3 Sheets—Sheet 1.

247 x

B. DEARBORN.

WINDMILL.

Patented Apr. 30, 1799.

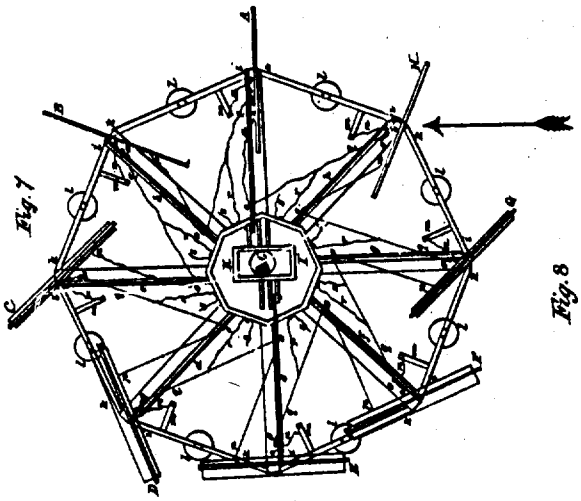


Fig. 1

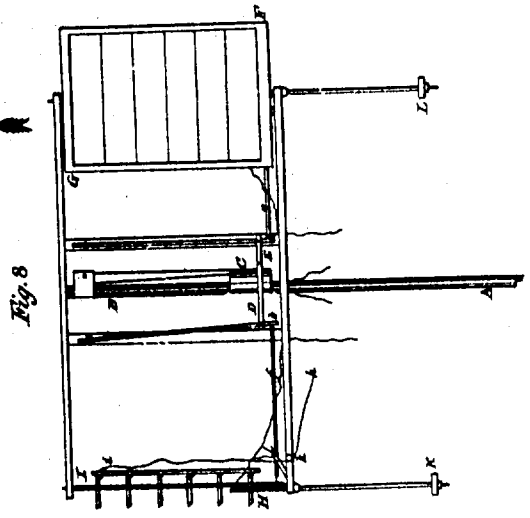


Fig. 8



Fig. 3

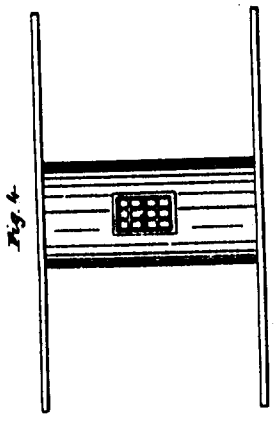


Fig. 4

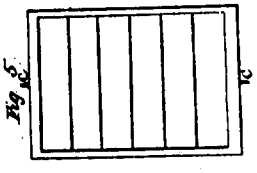


Fig. 5

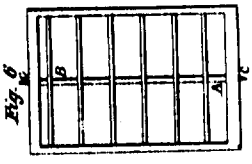


Fig. 6

Fig. 2

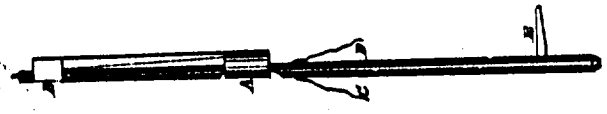


Fig. 7

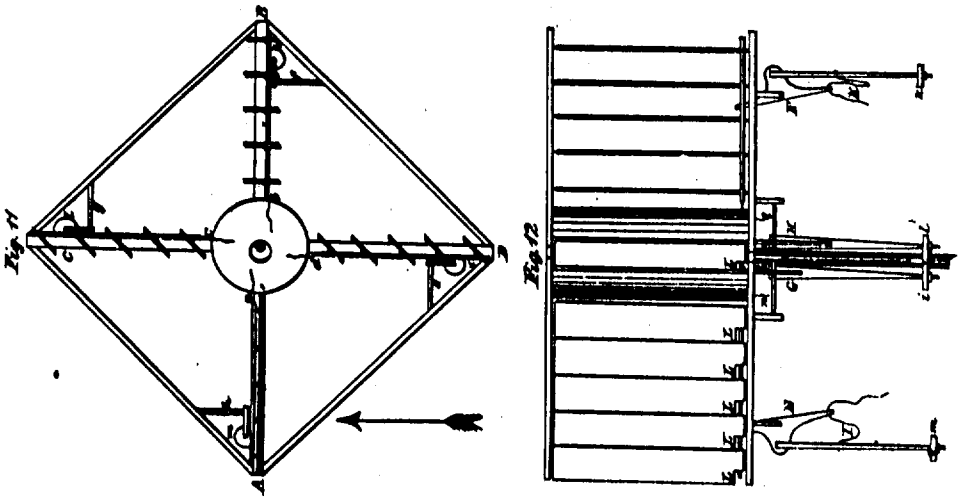
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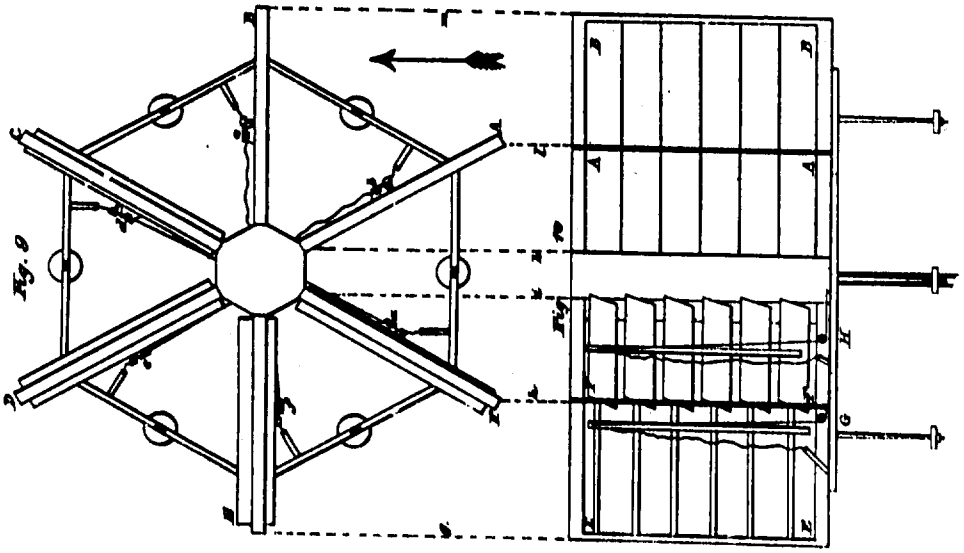
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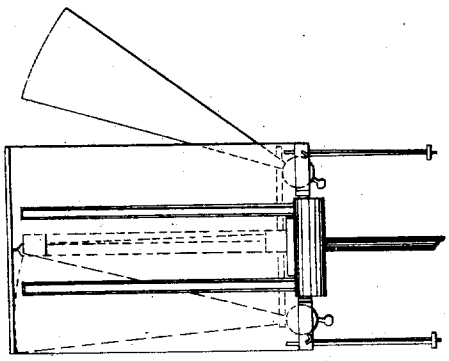
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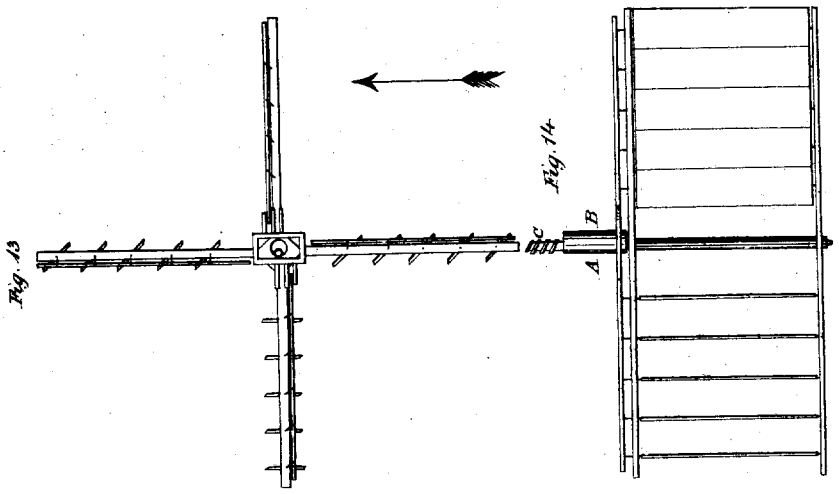
3 Sheets—Sheet 3.

B. DEARBORN.

WINDMILL.

Patented Apr. 30, 1799.





THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

Benjamin Dearborn of Hopkinton County 4/30/1799

Letters Patent Dated April 30. 1799.

The Schedule referred to in these Letters Patent and making part of the Specification is a description in the words of the said Benjamin Dearborn of his improvement being a double acting Bellows for wind or water with certain improvements for adjusting the velocity of the Wind in blowing vessels

The double acting Bellows is composed of two conical pieces of wood, or other suitable materials connected at their smaller ends by a tube, and formed on a common axis passing through the centre of the tube, and forming the shaft. The connecting tube is so constructed as to be drawn close upon one end of the shaft until it comes in contact with the circular ends of the cones, and to the other end of the shaft until the cones is in contact. When the wind is to be discharged the connecting tube is drawn back until it comes in contact with the circular ends of the cones which are nearly as large as the circles of the shaft. The tube is then constructed so as to admit air into the cones without passing over the shaft, and to turn it to that side which the wind is to pass. The shaft is made to turn upon its centre by means of a lever fixed in the connecting tube so that when the shaft is turned the connecting tube is turned with it. This lever may be put in on any side of the shaft but that side is the best which exposes the lever to be turned directly towards the person from which the wind flows. If the shaft should turn so easily as to be moved by the friction of the air in the connecting tube it may be prevented by passing a screw transversely to the length of the shaft through the connecting tube, and by screwing it into a circular cavity fitted to the shaft. Thereby it may not separate the sides of the cavity without touching the shaft or the screw may be made to be pressed by a spring in any part of its revolution or it may fall into notches in the shaft of the connecting tube and by touching the shaft it may be stopped or turned to any desired point. The connecting tube is moved by two cords or wires which pass through the shaft and down on opposite sides into the lower part of the bellows. This tube may be made to slide on pieces fixed transversely on the shaft, or it may move on the shaft of the bellows and turning on centres fixed in the tube and the cords may be fastened to the shaft or lever on the shaft but for common purposes

15 247X

it is most convenient at the present time from the combinations above described. this eccentric circle answers all the purposes of its invention in a mill for common purposes either 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 the eccentric 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 accomplishing it is to make the eccentric circle turn with a small fane in the midst of the top of the shaft. and connected with one side of the perpendicular of the eccentric circle. which side must be above the shaft and beam. and on the top of this wing first the fane must be so fixed that when it may be forward or directly from the wind the eccentric 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 eccentric 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 eccentric 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 eccentric 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 mill or paddle boards of a water mill may be turned on an 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 eccentric 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 been before to his knowledge been applied to mill-work. and he truly believes himself to be the original inventor of this power in such application of it may. and further he believes that if it is the will of the great Author of motion to indulge him

with the discovery and benefit of that which is recommended herein.
And the machine made use of in the room which I made used to the purpose
but hitherto mentioned and described. The use of the machine made as it
is applied in the model is to give the wings of the mill a circular motion of
ninety degrees. whereby they are brought 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 there between take an oblique direction to in-
crease the power of the wheel. all the wings taking in rotation the position
above mentioned. Of the directing frames. Around the machine there
are placed directing 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 circle a space in the form of a parallel
square. The breadth of this space is very little more than the diameter of the
circular rods. its length is nearly three times its breadth. These frames are
connected by pendant pieces or rods to each frame in such a manner that
the frames decline from side to side of the frame without touching each other.
This motion being produced by their turning round the circular axis of
communication to the wings or float boards by means of elbowed 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 these 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 numer-
ous each directing frame turning four six eight or more wings or floats.
The directing frames are prevented from turning in circular motion by a notched
slit in the opposite extremities which slide on a pin or float pierced in the frame.
Of the Quantity of Wing. The frame is made of any required length with just
sufficient breadth for the directing frames and their motion. It may be made
deeper or wider for the frame of the leaders. the object passing through the centre.
From the ends of the frames are extended any number of rods which may
be fixed together or separate in the middle they may be eight. From the
other ends of the frame are extended a number of rods not exceeding twelve

The others must be the same thickness. Then more may be of any required length each piece containing one or more rings or flood Boards, as the rings may be in number as mathematical frames opposed to the mean. Under the bottom of the Frame a cap sheet is to be fixed for giving motion to the machinery of the mast below when the work is to be done which the mill is designed to Perform. Of the rings. The rings of a double conical mill designed for the usual manner of a frame in the form of a square or parallelogram, containing a number of bars sufficient to fill or nearly fill the frame; the frame with its bars somewhat resembling a wooden blind. Each ring bears on two pieces resting on the sides of the frame, forming an axis. The axis is a little above the centre of the gravity in the bars. The lower part of the bars being a little heavier than the upper. The edges of the bars 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 the bevel or that side which is designed to face the vessel forms one plane surface. The bars are shut by their own weight, and opened by being communicating with the endless upright wire hereafter described, and also by bars communicating with the leaves. They are also opened by the wind or by any power applied on the side of them. Each leaf has a piece on the back by which it is opened. In the model these pieces are represented being all connected on a bar communicating with a perpendicular wire of steel which opens all the bars together when drawn upwards. Method of making the leaves, may include from side to side of the frame as in the model. It may be best to have the frame of the rings made with a perpendicular section and the bars of each ring on one side on each side of the centre piece. These two sets of bars may be opened by one piece communicating with both or with two pieces as the combination shews. or, perpendicular pieces may be put in or near the centre of the frame and the bars will be made as long as the breadth of the frame. The bars above described may be made wholly of wood boards with edges 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 flood Boards of a water mill may be

Fig. 1 and 2 are two sketches of the Governor, or may be used with either of the Governors mentioned hereby to be used for each. The Governor being in a great measure changed by the discovery of the Power, which is applied to the Governor — of the Centrifugal Regulator.

The Centrifugal regulator is applied to the mill — each having upward of as many. The Governor is intended for regulating a power in such a manner as to throw freely from the velocity of the Machinery, they are thrown outward from the centre by the centrifugal power produced by the rotatory motion of the mill. This power increases according to the velocity of the mill. A communication is made from the regulator to the sluice, by a rod or line, by a cord or chain or other means which shall increase the Aperture sluice and the regulator to a certain degree they open the sluice and the water flows through them. The degree of velocity at which the Governor shall open is determined by the length of the cord or chain which shall be lengthened or shortened by the application of the mill as the velocity shall increase. And when any property applied 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 regulator may also be made by the application of the centrifugal power in various ways, as by means of balls confined in long curves, or by fluids &c. in tubes. But weights are most simple and materially 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 movement of the curious. in philosophical experiments. of which application to the wings of a windmill it should be found by further experience in magnitude to answer the purpose here described & intended. As for a miniature model is desirous it must undoubtedly be accidental & discovery important to the arts: for if a mill wanting the power from the irregular windy of ever changing there can be self regulated by the centrifugal power so as to procure a tolerable equality in its motion during all seasons. when the wind is sufficient

From the numerous combinations of the inventor 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 to whom such application is due should receive to it an exclusive right to the benefit 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 for giving motion to the mills there or on the water or Boats &c. for the purposes of raising them Boats, of loading and discharging vessels, 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 ornament only, and not being necessary to the motion may be omitted if the construction chooses, for example, the dome is designed only to secure the internal machinery from storms & may be omitted entirely. It may be added at any time subsequent to the building of the mill. The ends which communicate with the leaders and from 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 immovably fixed to the shaft. The centrifugal regulators become unnecessary and must be omitted when the power is uniform as a current of water &c. The draught in the vent of fire 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. Small variations

24. [illegible] whether for make of spun yarn, or the use or manufacture of chimney. Hoisting rope of hemp and the shaft may be made with Manchester. Hoisting machine made of the same, and the shaft turning in the side with cog wheels attached to the shaft for doing the required work.

Ans.
Yes

[illegible]

[illegible] signature)