3 Sheets—Sheet 1.

247x

B. DEARBORN.

WINDMILL.

Patented Apr. 30, 1799.

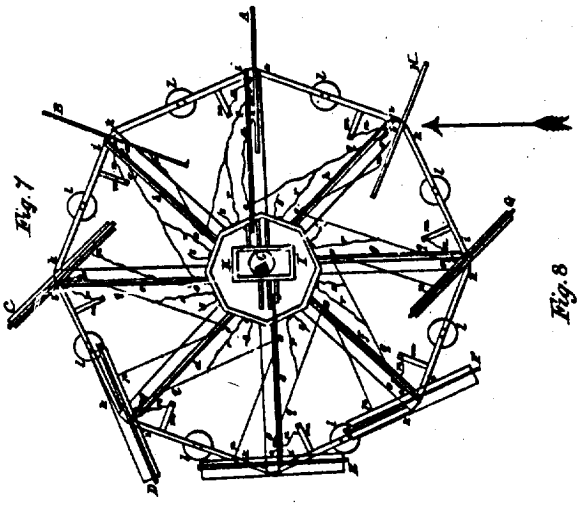


Fig. 1

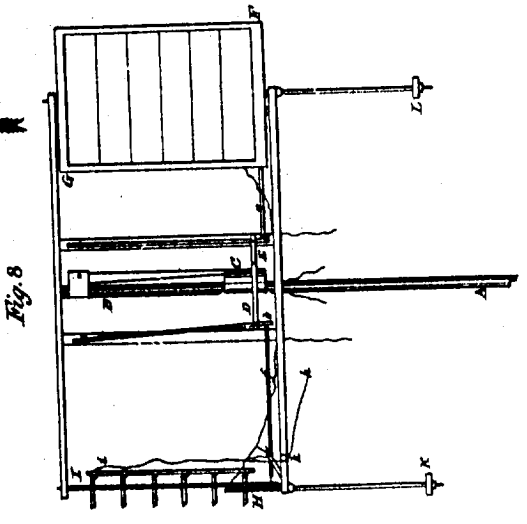


Fig. 8

Fig. 3

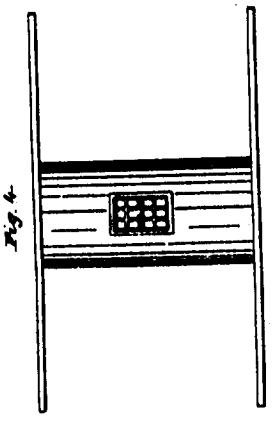


Fig. 4

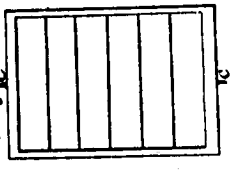


Fig. 5

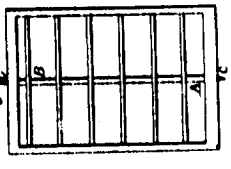


Fig. 6

Fig. 2

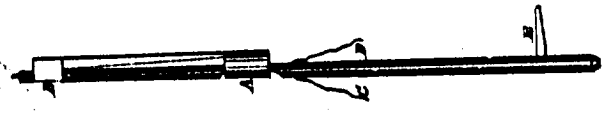


Fig. 7

247y

3 Sheets—Sheet 2.

B. DEARBORN.

WINDMILL.

Patented Apr. 30, 1799.

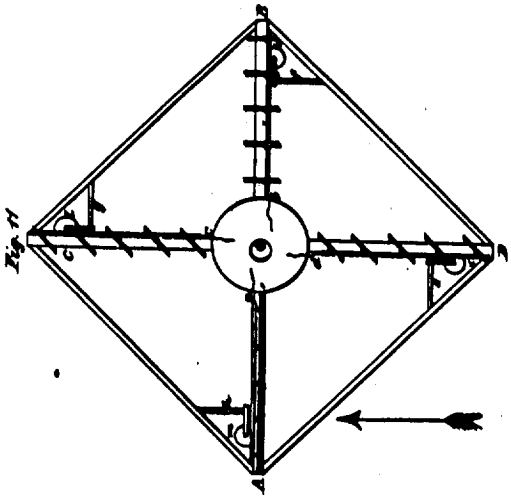


Fig. 11

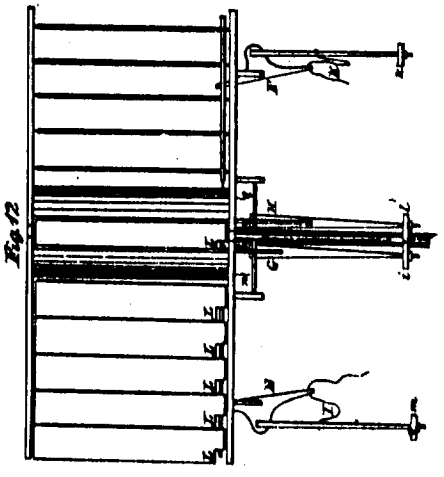


Fig. 12

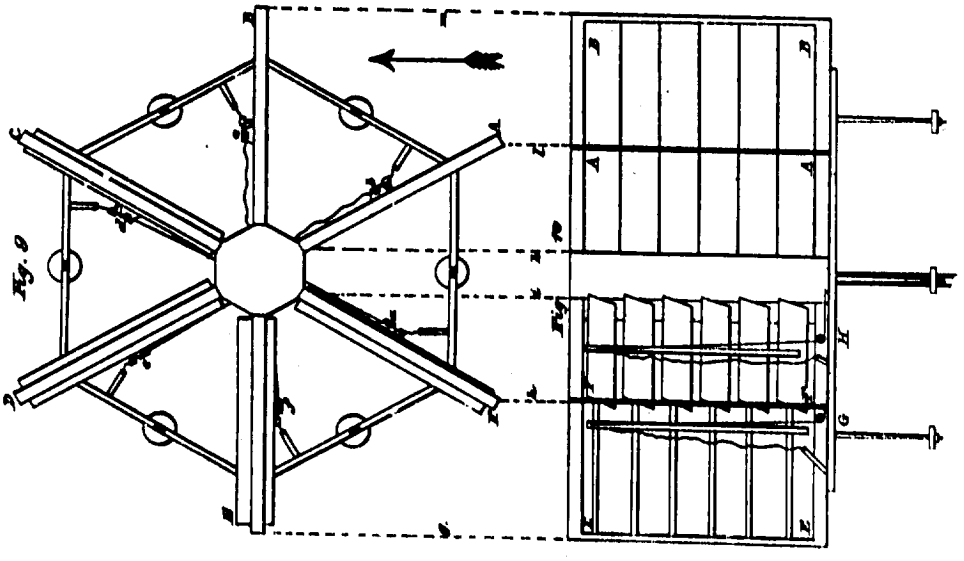


Fig. 9

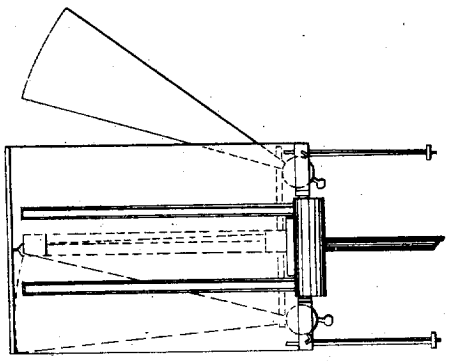
247X

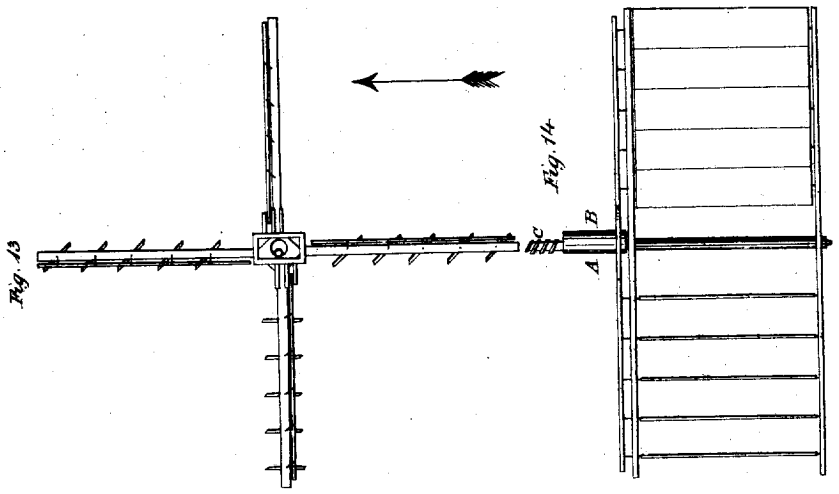
3 Sheets—Sheet 3.

B. DEARBORN.

WINDMILL.

Patented Apr. 30, 1799.





Benjamin Dearborn, Massachusetts 4/30/1799

Letters Patent Dated April 30. 1799.

The Schedule referred to in these Letters Patent and making part of the same containing a description in the words of the said Benjamin Dearborn himself of his improvement being a double central Mill for wind or water, with centrifugal regulators for adjusting the velocity of the Mill in strong winds.

The double central Mill has a horizontal motion round a perpendicular shaft or axis, and around an eccentric circle ~~...~~ facing or the axis of a sector nearly encompassing the shaft. The eccentric circle is so constructed as to be drawn over upon one side of the shaft until its periphery coincides or nearly coincides with the centre of the shaft while the mill is in motion. When the mill is to be stopped the eccentric circle is drawn back until its centre coincides as nearly as possible with the centre of the shaft. This circle is then constructed for common purposes without turning round on the shaft, and to turn it to that side which the wind requires. The shaft is made to turn upon its centre by means of a lever fixed in the lower part so that when the shaft is turned the eccentric circle is turned with it. This lever may be put in on any side of the shaft, but that side is the best which requires the lever to be turned directly towards that quarter from which the wind blows. If the shaft should turn so easy as to be moved by the friction of the mill in its circular motion it may be prevented by tapering the lower extremity to the form of the frustum of a cone inverted and setting it into a circular cavity fitted to its shape, whereby it may rest against the sides of the cavity without touching the bottom, or the lever may be made to be fixed by a pin in any part of its revolution or it may fall into notches like the tiller of some small vessels used in fishing &c. or a wheel with cogs may run round the shaft with a lantern or trundle head to turn it. The eccentric circle is moved by two cords or wires which pass through the shaft and down on opposite sides of it into the lower part of the mill. This circle may be made to slide on pieces fixed horizontally on the shaft, or it may swing at the end of a bar the other end turning on a hinge or pins as in the model and the circle may be placed at the upper or lower end of the bar. But for common purposes

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it is most convenient at the [illegible]. Upon the construction above described, the excentric circle answers all the the ends of its invention in a mill for common purposes erected on land or in a boat: but for special purposes as when a mill is required to be in motion at all times when the wind blows &c the excentric circle must be so constructed as to be turned by a fane or weathercock. This may be done by affixing the circle to one side of the shaft and confining the fane to the shaft in such a manner as that the shaft will be turned by the wind. But a better method of constructing it is to make the excentric circle turn with a [illegible] a [illegible] in the centre of the top of the shaft: and connected with one side of the [illegible] upright of the excentric circle, which side must rise above the shaft and down, and on the top of this rising part the fane must be so fixed that when turned to the leeward or directly from the wind: the excentric circle may give that position to the wings which will give the greatest power to the mill. For a water mill in a stream constantly running one course, the excentric circle must be moveable on one side of the shaft in the manner first above mentioned but need not turn. If the stream runs both ways as in tide mills the excentric circle must be made to turn by hand occasionally or to turn by the tide as in the above description it turns by the fane. A mill constructed with a fane in the manner above described will at all times be in a proper position for the wind or water when their power is sufficient to give it motion, and during the continuance of the power will be constantly at work without attendants for raising water or any other purpose to which it may be applied. The excentric circle above described may be applied in various ways to the purpose of increasing a power on one side of a wheel and reducing it on the other. for example the wings of a wind mill or ladle boards of a water mill: may be turned on a horizontal axis, or they may be thrown out on one side and drawn in on the opposite, or they may be raised on one side and depressed on the opposite with other variations by this invention. But in whatever manner the excentric circle may be applied to mill-work, the author of this description considers the right of the invention as vested in him. as it has never heretofore to his knowledge been applied to mill-works and he verily believes himself to be the original inventor of this power in such application of its uses. and further he [illegible] that if it is the will of the great Author of motion to indulge his

[illegible] with the economy and benefits of that which is denominated perpetual motion. that the eccentric circle will be the mean which shall lead to the long sought but hitherto unattained desideratum. The use of the eccentric circle as it is applied in the model is to give the wings of the mill a circular motion of ninety degrees. whereby they are turned with their broad surfaces to the wind on that side of the wheel which receives the power. and with their edges to the wind on the opposite side of the wheel. thereby making on that side the least possible resistance while those between take an oblique direction to increase the power of the wheel, all the wings taking in rotation the positions above described. Of the circulating frames. Around the eccentric circle are placed circulating frames their number being equal to one half the number of wings in a wind mill or float boards in a water mill. These frames are so constructed as to leave in the centre a space in the form of a parallel square. The breadth of this space is very little more than the diameter of the eccentric circle. its length is nearly twice its breadth. These frames are suspended by pendant pieces, two to each frame, in such a manner that the frames swing from side to side of the dome without touching each other. their motion being produced by their turning round the eccentric circle is communicated to the wings or float boards by means of straight pieces which may be called leaders: these are united at one end to the frame or to the pendant pieces which support the frames and at the other to the wing or float board. Each frame has two of those leaders attached to it thereby giving the proper position to two opposite wings or float boards in all parts of their revolution and in magnitude. The wings or floats may be more numerous each circulating frame turning four six eight or more wings or floats. The circulating frames are prevented from receiving a circular motion by a oblong slot in the opposite extremities which slide on a pin or post fixed in the dome. Of the Dome and Arms. The dome is made of any required length with just sufficient breadth for the circulating frames and their motion. It may be made square or in the form of a cylinder, the shaft passing through its centre. From one end of this dome are extended any number of arms which may be found convenient or useful, in the model they are eight. From the other end of the dome are equal number of arms are extended parallel to

the others and in the same direction. These arms may be of any required length each piece containing one or more wings or float Boards, or the wings may rest in circular or multangular frames affixed to the arms. Under the bottom of the Drum a cog wheel is to be fixed for giving motion to the machinery of the mill below when the work is to be done which the mill is designed to perform. Of the Wings. The wings of a double centred mill designed for the wind consist of a frame in the form of a square or parallelogram, enclosing a number of leaves sufficient to fill or nearly fill the frame; the frame with its leaves somewhat resembling a Venetian blind. Each leaf turns on two pivots resting on the sides of the frame, forming an axis. This axis is a little above the centre of gravity in the leaves. the lower part of the leaves being a little heavier than the upper. The edges of the leaves are made sloping, the bottom of each leaf shutting against the top of the next below in such a manner as that when all are shut their front or that side which is designed to face the wind forms one plane surface. The leaves are shut by their own weight and opened by lines communicating with the centrifugal regulators hereafter described, and also by lines communicating with the braces. they are also opened by the wind or by any power applied on the back of them. Each leaf has a pin on the back by which it is opened. in the model these pieces are wire and being all arranged in a line communicate with a perpendicular piece of wood which opens all the leaves together when drawn downward. Instead of making the leaves of a mill in magnitude nearly from side to side of the frame as in the model it may be best to have the frame of the wings made with a perpendicular piece in its centre and the leaves of each wing in two sets one on each side of the centre piece. These two sets of leaves may be opened by one piece communicating with both or with two pieces as the constructor chooses. or a perpendicular piece may be put in or near the centre of the frame, and the leaves still be made as long as the breadth of the frame. The leaves above described may be made solid of thin boards with ledges to prevent their warping. or with frames covered with cloth or any other light durable material. or even with thin sheet iron or other metal. The float Boards of a water mill may be

with wood or metal bars as above described: it may be made with or without [redacted] bars if the resistance produced thereby be not too great. The resistance being in a great measure destroyed by the opening of the bars when power is applied on the back of them — Of the Centrifugal Regulator.

The centrifugal regulators are weights suspended from the mill. Each being exposed at or near the end, is movable or hung upon a pivot in such a manner as to swing freely from the centre in the manner of a pendulum. They are thrown outward from the centre by the centrifugal power produced by the rotatory motion of the mill, this power increasing according to the velocity of the mill. A communication is made from the regulator to the pieces which open the bars by a cord, wire, chain or other means which shall answer the purpose designed. When the centrifugal power throws out the regulators to a certain degree they open the bars and the wind passes through them. The degree of velocity at which the bars shall thus open is determined by the length of the cord or chain which opens them, and this is lengthened or shortened by the workman at the mill as he shall find occasion, and when once properly adjusted will rarely require altering. The number of regulators may be equal to the number of wings, or one regulator may be made to open two or more wings. The regulators may also be made by an application of the centrifugal power in various ways, as by means of balls confined in long cavities, or by fluids &c in tubes, but weights are most simple and most easily applied. This power may also be applied to either side of the wing, but it is most convenient on the back. The author of this description knows of no instance in which the centrifugal power has heretofore been applied to any purpose except the amusement of the curious in philosophical experiments. If in its application to the wings of a windmill it should be found by future experience in magnitude to answer the purpose here described & claimed, as far as a miniature model is decisive it must undoubtedly be considered a discovery important to the arts: for if a mill receiving its power from the irregular winds of our atmosphere can be self-regulated by the centrifugal power so as to produce a tolerable equality in its motions during all seasons, when the wind is sufficient

247 than the unremitted exertion of the circulars have produced an effect remarkably beneficial to mankind. It is but just therefore if the aforesaid power has never before been applied to mill work, that the inventor who first appropriates this hitherto useless power to so important a purpose, should be secured in an exclusive right to the benefits arising from the application of that power in all the various manners in which it may be applied to the purpose of regulating the motion of wind mills whether they be erected on land, for giving motion to the works there or on the water in Boats &c. for the purposes of moving those Boats, of loading and discharging merchandizes, and numerous other useful purposes, to which such mills may be applied if those in magnitude shall be found to possess the properties of the miniature model in which case this mill will be capable of being applied to any kind of work, in which a mill can be successfully used. Some parts of the above described mill are designed for convenience only, and not being necessary to its motion may be omitted if the constructor chooses. for example, the dome is designed only to secure the internal machinery from storms & may be omitted entirely, or may be added at any time subsequent to the building of the mill. The cords which communicate with the leaders and open the leaves may be omitted, as they are only designed to reduce the resistance of the back wings. The wings may be made solid without leaves, the wheel turning on a horizontal axis, and this may be the form when this invention is applied to the construction of smoke jacks - to which the principles are equally applicable as to any other purpose. The eccentric circle may be immoveably fixed to the shaft. The centrifugal regulators become unnecessary and must be omitted when the power is uniform as a current of water or the draught or current of air in a chimney &c. The double centred mill is therefore subject to many variations in construction suitable to the various purposes to which it may be applied, the original principles still remaining the same.

The drawings accompanying this description are not laid down by any scale of measurement, because the forms sizes and proportions of the whole and its parts may be indefinitely varied. In all constructions

247 of this mill whether for water upon air, or the air or smoke of a chimney the arms may be fixed on the shaft and the shaft may turn with them having the eccentric circle outside of the arms. and the shaft turning in the circle with a cog wheel or other means fastened to the shaft for doing the required work.

Exd.
MC

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3000 words (Spacing cannot be made as there are no signatures)