

No. 710,029.

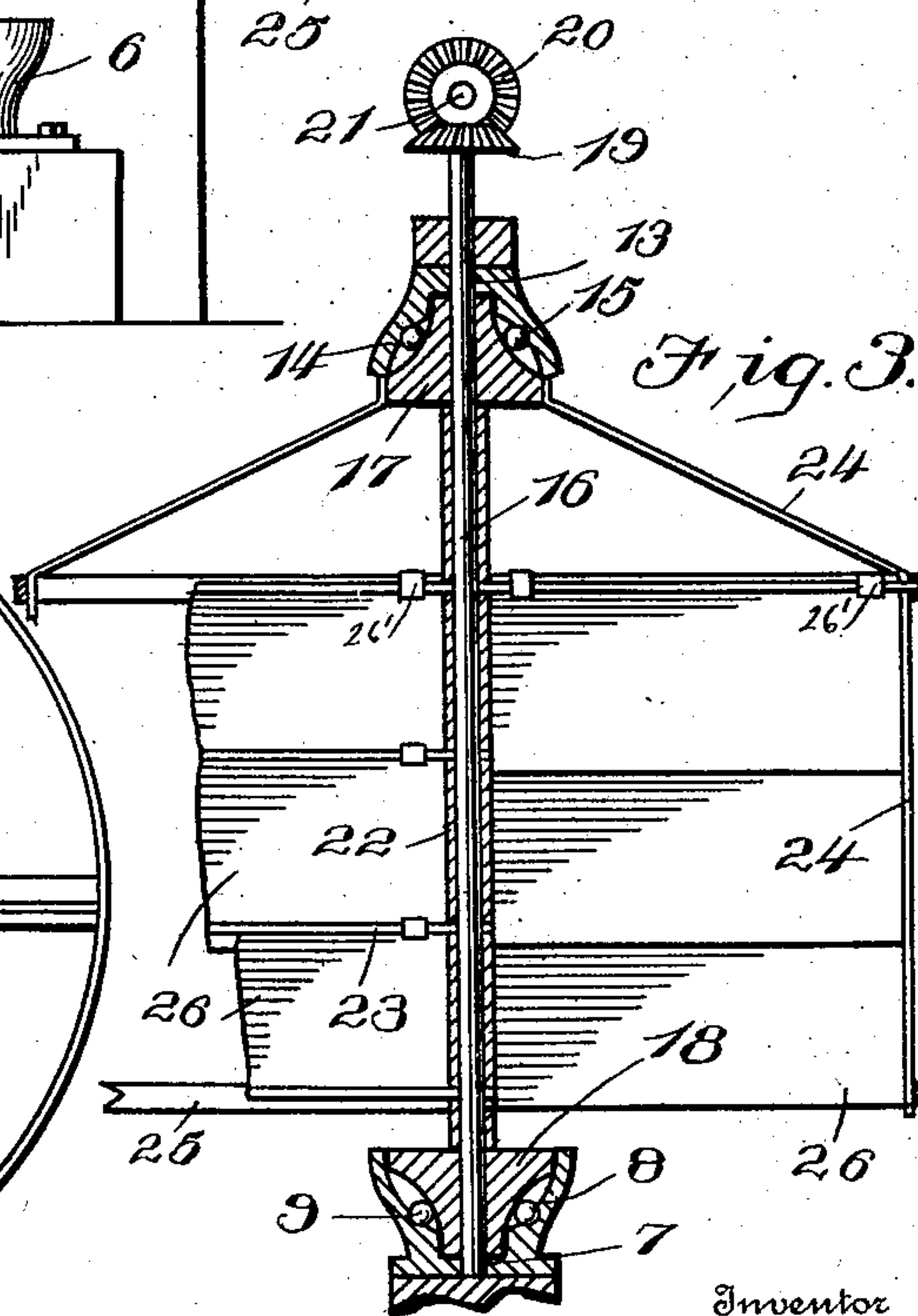
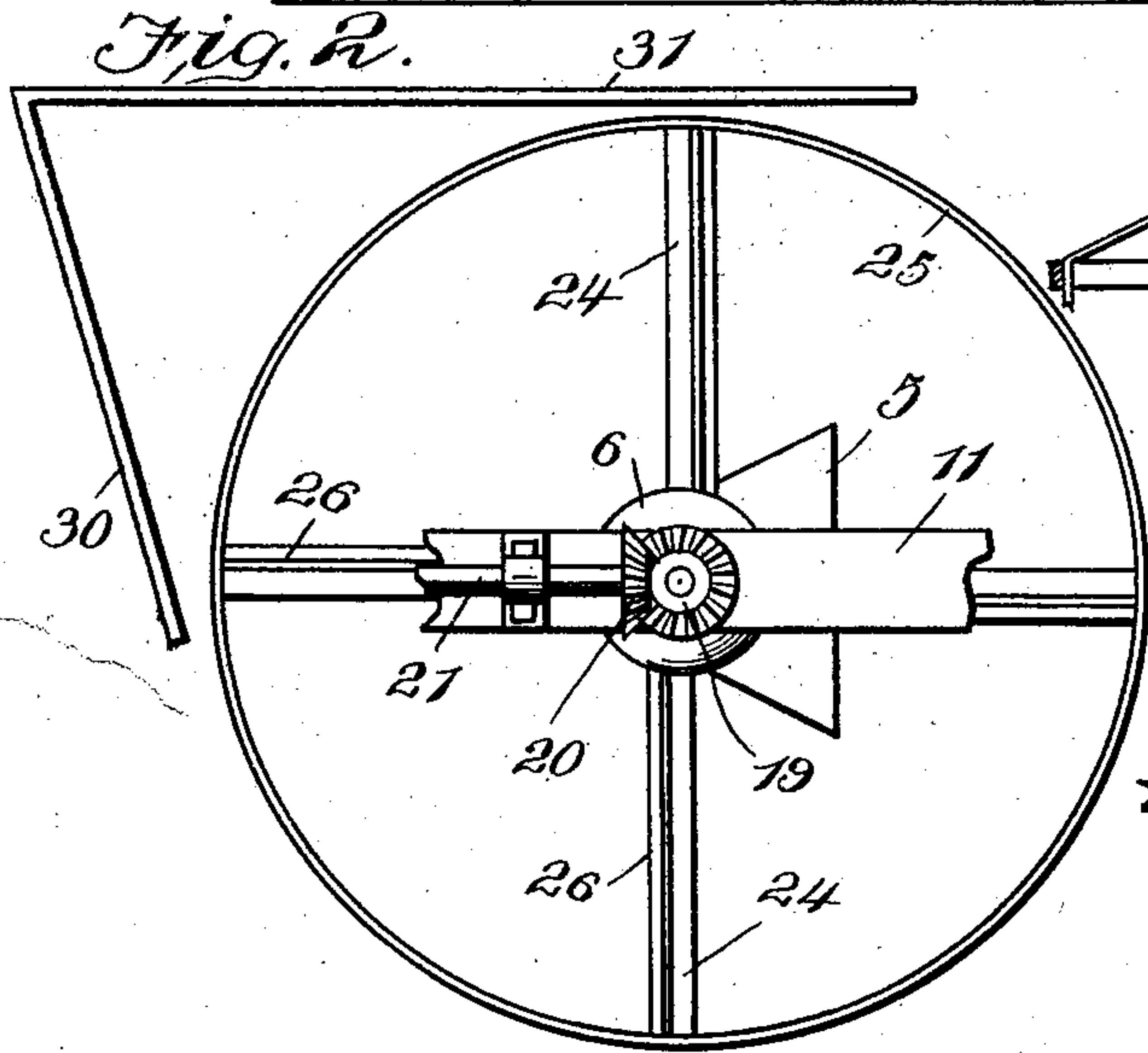
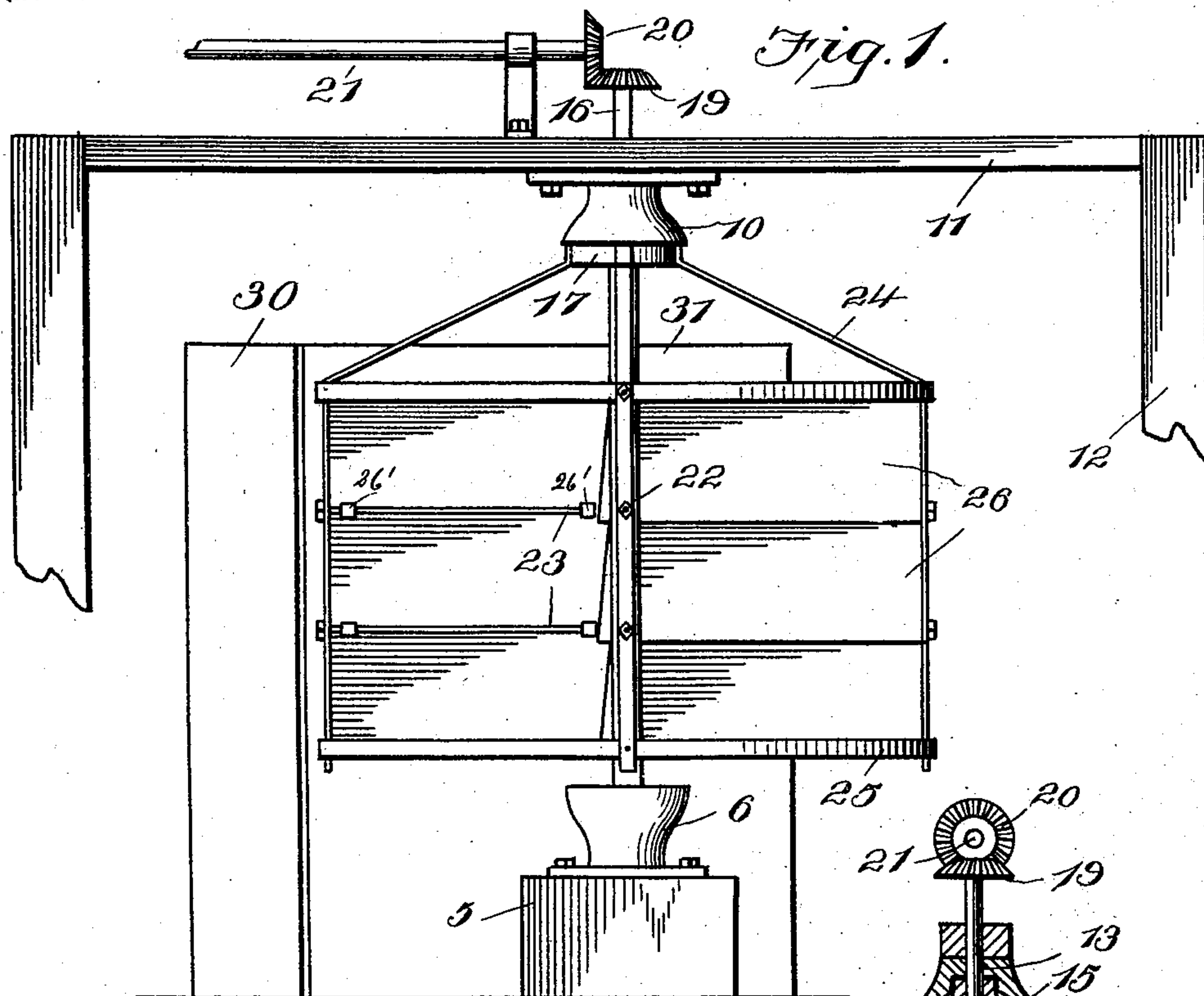
Patented Sept. 30, 1902.

R. E. WOOLMAN.

WATER WHEEL.

(Application filed Sept. 25, 1901.)

(No Model.)



Witnesses

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UNITED STATES PATENT OFFICE.

ROBERT E. WOOLMAN, OF ST. JOSEPH, MISSOURI.

WATER-WHEEL.

SPECIFICATION forming part of Letters Patent No. 710,029, dated September 30, 1902.

Application filed September 25, 1901. Serial No. 76,490. (No model.)

To all whom it may concern:

Be it known that I, ROBERT E. WOOLMAN, a citizen of the United States, residing at St. Joseph, in the county of Buchanan, State of Missouri, have invented certain new and useful Improvements in Water-Wheels; and I 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.

This invention relates to water-wheels; and it has for its object to provide a device of this nature that may be placed in the bed of a stream and will be operated by the current of the running water, a further object of the invention being to provide a construction which will be cheap of manufacture and efficient in its operation.

In the drawings forming a portion of this specification, and in which like numerals of reference indicate similar parts in the several views, Figure 1 is a side elevation of the mechanism. Fig. 2 is a top plan view of the mechanism. Fig. 3 is a vertical section through the mechanism, the shaft and its gears being shown in elevation.

Referring now to the drawings, upon a base there is secured a bearing-block 6, having a vertical cylindrical recess 7, the upper end of which is connected with a bowl-shaped race element 8, against which play bearing-balls 9, a corresponding bearing-block 10 being secured to the under side of a beam 11, disposed above the base and secured to the upright 12. The upper bearing-block has a vertical passage 13 throughout, which is continued through the beam, and the lower end of the perforation in the block is connected with a bowl-shaped race element 14, which receives bearing-balls 15.

A shaft 16 is provided for the wheel, and this shaft has the upper and lower race elements 17 and 18 in the form of cones attached thereto immovably, these cones being disposed against the upper and lower bearing-balls, so that the shaft has ball-bearings. The upper and lower portions of the perforations 7 and 13, respectively, are enlarged to receive the ends of the cones 17 and 18. The shaft is continued upwardly through the beam 11, and at its upper end is fixed a bevel-gear 19, which meshes with a similar gear 20 upon a

shaft 21 to convey energy to a proper point. Upon the shaft and connecting the cones is fixed a sleeve 22, with which are engaged the inner ends of horizontal rods 23 by screwing or riveting, the outer ends of the rods being engaged with metallic straps 24. The straps 24 are attached at their upper ends to the upper cone and are taken outwardly and downwardly and then bent sharply downwardly to form vertical portions, with which the outer ends of the rods are attached, as above stated. Connected to and inclosing the series of straps are the horizontal hoops or annular supports 25, arranged one at the upper ends of the vertical portions of the straps 24 and the other at the lower ends thereof, the uppermost and lowermost rods 23 being passed through the straps 24 and through the annular supports or hoops to hold them together.

Suspended pivotally from each of the rods 23, excepting the lowermost rods, is a wing 26, the wings being suspended through the medium of loops 26', which encircle the rods 23, and each wing depends below the upper edge of the wing next below, so that each wing is held against movement in one direction from a vertical position, while it is free to move in an opposite direction, the direction of free movement of all of the wings being the same, rotatably of the wheel. The lowermost wings rest with their lower portions normally against the lowermost rods 23. As the wings all swing freely in the same direction, rotatably of the wheel, if the wheel be placed in a current the current will flow against the wings and move those at one side of the wheel against the rods to rotate the wheel, while the wings at the other side of the wheel will be moved into horizontal positions, with the result that the wheel is rotated and energy is transmitted through the gear-wheels to the horizontal shaft.

In order that the full force of the current may be directed to the vertical wings at one side of the wheel and the wings at the opposite side may be relieved of direct action of the current, a deflector or dam is provided and includes the vertical sides 30 and 31, of which the side 31 extends laterally beyond the blades of the wheel and rearwardly thereof, while the side 30 is short and terminates in advance of the wheel and lies in a plane

passing between the center of the wheel and the adjacent side of the wheel, so that the water of the stream in which the apparatus is placed will be deflected at one side away
 5 from the approaching blades and will be directed against the outer end portions of the receding blades, the result being a rapid rotation of the wheel with a minimum resistance offered by the water and with a minimum of friction. The dam also prevents clog-
 10 ging of the wheel with sticks and other foreign matter.

What is claimed is—

A water-wheel comprising horizontal annu-
 15 lar supports arranged one above the other, vertical supports attached to the annular supports at points upon their inner peripheries, the ends of said supports being taken inwardly and upwardly toward the axis of
 20 the wheel, a conical bearing-block attached to the upper ends of the vertical supports, a bearing-cup disposed above the conical bearing-block, said conical bearing-block and bearing-cup having perforations therethrough, a
 25 shaft passed through the perforations and rigidly attached to the conical bearing-block, balls disposed between the conical bearing-block and the bearing-cup, a sleeve encircling the shaft and of lesser length than the

shaft, disposed against the under side of the
 30 conical bearing-block and extending to a point in the center and slightly below the plane of the lowermost annular support, a second conical bearing-block disposed against
 35 the lower end of the sleeve and rigidly mounted upon the lower end of the shaft, a second bearing-cup disposed below the second-named conical bearing-block, balls disposed between
 40 the conical bearing-block and the bearing-cup, horizontal rods attached at their inner ends to the sleeve and at their outer ends to the vertical supports, the uppermost and low-
 45 ermost rods being passed through the vertical supports and the annular supports to hold them together, and wings pivotally at-
 50 tached to the horizontal rods with the exception of the lowermost of said rods by means of loops upon their upper edges, said wings having their lower edges disposed below the horizontal rod next below.

In testimony whereof I hereunto sign my name, in the presence of two subscribing witnesses, on this 16th day of May, 1901.

ROBERT E. WOOLMAN.

Witnesses:

W. WILLIAM GEIERMANN,
 JOHN J. WOOLMAN.