G. F. SWAIN.

FLYING MACHINE.

APPLICATION FILED SEPT. 4, 1917.

1,298,120.

Patented Mar. 25, 1919.

3 SHEETS--SHEET 1.

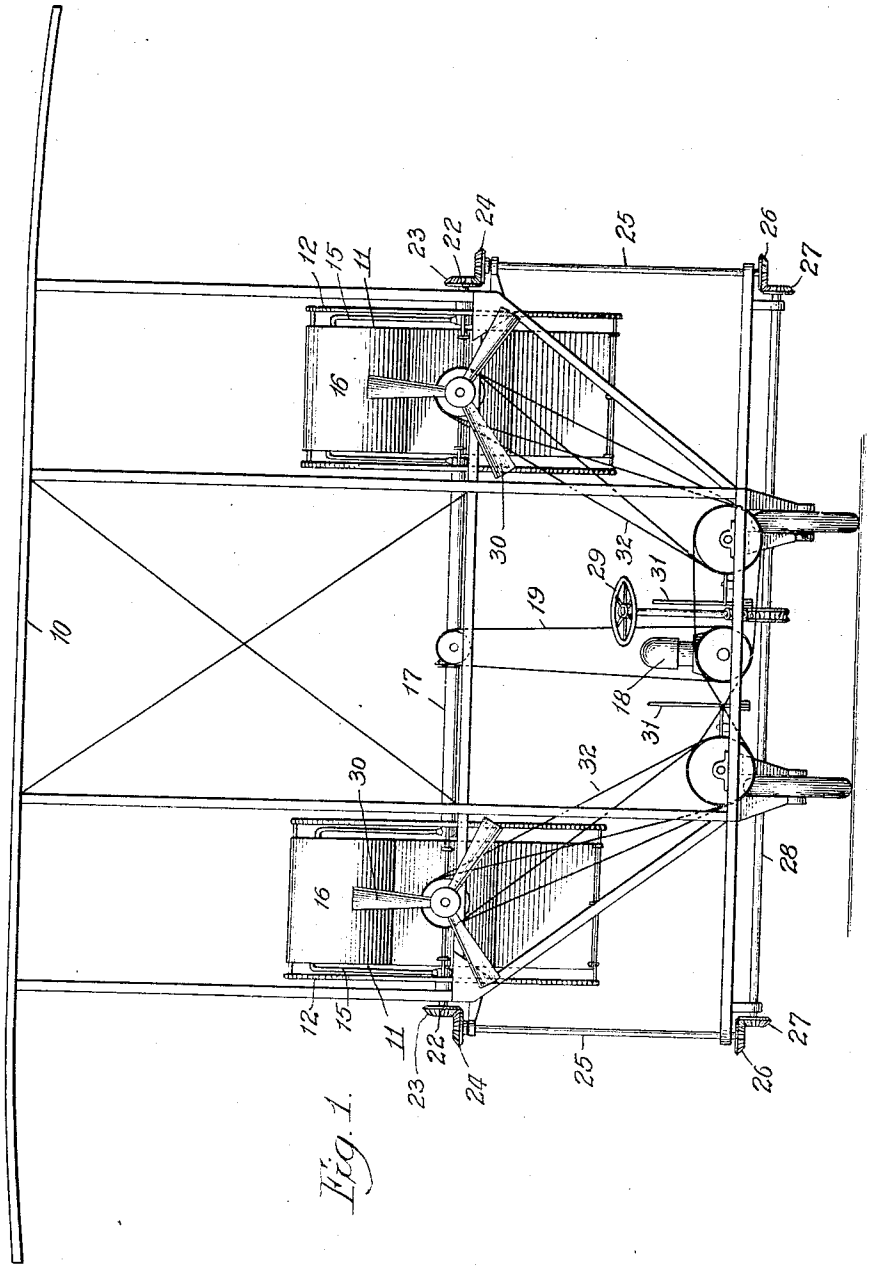

Fig. 1.

Witness:
John Enders

Inventor:
George F. Swain,
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3 SHEETS—SHEET 2.

Fig. 2.

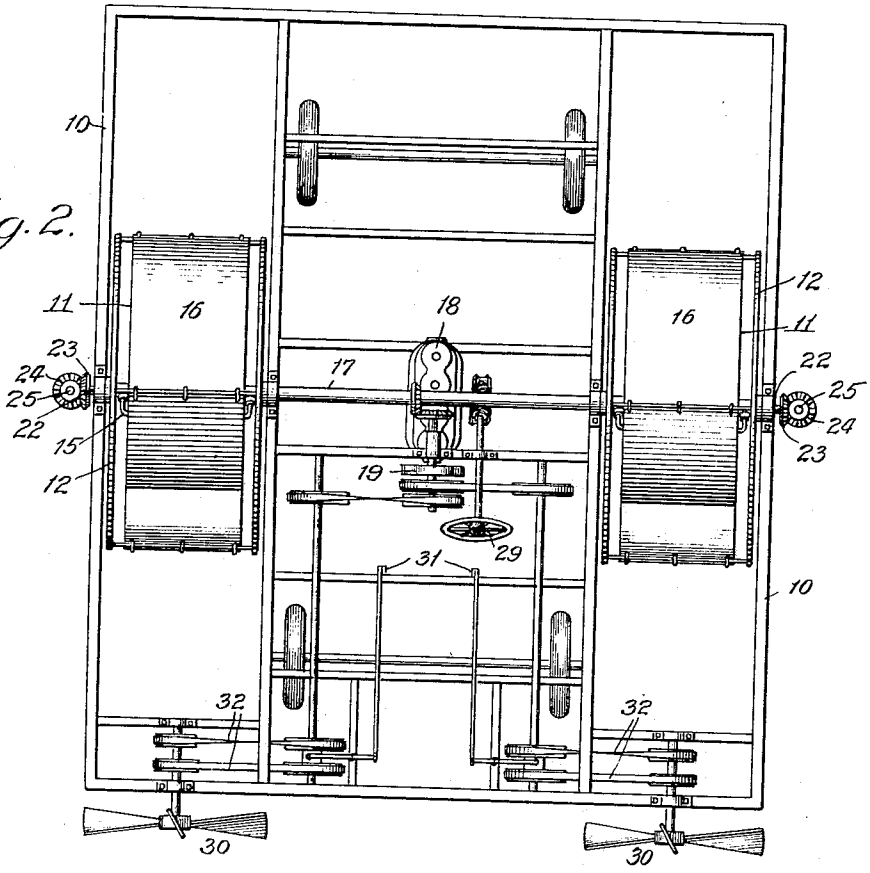
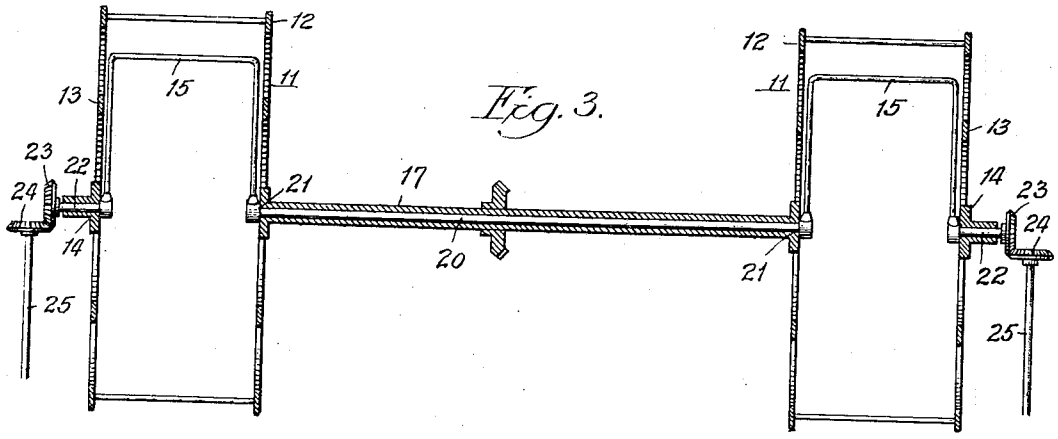


Fig. 3.



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3 SHEETS—SHEET 3.

Fig. 4.

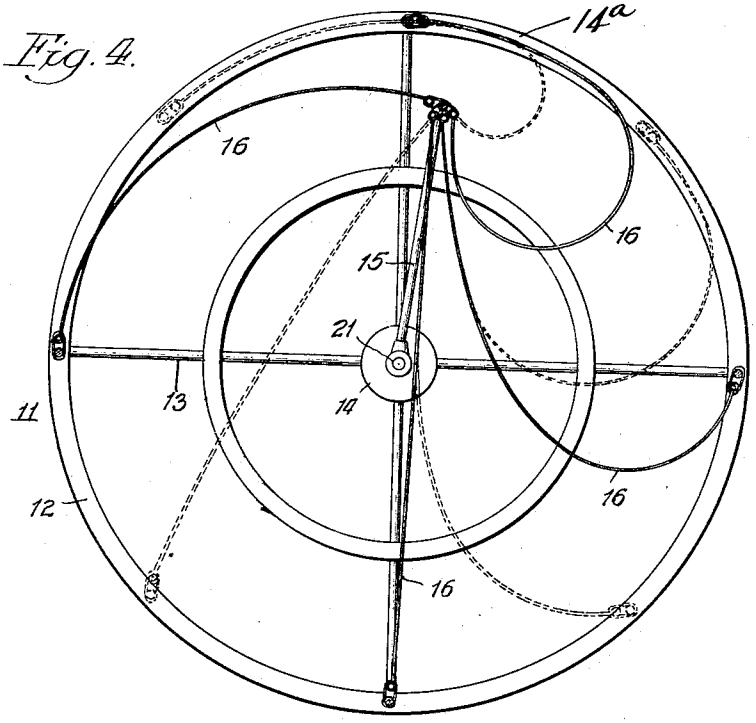
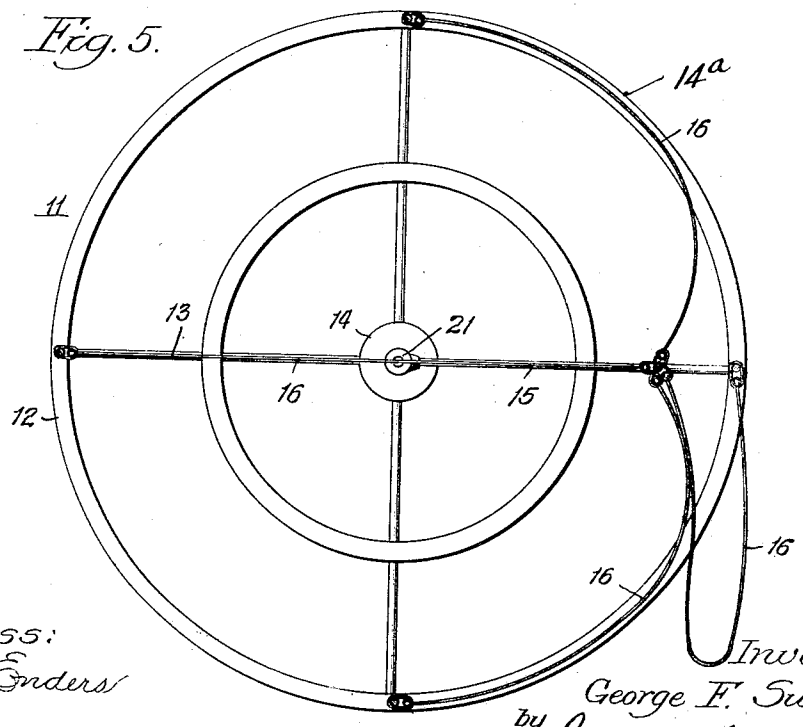


Fig. 5.



Witness:
John Enders

Inventor:
George F. Swain,
by George Manker
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UNITED STATES PATENT OFFICE.

GEORGE F. SWAIN, OF CHICAGO, ILLINOIS.

FLYING-MACHINE.

1,298,120. Specification of Letters Patent. Patented Mar. 25, 1919.

Application filed September 4, 1917. Serial No. 189,537.

To all whom it may concern:

Be it known that I, GEORGE F. SWAIN, a citizen of the United States, residing in the city of Chicago, Cook county, Illinois, have invented a new and useful Improvement in Flying-Machines, of which the following is a specification.

The object of my invention is to provide new and novel means for lifting, propelling, steadying and guiding flying machines. The means which I have provided, as will hereinafter be pointed out, may be employed in substantially any type of flying machine.

In the accompanying drawings, consisting of three sheets, Figure 1 is an end elevation. Fig. 2 is a top plan view. Fig. 3 is a fragmentary sectional view of the driving shaft and connections. Fig. 4 is an illustrative view of the lifting and driving device of my mechanism set for lifting. Fig. 5 is an illustrative view of the same mechanism shown in Fig. 4 set for propelling.

10 represents the main frame of the machine which may be of any suitable construction, the operation of my mechanism not being dependent upon the details of construction of the machine save so far as hereinafter pointed out. My improved lifting and driving mechanism is shown at 11. These may be arranged in pairs of a suitable number to properly lift and propel the machine. These lifting and propelling devices consist of a frame or reel 12, which frame in turn consists of a plurality of rectangular frames 13 intersecting at 14 forming a right angle when two of the frames 13 are used and forming different angles at the intersecting point when a greater number of frames 13 are employed. Within these frames is placed still another frame 15 so made as to be turned completely around on the inside of the frame 12 and pivoted at the same center 14 connecting, supporting and bracing the ends of the frames 13 I have provided a hoop or band 14^a as shown in Figs. 4 and 5. I have next provided sails 16 of any suitable material such as canvas or the like having the required weight, strength and wearing qualities, there being two separate sails for each of the rectangular frames 13; one end of the sail is secured to the outer end of the rectangular frame 13 by means of loops or other sufficiently flexible and suitable connections; the opposite end of each of the sails is fastened to the outer end of the frame 15. The pairs of lifting and propelling mechanisms 11 are connected with each other by a shaft 17 by which said pairs are driven simultaneously, power being imparted to the shaft 17 from the engine 18 by means of a belt 19 or other suitable driving connections.

I operate the frame 15 so as to set and adjust the sails in the required manner by means of the following chain of connections: A shaft 20 passes through the center of the shaft 17 and connects at each end with the frames 15 at 21. These frames 15 are each connected at the outer side thereof with a short shaft 22. A bevel gear 23 is mounted at the outer end of shaft 22 and meshes with a gear 24 mounted on a vertical shaft 25 which bears a gear 26 at the lower end thereof in mesh with gear 27. The gears 27 are mounted at opposite ends of the horizontal shaft 28. This shaft 28 is actuated by the steering gear 29.

When it is desired to change the position of the sails 16, the operator of the machine need only turn the steering gear 29 the required direction and distance. If the operator desires to apply the power so that the machine can be lifted, the steering gear 29 will be turned so as to set the frame 15 in a horizontal plane like shown in Fig. 5. If the operator desires to utilize the power for driving straight ahead, the frame 15 will be set in a vertical position as shown in Fig. 4. The application of the power for lifting or driving may be regulated by changing the respective angles or positions of the frame 15 by means of the steering gear 29.

Any suitable propellers for steering may be used with my invention. I have indicated an old, well known form 30 which may be actuated by levers 31 and the belt connections 32.

It will be seen that my invention resides in the sail-like lifting and propelling members operating much like a reel. I have ascertained, by experiment, that this lifting and propelling mechanism possesses many and great advantages, such as:

In case of accident to the engine, a sufficient number of the canvas sails will be in such position as to fill with air and assist the driver to land without danger to himself or injury to the machine.

By my arrangement of sails in connection with the revolving inner wheel, the lifting and propelling power is greatly increased; the steadying influence of my device enables the driver to land in a small area with

greater certainty and correspondingly to rise from limited and restricted places. The increased propelling and lifting power provided by my mechanism secures economy in the cost of power, greater speed, greater lifting power, greater carrying and sustaining ability and greater security and stability in operation, thus advancing flying machines for both freight and passenger service as well as for patrol, scout and military work.

Having now fully described my invention, what I claim and desire to secure by Letters Patent is:

1. In a flying machine, the combination of a plurality of outer reels composed of intersecting rectangular frames, an inner U shaped frame revoluble within each outer reel, means such as a main horizontal shaft 28, gears 26 and 27, vertical shafts 25, gears 23 and 24, and short shafts 22, for moving the U shaped frames; a second horizontal shaft parallel to the main shaft for revolving the outer reels; a sail attached to each end of each rectangular frame and all the sails of each reel having one end fastened to the inner U shaped frame.

2. In a flying machine, the combination of a plurality of outer reels composed of intersecting rectangular frames, an inner U shaped frame revoluble within each outer reel, means such as a main horizontal shaft 28, gears 26 and 27, vertical shafts 25, gears 23 and 24, and short shafts 22, for moving the U shaped frames; a second horizontal shaft parallel to the main shaft for revolving the outer reels; a sail attached to each end of each rectangular frame and all the sails of each reel having one end fastened to the inner U shaped frame, and a suitable steering wheel as shown and described.

3. In a flying machine, the combination of a plurality of reels, an inner U shaped frame revoluble within each outer reel, means such as a main horizontal shaft 28, gears 26 and 27, vertical shafts 25, gears 23 and 24 for short shafts 22 for moving the U shaped frames; a second horizontal shaft for revolving the outer reels, a sail attached to each end of each outer reel and all the sails of each reel having one end fastened to the inner U shaped frame, and a suitable steering wheel for steering and guiding the machine.

In witness whereof, I hereunto subscribe my name to this specification in the presence of two witnesses.

GEORGE F. SWAIN.

Witnesses:
RALPH ROSEN,
HARRY E. WALSH.