(No Model.)

M. B. WILLIAMS.

WINDMILL.

No. 344,761. Patented June 29, 1886.

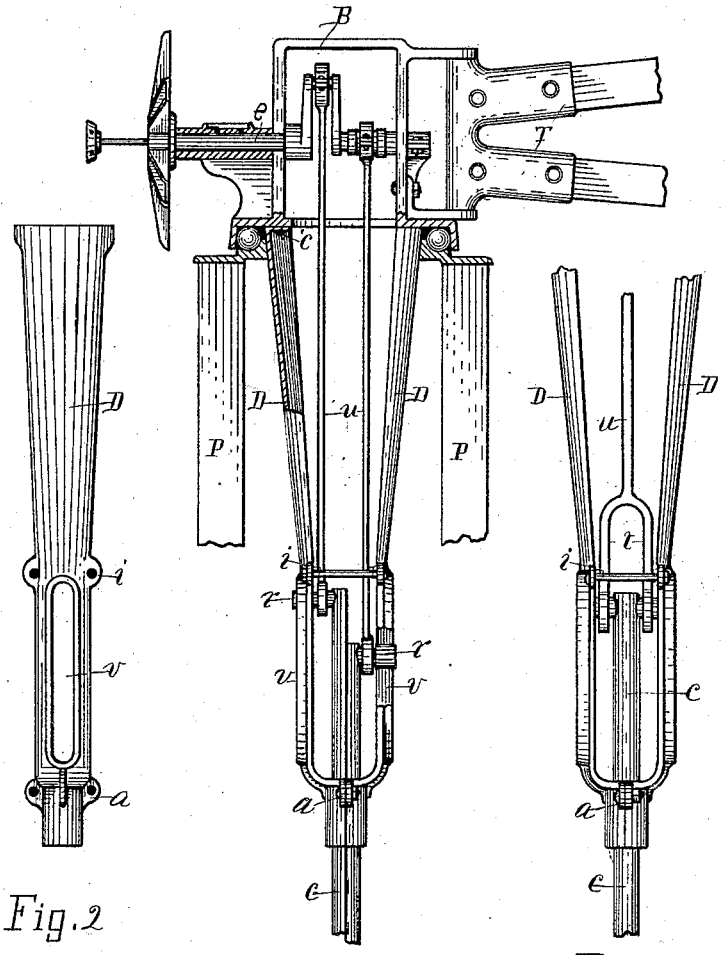

Fig. 1

Fig. 2

Fig. 3

Witnesses.
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UNITED STATES PATENT OFFICE.

MALCOLM B. WILLIAMS, OF KALAMAZOO, MICHIGAN.

WINDMILL.

SPECIFICATION forming part of Letters Patent No. 344,761, dated June 29, 1886.

Application filed August 29, 1885. Renewed April 29, 1886. Serial No. 200,757. (No model.)

To all whom it may concern:

Be it known that I, MALCOLM B. WILLIAMS, a citizen of the United States, residing at Kalamazoo, county of Kalamazoo, State of Michigan, have invented a new and useful Improvement in Windmills, of which the following is a specification.

This invention relates to the tubular pendent portion of the head of windmills; and it has for its object certain improvements hereinafter described and claimed.

In the drawings forming a part of this specification, Figure 1 is a vertical elevation of parts illustrating my invention, parts being in section showing features below described; Fig. 2, a detail of Fig. 1, looking from a point at either side of Fig. 1; and Fig. 3 shows the lower part of Fig. 1, with a change in certain parts.

Referring to the drawings and the letters marked thereon, B is the mill-head, having swivel or ball bearings in the top of the derrick P, in the common manner, to allow the wheel to shift from one point of the compass to another. The wheel or crank shaft is shown at *e* and the vane at T. Commonly-employed pitmen *u* connect the cranks of the wheel-shaft *e* with reciprocating rods *c*, said rods being within the tubular, or, rather, in this case, the skeleton, pendant of the head B.

Heretofore the pendant to the head has been integral with the head or the base of the head, or the turn-table in some cases, the same being equivalent to the head-base, thus necessitating great difficulty and expense in casting and causing inconvenience in adjusting the reciprocating rods and pitmen, the upper ends of said rods being too large to pass up through the tubular base of the pendant in which said rods have their bearing. It will be seen that I obviate these objections by casting the pendent in separate parts, D, and detachably connect their upper ends with the head, (see *c'*, Fig. 1,) and detachably bolt or secure their lower portions together, (see *a* in the different figures,) said lower portions being hollowed out or shaped to conform to the shape of the reciprocating rod or rods which have their bearings therein.

In the parts D are slots *v*, Fig. 2, in which the laterally-projecting studs *r* play during the reciprocating movement of the reciprocating rods *c*, said studs being connected with the reciprocating rods. By this means the upper ends of the reciprocating rods *c* have guide-bearings in the slots *v*, thus preventing the purchase which the pitmen, which are pivoted to said studs *r*, have from cramping the reciprocating rods out of their true vertical position during the rotation of the crank-shaft and the vertical play of the rods *c* and pitmen *u*. On each edge of the pendent parts D are bolt-holes *i*, Fig. 2, in which are placed adjusting-bolts, Figs. 1 and 3. By this means any untrueness of the parts D in their parallel relation to each other, or any twisting or warping of said parts D in casting, may be corrected by tightening or loosening either or both of the bolts at *i*, according to the desired effect, so that the slots *v* will always be vertically parallel and in true position in their relation to the parts playing therein.

In Fig. 3 only one pitman, *u*, and one reciprocating rod, *c*, is shown; but said rods have the lugs on opposite sides in the slots *v* in the same relation as in Fig. 1, and hence, so far as the construction of the pendent parts D are concerned, this is an equivalent use. Another advantage of having the lugs *r* play in the slots *v* is that it prevents any twisting and cramping of the pitmen on their crank and lug connections when the head and pendant turn during the shifting of the wheel from one point of the compass to another. Of course it is understood that to allow the wheel to thus shift the reciprocating rods are swiveled at some point in their construction, this well-known feature not being here shown, said rods *c* being here broken below the pendant. It will also be understood that the use of reciprocating rods in such constructions are to transmit motion to mechanism below.

Having thus described my invention, what I claim as new is—

1. A windmill-head provided with a pendent portion, made in separate parts, detachably connected together and detachably connected at the upper end with said head, substantially as forth.

2. A windmill-head provided with a pendent portion cast in two separate similar parts, detachably connected with the head and de-

tachably connected with each other at the base, said base being internally formed to provide suitable bearings for the reciprocating rod, substantially as set forth.

3. The combination of a mill-head, a reciprocating rod provided with side studs, pitmen pivotally connecting said studs, and a pendant formed in separate parts having slots in which said studs play, said parts being detachably connected with the mill-head and detachably connected with each other, substantiably as set forth.

4. The combination of the mill-head with a pendant made in separate parts, detachably connected together and detachably connected with the mill-head, and adjusting bolts connecting the edges of said pendent parts for the object stated, substantially as set forth.

5. The combination, with a mill-head and wheel-shaft, of a reciprocating rod, pitmen, and a pendant made in separate parts provided with slots in which the lugs of the upper end of the reciprocating rod play, said pendent parts detachably connected together and with the mill-head, and bolts connecting the edges of said parts for adjusting their position, substantially as set forth.

In testimony of the foregoing I have hereunto subscribed my name in presence of two witnesses.

MALCOLM B. WILLIAMS.

Witnesses:
FRANK P. JOHNSTON,
HALLECK J. ZINN.