J. W. KELLOGG.

CENTRIFUGAL FAN OR PUMP.

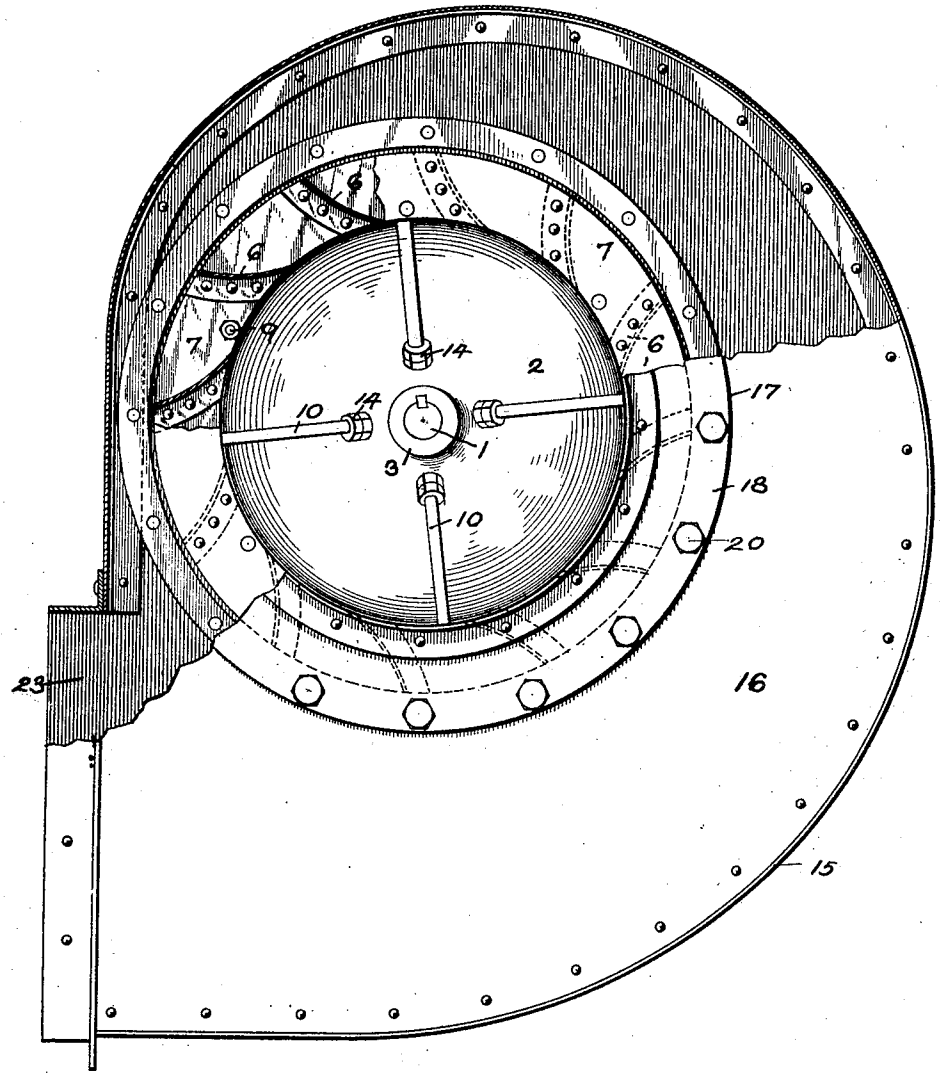
APPLICATION FILED APR. 4, 1908.

912,133.

Patented Feb. 9, 1909.

3 SHEETS—SHEET 1.

Fig. 1.



WITNESSES

M. Ray Taylor.

J. Ellis Glen

INVENTOR:

JAMES W. KELLOGG.

BY Albert G. Davis

ATTY.

J. W. KELLOGG.

CENTRIFUGAL FAN OR PUMP.

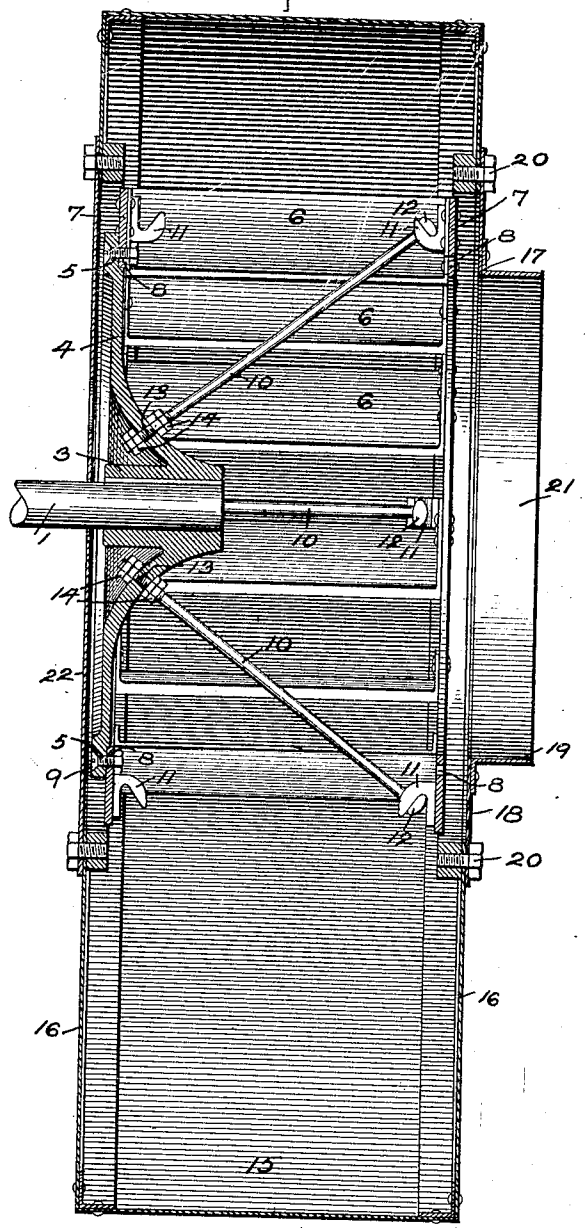
APPLICATION FILED APR. 4, 1908.

912,133.

Patented Feb. 9, 1909.

3 SHEETS—SHEET 2.

Fig. 2.



WITNESSES:

W. Ray Taylor.

J. Ellis Glen.

INVENTOR.

JAMES W. KELLOGG.

BY

ATTY.

J. W. KELLOGG.

CENTRIFUGAL FAN OR PUMP.

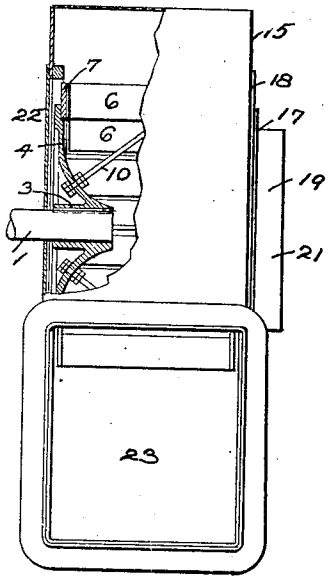
APPLICATION FILED APR. 4, 1908.

912,133.

Patented Feb. 9, 1909.

3 SHEETS—SHEET 3.

Fig. 3.



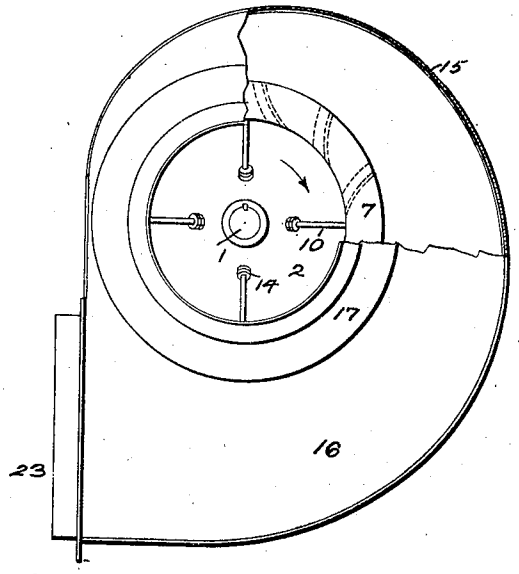
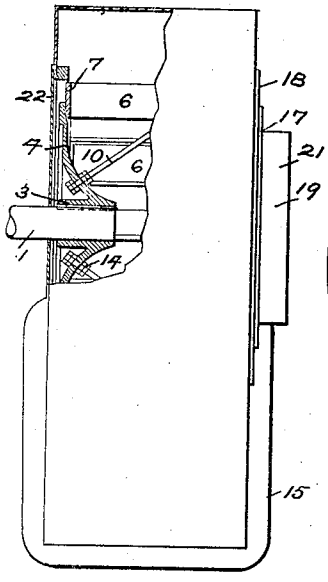
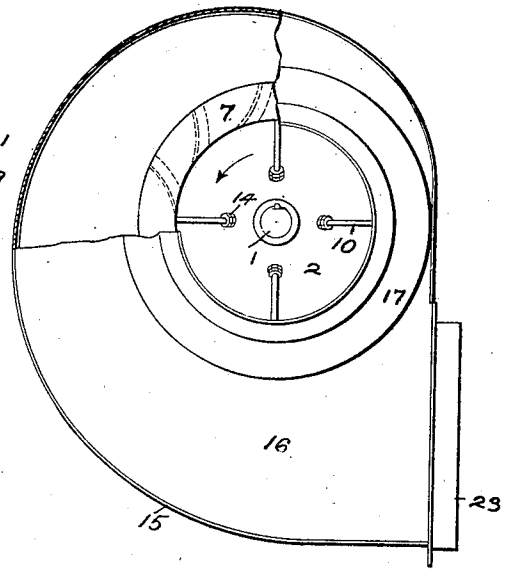


Fig. 4.





WITNESSES:

M. Ray Taylor.

J. Ellis Glen

INVENTOR.

JAMES W. KELLOGG.

BY Albert G. Davis

ATT'Y.

UNITED STATES PATENT OFFICE.

JAMES W. KELLOGG, OF SCHENECTADY, NEW YORK, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

CENTRIFUGAL FAN OR PUMP.

No. 912,133. Specification of Letters Patent. Patented Feb. 9, 1909.

Application filed April 4, 1908. Serial No. 425,089.

To all whom it may concern:

Be it known that I, JAMES W. KELLOGG, a citizen of the United States, residing at Schenectady, county of Schenectady, State of New York, have invented certain new and useful Improvements in Centrifugal Fans or Pumps, of which the following is a specification.

My invention relates to centrifugal fans and pumps having blades which must rotate in a certain definite direction with respect to the outlet opening in the casing, for the most efficient condition of operation.

Often, a limited space is provided for a fan and its driving motor which is usually direct-connected thereto, so that in case it is desired to change the outlet opening from the left hand side to the right hand side of the set, or vice versa, it becomes necessary to furnish an entirely new fan wheel which has blades arranged in a reverse direction to those in the original wheel. To avoid this difficulty I provide my wheel with a spider arranged to be secured to the shaft and having a radially extending flange or disk-shaped portion, the wheel proper being a separable structure having the blades mounted between two annuli, either of which may be secured to the flange of the wheel spider. The casing is constructed with openings of substantially the same diameter as the outside diameter of the wheel so that it may be readily removed axially from the wheel and turned about, and the hole in the casing which is not used as an inlet is closed by means of a plate which can be interchangeably secured over either opening.

Other points of novelty which characterize my invention will be pointed out in the claims annexed to and forming a part of this specification. For a better understanding of my invention, however, reference may be had to the following description taken in connection with the accompanying drawing.

Figure 1 is an elevation of my improved fan, with parts broken away to show the interior construction; Fig. 2 is a section at right angles to Fig. 1; Fig. 3 shows the arrangement of the parts for the direction of rotation as indicated by the arrow and with the outlet opening at the left of the inlet opening, and Fig. 4 shows views similar to Fig. 3, but for the opposite direction of rotation and with the outlet opening on the right.

The shaft 1 is driven by any suitable means, such as an electric motor, and has a spider 2 mounted upon the other end. This spider consists of a hub 3 cast integrally with the radially extending flange or disk-shaped portion 4, said flange having holes 5 about its periphery.

The wheel consists of blades 6 fastened to two annuli 7, which have holes 8 spaced similarly with the holes 5 and on a circumference of the same diameter, so that when one annulus 7 is brought in contact with the disk 4 the holes 5 and 8 register with one another. Bolts 9 are passed through these holes and fasten the wheel to the spider. Tie rods 10 may be used to stiffen the wheel. Hooks 11 are placed on both annuli. The heads 12 of the tie rods are held in the hooks on the annulus which is not bolted to the spider. The other end 13 of the tie rods is threaded and by means of nuts 14, is secured to the spider 2. The wheel is mounted in a snail casing 15. The two sides 16 of the casing are exactly similar and have openings therein which are substantially equal to the outside diameter of the wheel. An inlet plate 17, which consists of a ring of metal 18 to which is fastened a tubular portion 19, is bolted to the side of the casing by means of bolts 20 and forms the inlet opening 21 to the fan. A flat plate 22 is bolted to the other side of the casing and completely covers the hole therein. The bolt holes are spaced similarly and on circumferences of equal diameter on both sides of the casing so that the inlet plate 17 and the flat plate 22 are interchangeable.

In case it is desired to have the outlet opening 23 on the left hand side of the casing, when one is facing the inlet opening, the parts are arranged as in Figs. 1, 2 and 3, and the direction of rotation to produce a pressure at the outlet opening is clockwise, as indicated by the arrow. If the outlet opening must be placed on the right hand side, the parts must be arranged as shown in Fig. 4 and the direction of rotation is then counter-clockwise with respect to the inlet opening, but it will be noted that the rotation is in the same direction with respect to the outlet opening. If it is desired to rearrange the parts to place the outlet opening as shown in Fig. 4, the inlet plate 17 and the plate 22 are removed from the casing which permits the casing to be moved axially from around the fan. The nuts are removed from the tie rods 10, which allow the heads to be removed

from the hooks 11. By now removing the bolts 9 the wheel is freed from the spider and can be reversed so that the blades 6 will slope in the opposite direction (see Fig. 4). The other annulus 7 is then bolted to the disk 4 and the heads on the rods 10 placed in the hooks 11 on the annulus which previously had been bolted to the spider. The casing is then placed in position so that the outlet opening 23 is on the right, and the inlet plate 17 and the flat plates 22 are placed on the opposite sides of the casing from which they were removed, thus leaving the plates in the same relative position with respect to the spider, which has not been moved. The rotation of the wheel in the opposite direction to that in which it rotated before, produces pressure at the outlet opening.

I have described my invention as being particularly applicable to fans, but it is evident to those skilled in the art that it is also equally applicable to centrifugal pumps and the like. I further desire it to be understood that my invention is not limited to the particular construction shown and described and I aim in the appended claims to cover all modifications which do not depart from the spirit of my invention.

What I claim as new and desire to secure by Letters Patent of the United States, is:

1. A power driven fan or pump comprising a spider secured to the power shaft, said spider having a radially extending flanged portion, and a separable fan wheel comprising blades secured at their ends to annuli, said annuli being so constructed and arranged that either may be fastened to said flanged portion, whereby the wheel may be arranged for operation in either direction of rotation.

2. A power driven fan or pump comprising a spider secured to the power shaft, said spider having a radially extending flanged portion and bolt holes near its periphery, and a separable fan wheel comprising blades secured at their ends to annuli, said annuli having similarly located bolt holes which will register with the holes in the flanged portion, and bolts for fastening either of said annuli to said flanged portion, whereby the wheel may be arranged for operation in either direction.

3. A power driven fan or pump comprising a spider secured to the power shaft, said spider having a radially extending flanged portion and bolt holes near its periphery, and a separable fan wheel comprising blades secured at their ends to annuli, said annuli having similarly located bolt holes which will register with the holes in the flanged portion, bolts for fastening either of said annuli to said flanged portion, whereby the wheel may be arranged for operation in either direction, and tie rods fastened at one end to said spider and removably secured at their other end to the outside annulus.

4. A power driven fan or pump comprising a spider secured to the power shaft, said spider having a radially extending flanged portion, a separable fan wheel comprising blades secured at their ends to annuli, said annuli being so constructed and arranged that either may be fastened to said flanged portion, whereby the wheel may be arranged for operation in either direction of rotation, hooks on the inside of both annuli, and tie rods fastened at one end to said spider and arranged to engage the hooks on the outside annulus.

In witness whereof, I have hereunto set my hand this second day of April, 1908.

JAMES W. KELLOGG.

Witnesses:
HELEN ORFORD,
EDWIN L. RICH.