

E. M. AMY.  
WINDMILL.  
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998,446.

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Fig. 3.

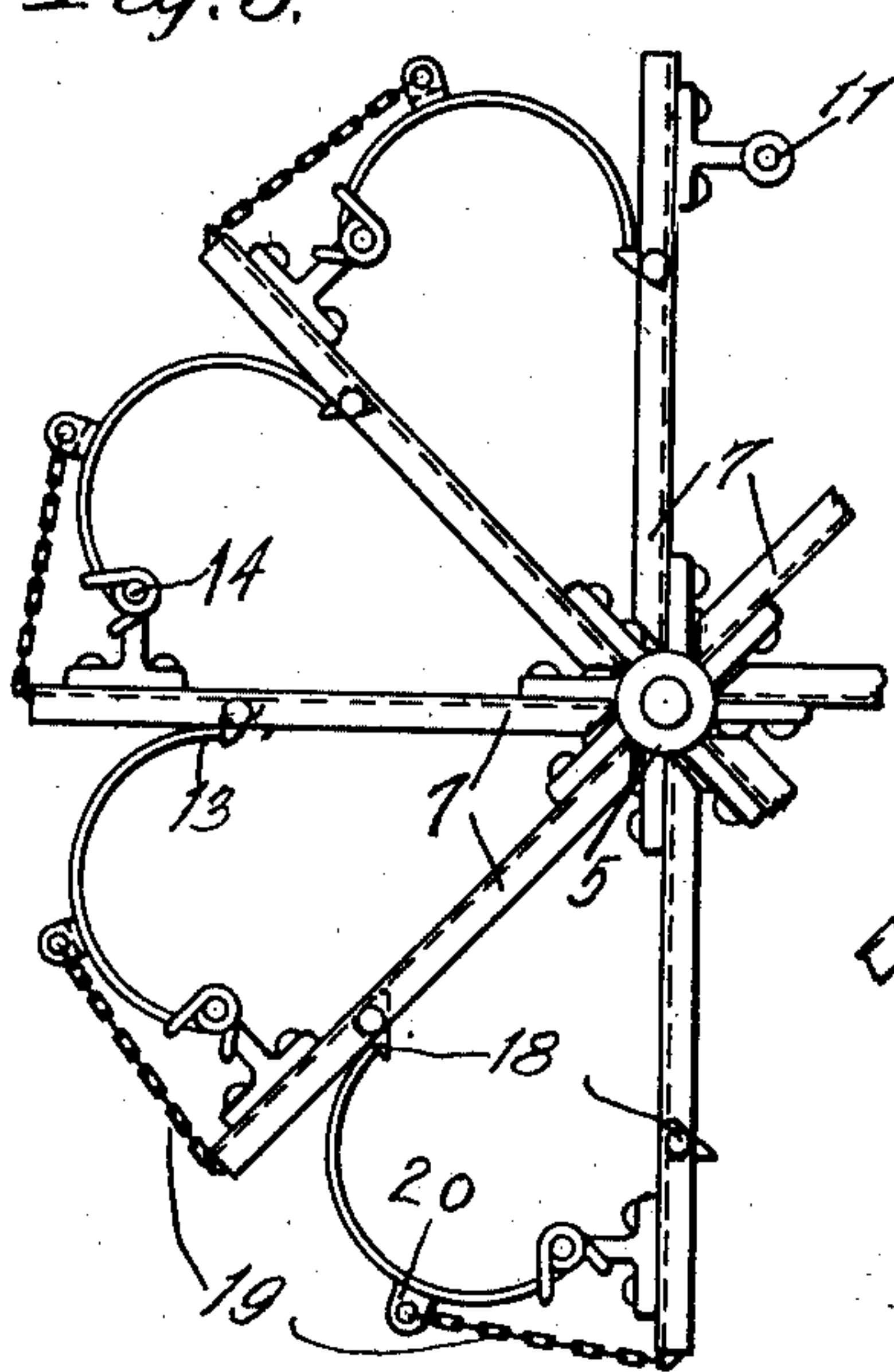


Fig. 2.

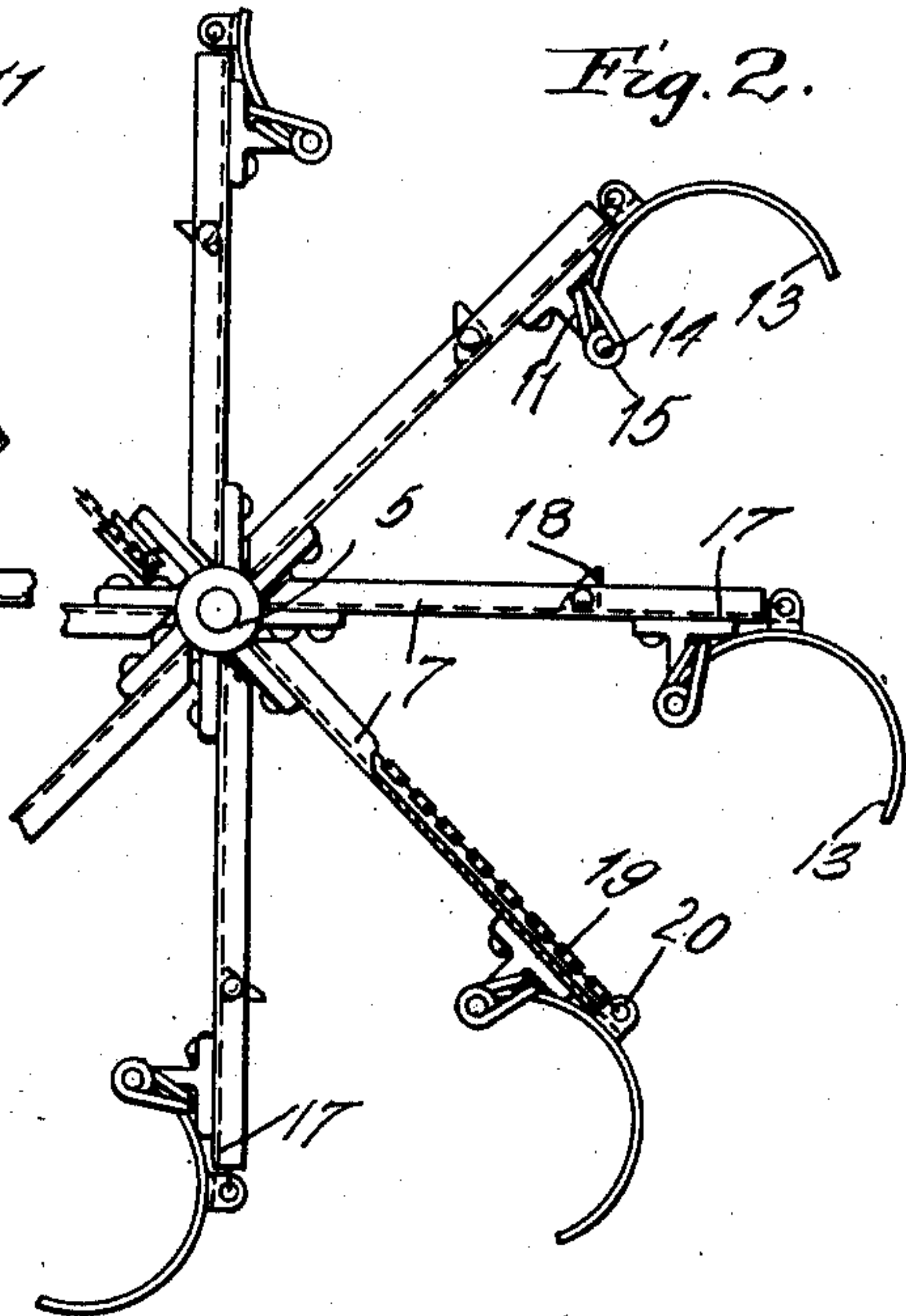
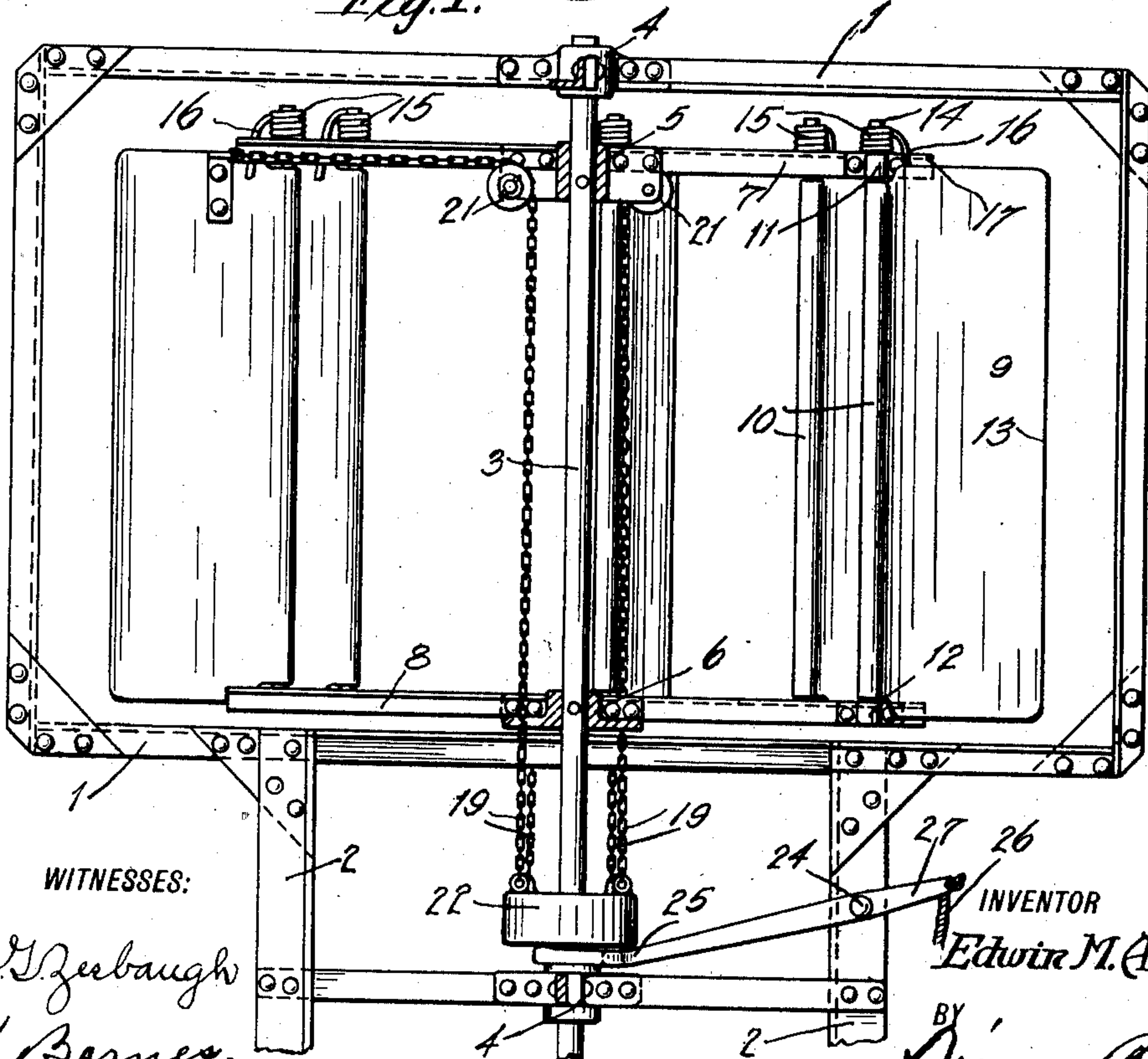


Fig. 1.



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# UNITED STATES PATENT OFFICE.

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## WINDMILL.

998,446.

Specification of Letters Patent. Patented July 18, 1911.

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*To all whom it may concern:*

Be it known that I, EDWIN M. AMY, a citizen of the United States, residing at Seattle, in the county of King and State of Washington, have invented certain new and useful Improvements in Windmills, of which the following is a specification.

This invention relates to improvements in wind-mills.

10 The object of my improvements is to provide a wind-mill which will be actuated by the wind when blowing in any direction without the necessity of using a tail vane or other contrivances usually employed.

15 The invention works equally well with the wind blowing in any direction and light, variable, or fluctuating winds are utilized with a maximum of efficiency.

A further object of the invention is to provide a simple and comparatively inexpensively constructed wind-mill provided with means to throw it out of operation when desired as when the force of wind increases to a velocity that would endanger the stability of the structure.

20 With these and other objects in view, the invention consists in the novel construction, combination and adaptation of parts, as hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the claims hereto appended, it being understood that various changes in form, proportion, size and minor details of construction within the scope of the claims may be resorted to without departing from the spirit of or sacrificing any of the advantages of the invention.

30 In the drawings, Figure 1 is a view of devices embodying my invention shown partly in side elevation and partly in vertical section. Fig. 2 is a fragmentary plan view of the vane-supporting cross arms with the vanes and attached mechanism in open condition. Fig. 3 is a like view with the vanes closed.

45 The reference numeral 1 designates a suitable tower structure provided with supporting legs 2.

3 is a vertical shaft supported in bearings 4 axially of the tower. Fixedly mounted for rotation with said shaft are spaced upper and lower hub-members 5 and 6, respectively, to each of which are secured an equal number of radially disposed angle-bars 7 and 8 respectively arranged symmetrically one above the other.

9 are wind-vanes, concavo-convex in cross section, which are each provided along one of their longitudinal edges with a post 10 projecting at both ends beyond the vane to form a pivotal connection in bearings 11 and 12 in the upper and lower of the bars 7 and 8, respectively. Said bearings are positioned in proximity of the outer extremities 17 of said bars and the respective vanes are arranged to extend outwardly from said pivots when in open operative condition and have their convex surfaces contact with the extremities of the bars to limit the advance movement thereof. The upper pivot 14 is desirably projected upwardly beyond said bearing 11 to receive a coil spring 15 having an extremity 16 thereof extended downwardly in engagement with the convex side of the respective vane and tending to urge the latter rearwardly, that is to say, into the position in which they are shown in Fig. 3, wherein the vanes are folded inwardly and their outer lateral edge 13 is engaged by a stop 18 secured on the rearward proximate bar. Said stops are positioned upon said bars inwardly of the pivotal connections upon the same bar that in said closed condition of the wheel the vanes in advance will be shielded from wind catching on their under side by the further radially projecting pivotal edges of the next rearward vanes.

19 are flexible connections which are secured to each vane, as by an apertured lug 20 on the convex side thereof, and are extended radially along the channels of the upper bars 7 to the inner end of the respective bar thence over anti-friction rollers 21 downwardly to connection with a suspended annular weight 22 which may desirably encircle said shaft 3. Said weight through its connection 19 has sufficient gravity to retain the vanes in their outermost extended positions in opposition to the several springs 15 and in the operation of wind-mill performs that function. When it is desired to throw the machine out of operation, the said weight is elevated through suitable mechanical devices, as by a lever pivoted at 24 to one of the tower supports. One end 25 of said lever is arranged to engage the under side of said weight 22 whereby the latter may be raised and secured as by a rope 26 attached to the opposite end 27 of the lever and extending to within reach of a person standing on the ground level.



The manner of operation of my improved wind-mill, it is thought, will be evident from the foregoing description. It may be said, however, that in the revolutions of the wheel, the several vanes are held and secured in operative condition by the tension exerted thereon by the suspended weight 22 which will thereupon be about in the position indicated by dotted lines *a* in Fig. 1.

When it is desired to discontinue the operation of the wind-mill, the said weight is elevated and secured, as described, whereupon the springs 15 assert themselves and swing the vanes inwardly until interrupted by the stops 13 upon the rearwardly adjoining bar. In such condition, the lateral edges 17 of the vanes are positioned inwardly toward the axis of the wheel relative to its opposite pivotal edge 10 which deflect and break the force of the wind and thus guard said edge 17 against being blown outwardly when the same is directed against the wind. When it is desired to open said vanes to operate the wheel, said weight is released from its supported engagement with the lever arm 25 and again permitted to exert a pull through said flexible connections 19 upon the several vanes and overcome the opposition of the springs 15 and opens the vanes to lie in their extended positions, as best illustrated in Fig. 2.

The apparatus described is simple in construction, has few moving parts and is very efficient to perform the work for which intended.

What I claim as my invention and desire to secure by Letters-Patent, is—

1. A wind mill comprising the combination of a revolving shaft, two sets of spaced bars radiating from said shaft, concavo-con-

vex vanes pivotally secured upon one side thereof to said bars, spring devices upon each vane urging the latter to swing inwardly, and a weight operatively connected by a flexible connection to each of said vanes tending to open said vanes and capable of overcoming the power of said springs.

2. A wind-mill comprising the combination of a revolving shaft, two sets of spaced bars radiating from said shaft, concavo-convex vanes pivotally secured upon one side thereof to said bars, spring devices upon each vane urging the latter to swing inwardly, a stop upon each of the arms limiting the inward movement of the adjacent advance vanes, and a weight operatively connected by a flexible connection to each of said vanes tending to open said vanes and capable of overcoming the power of said springs.

3. A wind-mill comprising the combination of a revolving shaft, two sets of spaced bars radiating from said shaft, concavo-convex vanes pivotally secured upon one side thereof to said bars, spring devices upon each vane urging the latter to swing inwardly, a stop upon each of the arms limiting the inward movement of the adjacent advance vane, a weight operatively connected by a flexible connection to each of said vanes tending to open said vanes and capable of overcoming the power of said springs, and means to raise and maintain said weight from influencing said vanes and thereby permit said springs to bring said vanes to closed condition.

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Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."