(No Model.)

B. F. COON.

WIND ENGINE.

No. 555,929. Patented Mar. 10, 1896.

Fig. 1.

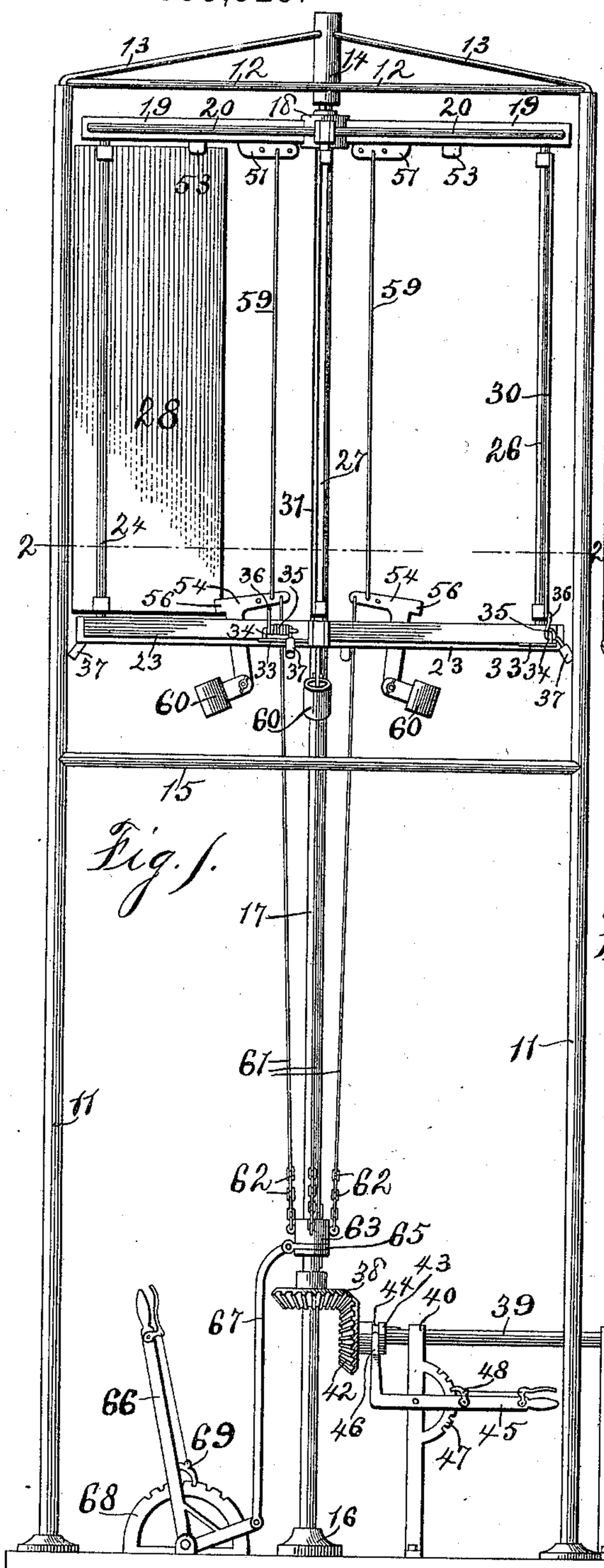

Fig. 2.

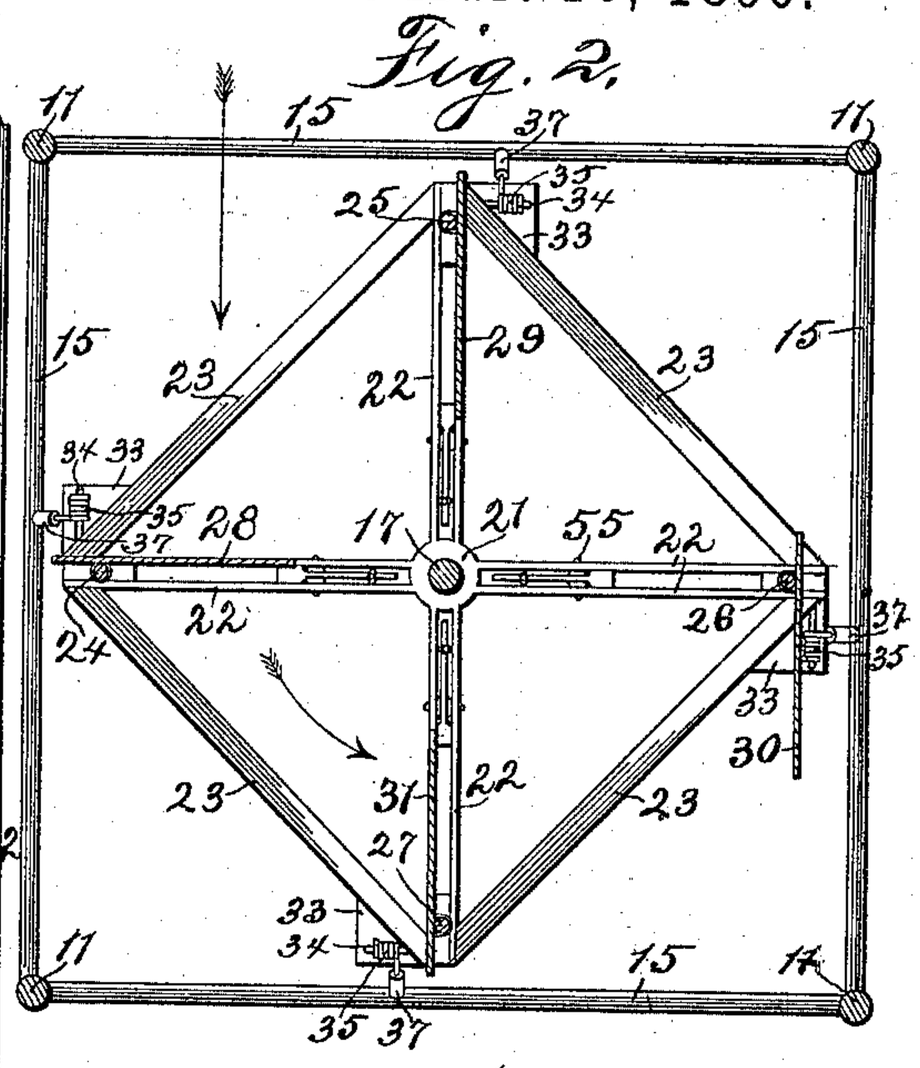

Fig. 3.

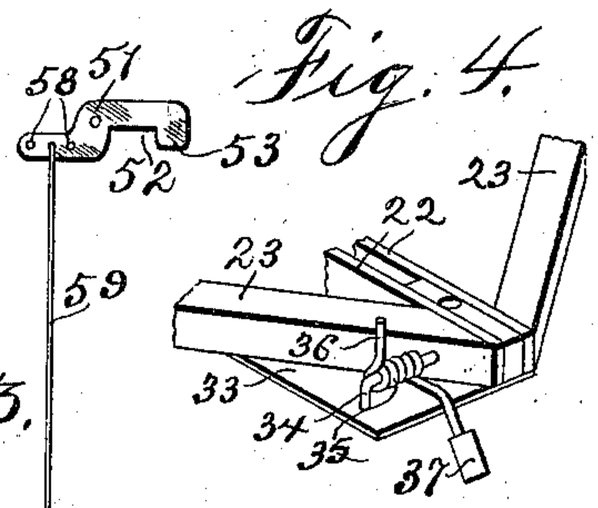

Fig. 4.

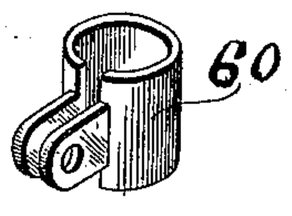

Fig. 5.

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UNITED STATES PATENT OFFICE.

BENJAMIN F. COON, OF JAMAICA, IOWA.

WIND-ENGINE.

SPECIFICATION forming part of Letters Patent No. 555,929, dated March 10, 1896.

Application filed May 2, 1895. Serial No. 547,826. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN F. COON, a citizen of the United States, residing at Jamaica, in the county of Guthrie and State of Iowa, have invented new and useful Improvements in Wind-Engines, of which the following is a specification.

The object of my invention is to provide an improved means for utilizing the velocity and quantity of natural air-currents in the propulsion and operation of machines.

My invention consists in the construction, arrangement, and combination of elements hereinafter set forth, pointed out in my claim, and illustrated in the accompanying drawings, in which—

Figure 1 is an elevation of the complete machine. Fig. 2 is a sectional plan of the machine on the indicated line 2 2 of Fig. 1. Fig. 3 is a detail elevation of the automatic governor detached from the machine. Fig. 4 is a perspective in detail of one of the vane-stops secured to the frame. Fig. 5 is a detail perspective of a governor-weight detached from the machine.

In the construction of the machine as shown the numeral 10 designates a base, to each corner of which is secured a metallic post 11. The upper ends of the posts 11 are connected by stays 12, which conjunctively form a square frame, and the corners of said frame are connected by obliquely-positioned braces 13, the inner ends of which braces 13 are connected to a bearing 14. The central portions of the post 11 are connected by stays 15, which stays conjunctively form a square frame. A step 16 is positioned in the central portion of the base 10 and a shaft 17 is located in a vertical plane in said step, and the upper end of said shaft is supported against lateral movement by engagement in the bearing 14.

A wind-wheel is provided, which wheel comprises upper and lower heads and vanes connected as follows: The upper head is formed with a hub 18 rigidly connected to the shaft 17 immediately beneath the bearing 14. Arms 19, arranged in pairs, are fixed at one end to the hub 18 and radiate therefrom, and the outer ends of the pairs of arms are connected by braces 20, which braces conjunctively form a square frame. The two arms 19, forming any pair, are parallel with each other in the pair. The lower head is formed with a hub 21 rigidly connected to the shaft 17 at a distance below the hub 18. Arms 22, arranged in pairs, are fixed at one end to hub 21 and radiate therefrom, and the outer ends of the pairs of arms are connected by braces 23, which braces conjunctively form a square frame. Bars 24, 25, 26, and 27 are positioned vertically between and connect the pairs of arms 19 to the pairs of arms 22, and vanes 28, 29, 30, and 31 are fixed to the said bars, respectively, by means of clips 32 and rotate conjunctively with said bars. The vanes are made of sheet metal or similar material in rectangular form, and a portion less than one-half of each vane projects beyond the respective carrying-bar 24, 25, 26, or 27 opposite the major portion of the vane, thus positioning the bar off the center of the vane and providing for the rotation thereof out of the wind, when released, by the force of the air-currents. It will be observed that the vanes are thus positioned so that the force of the air-currents will, when the vanes are released, swing the vanes around the bar, since the bar is not in the center of the vane and the vane does not balance on the bar.

Plates 33 are fixed to the end portions of the braces 23, and pins 34, having bent heads, are horizontally positioned in said braces and project above and parallel with said plates. Stops 35 formed of spirally-wound wire are mounted on the pins 34, and each stop is provided with an upwardly-projecting end portion 36 and a downwardly-extending weighted end portion 37, Fig. 4. A bevel gear-wheel 38 is mounted rigidly on the lower portion of the shaft 17. A counter-shaft 39 is mounted for rotation in standards 40 41 fixed to and rising from base 10, and a bevel gear-wheel 42 is feathered to the inner end of said counter-shaft and meshes at times with the wheel 38. A hub 43 on the gear-wheel 42 is provided with an annular groove 44, and a bell-crank lever 45 fulcrumed on the standard 40 has a bifurcated end portion 46 engaging in said groove. A segmental rack 47 is fixed to the standard 40, and pawl-and-lever mechanism 48, of common form, mounted on the lever 45, engages said rack. A crank-wheel 49 having a wrist-pin 50 is mounted on the outer end portion of the counter-shaft 39, to which

attachment of driven machinery may be made.

A governor is provided and portions thereof are shown in detail in Figs. 3 and 5, which governor is constructed as follows: A lever 51, having a notch 52 in the lower edge of the outer arm thereof, is fulcrumed in one of the pairs of arms 19 by means of a pin transversely seated in said arms, and the outer end portion 53 of said lever projects below the lower face of said arms at times, Fig. 1. A bell-crank lever 54 is fulcrumed on a pin 55 transversely seated in one of the pairs of arms 22 in vertical alignment with the lever 51, and a stud 56 on said lever 54 projects horizontally beyond the vertical arm thereof. A plurality of apertures 57 are formed in the horizontal arm of the lever 54, and a plurality of apertures 58 are formed in the inner arm of the lever 51, and a connecting-rod 59 is mounted adjustably in said apertures in a vertical plane, thus adjustably connecting the said levers. A weight 60 is fixed to and projects outwardly at an oblique angle from the vertical arm of the lever 54, which weight is formed of a rim of metal inclosing a space in approximately a vertical plane. A connecting-rod 61 is fixed at its upper end to the end of the horizontal arm of the lever 54 and extends downwardly therefrom. A series of links 62 connect the lower end of the rod 61 with a sleeve or collar 63, mounted for reciprocation on the shaft 17 directly above the gear-wheel 38.

A complement of levers 51 54, rods 59 61, and links 62 is provided for each pair of arms in the wind-wheel. An annular groove is formed in the sleeve 63, and a strap 65 is mounted in said groove. A hand-lever 66 is fulcrumed on the base 10 and a rod 67 connects said lever with the strap 65. A segmental rack 68 is fixed to the base 10, and pawl-and-lever mechanism 69 on the lever 66 engages said rack.

In practical use the parts are adjusted as shown in Figs. 1 and 2, and the air-currents engage the vanes, as indicated by arrows, and revolve the wind-wheel. The vanes are respectively held by levers 51 54 in planes in alignment with the pairs of arms when the air-currents engage said vanes, and when the vanes are moving against the air-currents they automatically swing into a plane at right angles to the arms and engage the stops 35. When the speed of the wind-wheel approximates to a dangerous degree, the centrifugal force generated thereby impels the weights 60 outwardly and upwardly, thus oscillating the levers 54 51 out of engagement with the vanes and releasing said vanes to rotate out of the wind and present their edges to the air-currents. Upon the resulting slackening of the speed of the wind-wheel the weights 60 descend by gravity and reposition the levers 54 51 to engage the vanes, and said vanes swing around and over the stops 35 into operative positions, the stops moving revolubly against the gravity force of the weighted end portions 37 to permit the passage of the vanes and repositioning automatically. To throw the wind-wheel out of operative position the levers 51 54 are oscillated by manual actuation of the lever 66 to depress the sleeve 63 and are retained in such position by engagement of the pawl mechanism 69 with the rack 68. The driven mechanism is disconnected from the wind-engine by moving the gear-wheel 42 along the shaft 39 out of engagement of the gear-wheel 38, which movement of the gear-wheel 42 is effected by manual actuation of the lever 45.

I claim as my invention—

A wind-engine comprising a support, a shaft vertically positioned for rotation in said support, heads fixed to said shaft, in parallel horizontal planes, rods 24, 25, 26, 27, vertically positioned and connecting said heads, vanes mounted on said rods, for rotation, and extending unequal distances therefrom, bell-crank levers 51, mounted in the upper head in the paths of rotation of the vanes weighted bell-crank levers 54 mounted in the lower head in the paths of rotation of the vanes, rods 59 connecting said levers in pairs, rods 61 depending from the levers 54, a collar 63 mounted on the said vertical shaft, flexible connections between the collar and rods 61 and a manually-operated lever 66 connected to the collar whereby the vanes may be manually controlled, the weighted bell-crank levers automatically governing the vanes by centrifugal force, as set forth.

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