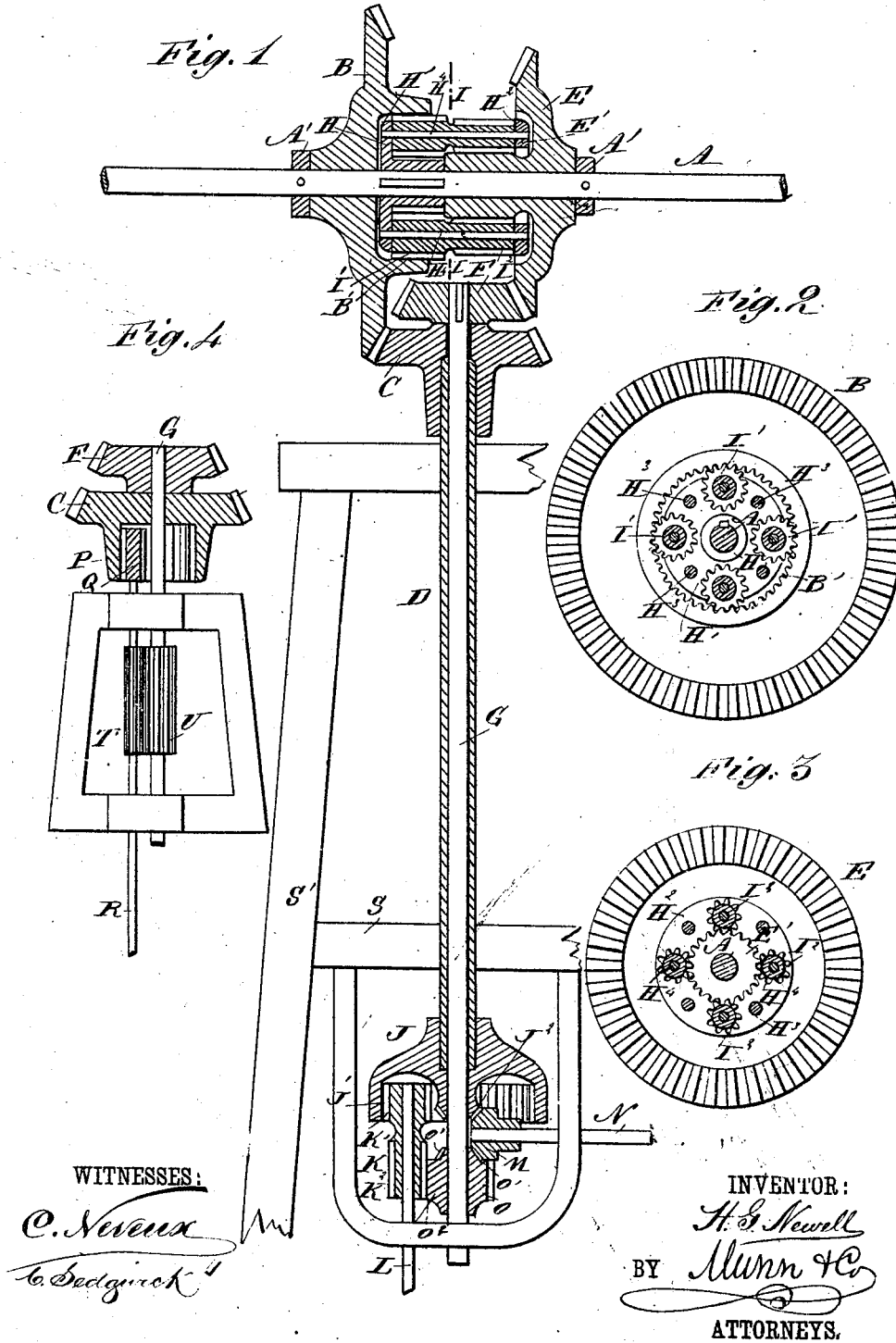


(No Model.)

H. G. NEWELL.
GEARING FOR WINDMILLS.

No. 346,674.

Patented Aug. 3, 1886.



UNITED STATES PATENT OFFICE.

HENRY G. NEWELL, OF ORWELL, PENNSYLVANIA.

GEARING FOR WINDMILLS.

SPECIFICATION forming part of Letters Patent No. 346,674, dated August 3, 1886.

Application filed February 26, 1886. Serial No. 193,344. (No model.)

To all whom it may concern:

Be it known that I, HENRY G. NEWELL, of Orwell, in the county of Bradford and State of Pennsylvania, have invented a new and Improved Gearing for Windmills, of which the following is a full, clear, and exact description.

The object of my invention is to provide a new and improved gearing for windmills, by means of which the full power of the windmill is transmitted to the work-shaft, and the wind-wheel is always kept in the direction of the wind, even when the windmill is burdened with heavy work.

The invention consists of trains of gear-wheels connected with the wind-wheel shaft and operating two shafts which impart motion to the transmitting shafts.

The invention also consists in various parts and details and combinations of the same, as will be fully described hereinafter, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional side elevation of a part of a windmill, showing my improvements. Figs. 2 and 3 are face views of sets of gear-wheels. Fig. 4 represents a modification.

On the wind-wheel shaft A is placed loosely the bevel gear-wheel B, which meshes into the bevel gear-wheel C, firmly attached to the vertical hollow shaft D. A bevel gear-wheel, E, on shaft A meshes into the bevel gear-wheel F, secured to the upper end of the vertical shaft G, which passes through the hollow shaft D. The bevel gear-wheels B and E are held in place on the shaft A by the collars A' A'.

Between the bevel gear-wheels B and E is placed, and is secured to the wind-wheel shaft A, a frame, H, provided with a disk, H', and a ring, H², which are connected by stays H³, and between which are placed the one or more double gear-wheels I, revolving on the shafts H⁴, which have their bearings in the disk H' and the ring H² of the frame H. The double gear-wheels I consist each of the gear-wheel I', which meshes into the internal gear B', formed on the bevel gear-wheel B, and of the gear-wheel I², which meshes into the external

gear-wheel E', formed on the hub of the bevel gear-wheel E.

To the lower end of the vertical hollow shaft D is secured a wheel, J, provided with the internal gear-teeth J', into which mesh the teeth K' of the wheel K, secured to the vertical shaft L. On the wheel J is also formed the bevel gear-wheel J², which is in gear with the bevel gear-wheel M, secured to the horizontal shaft N. The bevel gear-wheel M also meshes into the bevel-teeth O', formed on the wheel O, fastened to the vertical shaft G. The wheel O is provided with the gear-teeth O², which mesh into the teeth K², formed on the wheel K. The shafts L and N are used as transmitting shafts, and are mounted in a suitable frame, S, on the main frame S' of the windmill.

The objects of the shafts L and N are to afford direct connection with driven machinery in vertical, oblique, or horizontal directions, and to the use of one or both shafts simultaneously or separately by connecting or disconnecting said shafts with the machinery to be operated. In well-drilling, for instance, the shaft L may be used for operating the drill, while the shaft N may operate the windlass or sand-pump. Other uses will suggest themselves, as occasion may require.

The operation is as follows: The bevel gear-wheel B, meshing into the bevel gear-wheel C, rotates the hollow shaft D, and the bevel gear-wheel E, meshing into the bevel gear-wheel F, rotates the shaft G, passing through the hollow shaft D. The hollow shaft D imparts a rotary motion to the wheel J, which rotates, by means of the internal gear J', the double gear-wheel K, which rotates the transmitting-shaft L. The bevel external gear-wheel J² on the wheel J imparts a rotary motion to the bevel gear-wheel M, which in turn sets the horizontal transmitting-shaft N in motion. The double gear-wheel O, meshing into the bevel-gear-wheel M on the shaft N, and into the gear-wheel K² on the vertical shaft L, transmits the power of the shaft G to the shafts N and L. The rotation of the wind-wheel shaft A rotates the frame H, carrying the double gear-wheels I, which permit the bevel gear-wheel E, by means of the internal gear-teeth, B', and the external gear-wheel E', by means

of the external gear E', to rotate backward and forward only when the wind-wheel shaft changes its direction, or revolves around the turn-table in the opposite direction when the wind-wheel is idle.

All of the gear-wheels are in such relative proportion in size, number of teeth, and pitch as to insure a smooth running of said wheels.

The gear-wheels B and E, being placed opposite each other on the shaft A, at each side of the shafts D and G, prevent the tendency of the wind-wheel to deflection from the true direction of the wind, and at the same time equalize the transmission of power, friction, strain, &c., and balance the wind-wheel.

Instead of using the hollow shaft D, I can construct the wheel C in the manner shown in Fig. 4, in which the gear-wheel C is provided with the internal gear-teeth P, into which meshes a gear-wheel, Q, attached to the vertical transmitting-shaft R, which is provided with the gear-wheel T, which meshes into the gear-wheel U, fastened to the shaft G. The result obtained by this gearing is the same as that obtained by the one above described.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. In a gearing for windmills, the wind-wheelshaft A, provided with the frame H, carrying the double gear-wheels I, the bevel gear-wheel B, having internal gear-teeth B', and

the bevel gear-wheel C, attached to the hollow shaft D, in combination with the bevel gear-wheel E, provided with the external gear E', and the bevel gear-wheel F, attached to the shaft G, substantially as herein shown and described.

2. In a gearing for windmills, the hollow shaft D, provided on its lower end with the wheel J, having the internal gear J', and the double gear-wheel K, in combination with the shaft G, provided with the bevel gear-wheel O, and the bevel gear-wheel M, attached to the shaft N and meshing into the wheel O, and into the bevel gear-wheel J', formed on the wheel J, substantially as herein shown and described.

3. In a gearing for windmills, the wind-wheel shaft A, the frame H, carrying the double gear-wheels I, the gear-wheel B, provided with the internal gear B', and the bevel gear-wheel E, provided with the external gear E', in combination with the bevel gear-wheel C, the hollow shaft D, the wheel J, provided with the internal gear J', the double gear wheel K, the shaft L, the bevel gear-wheel F, the gear-wheels O and M, and the shaft N, substantially as herein shown and described.

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Witnesses:

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