(No Model.)

J. J. F. McDERMOTT.

POWER TRANSMITTER FOR WINDMILLS.

No. 559,082. Patented Apr. 28, 1896.

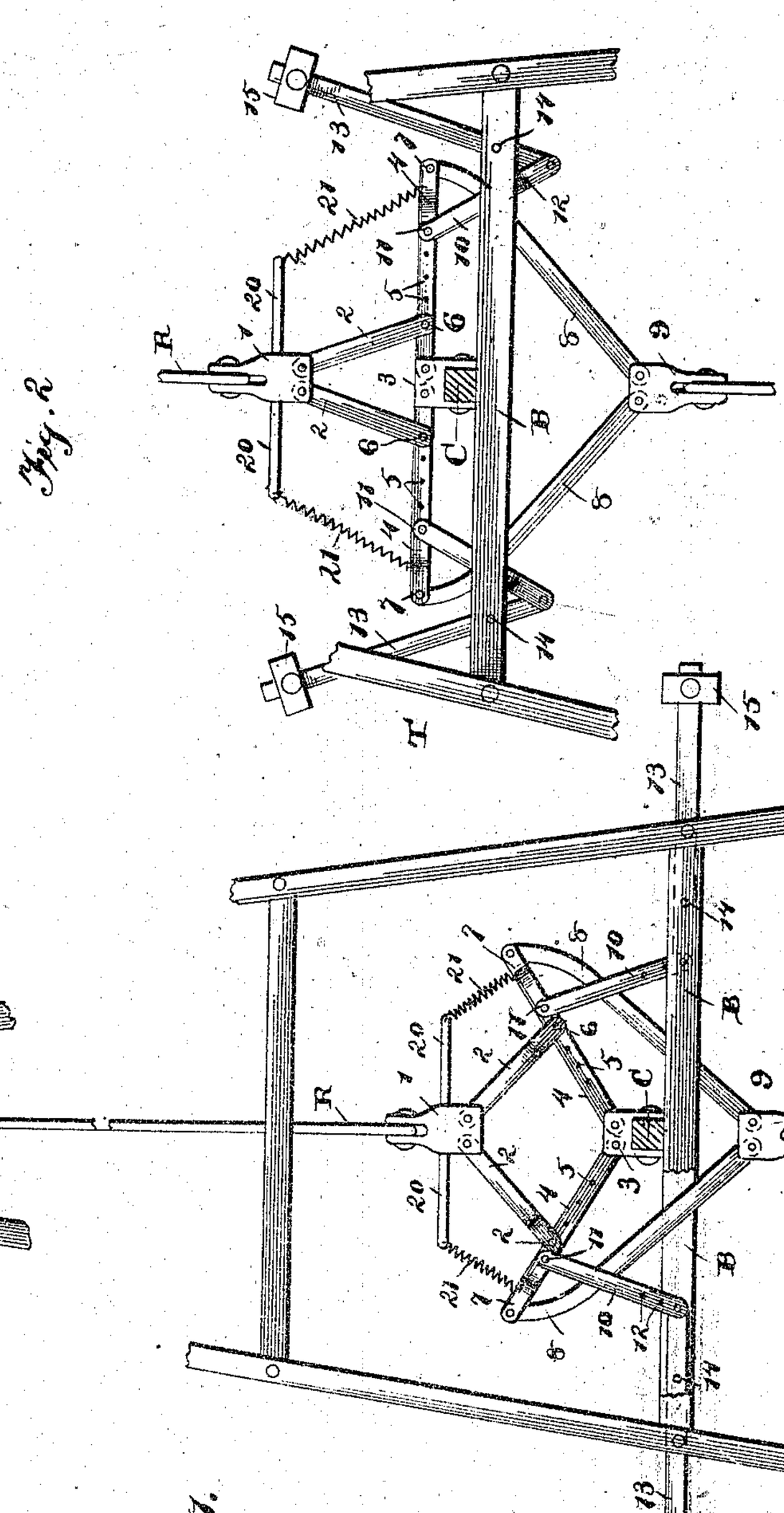

Fig. 2.

Fig. 1.

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UNITED STATES PATENT OFFICE.

JAMES JOSEPH FRANCIS McDERMOTT, OF ST. PAUL, MINNESOTA, ASSIGNOR OF ONE-HALF TO ANTHONY YOERG, JR., OF SAME PLACE.

POWER-TRANSMITTER FOR WINDMILLS.

SPECIFICATION forming part of Letters Patent No. 559,082, dated April 28, 1896.

Application filed August 6, 1895. Serial No. 558,398. (No model.)

To all whom it may concern:

Be it known that I, JAMES JOSEPH FRANCIS MCDERMOTT, a citizen of the United States, residing at St. Paul, Ramsey county, Minnesota, have invented certain new and useful Improvements in Power-Transmitters for Windmills and the Like, of which the following is a specification.

This invention relates more especially to that class of devices known as "mechanical movements;" and the object of the same is to produce a device of this character capable of attachment more particularly to a windmill and adapted to convert the usually short stroke of the rod driven by the wheel into a longer stroke of the pump-rod.

Water is the great desideratum on a farm, the life and health of man and beast and the productiveness of the soil absolutely depending on it. It is true that a short stroke of the pump-rod continued for twenty-four hours would raise as large a quantity of water as is possible by a stroke of double length continued for but twelve hours; but, as a steady wind-power cannot always be relied on, it is the part of wisdom and economy to cause the rotation of the wheel to draw up all the water possible within the shortest space of time, especially during seasons of drought and while the wind is liable to die out completely at any time. To this end I have devised a mechanical movement which will convert a short stroke on the power-rod into a longer stroke on the pump-rod. Moreover, it is well known that the sudden upward movement of the pump-rod and its valve as the rod commences its upward stroke is injurious to the strongest pump and in time will necessitate repairs. To overcome this, various devices have been employed, including a stout spring interposed within the length of the rod. The device described below (whether the springs are used or not) effectually prevents all jerking on the rod by the use of weights which do not wear out or become affected by exposure to atmosphere like springs. The specific construction of the device is given below, wherein reference is made to the accompanying drawings, in which—

Figure 1 is a side elevation of this improved device with the pump-rod at its highest point. Fig. 2 is a similar view with the pump-rod lowered and showing the toggle adjusted to produce a stroke of different length.

Referring to the said drawings, the letter T designates the windmill-tower, and W the wind-wheel. From the latter the power-rod R leads downward through the tower, as usual.

P is a pump mounted above a suitable well, cistern, or other source of water supply, and P R is the pump-rod thereof. Heretofore the power-rod R was connected directly or pivotally with the pump-rod P R, or possibly a stout spring was interposed between them to prevent jerking; but my invention consists in interposing at this point a mechanical movement which not only prevents jerking on the pump-rod, but also practically doubles the length of the stroke thereof—that is to say, where the stroke of the power-rod R, produced by a small wheel, is about four inches, the use of my invention will impart a stroke to the pump-rod P R of about eight inches, although this distance can be varied by the adjusting means which I employ or any equivalent thereof.

Coming now to the present invention, the numeral 1 designates a fork, clevis, or similar device to which the lower end of the power-rod is connected in any preferred manner, and 2 2 are the arms of a toggle, pivoted at their upper ends to this fork and diverging downwardly.

3 is a support or block, preferably mounted on a cross-beam C in the tower, and 4 4 are what we will call the horizontal "arms," pivoted at their inner ends to this block and extending nearly horizontally outward from opposite sides thereof. The bodies of these arms are provided with several holes 5 5, in which the lower ends of the toggle members may be adjustably pivoted, as by the bolts 6 6, and their outer ends are forked, as at 7. Within the latter are pivoted the upper ends of two rods 8 8, which preferably curve slightly inward and converge toward their lower ends, passing intermediate their ends between a double beam B of the tower, and their lower extremities are pivoted to a fork or clevis 9, wherein is secured the upper end of the pump-rod, as shown.

10 is a link, preferably double, pivoted at

its upper end at 11 to each arm 4, just inside its fork 7, extending thence downward and slightly outward between the two members of the double beam B, and provided with a number of holes 12 near its lower end, and 13 is a lever, pivoted at its inner end in one of these holes, having its fulcrum 14 between its extremities supported in the beam B, and carrying a weight 15 at or near its outer end, as shown. There are two of these links, levers, and weights, one for each arm 4. In some cases springs may also be used in this device, and I have shown them as applied thereto in the drawings. My preferred method of applying them is to locate a cross-arm 20 through the upper clevis 1, and connect the springs 21 at their upper ends with the extremities of this arm, and at their lower ends with one of the holes 5 5 in the arms 4 4, as shown, although obviously the springs might be attached at several other points in the device, if desired.

Fig. 1 shows the device set to produce a short stroke of the pump-rod, and Fig. 2 a long stroke, the latter end being effected by moving the bolts 6 6 nearer the center. In operation the crank-wheel connected with the wind-wheel reciprocates the power-rod R through a distance of, say, four inches. This causes the clevis 1 to rise and fall for that distance. The arms 4 are hence moved on their pivots in the block 3 by the toggle 2, and their outer ends are caused to rise and fall for a greater distance, the latter being regulated by the position of the bolts 6. The forks 7 at such outer ends raise and lower the rods 8, and the latter move the lower clevis 9, which carries the pump-rod P R. As the power-rod and pump-rod descend from the position shown in Fig. 1 the descending arms 4 push downward on the links 10 and cause the weights 15 to rise, thus balancing the weight of the two rods, (and the springs 21, if employed, assist at this time,) and toward the lower end of the stroke the two weights swing inward over their fulcrums, so as to remove this balancing effect from the rods and permit the crank in the wind-wheel mechanism to pass the dead-center at its lowest point.

The use of the springs is of course optional with the mill-owner, and to that end I propose to supply the cross-arm 20 with each upper clevis and the springs themselves, and leave it to his judgment whether to use them or not, according as the exigencies of each individual case shall demand.

All parts of the desired sizes, shapes, materials, and ornamentation, and considerable change from the exact construction described may be made without departing from the spirit of my invention. It will be obvious that the device of itself may be employed in numerous other places and put to a variety of uses without losing its identity as a means for doubling the length of a stroke, or, if turned about end for end, for dividing the length thereof. I do not, therefore, wish to be considered as limiting its use to windwills alone.

What is claimed as new is—

1. In a mechanical movement, the combination with a vertically-reciprocated upper clevis, a toggle pivoted thereto, a fixed support beneath the clevis, divergent arms pivoted thereto, the lower ends of the toggle members being pivoted to such arms between their ends, rods pivoted to the outer ends of the arms and converging downward, and a lower clevis pivoted to the lower ends of the rods; of levers standing at opposite sides of said support and pivoted between their ends in suitable fulcrums, weights at their outer ends, and outwardly-diverging links pivotally connecting their inner ends with said arms and of such length as to throw the weights over the lever-fulcrums, substantially as described.

2. In a mechanical movement, the combination with a vertically-reciprocated upper clevis, a toggle pivoted thereto, a fixed support, divergent arms pivoted thereto and to whose bodies the lower ends of the toggle members are pivoted, and rods leading from the outer ends of the arms downward to the work; of two weighted levers, links connecting their lighter ends with said arms, a cross-arm through said clevis, and springs connecting the ends of this arm with the divergent arms, as and for the purpose set forth.

3. In a mechanical movement, the combination with a reciprocating clevis, a fixed support in line of its reciprocation, a toggle pivoted to the clevis, divergent arms pivoted to the support and to whose bodies the ends of the toggle members are pivoted, and rods leading from the outer ends of the arms to the work; of a cross-arm fixed through said clevis, and contractile springs connecting the ends of this arm with said divergent arms, as and for the purpose set forth.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JAMES JOSEPH FRANCIS McDERMOTT.

Witnesses:
LOUIS FEESER, Jr.,
JOHN F. BRUGGEMAN.