

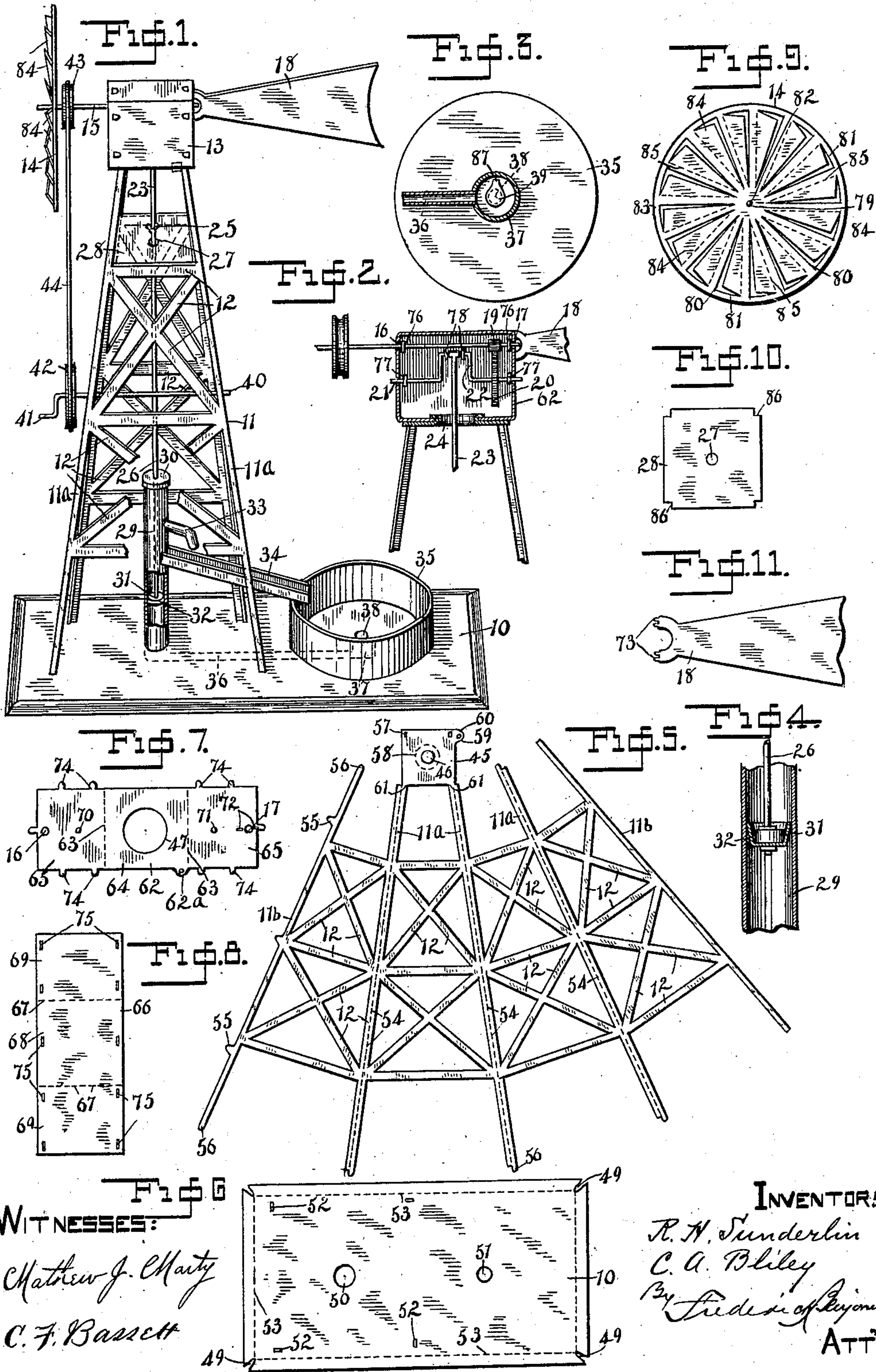
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PATENTED JAN. 21, 1908.

R. H. SUNDERLIN & C. A. BLILEY.

TOY WINDMILL.

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# UNITED STATES PATENT OFFICE.

REY HENRY SUNDERLIN AND CHARLES A. BLILEY, OF CRIPPLE CREEK, COLORADO.

## TOY WINDMILL.

No. 877,382.

Specification of Letters Patent.

Patented Jan. 21, 1908.

Application filed March 1, 1907. Serial No. 360,015.

*To all whom it may concern:*

Be it known that we, REY HENRY SUNDERLIN and CHARLES A. BLILEY, citizens of the United States, residing at Cripple Creek, in the county of Teller and State of Colorado, have invented certain new and useful Improvements in Toy Windmills, of which the following is a specification.

Our invention relates to toys and has special reference to that class known as mechanical toys.

The chief objects of our invention are to provide a toy that will be novel in its application thus affording an unusual entertainment; to design a toy of such construction that it can be readily and economically manufactured; to produce a mechanical toy that will be automatic in its action; and to furnish a toy that can be operated by a natural force, or arranged to be manually worked when desired.

We accomplish the above and other important objects by constructing a toy in the form of a miniature wind mill mounted upon a frame and connected to a pump by a pitman rod, the pump being in communication with a water tank by means of a hidden pipe, the arrangement of the parts being such that when the wind wheel revolves the pump will operate to draw water from the bottom of the tank through the concealed pipe and deliver it into an open trough from whence it runs back into the tank in a visible stream.

In the accompanying drawing which forms a part of this specification:—Figure 1 is a perspective view of our improved mechanical toy in its complete form; Fig. 2 is a partial view showing the gear casing in longitudinal section; Fig. 3 is a partial view of the under side of the tank the pipe and valve chamber being in section; Fig. 4 is a fragmentary view of the pump casing in section to show piston and valve; Fig. 5 is a detail showing the tower frame before being bent into form; Fig. 6 is a plan view of the base plate previous to shaping the margins; Fig. 7 is a detail view of the bearing plate which enters into the construction of the gear casing, showing it in the flat previous to being bent for assembling; Fig. 8 is a similar view of the top plate which forms the cover for the gear casing; Fig. 9 is a view in elevation of the wind wheel detached from its shaft; Fig. 10 is a plan view of the platform, and Fig. 11 is a fragmentary view of the base of the vane.

Referring to the drawing 10 represents a base upon which is mounted a tower 11 consisting of a framework having longitudinal members 11<sup>a</sup> provided with transverse and diagonal braces 12. Secured to the top of this frame is a rectangular gear casing 13 which supports a wind wheel 14 carried upon a horizontal shaft 15 journaled in bearings 16, 17, in the casing 13. The latter is arranged to turn upon a vertical axis in a manner hereinafter described and is furnished with a vane 18 which will keep the wheel 14 facing the wind or artificial air current, when the latter is utilized. The shaft 15 carries a pinion 19 which meshes with a larger gear 20 mounted on a parallel shaft 21 having a crank 22 upon which is journaled a pitman rod 23. This rod extends downward through an orifice 24 in the bottom of the casing and is connected by a hinge joint 25 to a vertical pump rod 26 which passes through a hole 27 in a platform 28 supported on the upper series of cross braces 12 of the frame 11 and extends down to the lower part of the said frame where it enters a pump casing 29, through a cap 30 which forms a cover for the pump casing. The lower extremity of the pump rod 26 is secured to a piston or plunger 31 furnished with a valve 32 formed of a leather washer in a well known manner. The pump casing is supplied with a spout 33 beneath which is placed a trough 34 leading to an open tank 35 which rests upon the base 10. The pump casing is extended below the upper surface of the base 10 and is provided with a pipe 36 which runs beneath the base to a point below the center of the said tank where it is turned upward and furnished with an enlargement which forms a valve chamber 37 communicating with the tank through an orifice 38 which is closed by a check valve 39.

At a convenient point upon the frame is mounted a shaft 40 having an operating crank handle 41. This shaft carries a grooved pulley 42 which is connected to a similar pulley 43 fixed to the wheel shaft 15 external to the gear casing 13 by an endless cord or belt 44.

The upper end of the frame 11 is supplied with a top-plate 45 having a central orifice 46. Upon the top-plate rests the bottom of the gear casing 13 also having a central aperture 47 which registers with the orifice 46 in the top-plate. The latter opening is smaller than the one in the casing above and its free margin is turned upward and recurved over the



edge of the opening 47 forming a bearing 48 about which the casing may be revolved in a horizontal plane.

Referring to the drawing more in detail we will now describe the various parts with special reference to improved methods of construction, both of the frame and other supports, and the operative mechanism with a view to point out simple and inexpensive methods of assembling the miniature structure.

We have designed the various parts so that they can be manufactured largely by die work, and it is our intention to make use of tin plate or other thin metal for the main portion of the structure, although other material may be employed if found suitable.

The base 10 is preferably constructed of a single plate the blank being rectangular in form. Fig. 6 shows this part after being blanked out and the necessary holes and slots formed therein preparatory to being bent into shape. The angles have miters 29 cut in ogee form to facilitate shaping the margins into moldings which raise the central plate above the surface on which the base may rest to afford a space for the hidden pipe 36. The plate is furnished with apertures 50, 51, for the pump casing and check valve chamber, respectively, and at equal distances from the pump hole 50 are slots 52 arranged in a rectangle to correspond with the tower base and with which ears formed on the frame, as detailed hereinafter, will engage. The dotted lines 53 indicate the location of the lines of direction for the bends in the plate to form the depressed margins.

In Fig. 5 is shown the detail for the tower which is constructed of a single piece, including the top plate 45. Three of the longitudinal members 11<sup>a</sup> are designed to be bent along the dotted lines 54 the marginal strips 11<sup>b</sup> when combined forming the fourth and completing the rectangle on a horizontal plane. One of the strips 11<sup>b</sup> is supplied with ears 55 which are soldered to the companion strip. The lower ends of the members 11<sup>a</sup> and one of the members 11<sup>b</sup> are furnished with ears 56 to engage the slots 52 in the base 10; the upper ends of two of the members 11<sup>a</sup> are formed integral with the top plate; the remaining member 11<sup>a</sup> and one of the halves 11<sup>b</sup> of the fourth longitudinal member are supplied with an ear at their upper and lower ends to engage slots 57 and 52 respectively in the said top and base plates. The former is perforated in the center as previously mentioned and the dotted line 58 indicates the portion which is recurved to project through the orifice in the gear casing bottom as described, and which laps over the superimposed plate to form a sort of eyelet, or swivel on which the said gear casing may turn. Near one corner the top plate 45 has a projection 59 in which is a perforation 60,

which registers when assembled with a similar aperture in the bearing plate described hereinafter. The character 61 indicates the location of the bends between the plate and the two members 11<sup>a</sup> formed therewith. The gear casing 13 is composed of two plates shown in Figs. 7 and 8 the former illustrating the bearing plate 62 which is bent in the lines 63 to form the bottom 64 and the ends 65 of said casing, and the latter showing the cover plate 66 which is bent on the lines 67 to form the top 68 and the sides 69 of the casing when assembled.

In the center of the bearing plate 62 is shown the opening 47 previously described the holes 16, 17, for the wheel shaft and apertures 70, 71, for the crank shaft 21. Adjacent to the holes 17 are slots 72 with which ears 73 formed integral with the vane 18 engage when assembled. Along the margin of the plate are a series of spaced ears 74 which engage a slot 75 formed in the cover plate 66 when the parts are assembled and a projection 62<sup>a</sup> is left on the margin to correspond with the projection 59 and has a similar perforation 60.

Collars 76 are secured to the wheel shaft 15 by soldering to form guards which hold said shaft in place in its bearings. Similar collars 77 are fixed on the crank shaft 21 in the same manner to prevent lateral play and the crank is supplied with guards 78 also soldered in place to form a journal box for the pitman rod 23.

The shafts 15, 21, and 40, and the rods 23 and 26 are constructed of wires of a suitable gage bent to the shape required. The motor wheel 14 is preferably formed of a single circular piece having a central perforation 79 for the shaft 15 to which the wheel is soldered, and is furnished with a series of spaced radial cuts 80 which are joined at their outer ends by shorter peripheral slots 81. The radial slots have a length less than a semi diameter of the wheel, so that a portion of the material is left intact at the center to form a hub 82 and a portion is left at the margin to form a strengthening rim 83. The angular flaps 84 thus formed are then bent outwardly along the dotted lines 85 so that they stand out at an angle with the plane of the plate and at a suitable inclination to be acted upon by the wind current to set up a rotary motion in the wheel and attached shaft. The platform 28 is placed upon the upper series of horizontal braces to afford a bearing for the pump rod 26 and has angular gains 86 cut at each corner to engage the longitudinal members 11<sup>a</sup> and 11<sup>b</sup>.

Fig. 3 shows the check valve 39 which is formed of a thin piece having a projection upon one side to form a valve stem 87 which is secured to the under side of the tank 35 by soldering.

It will be readily understood that when the



parts are assembled the ears which engage their appropriate slots will be clenched so as to hold the parts firmly together without the necessity of using solder.

5 To operate the appliance when it has been properly assembled the tank 35 is nearly filled with water and the device placed where there is a strong current of air. The pressure of the wind upon the vane will cause the  
10 wheel to face against the current and the force of the air upon the wings will set the apparatus in motion, so that the piston will be reciprocated in the pump. The upward movement of the piston will cause the valve  
15 39 to open and the water will enter the pump casing through the pipe 36; when the piston descends the pressure will close the valve and the water will find its way between the piston and the casing walls. When the piston  
20 again ascends the valve 32 will close and the piston will lift the water above it and when it reaches the level of the spout it will run into the tank through the medium of the trough 34.

When it is desired to operate the mechanism by means of the crank 41 the gear casing is turned until the projections 59 and 62<sup>a</sup> coincide when a common pin or piece of wire is passed through the apertures 60 to hold the casing from revolving when the said crank is  
30 turned.

Having thus described our invention we claim:—

1. A toy wind mill, including a base plate, a tower composed of a single piece of metal  
35 having apertures therein to form lattice work, a casing supporting plate formed integral with said tower, a casing composed of two rectangular plates, one of said plates having marginal slots and the other plate  
40 provided with integral ears engaging said marginal slots, means for joining said tower to the base plate, said means consisting of ears formed integral with the tower and engaging slots cut in the said base plate.

45 2. A toy wind mill, including a base plate, a tower composed of a single piece of metal having apertures therein to form lattice work, a casing supporting plate formed integral with said tower, a casing formed of two  
50 rectangular plates, one of said plates having a series of integral ears adapted to engage slots in the other plate, a swivel connection between the casing and said supporting plate, means for joining said tower to the  
55 base plate, said means consisting of ears formed integral with the tower and engaging slots cut in the said base plate.

3. In a toy wind mill having a base plate, a tower consisting of a single piece of metal having apertures cut therein to form longitudinal strips connected by parallel and diagonal members, a casing supporting plates formed integral with two of said longitudinal strips and provided with slots, a casing formed of oblong plates, one of said plates  
65 provided with marginal slots and the other plate having integral ears adapted to engage the marginal slots, and a series of ears formed integral with said longitudinal strips and adapted to engage said slots in the supporting casing plate and the said base plate.  
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4. In a toy wind mill having a base plate, a tower consisting of a single piece of metal having apertures therein to form lattice work, a casing supporting plate formed integral with the tower and provided with a central aperture, a casing carried on said supporting plate, said casing consisting of two plates, means for joining said plates, said means consisting of ears formed integral with  
75 one plate and adapted to engage slots cut in the other plate, the first named plate having an opening registering with said aperture, a swivel connection between the casing and the supporting plate, said connection consisting  
80 of a recurved flange surrounding the said opening and engaging the margins of said aperture and means for securing said tower to the base.

5. In a toy wind mill having a base plate, a tower consisting of a single piece of metal having apertures cut therein to form longitudinal strips connected by parallel and diagonal members, and a casing plate formed integral with two of said longitudinal strips  
85 and provided with slots, and a series of ears formed integral with said longitudinal strips and adapted to engage said slots in the casing plate and the said base plate.

6. A toy wind mill, including a base plate, a tower composed of a single piece of metal having apertures therein to form lattice work, means for joining said tower to the base plate, said means consisting of ears formed integral with the tower and engaging  
100 slots cut in the said base plate.

In testimony whereof we affix our signatures in presence of two witnesses.

REY HENRY SUNDERLIN.  
CHARLES A. BLILEY.

Witnesses:

L. B. LONG,  
W. C. BENTLEY.