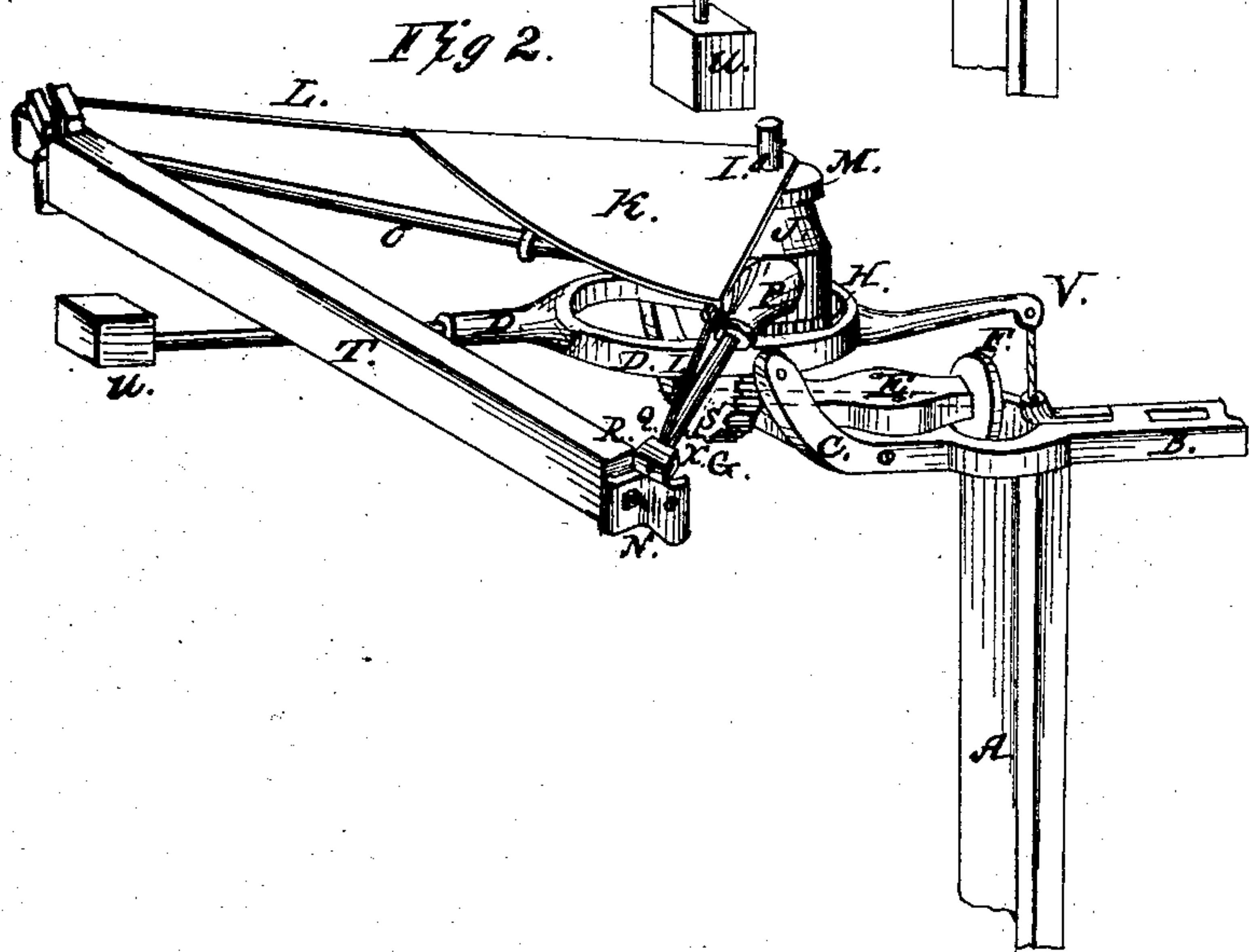
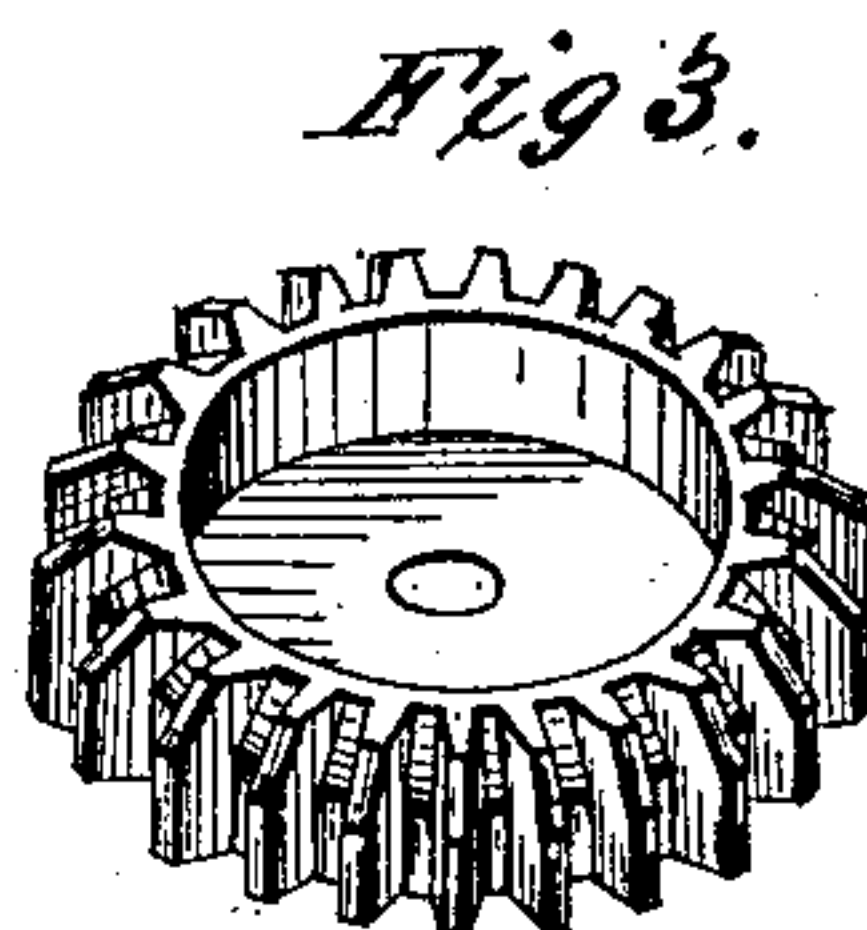
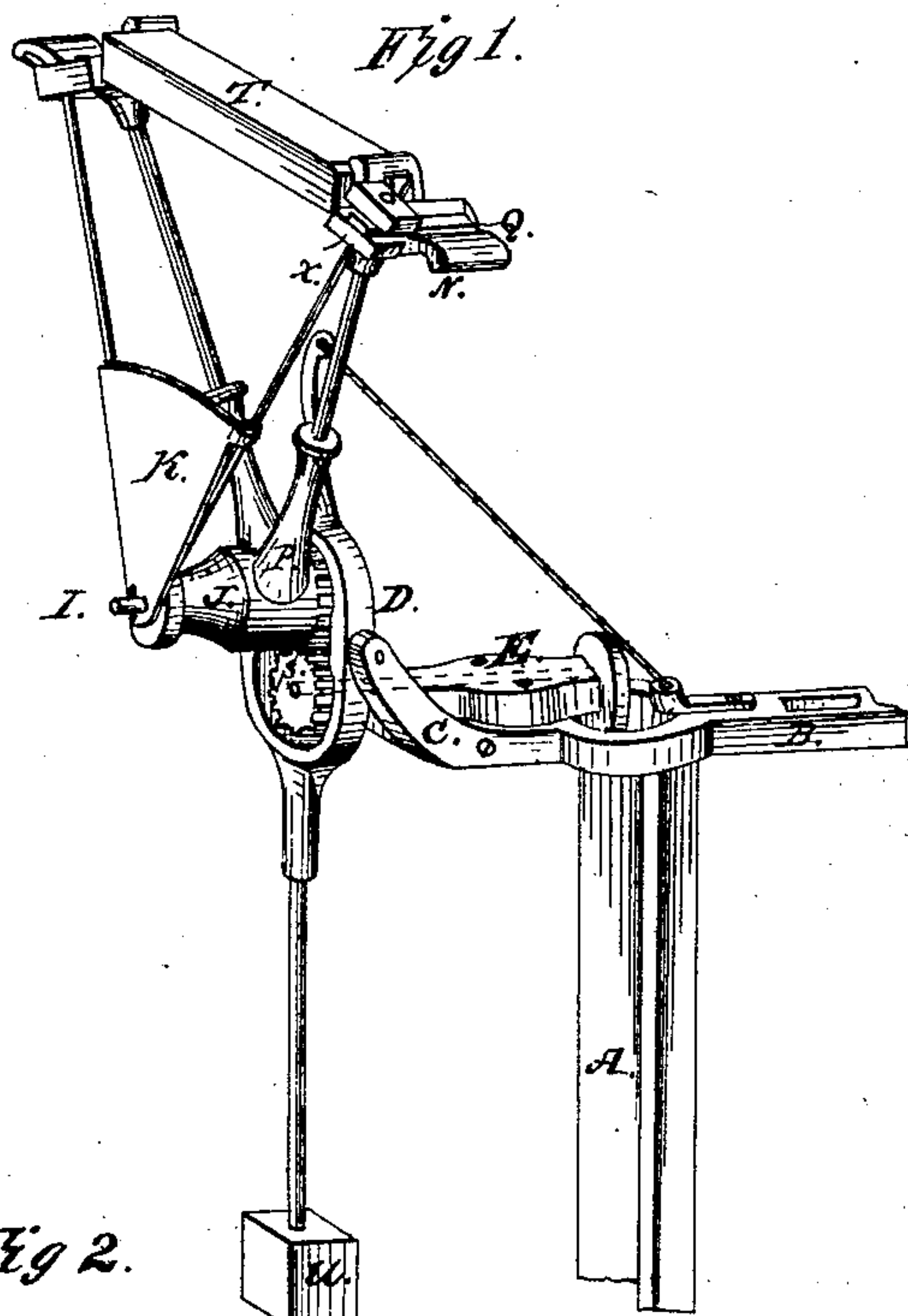


I. LEHMER.
Wind-Mill.

No. 163,669.

Patented May 25, 1875.



Witnesses:

Hiram Humebaugh.
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UNITED STATES PATENT OFFICE.

ISAAC LEHMER, OF GREENFIELD, INDIANA.

IMPROVEMENT IN WINDMILLS.

Specification forming part of Letters Patent No. **163,669**, dated May 25, 1875; application filed March 24, 1875.

To all whom it may concern:

Be it known that I, ISAAC LEHMER, of Greenfield, La Grange county, and State of Indiana, have invented an Improved Windmill, of which the following is a specification:

My invention consists in the provision of certain mechanism whereby the transition of those wind-wheels which, by the force of the wind, assume any intermediate position, from a vertical to a horizontal one, may be effected by means simple and durable, and not liable to be injured by storms of great intensity, while at the same time the rotation of the wheel, whatever may be its inclination, proceeds with certainty and uniformity; and my invention further consists in devices for securing the cross-bars which form the outer frame of the wheel to the radial arms and to the rods, to which the disk of the wheel is fastened; and my invention further consists in my method of pivoting the wind-wheel below the central hub, from which the arms diverge, so that, with a weight attached to the lower end of an oblong head-piece, into which one of the cog-wheels, upon which the hub of the wheel is seated, is secured, a proper equipoise may be maintained, all of which will be more explicitly set forth in the drawings accompanying this specification and the description connected therewith, in which—

Figure 1 is a perspective view of my apparatus in its normal or vertical position, and Fig. 2 a view exhibiting it in a horizontal state, so placed by the violence of the wind, or, if desired, by the hand of the operator. Fig. 3 represents one of the obtuse-angled cog-wheels, of which I employ two, to the upper one the hub of the wind-wheel being attached, and the lower one rotating a spindle to which the crank is secured.

A represents the V-shaped upright, upon which the bed-plate B is seated. At the forward end of the bed-plate are secured two curved arms, C, by which an oval-shaped head-piece, D, is supported. To the bed-plate two bellows-shaped pieces, forming a journal-box, E, into which the shaft turns, to which the crank-wheel F is attached, are firmly secured. The position of this shaft is shown by dotted lines through the pieces forming the journal-box E. Upon the forward end of this shaft, which is designated at s, is secured the lower

cog-wheel, G. The upper cog-wheel H rotates upon a spindle, I, which is attached to the upper part of the oval head-piece D. The base of this cog-wheel is firmly secured to the hinder part of the hub J. This hub, with the upper cog-wheel, H, attached, revolves freely upon the spindle I, carrying the wind-wheel. The cog-wheels G and H are so constructed that, whatever inclination of the wind-wheel may ensue from the force of the wind, their contact is invariably maintained. The cogs are so made that they represent an obtuse angle, except for a small portion at the intersection of the exterior lines or surfaces, where they are rounded, to better retain their adjustability, and for the consequent diminution of friction. At K is shown a section of a central disk, the object of which is to turn the wind from the center of the wind-wheel and direct it upon the slats or fans. These slats are not represented in the drawings, as their use and position upon the wheel are obvious. The periphery of the disk is secured to metallic rods L, and the center is seated upon an annular piece, M, surrounding the forward end of the shaft I. Into this ring M the inner ends of the metallic rods are secured. The outer ends of these rods or braces pass through the projecting part or lug of a hod-shaped socket or cap, N, surmounting the outer ends of the braces, and radial arms O seated in the sleeves or shoulders P, which, with the hub J, for solidity, are formed in one piece. These rods L, also, are inserted through a key, Q, and extend outward through a nut, as seen at R. These braces tend to strengthen the main arms of the wheel, and serve to hold the hod-shaped cap N on the outer end of the arm. The key Q assists to bind the cap and brace-rods firmly to their places, and also serves to lock the nut R and to bind a screw-head that secures the bar T to the cap N. It may, however, be dispensed with by forming a recess on the lug or projection X of the hod-shaped cap N, to receive a nut, through which the outward ends of the brace-rods pass. This cap N serves as a seat to hold a cross-brace, T—also as a base for the key Q—and is important as a means of uniting at their extremities the cross brace or bar T, the metallic rods, and radial arms, which constitute the frame-work of the wind-wheel, a

section of one-fourth of which is shown in the drawing. The slats or fans of the wind-wheel are secured to the cross-bar T. To the lower end of the head-piece D a weight, U, is attached, which may be regulated as desired, and to the projection upon the top of the head-piece a cord is secured. This may be seen at V. An attendant, whenever it is desired, by pulling the cord brings the wind-wheel from its vertical to a horizontal position, and therefore into a state of inactivity, as its edge is thus presented to the wind. The hub and radial sleeves being formed in one piece, and the sleeves being hollow to receive the arms to which the cross-bars are attached, are therefore very strong, and superior to the ordinary spider, to which arms are bolted, as in the latter method the bolts and nuts are liable to become loose, and sometimes endangering the arms of the wheel. The cog-wheel gearing forms an important part in the rotation of the wind-wheel, the formation of the cogs permitting it to be tipped, serving thus in a double capacity, and thereby affording a simple and durable means for these purposes, and is a valuable part of my invention.

Any well-known bevel-gearing may be substituted for mine, but I prefer it as already illustrated.

The arrangement of the wind-wheel, seated within the head-piece D and suspended below the hub N, with the spindle upon which it ro-

tates, is simple and effective, making it easy to adjust the proper equilibrium, with the use of the weighted arm at the lower end of, and forming part of, the head-piece.

It will thus be seen that my alleged novelty embraces an apparatus simple, durable, compact, serving well the purpose for which it is designed, and not liable to get out of order by sudden and severe changes or degrees of wind.

I am aware that there are examples of wind-wheels which assume any intermediate position, from a vertical to a horizontal one, by the force of the wind, and such, therefore, I do not claim, irrespective of the devices which I employ; but

What I do claim, and desire to secure by Letters Patent, is—

1. The combination, with a wind-wheel of the character described, of the bevel-wheels G and H, and for the purpose set forth.

2. The devices N R Q for securing the outer ends of the rods L and arms O to the transverse bar T, as described.

3. The combination of the wind-wheel with the shafts S and I, bevel-wheels G H, and oval head-piece D, for the uses and purposes expressed.

ISAAC LEHMER.

Witnesses:

HIRAM HINEBAUGH,
THEODORE T. BELKNAP.