

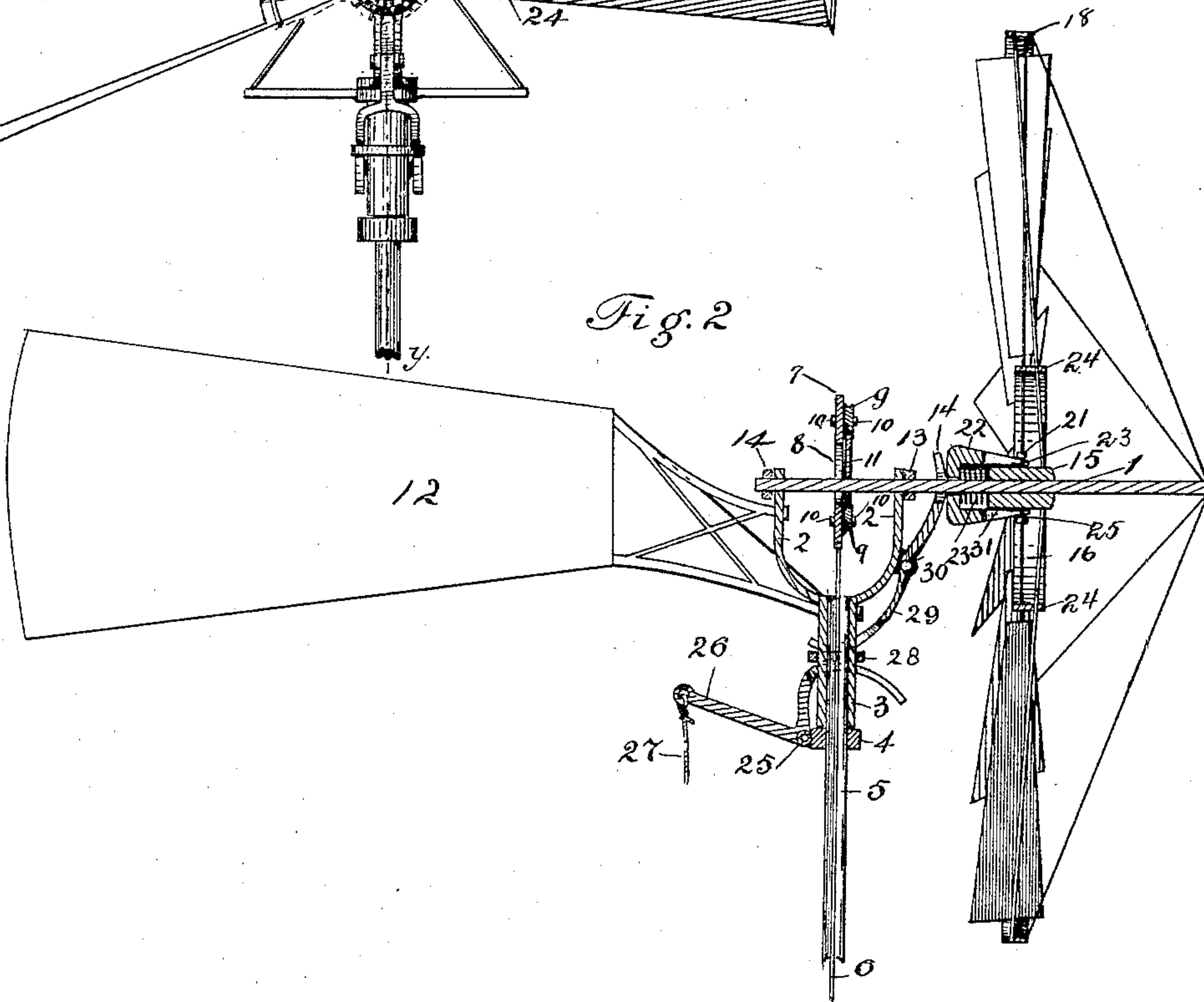
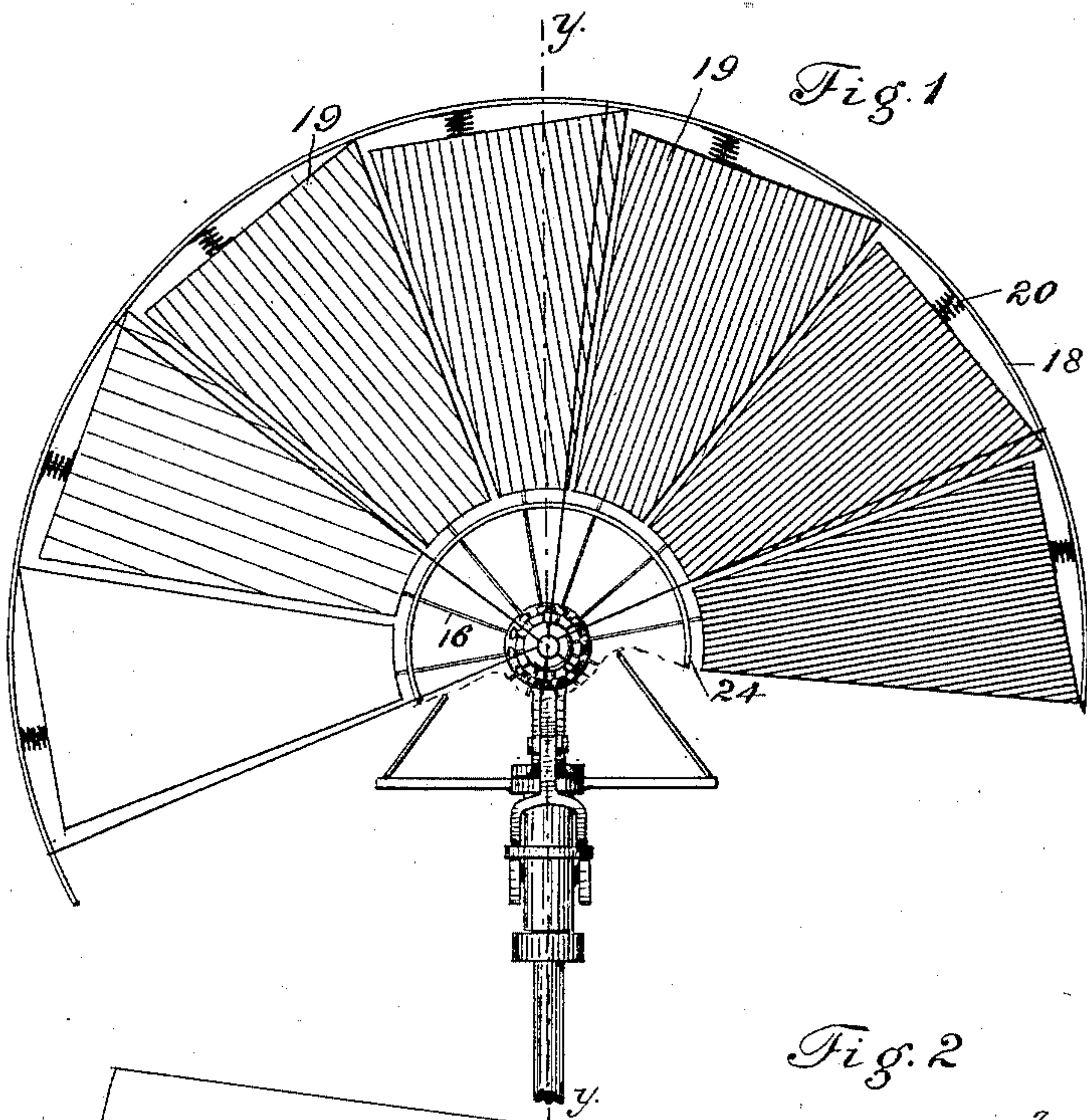
(No Model.)

2 Sheets—Sheet 1.

G. S. CHAPMAN.  
WINDMILL.

No. 444,793.

Patented Jan. 13, 1891.



WITNESSES:

*Wm Jowalski*  
*Wm M Connell*

INVENTOR

*General S. Chapman*  
BY *A. J. O'Brien*  
*his* ATTORNEY

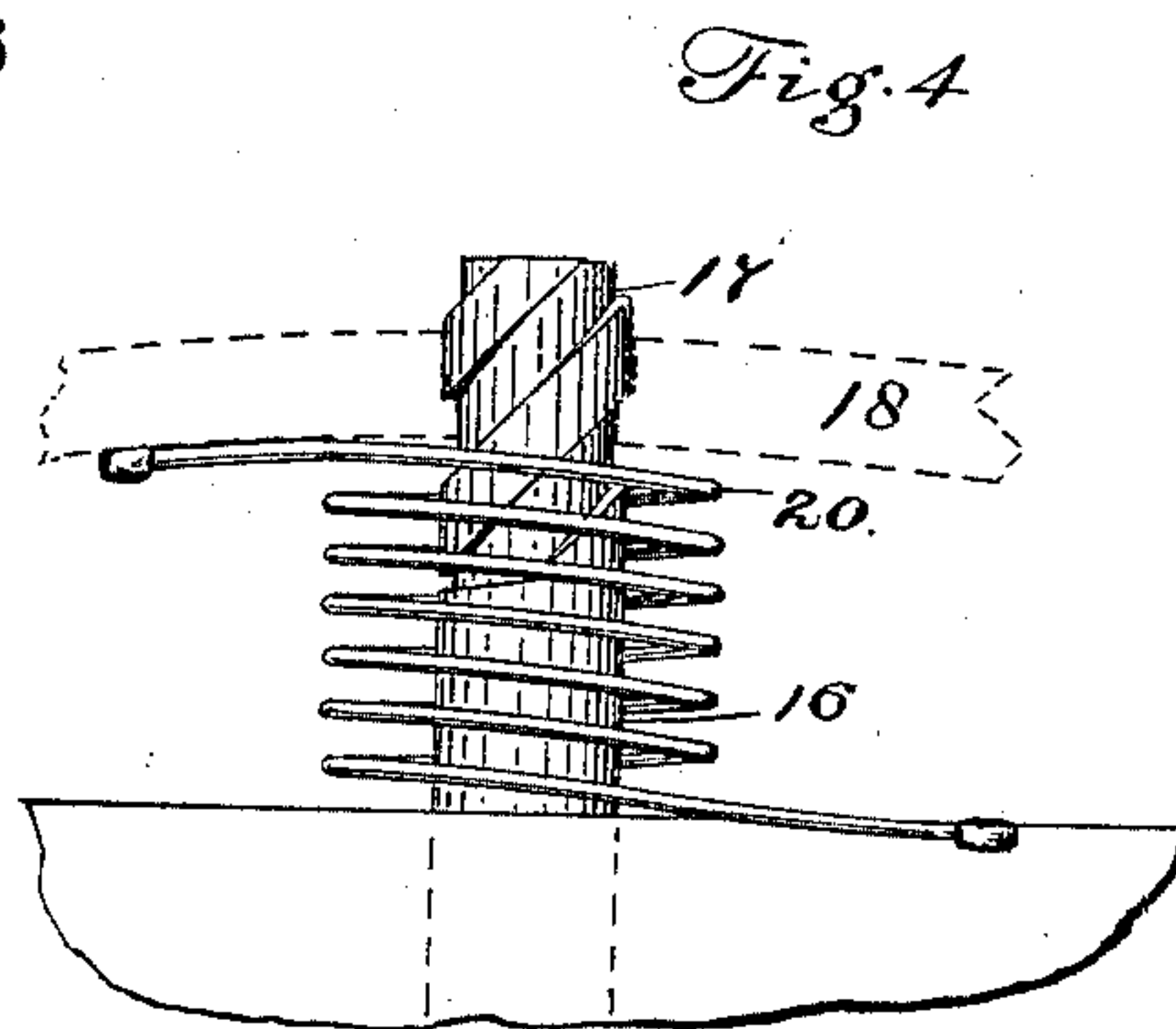
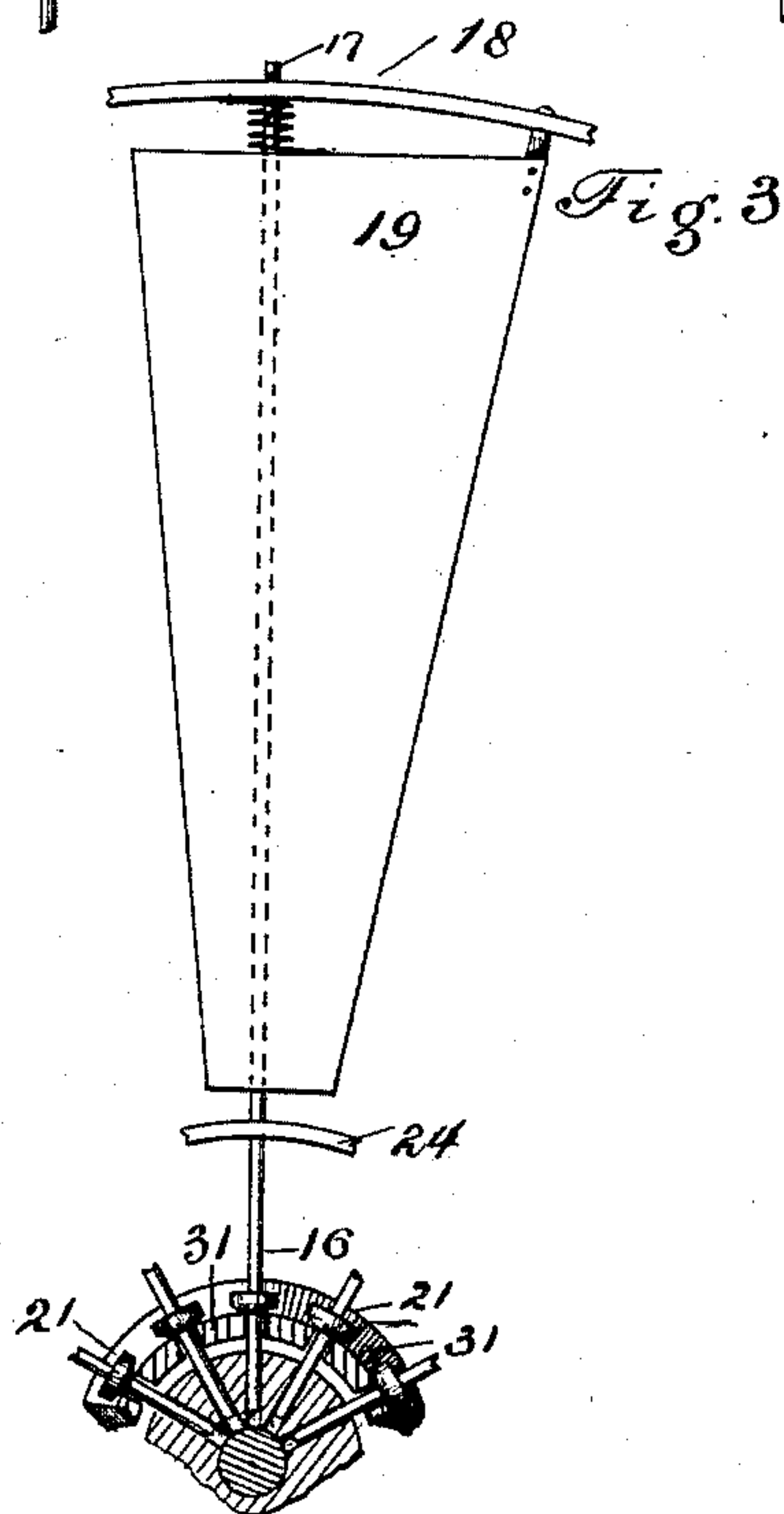
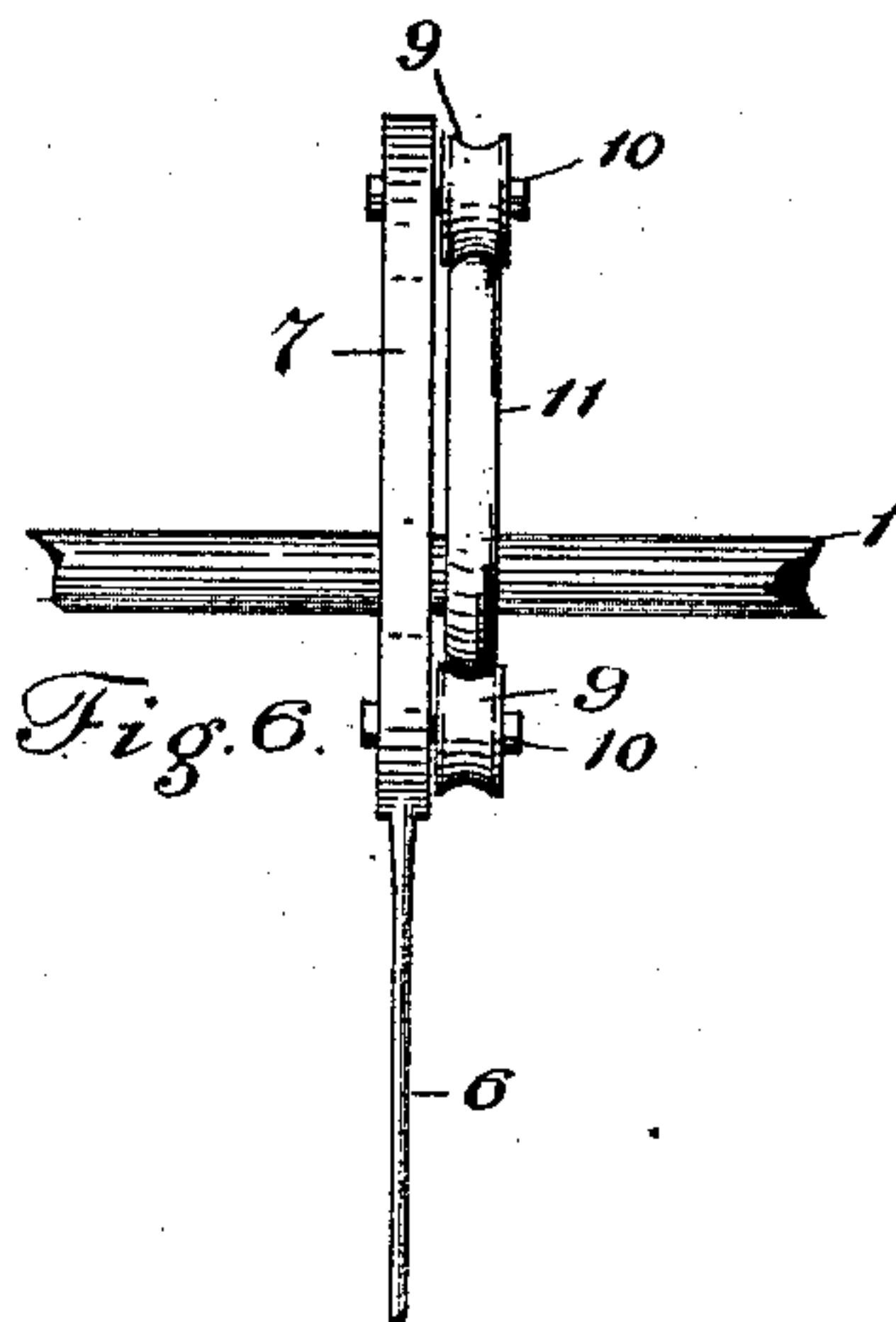
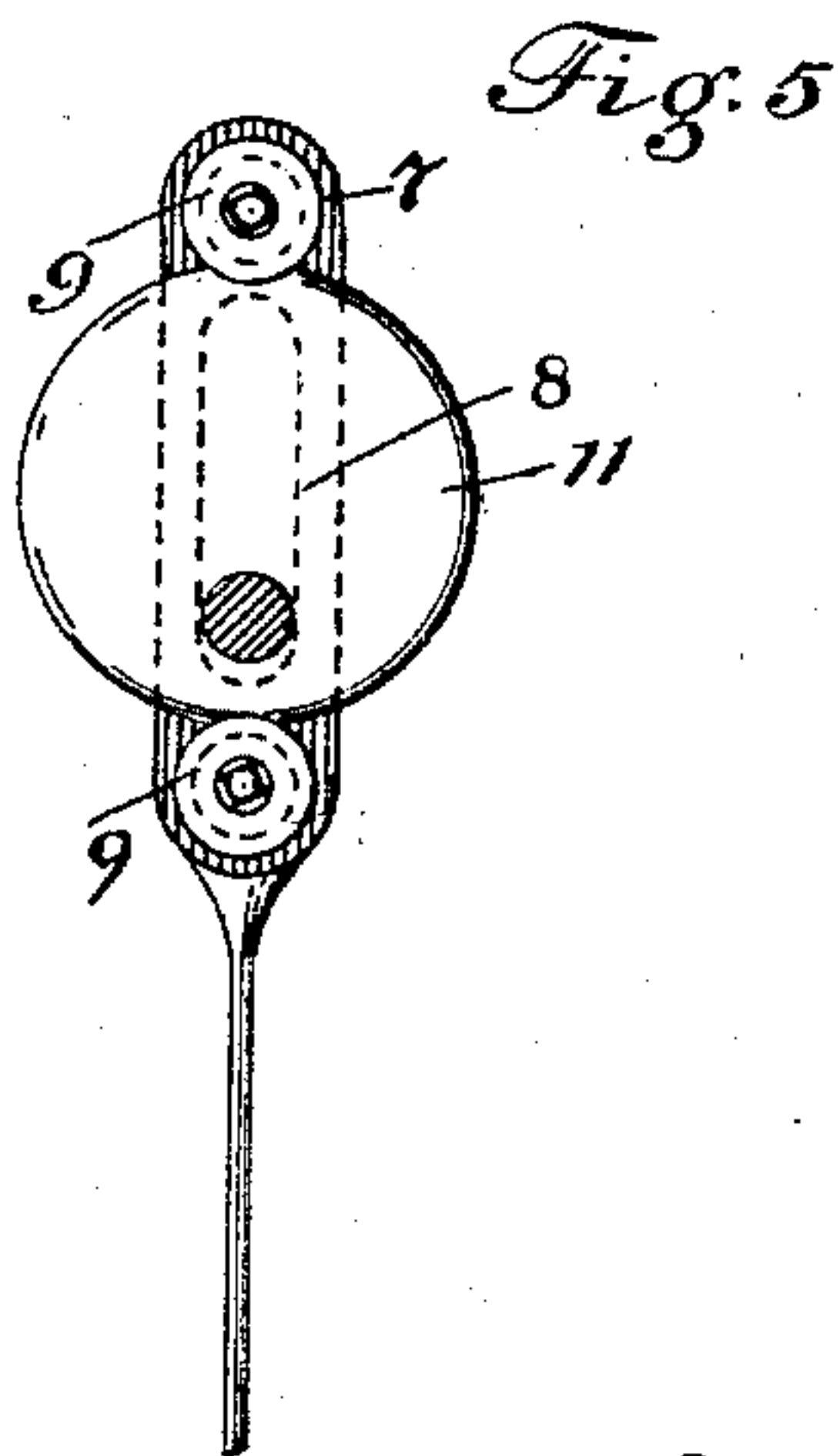
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2 Sheets—Sheet 2.

G. S. CHAPMAN.  
WINDMILL.

No. 444,793.

Patented Jan. 13, 1891.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

GENERAL S. CHAPMAN, OF DENVER, COLORADO.

## WINDMILL.

SPECIFICATION forming part of Letters Patent No. 444,793, dated January 13, 1891.

Application filed December 6, 1889. Serial No. 332,846. (No model.)

*To all whom it may concern:*

Be it known that I, GENERAL S. CHAPMAN, a citizen of the United States, residing at Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Windmills; and I do 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, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in windmills, and the special object of my invention is to provide a device for utilizing the power of the wind in pumping water, but which may be used for all other purposes common to mills of this class, said device to be of simple construction, durable, easily operated, reliable, and effective for the purpose intended; to which ends my invention consists of the features, arrangements, and combinations hereinafter described and claimed.

In the drawings is illustrated an embodiment of my invention, in which drawings—

Figure 1 is a front elevation of the improvement. Fig. 2 is a vertical section taken on the line *y y*, Fig. 1. Figs. 3, 4, 5, and 6 are enlarged details of the mechanism.

In the views, let the reference-numeral 1 indicate a main propelling-shaft suitably journaled within the forked extremities 2 2 of the sleeve 3, which rests upon a stationary collar 4, supported from beneath in any suitable manner.

5 is a guide-pipe for the pitman-rod 6, communicating with the pump or other mechanism below to which the power is to be applied. Pipe 5 is surrounded by sleeve 3 and collar 4, the sleeve being free to turn upon said pipe. The upper portion of rod 6 is formed into a flattened part 7, provided with a vertical slot 8 and two small pulleys 9 9, which turn freely on pivots 10 10. Through slot 8 passes the main shaft 1, to which is rigidly secured the eccentric 11, engaging the pulleys 9 at opposite points of its periphery.

As shaft 1 revolves, the eccentric gives a

vertical reciprocating movement to the pitman-rod, part 7 sliding over shaft 1 by virtue of the slot 8, which is of sufficient length to permit the required length of stroke to the pitman. Suitably secured to sleeve 3 and one of its forked extremities 2 is the vane 12. Rigidly secured upon shaft 1 are the collars 13 and 14, the former just in front of one of the forks 2, and the latter just in the rear of the other of said forks, so that said shaft shall have no lateral or sliding movement either forward or backward.

Rigidly secured upon shaft 1 at a considerable distance from either extremity is the hub 15. Within this hub are pivoted the inner extremities of the radial arms or spokes 16, which may be of any desired length. The outer extremities of these spokes are provided with a threaded portion 17, engaging corresponding threaded apertures in the circular rim 18, forming the periphery of the wheel of the mill. The thread 17 is of sufficient pitch that a direct outer shove upon the spokes will cause each of them to traverse its corresponding threaded aperture, the spoke making a certain portion of a revolution depending upon the length of outward movement given to the spokes or upon the length of thread 17. Rim 18 is supported in position by the auxiliary spokes or braces 19, secured to and extending from the rim of the wheel at one extremity to the forward end of shaft 1 at the opposite extremity. Rigidly secured upon each spoke 16 is a blade or fan 19. This fan is secured to the spoke or rod at a distance from the longitudinal center of the fan, so that when the wind strikes the fan the force upon one side thereof (this side being the same in all the fans) will be enough greater than the force on the other side to turn the fan with its respective spoke. Coiled around the outer extremity of each spoke between the rim of the wheel and the outer extremity of the blade or fan 19 is a coiled spring 20, one extremity of said spring being secured to the rim of the wheel and the other extremity thereof to the outer extremity of the fan or blade, as shown in Fig. 4, in which the rim of the wheel is indicated by dotted lines.

Spokes 16 are free to move outwardly when



sufficient power is brought to bear upon them, their inner extremities being embedded in the hub 15 to a sufficient depth to permit considerable outward movement and still retain their sockets. Rigidly secured to each spoke 16 and normally quite close to hub 15 is a button 21.

Secured upon shaft 1 and in the rear of the hub 15 is the sliding collar 22, provided with wedge-shaped forked or toothed projections 23, extending on each side of each spoke 16, the points 31 of these wedge-shaped projections normally just entering on each side the spokes between the hub and the buttons 21. Between collar 22 and hub 15 is a recess, within which is seated a coiled spring 23. Between the hub 15 and the inner extremities of the blades 19 is the small wheel or rim 24, through which the spokes pass.

Pivoted to collar 4 at 25 is a sort of bell-crank lever 26, one extremity of which is provided with a rope, cord, or wire 27, extending downward within reach of a person from the ground. The opposite or forked extremity of lever 26 rests under a collar 28, adapted to slide on sleeve 3.

29 is another lever, provided with fulcrum 30, secured to the forward branch of the forked extremity of sleeve 3. Both extremities of lever 29 are forked or branched, the upper on each side of shaft 1 and just behind and in contact with collar 22, the lower on each side of sleeve 3 and just above and in contact with collar 28. By virtue of this mechanism, when power is applied to cord 27, sleeve 22 is forced forward upon the shaft and its wedge-shaped extremities are crowded under buttons 21, forcing the spokes outwardly sufficiently to cause them to make half a revolution, their threaded extremities engaging the apertures in the rim of the wheel, as before described. The blades now stand in the position shown in Fig. 2, and the mill is out of gear, since the edges of the blades are presented to the wind and, cord 27 being fastened, are held in this position.

It will be observed that my improved mill is also self-regulating, since a violent wind will force the blades into the position shown in Fig. 2. The action of the springs 20, however, is always exerted against this result. Hence the inclination of the plane of the blades to that of the spokes of the wheel will always depend upon the force of the wind when the mill is left by itself.

Having thus described my invention, what I claim is—

1. The combination, with the main shaft 1 and the rim 18, of spokes 16, pivoted in sockets in the hub upon the shaft at one extremity and entering apertures in the rim at the opposite extremity, the outer extremity of the

spokes being threaded for a short distance, the apertures of the rim 18 being threaded to correspond with the threaded extremities of the spokes, the fans 19, rigidly secured to the spokes at one side of the longitudinal center of the fans, the springs 20, coiled around the spokes between the ends of the fans and the rim of the wheel, one extremity of the spring being secured to the said rim and the opposite extremity to the ends of the fans, substantially as described.

2. The combination, with the main shaft 1 and the rim 18, of the radial arms 16, pivoted in the hub upon the shaft, this portion of which is enlarged or provided with a hub 15, rigidly seated thereon, the outer extremities of the arms 16 being provided with threads 17, adapted to enter apertures in the rim correspondingly threaded, fans 18, rigidly secured to the radial arms, buttons 21, rigidly secured to arms 16 near the shaft, a sliding sleeve 22, secured upon the shaft in the rear of hub 15, a spring 23, secured within a recess between the sleeve and the hub, sleeve 22 being wedge-shaped and terminating in teeth 31, extending on each side of the base of the radial arms and beneath the buttons 21, and suitable means for giving a forward movement to sleeve 22 and forcing the radial arms outwardly, said means being connected with a rope or its equivalent and actuated by a downward pull, substantially as described.

3. The combination, with the main shaft 1 and the rim 18, of the radial arms 16, pivoted in sockets in the hub upon the shaft, this portion of which is enlarged or provided with a hub 15, rigidly seated thereon, the outer extremities of the arms 16 being provided with threads 17, adapted to enter apertures in the rim correspondingly threaded, fans 18, rigidly secured to the radial arms, buttons 21, rigidly secured to arms 16 near the shaft, a sliding sleeve 22, secured upon the shaft in the rear of hub 15, a spring 23, secured within a recess between the sleeve and the hub, sleeve 22 being wedge-shaped and terminating in teeth 31, extending on each side of the base of the radial arms and beneath the buttons 21, and suitable means for giving a forward movement to sleeve 22, forcing radial arms outward, said means consisting of a combination of levers pivoted to the frame-work and actuated by a downward pull on a cord or its equivalent connected with said levers, substantially as described.

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

GENERAL S. CHAPMAN.

Witnesses:

L. F. WILBER,  
J. B. WILLSEA.