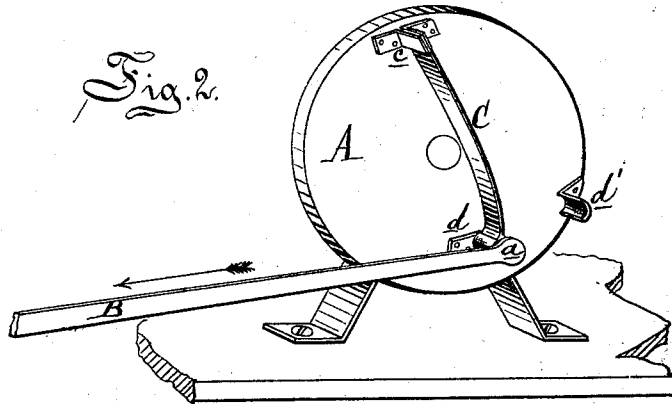
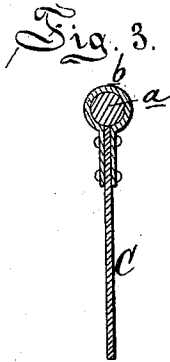
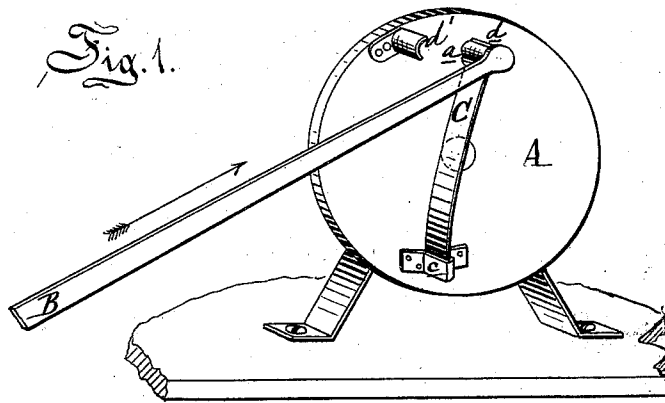


T. L. HUBBARD.

DEVICES FOR OVERCOMING THE DEAD-CENTRES OF CRANKS.

No. 178,150.

Patented May 30, 1876.



Attest:
Edward Barthel
Thos. C. Day

Inventor:
T. L. Hubbard
By Atty
Thos. C. Day

UNITED STATES PATENT OFFICE.

THEODORE L. HUBBARD, OF PORT HURON, MICHIGAN.

IMPROVEMENT IN DEVICES FOR OVERCOMING THE DEAD-CENTERS OF CRANKS.

Specification forming part of Letters Patent No. **178,150**, dated May 30, 1876; application filed December 24, 1875.

To all whom it may concern:

Be it known that I, THEODORE L. HUBBARD, of Port Huron, in the county of St. Clair and State of Michigan, have invented a Device for Overcoming the Dead-Centers of Cranks, of which the following is a specification:

My invention has for its object to provide a means for overcoming the dead-centers of cranks, and is more especially adapted to and applicable in the conversion of reciprocating into rotary motion, in which case it takes the form of a peculiar connection of the pitman to the crank-disk, consisting of a leaf-spring eccentrically secured at one end to a bracket on the face-plate, the free end having an eye, which receives a wrist on the pitman, which eye end plays between two socket-lugs projecting from the face-plate in the radius of the spring, as more fully hereinafter set forth.

Figures 1 and 2 are perspective views, showing different positions of the crank and pitman. Fig. 3 is a cross-section of the pitman, wrist, and spring.

In the drawing, A represents a face-plate or crank-disk, to be rotated by a reciprocating pitman, B, at the end of which is a wrist, *a*, journaled in an eye, *b*, at the free end of a leaf-spring, C, whose other end is rigidly secured in a bracket, *c*, placed near the periphery of the face-plate, in such a position that the leaf-spring will take the direction of a chord (other than a diameter) across the said face-plate. Two concave or socket lugs, *d d*, limiting the curvilinear movement of the free end of the leaf-spring, project from the face-

plate, in the line of the circle of which the leaf-spring is a radius, the said lugs, from the position of such spring, being at different distances from the center of the face-plate.

These socket-lugs should be faced with rubber or other elastic material, to ease the impact of the eye *b*.

Suppose the pitman to be moving in the direction of the arrow in Fig. 1, the eye *b* will rest in and exert a propelling strain upon lug *d* until just before the back center is reached, when it will move out of the said socket. The pressure of the pitman being still in the same direction, a tensile strain is put by it upon the spring; whose connection to the face-plate (the bracket) being above the line of centers, the motion of the face-plate is continued thereby until the pitman commences the return movement, when the spring will yield, and the eye *b* will jump back into the socket-lug *d*, now some distance below the line of centers, and act upon it to rotate the face-plate until the other center is approached, when the action will be the reverse of that just described.

What I claim as my invention is—

The spring and socket lugs, secured to the face of a crank-disk, substantially as described, in combination with the wrist on the pitman, journaled in an eye at the free end of said spring, substantially as and for the purpose set forth.

THEODORE L. HUBBARD.

Witnesses:

JAMES G. BRIGHT,
ANNA E. MCKAY,
NELLIE MCKAY.