

No. 717,110.

Patented Dec. 30, 1902.

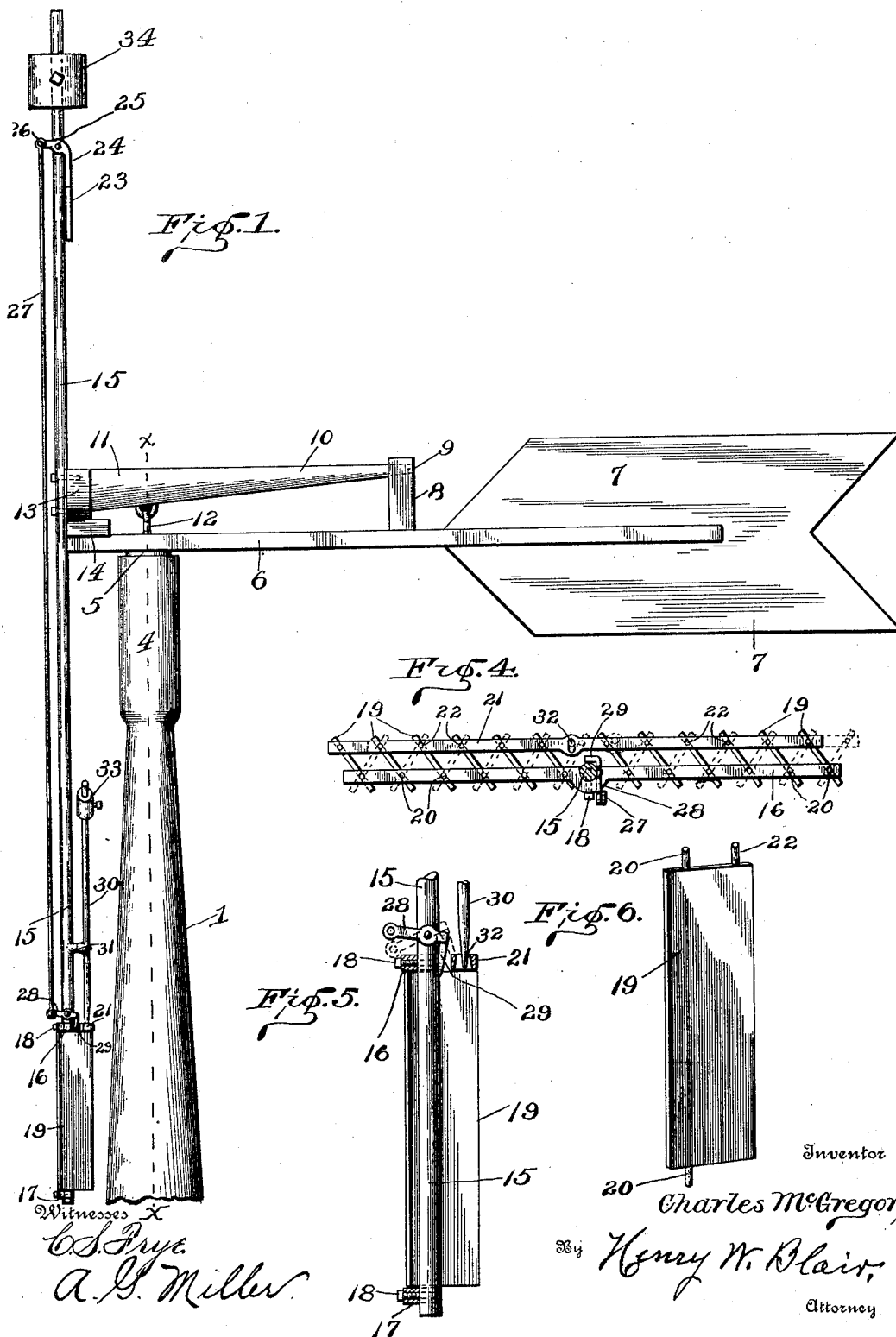
C. MCGREGOR.

WIND MOTOR.

(Application filed Mar. 25, 1902.)

2 Sheets—Sheet 1.

(No Model.)



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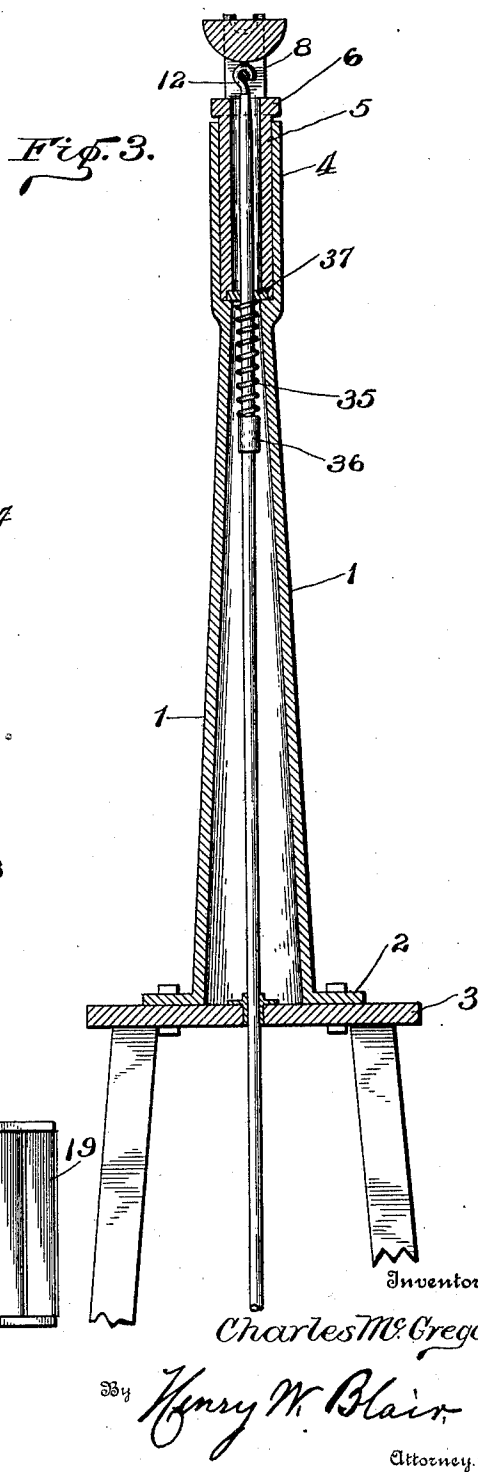
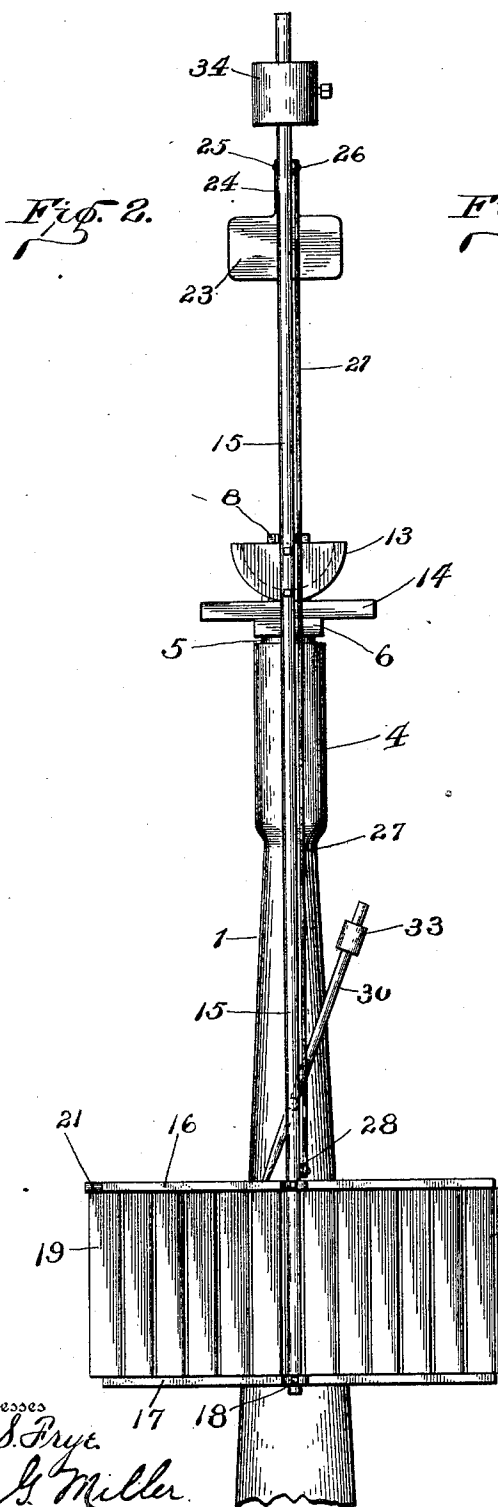
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2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

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WIND-MOTOR.

SPECIFICATION forming part of Letters Patent No. 717,110, dated December 30, 1902.

Application filed March 25, 1902. Serial No. 99,949. (No model.)

To all whom it may concern:

Be it known that I, CHARLES MCGREGOR, a citizen of the United States, residing at Nashua, in the county of Hillsboro, State of New Hampshire, have invented certain new and useful Improvements in Wind-Motors; and I do hereby 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.

My invention relates to wind-motors; and it consists of certain novel features of combination and construction of parts the preferred form or materialization whereof will be hereinafter fully set forth and illustrated in the accompanying drawings.

The object of my invention is to provide a mechanism of simple though reliably efficient character which will utilize and be operated by a minimum amount of the wind and which will at the same time automatically protect itself from a wind of undue strength or violence, inasmuch as certain controlling devices will be automatically set in motion when the wind becomes unduly strong, and said devices will operate to check further movement of the mill until the storm shall have subsided. It also eliminates friction and the necessity of lubrication.

Other objects and advantages will be hereinafter made clearly apparent.

In the accompanying drawings, Figure 1 is a side elevation of my wind-engine complete, showing only a portion of the supporting derrick or frame. Fig. 2 is a front elevation of my wind-engine, taken from the left side of Fig. 1. Fig. 3 is a vertical central section of Fig. 1 on line *x x*. Fig. 4 is a top plan view of the movable sails or blades and the frame employed to hold them in their respective operative positions. Fig. 5 is a vertical section of the frame illustrated in Fig. 4, taken on a line adjacent to the carrying-frame connected to said frame. Fig. 6 is a perspective detail view of one of the blades or sails removed from the frame illustrated in Fig. 4.

In order to conveniently designate and refer to the various details and cooperating ac-

cessories of my invention, numerals will be employed, of which 1 indicates the upper portion of a derrick or supporting-post, which may be of the usual or any preferred construction, though in this instance said part consists of a substantially tubular body portion, preferably slightly conical, the enlarged lower end being provided with a suitable flange 2, by which it may be bolted or otherwise secured to the upper end 3 of the derrick proper.

The upper end of the post 1 is provided with the cylindrical tubular terminal 4, within which is seated the tubular stem 5, to the upper end of which is rigidly connected or integrally formed the base member 6, to the outer free end of which is connected the guiding-vane 7, common to all windmills and of any preferred construction. Upon the base member 6 I erect the standard or post 8, the upper end of which is provided with a suitable aperture adapted to receive a journal or lug 9, formed upon the reduced end of the rocker-beam 10, which, it will be observed, is provided upon the end opposite to said journal with the body-section 11, relatively of much larger size, and to the under side of said enlarged portion I pivotally connect the upper end of the pump-rod 12, as clearly shown in Fig. 1 and other views. To the extreme end of the enlarged body-section 11 I connect in any preferred way the rocker 13, designed to play or travel upon the tread-plate 14, which is connected in any suitable manner to a contiguous part of the end of the base member 6.

It will be observed that the rocker 13 is so disposed upon the extreme outer edge of the tread-plate 14 that the outer surface of said rocker will lie flush with the outer edge of said plate, the object of this disposition being to insure that the driving-shaft 15, which is designed to carry the actuating mechanism, as will be hereinafter explained and which is connected to the central portion of said rocker, will be left free to swing or vibrate as a pendulum without engaging said tread-plate or the end of said base member.

To the lower end of the shaft 15 I connect the sail-carrying frame, comprising the hori-

zontally-disposed upper and lower sections, respectively, 16 and 17, said sections being connected in any preferred way to the shaft 15, as by the set-screws 18, as more clearly 5 shown in Fig. 5. Within the frame thus or otherwise provided by the horizontally-disposed sections 16 and 17 I pivotally mount the individual sails 19, by means of the journals or lugs 20, it being understood that suitable 10 apertures in the frame-sections 16 and 17 will be provided to receive said lugs, whereby the sails 19 will be pivotally disposed in a substantially vertical position.

It will be observed that the journals 20 are 15 nearer the outer edge of the sail, this disposition of said journals being very desirable and important, as will be hereinafter more clearly pointed out. Designed to coöperate with the upper frame-section 16 and the plurality of sails 19 carried thereby is the auxiliary or controlling bar 21, which is also 20 provided at proper intervals with an aperture, each aperture being designed to receive the lug 22, formed upon the upper end of the sail near the inner edge thereof, and it will be 25 observed by reference to Fig. 4 and other views that when the bar 21 is moved longitudinally to the right or to the left all of the sails 19 connected therewith will be adjustably 30 disposed and secured at any desired angle, all of the sails being thereby substantially parallel with each other.

It is very important that the disposition and control of the plurality of sails 19 shall 35 be wholly automatic in order that they may present a proper angle to the wind at the desired moment to attain the best results. With this purpose in view it becomes desirable to provide some suitable compensating devices 40 by the use of which the series of blades 19 will when the pendulum or shaft 15 has swung to the full limit in one direction be turned so as to present a different angle to the wind, and thereby insure that when said shaft shall 45 have reached the limit of the stroke it shall be automatically sent in the opposite direction and that when it shall have reached the full limit of movement in such opposite direction the position of the blades will be 50 again reversed and this operation continued *ad infinitum* until automatically or manually stopped, as hereinafter described.

While it will be understood that various means may be adopted to thus control the 55 position of the plurality of sail-sections 19, the means which I will hereinafter particularly describe will be representative in the broad sense of all equivalent construction, inasmuch as various equivalents and substitutes 60 may be employed without departing from the spirit and scope of my invention. I therefore provide and preferably locate upon the upper end of the shaft 15 the auxiliary sail 23, which is provided with the bifurcated 65 arm 24, one branch of said arm being disposed upon either side of said shaft and pivotally connected thereto, as indicated by the numeral 25.

One of said arms 26 is slightly extended and pivotally connected to the controlling-rod 27, the lower end of which extends downward into 70 pivotal engagement with the outer end of the controlling-detent 28, said detent being pivoted to a contiguous part of the shaft 15, and is provided with the depending finger 29, which is designed to be moved outward against a 75 contiguous part of the bar 21, when the auxiliary sail is elevated by an undue stress of wind, thereby holding said bar away from the section 16 and disposing all of the sails 19 80 substantially parallel with the plane of the wind, and thus permit the wind to pass freely between said sails and stopping the engine.

In order that the plurality of sail-sections 19 may be properly disposed to receive the 85 full force of the wind incident to the operation of my wind-engine, I provide the simple device illustrated in Figs. 1 and 2, wherein it will be observed that I have provided the controlling-lever 30, which is pivotally 90 connected to the inner side of the shaft 15, as indicated by the numeral 31. The lower end of the lever 30 is designed to take loosely into the transversely-disposed aperture 32, provided in a contiguous part of the bar 21, and since the upper end of the lever 30 is provided 95 with the adjustable weight 33 it is obvious that said weight will by action of gravity so control the movement of said lever as to adjust the plurality of blades or sails 19 and dispose them at the proper angle to the plane 100 of the wind. When the sails and their carrying-frame shall have been swung to the full limit in one direction, the weight 33 will drop inward, and thereby reverse the position of all the sails and dispose them at such an angle 105 to the wind that they will all be forced in the opposite direction, when the operation of the weight 33 will be repeated and the engine driven on indefinitely. It will also be clearly 110 apparent that instead of the automatic means herein employed to control the sail-sections 19 said control may be effected manually or by a float, as by means of a cord extending to a point convenient to the operator.

In order to provide the requisite momentum, I attach the adjustable weight 34 to the 115 upper end of the shaft 15, as fully set forth in Fig. 2. I deem it desirable in some instances to employ the spring 35, disposed around the pump-rod and confined in its operative position by a swell or collar 36 upon 120 the pump-rod and a disk or pin 37, as clearly shown in Fig. 3, the office of said spring being to cushion the blow imparted to the pump-rod by the rocker-beam, a further office 125 of said spring being to draw the pump-rod downward, ready for the next upward movement to be imparted thereto.

From the foregoing description of the construction and combination of parts deemed 130 necessary in carrying out my invention, considered in connection with the accompanying drawings, it is thought that the operation of my wind-engine will be fully apparent,

though it may be stated that after the several parts shall have been mounted and adjusted in their several respective positions the wind will act upon the series of sails 19 and swing the lower end of the lever carrying said sails to the right or left, according to the adjustment of said sails, and that when said lever shall have moved to the full limit of the stroke the sails will be automatically readjusted, so as to receive the full impact of the wind in a proper manner to force the sails and their carrying-frame in the opposite direction, the weight 33 falling by gravity to the right or left, and thereby insuring that the controlling-bar 21 will be positively moved to reliably control the sails. The obvious office of the vane 7 is to properly adjust the base member 6 so as to hold the series of sails squarely in the path of the wind.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a wind-engine of the character specified, a suitable supporting-standard; a base member pivoted on said standard; a vane carried by said base member; a rocker supported upon base member and having a vertical shaft, and means carried by the shaft adapted to actuate said rocker a pump-rod or the like being connected thereto and operated thereby, all substantially as specified and for the purpose set forth.

2. In a wind-engine of the character specified, a suitable support; a beam provided with a rocker, a tread-plate supporting the same, said beam being suitably mounted on said support; a shaft carried by said rocker-beam; a plurality of sails carried by said shaft and means to automatically adjust said sails whereby they will receive the full impact of the wind and swing said shaft to the right and the left all substantially as specified and for the purpose set forth.

3. In a wind-engine, a beam provided with a rocker and suitable supports for said beam and rocker; a plurality of adjustable sails and means to operatively connect said sails with said rocker-beam whereby the sails and their carrying-frame may be moved to the right and the left and means to change the position of said sails on their movement from the right to the left whereby they will receive the full impact of the wind and drive said rocker-arm and mechanism connected therewith, all substantially as specified and for the purpose set forth.

4. In a wind-engine of the character specified comprising a suitable support; a base member pivoted to the upper end of said support and adapted to swing in a horizontal plane; a beam provided with a supported rocker, said beam being pivotally disposed on said base, in combination with a plurality of movable sail-sections and means to operatively connect said sails with said rocker-beam whereby they will be swung to the right and

to the left and thereby receive the impact of the wind to actuate said rocker-beam and drive mechanism connected therewith, all substantially as specified and for the purpose set forth.

5. The herein-described wind-engine comprising a suitable support; a base member pivoted thereon and having a wind-vane 7; a beam provided with a supported rocker, said beam being pivotally mounted on said base; a shaft connected to said rocker-beam and having a sail-carrying frame; a plurality of sails operatively mounted in said frame and automatic means carried by said shaft to simultaneously change the position of all of said sails whereby they will all be disposed substantially parallel with each other and at an oblique angle to the wind, all substantially as specified and for the purpose set forth.

6. In a wind-engine substantially as specified, a suitable support, a beam provided with a supported rocker, said beam being mounted on a suitable support on said support and operatively connected with the pump-rod; a shaft connected to said rocker-beam and having a plurality of individual sail-sections at its lower end, in combination with an auxiliary sail upon the upper end of said shaft and operatively connected with said series of sails whereby all of said series will be positively locked by the movement of said auxiliary sail, substantially as specified and for the purpose set forth.

7. In a wind-engine of the character specified, the herein-described rocker-beam comprising a tapered end having a journal 9 at one end and a rocker-section proper 13 at the opposite end and means to support and actuate said rocker-beam, substantially as specified and for the purpose set forth.

8. In a wind-engine, a vertical driving-shaft pivoted on a horizontal axis and carrying a frame having a plurality of adjustable sails, actuating said shaft, as set forth.

9. In wind-engines, a vertical driving-shaft pivoted on a horizontal axis and carrying a frame provided with adjustable sails actuating said shaft and means to control the position of each respective sail, as set forth.

10. In wind-engines, a vertical driving-shaft pivoted on a horizontal axis and carrying a frame provided with adjustable sails and also carrying an auxiliary controlling-sail, all arranged as set forth.

11. In wind-engines, a vertical driving-shaft pivoted on a horizontal axis and carrying a frame provided with adjustable sails, and also carrying an auxiliary controlling-sail, and a device connecting both sets of sails, as set forth.

In testimony whereof I affix my signature in the presence of two witnesses.

CHARLES MCGREGOR.

Witnesses:

EDWARD H. WASON,
THOMAS F. MORAN.