(No Model.)

G. N. TIBBLES.

DEVICE FOR CONVERTING RECIPROCATING INTO ROTARY MOTION.

No. 346,961. Patented Aug. 10, 1886.

Fig. 1.

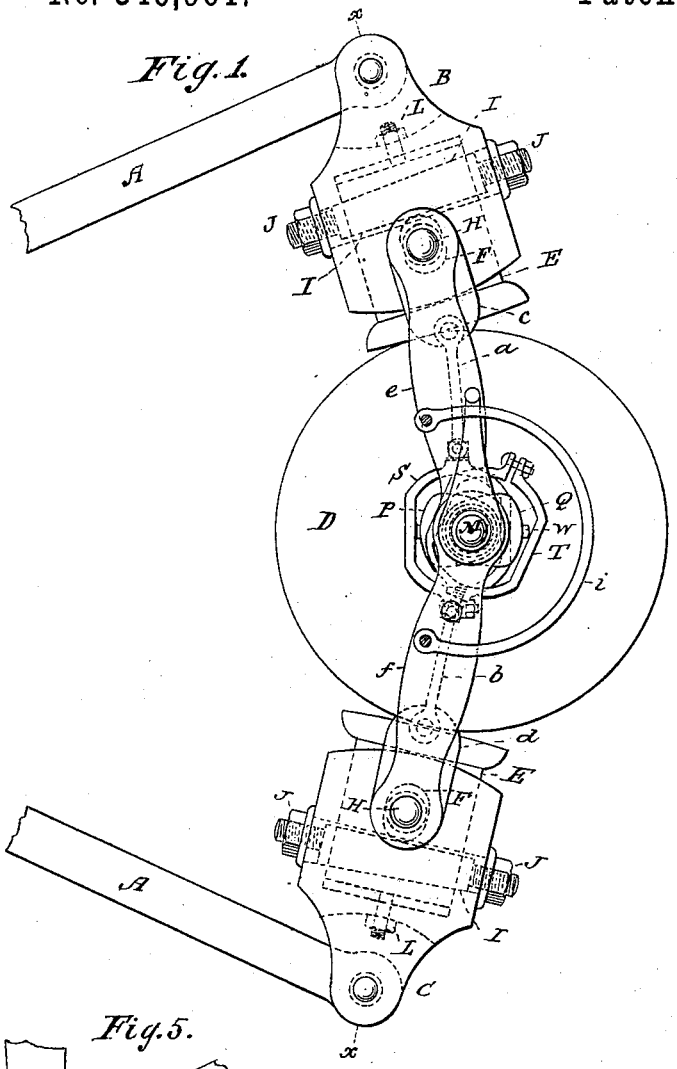


Fig. 2.

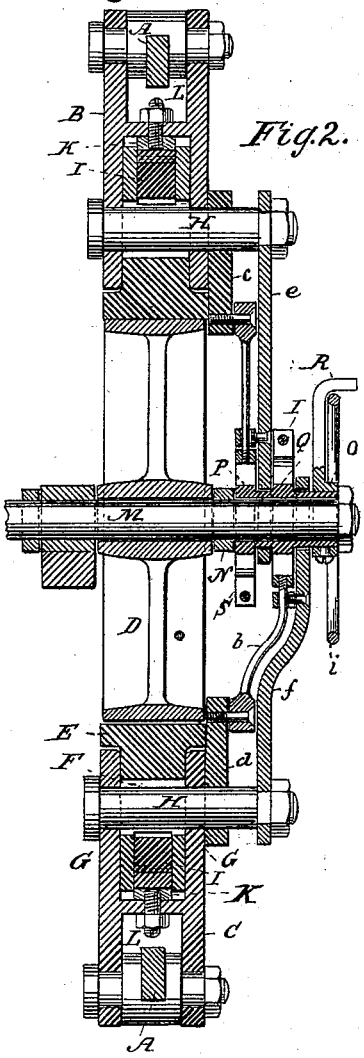


Fig. 5.

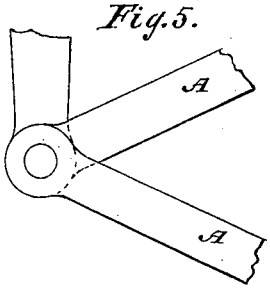


Fig. 3.

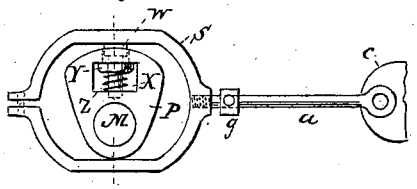
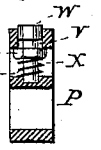


Fig. 4.



WITNESSES:

Edward Wolff.
Herman Gustow.

INVENTOR

George N. Tibbles,
BY
Chas. C. Gill
ATTORNEY

UNITED STATES PATENT OFFICE.

GEORGE N. TIBBLES, OF JERSEY CITY, NEW JERSEY.

DEVICE FOR CONVERTING RECIPROCATING INTO ROTARY MOTION.

SPECIFICATION forming part of Letters Patent No. 346,961, dated August 10, 1886.

Application filed December 31, 1885. Serial No. 187,282. (No model.)

To all whom it may concern:

Be it known that I, GEORGE N. TIBBLES, a citizen of the United States, and a resident of Jersey City, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Means for Converting a Reciprocating Motion into a Rotary Motion, of which the following is a specification.

The invention relates to improved means for converting a reciprocating motion into a continuous reversible rotary motion; and it consists in the devices hereinafter described, and particularly pointed out in the claims.

The invention sought to be protected hereby is an improvement on the invention described and claimed in Letters Patent of the United States granted to me July 16, 1872, and numbered 129,437. It is to be understood, however, that the present invention is not limited to use on traction-engines, since it is equally applicable for use in connection with any machinery where it is desired to convert a reciprocating motion into a continuous rotary motion.

In the accompanying drawings, forming a part of this application, Figure 1 is a plan view of an arrangement of devices embodying the invention. Fig. 2 is a vertical section of same, taken on the dotted line *x x* of Fig. 1. Fig. 3 is a detached plan view of a portion of the mechanism, and is hereinafter referred to. Fig. 4 is a section through one of the cams on the dotted line shown in Fig. 3, and Fig. 5 is a detached view of the joined ends of the connecting-rods to which the reciprocating movement is imparted.

In the drawings, A A designate connecting-rods, which are secured on a single pivot at one end to a lever or any other suitable device connected with and adapted to receive a reciprocating motion from the piston-rod of an engine in any well-known manner. The other ends of the connecting-rods A A diverge outward, one being pivoted in the outer portion of the shoe B and the other in the like portion of the shoe C. The shoes B C are exactly the same in outline and construction, and one is located above and the other below the clutch-wheel D.

Each of the shoes B C is in the form of a hollow shell, and receives the shank end of the clutch-block E, the other end of which is enlarged laterally and has a convex face in near relation to the periphery of the clutch-wheel D. The block E has a transverse elongated opening or slot, F, through which and apertures G in the shoe passes a pin, H, whereby the block is retained in position. In the space between the pin H and the solid end of the block is a wedge, I, which is inserted through lateral openings in the shoe and held between the screws J on opposite edges thereof.

The purpose of the wedge I is to enable the adjustment of the block E nearer to or farther from the periphery of the wheel D, according to the proportions of the parts and other circumstances. After the desired adjustment of the clutch-block E with relation to the wheel D has been attained, a suitable packing—say of paper—will be inserted into the space K, and therein retained by the screw and nut L.

The clutch-wheel D is rigidly mounted upon a shaft or axle, M, upon which, on one side of the wheel, is arranged a washer, N, and sleeve O, which carries or is formed in one piece with the cams lettered P Q, respectively, and the hand-lever R. The lever R and sleeve O, with cams P Q projecting at opposite sides therefrom, constitute what may be termed the "reverse," since by turning the sleeve by means of the lever the cams P Q are thrown into a different position with relation to the yokes S T inclosing them, and operate, as hereinafter specified, to reverse the motion of the wheel D.

The cams P Q are similar in outline and construction, and each has a transverse slot, V, inclosing a headed screw, W, and opening into an aperture, X, wherein upon the shank of the screw is a nut, Y, and coiled spring, Z, as shown in Figs. 3 and 4, the purpose of the screw with its spring and adjusting-nut being to compensate for any wear on the edges of the cam and surrounding yoke, and to give said yoke the particular inclination desired, in order to attain the most satisfactory results.

The yokes S T are respectively connected with one end of the spring-bars *a b*, the other ends of which are pivoted, respectively, to the links *c d*, rigidly connected to or formed in one piece with the shoes B C.

Upon the pins H H are retained the outer

ends of the bars *e f*, the inner ends of which are secured upon the sleeve O, hereinbefore referred to. Upon the inner side of the bars *e f*, near their inner ends, are small blocks *g h*, retained in position by screws, and through which pass the spring-bars *a b*, as shown in Fig. 2.

A semicircular rest and guide, *i*, attached to the mechanism in any suitable manner, may be provided for the lever R of the reverse, if preferred.

Operation: The lever R and cams P Q being in the position shown in Fig. 1, and the rods A A being drawn to the left, the shoes B C will be at an angle to each other on the left-hand side of the vertical center of the clutch-wheel D, in which condition of the mechanism the spring-bar *a* is bent slightly toward the left, and the left-hand end of the convex face of the upper clutch-lock E is in contact with the wheel D at a tangent to its periphery, while the convex face of the lower clutch-lock E slightly escapes contact with said wheel. The parts being in the position specified, a reciprocating movement to the right applied to the rods A A would have the effect of causing the lower clutch-block E to move easily to the right of the vertical center of the wheel D until the left-hand end of its convex face came in contact with the periphery of said wheel, and at the same time of moving the upper clutch-block, E, to the right, which latter clutch-block, being at this time in firm contact with the wheel, causes it to rotate with the axle M until the spring-bar *a* has become straightened by the movement, and the distance between the block and the axle thus slightly increased, whereby the upper clutch-block will be freed from firm union with the wheel. The movement of the rods A A to the right, it will be observed, causes the upper clutch-block to rotate the wheel D and axle M a given distance and brings the lower clutch-block into position, whereby, when the rods A A are drawn to the left, it will continue the rotation of the wheel, while at the same time the upper clutch-block E returns to its former position, being that shown in Fig. 1. When the rods A A are moved to the right, the upper clutch-block rotates the wheel D, and the lower clutch-block gets into position, and when the rods A A are drawn to the left the lower clutch-block continues the rotation of the wheel, and the upper clutch-block is brought into proper position to engage the wheel during the next movement to the right of said rods. The clutch-blocks thus alternately engage the wheel and impart to it a continuous rotary motion. When an intermittent rotary motion of the wheel D is desired, only one of the clutch-blocks need be employed.

In the foregoing description I have explained the continuous rotation of the wheel D in one direction. This movement, however, may be reversed and the wheel given a continuous rotation in the opposite direction by simply moving the lever R downward and thus altering the position of the cams P Q in their yokes S T. Under this condition of the mechanism the right-hand ends of the convex faces of the blocks E will alternately engage the wheel D, instead of the left-hand ends, as before.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The devices for converting a reciprocating into a rotary motion, which consists of the clutch-wheel secured on a shaft, the clutch-blocks mounted in shoes B C, bars connecting the shoes to the axle of the wheel, connecting-rods A A, the spring-bars *a b*, secured at one end to the shoes, and having at the other yokes S T and cams P Q, secured within the said yokes, substantially as set forth.

2. The devices for converting a reciprocating into a rotary motion, which consists of the clutch-wheel, clutch-blocks mounted in pivotally-secured shoes, to which power is applied, the reverse-sleeve O on the axle of the wheel and carrying cams P Q, the yokes inclosing said cams, and spring-bars between the shoes and the cams, substantially as shown and described.

3. In means for converting a reciprocating motion into a rotary motion, the wheel, clutch-blocks, shoes, spring-bars, yokes, cams, and reverse-sleeve, combined and arranged substantially and for the purposes described.

4. The devices for converting a reciprocating into a rotary motion, which consists of the wheel, the shoe inclosing the clutch-block and receiving the power, the bar connecting the shoe with the axle of the wheel, the spring-bar attached at one end to the shoe or a link connected therewith, and having at the other end a yoke, and the cam on said axle and inclosed by said yoke, substantially as set forth.

5. In devices for converting a reciprocating into a rotary motion, the reverse O, mounted on the axle of the clutch-wheel and carrying cams which coact through rods with reciprocating shoes on the periphery of the wheel, substantially as and for the purposes described.

6. In devices for converting a reciprocating into a rotary motion, the clutch-wheel, clutch-blocks, spring-bars, yokes connected with said bars and encompassing the axle of said wheel, and the oppositely-projecting cams which are inclosed by said yokes and have an adjustable pin or section, W, substantially as set forth.

7. In devices for converting a reciprocating into a rotary motion, substantially as hereinbefore described, the shoe adapted to have a reciprocating motion and an oscillating motion and inclosing the clutch-block and adjusting-wedge, as set forth.

8. In devices for converting a reciprocat-

ing into a rotary motion, substantially as described, the shoe adapted to have a reciprocating motion and an oscillating motion, and inclosing the clutch-block, adjusting-wedge held between set-screws, and a packing retained by screw L, substantially as shown and described.

Signed at New York, in the county of New York and State of New York, this 28th day of December, A. D. 1885.

GEORGE N. TIBBLES.

Witnesses:
CHAS. C. GILL,
EDWARD WOLFF.