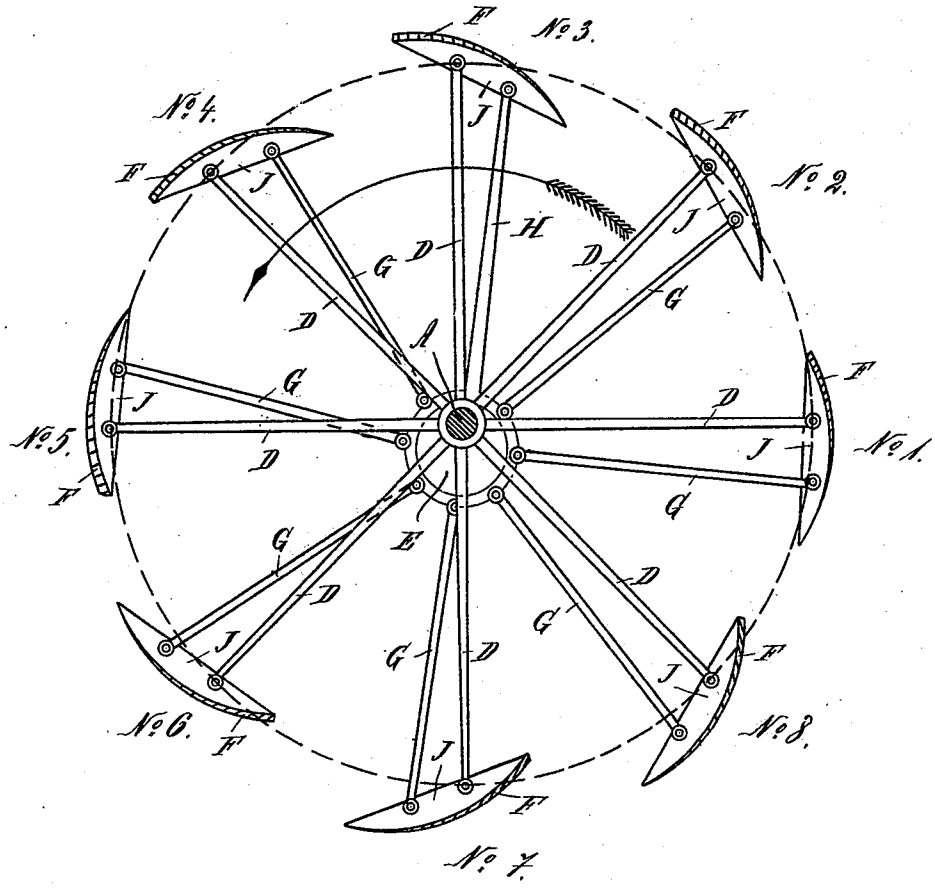
(No Model.) 2 Sheets—Sheet 1.

G. WELLNER.

FLYING APPARATUS.

No. 516,581. Patented Mar. 13, 1894.

Fig. 1.



Witnesses
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Geo. Sally.

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(No Model.) 2 Sheets—Sheet 2.

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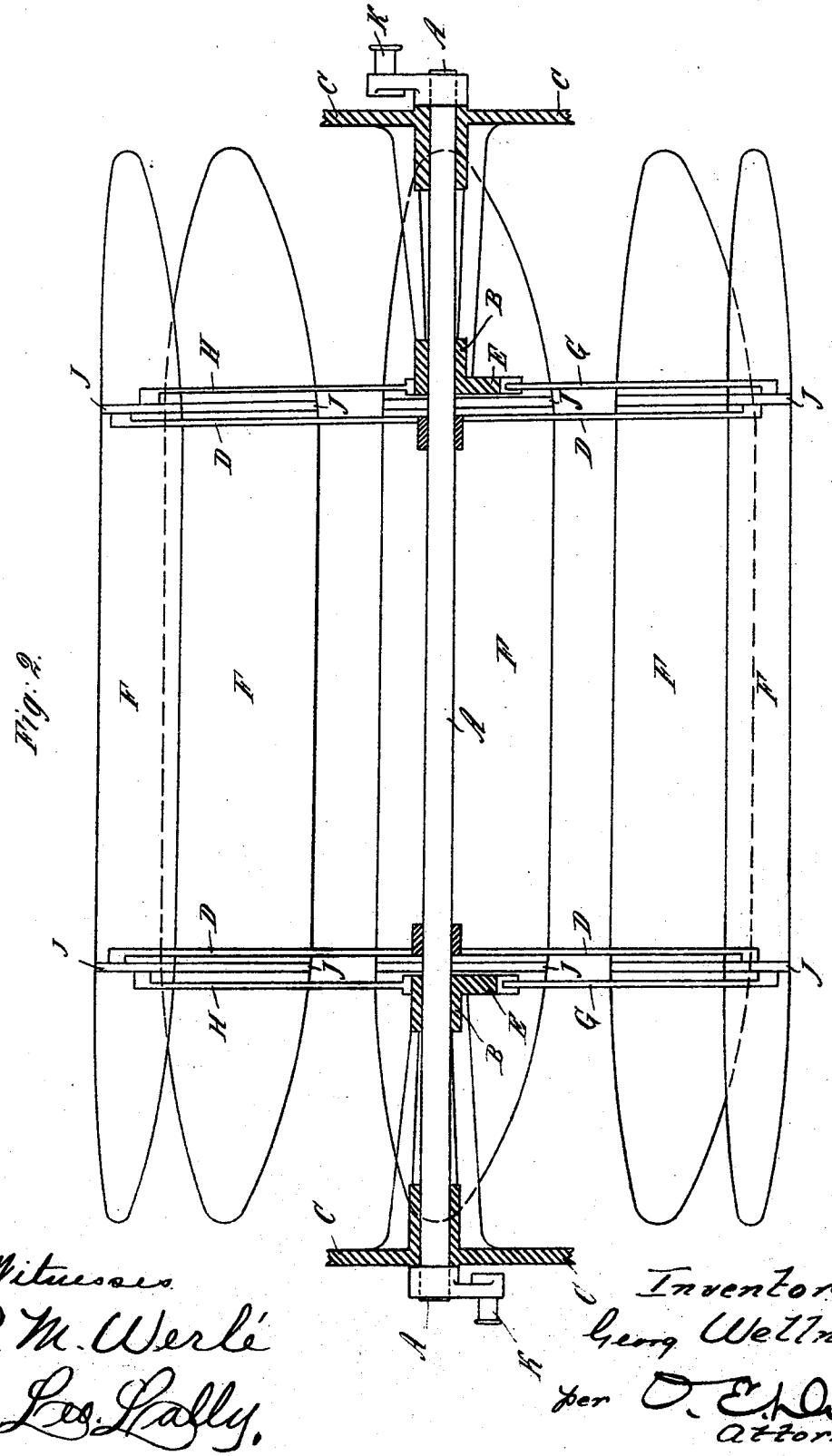

Fig. 2.

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UNITED STATES PATENT OFFICE.

GEORG WELLNER, OF BRÜNN, AUSTRIA-HUNGARY.

FLYING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 516,581, dated March 13, 1894.

Application filed June 17, 1893. Serial No. 478,183. (No model.) Patented in Germany April 22, 1893, No. 71,903; in France May 2, 1893, No. 229,796, and in England May 26, 1893, No. 10,405.

To all whom it may concern:

Be it known that I, GEORG WELLNER, a subject of the Emperor of Austria-Hungary, residing at Brünn, Moravia, Austria-Hungary, have invented certain new and useful Improvements in Propeller-Wheels for Flying-Machines, (for which I have secured patents in Germany, No. 71,903, dated April 22,1893; in England, No. 10,405, dated May 26, 1893, and in France, No. 229,796, dated May 2, 1893,) of which the following is a specification.

The rotary sail for flying machines which forms the subject of this invention consists of an axle provided with arms and around them are arranged lifting surfaces, which are turned at slight angles during the revolution by a fixed eccentric with eccentric strap and rods. The rotation of the rotary sail when the axle is in the horizontal position produces the lifting power for rising and soaring in the air and in addition hereto under certain circumstances the production of power for driving in a horizontal direction for the purpose of producing forward motion in the direction of the axle.

Figure 1 of the accompanying drawings is an end view of the rotary sail and Fig. 2 a part longitudinal section.

A is the axis of rotation, which is mounted in bearings in the standards C and in the journals B connected to the said bearings. The shaft A has keyed thereon or otherwise fixed thereto the arms D forming a sort of star wheel. Either made in one with or fixedly connected to the journals B are the eccentric disks E, the eccentric straps 1 of which each have a rigid rod H while the others (seven in the present case) have jointed connecting rods G. The lifting surfaces F, of which there are eight, are arranged drum-fashion around the axle and have stiffening ribs J each of which has two bolts or studs through which they are movably connected to the star wheel D and to the eccentric by the rods H and G. In consequence of this movable connection with the eccentric, the front edge of the lifting surfaces (see direction of the arrow in Fig. 1) in the uppermost position (No. 3) is raised or is further from the center and in the lowest position (No. 7) is nearer the center at every revolution while it gradually takes up intermediate position at other periods, so that in the horizontal positions as shown at No. 1 to the right and No. 5 to the left, the lifting surfaces come near to the dotted circle of revolution. In addition, the ribs of the lifting surfaces and also the arms D, G and H may be made in the form of a screw so that when revolving they may work to propel in the direction of the axle in the same way as the propeller of a steam ship works in the water. If the ribs and arms are not made in this manner then the rotary sail merely has a lifting but no propelling power.

On the drawings the lifting surfaces are shown of an oval form and partly circular in section with decreasing thickness from front to back, other forms may however if considered advisable be utilized such as for instance, right angled elliptic, egg shaped, pointed wing-shaped and the like and other sections employed such for instance rectilinear tapering, parabolically curved or with sharper or easier curves.

With regard to the material of which the lifting surfaces are to be made, a hard substance with stiff ribs may be used such as for instance wood, tinned iron, vulcanite and the like or instead thereof flexible elastic and soft material may be employed such as silk, linen, sail, cloth or the like with stiff or flexible ribs.

The number of the arms of the wheels, of the star wheel systems and of the lifting surfaces depends upon the size of the rotary sail.

Motion is communicated to the axle of the rotary sails from a motor by means of cranks K as shown in Fig. 2 or by tooth wheels, pulley wheels, or in any other well known manner.

The rotary sail mechanism with regard to the connection of the movable surfaces with the fixed eccentric, slightly resembles Morgan's paddle wheel mechanism for steamships but the action and arrangement of the lifting surfaces in the rotary sail is quite different.

With reference to the disposition of the rotary sails for flying machines it should be observed, that they may either be used singly or two or more close to each other (and in that

case preferably in pairs running in opposite directions) or two, three or more may be arranged behind each other.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

The herein described propeller wheel for flying machines consisting of the shaft having the radial supports, the wings *f*, having the concaved inner surfaces as shown, said wings having the transverse ribs on their inner faces, the eccentrics on said shaft having the rods pivotally joined to said ribs, said radial supports also being joined to said ribs so that the wheel operates in the manner and for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORG WELLNER.

Witnesses:
JOH. E. BRUK,
RUDOLF V. LICHTENFELS.