

No. 653,615.

Patented July 10, 1900.

S. CAIRNCROSS.
AERIAL WHEEL.

(Application filed Nov. 25, 1899.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

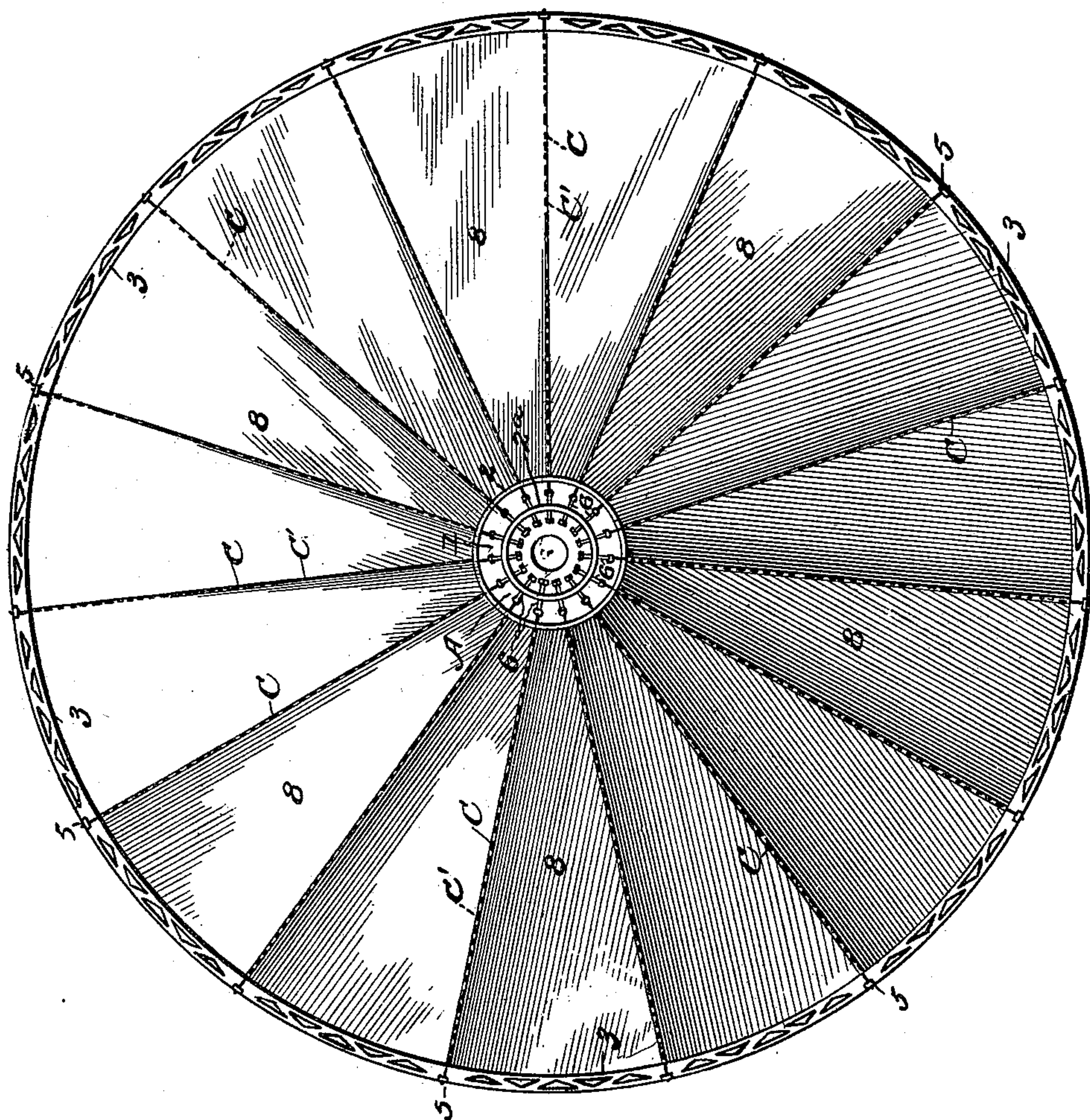
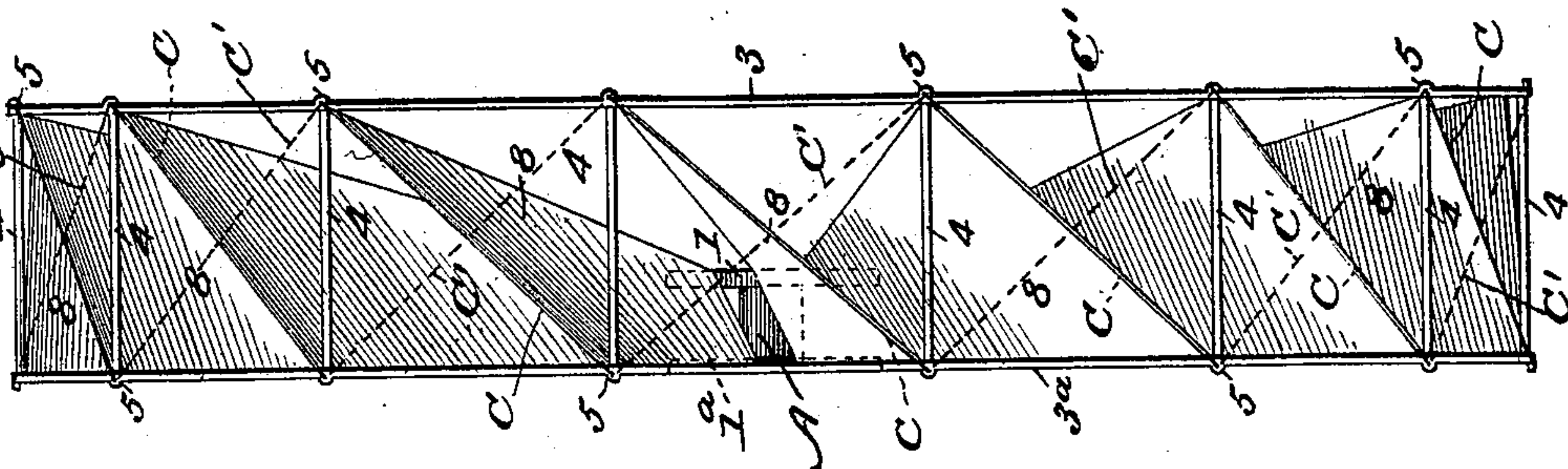


Fig. 2.



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No. 653,615.

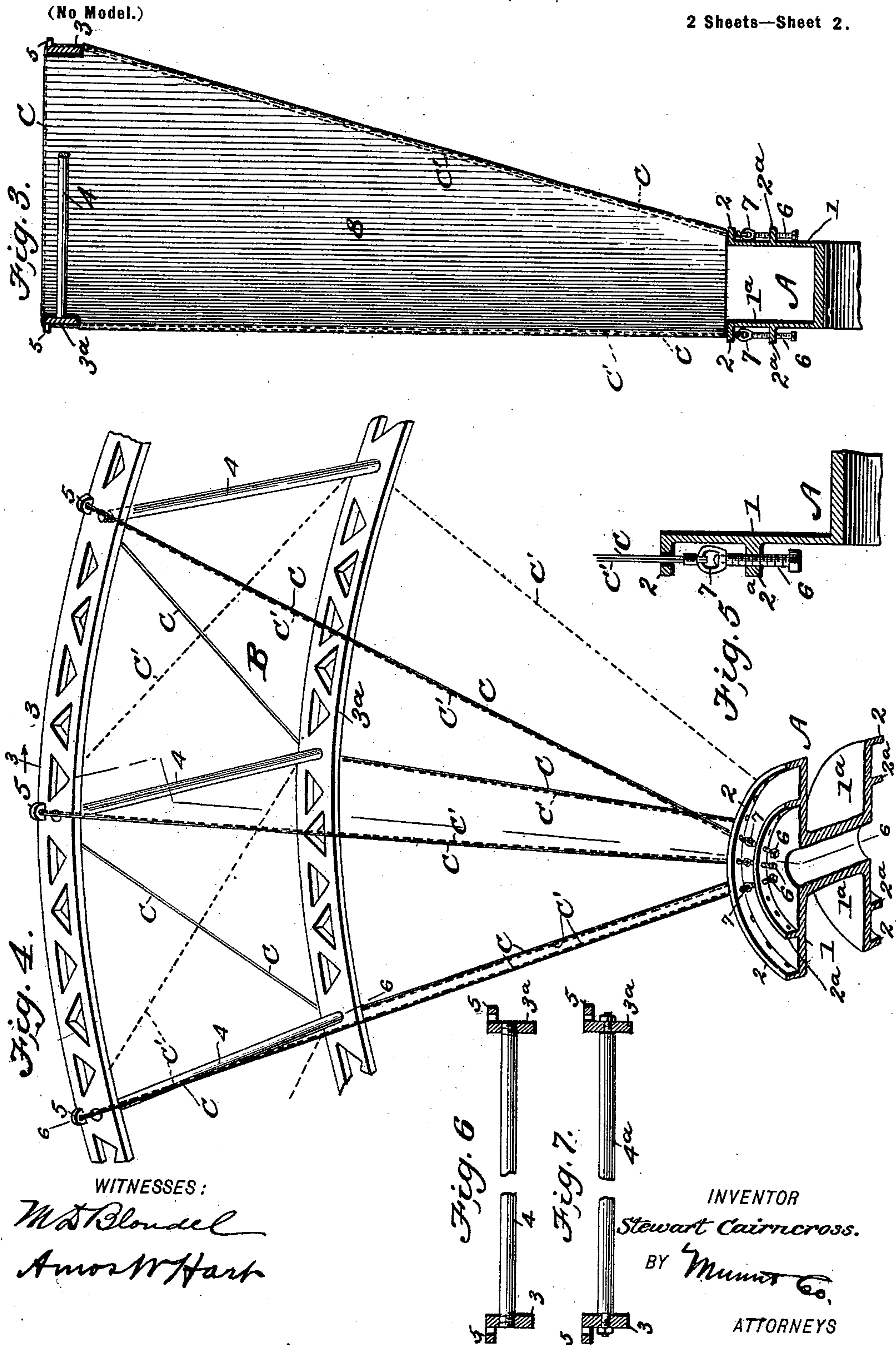
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UNITED STATES PATENT OFFICE.

STEWART CAIRNCROSS, OF GRAFTON, NORTH DAKOTA.

AERIAL WHEEL.

SPECIFICATION forming part of Letters Patent No. 653,615, dated July 10, 1900.

Application filed November 25, 1899. Serial No. 738,240. (No model.)

To all whom it may concern:

Be it known that I, STEWART CAIRNCROSS, residing at Grafton, in the county of Walsh and State of North Dakota, have invented a new and Improved Aerial Wheel, of which the following is a specification.

It is the object of my invention to provide an improved wheel which may be driven by the wind for operating pumps, grain-separators, threshing-mills, dynamos, and other small machinery, and also used as a propeller for an aerial apparatus.

The wheel is constructed with a special view to lightness and strength, as well as facility of adjustment of tension of the structure.

The details are as follows, reference being had to the accompanying drawings, in which—

Figure 1 is a face view of the wheel. Fig. 2 is an edge view of the same. Fig. 3 is a radial section on line 3 3 of Fig. 4. Fig. 4 is a perspective view of a portion of the wheel. Fig. 5 is an enlarged detail section of a portion of the hub of the wheel. Fig. 6 is a cross-section on line 6 6 of Fig. 4. Fig. 7 shows modifications of the brace and tie-rods.

The hub A of the wheel has two parallel radial webs 1 1^a, each of which has two concentric lateral flanges 2 2^a. The outer or peripheral frame B of the wheel is composed of two circular rims 3 3^a, arranged equidistantly from and concentrically with the hub A. These rims are connected and held rigidly parallel by means of stout wooden or metal rods 4, which are provided with screw-threads at their respective ends to adapt them to be screwed into holes in both rims simultaneously. It will be understood that the threads on the rods 4 must run in opposite directions. In place of this preferred construction rods 4^a, Fig. 7, may be provided with shoulders and reduced and threaded ends for application of screw-nuts. The circular peripheral frame B thus produced is connected with the hub by means of wires C, which are peculiarly arranged, as hereinafter described.

Each rim 3 and 3^a is provided on its outer side with a series of perforated lugs 5, one being located at the point where a rod 4 connects with the rims. The lateral flanges 2 and 2^a on the hub-webs 1 and 1^a are provided with corresponding series of holes arranged in ra-

dial alinement with such lugs 5 to provide for attachment of the wires C.

The holes of the inner flange 3^a are screw-threaded and screw-rods 6 are inserted therein and provided with polygonal heads F to adapt them to be conveniently rotated by a wrench. The outer ends of said rods are provided with swivels 7 for attachment of the wires C and C'. The latter are arranged and secured as follows: Each wire is attached at one end to the swivel 7 of a tension-adjusting screw-rod 6 on one side of the hub A, passes thence through the adjacent flange 2 on the hub, and thence radially outward to a lug 5 on the adjacent wheel-rim 3, thence over the outer side of such rim 3 and diagonally across the periphery of the circular frame B to another lug 5 on the opposite rim 3^a, and thence inward to another tension-screw 6, which is the opposite side of the hub A from that where the first end of the wire is connected. To enable the arrangement of wires C and C' to be more easily perceived, I have shown one set of wires C in full lines and the other set, C', by dotted lines in Figs. 2 and 4. Thus two adjacent wires C cross each other at right angles on the periphery of the wheel, as shown in Fig. 2, and the radial portions of each wire are arranged alongside similar portions of other wires, so that all the radial portions of the several wires form double strands or tension-spokes. It is apparent that this arrangement of the wires subserves an economy in construction and ties and braces the peripheral frame relative to the hub in a peculiarly strong and rigid manner, besides providing for a fine tension adjustment, as well as for attachment and support of the sails or vanes of the wheel. The sails are made of strong fabric and are practically triangular in shape, as shown in Fig. 3, but their narrower inner ends are truncated. One side edge of each sail is sewed or otherwise secured to one radial portion of a wire C on one side of the wheel and its opposite side edge is similarly secured to the radial portion of the same wire on the opposite side of the wheel, while the head or broad outer end of the sail is secured to the diagonal portion of the same wire. Thus each sail is held stretched taut and flat and in a plane which is transversely inclined at an angle of forty-five degrees, in which posi-

tion it is adapted to be either acted on by the
wind for driving or propelling light machin-
ery or to act positively as a propeller for driv-
ing an aerial car or other apparatus adapted
5 for aerial navigation. In either case the wheel
is arranged vertically on a horizontal axis.

Having thus described my invention, what
I claim, and desire to secure by Letters Pat-
ent, is—

10 The improved aerial wheel comprising a
hub, a peripheral frame, wires extending ra-

dially between such parts and across the
frame diagonally, and a series of sails com-
posed of flexible material and attached to
both the radial and diagonal portions of said 15
wires, whereby they are held in the diagonal
position, specified.

STEWART CAIRNCROSS.

Witnesses:

AMOS W. HART,
SOLON C. KEMON.