

(No Model.)

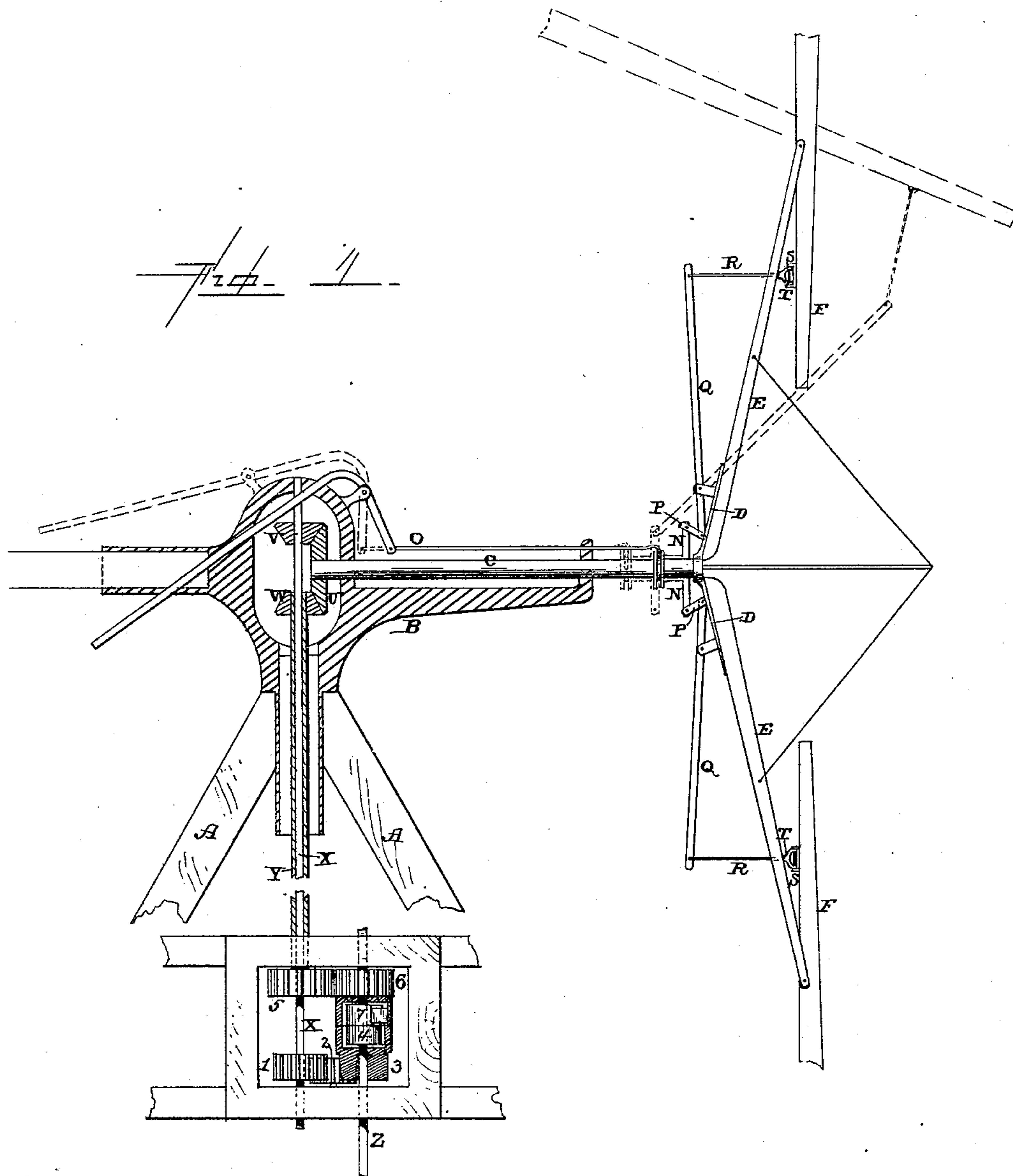
2 Sheets—Sheet 1.

C. W. & H. E. SYLVESTER.

WINDMILL.

No. 353,516.

Patented Nov. 30, 1886.



Witnesses

L. F. Gardner  
A. W. Brecht

Inventors

H. E. Sylvester,  
C. W. Sylvester,  
per  
J. A. Lehmann, atty.

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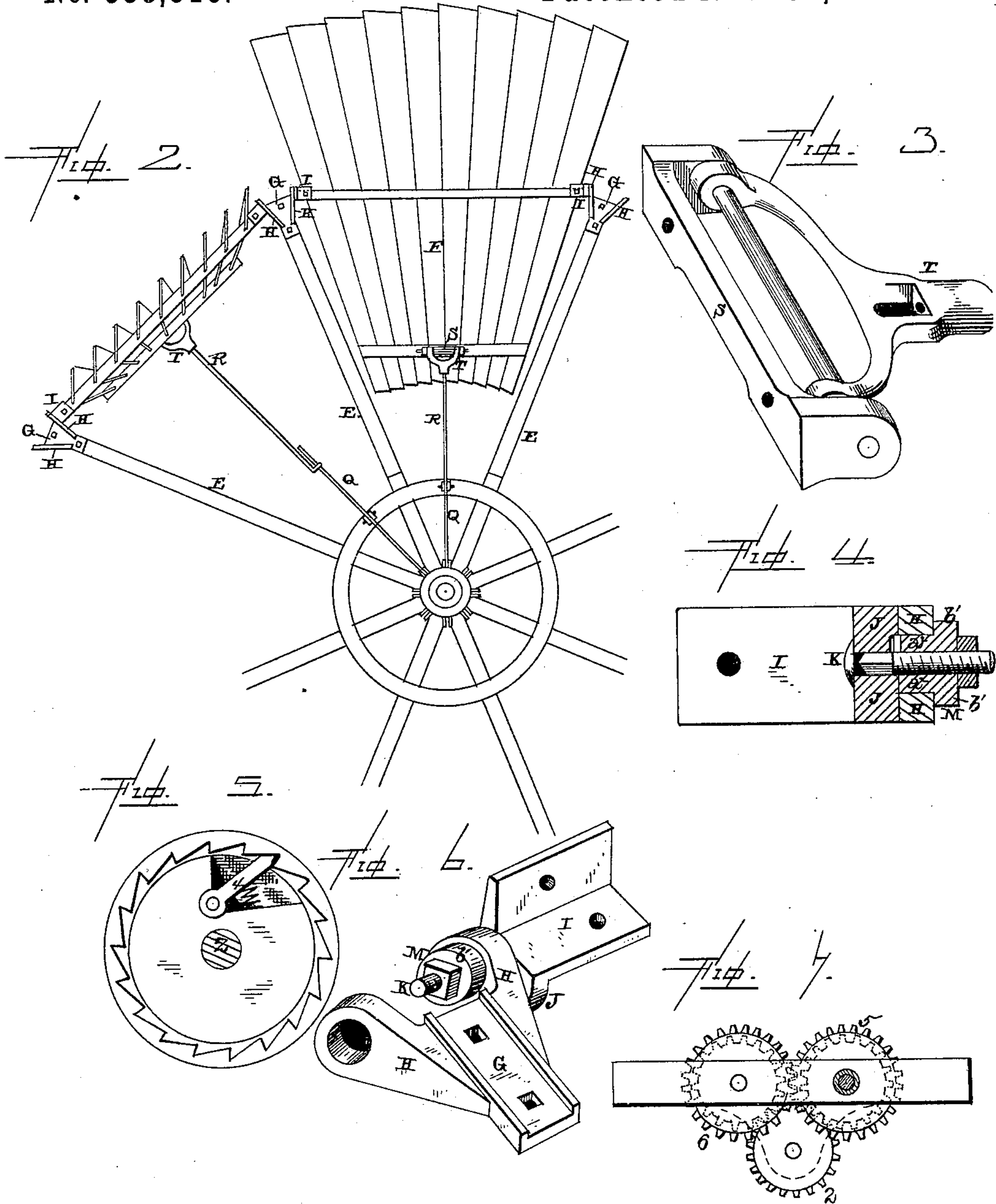
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# UNITED STATES PATENT OFFICE.

CHARLES W. SYLVESTER AND HENRY E. SYLVESTER, OF MARENGO, ILL.

## WINDMILL.

SPECIFICATION forming part of Letters Patent No. 353,516, dated November 30, 1906.

Application filed May 24, 1886. Serial No. 203,105. (No model.)

*To all whom it may concern:*

Be it known that we, CHARLES W. SYLVESTER and HENRY E. SYLVESTER, of Marengo, in the county of McHenry and State of Illinois, have invented certain new and useful Improvements in Windmills; and we 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 pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

Our invention relates to an improvement in windmills; and it consists in, first, the combination of the arms of the wheel, the castings which are connected thereto and provided with suitable ears, with the castings which are connected to the sections of the wheel, and which are connected by suitable clamping-bolts to the castings on the arms; second, the combination of the main shaft of the wheel, provided with the beveled gear at its inner end, the two shafts which revolve in opposite directions, and which are provided with pinions to mesh with the gear on the fan shaft, and the wheels by means of which the motion of the two shafts are concentrated upon a single shaft, all of which will be more fully described hereinafter.

The object of our invention is to connect the sections of the wheel to the arms by means of cheap, simple, and reliable fastenings, and thus dispense with the ball-and-socket joints which are generally employed for this purpose, and to produce a simple and reliable mechanism by means of which the power of the two shafts which revolve in opposite directions is concentrated upon a single shaft.

Figure 1 is a vertical section of a windmill embodying our invention. Fig. 2 is a front view of a portion of the wheel. Figs. 3, 4, 5, 6, 7 are detail views of the same.

A represents the frame-work upon which the mill proper is mounted; B, the casting, which is mounted upon the top of the frame-work, and which revolves thereon so as to form a turn-table, in the usual manner; and C is the wheel-shaft, which is journaled in the casting, as shown. To the outer end of this shaft C is secured a suitable spider, D, to which the arms E are rigidly secured. In between

the outer ends of the arms are journaled the sections F, which are made to open and close in the usual manner. To the outer end of each one of the arms E is secured the casting G, which is flanged upon its rear side, so as to fit over opposite edges of the arms, and which is provided with the two ears H, which are placed at an angle to each other, as shown.

To each one of the sections F are secured the triangular castings I, which are also provided with ears or flanges J, through which the clamping-bolt K and sleeve  $a^2$  on the nut M pass. This clamping-bolt K and sleeve  $a^2$  form the pivots upon which the sections F turn. The nuts M, which are applied to the clamping-bolts, are formed in a single piece with the washer  $b'$  and the sleeve  $a^2$ , so as to present as large a bearing-surface as possible upon the ears H. These two castings, C I, form a cheap, simple, and reliable means for connecting the sections F to the wheel, and are much cheaper, safer, and more easily repaired, in case they get out of order, than the ball-and-socket joints which are generally used for this purpose.

Placed upon the shaft C is the sliding collar N, which is operated by the jointed lever O, in the usual manner. Connected to this collar N are a series of short connecting-arms, P, which are pivoted at their opposite ends from the collar to the levers Q, which are pivoted upon the spider D. To the outer ends of these levers are loosely connected the connecting-rods R, which unite the sections to the levers Q.

To the rear side of each one of the sections is fastened a suitable casting, S, and to the end of the connecting-rods R is connected a pronged casting, T, which is bolted to the one S. These castings S T allow the sections to freely turn upon their pivots without any binding between them and the rods R, by means of which they are moved.

To the inner end of the shaft C is connected the gear-wheel U, which meshes with the two pinions, V W, placed upon the two shafts X Y, in the usual manner. The shafts X Y revolving in opposite directions, it becomes necessary to connect these two shafts in such a manner that their united power will be exerted in driving a single shaft, Z. For this purpose, upon the solid shaft X is rigidly secured



the wheel 1, which meshes with the idle-wheel 2, which in turn gears with a third wheel, 3, connected by an internal ratchet and pawl, 4, with the shaft Z. Rigidly secured to the lower 5 end of the hollow shaft Y is a pinion, 5, which gears with a wheel, 6, placed directly over the wheel 3, and which is also connected to the shaft Z by means of an internal ratchet and pawl, 7, the two wheels 1 and 5 being 10 made to revolve in opposite directions by the shafts X Y, having their rotary motion connected directly to the shaft Z by means of the gears 2, 3, and 6. The mechanism here shown and described is a very cheap and simple one, 15 and one which is not liable to get out of repair under any ordinary circumstances.

Having thus described our invention, we claim—

1. The combination of the arms E, the sec-

tions F, with the castings G, provided with 20 the two ears H, the triangular castings I, provided with the ears J, the clamping-bolts K, and the nuts M, substantially as described.

2. The combination of the main shaft C of the windmill, the gear U, the pinions V W, 25 and the two shafts X Y, which revolve in opposite directions, with the two gears 1 5, secured to the lower ends of the two shafts, the idle-wheel 2, and the two wheels 3 6, which are connected to the shaft Z by the ratchets 4 7, 30 substantially as set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

CHARLES W. SYLVESTER.

HENRY E. SYLVESTER.

Witnesses:

G. V. WELLS,

J. T. BELDIN.