April 14, 1925. 1,533,344

W. H. SINGLETON

SHIP VENTILATOR COWL

Filed Oct. 15, 1924 2 Sheets-Sheet 1

Fig. 1.

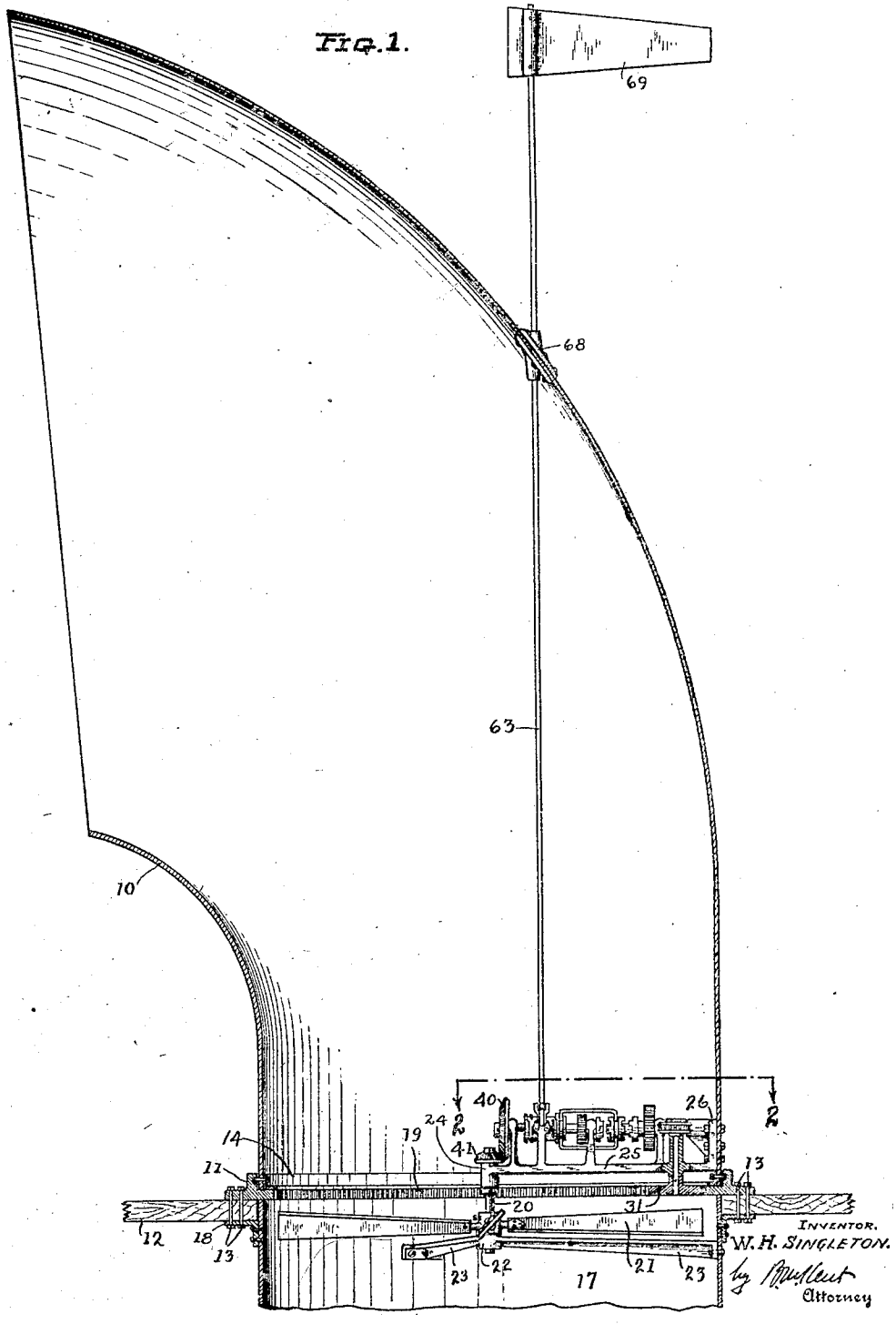

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Fig. 2.

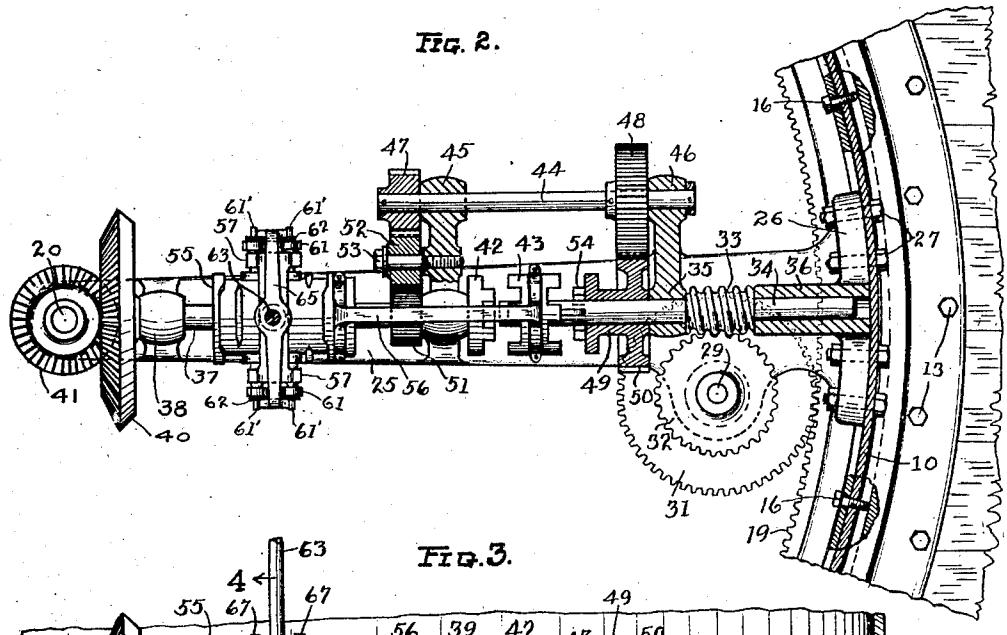


Fig. 3.

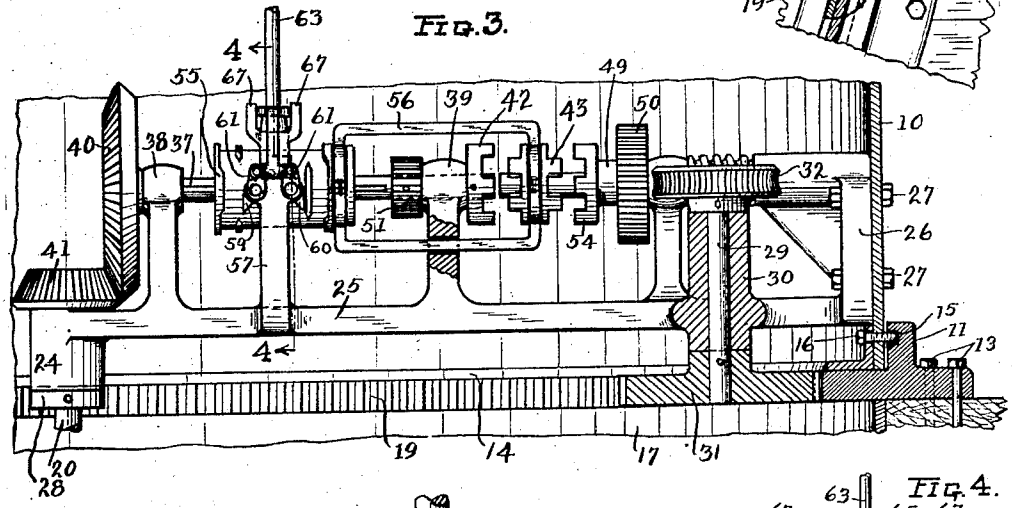


Fig. 5.

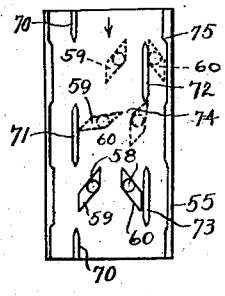


Fig. 6.

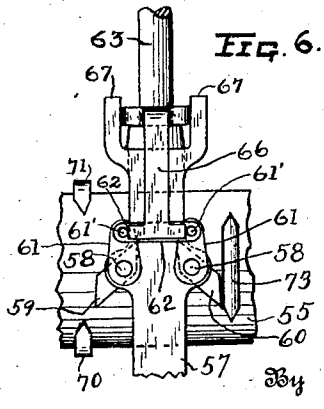
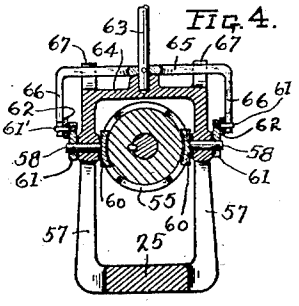


Fig. 4.



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Patented Apr. 14, 1925. 1,533,344

UNITED STATES PATENT OFFICE.

WILLIAM H. SINGLETON, OF CANTON, OHIO.

SHIP-VENTILATOR COWL.

Application filed October 15, 1924. Serial No. 743,752.

To all whom it may concern:

Be it known that I, WILLIAM H. SINGLETON, a citizen of the United States, and a resident of Canton, county of Stark, State of Ohio, have invented certain new and useful Improvements in Ship-Ventilator Cowls, of which the following is a specification.

This invention relates to cowls and more particularly to cowls for ventilating ships. More particularly the invention relates to mechanism for automatically moving the cowl to maintain the intake thereof toward the wind.

Cowls used on board ship are of very large size and it has heretofore been the custom to have them provided with suitable gearing by which they might be turned into the wind and it is the object of this invention to provide the cowl with mechanism for automatically performing this function. It is a further object of the invention to provide mechanism for rotating the cowl by means of a windmill, located in the cowl and driven by the current of air passing therethrough.

Other objects and the features of novelty will be apparent from the following description taken in connection with the accompanying drawings, of which:

Figure 1 is a vertical section through a ship's cowl, embodying my invention;

Fig. 2 is an enlarged plan view of the rotating mechanism for the cowl, as seen from the line 2—2 of Fig. 1, certain parts being shown in section;

Fig. 3 is a side elevation of the mechanism shown in Fig. 2;

Fig. 4 is a section on the line 4—4 of Fig. 3;

Fig. 5 is a development of the surface of the cylindrical cam constituting one of the elements of the mechanism; and

Fig. 6 is an enlargement of a fragment of Fig. 3.

Referring to the drawings, 10 indicates a cowl that is rotatable on the ring 11 which is fastened to the ship deck 12 by bolts 13. The lower end of the cowl is provided with an angle iron 14 having a horizontal flange that rests upon the ring 11 and this ring is provided with an internal groove 15 with which a series of set screws 16 cooperate to hold the cowl in the upright position. A pipe 17 is arranged in axial alignment with the cowl and is secured to the deck 12 in any suitable manner as by means of the angle iron 18 which is secured to the deck by the bolts 13.

The ring 11 is provided with teeth constituting an internal gear 19 arranged coaxial with the cowl and the pipe 17. A vertical shaft 20 is arranged at the center of this internal gear and carries a windmill 21 by means of which the shaft is rotated, the windmill being actuated by the air passing downwardly through the cowl. The lower end of the shaft 20 is supported in a bearing 22 and this bearing is supported by the brackets 23 which are secured to the pipe 17. The upper end of the shaft 20 is supported in a bearing 24 on the bracket 25, this bracket having an upturned end portion 26 that is secured to the cowl 10 by bolts 27. A collar 28 is secured on the shaft 20, by a set screw or in any other suitable manner, and supports the inner end of the bracket 25, the shaft 20 being, in turn, supported by the engagement of the hub of the windmill 21, with the upper end of the bearing 22.

A vertical shaft 29 is supported in the bearing 30, on the bracket 25, and carries at its lower end a pinion 31 that meshes with the internal gear 19. The gear 31 is fixed on the shaft 29 so as to rotate therewith and, on the upper end of this shaft, there is secured a worm gear 32 with which a worm 33 meshes. The worm 33 is secured to the horizontal shaft 34 that is supported in the bearings 35 and 36. A horizontal shaft 37 arranged in axial alignment with the shaft 34, but normally disconnected therefrom, is supported in the bearings 38 and 39, on the bracket 25. On one end of the shaft 37 there is a bevel gear 40 with which the bevel pinion 41, on the upper end of the shaft 20, meshes, so that the shaft 37 is driven by the shaft 20. A clutch member 42 is secured on the other end of the shaft 37 and is adapted to be disengaged by the shiftable clutch member 43 that is splined on the end of the shaft 34.

A horizontal shaft 44 is supported in bearings 45 and 46 on the bracket 25 and has secured thereon the gears 47 and 48. A sleeve 49 is loosely arranged on the shaft 34 and carries a gear 50 which meshes with the gear 48. A gear 51 that is secured to the shaft 37, meshes with an idler gear 52, supported on the stub shaft 53, and this idler gear meshes with the gear 47 so that the shaft 44 and sleeve 49 are driven from the shaft 37. The sleeve 49 carries a clutch member 54

with which the clutch member 43 is adapted to engage.

A cylindrical cam member 55 is splined on the shaft 37 so as to be rotated therewith and yet movable axially thereon and a yoke 56 connects the member 55 with the shiftable clutch member 43 so that the axial movements of the member 55 are transmitted to the member 43 to move the latter from the neutral position shown in Figs. 2 and 3, into engagement with either of the clutch members 42 or 54.

Two upright arms 57 are supported on the bracket 25, on opposite sides of the cam member 55 and each of these arms carries two short shafts 58. Each of the shafts 58 carries a member which cooperates with the cam member 55 and, since the two pairs of these members are alike I will describe the pair on one side of the cam member 55, these being shown at 59 and 60, in Fig. 5. Each of the shafts 58 carries at its outer end an arm 61 and the upper ends of each pair of these arms carry pins 61′ which are connected by links 62 so that the members 59 and 60 move together.

A shaft 63 has its lower end journalled in a cross member 64 which connects the upper ends of the arms 57, and a yoke 65 is pinned, or otherwise secured on the shaft 63 so as to move with the latter. The ends of the yoke 65 extend downwardly, as indicated at 66, between the pairs of pins 61′, and therefore, when the yoke 65 is turned by the shaft 63 the pairs of cam members 59 and 60 are given a corresponding movement. Lugs 67 project upwardly from the cross member 64 on opposite sides of the yoke 65 and serve to limit the swinging movement of the latter. The shaft 63 projects through a bearing 68, on the cowl 10, and carries at its upper end a vane 69 that is arranged exteriorly of the cowl and adapted to be turned by the wind.

In the operation of the mechanism, assuming that the parts are in the position shown in the drawings, with the cowl 10 turned into the wind, and the vane 69 standing in line with the direction of the wind, a change of the relation of the cowl, to the wind, either by a turning movement of the ship or a shifting of the wind, will cause the vane 69 to be turned by the wind and this turning movement will be transmitted to the yoke 65 and, from the latter, through engagement with the pins 61′, will cause the cam members 59 and 60 to be swung from the full line position shown in the lower part of Fig. 5. The full line position of the cam members 59 and 60 is their normal position and, since the current of air passing downwardly through the cowl will turn the windmill 21 and thus constantly rotate the cam member 55, the members 59 and 60 will move in the space between the cams 70, 71, and 72 and 73, the direction of rotation of the member 55 being indicated by the arrow in Fig. 5. Assuming that the turning of the vane 69 swings the members 59 and 60 into the dotted line position, indicated at 74 in Fig. 5, the cam projection 72 will then engage with the member 60, and since the latter is stationary, the member 55 will be shifted axially toward the left so that the cam projection 72 will pass between the members 59 and 60 and the clutch member 43 will be shifted to the left into engagement with the clutch member 42. The shaft 34 will then be rotated directly by the shaft 37 and this motion of the shaft 34 will be transmitted to the pinion 31 and, since the ring gear 19 is stationary, the cowl with all of its mechanism will be turned until the members 59 and 60 are shifted back to the full line position indicated in Fig. 5. When this occurs the cam surface 75 on the member 55, will engage with the cam member 60 and cause the member 55 to be shifted toward the right and, the rotation of the member 55 continuing, the projection 73 will then engage with the member 60 and cause the member 55 to be shifted still further toward the right until the members 59 and 60 are in the relation, to the member 55, indicated in full lines at the bottom of Fig. 5. A movement of the vane 69 in the opposite direction will cause the member 55 to be first shifted toward the right and engage the clutch member 43 with the clutch member 54, in which case the motion of the shaft 37 will be transmitted through the gears 51, 52, 47, the shaft 44, the gears 48 and 50, and the sleeve 49 so as to rotate the shaft 34 in the opposite direction from that previously described and thus shift the cowl in the opposite direction until the parts are again restored to their normal position.

In the operation of the mechanism the stops 67 limit the turning of the vane 69 so that the cowl will continue to follow the movements of the vane until the latter is in alignment with the wind, which will also bring the cowl into the wind.

From the foregoing it will be seen that I have provided an apparatus that will automatically maintain the cowl faced into the wind and that the shifting of the cowl is done by power derived from the windmill which is actuated by the air passing downwardly through the cowl.

While I have illustrated and described what I now consider to be the preferred form of the invention, it will be understood that changes in the details of construction, described and illustrated, may be made without departing from the spirit of the invention which is described in the appended claims.

Having thus described my invention, what I claim is:

1. In apparatus of the class described, the combination of a cowl, a windmill arranged in said cowl and operated by the air passing through the latter, mechanism for rotating said cowl, means for operatively connecting said mechanism with said windmill, a device for controlling said means, and a vane located exteriorly of said cowl for controlling said device.

2. In apparatus of the class described, the combination of a cowl, a windmill arranged in said cowl and operated by the air passing through the latter, mechanism for rotating said cowl, means for operatively connecting said mechanism with said windmill, a rotating cam actuated by said windmill, means actuated by said cam for operatively connecting said mechanism with said windmill and disconnecting the same, a vane, and means actuated by said vane for controlling the operation of said cam.

3. In apparatus of the class described, the combination of a cowl, a windmill arranged in said cowl and operated by the air passing through the latter, mechanism for rotating said cowl, means for operatively connecting said mechanism with said windmill, a vane, cam means actuated by said vane, and means operated by said windmill and controlled by said cam means for actuating the first-mentioned means.

4. In apparatus of the class described, the combination of a cowl, a windmill arranged in said cowl and operated by the air passing through the latter, mechanism for rotating said cowl, means for operatively connecting said mechanism with said windmill, a rotating cam operated by said windmill and arranged to be moved axially, means operatively connecting said rotating cam with the first-mentioned means and whereby the latter is actuated by the axial movements of the rotating cam, cam means cooperating with said rotating cam and controlling the axial movements of the latter, and a vane for controlling said cam means.

5. In apparatus of the class described, the combination of a cowl, a windmill arranged therein and operated by the air passing through the cowl, a stationary ring gear, gearing carried by the cowl and cooperating with said ring gear to rotate the cowl, a shaft carried by said cowl and rotated by said windmill, a clutch for connecting said shaft with said gearing, a member splined on said shaft and operatively connected with said clutch, cam means cooperating with said member to move the latter axially on said shaft to shift said clutch, and a vane for actuating said cam means.

6. In apparatus of the class described, the combination of a cowl, a windmill arranged therein and operated by the air passing through the cowl, a stationary ring gear, reversible gearing carried by the cowl and cooperating with said ring gear to rotate the cowl in either direction, a shaft carried by said cowl and rotated by said windmill, a shiftable clutch for operatively connecting said shaft and said gearing so as to rotate the cowl in different directions or to permit the cowl to be stationary, a member splined on said shaft and operatively connected with said clutch to shift the latter, cam means cooperating with said member to move the latter axially on said shaft, and a vane for actuating said cam means.

7. In apparatus of the class described, the combination of a cowl, a stationary ring gear, gearing carried by said cowl and cooperating with said ring gear to rotate the cowl, a power operated shaft carried by said cowl, clutch means for connecting said shaft with said gearing, a member splined on said shaft and operatively connected with said clutch means to actuate the latter, cam means cooperating with said member to move the latter axially on said shaft, and a vane for actuating said cam means.

8. In apparatus of the class described, the combination of a cowl, gearing for rotating said cowl, a power operated shaft, clutch means for operatively connecting said shaft and said gearing, a member splined on said shaft, means cooperating with said member to shift the latter axially on said shaft, and a vane for controlling the last-mentioned means.

In testimony whereof I affix my signature.

WILLIAM H. SINGLETON.