

No. 668,729.

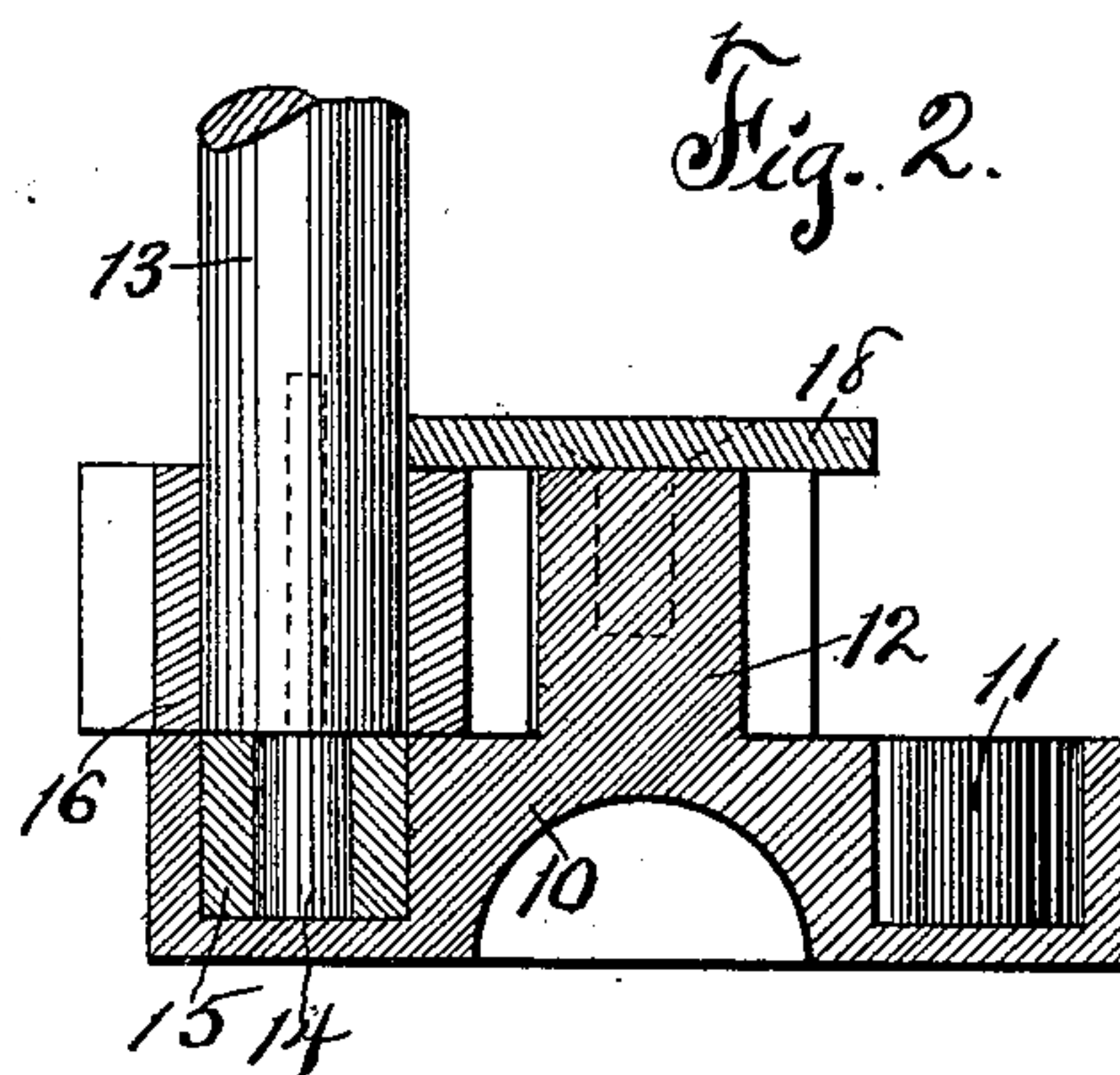
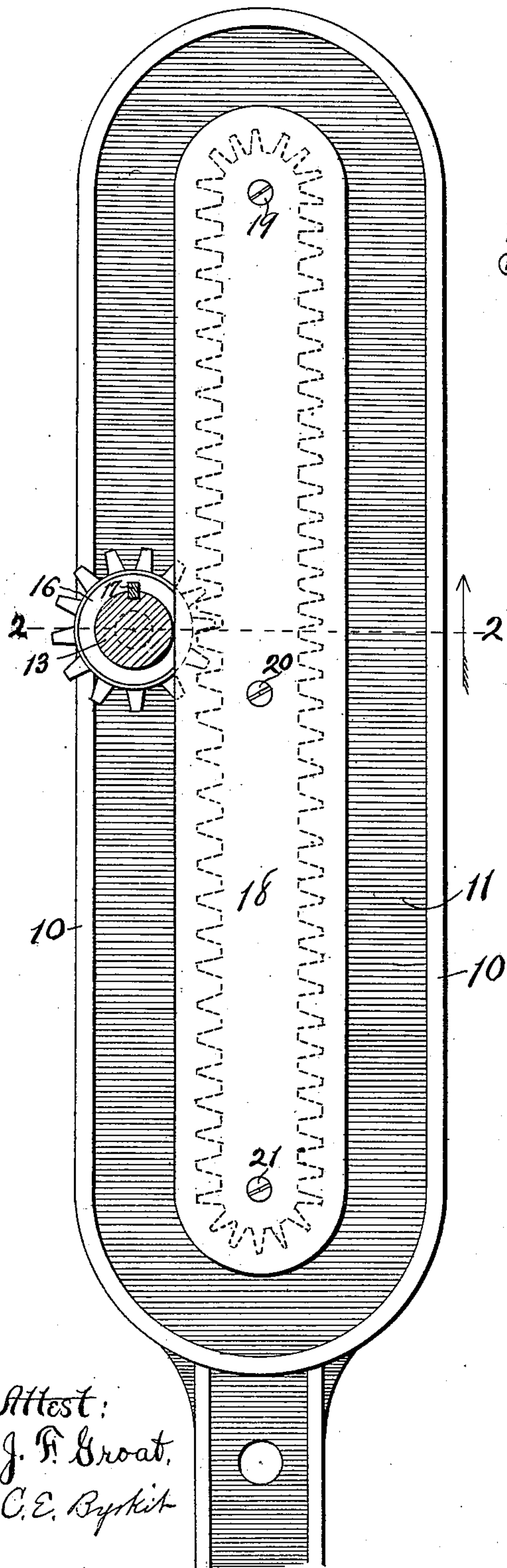
Patented Feb. 26, 1901.

G. A. CULVER.

LONG STROKE GEARING FOR WINDMILLS.

(Application filed Aug. 3, 1900.)

(No Model.)



Attest:
J. F. Groat,
C. E. Byrkit

Inventor:
George A. Culver,
By J. H. Swarth Atty

UNITED STATES PATENT OFFICE.

GEORGE A. CULVER, OF DES MOINES, IOWA, ASSIGNOR TO THE DEMPSTER MANUFACTURING COMPANY, OF SAME PLACE.

LONG-STROKE GEARING FOR WINDMILLS.

SPECIFICATION forming part of Letters Patent No. 668,729; dated February 26, 1901.

Application filed August 3, 1900. Serial No. 25,761. (No model.)

To all whom it may concern:

Be it known that I, GEORGE A. CULVER, a citizen of the United States of America, and a resident of Des Moines, Polk county, Iowa, have invented certain new and useful Improvements in Long-Stroke Gearing for Windmills, of which the following is a specification.

The object of this invention is to provide improved means to be employed as a long stroke for windmills and in which the lateral vibration of the pitman will be minimized in relation to the elevation thereof in the making of a single lifting or depressing stroke therewith.

My invention consists in the construction, arrangement, and combination of elements hereinafter set forth, pointed out in my claims, and illustrated by the accompanying drawings, in which—

Figure 1 is a face view or elevation of the device. Fig. 2 is a cross-section of the device on the indicated line 2 2 of Fig. 1.

In the construction of the device as shown the numeral 10 designates a back plate, in which is formed an endless groove of oblong form. The groove 11 is of uniform width and depth throughout its length and is parallel with the margin of the back plate. The groove 11 is formed with straight parallel side portions and arc end portions. An externally-toothed rack 12 is formed on the face of the back plate 10 within the space bounded by the inner wall of the groove 11, and hence is of oblong form, with its pitch-line straight on the side portions and rounded on the end portions concentric with the groove. The width of the rack 12 from base to base of the teeth thereof is approximately the same as the width of the groove 11.

The numeral 13 designates the shaft of a windmill or other prime mover, and the diameter of said shaft is approximately the same as the width of the groove 11. One end portion of the shaft 13 is reduced in diameter to form a spindle 14, and an antifriction roller or bushing 15 is mounted loosely thereon and enters the groove 11 for travel therein. The face of the roller or bushing 15 is of approximately the width of the depth of the groove 11, and the diameter of the roller is

only slightly less than the width of said groove. A pinion 16 is keyed at 17 to the shaft 13, and one end of said pinion abuts the face of the back plate 10 on either side of the groove 11. The pinion 16 is of approximately the same width of face as the rack 12 and meshes therewith. The pinion 16 is held in mesh with the rack 12 by rolling contact of the periphery of the roller or bushing 15 with the outer wall of the groove 11, and the back plate is steadied in its travel while the rack is traveling around the pinion by contact of the periphery of the roller or bushing with the inner wall of the groove. The rack is made of just such width as will provide end portions of such radius as to properly accommodate the pinion and travel smoothly and with the least wear around said pinion. The pinion is held in place and steadied with one end in contact with the back plate by means of a confining-plate 18, laid on the face of the rack 12 and secured by screws 19, 20, and 21, traversing the confining-plate and seated in the rack. The confining-plate 18 is of such width as to overlap the teeth of the pinion on either side of the rack, and the edge of said plate may provide a surface for rolling contact of the shaft 13 at a line on the periphery of the shaft adjacent the pinion.

Through the use of the externally-toothed rack 12 I am enabled to provide an extra long stroke with a minimum of lost motion, inasmuch as the lateral vibration of the rack and back plate is very small in respect of the length thereof and the time required for the rounded ends of the rack to cross the plane of the shaft is minimized in respect of the time required for the long straight side of the rack to traverse its length in mesh with the pinion.

I claim as my invention—

1. A long-stroke gearing for windmills, comprising a back plate formed with an endless oblong groove in one face thereof, a rack of oblong form on the grooved face of the back plate and within the space bounded by the groove, a shaft mounted for rotation and having one end extended within said groove a pinion on said shaft meshing with said rack and a confining-plate on the rack and overlapping the teeth of the pinion.

2
2. A long-stroke gearing for windmills, comprising a back plate formed with an endless groove of oblong form in one face thereof, a rack of oblong form on the grooved face of the back plate and within the space bounded
5 by the groove, a shaft mounted for rotation and having one end extended within the groove of the back plate, a pinion fixed to the shaft and meshing with the rack, one end
10 of the pinion overlapping the groove and contacting with the face of the back plate on either side of the groove, and a confining-plate on the rack and overlapping the pinion

to such a distance that the edge of the confining-plate provides a surface for rolling contact of the periphery of the shaft adjacent the pinion, the confining-plate acting as a guard against accidental release of the back plate from the shaft. 15

Signed at Des Moines, Iowa, this 25th day 20 of July, 1900.

GEORGE A. CULVER.

Witnesses:

S. C. SWEET,
C. E. BYRKIT.