

(No Model.)

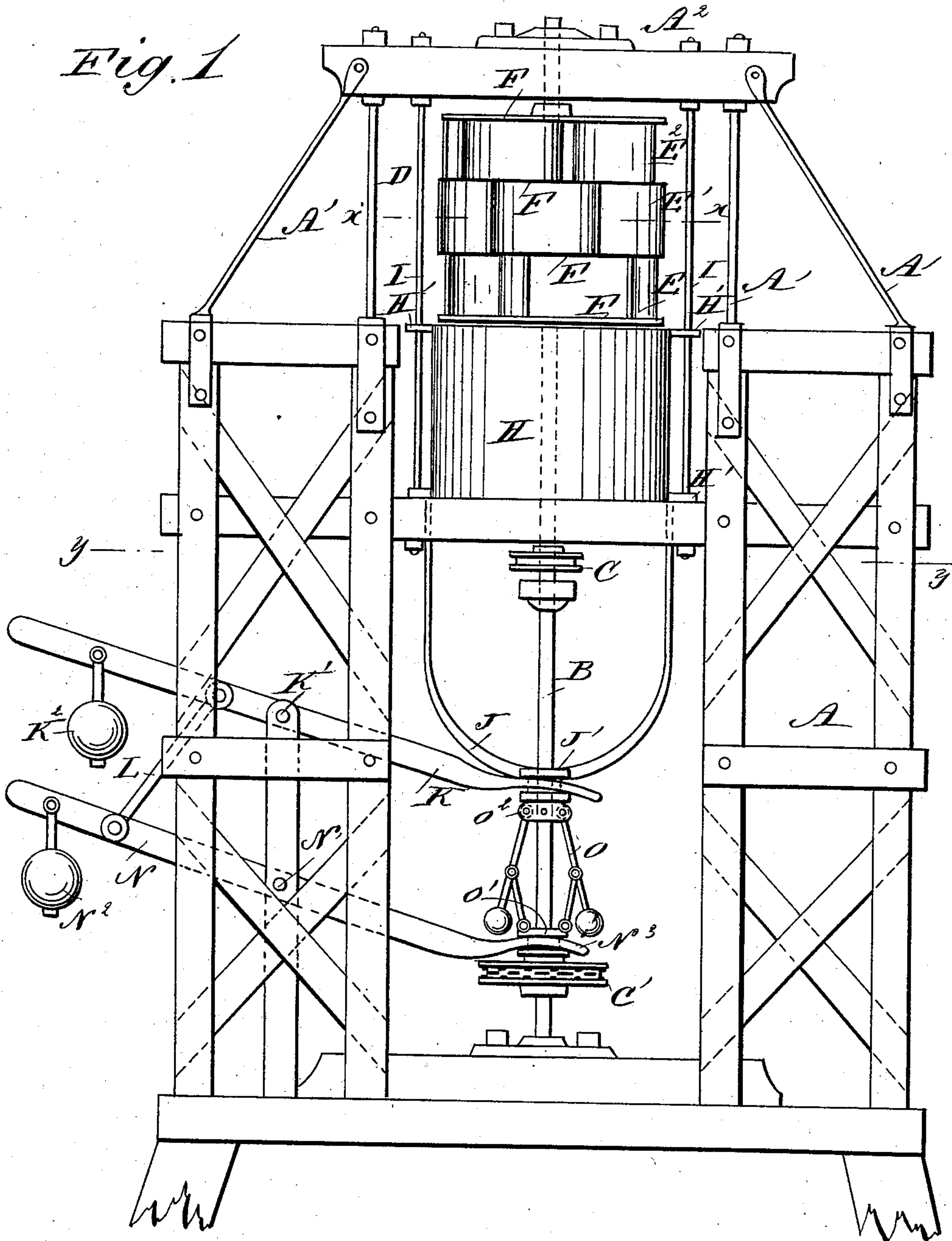
2 Sheets—Sheet 1.

M. J. S. SOLI.

WINDMILL.

No. 389,670.

Patented Sept. 18, 1888.



WITNESSES:

C. Neveu
G. Sedgwick

INVENTOR:

M. J. S. Soli
Munn & Co

BY

ATTORNEYS.

(No Model.)

2 Sheets—Sheet 2.

M. J. S. SOLI.

WINDMILL.

No. 389,670.

Patented Sept. 18, 1888.

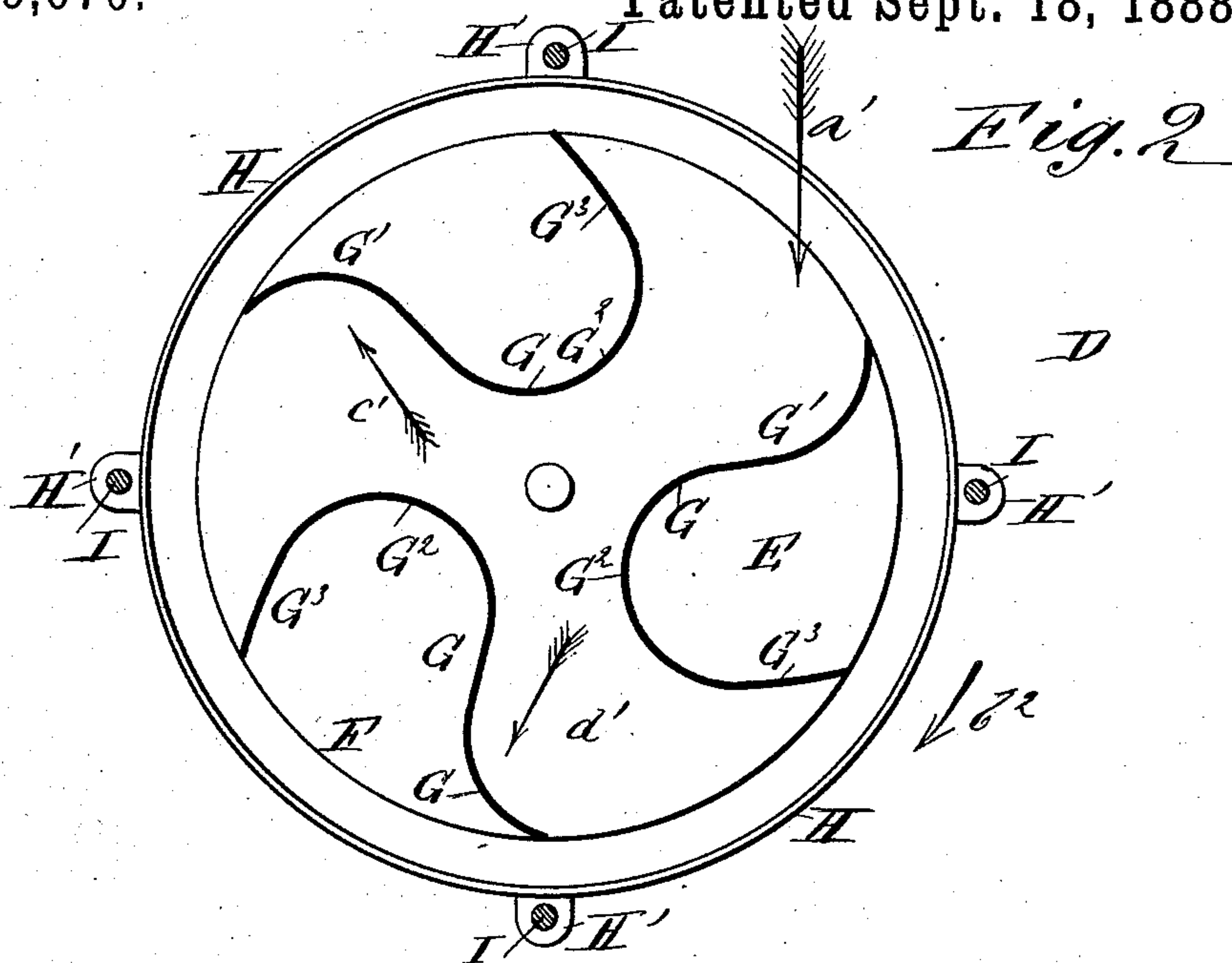
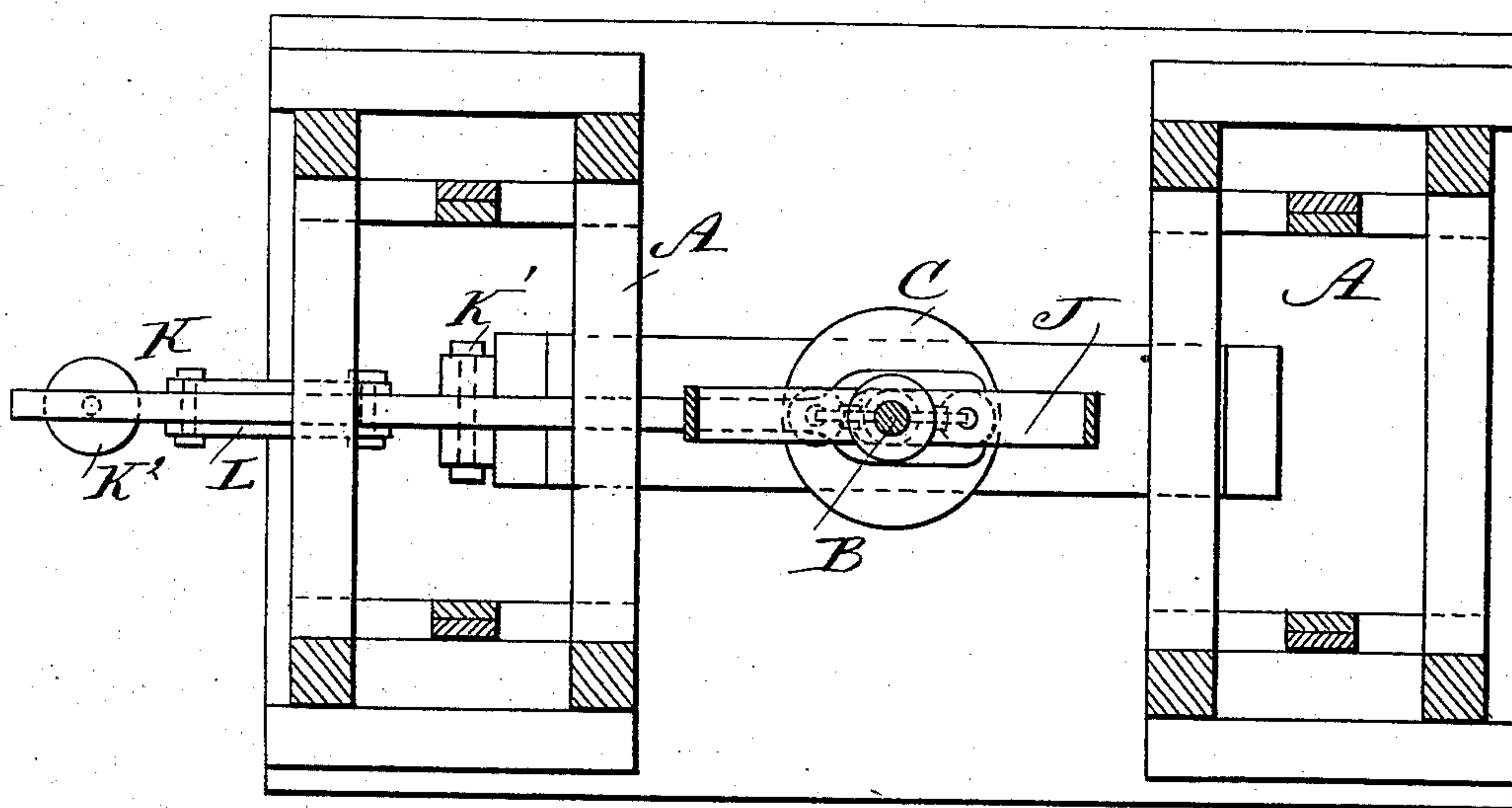


Fig. 3



WITNESSES:

C. Neveu
C. Sedgwick

INVENTOR:

M. J. S. Soli
Munn & Co

BY

ATTORNEYS.

UNITED STATES PATENT OFFICE.

MARCUS J. STROEM SOLI, OF BROOKINGS COUNTY, DAKOTA TERRITORY.

WINDMILL.

SPECIFICATION forming part of Letters Patent No. 389,670, dated September 18, 1888.

Application filed November 14, 1887. Serial No. 255,100. (No model.) Patented in Norway February 10, 1885; in Denmark July 16, 1885, No. 182, and in Germany March 18, 1886, No. 34,709.

To all whom it may concern:

Be it known that I, MARCUS J. STROEM SOLI, a citizen of Norway, at present residing in Brookings county, Territory of Dakota, have invented a new and Improved Windmill, (for which I have obtained a patent in Norway, dated February 10, 1885; in Denmark, dated July 16, 1885, No. 182, and in Germany, dated March 18, 1886, No. 34,709,) of which the following is a full, clear, and exact description.

The object of my invention is to provide a new and improved windmill which is simple and durable in construction, very powerful in operation, and self-regulating.

The invention consists of turbine wind-wheels of special construction and secured to the main driving-shaft.

The invention also consists of the construction and arrangement of certain parts and details and combinations of the same, as will be fully described hereinafter, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of my improvement. Fig. 2 is an enlarged sectional plan view of the wind-wheel on the line xx of Fig. 1, and Fig. 3 is a sectional plan view of my improvement on the line yy of Fig. 1.

On a suitably-constructed frame, A, is mounted the vertical driving-shaft B, provided with a belt-pulley, C, or chain-pulley C', connected by belts or chains, respectively, with suitable machinery to be driven. On the upper end of the shaft B is secured a wind-wheel, D, consisting of one or more turbines, E E' E'', &c., placed one above the other, and each provided with a top and bottom disk F, between which are held the curved blades G, forming orifices for the entrance and exit of the wind, and channels through the wheel. Each blade G is provided with a curved part, G', continuing into a semicircular part, G², which approaches the center of the disk and terminates in a straight part, G³, extending outward to the edges of the disks F. Thus, the wind striking the wind-wheel in the direction, say, of the arrow a' , exerts its pressure against the pocket

formed by the curved part G' of the blade G, and thereby turns the wind-wheel in the direction of the arrow b^2 . The wind, continuing onward from the curved part G' of the plate G, is partly deflected to the next following plate G in the direction of the arrow c' , and in passing out of the wheel strikes against the curved part G' of said plate, thus assisting in the rotary motion imparted in the direction of the arrow b' . Part of the wind also passes from the pocket of the part G' of the first blade G in the direction of the arrow d' to the third pocket formed by the part G' of the third plate, and also assists, before passing out of the wheel, in imparting rotary motion in the direction of the arrow b' to the wind-wheel D.

The turbines E, E', and E'' are arranged in such a manner that the outer edges of the parts G' and G³ of each blade G break joints, as illustrated in Fig. 1, so that the wind at all times, from whatever direction it comes, acts with full force against the wheel D—that is, the wind on entering the orifices, as well as on leaving the same, imparts motion to the wind-wheel D, thereby turning the main shaft B.

The wind-wheel D can be covered up wholly or partly by a casing, H, provided with lugs H', held on guides I, secured vertically to the main frame A. A U-shaped downwardly-extending rod, J, is secured by its ends to the lower end of the casing H and is provided in its middle with a collar, J', through which passes loosely the main shaft B. On the collar operate the forked ends of the lever K, fulcrumed at K' to the main frame A, and provided near its outer end with a weight, K². A link, L, is pivotally connected near the fulcrumed point of said lever K, and also connects with the second lever, N, fulcrumed at N' to the main frame A, and carrying on one outer end a weighted lever, N², and on its inner end being provided with a fork, N³, engaging a collar, O', of a governor, O, of any approved construction, and secured by its collar O² to the main shaft B. When the latter turns beyond the normal speed, the governor-balls fly outward and raise the collar O', so that the forked end N³ of the lever N swings upward and its outer end swings downward, thereby exerting a downward pull on the outer end of

the lever K, and thus imparting a swing to the same, so that its inner end moves upward and carries with it the U-shaped rod J, connected with the casing H, so that the latter slides
5 over the wind-wheel D a certain distance, according to the movement of the governor-balls. Part of the wind-wheel or the entire wind-wheel is thus covered up and the wind exerts its force only on part of the wheel, thereby de-
10 creasing its speed until the main shaft B again runs at a normal speed, when the governor-balls have moved to their former position, thereby removing the casing H again below the wheel D, as illustrated in Fig. 1.

15 It will be seen that by my improved wind-wheel I utilize the full force of the wind, regulate the speed of the shaft B automatically, and the wind can always act from whatever direction it blows without the shifting of vanes
20 and other devices usually employed in windmills. In order to present as few obstructions as possible to the wind for rotating the wind-wheel D, I prefer to construct the upper part of the frame A with metallic rods A', supporting
25 the wooden top A², which carries the uppermost bearing for the main shaft B.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

30 1. A turbine wind-wheel consisting of top and bottom plates and a series of spaced and independent blades arranged between the said plates, each blade extending inwardly from the

periphery toward the center and then curved outwardly to the periphery again, substantially
35 as described.

2. A turbine wind-wheel consisting of top and bottom plates F and the spaced and independent blades G, each formed with the curved
40 part G', the semicircular part G², and the curved part G³, substantially as herein shown and described.

3. In a windmill, the combination, with the main shaft, a wind-wheel mounted thereon, and a sliding casing for partially or wholly cover-
45 ing the wheel, of a weighted lever engaging a collar carried by the casing, a governor on the main shaft, and a second weighted lever engaging a collar of the governor and connected to the first-named weighted lever, substantially
50 as herein shown and described.

4. In a windmill, the combination, with the main shaft B and the wind-wheels E E' E², and the governor O on the said shaft, of the sliding casing H, provided with a downwardly-
55 extending arm, J, the pivoted weighted lever K, engaging a collar on the said arm, a second pivoted and weighted lever, N, engaging a collar of the governor, and the link L, pivoted to the said levers K N, substantially as herein
60 shown and described.

MARCUS J. STROEM SOLI.

Witnesses:

B. H. LIEN,
LOUIS PATNAND.