(No Model.) 2 Sheets—Sheet 1.

# E. A. MOON.

## DEVICE FOR CONVERTING MOTION.

No. 381,161. Patented Apr. 17, 1888.

Fig. 1.

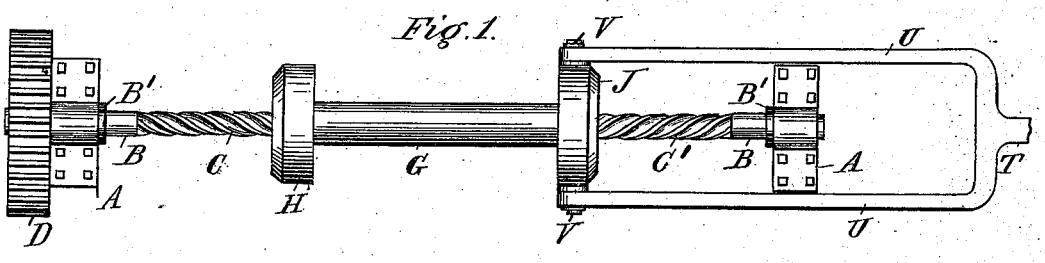


Fig. 2.

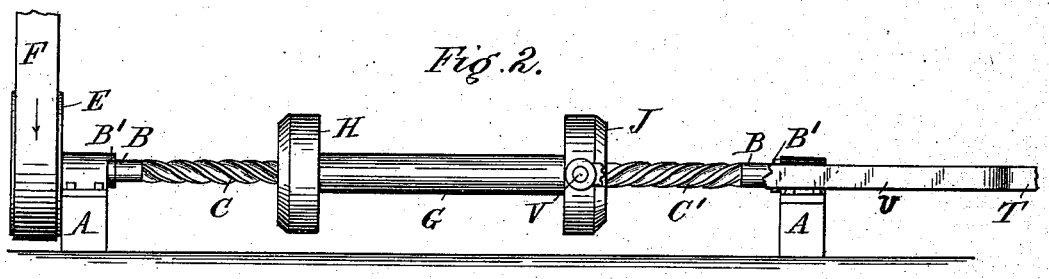


Fig. 4.

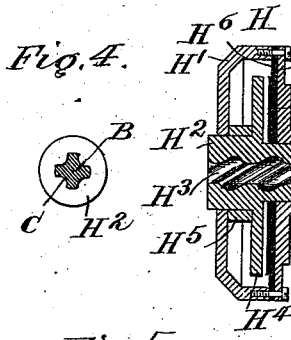


Fig. 3.

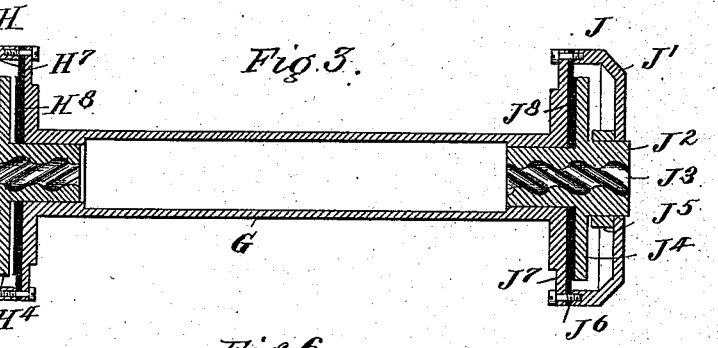


Fig. 5.

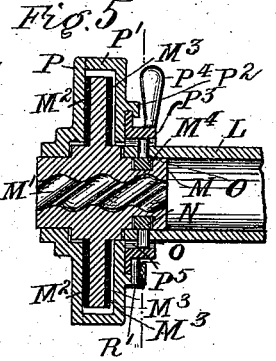


Fig. 7.

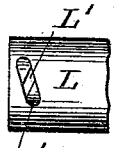


Fig. 6.

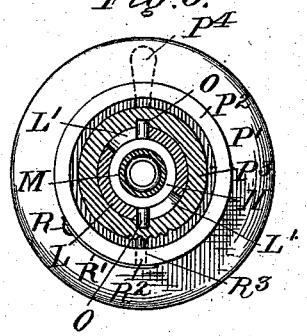


Fig. 8.

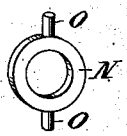



Fig. 9.

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(No Model.) 2 Sheets—Sheet 2.

# E. A. MOON.

## DEVICE FOR CONVERTING MOTION.

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*Fig. 10.*

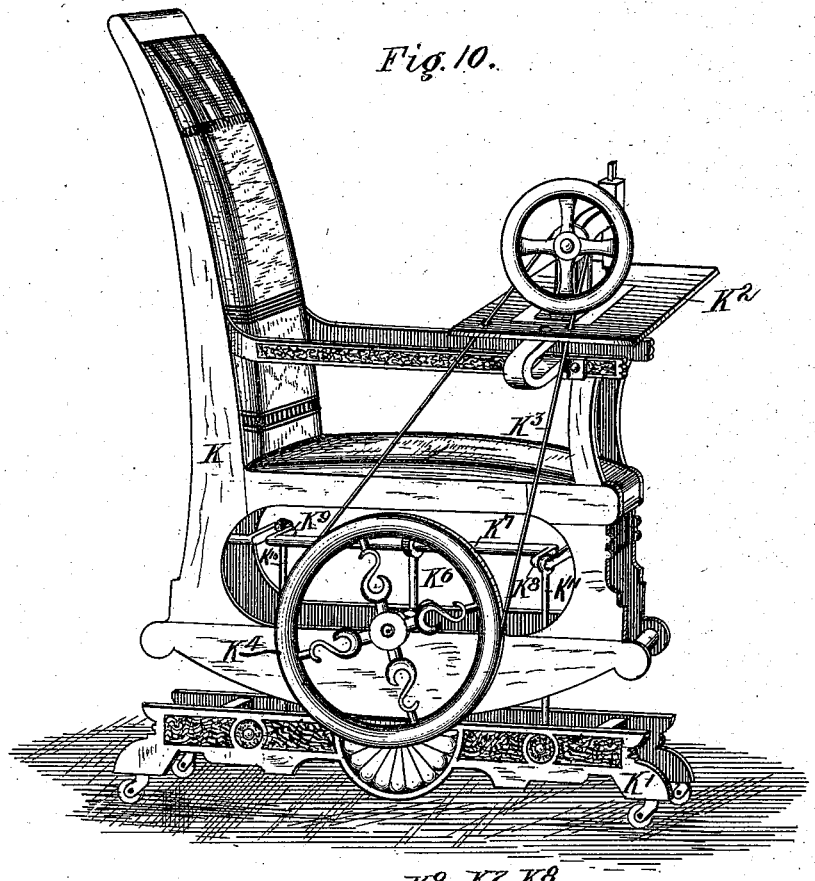
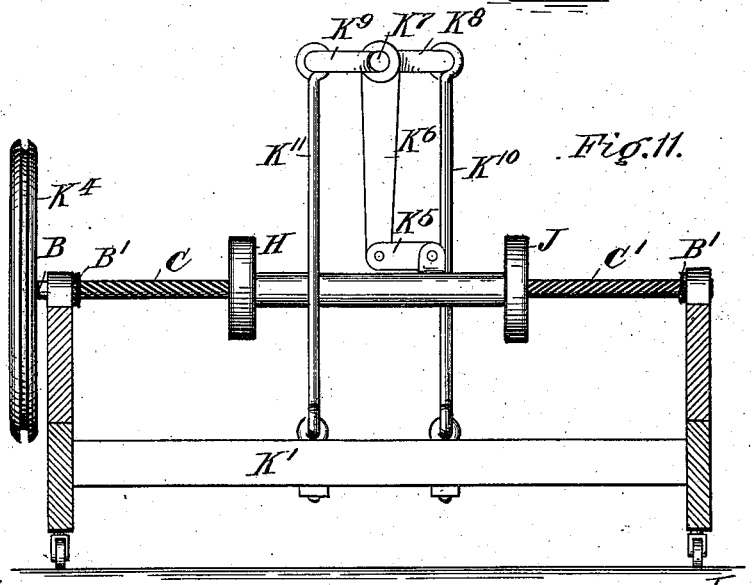



*Fig. 11.*

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# UNITED STATES PATENT OFFICE.

EDWARD ALMERON MOON, OF CLEVELAND, OHIO.

## DEVICE FOR CONVERTING MOTION.

SPECIFICATION forming part of Letters Patent No. 381,161, dated April 17, 1888.

Application filed June 6, 1887. Serial No. 240,478. (No model.)

*To all whom it may concern:*

Be it known that I, EDWARD ALMERON MOON, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a new and useful Device for Converting Motion, of which the following is a specification.

My invention relates to a device whereby reciprocating motion can be turned into rotary motion, and has for its object to provide a simple and convenient device whereby any kind of reciprocating motion can be converted into a rotary motion, and particularly to provide a device whereby such motion may be employed to operate sewing-machines, &c.

My invention is illustrated in the accompanying drawings, wherein—

Figure 1 is a plan view of my device for converting motion. Fig. 2 is a side elevation of the same. Fig. 3 is a longitudinal section through the pair of sliding clutches. Fig. 4 is a cross-section of the spiral rod and an end view of the internally-spiraled portion of the clutch. Figs. 5, 6, 7, and 8 are details of a modification of the clutch, whereby the same may be reversed and locked in position. Fig. 9 is a detail of the spiral rod. Fig. 10 is a perspective of a platform rocking-chair to which my device is attached for the purpose of operating a sewing-machine. Fig. 11 is a cross-section of a portion of the same, showing the operative mechanism.

Like parts are indicated by the same letters in all the figures.

A A are standards or supports in which the ends of the rod B are journaled. These rods are provided at each end with a collar, B′, which engages the inner side of the journal-box, so as to keep the rod B from sliding in either direction. The rod B is provided with the spirals C and C′, spiraled in opposite directions from the central point, $C^2$.

D is a gear wheel or pinion on the end of the rod B.

E is a pulley, which may be used when the gear-wheel is dispensed with, and is secured in like manner to the end of the rod, and F is a belt running thereon. There is a sliding clutch on the rod B, consisting of the ends H and J and the central cylindrical portion, G, and having at its opposite ends the flanges $H^7$ and $J^7$. To these flanges are secured, respectively, the cap-pieces H′ and J′ by bolts or otherwise, as may be desired.

Inserted in the ends of the cylindrical portion G and through apertures in the cap-pieces H′ and J′ are the pieces $H^2$ $J^2$, having the internally oppositely-spiraled apertures $H^3$ $J^3$. These pieces $H^2$ $J^2$ have respectively the flange portions $H^4$ $J^4$ and the collars $H^5$ $J^5$. On the surface of the flanges $H^7$ and $J^7$ are placed packing-rings or roughened surfaces $H^8$ and $J^8$, as shown. This packing or locking material or surface could be on either flange.

K is a rocking-chair, supported on the platform K′ and bearing the sewing-machine head $K^2$, operated by the belt $K^3$ from the fly-wheel $K^4$. Journaled on the rocking portion of the chair is a spiral rod similar to that shown in Fig. 1 and spiraled in opposite directions, as shown, the parts being lettered the same. This rod B is journaled in standards in like manner as the rod B shown in Fig. 1, the standards being portions of the chair. On this rod is placed the clutch having the ends H and J, with the same internal structure as that shown in Fig. 3. To this sliding clutch is pivoted the arm $K^5$, to which is pivoted the arm $K^6$, which in turn is secured to the rock-shaft $K^7$. This rock-shaft is provided with cranks $K^8$ $K^9$ near its opposite ends, and is pivoted or journaled at its opposite ends in the frame of the chair at right angles, or nearly so, to the rod B and somewhat above the same. From these cranks pass, respectively, the rods $K^{10}$ $K^{11}$, which are secured at opposite ends to the platform of the chair.

Referring to Figs. 1 and 2, T is a rod, which connects with the piston-rod of an engine or with any other device from which power is to be obtained, and it is bifurcated at the ends, as shown, having the arms U U, which are pivoted at the points V V to one end, J, of the sliding clutch.

In the modification exhibited in Figs. 5, 6, 7, and 8 the parts are as follows:

L is the central cylindrical portion, having at its ends and on opposite sides of each end the diagonal grooves L′ L′. The end of the piece L passes over the end of the spiraled portion M, which portion is provided with the internal spiral, M′, the double packed or

roughened surfaces $M^2$ $M^3$, and the groove $M^4$, in which lies the ring N, provided with the pins O O. These pins project through the inclined grooves L′ L′ in the end of the cylindrical part L. The case of the clutch is composed of the two portions P and P′, properly secured together and composed of sections. On the portion P′ there is the ledge $P^2$, beneath which lies the edge of the collar $P^3$, which has the handle $P^4$ thereon. This collar is provided with internal grooves, $P^5$, parallel with the length of the cylindrical portion L, and into which the ends of the pins O O project. I have shown in the modification one end of the sliding clutch. The other end, of course, is the same, though reversed, as is clearly understood from an examination of Fig. 3.

On the outer surface of the portion $P^2$ is secured by a bolt the spring R′, having the pin $R^2$ on its inner end and passing through the aperture $R^3$ in the raised portion $P^2$ on the part P′ and engaging a series of notches on the portion $P^3$, thus locking the same in any position it may be desired.

The use and operation of my invention are as follows: I have described, first, a device for converting reciprocating motion into rotary motion, as illustrated in Figs. 1, 2, 3, and 4, which may be employed easily for any purpose or in any machine where it is desired to make this change. The parts having been set in position, as shown in Fig. 1 or Fig. 2, with the gear-wheel or the pulley and belt in proper connection with the parts to which the power is to be applied, the rod T is connected with the piston of a steam-cylinder or with any other power-supplying device from which power is to be derived. The ends U U are pivoted to one end, J, of the sliding clutch, or they may be pivoted to any part of the cylindrical portion G, or to the opposite end of the clutch to the part H. If, now, the power be applied so that the rod T is reciprocated, the sliding clutch will be reciprocated along the rod B. The rod B will be held on its standards A, so as not to move longitudinally, but be free to rotate in the boxings on the standards. The internal spirals, $H^3$ and $J^3$, in the ends of the sliding clutch will engage, respectively, the spirals C and C′ on the rod B. Now, while the sliding clutch is moving toward the left or toward the pulley or cog-wheel on the end of the rod B, it will be apparent that the friction of the rod B within the spirals on the ends of the clutches will cause the flange $H^4$ to press against the packing or roughened surface $H^5$, where it is held from rotation, and the further motion of the clutch in the same direction will cause the spirals C on the rod B to travel in the spirals $H^3$ of the end of the clutch, and thus the rod B will rotate on its standards A A. This rotation will be in the direction of the arrow. When the clutch has reached the end of its stroke toward the left, the reverse motion of the reciprocating rod T will cause the clutch to travel in the opposite direction, and upon its moving in that direction the friction of the spirals C C′ in the spirals $H^3$ $J^3$ will cause the flange $H^4$ to be detached from the packing-surface $H^5$ and will cause the flange $J^4$ in the opposite end of the clutch to engage the packing-surface $J^5$, as shown in Fig. 3, and the further motion of the sliding clutch toward the right will cause the rod B to continue its motion in the same direction as before. Thus, by reciprocating the sliding clutch, having its ends constructed as shown in Fig. 3, on the rod B, having its portions oppositely spiraled, as shown, a constant rotary motion will be imparted to the rod B, so that the reciprocating motion imparted to the sliding clutch will be transmitted in the form of a rotary motion by means of the gear-wheel or the belt and pulley to the machinery to which it may be desired to be applied.

I have illustrated in Figs. 10 and 11 how this device can be employed in operating sewing-machines. There are many instances where it is desired that a sewing-machine should be operated by means other than those commonly employed, and I have adapted my device for use upon a rocking-chair, so that the motion of the chair can be employed to operate the head of the machine, the head being clamped to the arm of the chair and the band passing from the fly-wheel in the usual manner. This fly-wheel is secured to one end of a double-spiraled rod like the rod shown in Fig. 1, which is journaled in the rocking portion of the chair. On this are mounted the sliding clutches, as shown in Figs. 1 and 2, which are linked to the rock-shaft, which rock-shaft is secured in the rocking portion of the chair at right angles, or nearly so, to the frame of the chair, and at its opposite end is attached by links to the permanent or platform portion of the chair, so that by rocking the chair the rock-shaft is set in motion. The arm which depends from it is rocked back and forth. This motion causes the sliding clutch to reciprocate on the rod B, thus giving it a continuous rotary motion, which motion, by means of the belt, is communicated to the sewing-machine and the same is set in motion, as indicated in Figs. 10 and 11. Now it is possible that in some cases and in some devices where my invention may be applied it may be desirable to reverse the motion of the rod. It might be desirable to have the belt travel in a direction opposite to that indicated by the position of the arrow. This I accomplish by means of the mechanism illustrated in Figs. 5, 6, 7, and 8. The internal spiraled piece in the end of the clutch is provided with a flange, upon each face of which is placed the packing material or roughened surface, though the same might be placed on the opposite walls of the chamber in which such spiral piece moves. This spiral piece is provided at its inner end with a projecting portion, which is inserted within the end of the cylindrical connecting-piece. It has also the groove in which lies the collar N, with the projecting pins O O.

In the end of the cylindrical portion L are slots L′ L′, which receive the pins on the ring N. One or both of the pins may be placed in position after the end M is inserted within the end of the cylindrical portion L, the pins projecting through the slots, thus locking the spiraled piece to the end of the connecting cylindrical piece. The shell in which the flange of the spiral piece moves is composed of two or more portions secured together and in suitable sections, and on the outside of the sections of the shell portion P′ is a ledge which holds the collar $P^3$ in position. This collar plays upon the side of the shell, encircles the end of the piece L, and is provided with the handle $P^4$, by which it can be turned on the cylindrical portion L. It is also provided with the slots $P^5$, which are parallel to the length of the cylindrical portion L and receive the pins O O. The ring N has a slight play in its groove. Now, by moving the handle $P^4$ and rotating the collar $P^3$ it will be clear that the ring N will be rotated in its groove, and as the pins O travel in the diagonal slots L′ L′ the position of the portion M will be changed at will. By moving it in one direction the packing-surface is brought in close proximity with the left-hand inner wall of the shell. By moving it in the other the packing-surface $M^3$ is brought near to the other inner wall of the shell. When the clutch is moving toward the left, the packing-surface $M^3$ will be free from the inner wall of the shell, so that it cannot touch the same, and when the clutch is moving toward the right the spiraled piece M will be locked against the inner wall of the shell and the rod will rotate. When the clutch is moving in the opposite direction, the action of the spiral rod will be reversed by the action of the clutch mechanism at the other end of the portion L. Thus by turning the handle $P^4$ the position of the flange on the spiral piece M may be fixed at any convenient point within the shell. The parts may be so set that the spiraled piece M will engage neither of the walls, and thus they will be thrown out of operation altogether, or so that it will engage either wall at will, and thus, by setting the structure as shown, the rotation of the rod B may be changed at will. When the handle $P^4$ has been moved far enough to throw the spiral piece M into the position desired, it is important that it should be locked in that position, so as not to slip, and to effect this purpose I have provided a spring, R′, carrying the pin $R^2$, which engages the notches on the edge of the collar $P^3$, thus locking the same in any position where it may happen to be.

The operation of the modification shown in Figs. 5, 6, 7, and 8 is as follows: The action of the clutches depends upon the side of their cases on which they lock—as, for instance, if the clutches lock on the side of the case toward the connecting-piece, as shown in Fig. 3, then the spiral shaft will move in a certain direction. Now, if those clutches were so arranged as to lock upon the opposite sides, it must be apparent that the spiral shaft would rotate in the opposite direction, for, in the first case, when the shaft is moved toward the left, the right-hand clutch is locked and causes it to rotate. When it is moving toward the right, the left-hand clutch is locked and causes it to rotate in the same direction. If, now, when moving toward the left, the left-hand clutch were locked and the right-hand end loose, it is apparent that the spiraled shaft will rotate in the opposite direction. Now, the devices shown in Figs. 5, 6, 7, and 8 are simply designed to present means whereby the position of the clutches in their cases may be shifted so that they may be locked upon either side of the clutch, as desired.

I claim—

A device for converting reciprocatory into rotary motion, consisting of a shaft journaled and provided with oppositely-spiraled ends, in combination with a sliding clutch the ends of which are provided with oppositely-spiraled pieces having engaging-surfaces on opposite sides of said pieces and with engaging-surfaces on the ends of the shell of the clutch, and suitable means, consisting of the ring N, having the pins O, projecting through and adapted to traverse the slots L′ of the collar $P^3$, whereby the spiraled pieces may be changed in position with reference to the clutches, so that either of the engaging-surfaces may be brought into proximity to the engaging-surface of the clutch, so that the spiraled piece may be fastened upon the engaging-surface either when the clutch moves to the right or to the left, as may be desired.

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