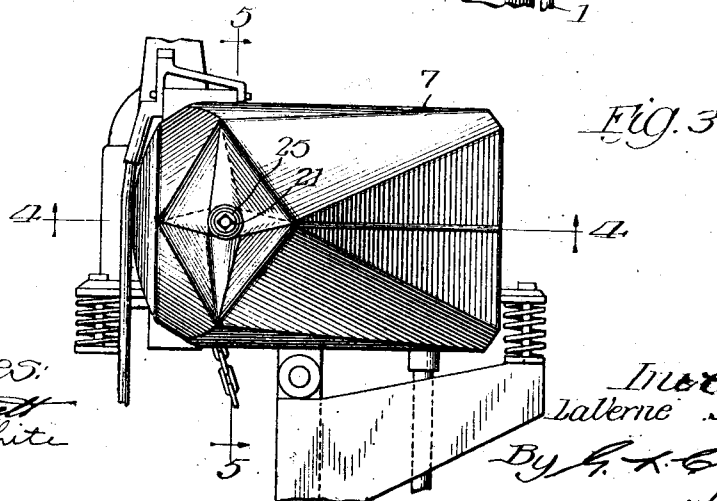
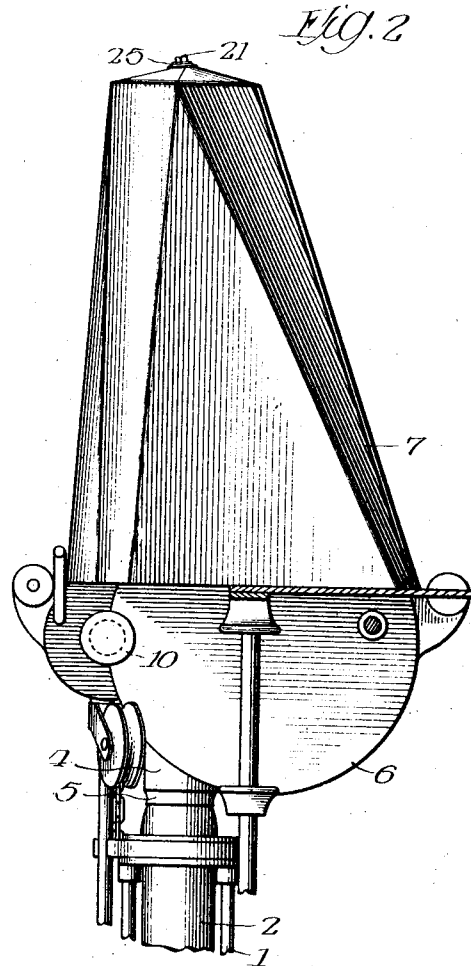
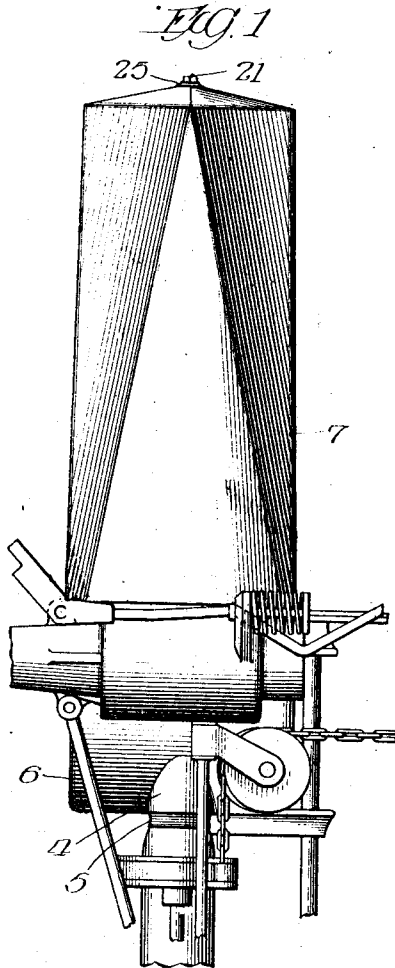


LA VERNE NOYES.  
GEAR CASING FOR POWER TRANSMISSION.  
APPLICATION FILED OCT. 7, 1914.

1,141,356.

Patented June 1, 1915.

2 SHEETS—SHEET 1.



Witnesses:  
*W. Barrett*  
*Edna L. White*

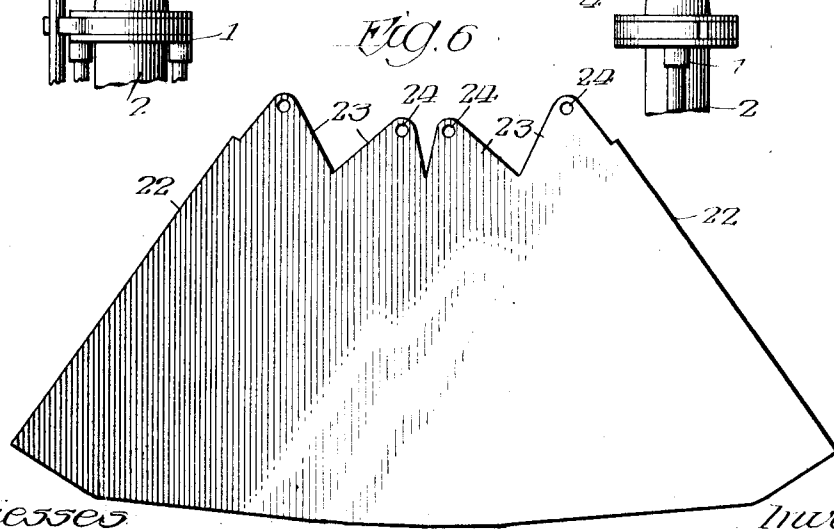
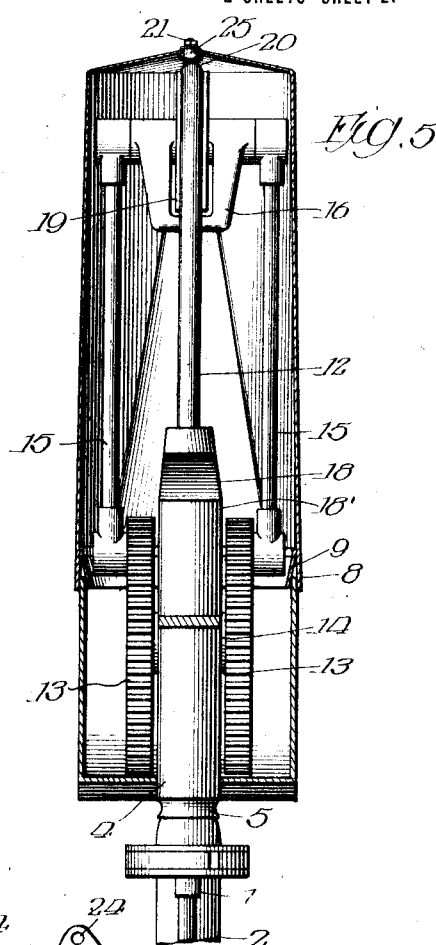
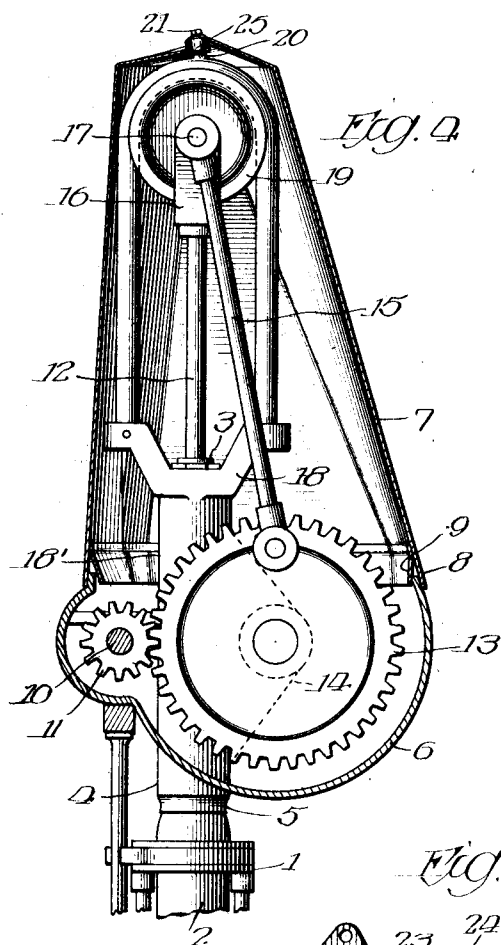
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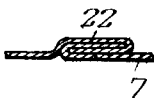
Patented June 1, 1915.

2 SHEETS—SHEET 2.



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FIG. 7



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# UNITED STATES PATENT OFFICE

LA VERNE NOYES, OF CHICAGO, ILLINOIS, ASSIGNOR TO AERMOTOR COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

## GEAR-CASING FOR POWER TRANSMISSION.

1,141,356.

Specification of Letters Patent.

Patented June 1, 1915.

Application filed October 7, 1914. Serial No. 865,454.

*To all whom it may concern:*

Be it known that I, LA VERNE NOYES, citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Gear-Casings for Power Transmission, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to gearing structures employing meshed gears and pitmen operated thereby and has for its object the provision of a housing for the gearing and the moving parts appertaining thereto whereby the working parts will be closely covered with due allowance for the range of movement of the shifting elements thereof.

The device of my invention is of particular service in the construction of the power transmitting gearing portions of wind mills. The housing is desirably made in part of a hood or cover formed of a single sheet of metal and which may be supplemented by an inner flange at the base thereof to form a circumscribing groove for receiving the rim of a lubricant containing basin which is also desirably employed, in conjunction with the hood, completely to inclose the gearing. The upper portion of the hood, viewed in plan, has a contour which defines a geometrical figure having axes which are generally perpendicular to the sides of the figure that is defined by the contour at the base of the hood. Each of these figures is perfectly polygonal and substantially parallelogrammatic and the diagonal axes of the first figure are desirably of unequal length and perpendicular to the sides of the figure defined by the contour of the base of the hood. Adjacent sides of the figure defined by the base of the hood are of unequal length, the longer sides being parallel with the planes of movement of the inclosed pitmen and to which longer sides the longer or major diagonal axis of the top of the hood is perpendicular. By this generally described construction the objects of my invention are attained.

I will explain my invention more fully by reference to the accompanying drawing showing the preferred embodiment thereof and in which—

Figure 1 is a side elevation of a structure embracing my invention; Fig. 2 is a view in

elevation taken in a direction at right angles to that in which Fig. 1 is taken; Fig. 3 is a plan view; Fig. 4 shows the gearing in one elevation, the hood being taken in section on line 4 4 of Fig. 3; Fig. 5 is another elevation with the hood taken in section on line 5 5 of Fig. 3; Fig. 6 is a view of a sheet metal stamping that may be folded to form the hood; and Fig. 7 is a detail of a joint that is desirably made in the formation of the hood.

Like parts are indicated by similar characters of reference throughout the different figures.

The portion of the wind mill structure shown includes the top portion of a tower 1 that terminates in a stationary upright tubular column 2 whose reduced upper end constitutes an upright shaft 3 affording an upright axis about which the wind mill head 4 may turn upon a step bearing ring 5 supported upon the lower column portion. The head 4 is enlarged into an oil chamber or basin 6, constituting the preferred form of base portion of the housing, that may contain lubricant for the gearing of the mill. A chamber closing hood 7 has sheds 8 and 9 between which the basin rim is received and which respectively prevent entrance of water and exit of oil at said rim. The wind mill 10 is journaled in enlargements of walls of the basin 6 and carries two upright pinions 11 for driving the upright pump or load rod 12. Upright transmission gears 13 are in mesh with pinions 11 adjacent the load rod and are journaled within a bearing 14 carried by the head 4. Pitmen 15 connect gears 13 with the upper end of the load rod 12. A stirrup 16 is fixed upon the upper end of the load rod and carries bearings in which a shaft 17 turns. The outer ends of this shaft are preferably in fixed connection with the upper ends of the pitmen 15 whereby the pitmen are maintained in proper interrelation without relying upon a guide structure to perform this function. The gears and pitmen are equidistant from a plane parallel to the gears and which plane include the axis of the load shaft whereby the driving force upon the load rod is evenly distributed. The head 4 carries an upright stirrup 18 whose parallel branches constitute upright guides that are simultaneously received in the grooved anti-friction wheel or roller 19 that turns on or with respect to the shaft 17. Said roller is

permitted very slight bodily movement in the plane of the stirrup 18 so that it may have rolling engagement with but one vertical branch of the stirrup 18 at a time. The threaded stem 20 of the stirrup 18 passes through the top of the hood 7 and a nut 21 is screwed down upon the top of the hood whereby the hood is thoroughly clamped in position.

It will be observed that the spur gears 13 with which the pitmen 15 are directly connected extend much farther upon one side of the load rod 12 than the pinions 11 extend upon the opposite side of such rod and that the pinions 11 do not extend very far beyond the portion 18' of the mill head upon which the inverted stirrup 18 is mounted. The basin 6, therefore, projects much farther upon one side of the load rod 12 (there to accommodate the gears 13 and the movement of the lower ends of the pitmen) than it does upon the other whereby that side of the hood 7 that engages the portion of the basin 6 where the pinions 11 are mounted may be substantially vertically disposed while the opposite wall of the hood may slope downwardly away from the aforesaid vertical wall of the hood to accommodate the movement of the pitmen. The contour of the bottom of the hood substantially defines a parallelogram as does the contour at the top of the hood, the diagonal axes of the top of the hood intersecting at the axis of the load rod and being substantially perpendicular to the sides of the geometrical figure at the bottom of the hood. One of the diagonals of the top of the hood is in the same vertical plane with the inverted stirrup 18' and the other of these diagonals is in the same vertical plane with the axis of the shaft 17 and the plane of movement of the upper ends of the pitmen, and inasmuch as the shaft 17 is longer than the width of the stirrup 18 the diagonal of the top of the cover that is in the same vertical plane with the axis of the shaft is longer than the remaining diagonal of the top of the cover, there being thus but slight clearance between the upper portion of the hood and the contiguous power transmitting structure. The hood is formed with eight triangular faces each of four of which being defined by the sides of the parallelogrammatic figure defined by the contour of the top of the hood and the respectively underlying corners of the parallelogrammatic figure defined by the contour of the bottom of the hood, while the remaining four faces are defined by the sides of the parallelogrammatic figure defined by the contour of the bottom of the hood and the respectively overlying corners of the parallelogrammatic figure defined by the contour of the top of the hood. By the formation of the hood described there are afforded two triangular side walls or faces of the hood which are substantially parallel with each other and substantially parallel with the planes of movement of the pitmen, these walls and the remaining six walls or faces of the hood being brought into very close proximity with the power transmitting mechanism carried upon the head of the wind mill with due allowance for the movement of the pitmen 15 by the sloping wall portions of the hood which rise from the part of the basin 6 upon the same side of the load rod 12 upon which the major parts of the pinions 13 are disposed.

In the process of manufacturing the hood a stamping is desirably made in the form illustrated in Fig. 6; this stamping including two extensions 22 that are folded into interlocking engagement in the formation of the hood, to constitute a seam with the interlocking formation illustrated in Fig. 7. The upper end of the stamping terminates in four triangular wings 23 whose apex portions are provided with circular openings 24 that are brought into register when the stamping is folded, the wings 23 then jointly serving to form the top wall of the hood. A tubular washer 25 is passed through the aligned openings 24 and is upset to form a tubular rivet that will maintain the triangular wings in assembly, the threaded stem 20 passing directly through the body of the washer when the hood is to be mounted in place. The material of which the hood is made is preferably sheet iron that is thoroughly galvanized to seal the joints at the seam 22 and between the wings 23 to make the hood weather proof.

The present invention embraces a gear structure which is inclusive of a novel form of housing. There are characteristics herein disclosed which are claimed in other co-pending applications. Reference is made to my applications Serial No. 830,627, filed April 9, 1914 and Serial No. 865,451, filed October 7, 1914.

While I have herein shown and particularly described the preferred embodiment of my invention I do not wish to be limited to the precise details of construction shown as changes may readily be made without departing from the spirit of my invention, but

Having thus described my invention I claim as new and desire to secure by Letters Patent the following:—

1. A gear structure including the base portion of a housing; two upright pinions mounted in such base portion; two upright gear wheels in mesh with said pinions; an upright load rod disposed between the planes of rotation of said gears and pinions and located near their place of meshing; pitmen connecting the gear wheels with the upper end of the load rod; a guide for di-

recting the upper ends of the pitmen and load rod in their movement; and a hood fastened into engagement with the base portion of the housing and covering said pinions, gear wheels, pitmen and guide, the top of the hood having axes of unequal length which intersect at the axis of the load rod, one of the aforesaid axes being included substantially in the plane of movement of the upper ends of the pitmen, the contour of the bottom of the hood defining a parallelogrammatic figure having two sides substantially parallel with the planes of movement of the pitmen and longer than the remaining sides, the axes at the top of the hood being perpendicular to the sides of the figure at the bottom of the hood, the sides of the hood having eight triangular faces each of four of which being defined by the sides of the parallelogrammatic figure defined by the contour of the top of the hood and the respectively underlying corners of the parallelogrammatic figure defined by the contour of the bottom of the hood, while the remaining four faces are defined by the sides of the parallelogrammatic figure defined by the contour of the bottom of the hood and the respectively overlying corners of the parallelogrammatic figure defined by the contour of the top of the hood.

2. A gear structure including the base portion of a housing; two upright pinions mounted in such base portion; two upright gear wheels in mesh with said pinions; an upright load rod disposed between the planes of rotation of said gears and pinions and located near their place of meshing; pitmen connecting the gear wheels with the upper end of the load rod; a guide for directing the upper ends of the pitmen and load rod in their movement; and a hood fastened into engagement with the base portion of the housing and covering said pinions, gear wheels, pitmen and guide, the top of the hood having a contour which defines a parallelogrammatic figure one of whose diagonal axes is substantially in the plane of movement of the upper ends of the pitmen, the contour of the bottom of the hood also defining a parallelogrammatic figure having two sides substantially parallel with the planes of movement of the pitmen and longer than the remaining sides, the axes at the top of the hood being perpendicular to the sides of the figure at the bottom of the hood, the sides of the hood having eight triangular faces each of four of which being defined by the sides of the parallelogrammatic figure defined by the contour of the top of the hood and the respectively underlying corners of the parallelogrammatic figure defined by the contour of the bottom of the hood, while the remaining four faces are defined by the sides of the

parallelogrammatic figure defined by the contour of the bottom of the hood and the respectively overlying corners of the parallelogrammatic figure defined by the contour of the top of the hood.

3. A gear structure including the base portion of a housing; two upright pinions mounted in such base portion; two upright gear wheels in mesh with said pinions; an upright load rod disposed between the planes of rotation of said gears and pinions and located near their place of meshing; pitmen connecting the gear wheels with the upper end of the load rod; a guide for directing the upper ends of the pitmen and load rod in their movement; and a hood fastened into engagement with the base portion of the housing and covering said pinions, gear wheels, pitmen and guide, the top of the hood having axes of unequal length which intersect at the axis of the load rod; one of the aforesaid axes being included substantially in the plane of movement of the upper ends of the pitmen, the contour of the bottom of the hood defining a parallelogrammatic figure having two sides substantially parallel with the planes of movement of the pitmen and longer than the remaining sides, the axes at the top of the hood being perpendicular to the sides of the figure at the bottom of the hood.

4. A gear structure including the base portion of a housing; two upright pinions mounted in such base portion; two upright gear wheels in mesh with said pinions; an upright load rod disposed between the planes of rotation of said gears and pinions and located near their place of meshing; pitmen connecting the gear wheels with the upper end of the load rod; a guide for directing the upper ends of the pitmen and load rod in their movement; and a hood fastened into engagement with the base portion of the housing and covering said pinions, gear wheels, pitmen and guide, the top of the hood having a contour which defines a parallelogrammatic figure one of whose diagonal axes is substantially in the plane of movement of the upper ends of the pitmen, the contour of the bottom of the hood also defining a parallelogrammatic figure having two sides substantially parallel with the planes of movement of the pitmen and longer than the remaining sides, the axes at the top of the hood being perpendicular to the sides of the figure at the bottom of the hood.

5. A gear structure including the base portion of a housing; two upright pinions mounted in such base portion; two upright gear wheels in mesh with said pinions; an upright load rod disposed between the planes of rotation of said gears and pinions and located near their place of meshing; pitmen connecting the gear wheels with

the upper end of the load rod, a guide for directing the upper ends of the pitmen and load rod in their movement; and a hood fastened into engagement with the base portion of the housing and covering said pinions, gear wheels, pitmen and guide, the top of the hood having axes of unequal length which intersect at the axis of the load rod, one of the aforesaid axes being included substantially in the plane of movement of the upper ends of the pitmen.

6. A gear structure including the base portion of a housing; two upright pinions mounted in such base portion; two upright gear wheels in mesh with said pinions; an upright load rod disposed between the planes of rotation of said gears and pinions and located near their place of meshing; pitmen connecting the gear wheels with the upper end of the load rod; a guide for directing the upper ends of the pitmen and load rod in their movement; and a hood fastened into engagement with the base portion of the housing and covering said pinions, gear wheels, pitmen and guide, the top of the hood having a contour which defines a parallelogrammatic figure one of whose diagonal axes is substantially in the plane of movement of the upper ends of the pitmen.

7. A gearing structure including the base

portion of a housing; gearing mounted in such base portion; a hood covering the gearing and formed of sheet metal stamping terminating at its upper end in triangular wings having alined openings and jointly serving to constitute a top wall of the hood; and a fastening device for holding the hood in engagement with the base portion of the housing and including a member which passes through said alined openings.

8. A gearing structure including the base portion of a housing; gearing mounted in such base portion; a hood covering the gearing and formed of sheet metal stamping terminating at its upper end in triangular wings having alined openings and jointly serving to constitute a top wall of the hood; a rivet passing through said alined openings for holding the wings in assembly, this rivet having a hole therethrough; and a fastening device for holding the hood in engagement with the base portion of the housing and including a member which passes through the hole in said rivet.

In witness whereof, I hereunto subscribe my name this 30th day of Sept. A. D. 1914.

LA VERNE NOYES.

Witnesses:

L. C. WALKER,  
F. E. SMITH.