H. B. KEIPER.

Combined Lever Rotary Motion by Impact.

No. 216,794. Patented June 24, 1879.

Fig. 1.

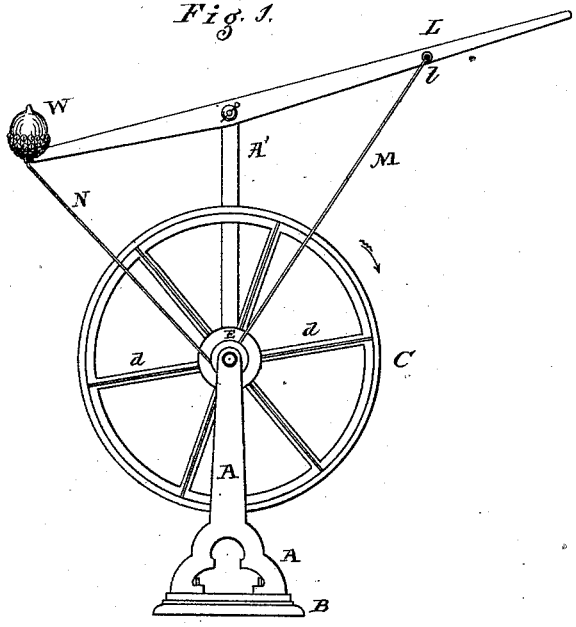


Fig. 2.

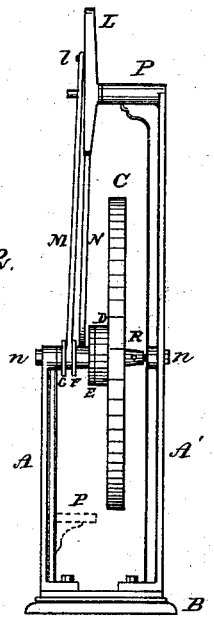


Fig. 4

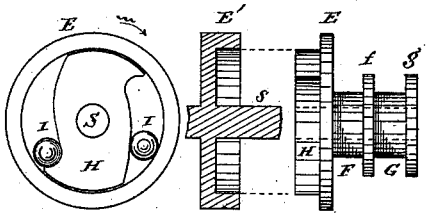


Fig. 3.

·WITNESSES·

B. B. Long

Jno. L. Loney

·INVENTOR·

H. B. Keiper

# UNITED STATES PATENT OFFICE.

HENRY B. KEIPER, OF LANCASTER, PENNSYLVANIA, ASSIGNOR OF ONE-HALF HIS RIGHT TO JOHN M. KEIPER, OF SAME PLACE.

## IMPROVEMENT IN COMBINED LEVER ROTARY MOTION BY IMPACT.

Specification forming part of Letters Patent No. **216,794**, dated June 24, 1879; application filed March 6, 1879.

*To all whom it may concern:*

Be it known that I, HENRY B. KEIPER, of the city of Lancaster, Lancaster county, and State of Pennsylvania, have invented certain Improvements in Combined Lever Rotary Motion by Impact, of which the following is a specification.

The object of this invention is to connect a vibrating arm or lever with a combined cam-pulley and case or flanged hub of a fly-wheel, which severally and jointly revolve loosely upon a dead or fixed shaft in such a manner that, by a single downward or upward pull of the lever or strap, impact will be given instantaneously, so as to give the wheel or a fan rapid motion, the momentum of which, and repeated action of the pull at intervals, will propel other gear or machinery connected therewith.

The accompanying drawings, with the letters of reference marked thereon, and a brief explanation, will enable those skilled in the art to make and use the same, and in which—

Figure 1 represents the front or side elevation of the wheel, &c.; Fig. 2, an end view, showing the two standards, &c.; Figs. 3 and 4, detached portions, enlarged, central hub and pulley-cam.

The standards A A′, on a base or floor, B, support a fixed shaft, S. On this shaft the wheel C, having a case-like flanged hub, D, sits loosely, so as to revolve freely. A sleeve, R, is shown, to which a fan, strap-pulley, or cogged wheel may be attached to propel other gear.

Into the open case of the hub D is fitted the raised cam H on the disk E, which latter overlaps and covers the rim of the hub-case D. This raised cam extends to the bottom of the case, or nearly, the circle being cut down on two opposite sides, leaving the slightly ogee curved and perpendicular walls to form two wedge-shaped chambers, reversely terminated by a kind of concave pocket, as shown by Fig. 4, having a single ball in each chamber within the case of the hub D when in place. The outer face of the disk E has cast with it two flanged pulley-like strap-holders, F G, and flanges *f g*, the whole forming what I term a "flanged pulley" or "double pulley and cam." This latter combined cam arrangement is disconnected from the case D, and also sits loosely upon the fixed shaft S with the hub of the wheel.

To give motion to the wheel C, or its equivalent, I use two straps, M N, the end of one being attached to the end of a lever-arm, L, on one side of the fulcrum-arm P, and the other a like distance from the fulcrum on the other side. This fulcrum-arm P may be above or below the wheel, with its strap-connection simply reversed on the pulleys, and the lever answer for a treadle, one of the straps being coiled around one of the pulley-spaces, say, strap N on space F. The lever being now raised, and the strap M connected with space G unwound and drawn tight by a strong downward pull of the lever, the strap M in unwinding necessarily turns the cam-pulley, and the balls I in quick succession impinge against the hub-case or inner periphery, which gives motion to the wheel or case D with great energy and runs it at a high speed. At the same time, at the end of the stroke or pull, the lever, by the weight *w*, rises into position for another impulse, uncoiling the one strap and re-coiling the other. While the cam, balls, and pulleys rest the impulse given to the wheel continues to revolve it for a length of time corresponding to the resistance.

A spring might be employed to restore the lever ready for a stroke.

I am aware that balls or wedges, in combination with cam-hubs, have been used to prevent retrograde motion, as also clutches on a curved lever between the rim of the hub or case and spool or pulley, operated by a single cord—an arrangement I disclaim; but I am not aware that a double-cam pulley operated by two straps in this manner were ever before known or used for propelling a fan or wheel, as herein shown and specified. I now drive a fan in a case or blower for a forge-fire, where the flanged hub and pulleys are on one side of the case, and the fly-wheel on the outer end of the sleeve R of the fan, cam, and pulley appliances herein set forth, which can be actuated by the strap and hand-hold direct, and react upon the strap of motion by a spring-connection.

What I claim as my invention is—

The combination of the raised cam-face H upon the covering-flange E, cast in a single piece with the double strapways F G and flanges *f g*, when said cam H enters and forms two side chambers with the inner periphery of the rim of the case D for impact-balls I, operated by two separate straps, M N, one end of each affixed to its respective way F G on the combined cam-pulley, arranged and operating substantially as and for the purpose specified.

H. B. KEIPER.

Witnesses:
J. B. LONG,
JNO. C. LONG