

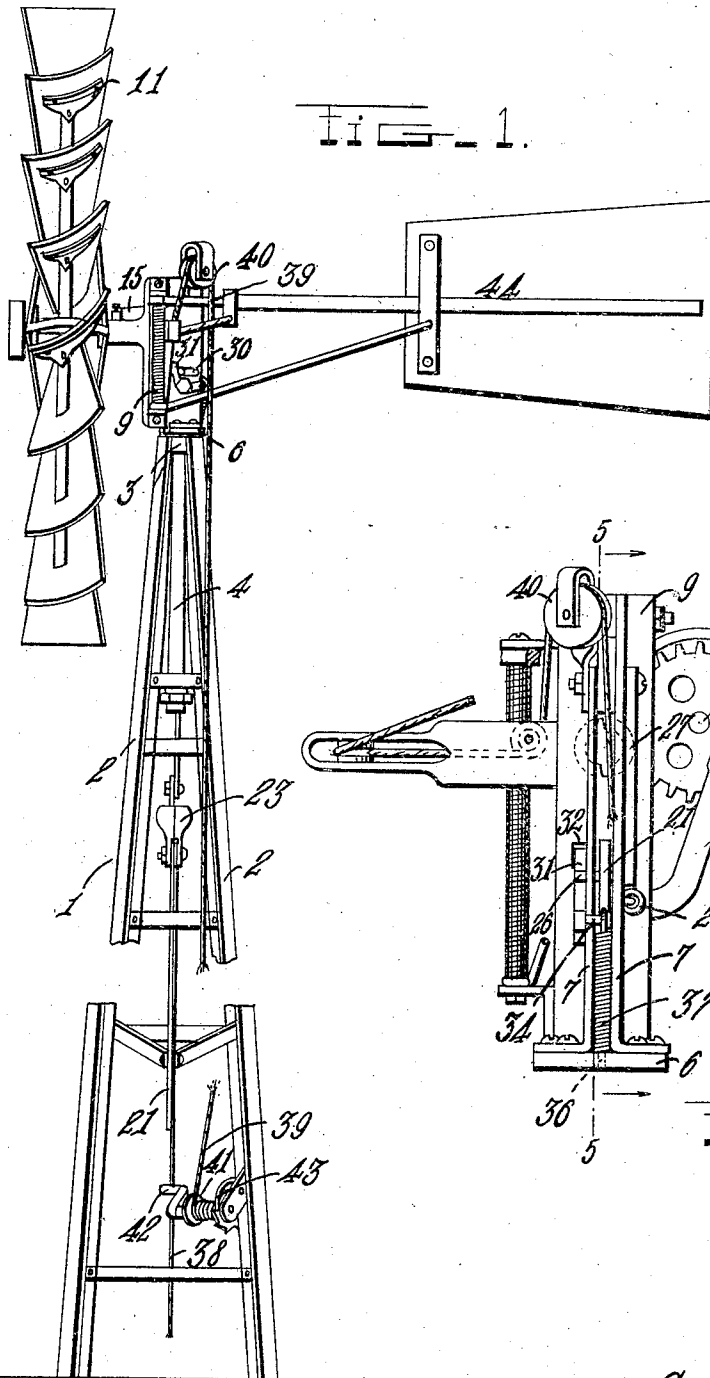
C. S. AGRE.
WINDMILL.

APPLICATION FILED OCT. 18, 1909.

953,890.

Patented Apr. 5, 1910.

3 SHEETS—SHEET 1.



Witnesses
C. R. Hardy
L. O. Hilton

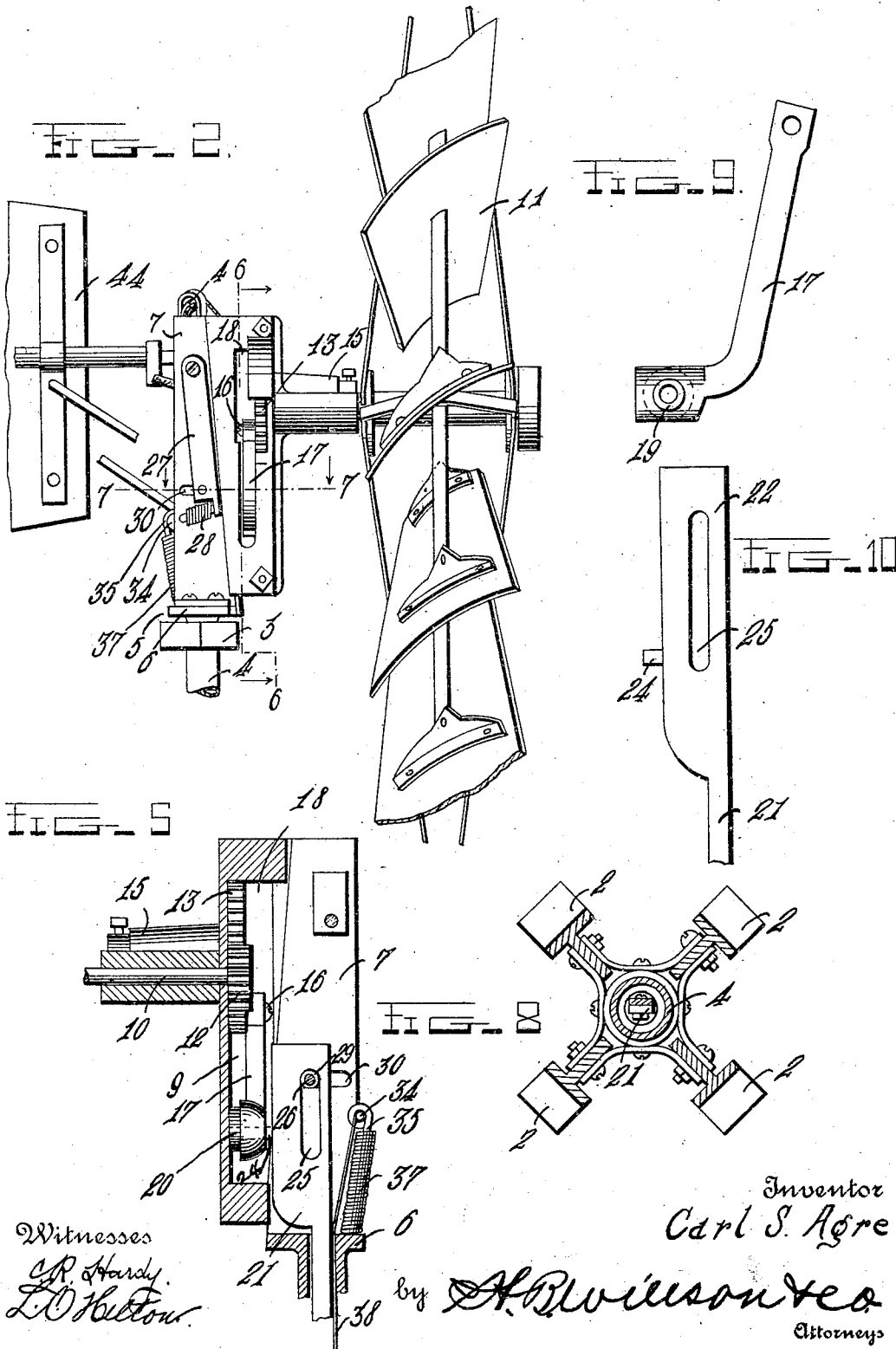
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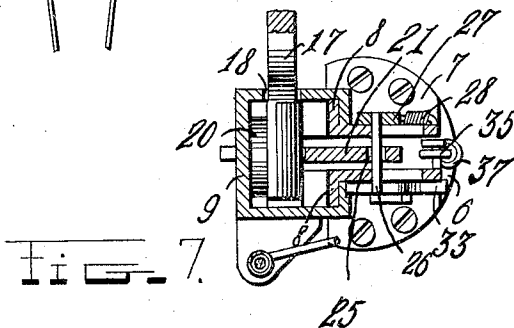
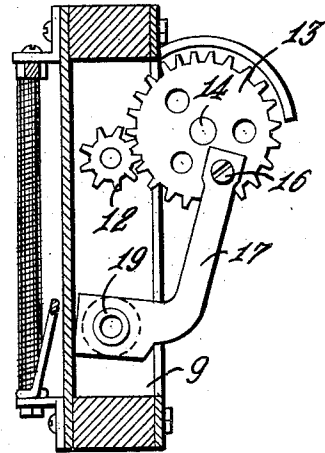
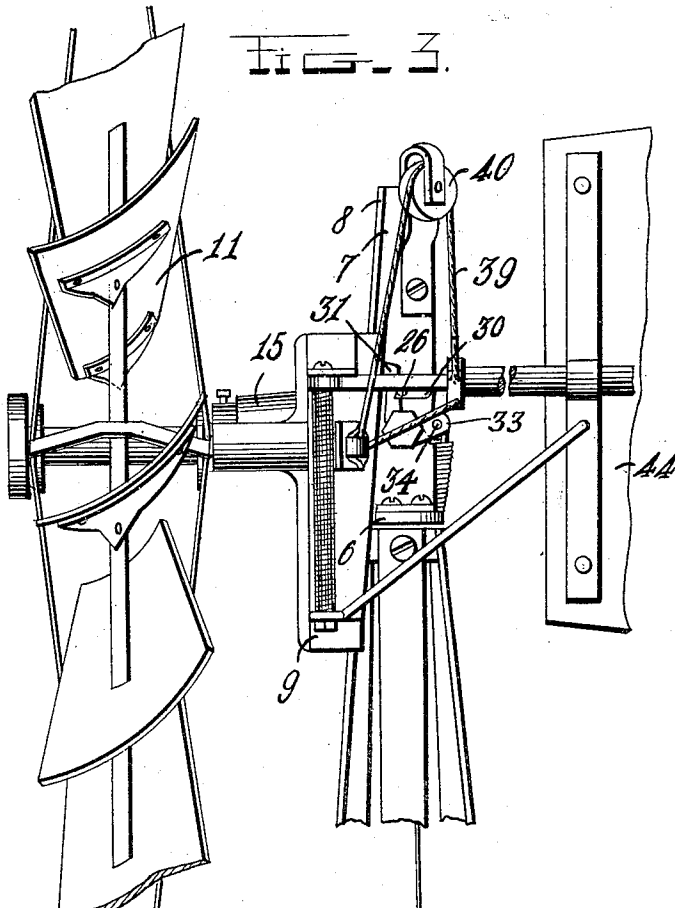
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3 SHEETS—SHEET 3.

Fig. 6.

Fig. 3.



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UNITED STATES PATENT OFFICE.

CARL S. AGRE, OF VOLGA, SOUTH DAKOTA.

WINDMILL.

953,890.

Specification of Letters Patent.

Patented Apr. 5, 1910.

Application filed October 18, 1909. Serial No. 523,211.

To all whom it may concern:

Be it known that I, CARL S. AGRE, a citizen of the United States, residing at Volga, in the county of Brookings and State of South Dakota, have invented certain new and useful Improvements in Windmills; and I do 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 improvements in windmills.

One object of the invention is to provide a windmill having means whereby the wheel and head of the mill may be quickly and easily raised and lowered to permit the operating mechanism to be oiled or for safety in case of high winds.

Another object is to provide a fastening device for holding the head in operative position on the frame and which will be automatically engaged with the head when the latter is raised to an operative position and having means whereby the same may be disengaged when it is desired to lower the head and wheel.

A still further object is to provide an improved power transmitting connection between the operating gears and the pump rod which will automatically couple or engage the pump rod when the head is raised to an operative position and which will be uncoupled or disengaged when the fastening mechanism of the head is released.

With the foregoing and other objects in view, the invention consists of certain novel features of construction, combination and arrangement of parts, as will be more fully described and particularly pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a side view of a windmill and tower embodying my invention and showing the head and wheel in operative position; Fig. 2 is an enlarged side view of one side of the head; Fig. 3 is a similar view of the opposite side of the head and upper end of the tower frame, showing the head and wheel in partly lowered position; Fig. 4 is a rear view of the parts shown in Figs. 1 and 2; Fig. 5 is a vertical longitudinal section on the line 5—5 of Fig. 4; Fig. 6 is a vertical transverse section on the line 6—6 of Fig. 2; Fig. 7 is a horizontal section on the line 7—7 of Fig. 2;

Fig. 8 is a similar view through the upper portion of the tower frame, showing the construction of the supporting standards whereby they serve as tracks to permit the head and wheel to be raised and lowered; Fig. 9 is a detail view of the pitman rod which connects the power transmitting gears to the upper end of the pump rod; Fig. 10 is a similar view of the upper end of the pump rod.

Referring more particularly to the drawings, 1 denotes the tower which consists of suitably braced standards 2, which incline upwardly from the ground to the upper end of the tower, as shown. The standards 2 are preferably constructed of T iron bars whereby they are adapted to serve as tracks or guide bars for a purpose hereinafter described. In the upper portion of the tower, are arranged bearings 3, in which is revolvably mounted the tubular extension 4 of a head 5. The head 5 comprises a base plate 6, to which are bolted or otherwise secured the right angularly bent lower ends of parallel supporting plates 7. The plates 7 are spaced apart a suitable distance and have their front edges formed at an inclination. The inclined edges of the plates 7 are bent outwardly at a right angle to provide guide flanges 8 with which are slidably engaged the combined journal box and gear casing 9 of the wheel, said casing having formed in its opposite sides guide grooves which are engaged with said flanges, as shown. In the upper portion of the casing 9 is formed the journal box in which is revolvably mounted the shaft 10 of the wind-wheel 11.

Fixedly mounted on the inner end of the shaft 10, within the casing 9, is a spur gear pinion 12 which is engaged with and operates a drive gear 13 fixed on the inner end of a short shaft 14 which is journaled in a suitable bearing 15 formed on the casing 9, said shaft being held in position by a collar and set screw arranged on the opposite end thereof, as shown.

Pivotaly connected to a wrist pin 16 projecting from the rear side of the gear, 13, is a pitman rod or connection 17, the lower end of which is curved laterally and projects into a slot 18 formed in the adjacent side of the casing 9. On the inner end of the pitman rod 17 is secured a tubular shaft or journal 19, on one end of which is revolvably mounted an anti-frictional bearing

roller 20 which is adapted to engage the opposite sides of the inner walls of the casing 9 when the pitman rod is drawn up and down by the operation of the drive gear 13. The inwardly curved end of the pitman rod is beveled or inclined on one side at its upper and lower edges, for a purpose hereinafter described.

Arranged in the center of the tower, in the usual or any suitable manner, is a pump rod 21, which is formed in sections, the upper section 22 being connected to the lower section by a swivel joint 23, whereby said upper section is permitted to revolve with the head 5 and its tubular extension 4. The upper section of the rod is in the form of a flat metal bar and extends upwardly through the tubular extension 4 to a suitable point between the plates 7 of the head. On the upper portion of the pump rod between the plates 7 of the head is formed a forwardly projecting stud 24 which is adapted to be engaged with the tubular shaft 19 on the lower end of the pitman rod 17, whereby the movement of the pitman rod is communicated to the pump rod to reciprocate the same and thereby operate the pumping mechanism at the lower end of the tower.

In the upper portion of the pump rod which extends between the plates 7 of the head, is formed a vertically disposed slot 25 with which is engaged a transversely disposed pin 26 fixed on the lower end of an arm 27 which is pivotally mounted on one side of the head and is engaged at its lower end by a coil spring 28 which is arranged on and secured to the head by a stud or other suitable fastening mechanism. On the portion of the pin 26 engaged by the slotted end of the pump rod is mounted an anti-frictional roller or sleeve 29, whereby said slotted upper end of the rod is free to reciprocate on said pin. The pin extends through transversely arranged slots 30 formed in the opposite plates 7 of the head and the free end of the pin projects beyond the outer side of the head opposite to the side upon which the arm 27 is pivoted and said projecting end of the pin is engaged with a retaining pawl or dog 31 pivotally mounted on the adjacent side of the head, as shown.

The pawl 31 has one end normally held in engagement with a notch or recess 32 formed in the rear edge of the casing 9 whereby said casing is held in operative position on the head. The pawl 31 is provided with a right angularly projecting operating lug 33 which is connected by a pin 34 to the upper end of a holding rod 35, the lower end of which is engaged with a guide aperture 36 in the base plate 6 of the head. Around the rod 35 is arranged a coil spring 37, the pressure of which is exerted to normally hold the pawl 31 in yielding engagement with the

notch or recess 32 in the casing 9. Connected to the pin 34, is a releasing wire or cable 38 which extends downwardly through the tubular extension of the head, and through the swiveled joint 23 to the ground.

To the top of the casing 9, is connected the upper end of a raising and lowering cable 39 which passes over a guide pulley 40 revolvably mounted on the upper portion of the head and from said pulley the cable passes downwardly and is connected at its lower end to the winding drum 41 of a windlass which is mounted on one of the standards 2 of the tower, near its lower end. The shaft of the drum 41 is provided with a crank handle 42 and with a pawl and ratchet mechanism 43 whereby the drum is held against casual retrograde movement.

On the casing 9 is secured, in the usual or any suitable manner, a vane 44 by means of which the wheel is held to the wind when in an operative position on the head 5. When it is desired to lower the wheel and vane for the purpose of oiling or repairing any of the parts, or when the mill is in danger from high winds, the pawl releasing wire or cable 38 is pulled downwardly thus disengaging the pawl 31 from the notch 32 in the casing 9 and simultaneously retracting the stud 24 on the upper end of the pump rod from engagement with the tubular shaft 19 in the lower end of the pitman rod 17. When the pawl 31 and the stud 24 have been thus disengaged by the releasing wire, the pawl is disengaged from the ratchet teeth of the winding drum 41, thereby permitting the raising and lowering cable 39 to be unwound thus permitting the casing 9 to slide downwardly on the guide flanges 8 of the head and onto the flat outer sides of the standards 2. When the casing is thus moved downwardly, the guide grooves therein engage the opposite side edges of the standards, thus holding the casing into engagement with the latter while descending. When it is desired to again raise the casing to bring the wheel and vane to an operative position, the raising and lowering cable 39 is rewound upon the winding drum 41, thus drawing the casing upwardly until the notch 32 is opposite to the pawl 31, at which time the pawl will spring into engagement with the notch and thus retain the casing in position. As the casing is thus brought upwardly, the beveled portion on the upper edge of the lower end of the pitman rod 17 will be brought into engagement with the stud 24 on the upper end of the pump rod, thereby bringing the pump rod back until the tubular shaft 19 is opposite to said stud, at which time, the stud will spring into engagement with said tubular shaft in the lower end of the pitman rod, thus operatively connecting the pump rod thereto.

Having thus described my invention, what I claim is:

1. In a windmill, a tower comprising standards constructed in the form of tracks, a head mounted on the upper end of said tower, a journal box slidably mounted on said head and adapted to be lowered into engagement with one of said track standards, a wind wheel journaled in said box, a windlass arranged on said tower near its lower end, a raising and lowering cable connected at one end to said box and adapted to be wound on and unwound from said windlass to raise and lower said box and wheel on said track standards, a spring projected pawl arranged on said head and adapted to automatically engage said box to hold the latter in operative position on the head, and means whereby said pawl is released from the ground.

2. In a windmill, a tower comprising standards in the form of tracks, a head mounted on the upper ends of said standards, a combined journal box and gear casing slidably mounted on said head and adapted to be lowered into engagement with said track standards, a wind wheel journaled in said box, a train of gears operated by said wheel, a pitman rod connected to one of said gears, a pump rod arranged in said tower and head, means for detachably connecting the upper end of said pump rod with said pitman rod, means for disconnecting said parts to permit the journal box and casing and said wind wheel to be lowered, and means whereby said gear casing and wheel are raised and lowered to and from the ground.

3. In a windmill, a tower comprising standards in the form of tracks, a head revolvably mounted on said standards, said head comprising a base plate having a tubular bearing extension, upwardly projecting parallel plates, guide flanges formed on one edge of said plates, a combined journal box and gear casing slidably engaged with the flanged edges of said plates, a wind wheel revolvably mounted in said box, a vane carried by said casing, a train of gears operated by said wind wheel, a pitman rod connected to one of said gears and having its opposite end slidable in said casing, a friction roller on the end of said pitman rod, a pump rod

slidably mounted in said head and having its upper end projecting between the plates of the latter, a stud on the upper end of said pump rod to engage said pitman rod whereby said parts are detachably connected, a spring projected pawl mounted on said head and adapted to automatically engage said casing, whereby the latter is held in operative position, means whereby said pawl is released from the ground, and means whereby the movement of said pawl will disengage the connecting stud on the pump rod from said pitman rod.

4. In a windmill, a tower, a head revolvably mounted thereon, a combined journal box and gear casing, slidably engaged with said head, a guide pulley fixed to said head, a windlass arranged on said tower near its lower end, a cable connected at one end to said casing and passing over said pulley and adapted to be wound on said windlass whereby said casing is raised and lowered, a wind wheel revolvably mounted in said journal box, a train of gears arranged in said casing and operated by said wheel, a pitman rod connected to one of said gears, a tubular shaft arranged in the opposite end of said pitman rod, an anti-frictional roller revolvably mounted on said shaft and adapted to engage the walls of said casing, a pump rod arranged in said head, a stud on the upper end of said pitman rod, a spring retracted arm connected with the upper end of said pump rod, whereby said stud thereon is yieldingly held in engagement with said pitman rod, a spring projected pawl pivotally mounted on said head and adapted to engage said casing whereby the latter is held in an operative position, a cable connected with said pawl and extending to the ground, whereby said pawl may be released from engagement with said casing, and means to connect said pawl with the pump rod engaging arm whereby when said pawl is released, the pump rod will be disconnected from said pitman rod.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

CARL S. AGRE.

Witnesses:

PHILO HALL,
W. H. RANDLE.