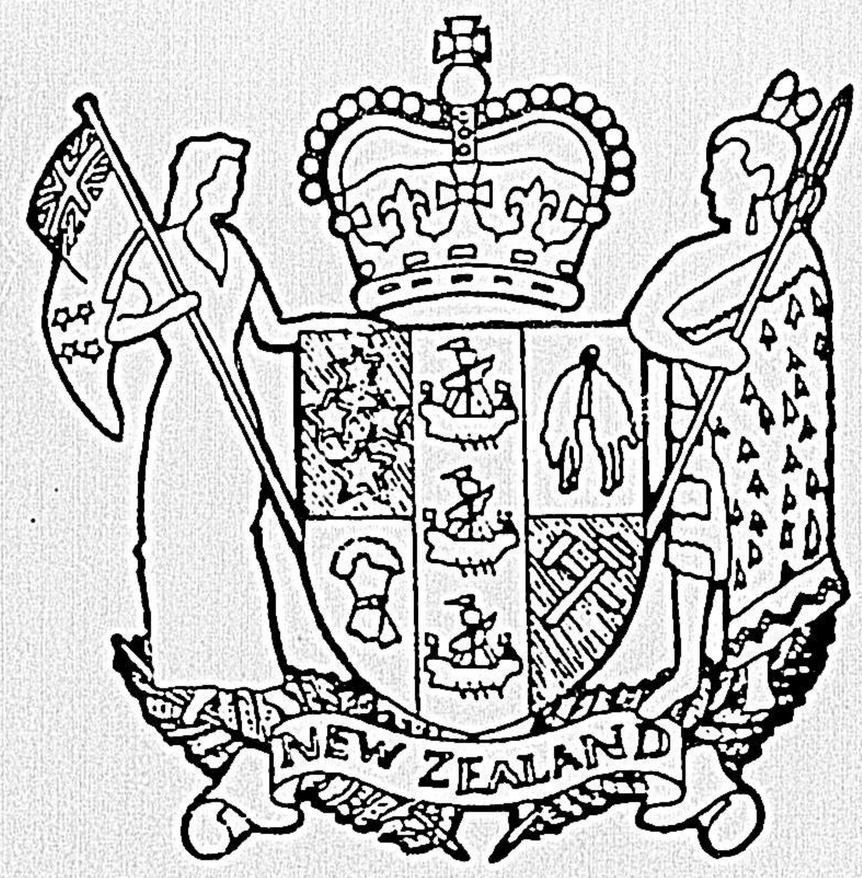


NEW ZEALAND

PATENT SPECIFICATION

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PATENTS, DESIGNS & TRADE MARKS ACT, 1911.

COMPLETE SPECIFICATION.

Improvements in windmills and the like.

I, WILLIAM EDGAR MUNTZ, British subject, c/o Lloyds Bank Ltd., St. James Street, London, S.W. late of H.M. Dept. Public Works, India, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:-

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In bye gone days before the invention of the steam-engine and when, before the Repeal of the Corn Laws, practically the whole of the grain in the United Kingdom was home-grown, it was ground locally for the farmers by mills driven by water power where available orin the alternative by windmills which have more and more fallen into disuse but of which the ruins are still in evidence throughout the countryside.

These windmills were all more or less constructed on the same pattern i.e. a hollow brick-work tower sheltering the grinding machinery of the mill proper and on the summit of them a platform capable of being revolved supporting the axle geared up to the mill stones the "sails" or vanes rigidly attached to this axle being so designed as to cause it to revolve by the force of the wind sliding off them - at an angle as it passed through this wind wheel.

These sails were evidently purposely made of fabric stretched over light wooden frames so as to reduce to a minimum the overhanging weight of the wind wheel.

The extremity of the axle remote from the on-coming wind was embraced by the eye of a strut extending out-wardsyand downwards to the ground with a friction wheel inserted in that end running on a circular tram-line around the supporting tower so as to allow of the platform supporting the axle and sails being revolved by a hand - winch to oppose these sails to the wind at such an angle as desired.

As steam engines with a cheap coal supply came more and more into general use and as grain was imported from abroad in ever-increasing quantities, the grinding of it

locally fell more and more into desuetude but a certain demand arose for windmills apparently originating in the Colonies, to pump water from wells for domestic use and this demand has been met by the construction of small galvanised iron wheels having a large number of vanes inclined to the direction of the wind and almost over-lapping and having further a rudder or tail serving to automatically oppose the full width of the wheel to an ever varying direction of the wind.

The design of these metallic wind wheels whilst probably tending to increase efficiency and eliminate the factor of damage to the sails by gales, had however this very serious disadvantage of enormously increasing their over-hanging weight which our ancestors so evidently foresaw would involve not only undue fatigue on the axle itself and uneven friction on its bearings but militate seriously against that balance of the revolving platform so necessary to avoid distortion of the super-structure besides increasing the resistance to the automatic adjustment to meet the oncoming wind.

The object then of this my invention is so to modify the design of the metallic windmills to day in general use, that whilst conserving their advantages over these of our ancestors, I eliminate and neutralize the factor of increased over-hanging weight with its consequental drawbacks as above enumerated.

In carrying out my invention one or more wind-wheels or other rotative power-absorbing members are supported by an annular float to which is connected one end of a tie_rod, the other end being anchored where the axis of

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rotation of the float cuts the ground, the whole being so arranged as to allow the float freely to turn and to tilt.

Preferably I provide two wind-wheels, one of which is mounted at one end of a shaft and the other at the other end, the axis of the said shaft passing through the axis of revolution of the float; the wind-wheels have equal moments on the supporting-shaft bearings so that one may balance the other and give an even distribution of pressure on the shaft-bearings and on the float. If the wind-wheels are equidistant from the axis of revolution of the float they will be made of the same weight.

The float may conveniently have secured thereto a platform on which the shaft-bearings and possibly a dynamo or other actuated machinery are mounted.

The float is fluidly supported in an annular tank, which is preferably mounted on three latticed steel or wooden legs positioned one at each corner of an equilateral triangle.

The tank is of such depth and width as will allow of the immersion of the float therein whilst ensuring under all circumstances its complete flotation i.e., that the float shall never touch the bottom of the tank, and that no half of its circumference can under any conditions be entirely submerged by thrust due to the maximum wind-pressure, the weight of the float together with that of the wind-wheels and shaft, the supporting platform, and, if desired, a dynamo or other machinery being at the same time held under consideration.

To this revolving platform I attach a tie-rod, preferably tubular, whose other extremity is anchored where the axis of rotation of platform cuts the ground and at each of its side ends is a universal joint to allow of the tilting-over of the platform and float as a whole by wind-pressure whilst at the same time preventing the latter touching the sides of the tank.

As in the present-day type of windmill, a rudder may be affixed, if found desirable, to automatically hold the wheels up to the wind.

Preferably two one of the wheels would be of considerably larger diameter than the other, the space occupied by its vanes being annular along its circumference, and the smaller wheel being of approximately the same diameter as the unobstructed centre of the larger one, the sectional areas of those parts of the surface of each wheel filled in with vanes when taken across the direction of the wind being preferably equal.

I do not wish to limit my invention to the lattice work legs I judge best to minimize obstruction of the wind nor do I wish to limit it to a double wheel nor to an annular fluid tank as the platform may revolve on any modification of a water slide or any greased equivalent or even on conical rollers or balls; my invention in its best form comprises the combination of two wind wheels one on each side of their supporting platform and the outside bearings of their shaft being as close to the circumference of this platform as may be found feasible, with an annular float or equivalent device which shall give an ever-increasing counter-

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thrust against any tilting that may occur of the re-revolving platform whilst conserving a minimum of resistance to its automatic adjustment.

Each of these two integers or factors I believe to be new as applied to windmills or the like, whether of the metallic-vaned type or otherwise and I also believe that with two opposed wheels on the same shaft, the vaned-area in one being complimentary to the vaned-area in the other, is a novelty.

When two wheels are employed I preferably mount one of them on a shaft rotating in fixed bearings whilst the other wheel is mounted on a shaft rotating in a rocking bearing, the adjacent ends of the shafts being coupled together as by forming the one with a squared end located within a squared recess in the end of the other, play being allowed so that should the wind pressure tend to tilt over one of the wheels, the corresponding wind pressure on the other wheel will in part or in whole neutralize this tendency to tilt.

In the accompanying drawings which illustrate the invention figure 1 is a section, figure 2 is a plan thereof, and figure 3 is a detail view.

1 are latticed girders on the top of which is mounted an annular tank 2 containing liquid. 3 is an annular float, floating in the tank 2 and having mounted upon it a platform 4 carrying fixed bearings 5, for a shaft 6 and a rocking bearing 7 for a shaft 8. The shaft 8 is provided with a squared recess the walls of which are engaged preferably with a certain amount of play by the squared end 9 of the shaft 6. Mounted upon the shaft 6

is a wind wheel 10 comprising a number of vanes carried by a rim 11 which is carried by spokes 12 on a hub 13. 14 is a wind wheel mounted on the shaft 8 and comprising a number of vanes the diameter of the wheel 14 being approximately equal to the interior diameter of the rim 11, the combined area of the vanes on the wheel 10 being also approximately equal to the combined area of the vanes on the wheel 14.

A casing 16 is carried by ball bearings on the shaft 6, and between the casing 16 and a flange 15 on the shaft 6 is interposed a thrust bearing. The casing 16 is connected by a ball and a socket joint 17 to a tie rod 18 the other end of which is similarly provided with a ball 19 engaging a socket carried by a foundation bolt 20 let into the concrete or other foundation and situated in line with the normal axis of rotation of the float 3. The tie rod 18 is provided with a right and left hand threaded sleeve 21 by means of which the length of the rod 18 can be adjusted. 22 is a dynamo mounted on the platform 4 and connected by gearing 23 to the coupled shafts 6, 8.

Current is led from the dynamo 22 by insulated cables 24 passing through the hollow tie rod 18.

It will be seen that when the wheels 10and 14 are subjected to fluid pressure acting in any direction other than that which is coaxial with the shafts 6, 8, these latter will tend to tilt in opposite directions.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:-

1. A rotary prime-mover actuated by fluid pressure

in which the axle or axles of the rotative power-absorbing member or members thereof is or are entirely supported on a rotatable floating member allowing of automatic frictionless adjustments of the said power-absorbing member or members at any pre-determined angle to the line of impact of the fluid with the member or members adapted to absorb its power.

2. A rotary prime mover having a plurality of rotative power absorbing members on the same or engaged shafts, the sums of the opposed moments of thrust due to their weight on the supporting bearings tending to neutralize.

3. The combination with an annular float and one or more rotative power absorbing members carried thereby, of a tie rod one end of which is connected to the float, and the other end is anchored where the axis of rotation of the float cuts the ground, the whole being so arranged as to allow the float freely to turn and to tilt without touching the side or bottom of the tank.

4. A fluid actuated prime mover having one or more rotative power absorbing members mounted on an annular float or other equivalent device, the float being adapted to give an ever-increasing counter-thrust against tilting whilst giving a minimum of resistance to the automatic adjustment of the members to the line of fluid pressure.

5. A rotary prime mover actuated by fluid pressure as in claim 2 and in which the rotative power absorbing members are so designed, constructed and positioned that the relative superficial area effectively acted on (by that component of the fluid pressure along the longitudinal centre line of the axle) on one side of the intermediate point of axle support bears such a propor-

tion to that on the other side of the said axle support that the sums of the opposed moments of fluid pressure around such intermediate point are approximately equal and balance each other.

6. A rotary prime mover actuated by fluid pressure as in claim 2 and 5 where the design and construction is such that the sums due respectively to weight and fluid pressure exerted in one sense tend to balance those opposed to them and exerted in the other sense.

7. The combination with an arrangement as claimed in claim 5 of a dynamo carried on the float and means for conveying current thrdugh the tie rod substantially as described.

8. A fluid actuated rotary prime mover each actuated member of which is mounted on a separate axle so connected as to be incapable of individual rotation but with play between their engaging ends, such revolving axles running in bearings so constructed and positioned that the actuating fluid pressure on one member will tend to neutralize and so eliminate any tendency to tilt caused by uneven fluid pressure on the other member.

Dated this day of 1921.

Dated at Wellington this 6th day of December 1921.

Baldwin & Raymond
Attorneys for the Applicant.

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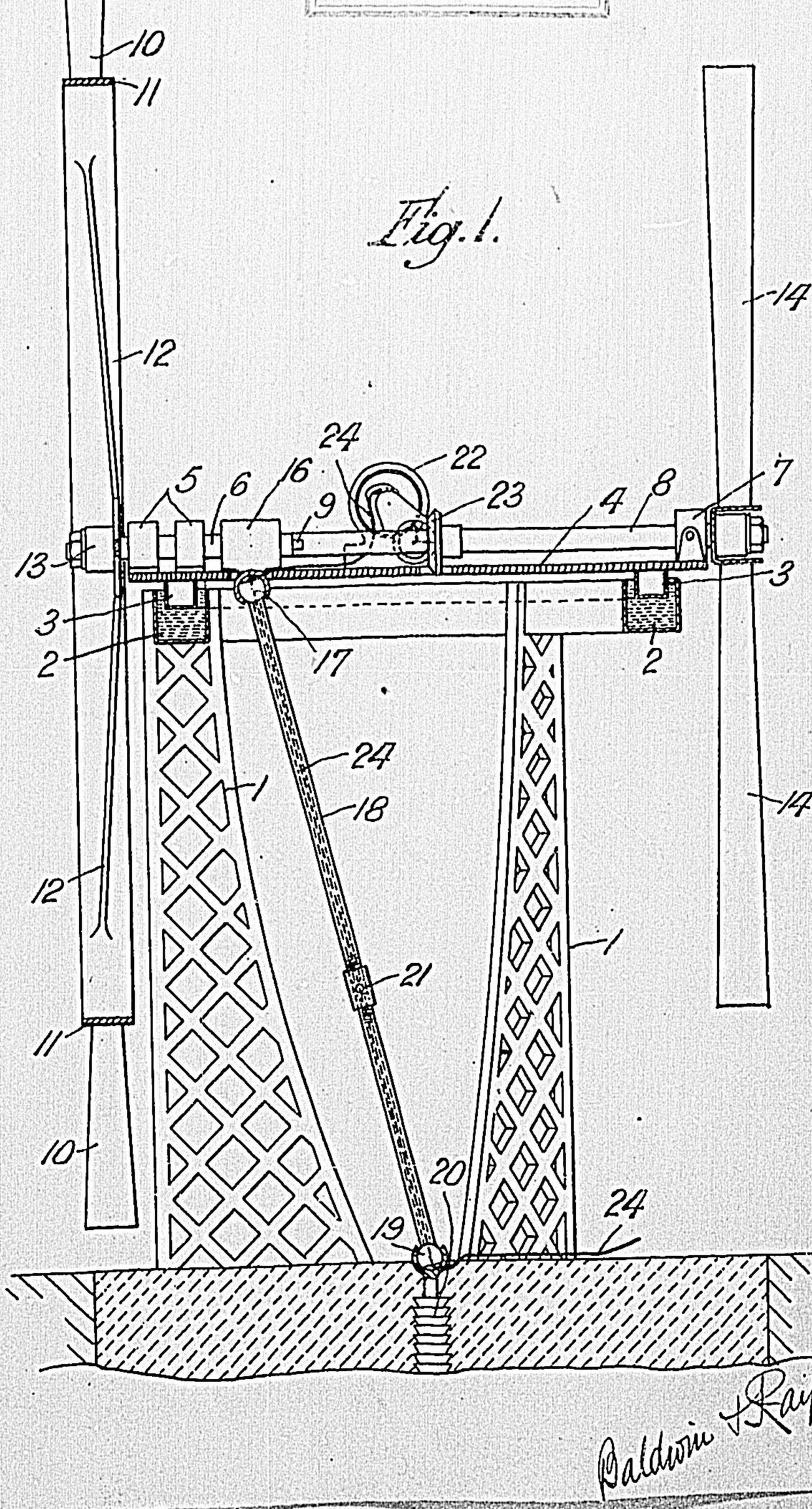
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Fig. 1.



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Fig. 2

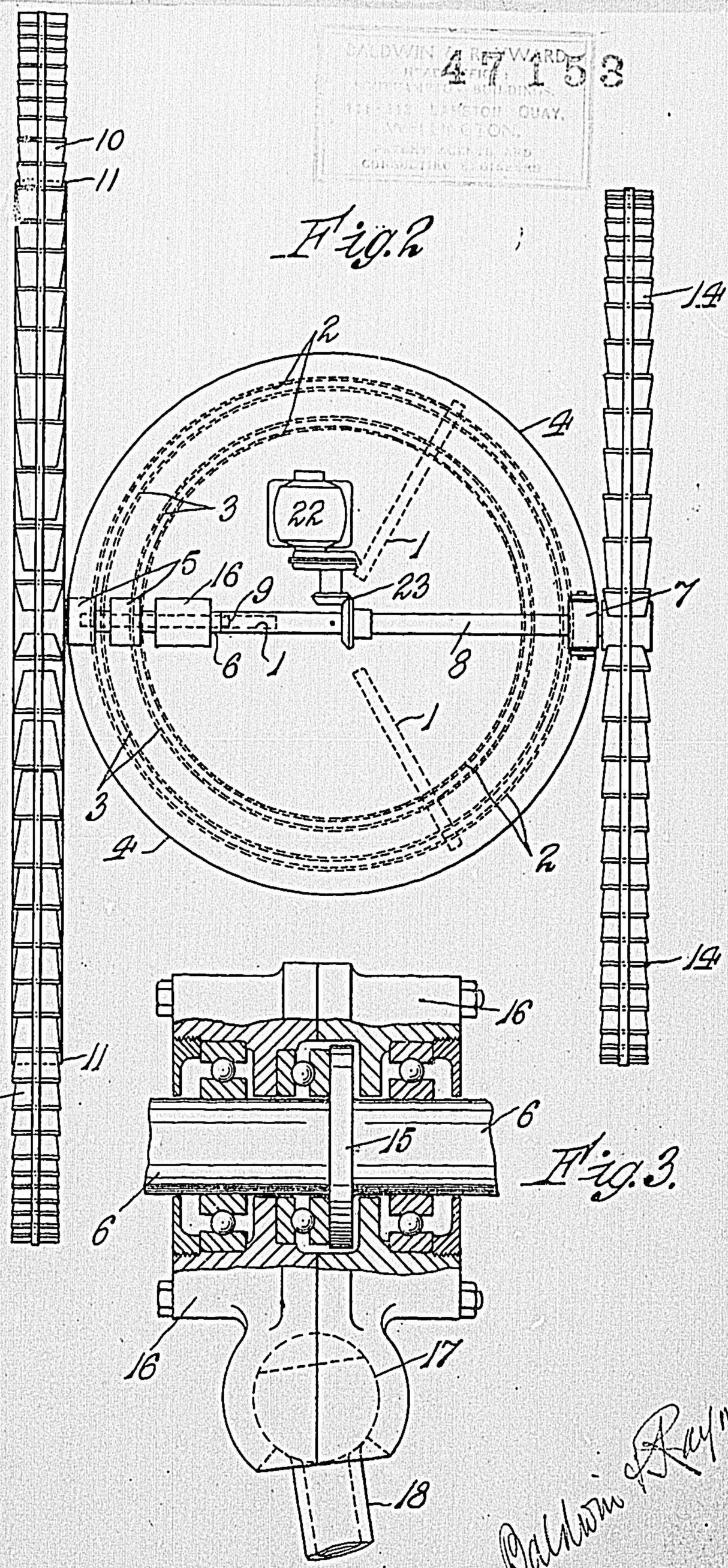


Fig. 3.

END