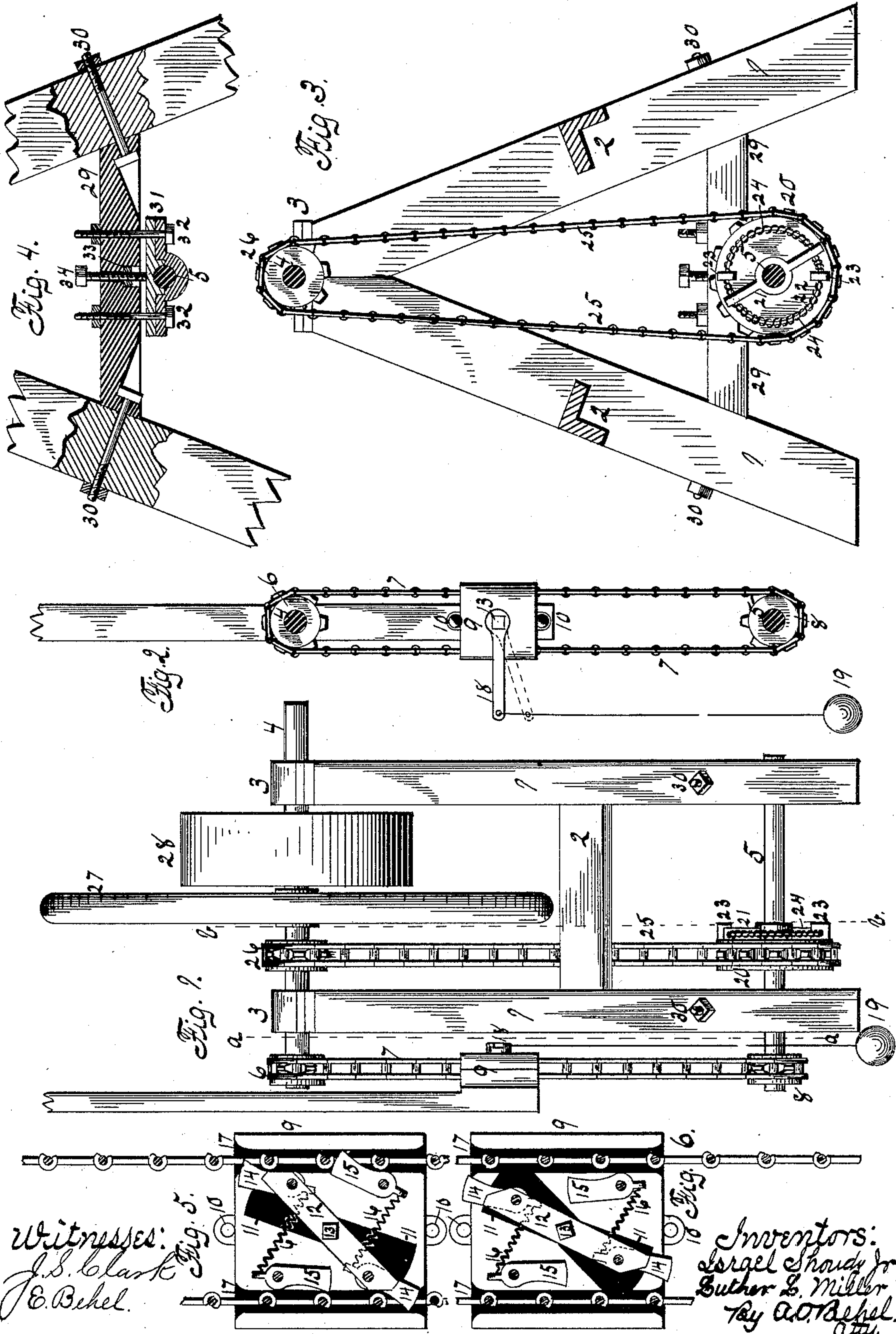


(No Model.)

I. SHOUDY, Jr. & L. L. MILLER.
POWER CONVERTER.

No. 431,854.

Patented July 8, 1890.



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UNITED STATES PATENT OFFICE.

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POWER-CONVERTER.

SPECIFICATION forming part of Letters Patent No. 431,854, dated July 8, 1890.

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To all whom it may concern:

Be it known that we, ISRAEL SHOUDY, Jr., and LUTHER L. MILLER, citizens of the United States, residing at Rockford, in the county of Winnebago and State of Illinois, have invented certain new and useful Improvements in Power-Converters, of which the following is a specification.

The object of this invention is to convert a reciprocating movement into a rotary motion, and which is especially adapted for use in connection with windmills for the various purposes for which such power may be employed.

In the accompanying drawings, Figure 1 is a side elevation of our power-converter. Fig. 2 is a vertical section on dotted line *a*, Fig. 1. Fig. 3 is a vertical section on dotted line *b*, Fig. 1. Fig. 4 is a vertical section through one of the adjustable box-bearings. Fig. 5 is an interior view of the clutch mechanism with one-half of the outer casing removed. Fig. 6 is a similar view to Fig. 5, showing the pawls held out of action.

The frame-work for supporting the operating parts consists of legs 1, joined together at their tops and held separated by cross-bars 2. Upon the upper ends of these legs are placed box-bearings 3, supporting the horizontal shaft 4. A shaft 5 is supported in bearings near the lower end of the frame-work. A sprocket-wheel 6 is mounted loosely upon the projecting end of the shaft 4 and is connected by a chain 7 with a sprocket-wheel 8, secured on the projecting end of the shaft 5, so as to turn therewith. A clutch mechanism having its casing in two sections 9 is secured to the pitman or pumping rod of a windmill by bolts passing through eyes 10, or when the power is located some distance from the mill to some part having a connection with the pitman-rod. A portion of the casing is recessed, as at 11, in which is pivoted a bar 12 about midway of its length, and has a square shank 13, that projects through the casing on the side opposite the pitman-rod. Pawls 14 are pivoted near the ends of the bar 12 and move with the bar in its oscillatory movements. Pawls 15 are pivoted to the casing and are connected with pawls 14 by coil-spring 16, connected to an extension on each of the pawls. The casings are provided with lengthwise chain-grooves 17.

With the casing secured to the pitman-rod, the pawls in position, and the chain 7 passing through the casing, the clutch mechanism is in position to be operated. In the upward movement of the pitman-rod one of the pawls will engage the chain on the right-hand side, thereby carrying the chain upward the length of the stroke. In the downward portion of the stroke one of the pawls on the left-hand side will engage the chain, carrying it downward, thereby causing a rotary movement of the sprocket-wheels carrying the chain. This movement is imparted to the shaft 5. While a pawl on one side is in engagement with the chain the pawls on the opposite side will rock on their pivots, allowing the chain to pass. By means of the arm or lever 18, placed on the shank 13, the pawls may be held out of engagement with the chain, allowing the pitman-rod to reciprocate for the purpose of pumping water without running our power-converter. This is accomplished by oscillating the bar 12, carrying the pawls, moving them out of contact with the chain, and the spring-connection between the pawls will move the pawls not having a connection with the bar out of action. We have employed a weight 19, having a connection with the arm 18, for holding the pawls out of action.

It is evident that instead of the pawls being carried by a single head the head may be in two sections, one section embracing the chain in its upward movement and the other in its downward movement. It is further evident that a belt or rope might be used in place of the chain, and the clutch mechanism so constructed as to embrace the belt or rope without departing from our invention. In this instance we have shown four pawls, two on each side, set with relation to each other so that when one pawl is in engagement with the chain the other will be in the opening of a link, thereby loosening but the one half of the length of a link at the ends of the stroke of the pitman-rod.

Within the frame-work and upon the shaft 5 is loosely mounted a sprocket-wheel 20, and has a connection with the shaft through the medium of other parts, which consists of a two-armed lever 21, pivoted or otherwise secured to the shaft. The ends of these arms are perforated, and through which passes a

curved wire rod 22, having its ends secured in studs 23, projecting from the face of the wheel 20. Springs 24 are placed on the rod 22 on each side of the two-armed lever. The motion imparted to the shaft 5 by the clutch mechanism is an intermittent rotary movement consequent upon the pawls alternately engaging the chain belt. Therefore the two-armed lever has not a continuous rotary movement.

By the employment of the spring-connection with the sprocket-wheel 20 the first movement of the arms will be to compress the spiral springs, thereby storing up power to drive the sprocket-wheel during the stand-still period of the two-armed lever. By this arrangement we are able to produce a continuous rotary movement of the sprocket-wheel 20. This sprocket-wheel, by means of a chain belt 25, has a connection with a sprocket-wheel 26, secured to the horizontal shaft 4, and upon said shaft are mounted a balance-wheel 27 and a pulley 28, on which a belt may be placed to transmit the power to the machine which it is desired to drive. The lower shaft 5 is supported in vertically-adjustable bearings. (Shown at Fig. 4.) A brace 29 is secured to the legs 1 by bolts 30. The bearing 31, that surrounds the shaft, is the ordinary two-part box, through which pass bolts 32, which also extend upward through the brace and receive screw-nuts on their projecting ends. The under side of the brace is recessed, and in said recess is placed a screw-nut 33, through which passes a threaded bolt 34. By means of this bolt the bearing is held firmly in its adjusted position, and the employment of the screw-nut saves the labor of tapping the brace.

We claim as our invention—

1. In combination, wheels, a belt connecting the wheels, and a reciprocating head having ways for the belt and provided with an

oscillating bar, pawls pivoted to the head at each side of the oscillating bar, pawls pivoted to each end of the said bar, and springs for connecting the pawls of the bar to the pawls of the head.

2. The combination of a shaft, a two-arm lever secured thereto, a pulley loosely mounted on the shaft and provided with projecting studs on its face, a ring secured to said studs and projecting through the arms of said lever, and springs engaging said ring and bearing with their ends against said studs, substantially as set forth.

3. A converter for changing a reciprocating movement into a rotary movement, consisting of suitable frame-work supporting two shafts, wheels mounted on the shafts and having a belt-connection, a reciprocating head provided with pawls which alternately engage the belt, a wheel loosely mounted on one of the shafts, a two-armed lever secured to the shaft, a spring-connection between the lever and wheel, and a connection between the wheel and the other shaft, substantially as set forth.

4. A converter for changing a reciprocating movement into a rotary movement, consisting of suitable frame-work supporting two shafts, wheels mounted on the shafts and having a belt-connection, a reciprocating head provided with pawls which alternately engage the belt, a wheel loosely mounted on one of the shafts, a two-armed lever secured to the shaft, a spring-connection between the lever and wheel, and a belt-connection between the wheel and a wheel mounted on the other shaft, substantially as set forth.

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