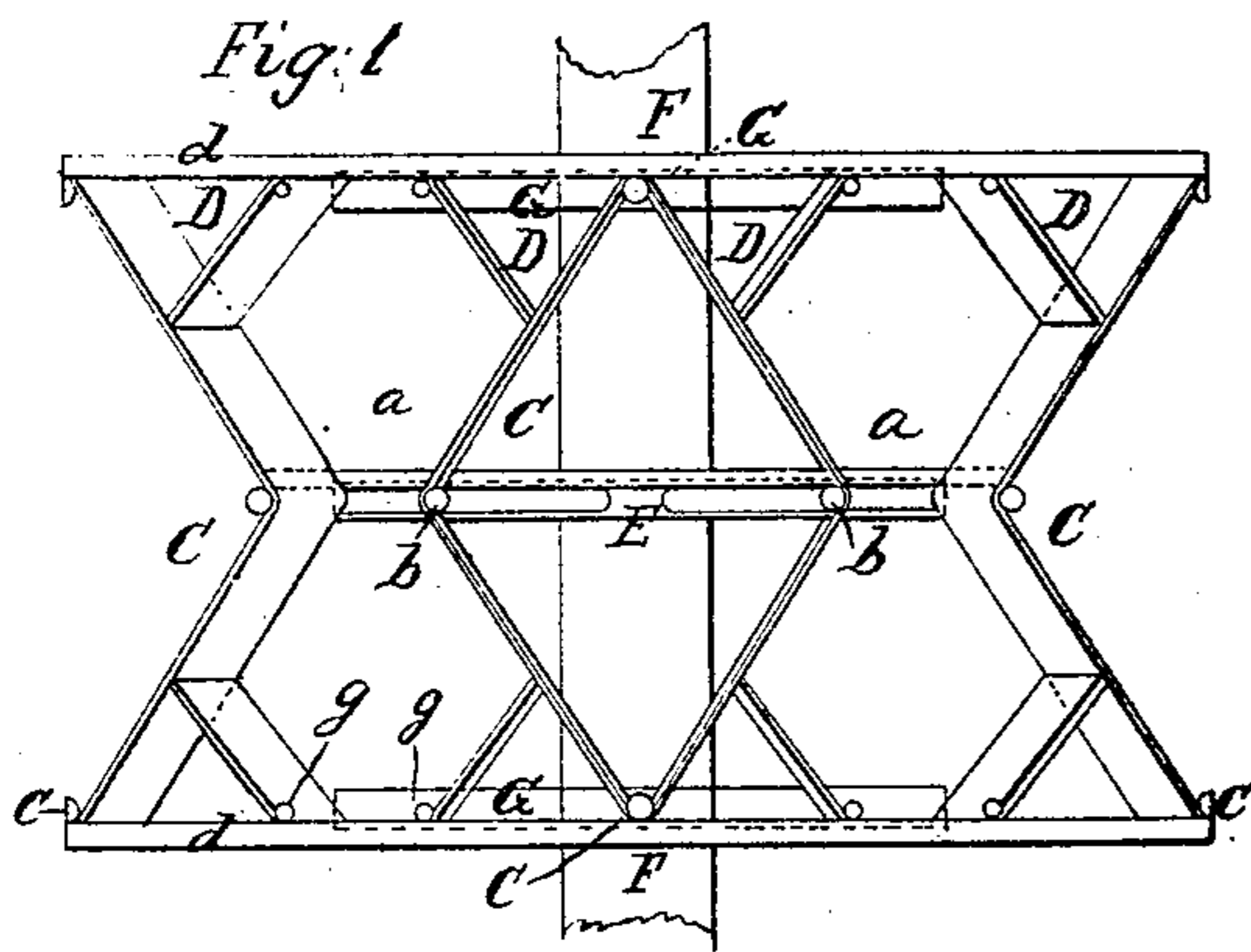


W. H. Holland. Paddle Wheel.

N^o 60,517.

Patented Dec. 18, 1866.



Witnesses.
Geo. H. Andrews
Samuel A. Piper.

Inventor
William H Holland
by his attorney
R. H. Eddy

United States Patent Office.

IMPROVED PADDLE-WHEEL.

WILLIAM H. HOLLAND, OF CHELSEA, MASSACHUSETTS.

Letters Patent No. 60,517, dated December 18, 1866.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL PERSONS TO WHOM THESE PRESENTS SHALL COME:

Be it known that I, WILLIAM H. HOLLAND, of Chelsea, in the county of Suffolk, and State of Massachusetts, have invented a new and useful Improvement in Paddle-Wheels for navigable vessels; and I do hereby declare the same to be fully described in the following specification, and represented in the accompanying drawings, of which—

Figure 1 is a top view.

Figure 2, a side elevation.

Figure 3, a longitudinal section; and

Figure 4, a transverse section of a sectional part of a paddle-wheel, made in accordance with my invention, the same exhibiting about one-eighth of the wheel, the remainder of it being similarly constructed.

This wheel is intended to be made of plate metal and metallic rods, (but may be constructed of wood, if desirable,) and in some respects is analogous to the wheel represented in Letters Patent numbered fifty-five thousand seven hundred and seventy, and granted to me; that is to say, it has two auxiliary floats, D D, combined with each of its main floats, C. Neither of the auxiliary floats, D, extend from the vertex of its main float, but projects from the main float at a point which is about midway between its vertex and the next adjacent end of the main float. Each main float, C, consists of a plate of metal bent at its middle to an obtuse angle, and their main floats are arranged in pairs, those of each pair, as well as their auxiliary floats, D D D D, being made to stand in opposite directions, as represented in the drawings; furthermore, there is a space, *a*, between the vertex of each float and that of the next float of the next contiguous pair. Each main float at its vertex lies against and is connected to one of a series of rods or arms, *b*, extended radially from a hub, E, fixed in a tubular or solid shaft, F. The said float is also connected at each of its ends to one of another set of radial arms or rods, *c*, there being two series of these latter arms, those of each series being projected from one of two other hubs, G G, arranged on the shaft, F, and with the first-mentioned hub between them in manner as represented in the drawings. Each outer set of radial arms is to be strengthened by being connected to a series of concentric rings, *d e f*, which are also provided with two shorter or auxiliary radial arms, *g g*, arranged between each pair of the arms, *c c*, and connected to the rings; to each of these auxiliary arms one end of one of the auxiliary floats, D, is fastened, the auxiliary arm serving as a support for the said float. My wheel, though in some respects similar to the paddle-wheel represented in the United States Patent numbered fifty thousand four hundred and seventeen, is very different therefrom; in this latter the floats or paddles of each pair are connected at their middles, whereas the main paddles of my wheel are entirely disconnected at their middles, and the arrangement of them is such as to form spaces between the vertices of every two of them, as set forth.

I do not herein claim the combination and arrangement of two auxiliary paddles, D D, with each of the main paddles or floats, C C; nor do I claim the wheel as exhibited in the patent hereinbefore last mentioned. I claim my improved paddle-wheel or propeller, as constructed, with its main and auxiliary floats C D, three series of radial rods and arms, and two series of radial auxiliary radial arms, arranged and combined together, and with rings and hubs, substantially as hereinbefore described.

WM. H. HOLLAND.

Witnesses:

R. H. EDDY,

F. P. HALE, Jr.