(No Model.)

T. WILSON.

MECHANISM FOR CONVERTING MOTION.

No. 276,206. Patented Apr. 24, 1883.

Fig. 1.

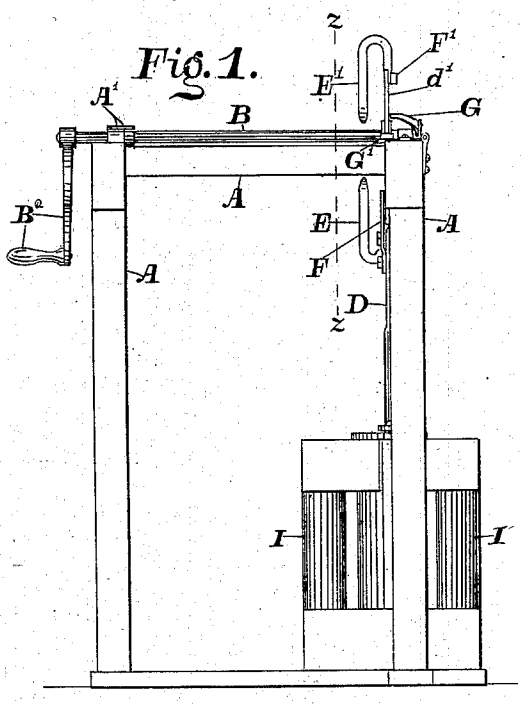


Fig. 2.

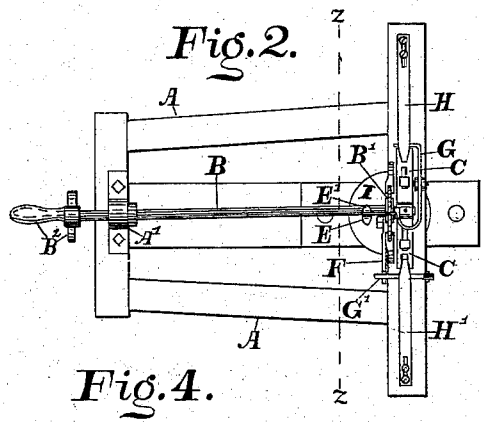


Fig. 4.

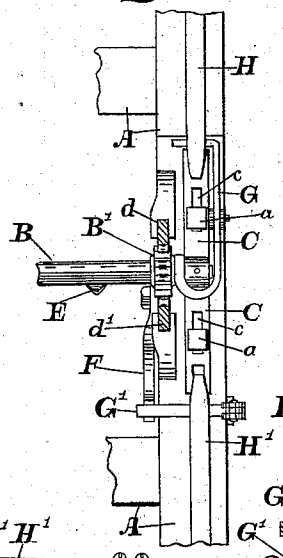


Fig. 5.

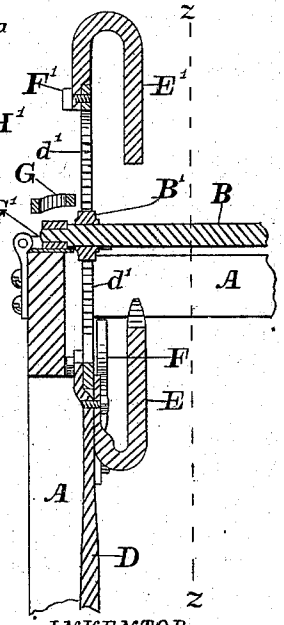
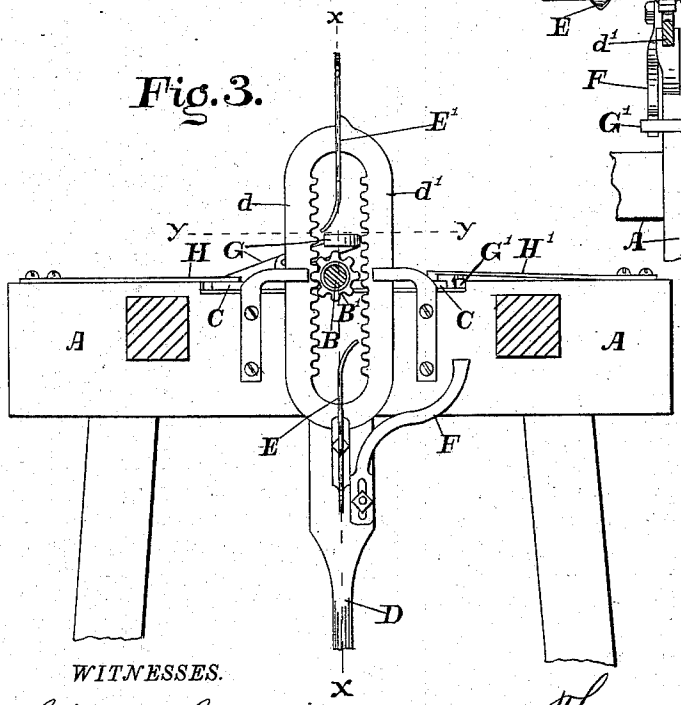


Fig. 3.



WITNESSES.

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UNITED STATES PATENT OFFICE.

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MECHANISM FOR CONVERTING MOTION.

SPECIFICATION forming part of Letters Patent No. 276,206, dated April 24, 1883.

Application filed March 14, 1882. (No model.)

To all whom it may concern:

Be it known that I, THORNTON WILSON, of Fillmore, county of Putnam, and State of Indiana, have invented certain new and useful Improvements in Mechanism for Converting Motion, of which the following is a specification.

My said invention consists of certain novel devices and combinations of parts whereby the continued rotation of a shaft in one direction is enabled to impart a reciprocal motion to a pitman or other equivalent part of a different (preferably slower) speed than the ordinary crank movement. In the example shown it is illustrated as applied to a force-pump, but may of course be applied to any device or machine where its peculiar operation is desired.

Referring to the accompanying drawings, which are made a part hereof, and on which similar letters of reference indicate similar parts, Figure 1 is a side elevation of a force-pump to which my invention is applied; Fig. 2, a top or plan view of the same; Fig. 3, a view principally confined to the parts embodying my invention on an enlarged scale, as seen when looking to the left from the dotted line *z z;* Fig. 4, a horizontal sectional view looking downwardly from the dotted line *y y* in Fig. 3, and Fig. 5 a vertical sectional view looking to the left from the dotted line *x x.*

In said drawings, the portions marked A represent a frame-work upon which the mechanism is mounted; B, a shaft mounted at one end in an ordinary bearing, A′, and at the other in a sliding bearing; C, said sliding bearing; D, a pitman, the upper end of which terminates in a double rack-bar, *d d′;* E E′, springs secured to said double rack-bar; F F′, projecting arms thereon; G G′, hinged levers operated by said arms; H H′, spring-catches whereby the sliding box C is secured in place, which are operated to release their engagement with said box by said levers; and I, a force-pump apparatus, which is shown in connection with my invention to illustrate its working.

The frame A may be constructed in a convenient and suitable manner to support the mechanism, which is secured thereto by any of the ordinary means.

The shaft B rests in the bearings A′ and C, and has mounted thereon a pinion, B′, and a crank or other device for turning the same, B^2.

The sliding box C is secured to the frame-work by bolts *a*, which pass through slots *c* therein, or by suitable slides. It is adapted to be moved back and forth so as to cause the pinion B′ to engage with one or the other of the sides *d* or *d′* of the double rack-bar, as it operates the pitman to move down or up. It is held in one or the other position until disengaged by the spring-catches H and H′, respectively.

The pitman D is an ordinary pitman, except at its upper end, which is slotted or bifurcated to form a double rack-bar, the two sides being provided with teeth on their adjacent faces, as shown, in which the pinion B′ will engage, and thus drive said pitman up and down.

The springs E and E′ strike against and press upon the shaft B when the pitman is nearing the end of its stroke, and thus force it sidewise, when the sliding bearing C is released and permits. The spring E operates to force the shaft toward the rack portion *d* when the pitman has reached the top of its stroke, and thus throw the pinion B′ into engagement therewith, and the spring E′ operates, when the pitman reaches the bottom of its stroke, to force the shaft B toward the rack portion *d′* and throw the pinion into engagement with that portion. By means of this successive throwing of the pinion back and forth as the ends of the stroke are reached, a continual engagement between it and one of the other of the two rack portions is effected, and a continuous reciprocal movement of the pitman thus secured by a continuous rotation of the shaft in one direction.

The arms F F′ operate through the hinged levers G G′ to raise the spring-catches H H′, and thus release the sliding box C at the proper times to permit the required movement of the same. The arm F operates, when the pitman reaches the top of its stroke, to raise the hinged lever G′, and through it the spring-catch H′, and thus permit the sliding box C, and with it the shaft and pinion, to move toward the opposite side of the machine, (which movement is caused by the spring E,) thereby throwing the pinion out of engagement with the rack portion *d′* and into engagement with the rack portion *d*. The arm or projection F′ operates in a similar manner through the hinged lever G

upon the spring-catch H, and permits the parts C B B′ to execute the reverse movement to that just described.

The spring-catches H H′ operate to catch and hold the sliding box C until disengaged by the operation of parts herein described. As shown in the drawings, (most plainly in Fig. 3,) the catch H is holding the sliding box, and through it and the shaft the pinion B′, toward its side of the machine, thus securing said pinion in engagement with the rack portion *d*. When the sliding box is forced toward the other side, the catch H′ engages therewith and holds it just as securely in that position.

The pump portions I are simply shown so as to illustrate a complete working-machine, there being no intention to limit the use of this invention to a pump, although it is peculiarly well adapted to use in connection therewith.

As will be readily understood from the drawings and the foregoing description, the shaft B makes several revolutions to each stroke made by the pitman, and therefore the pitman is driven with a greatly-increased power over what is produced from the ordinary crank-connection of pitmen with shafts when the length of the stroke is considered. As will also be seen, any desired length of stroke can be obtained by simply increasing the length of the rack-bars. This is of great advantage in such uses as heavy pumping, as from mines, &c., or where a large amount of water is to be raised, as a long and powerful lift is there much more desirable than a shorter and more rapid one, which is proportionately weaker.

Having thus fully described my said invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of the shaft and pinion, the double rack-bar, the sliding box C, the catches therefor, means whereby said rack-bar as it reciprocates operates to alternately disengage said catches, and means whereby said shaft and pinion are moved from side to side as said rack-bar reaches the ends of its stroke, substantially as set forth.

2. The combination of the shaft and pinion, the internally-toothed double rack-bar, and springs E E′ on said rack-bar, which as said rack-bar approaches the ends of its stroke will engage with said shaft and operate to throw said shaft and pinion from one side to the other, whereby said pinion is caused to engage with first one side and then the other of said rack-bar, all substantially as set forth.

3. The combination of the shaft and pinion, the sliding box C, the catches H H′, the levers G G′, the arms or projections F F′, and the springs E E′, all substantially as set forth.

In witness whereof I have hereunto set my hand and seal, at Indianapolis, Indiana, this 11th day of March, A. D. 1882.

THORNTON WILSON. [L. S.]

In presence of—

C. BRADFORD,

CHAS. L. THURBER.