

(No Model.)

R. G. KIRKWOOD.

WIND WHEEL.

No. 254,985.

Patented Mar. 14, 1882.

Fig. 1.

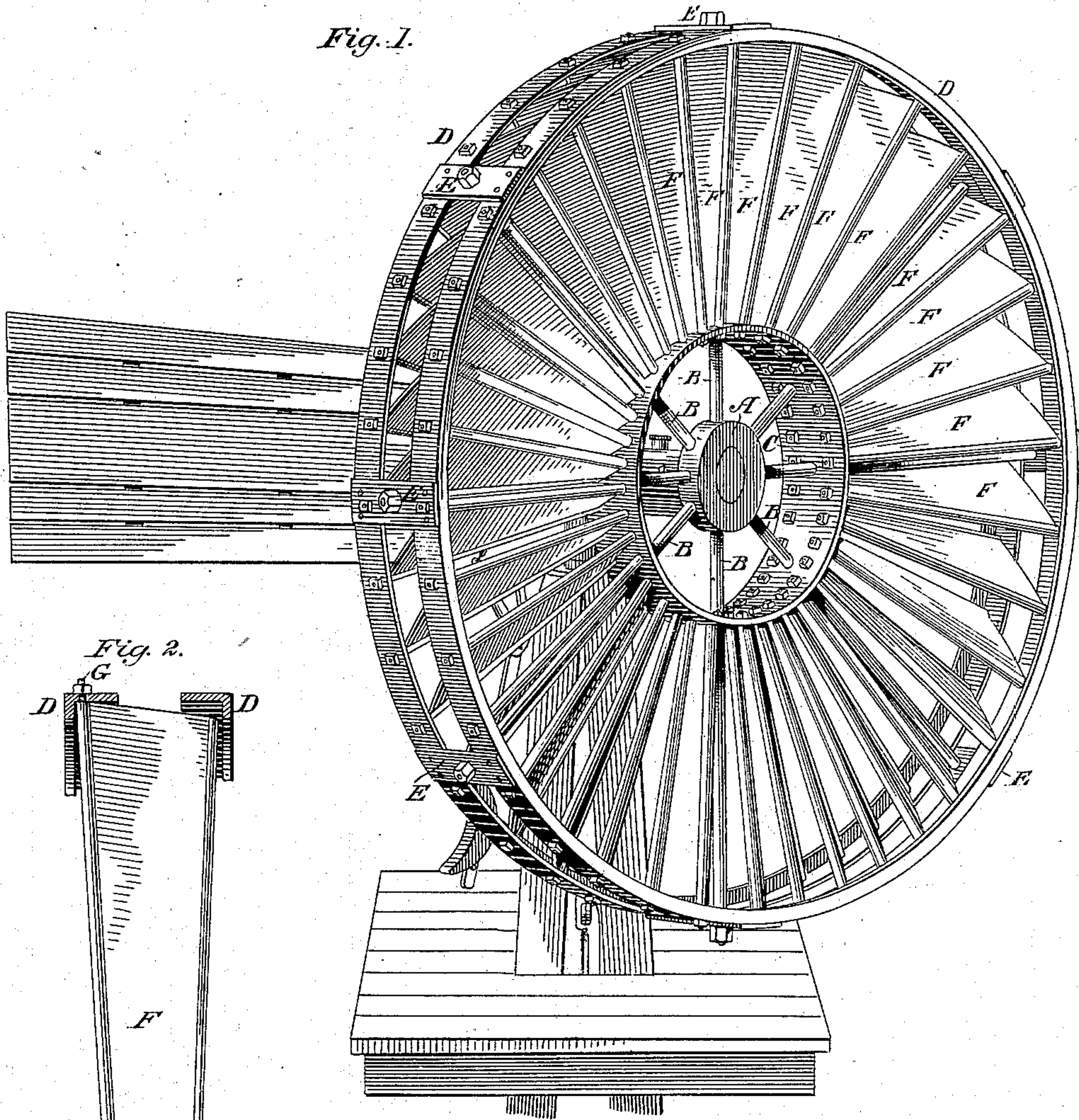


Fig. 2.

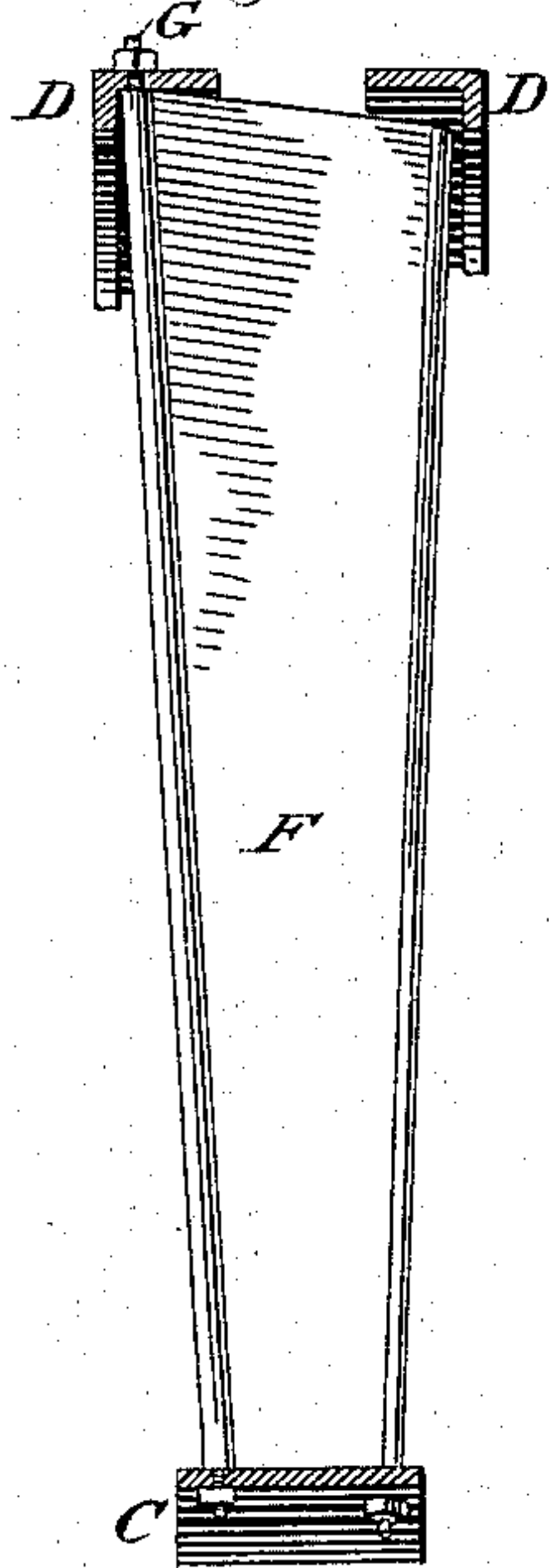


Fig. 3.

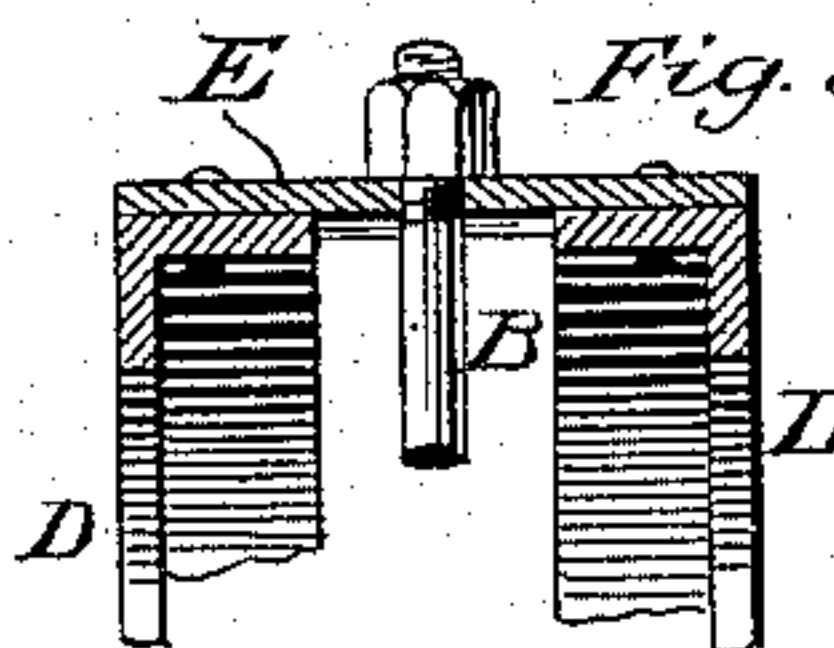


Fig. 4.

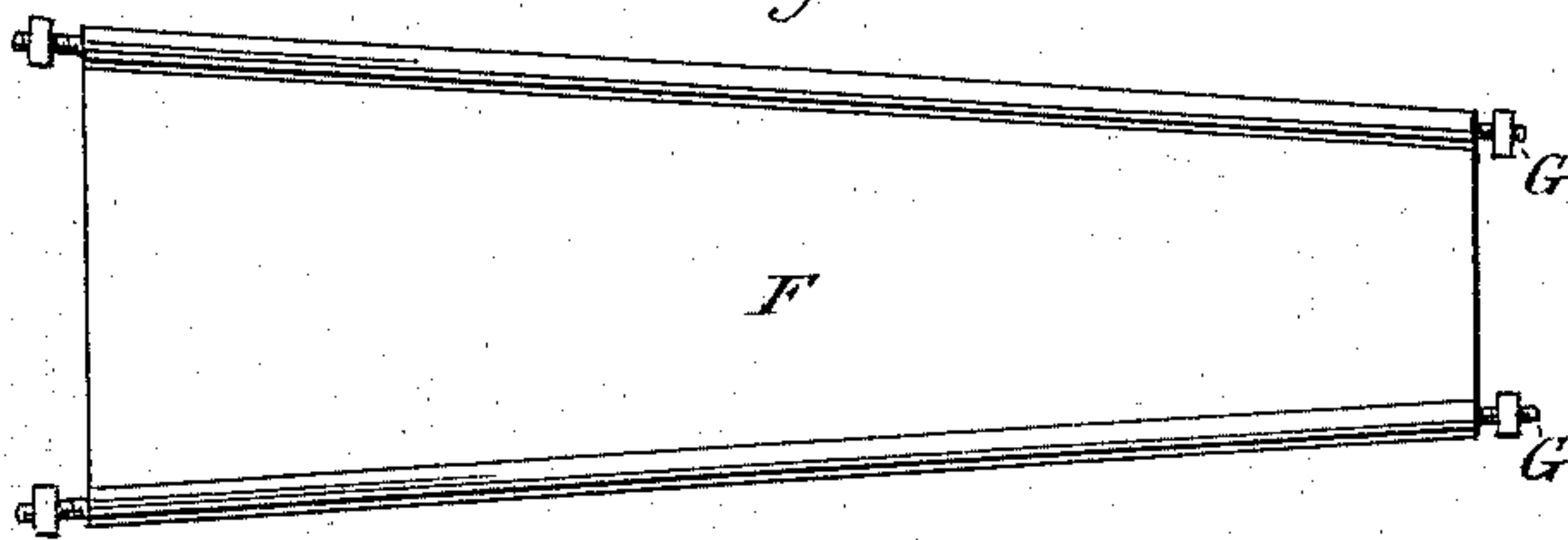


Fig. 5.

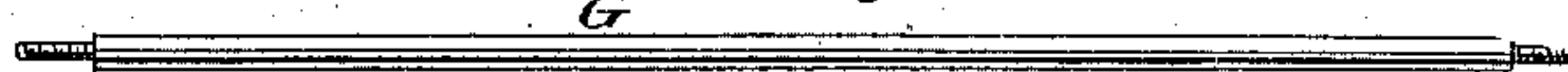
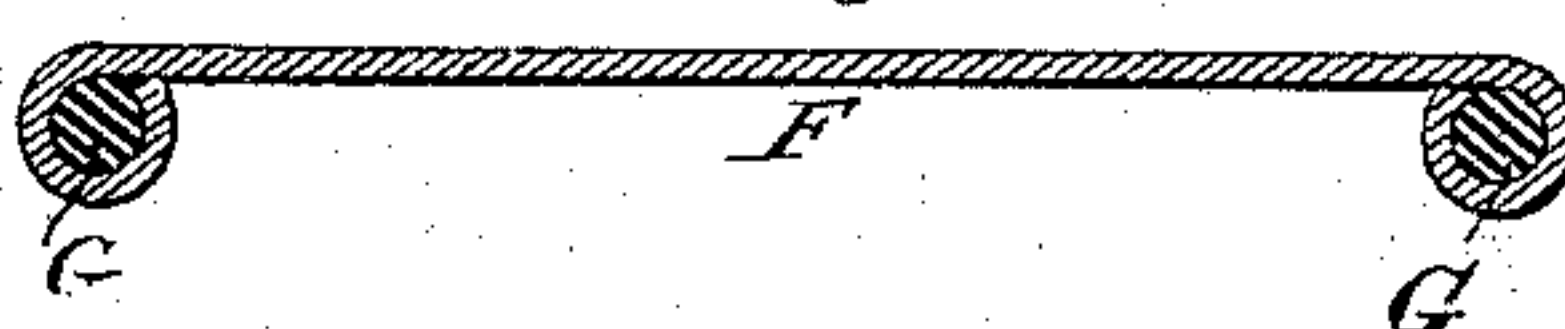


Fig. 6.



Witnesses:
J. C. Turner
C. C. Poole

Inventor:
R. G. Kirkwood
By his atty
R. W. Smith

UNITED STATES PATENT OFFICE.

ROBERT G. KIRKWOOD, OF ELLICOTT CITY, MARYLAND.

WIND-WHEEL.

SPECIFICATION forming part of Letters Patent No. 254,985, dated March 14, 1882.

Application filed August 3, 1881. (No model.)

To all whom it may concern:

Be it known that I, ROBERT G. KIRKWOOD, of Ellicott City, in Howard county, in the State of Maryland, have invented a new and useful Improvement in Wind-Wheels; and I do hereby declare that the following is a full and exact description of the same.

My improvement relates to the manner of constructing the wheel, and has for its object increased durability and cheapness of the same.

Wind-wheels have heretofore been generally made of wood, though I am aware they have also been made of metal, and for that reason I do not herein claim anything as to the material, further than it has particular relation to the manner of employing it in the construction of said wheel.

My invention therefore consists in a wind-wheel the frame whereof is composed of strips of sheet-iron joined together by radial arms, part of which extend to the central metallic hub, to which they are rigidly attached, and provided with vanes of sheet metal supported at the edges by attachment to radial rods which extend from the inner to the outer rim.

That others may fully understand my improvement, I will more particularly describe it, having reference to the accompanying drawings, wherein—

Figure 1 is a perspective of my wheel in working position. Fig. 2 is a partial section parallel with the axis. Figs. 3, 4, 5, 6 are details.

The frame-work for mounting my wheel (shown in the drawings) is a structure in common use, and does not form a part of my present invention. It is shown merely by way of illustration, and does not require any description herein.

My wheel is provided with a central solid metallic hub, A, into which the radial arms B are rigidly set. The number of these arms is greater or less, according to the diameter of the wheel; but I think eight arms is a proper number for wheels of ordinary size. An inner rim, C, of sheet-iron, which for a wheel ten feet in diameter may be one-eighth of an inch thick and four inches wide, is placed upon the arm B at a distance from the hub equal to about one-third the radius of the wheel. The arms B may pass through holes made in the rim C,

or may be attached otherwise, if preferred. The outer rim is attached to the arms B at their extremities, and said rim is composed of two strips, D D, of iron, which, if the same thickness as the inner rim and each one inch in width, will, I think, be of sufficient strength. It is evident, however, that these dimensions may be changed as experience or particular duty may require; and it is also apparent that they may be made of angle-iron, and the stiffness thereby increased. The rims D are attached together by stays E, which form also the direct attachment to the extremities of the arms B.

The parts above described constitute the frame of the wheel. The immediate mode of attachment of the parts to each other may be by nuts, riveting, or otherwise, as preferred.

The vanes F are composed of sheet metal, and they extend from the inner to the outer rim. They are of such width at the outer and inner ends as will cause them to reach from the center of one rim D to the center of the other rim D measuring upon a line bearing the proper obliquity to the axis of the wheel. For a ten-foot wheel this will give a width of vane about thirteen inches at the outer end and a length of about three feet two inches. The longitudinal or radial edges of the vanes are turned or rolled over in a tubular way, so as to embrace and inclose the straining or supporting rods G, the ends whereof are secured in the outer and inner rims, respectively, by screw-nuts or otherwise. By these means the vanes are securely held in position and the frame of the wheel greatly strengthened.

By the mode of construction described above the wheel becomes in effect a trussed wheel—that is, its parts are strengthened by straining-bolts, and, as is well known, a given strength to resist known strains can be secured in that way with less material than in any other.

If the vanes were extended to the central hub, as they might be, the expense and weight of the wheel would be increased without any corresponding increase of power derived from the vane-surface contiguous to the center. I therefore place the inner rim, C, at a distance from the center equal to one-third the radius, or thereabout, and leave all within said rim an

open skeleton, through which the wind may pass with the least possible obstruction.

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

- 5 1. A wind-wheel provided with sheet-metal inner and outer rims supported upon radial arms which spring from a central hub, combined with sheet-metal vanes supported at their longitudinal edges by straining-rods, which at
10 their extremities are secured to the inner and outer rims, respectively.

2. A wind-wheel provided with a central hub

and radial arms springing therefrom, an inner rim of sheet-iron attached to said arms, and two narrow outer rims of equal peripheral length, united and joined to the radial arms by cross-stays, combined with vanes of sheet-iron attached at the longitudinal edges to rods which at their ends are secured to the inner and outer rims, respectively. 15

R. G. KIRKWOOD.

Witnesses:

JAMES E. VANSANT,
JAS. G. KIRKWOOD.