

(No Model.)

2 Sheets—Sheet 1.

F. KLINE.
POWER WHEEL.

No. 564,790.

Patented July 28, 1896.

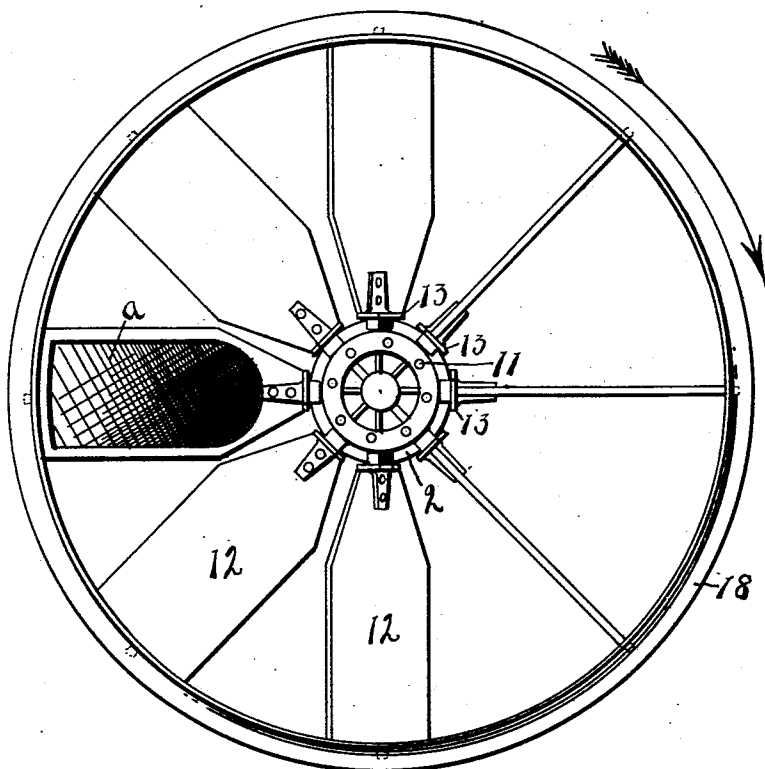


Fig 1

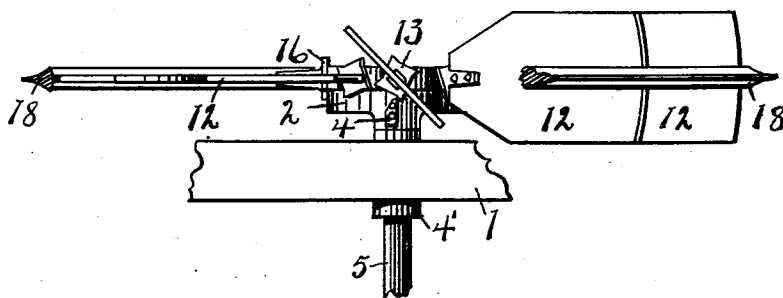


Fig 2

WITNESSES

Carl W. Keller.

Maud Schumacher.

INVENTOR

Frank Kline
By William Webster
att'y

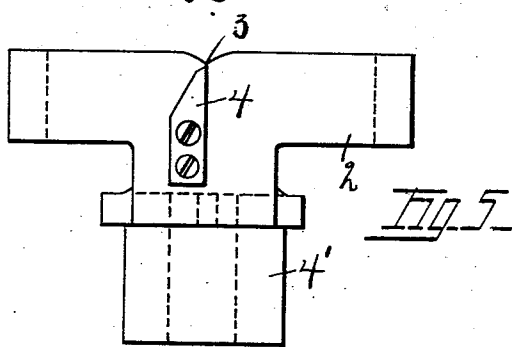
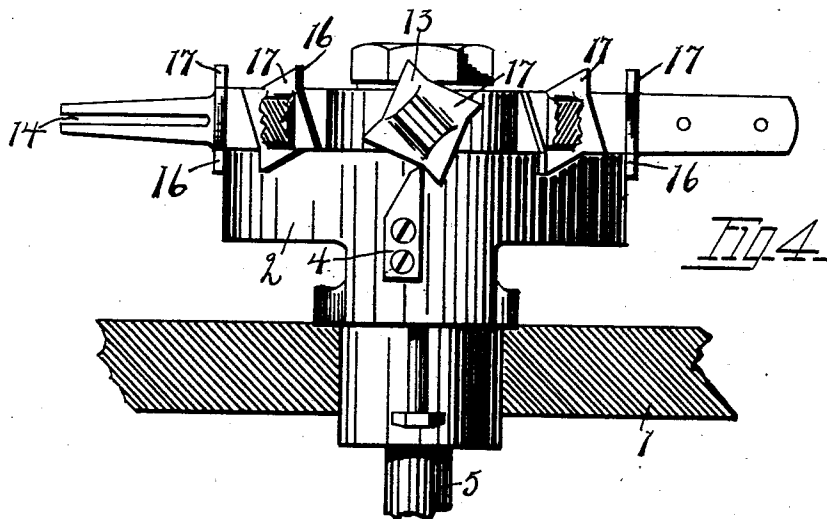
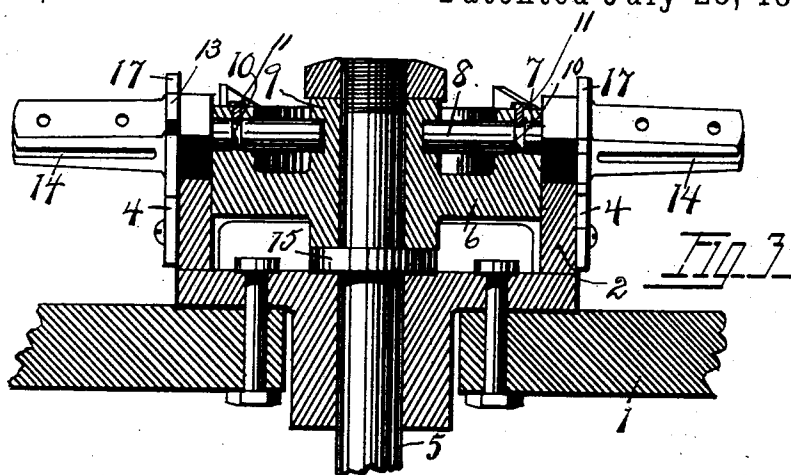
(No Model.)

2 Sheets—Sheet 2.

F. KLINE.
POWER WHEEL.

No. 564,790.

Patented July 28, 1896.



WITNESSES

Carl H. Keller.

Max Schumacher.

INVENTOR

Frank Kline
By William Webster
att'y

UNITED STATES PATENT OFFICE.

FRANK KLINE, OF ARCADIA, OHIO, ASSIGNOR OF ONE-HALF TO CYRUS STACEY, OF SAME PLACE.

POWER-WHEEL.

SPECIFICATION forming part of Letters Patent No. 564,790, dated July 28, 1896.

Application filed May 6, 1895. Serial No. 548,363. (No model.)

To all whom it may concern:

Be it known that I, FRANK KLINE, of Arcadia, county of Hancock, and State of Ohio, have invented certain new and useful Improvements in Power-Wheels; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification.

My invention relates to a power-wheel, and has for its object to construct a wheel of great strength combined with minimum lightness, and that shall present the greatest resistance to air or water upon the working side of the wheel with a minimum resistance to the idle portion.

A further object is to feather the blades by a novel mechanism presenting a minimum amount of friction, with a positive lock to the blades whether presented for resistance and power or feathered for non-resistance.

The invention is designed for several uses, among which may be enumerated that of propelling vessels, air-navigation, or machinery of various forms.

In the drawings, Figure 1 is a front elevation of the wheel. Fig. 2 is an edge view. Fig. 3 is a central transverse section through the hub and working parts. Fig. 4 is an elevation with the blades removed to disclose the star-wheel and tappet. Fig. 5 is an elevation of the ring, showing the V-shaped recess for allowing a partial revolution of the blade and the tappet for tripping the star-wheel.

1 designates the foundation, upon which is secured an annulus 2, having oppositely-disposed V-shaped notches 3 formed in the edge, and coincidently thereto a tappet 4, secured upon the outer periphery, with an extended hub 4', projecting from the base, through which the power-shaft 5 passes and is journaled.

Within the annulus 2 is journaled a disk 6, the upper portion of the disk extending beyond the plane of the annulus and formed with journal-openings 7 for the reception of a plurality of blade-journals 8, there being

eight blades shown in the present instance, the inner ends of the blade-journals being further journaled in a hub 9, formed integral with the disk.

A preferred means of securing the blade-journals in the disk to prevent longitudinal movement is to form a circumferential groove 10 in the blade-journal and perforate the disk coincidently to receive locking-pins 11.

Each blade 12 is formed, preferably, of a light strong metal, preferably aluminium, and comprises a frame to which is secured a fabric-body portion, preferably oiled silk, which, being light, strong, and impervious, with a slight inclination to convexity under pressure, offers great resistance to air. This fabric-body portion may be secured in the blades by forming the frame of the blades in two like, longitudinal sections between which the margin of the fabric is clamped. (See *a*, Fig. 1.)

The construction just described is especially designed for use in a wheel for aerial navigation and is susceptible of numerous modifications, as the frame may be solid and the fabric secured thereon by any approved fastening. Heavy canvas may be used or any appropriate fabric.

In some uses the blade may be solid metal or wood, and perhaps in water-navigation this construction is preferable.

The shank or inner end of the blade is squared to receive a star-wheel 13, having a kerf or socket 14 centrally thereof to allow of passing the shank therethrough, and the squared portion of the shank extends a sufficient length to rest upon the edge of the annulus, thereby locking the blade from revolution as it revolves around the annulus. The inner end of the blade-shank is rounded beyond the squared portion and journaled in the disk, as has been described.

Hub 9 of the disk is centrally bored to receive the power-shaft, which extends therethrough and is secured to the disk in any preferred manner to revolve therewith, the inner end of the hub preferably resting upon a collar 15, through which the power-shaft is passed.

Star-wheel 13 is rectangular in shape, thereby forming right-angled sides 16, each cor-

ner of the wheel being extended beyond the sides, thereby forming acute-angled projections 17, which contact with tappet 4 just at the point that the squared portion of the blade-shank coincides with the V-shaped recess 3, thereby causing the blade to make a one-fourth revolution, which, as the tappet and V-shaped recess are duplicated and arranged in diametrically opposite order upon the annulus, causes one blade to be thrown to the wind and the opposite blade to be thrown from the wind.

It will be seen that the parts are compact and inexpensive of construction and that the change of blade from resistance to non-resistance is made in a positive manner without jar or undue strain upon the parts.

In order to more fully support the blades and afford rigidity when resistance is offered, there is a ring 18, arranged circumferentially of the wheel, into which the outer ends of the blades are journaled, thereby affording an extra bearing-point to those in the disk.

To avoid resistance during the revolution of the wheel, the ring is formed with a base of sufficient width to receive the journals of the blades, and is then inclined to an apex at the outer periphery.

It will be apparent that I may vary the form of the star-wheel greatly without departing from the spirit of my invention, and in fact I may employ a circular wheel having four pins projecting from the periphery at diametrically opposite points and accomplish the result desired.

What I claim is—

1. In a power-wheel, an annulus having V-shaped marginal recesses and coincident tappets, a disk journaled in the annulus having journaled thereon a plurality of blade-shanks provided with a squared portion to bear upon the annulus, and an irregular wheel to contact with the tappets.

2. In a power-wheel, an annulus having a depending hub, a disk journaled in the annulus having a hub, a power-shaft journaled in the hub of the annulus and secured in the hub of the disk, a plurality of blade-shanks journaled in the disk and having squared portions to rest upon the annulus, oppositely-disposed recesses formed in the annulus and coincident tappets secured upon the annulus, and a wheel with irregular surfaces upon the shanks to contact with the tappets.

3. In a power-wheel, a fixed circumferential section, an internal movable section, blade-shanks journaled in the inner section and held from longitudinal movement therein, V-shaped recesses formed in the outer section at diametrically opposite points, a squared section upon the shanks adapted to fit the recesses, an irregular wheel upon the shanks, and means for revolving the wheel to cause the shank to fit the recess.

In testimony that I claim the foregoing as my own I hereby affix my signature in presence of two witnesses.

FRANK KLINE.

Witnesses:

WILLIAM WEBSTER,
MAUD SCHUMACHER.