

No. 626,814.

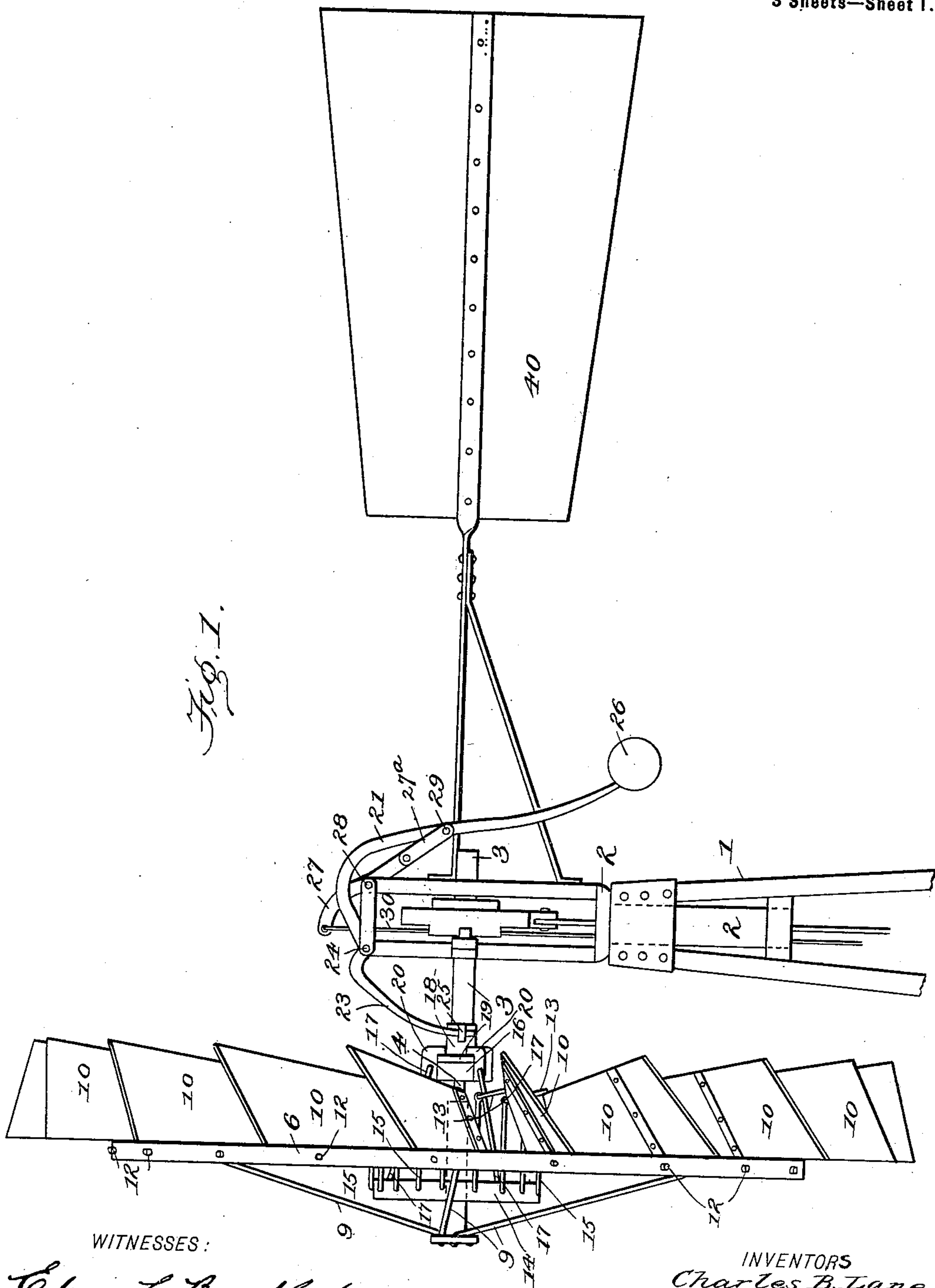
C. B. & W. J. LANE.
WINDMILL.

Patented June 13, 1899.

(No Model.)

(Application filed June 24, 1897.)

3 Sheets—Sheet 1.



WITNESSES:

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Victor J. Evans

INVENTORS

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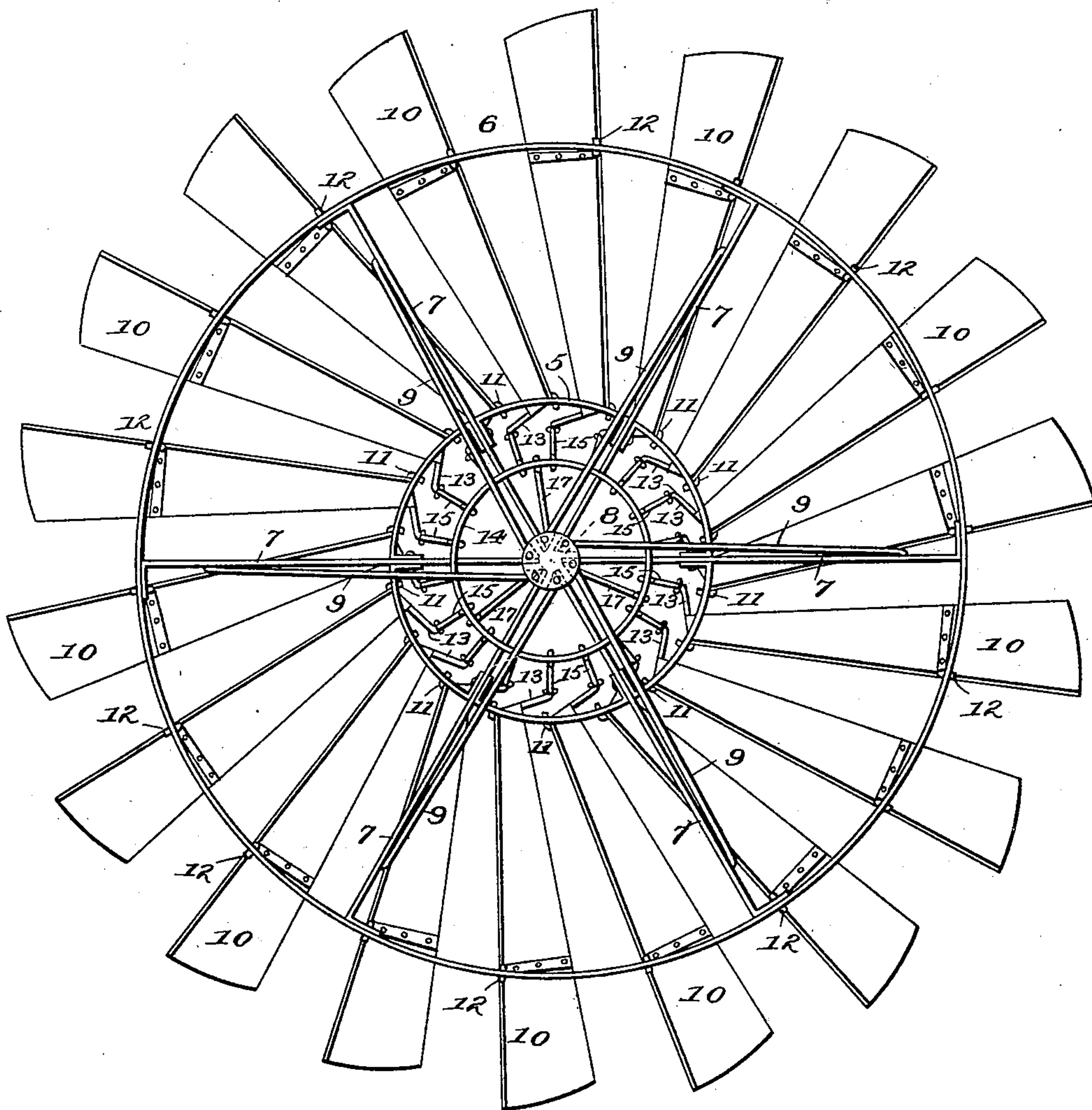
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Fig. 2.



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Fig. 3.

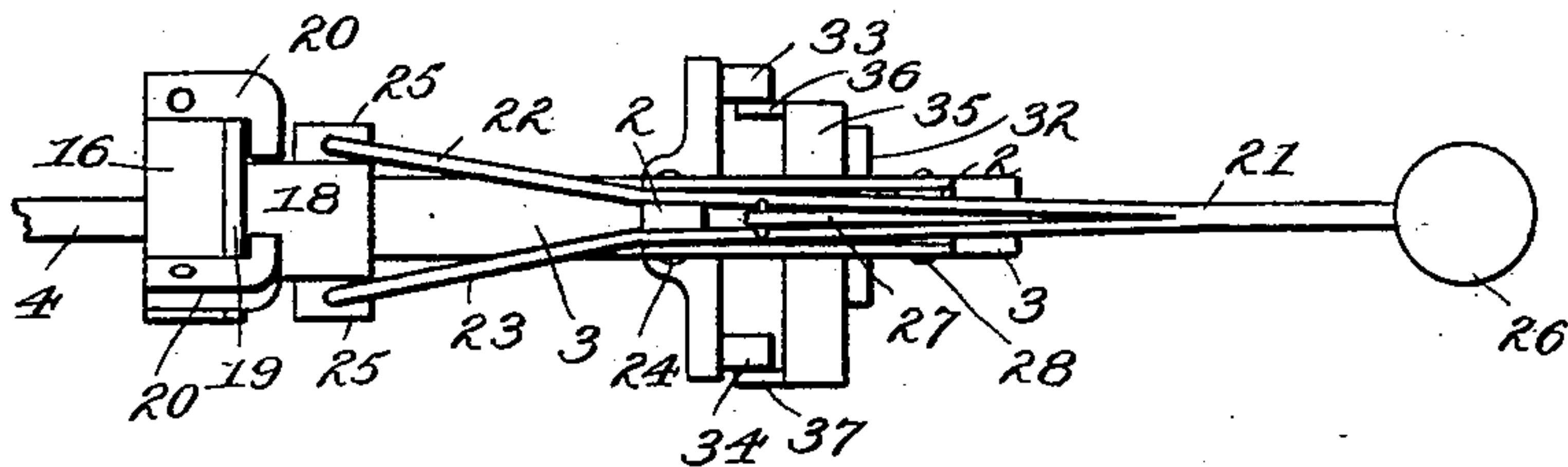


Fig. 4.

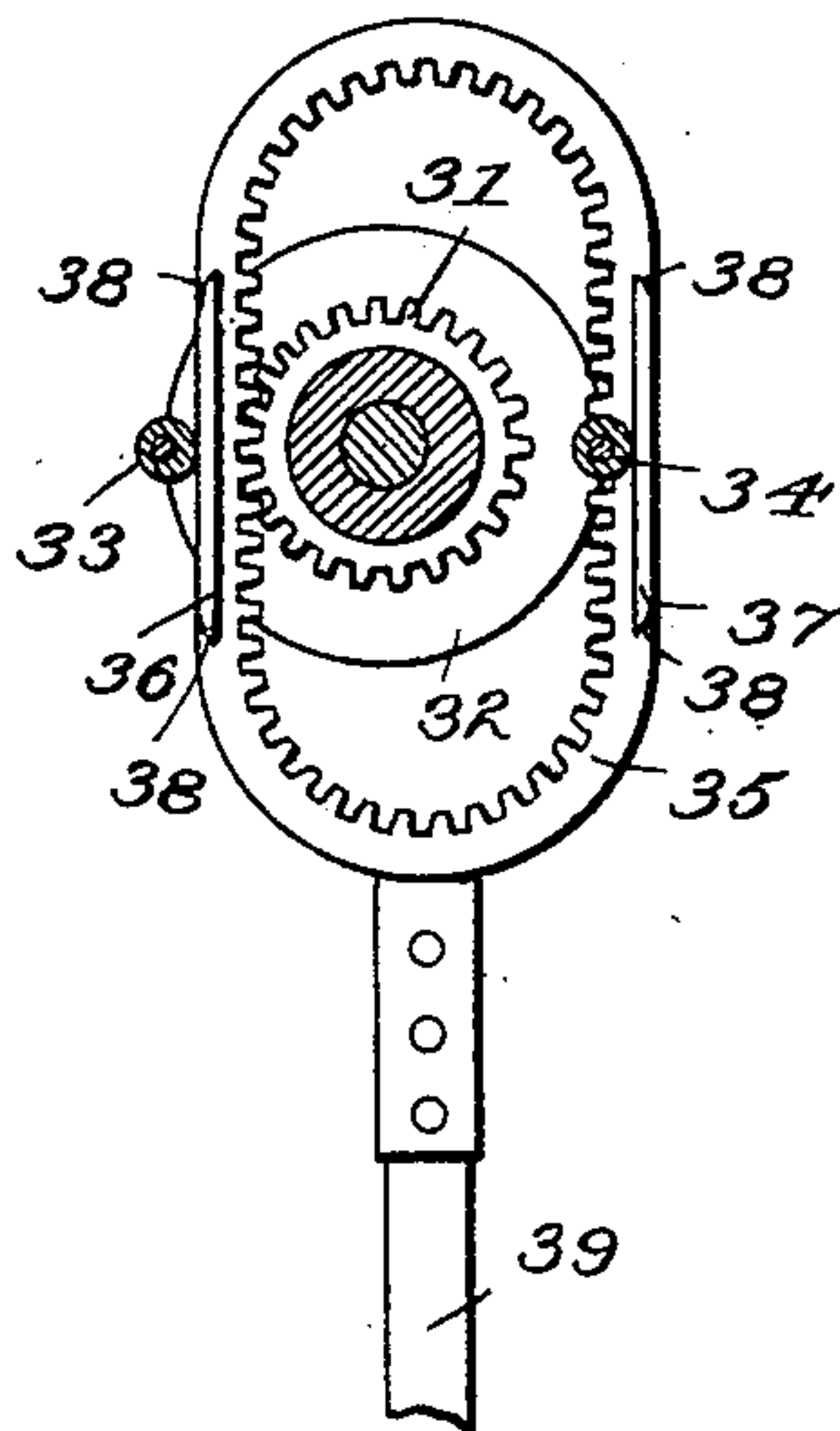
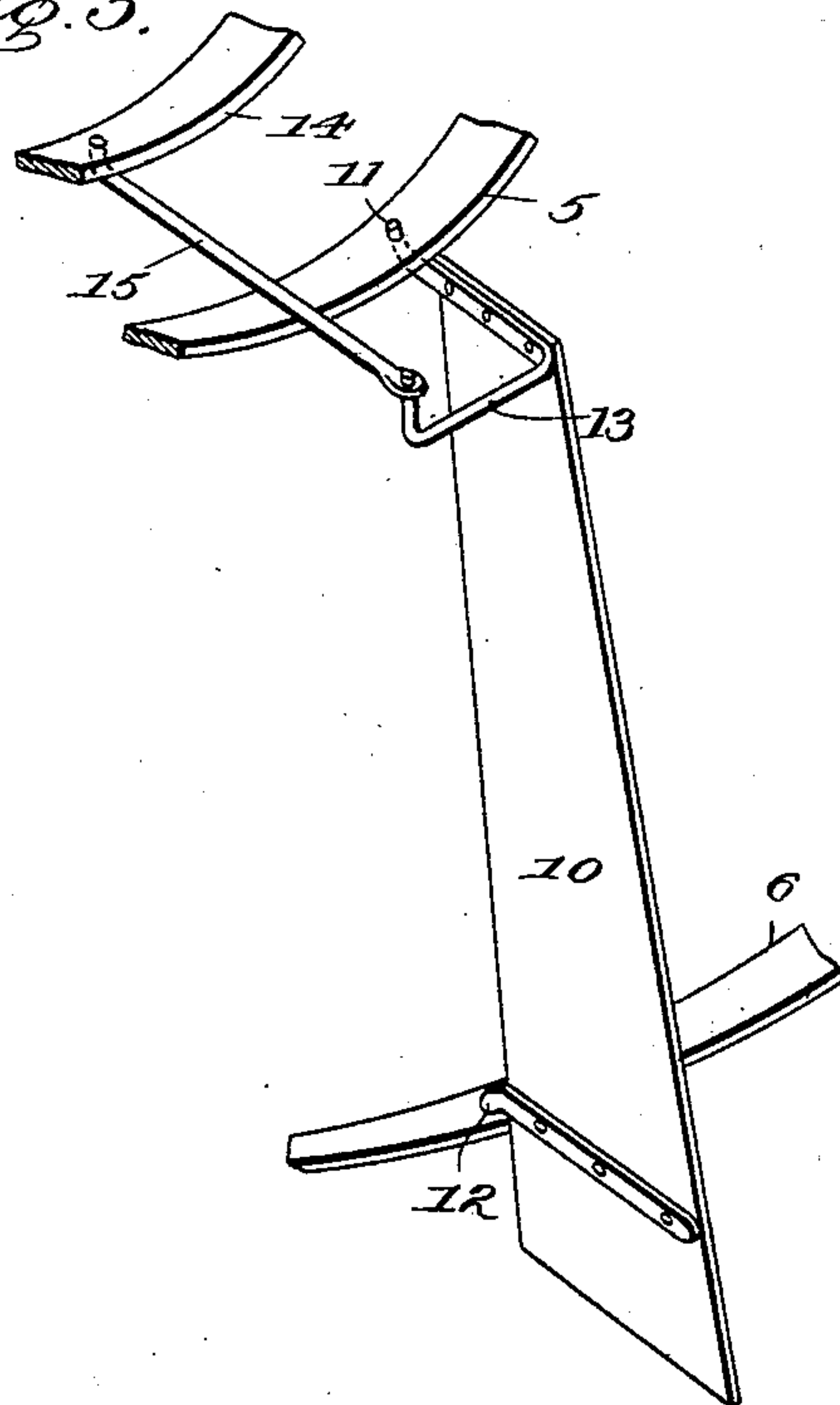


Fig. 5.



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UNITED STATES PATENT OFFICE.

CHARLES B. LANE AND WILLIAM J. LANE, OF MILO, MISSOURI.

WINDMILL.

SPECIFICATION forming part of Letters Patent No. 626,814, dated June 13, 1899.

Application filed June 24, 1897. Serial No. 642,132. (No model.)

To all whom it may concern:

Be it known that we, CHARLES B. LANE and WILLIAM J. LANE, of Milo, in the county of Vernon and State of Missouri, 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 appertains to make and use the same.

The invention relates to improvements in windmills.

The object of the present invention is to improve the construction of windmills and to provide a simple and comparatively inexpensive one capable of automatically adjusting itself to suit the force of the wind, so that it will run at a uniform speed, and adapted to be readily operated by hand to throw it into and out of the wind.

The invention consists in the construction and novel combination and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the claim hereto appended.

In the drawings, Figure 1 is a side elevation of a windmill constructed in accordance with this invention. Fig. 2 is an elevation of the wind-wheel. Fig. 3 is a detail plan view illustrating the arrangement of the levers for controlling the wind-wheel. Fig. 4 is a detail view illustrating the construction of the gearing for connecting the wind-wheel shaft with the pump-rod. Fig. 5 is a detail perspective view illustrating the manner of hinging the blades of the wind-wheel.

Like numerals of reference designate corresponding parts in all the figures of the drawings.

1 designates a tower constructed in any suitable manner and forming a support for a turn-table 2, which is substantially Y-shaped, its arms being parallel and extending vertically from the top of the tower to form a bearing-bracket. The arms of the bearing-frame or turn-table are provided with horizontal bearings 3, receiving a horizontal wind-wheel shaft journaled on the bearing-bracket and carrying a wind-wheel.

The frame of the wind-wheel is provided with inner and outer concentric rings 5 and 6, which are connected by braces 7 with the

hub 8, and the latter is suitably secured to the wind-wheel shaft 4. The braces 7 are connected near their outer ends to the outer ends of inclined braces 9, which are arranged at an angle to the braces 7 and are secured at their inner ends to a fixed collar or flange of the outer end of the hub, as clearly illustrated in Fig. 1 of the drawings.

The blades 10 of the wind-wheel, as clearly illustrated in Fig 5 of the accompanying drawings, are provided with inner and outer pin-tles 11 and 12, journaled in perforations or eyes of the inner and outer rings 5 and 6 and preferably formed integral with metal bars or cleats, which are secured across the faces of the blades, as shown. Each blade is provided at its inner end with a substantially L-shaped arm or crank 13, arranged at the outer or free edge of each blade and extending from the same at right angles to the plane of the face of the blade. The arm 13, which is preferably formed integral with the inner metal bar or cleat, is connected with a ring 14 by a rod 15. The ring 14 encircles the shaft and the hub of the wind-wheel, being located in the space between the braces 7 and 9, and it is connected with a sliding coupling by rods 17, the sliding coupling being mounted on the shaft at the opposite side of the wind-wheel in the space between the latter and the bearing-frame of the turn-table. The sliding coupling, which is composed of two sections 16 and 18, is provided on the section 16 adjacent to the wind-wheel with radial flanges to which the rods 17 are connected, and these radial flanges are provided at their inner ends with arms 20. The arms 20 loosely embrace an annular flange 19 of the other section 18.

The section 18 of the sliding coupling is provided at opposite sides with perforated ears 25, which receive the sides or arms 22 and 23 of a forked shifting lever 21. The forked shifting lever, which is substantially U-shaped in side elevation, as shown in Fig. 1 of the drawings, is fulcrumed at the upper end of one of the arms of the bearing-frame or turn-table, being provided at its fulcrum-point with a substantially V-shaped bend, which offsets the depending portions of the lever from the sides of the bearing-frame or turn-table. The arms 22 and 23 slide freely

through the perforated eyes of the coupling, and the other end of the shifting lever carries a weight 26, which operates to hold the blades normally closed and in proper position to be acted on by the wind.

The blades of the wind-wheel are opened by hand to throw the wind-wheel out of the wind by means of an operating-wire 30 or similar connection, which is attached at its upper end to one end of a lever 27, and the latter, which is located between the sides 22 and 23 of the shifting lever, is fulcrumed between its ends at 28 on the upper end of the adjacent arm of the bearing-frame or turn-table. The outer end of the lever 27 is connected by a link 27^a with the shifting lever, and when the inner end of the lever 28 is drawn downward the outer weighted portion of the shifting lever will be swung upward, thereby sliding the coupling toward the tower and opening the blades of the wind-wheel. When the wire 30 is drawn downward, the lever 27 swings on its pivot, and as its outer end is connected by the link 27^a with the weighted end of the lever 21 the weighted arm thereof is swung upward and outward, causing the other arm to swing downward and inward, which carries the sliding sleeve in the direction of the power and operates the sliding frame or ring, which is connected with the hinged blades at the outer edges thereof. This movement of the sliding ring in the direction of the power operates to open the blades, and thereby stop the windmill.

The wind-wheel shaft carries a pinion 31, located between the arms of the bearing-frame or turn-table and provided with a collar 32. The collar 32 carries a pair of cam-levers 33 and 34, and the pinion 31 meshes with an open internal rack 35 of substantially elliptical shape. The rack 35 is provided with vertical flanges 36 and 37, adapted to run against the cam-rollers, and one of the cam-rollers bears against the outside of one of the flanges and the other cam-roller bears against the inner face of the other flange. The pinion shifts the rack automatically and the continuous rotary motion of the shaft vertically reciprocates the pump-rod 39, which is connected with the elliptical rack.

The windmill is provided with a tail or vane 40, which is rigidly connected with the bearing-frame or turn-table by suitable braces, and it is adapted to maintain the wind-wheel in the wind.

The invention has the following advantages:

The windmill, which is simple and comparatively inexpensive in construction, is adapted to regulate itself automatically and run at a uniform speed, as the weight on the shifting lever tends to hold the blades closed or in position to be engaged by the wind, and when the force of the latter overcomes the effect of the weight through increased velocity the blades are opened to a greater or less extent and less of their surface is exposed to the wind.

The windmill is adapted to be thrown into and out of operation by hand, and the lever 27, which is centrally mounted on one side of the bearing-frame or turn-table, operates in the space between the sides of the shifting lever.

Changes in the form, proportion, and minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

What we claim is—

In a windmill, the combination of a bearing-frame, a wind-wheel shaft, a wind-wheel having hinged blades, a sliding coupling mounted on the shaft, connected with the blades of the wind-wheel and provided at opposite sides with perforated ears 25, the substantially U-shaped shifting lever extending over the top of the frame and having its arms located at opposite sides thereof and provided between its ends with a depending substantially V-shaped bend forming a fulcrum-point, said shifting lever being forked and having the sides thereof passing loosely through the perforated ears 25 of the coupling, a weight arranged at the outer end of the U-shaped lever, the lever 27 located between the sides of the fork of the shifting lever and fulcrumed between its ends at the top of the bearing-frame, the link 27^a connecting the outer end of the lever 27 with the shifting lever at the crotch thereof, and operating mechanism connected with the inner end of the lever 27, substantially as described.

In testimony whereof we have signed this specification in the presence of two subscribing witnesses.

CHARLES B. LANE.
WILLIAM J. LANE.

Witnesses:

ANDORES COX,
J. G. BOWEN.