B. C. COLE.

AIRSHIP.

APPLICATION FILED SEPT. 19, 1911.

1,027,990.

Patented May 28, 1912.

4 SHEETS—SHEET 1.

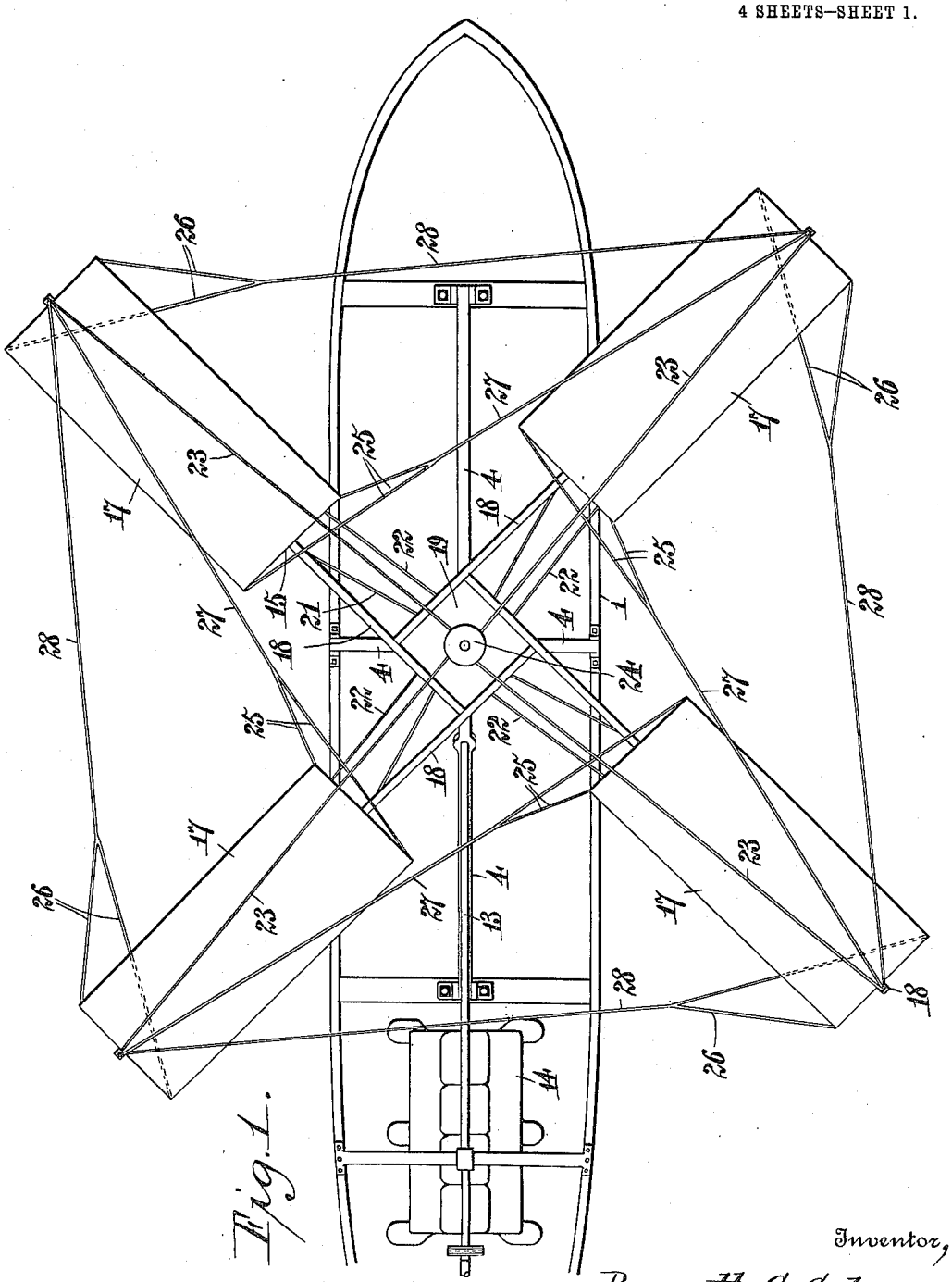

Fig. 1.

Witnesses:

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4 SHEETS—SHEET 2.

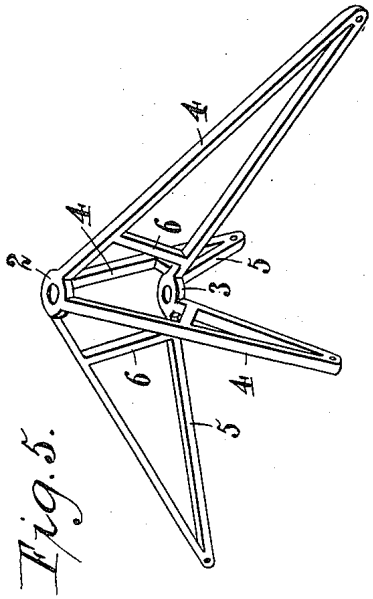

Fig. 5.

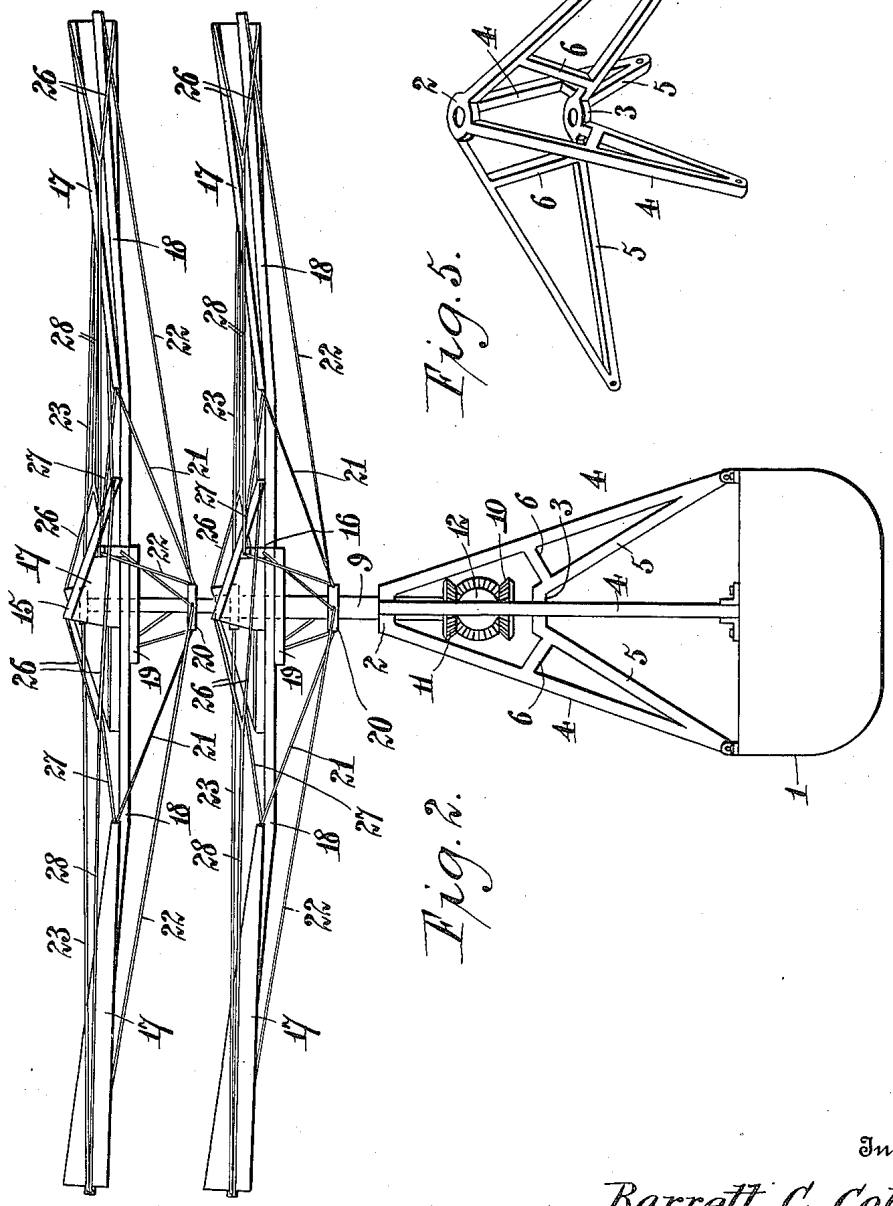

Fig. 2.

Witnesses:—

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4 SHEETS—SHEET 3.

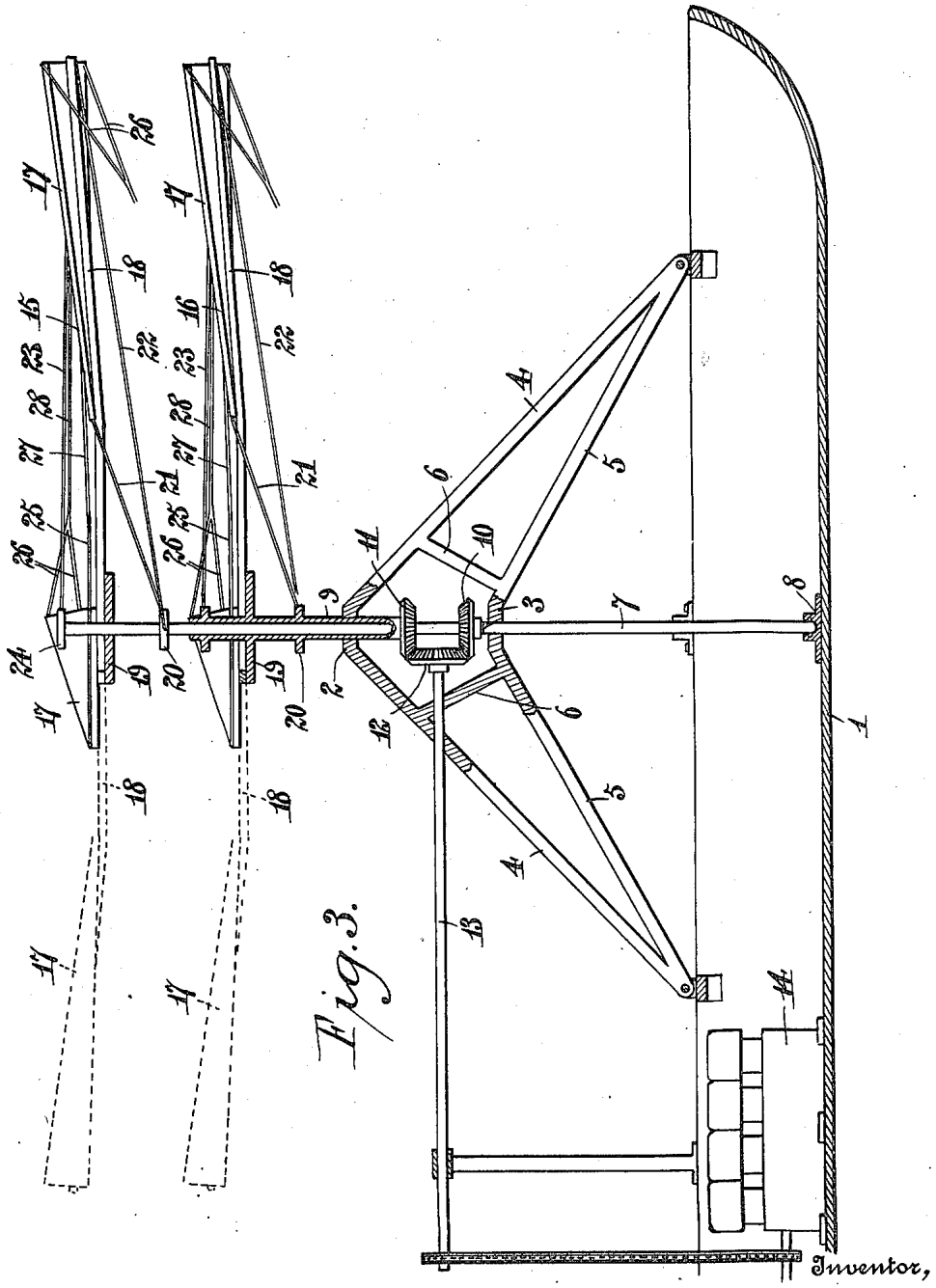

Fig. 3.

Witnesses:—

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4 SHEETS—SHEET 4.

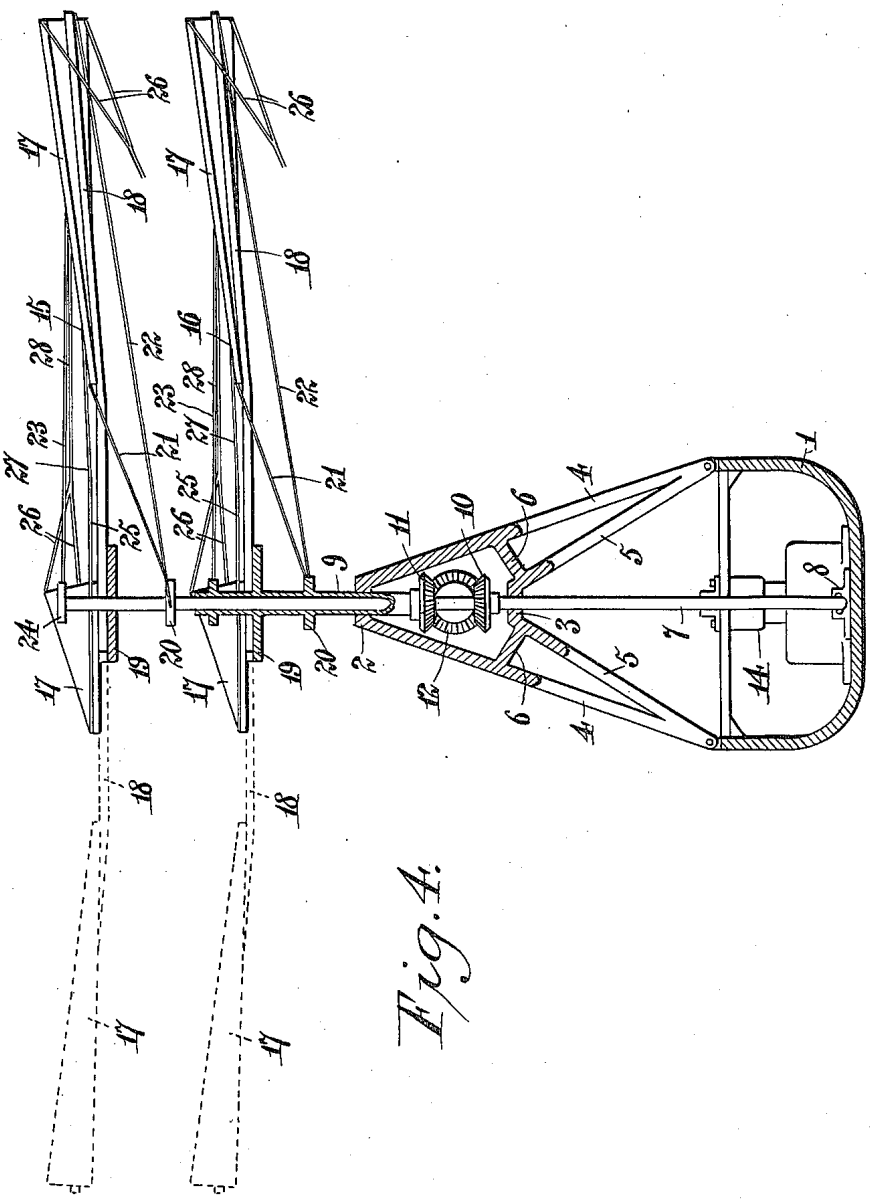

Fig. 4.

Witnesses:—

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UNITED STATES PATENT OFFICE.

BARRETT C. COLE, OF MARSHALL, WYOMING.

AIRSHIP.

1,027,990. Specification of Letters Patent. Patented May 28, 1912.

Application filed September 19, 1911. Serial No. 650,231.

To all whom it may concern:

Be it known that I, BARRETT C. COLE, a citizen of the United States, residing at Marshall, in the county of Albany and State of Wyoming, have invented new and useful Improvements in Airships, of which the following is a specification.

This invention relates to airships of the heavier-than-air type, the main object of the invention being to provide an airship having oppositely rotating lifting, sustaining and driving wheels or propellers of simple, strong and durable construction, whereby the ship may be launched from the ground without a preliminary run, sustained in the air over any given point, propelled horizontally at considerable speed, and controlled in descent so that safe landings may be made.

A further object of the invention is to provide a novel construction and manner of bracing the parts of the lifting and driving wheels, and a novel construction of main frame for supporting a suitable type of car or body, the parts being so combined and arranged as to secure maximum strength and rigidity with a desired lightness of weight.

With these and other objects in view, the invention consists of the features of construction, combination and arrangement of parts, hereinafter fully described and claimed, reference being had to the accompanying drawings, in which:—

Figure 1 is a top plan view of an airship embodying my invention. Fig. 2 is a front elevation of the same. Fig. 3 is a vertical longitudinal section. Fig. 4 is a vertical transverse section. Fig. 5 is a perspective view of the main frame and car.

Referring to the drawings, 1 designates a car or body of boat or other desired shape, which is supported from a star-shaped or spider-like main frame comprising a pair of superposed bearing members 2 and 3 and upper and lower sets of arms 4 and 5 radiating therefrom. As shown, the arms 4 and 5 of each set are arranged at an angle of 90° to each other and incline at an outward and downward angle, the upper arms 4 being arranged above their companion lower arms 5 and connected therewith at their outer ends. Braces 6 connect the pairs of upper and lower arms and thus provide trussed radiating beams of approximately V-form, whereby maximum strength and rigidity of structure is obtained in the formation of a frame which may be of comparatively light weight. Two of the V-shaped beams extend parallel with the line of flight and project fore and aft, respectively, while the other beams extend in opposite directions laterally, thus providing for the stable support of the car or body 1.

A vertical shaft 7 extends through and is journaled in the bearings 2 and 3 and in a suitable bearing 8 secured to the body or car, which bearings may be of the anti-friction type if desired. Surrounding this shaft 7 and journaled thereon and in the bearing 2 is a relatively shorter hollow shaft 9, which terminates below the upper end of said shaft 7 and immediately below the bearing member 2. Secured to the shafts between the bearing members 2 and 3 are beveled gears 10 and 11 meshing with a beveled drive gear 12 carried by a drive shaft 13 suitably driven from a motor 14 upon the car or body, whereby the shafts are driven simultaneously at a corresponding speed in opposite directions.

Mounted upon the upper ends of the vertical shafts in superposed relation are lifting, sustaining and driving wheels or propellers 15 and 16. Each of these wheels or propellers comprises a series of blades 17 mounted upon radial arms or bars 18 secured to a disk or head 19 fixed to its shaft, said blades and bars being preferably four in number and arranged at an angle of 90° to each other, the bars or arms being also suitably secured at their inner ends to each other to form a staunch and rigid propeller frame. The blades 17 are suitably curved, inclined or otherwise arranged to secure both a sustaining and a propelling action and are reinforced at their inner ends from a collar 20 secured to the shaft below the head or disk 19 by truss rods or wires 21, while the outer ends of the arms or bars 18 are reinforced upon said collar 20 by truss wires or rods 22. Similar truss wires 23 connect and stay the outer ends of the arms or bars 18 with and from a collar 24 secured to the shaft above the head or disk 19. Secured to the inner corners of each blade are branch wires or rods 25, and secured to the outer corners of each blade are branch wires or rods 26, and these sets of branch wires or rods are respectively connected with main truss wires or rods 27 and 28 leading from the outer end of the sup-

porting arm or bar 18 of the next adjacent blade in advance thereof, whereby each blade is sustained against the pressure of the air to maintain its normal contour and position, the construction and arrangement of the several parts of each wheel or propeller being such as to obtain great strength and rigidity without excess weight.

In operation, the propellers are set in motion and will exert a lifting and driving effect, so that the machine will be launched directly from the ground without a preliminary run, and when the desired altitude is reached the speed of the propellers may be regulated to drive the machine ahead and sustain it in the air. By reducing the speed of the propellers the machine may be allowed to descend as slowly as desired so that a safe landing may be made. In practice, suitable rudders may be employed for steering purposes, and one or more additional propellers for a direct forward driving action may be used while the lifting and sustaining wheels are employed simply to support the machine in the air.

Having thus described the invention, what I claim as new is:

1. An airship embodying a main frame, a car carried thereby, concentric vertical shafts journaled on the main frame, a head fixed to each shaft, collars upon each shaft above and below the head thereon, a series of radiating arms secured to the head and to each other, propeller blades carried by the arms, braces connecting the outer end of each arm with the respective collars, braces connecting the inner end of each arm with the lower collar, brace rods or wires connected with the outer end of the supporting arm of each blade, branches connecting the same with the inner and outer corner portions of the next adjacent blade, and gearing for simultaneously rotating the shafts in opposite directions.

2. An airship embodying a car or body, a main frame carrying the same and comprising superposed bearings and connecting superposed pairs of arms radiating therefrom and inclined outwardly and downwardly, forming V-shaped truss beams projecting fore and aft and laterally, a vertical shaft journaled in said bearings, a second vertical shaft journaled upon the first-named shaft and in the upper bearing, oppositely rotating propellers carried by said shaft, beveled gears upon the shafts between the bearings, a beveled drive gear meshing with the beveled gears upon the shafts, and means for driving said beveled drive gear.

In testimony whereof I affix my signature in presence of two witnesses.

BARRETT C. COLE.

Witnesses:
A. W. BROWN,
MARY E. BEAN.