

J. S. WATTERSON.
MECHANISM FOR CONVERTING MOTION.
APPLICATION FILED AUG. 26, 1908.

950,975.

Patented Mar. 1, 1910.

2 SHEETS—SHEET 1.

Fig. 1.

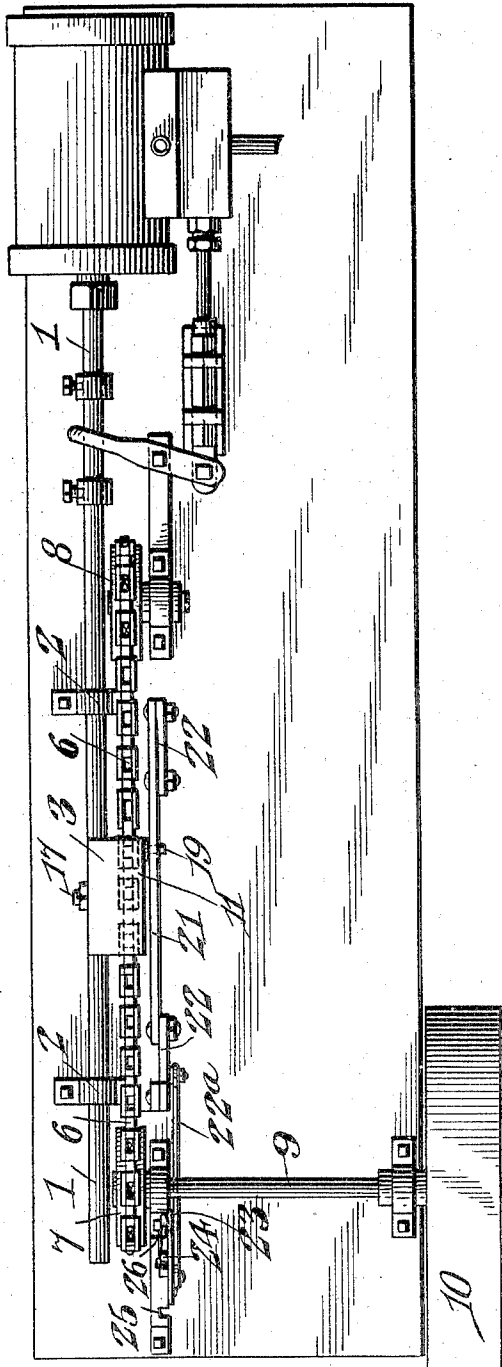
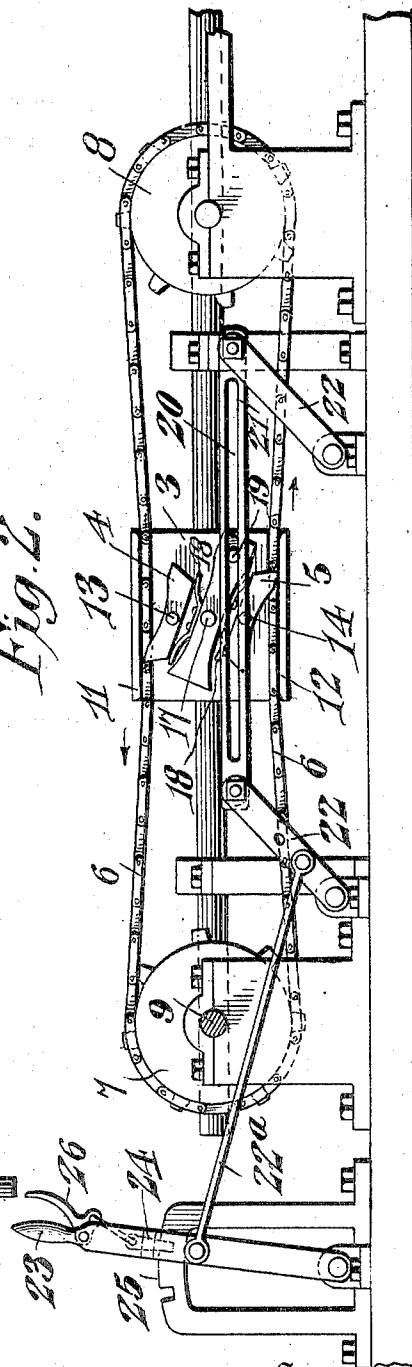


Fig. 2.



Witnesses

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2 SHEETS—SHEET 2.

Fig. 3.

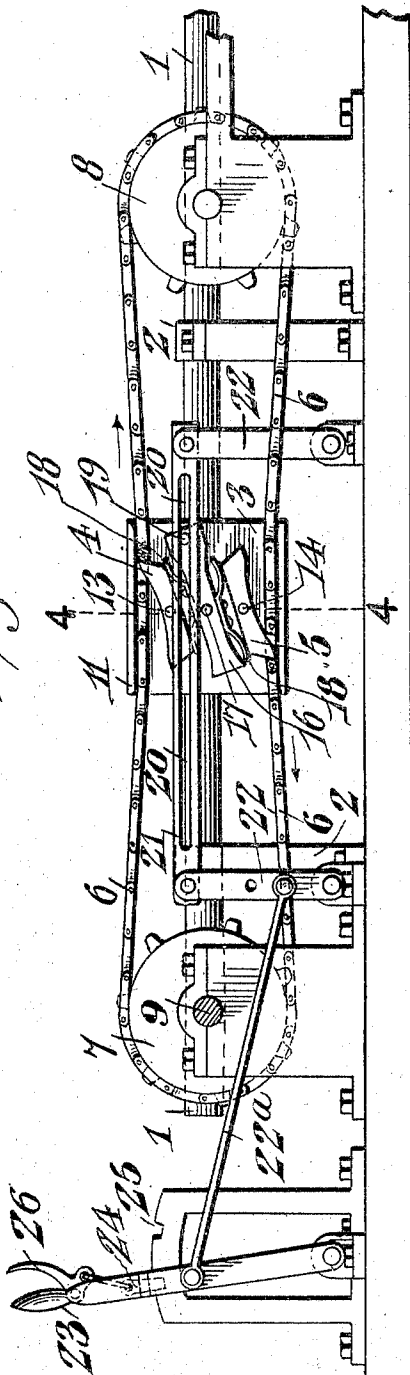


Fig. 4.

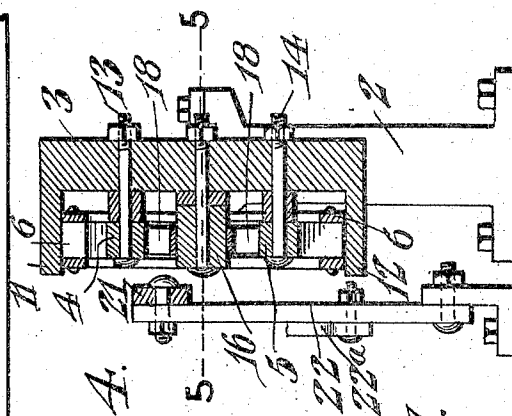


Fig. 5.

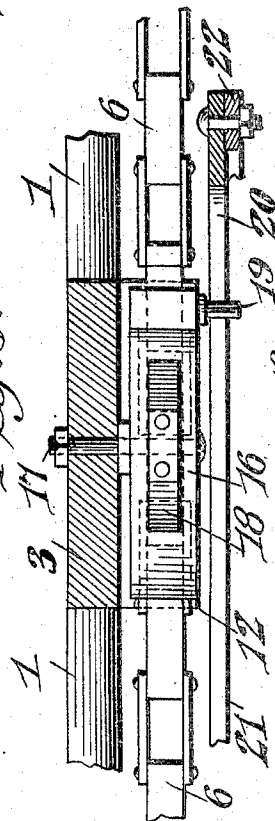
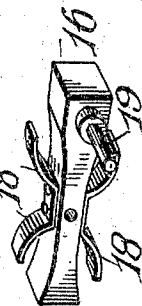


Fig. 7.



Fig. 6.



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MECHANISM FOR CONVERTING MOTION.

950,975.

Specification of Letters Patent.

Patented Mar. 1, 1910.

Application filed August 26, 1908. Serial No. 450,397.

To all whom it may concern:

Be it known that I, JOHN S. WATTERSON, a citizen of the United States, residing at Bristol, in the county of Sullivan and State of Tennessee, have invented a new and useful Mechanism for Converting Motion, of which the following is a specification.

The invention relates to improvements in mechanism for converting reciprocatory motion to rotary.

The object of the present invention is to provide simple, inexpensive and efficient mechanism designed for use in connection with steam and various other kinds of engines, and adapted to enable continuous rotary motion to be transmitted to a driven member from a reciprocating driving member or piston without employing crank mechanism, thereby eliminating the dead centers incident to crank mechanism and enabling the full power of the actuating force to be transmitted to the driven member during each stroke of the reciprocating driving member or piston.

With these and other objects in view, the invention consists in the construction and novel combination of parts hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the claims hereto appended; it being understood that various changes in the form, proportion, size and minor details of construction, within the scope of the claims, may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawings:—Figure 1 is a plan view of a portion of an engine equipped with mechanism, constructed in accordance with this invention for converting reciprocatory motion to rotary. Fig. 2 is a longitudinal sectional view of the same, the belt engaging devices being arranged for moving the belt in one direction. Fig. 3 is a similar view, the belt engaging devices being shifted and arranged for moving the belt in the opposite direction. Fig. 4 is a vertical sectional view, taken substantially on the line 4—4 of Fig. 3. Fig. 5 is a detail horizontal sectional view on the line 5—5 of Fig. 4. Fig. 6 is a detail perspective view of the shiftable member for yieldably holding the

dogs in position for engaging and actuating the endless belt. Fig. 7 is a detail view of one of the dogs.

Like numerals of reference designate corresponding parts in all the figures of the drawings.

1 designates a reciprocating piston, operating in suitable guides 2 and constituting a portion of a steam engine, but the mechanism for converting motion is applicable to various other types of engines employing a reciprocating piston or driving member, and as the particular construction of the engine and means for actuating the piston does not constitute a portion of the present invention, a detail description thereof is deemed unnecessary.

The piston, which is arranged horizontally, is provided with an integral support 3, carrying upper and lower dogs 4 and 5, which constitute devices for engaging an endless belt 6. The endless belt 6, which is preferably in the form of a sprocket chain, is arranged on sprocket wheels 7 and 8 and has upper and lower flights or stretches. The sprocket wheel 7 is fixed to one end of a horizontal shaft 9, disposed transversely with relation to the reciprocating piston and journaled in suitable bearings and having a fly wheel 10, mounted on it at the other end thereof. The fly wheel, which is rotated by the mechanism herein described, is adapted to receive a belt for enabling such rotary motion to be transmitted to the machine or mechanism to be operated, but any other form of gearing may be employed for this purpose, as will be readily understood.

The integral support 3, which is approximately rectangular, extends above and below the horizontal piston rod, and is provided at the top and bottom with horizontal flanges 11 and 12. The upper flange is located above the upper stretch of the endless chain and coöperates with the upper dog 4, and the lower flange 12 is arranged beneath and supports the lower stretch of the sprocket chain and coöperates with the lower dog 5. The dogs, which are spaced apart, are secured to the support by pivots 13 and 14, and they are reversely arranged, the upper end of the upper dog being arranged to engage the upper stretch of the sprocket chain

and the lower end of the lower dog being in position for engaging the lower stretch of the sprocket chain. When the piston is moved in one direction, one of the dogs engages the contiguous stretch of the sprocket chain, and when the piston is moved in the opposite direction, the other dog will engage the other stretch of the sprocket chain. By this construction the sprocket chain is continuously moved in the same direction when the piston rod is reciprocated. The sprocket chain is firmly gripped or held against the flanges by the dogs, and when one of the dogs is engaging and actuating one stretch of the chain, the other dog is sliding over its stretch of the chain in the opposite direction to the movement of the same.

The dogs are yieldably held in position for engaging the upper and lower stretches of the sprocket chain by means of a shiftable member 16, consisting of a bar or piece, pivoted intermediate of its ends to the support at the center thereof by means of a transverse pin or bolt 17 and arranged at an inclination. The shiftable member 16 is provided at its upper and lower edges with springs 18, centrally secured to the shiftable member and having oppositely disposed resilient arms or portions, diverging from the central attaching portion and bearing against the dogs at opposite sides of the pivot or points thereof. The shiftable member is provided at one end with a horizontally projecting pin or arm 19, operating on a longitudinal slot 20 of a horizontally disposed relatively fixed shiftable guide 21, supported by a pair of oscillatory arms 22 and adapted to be raised and lowered to oscillate the shiftable member and change the position of the dogs. When the shiftable guide is arranged at the downward limit of its movement, as illustrated in Fig. 2 of the drawings, the dogs are in position for moving the endless sprocket chain in one direction, and when the guide is raised to the limit of its upward movement, the position of the dogs is changed and the latter are adapted to reverse the chain and move the same in the opposite direction. The oscillatory arms of the reversing mechanism are arranged in a vertical position when the horizontal guide is at the limit of its upward movement, and they are set at an inclination when the guide is lowered for changing the position of the dogs. The oscillatory arms are pivoted at their lower ends to suitable supports, and one of the arms is connected by a rod 22^a with a shifting lever 23, equipped with a dog or detent 24, adapted to engage a suitable ratchet 25 and connected with a latch lever 26, located adjacent to the handle or grip of the shifting lever. The shifting lever is adapted to be oscillated to change the dogs from one position to the other.

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

1. In mechanism of the class described, the combination with a reciprocatory driving member, of a driven member including an endless belt having opposite stretches, spaced belt-engaging pawls located between the stretches of the belt and extending longitudinally of the same and pivoted at an intermediate point, each pawl cooperating with one of the stretches, and reversing mechanism for swinging the pawls on their pivots to present either end of the pawls to the belt for driving the latter in either direction.

2. In mechanism of the class described, the combination with a reciprocatory driving member, of a driven member including an endless belt having opposite stretches, spaced belt-engaging pawls located between the stretches of the endless belt, each pawl cooperating with one of the stretches and pivoted at an intermediate point and shiftable to present either end to the adjacent stretch of the belt, whereby the pawls may be arranged for driving the belt in either direction, a shiftable member interposed between the belt-engaging pawls, and springs located at opposite sides of the shiftable member and carried by the same and yieldably maintaining the belt-engaging pawls in position for engaging the opposite stretches of the belt.

3. In mechanism of the class described, the combination with a reciprocatory driving member, of a driven member including an endless belt having opposite stretches, spaced belt-engaging pawls located between the stretches of the endless belt, each pawl cooperating with one of the stretches and pivoted at an intermediate point and shiftable to present either end to the adjacent stretch of the belt, whereby the pawls may be arranged for driving the belt in either direction, and a shiftable member provided with springs secured at an intermediate point to the shiftable member and having opposite arms or portions bearing against the opposite portions of the belt-engaging pawls, said shiftable member being movable to simultaneously change the position of the pawls.

4. In mechanism of the class described, the combination with a reciprocatory driving member, of an endless belt, spaced belt engaging devices carried by the driving member and arranged to engage the belt, a shiftable member interposed between and arranged to simultaneously actuate both of the belt engaging devices, and operating mechanism provided with a relatively fixed adjustable guide connected with the shiftable member.

5. In mechanism of the class described,

the combination with a reciprocatory driving member, of an endless belt, spaced belt engaging devices carried by the driving member and arranged to engage the belt, a shiftable member interposed between and arranged to simultaneously actuate both of the belt engaging devices, operating mechanism comprising a relatively fixed guide connected with the shiftable member, oscillatory arms supporting the guide, and means for oscillating the arms.

6. In mechanism of the class described, the combination with a reciprocatory driving member, of an endless belt, spaced belt engaging devices carried by the driving member and arranged to engage the belt, a shiftable member interposed between and arranged to simultaneously actuate both of the belt engaging devices, operating mechanism comprising a relatively fixed guide connected with the shiftable member, oscillatory arms supporting the guide, and a

shifting lever connected with one of the arms for oscillating the same.

7. In mechanism of the class described, the combination with a reciprocatory driving member, of an endless belt, spaced belt engaging devices, a shiftable member located between and arranged to simultaneously actuate the belt engaging devices and provided with a projecting portion, and operating mechanism including a relatively fixed guide provided with a longitudinal slot receiving the projecting portion of the shiftable member, and means connected with the guides for changing the position of the same.

In testimony, that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

JOHN SHARP WATTERSON.

Witnesses:

SAM. COHEN,
JOHN KING.