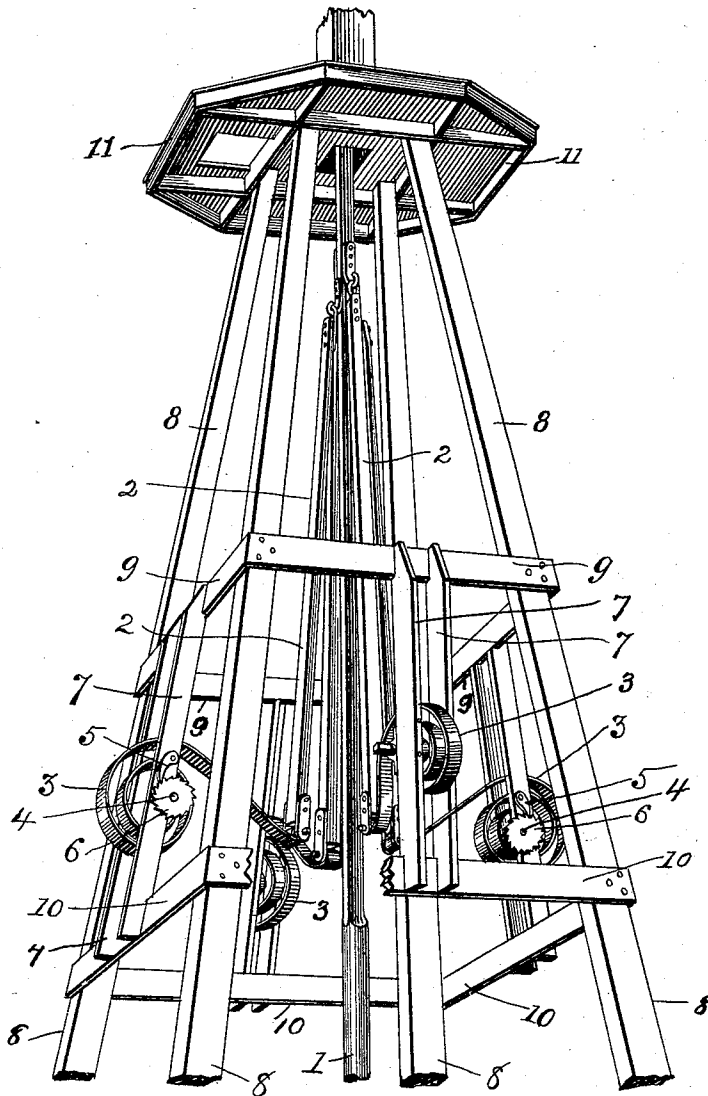


(No Model.)

W. L. BLACK.
COMPENSATING PUMP SPRING.

No. 495,294.

Patented Apr. 11, 1893.



Witnesses:

Gray B. Hills,
F. M. Ritter, Jr.

Inventor:

William L. Black
By his attorneys
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UNITED STATES PATENT OFFICE.

WILLIAM L. BLACK, OF FORT MCKAVETT, TEXAS.

COMPENSATING PUMP-SPRING.

SPECIFICATION forming part of Letters Patent No. 495,294, dated April 11, 1893.

Application filed July 29, 1892. Serial No. 441,619. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM L. BLACK, a citizen of the United States, residing at Fort McKavett, in the county of Menard and State of Texas, have invented certain new and useful Improvements in Compensating Pump-Springs; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention is designed as an improvement upon my former invention in compensating pump springs, patented to me April 21, 1891, No. 450,657. In the former arrangement the suction rod was connected by means of an adjustable sleeve with the inner ends of flat plate springs which were connected at their outer ends to the derrick or framing, short links being interposed between the inner ends of the springs and the sleeve. In the present improvement I dispense with the sleeve, and employ volute springs instead of the straight flat springs formerly used; I also dispense with the links and connect the inner ends of the springs to long pitmen which have a pivotal connection with the suction rod at a point above the springs; I furthermore provide a means for adjusting the tension of the springs without altering the connection of the same with the suction rod. By reason of these improvements I am enabled to secure greater freedom of movement for the suction rod, and obtain a more advantageous application of the spring power, besides providing for a more simple and effective adjustment for the spring.

The improvement consists in the construction and arrangement hereinafter described and claimed, and illustrated in the accompanying drawing representing in perspective a fragment of the frame work or trestle of a windmill pump with my improved compensating spring connected with the suction rod.

The framing of the pump may be of any approved pattern, that shown in the drawing being of a common style, consisting of upright corner posts 8, cross pieces 9, 10, connecting the posts, and the platform 11 at the apex of the trestle. The suction rod 1 is of the form and construction ordinarily employed in this class of pumps. The upper portion of the rod is preferably squared, as shown in the draw-

ing, and to each of the four sides is attached by any suitable means a long pitman 2.

The means shown in the drawing for connecting the pitman with the rod consist of small plates secured to the rod and having hooks which engage eyes formed on corresponding plates fastened to the upper ends of the pitmen. Obviously any other devices may be employed for connecting the parts together.

Between the cross pieces 9, 10, on either side of the frame, I secure pairs of vertical parallel bars 7, and in suitable boxes mounted on these bars I journal short shafts 4. On one end of each of these shafts is rigidly secured a ratchet wheel or disk 6, and the opposite end of the shaft which projects slightly beyond its bearing box is squared for a purpose to be presently described. Pawls 5 are pivoted on the bars 7 in proximity to the ratchets, and these pawls may be spring pressed or held by gravity into normal engagement with the said ratchets to prevent their turning backward.

Secured to each of the shafts 4 is one end of a long plate spring coiled or wound into the form of a volute. The other end of each spring is extended inward toward the center of the trestle and is connected to the lower end of one of the pitmen 2. The connection shown in the drawing is a pivotal one, formed by turning over the end of the spring and running through the eye thus formed a pintle connecting a pair of small plates fastened to the lower end of the pitmen.

The construction being as thus described, the operation is in a general way the same as in my former patent of April 21, 1891. Starting with the suction-rod in its elevated position, the springs are not materially strained, but hold the rod up against descent by its own weight. As the crank turns to force the rod down, the springs are bent in an obvious manner and put under increased tension. As soon as the rod starts on its upstroke the springs recoil and assist the cranks in pulling up the rod, thereby reducing by the amount of their expansive force the power required to lift the rod. It thus appears that by dividing the work to be done between the up and down strokes of the rod I distribute the power over both halves of the crank's revolution, and thereby utilize the entire revolution, instead of doing all the work in one half of the

revolution and leaving the other half practically idle. The springs are independently adjustable by means of the shaft and pawl and ratchet arrangement, the squared end of the shaft permitting the application of a handle or wrench thereto for the purpose of turning it to wind up the spring. The springs should be properly adjusted or set to hold up the weight of the rod, and the independent adjustment permits the equal distribution of same on the four springs.

I do not wish to be understood as limiting the invention to windmill pumps, as it may obviously be applied to other power actuated pumps, or even to hand actuated devices.

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

1. The combination of the suction rod, the pitmen connected therewith at their upper ends, and the volute springs secured to the framing and connected to the free lower ends of the pitmen, substantially as described.

2. The combination of the suction rod, the pitmen connected therewith at their upper ends, and the volute springs, the outer ends of the springs being connected to shafts having means for adjustment to vary the tension of the springs, and the inner ends being connected to the free lower ends of the pitmen, substantially as described.

3. The combination of the suction rod, the pitmen 2 pivotally connected with the rod at their upper ends, and the volute springs 3, the outer ends of the springs being connected to the shafts 4 having pawl and ratchet adjustments 5, 6, for the purpose of varying the tension of the springs, and their inner ends being connected with the lower free ends of the pitmen, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM L. BLACK.

Witnesses:

TOM ELLIOT,
THOMAS BALL.