J. T. Jones

Friction Driver

No. 75023 Patented Mar. 3 1868

Fig. 1.

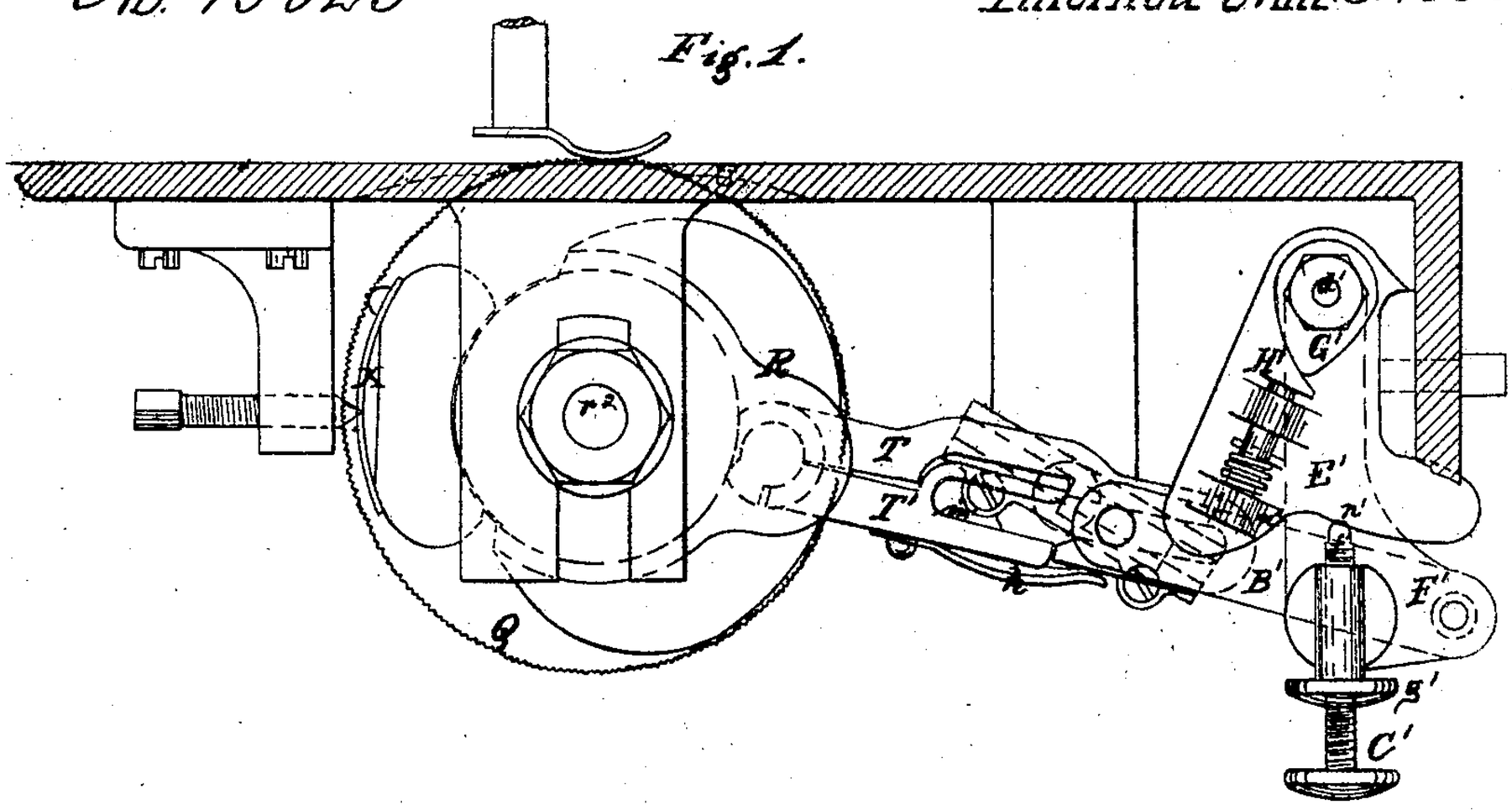


Fig. 2.

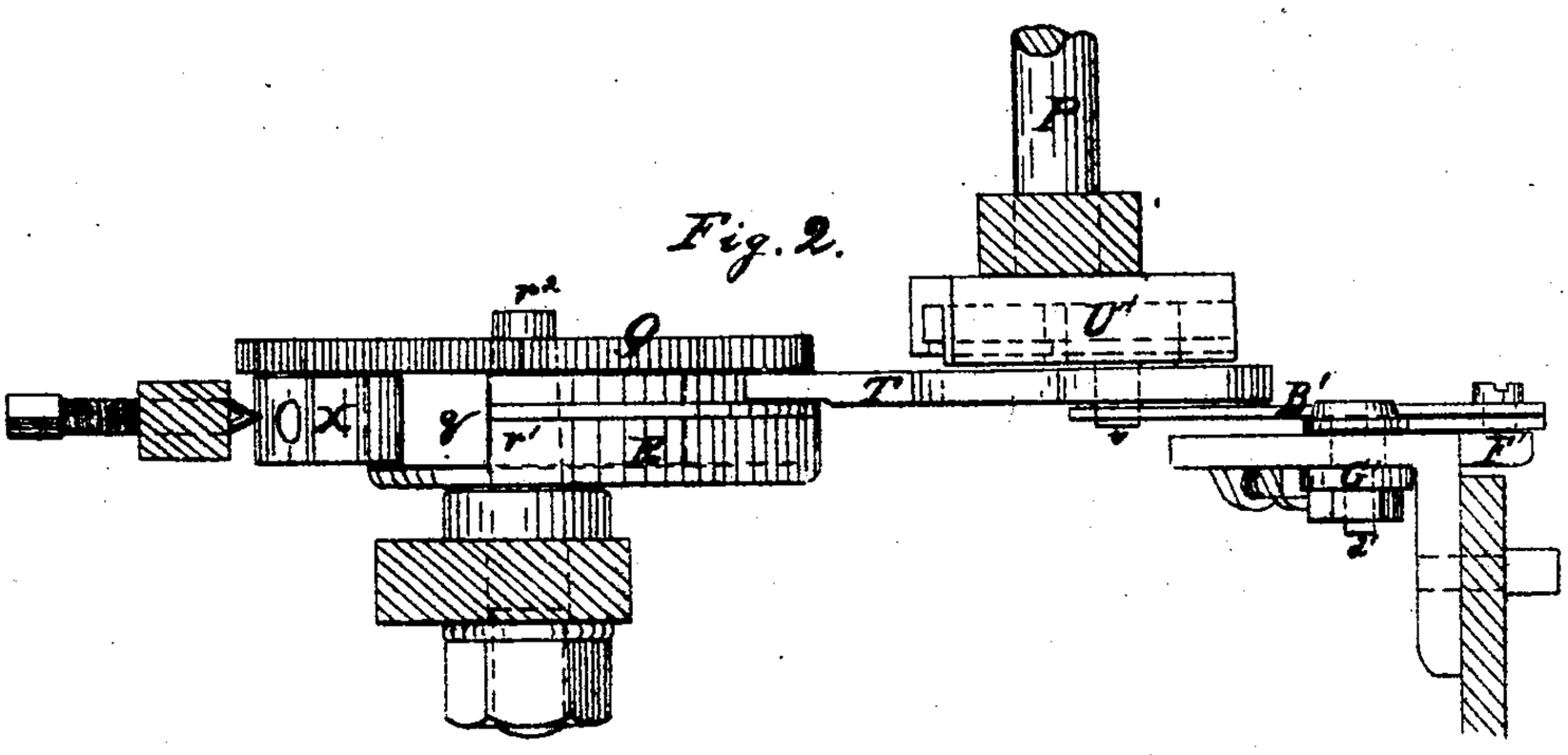


Fig. 3.

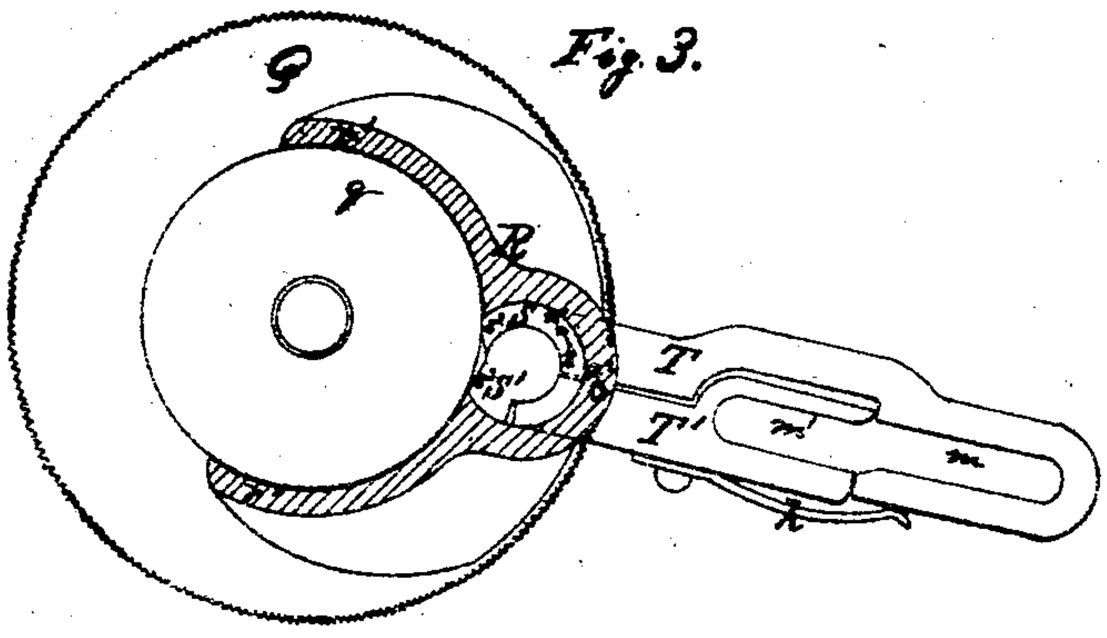
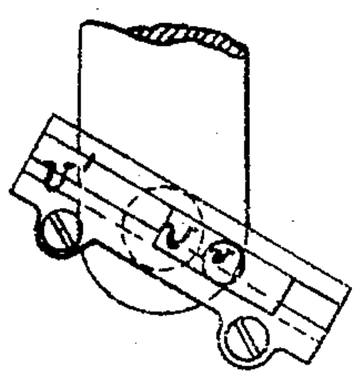


Fig. 4.



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Letters Patent No. 75,023, *dated March* 3, 1868.

IMPROVEMENT IN FRICTION-DRIVERS.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, JOHN THOMAS JONES, of the city, county, and State of New York, have invented certain new and useful Improvements in Friction-Drivers, for converting reciprocating motion into rotary motion, and that the following is a full, clear, and exact description and specification of my said improvements.

The object of the invention is to enable the direction in which the wheel (or other instrumentality that is caused to revolve) is driven to be readily reversed, and also to equalize the amount of movement in opposite directions.

To these ends, the first part of the invention consists of the combination of the hub or rim, appertaining to the article to be driven, with a friction-clamp, two rocking-cams, and two levers, projecting at the same side of the hub and operating the cams, so that by operating one lever the friction-clamp is caused to drive the hub in one direction, while by operating the other lever the direction of driving is reversed.

The second part of the invention consists of the combination of the said hub, friction-clamp, rocking-cams, and levers, with a reciprocating driver, which may be engaged with either of the two levers, so that the direction of movement of the hub may be reversed by transferring said driver from one lever to the other.

The third part of the invention consists of the combination of the said hub, friction-clamp, cams, levers, and reciprocating driver, with a transferrer and a gauge for determining the distance to which the reciprocating driver is moved when transferred from one cam-lever to the other, whereby the amount of reversed movement imparted to the hub after transferrence may be made equal to that imparted before the transferrence of the driver.

The fourth part of the invention consists of the combination of the hub and friction-clamp with a rocking-cam, lever for operating the same, reciprocating driver, gauge for regulating the position of the same, and holding-mechanism for holding the driver in the position in which it is placed, so that when the driver is set to impart a certain movement to the hub, the driver will be held in the position in which it is so set, and the motion imparted will remain unchanged until some alteration is made by the operator.

The improvements thus set forth may be applied to various purposes, one of the most important of which is the movement of the feed-wheel of sewing-machines; and in order that my invention may be fully understood, I will proceed to describe such an application of it, referring to the accompanying drawings, and to the figures and letters of reference marked thereon—

Figure 1 representing a transverse section of the bed-plate of a sewing-machine with my improvements applied to the feed-wheel thereof,

Figure 2 representing a plan of the machine, and

Figures 3 and 4 representing views of detached parts of the mechanism.

The feed-wheel Q, to which the improvements are applied, is constructed to revolve upon a fixed arbor, r^2, and has a hub, q, to which the friction-clamp R is fitted. The form of friction-clamp which is represented is forked, its two arms, r^1 r^1, partially embracing the hub q, and the rocking-cams S S^1 being arranged at the crotch of the arms, so that when a cam is borne against the hub the ends of the arms r^1 r^1 are drawn towards the cam, and the hub is held at three places where the cam and the extremities of the arms bear upon it. One of the cams, S, is arranged to rock in a circular socket formed in the friction-clamp R. The other cam, S^1, is arranged to rock in a circular socket formed in the first cam, so that two rock upon the same axis, while each has a nipping-face, s^2 and s^3, which, when the cam is rocked in one direction, is borne against the hub q and nips it. The nipping-faces s^2 s^3 of the two cams are at opposite sides of their common axis, so that one cam, S, nips the hub when rocked in one direction, (as indicated by the arrow x' in fig. 3,) while the other cam, S^1, nips the hub when rocked in the opposite direction to the first. Each cam is fitted with a lever, T and T′, by which it is rocked; and a pin, a^2, is projected from the friction-clamp in such a position relative to the operating-levers that each lever strikes said pin after it has rocked its cam, so as to release the nip on the hub, and that the continued movement of the lever (after such release) causes the friction-clamp R to turn upon the hub q to the position at which it is to gripe the hub preliminary to imparting a succeeding movement to it. The hub q has a

friction-brake, X, fitted to it, to prevent retrograde motion while either lever is rocking its cam to release the hub and move the friction-clamp after such release. One of the levers, T′, is fitted with a spring, *h*, that bears upon the other, T, and causes the two slightly to diverge, so that when one cam is operating the other may not interfere with its action.

In order that both levers, T T′, may be operated by the same driver, they are arranged nearly in the same radial line, (to the axis of the hub *q*,) and are slotted in opposite directions, so that the driver may be moved radially out of the slot *m* of one lever, T, into the slot m^1 of the other, and *vice versa*. The driver consists of a pin, *v*, which projects from a slide, U, that is fitted to move in a slotted head, U′, to which an oscillating movement is imparted by securing it to the end of a rock-shaft, P. Consequently, the driver is caused to reciprocate by the oscillation of the head U′. The axis of the rock-shaft P is arranged opposite the place at which the adjacent ends of the slots *m* m^1 of the operating-levers T T′ meet each other, so that when the driver *v* is on one side of said axis it operates in connection with one lever, T, and when it is on the other side of said axis it operates in connection with the other lever, T′. As the slotted head U′ is, in this example, caused to oscillate to the same extent at all times, the distance which the driver is moved by any one oscillation depends upon its radial distance from the axis of the rock-shaft, and the greater the distance the greater the movement. Hence, by changing the distance of the driver from the axis of the rock-shaft, the extent of movement of the lever, (upon which the driver acts,) the extent to which the friction-clamp R is moved, (by the lever,) and the extent to which the hub *q* is turned, (by the movement of the friction-clamp,) are all changed.

In order that the driver may be conveniently moved, either for the purpose of transferring it from the lever T of one of the cams to that, T′, of the other cam, or for the purpose of changing the position of the driver relatively to the lever it is operating, so as to vary the extent of movement, a transferrer, B′, is provided. This transferrer consists of a link, which is connected at one end with the driver *v*, and at the other with a vibratable handle, C′, so that by moving said handle on its pivot *d*′, the driver *v* may be moved to the required position. The distance to which the driver is moved is determined by a gauge, E′, consisting of a stationary plate with an inclined edge, against which the end of a screw-pin, *f*′, (that is connected with the handle C′,) abuts, so as to stop the movement of the handle and transferrer at the desired place. As the gauge is used for determining the distance to which the driver is to be moved when transferred from the slot of one lever, T, to that of the other, T′, it has two inclined edges, n^1 n^2, presenting a V profile; and as the slot m^1 of one of the levers, T′, is nearer the axis of the hub *q* than that of the other, T, and consequently requires a less change in the position of the driver *v* than the other slot does, to produce an equal difference of angular movement in the levers, the two edges n^1 n^2 of the gauge are inclined at different angles, so as to correspond with the difference in the extent to which the driver is to be moved to produce equal angular movements of the two levers (and consequently of the friction-clamp) in opposite directions. The position of the screw-pin *f*′ is regulated by turning the handle C′, which also forms the head of the screw; and a pinch-nut, *g*′, is provided to secure the screw-pin in any desired position.

In order that the transferrer B′, and consequently the driver *v*, may be held in their positions, a spring-locking mechanism is provided. This mechanism consists of a spring-piston, H′, and a heart-shaped cam, G′, the latter being connected with the stock F′ of the vibrating handle C′ of the transferrer B′, and the former being secured to the stock of the gauge E′. The piston H′ is pressed towards the axis of the cam by a spring, and its head is V-formed, so that the cam is forced away from the central line of the piston-head, whether the cam be at one side or the other thereof. The point of the cam G′ is opposite the apex of the piston-head when the driver is in its central position, or is opposite the axis of the rock-shaft P. Hence, when the driver is at either side of such central position, it is held there by the piston, which, acting upon the cam G′, holds the screw-pin *f*′ against the gauge E′.

The holding-mechanism will perform its function, when used in connection with one lever and one cam, without the other lever and its rocking-cam, and may be used advantageously in combination with one lever and one cam when it is not deemed expedient to have a second rocking-cam and lever to reverse the movement of the feed-wheel.

Having thus described one application of my improvements, what I claim as my invention in friction-drivers, and desire to secure by Letters Patent, is—

The combination of the hub, friction-clamp, two rocking-cams, and two operating-levers, arranged at the same side of the hub, substantially as before set forth.

Also, the combination of the hub, friction-clamp, two rocking-cams, operating-levers, and reciprocating driver, substantially as before set forth.

Also, the combination of the hub, friction-clamp, two rocking-cams, operating-levers, reciprocating driver, transferrer, and gauge, substantially as before set forth.

Also, the combination of the hub, rocking-cam, lever, reciprocating driver, transferrer, gauge, and holding-mechanism, substantially as before set forth.

In testimony whereof, I have hereto set my hand, this twenty-fourth day of December, A. D. 1867.

J. T. JONES.

Witnesses:

W. L. BENNEM,

J. RATHBONE, Jr.