

(No Model.)

F. B. STEARNS.
WINDMILL WHEEL.

No. 510,054.

Patented Dec. 5, 1893.

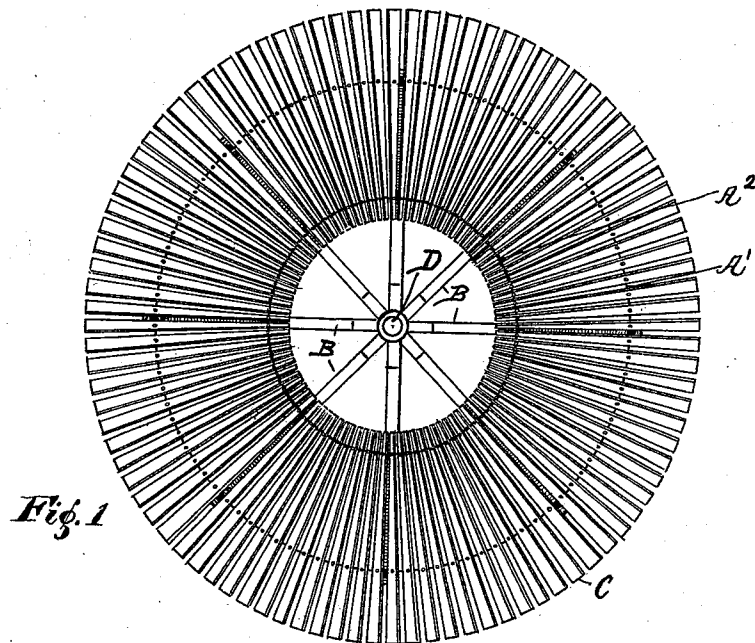


Fig. 1

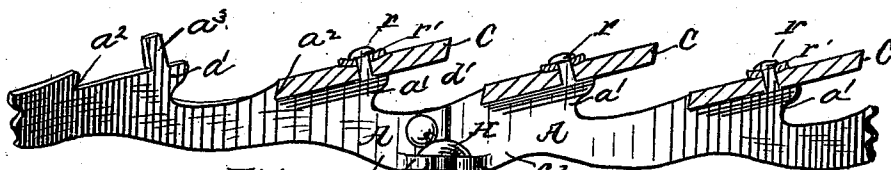


Fig. 2.

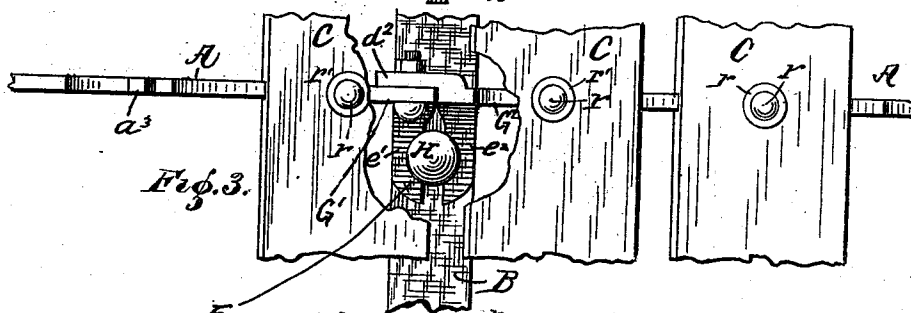


Fig. 3.

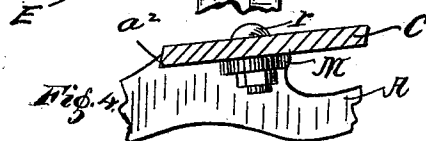


Fig. 4.

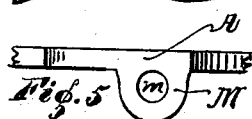


Fig. 5.

Witnesses:
W. B. Rushong
Chas. Schmalkholz

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UNITED STATES PATENT OFFICE.

FRED B. STEARNS, OF RUSHVILLE, ASSIGNOR TO THE STEARNS MANUFACTURING COMPANY, OF CONNERSVILLE, INDIANA.

WINDMILL-WHEEL.

SPECIFICATION forming part of Letters Patent No. 510,054, dated December 5, 1893.

Application filed October 10, 1891. Serial No. 408,370. (No model.)

To all whom it may concern:

Be it known that I, FRED B. STEARNS, a citizen of the United States, residing at Rushville, in the county of Rush and State of Indiana, have invented certain new and useful Improvements in Windmill-Wheels; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in the construction of wind wheels for wind mills and has special reference to the construction of the felly and the method of attaching the fellies to the arms and the sails to the fellies.

The object of the invention is to construct a wheel that will present an unbroken front or face, that is, in which none of the sails are left out of the wheel over the arms.

Another object of the invention is to construct a felly having the maximum strength and offering the minimum amount of surface resistance to the passage of the wind through the wheel.

Still another object is to afford a simple, inexpensive, and at the same time a very secure and durable means of fastening the sails to the fellies and also to afford a cheap and durable connection between the fellies and arms such as is also capable of adjustment to meet any variation in contact between the fellies and arms.

Another still more important object is attained in the use of this felly (viz.), that by its use no two pieces of wood come in contact one with the other in the entire construction of the wheel, thereby doing away with all liability of the wood work rotting or becoming decayed at the joints and therefore it is believed that a wheel built after my improved method will last at least one half longer than when constructed in the ordinary way.

I accomplish the objects of the invention by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a full front view of a wheel constructed in accordance with the spirit of my invention; Fig. 2, a detail in side elevation of the felly showing the arm and three of the

sails in cross section, the latter being secured by riveting, and showing one of the sail spaces left vacant on the felly to better illustrate the construction. Fig. 3, is a top view of the detail shown in Fig. 2, the sails immediately over the arm being broken away in part to show the joint between the two sections of the felly and the adjustable connection between the felly and arm. Fig. 4 is a modification of the felly in which an ear instead of a rivet is formed integral with the felly and has a hole therethrough for the insertion of a bolt or rivet by which the sail is fastened to the felly, and Fig. 5, is a top view of same, showing the sail removed.

Similar letters of reference refer to like parts throughout the several views of the drawings.

A represents the felly, B the arms and C the sails.

D is the spider to which the arms B are secured in the usual manner. The arms radiate from the center and form the supports for the fellies, which are curved and are arranged in a double series of circles (as shown at A', and A², in Fig. 1), placed a sufficient distance apart to afford the proper support for the sails.

The fellies will be made preferably of malleable iron in sections long enough to reach from one arm to the other where they will be joined together and fastened to the arm in the manner hereinafter described. I have found that one eighth of an inch in thickness and an average of one inch in width will make a felly sufficiently strong for my purpose but it is not desired to limit this invention to the dimensions herein given. The fellies will be placed with their narrowest dimensions out, or next to the sails which arrangement presents the narrowest dimensions against the wind and offers the least obstruction to the passage of the air through the wheel, and also places the greatest strength of material in the position to best resist the strain which the felly will have to bear.

A series of steps *a'* are formed on the outer edge of the fellies to receive the sails. The inclination of the steps corresponds to the inclination of the sails with relation to the face

of the wheel. A bearing or stop a^2 against which the lower edge of the sail rests, is formed integral with the step and is shaped so as to overlap the edge of the sail forming a dovetail therewith as shown in Fig. 2, and assists materially in forming a secure attachment of the sail to the felly. The lug a^3 formed integral with the felly and projected up from the step, is extended through the sail and riveted on the opposite side as shown at r , thus securing the sail in a simple and substantial manner. The washer r' is interposed between the point and sail in the usual manner of using washers.

The sails C will preferably be of wood, cut in thin strips of wedge shaped pattern, longitudinally, although it may be of metal instead of wood. The outer edge of the sails will be beveled as shown in the drawings in order to offer as little resistance as possible to the wind and the inner edge will be beveled in a corresponding direction so as to fit into the dovetail notch a^2 .

The sections of the felly are bolted together as shown at d' , Figs. 2 and 3, the offset d^2 allowing the alignment of the sections to be preserved as is shown. The tongue e' projected laterally from the section G and the tongue e^2 projected in like manner from the section G² form together a slotted ear E and through this slot the bolt H which is continued through the arm B, is projected, and by means of the nut h on the opposite side of the arm, is fastened so as to secure the fellys to the arm. The slot allows of an adjustment which is very desirable.

In the modification shown in Figs. 4 and 5 the lug a^3 forming the rivet for securing the sails to the arms is discarded and an ear M integral with the felly is formed. This ear is parallel with the lower face of the sails and is

provided with a hole m through which a bolt may be inserted and the sail fastened thereby instead of being riveted. This construction admits of the sails being removed for convenience in shipment and in making repairs.

I claim—

In a wind wheel, the spider D, to support the arms, arms B to support the felly and the sails C, in combination with a metallic felly A adapted to be secured to the arms and to form a support for the sails which will be fastened thereto, the said felly being formed in sections of greater width than thickness, and attached to the arms of the wheel so as to present the narrowest dimensions of the felly to the wind, and having a series of steps formed on its outer edge to receive the sails; said steps being sloped to correspond to the angle of the sails with the face of the wheel and having the cut-under notch a^2 and the lateral projection M and fastenings r for securing the sails to the felly, and the said felly having at one end the lateral projection e' and at the other end the lateral projection e^2 , the sections having overlapping joints and bolts passing through said joints and connecting the sections into one continuous felly whereby also the projections e' and e^2 will be brought together and secured in pairs with an intervening space between them through which a bolt projected therethrough and through the arm will form an adjustable attachment of the felly to the arm, substantially as and for the purposes described.

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

FRED B. STEARNS.

Witnesses:

BEN L. SMITH,

NED ABERCROMBIE.