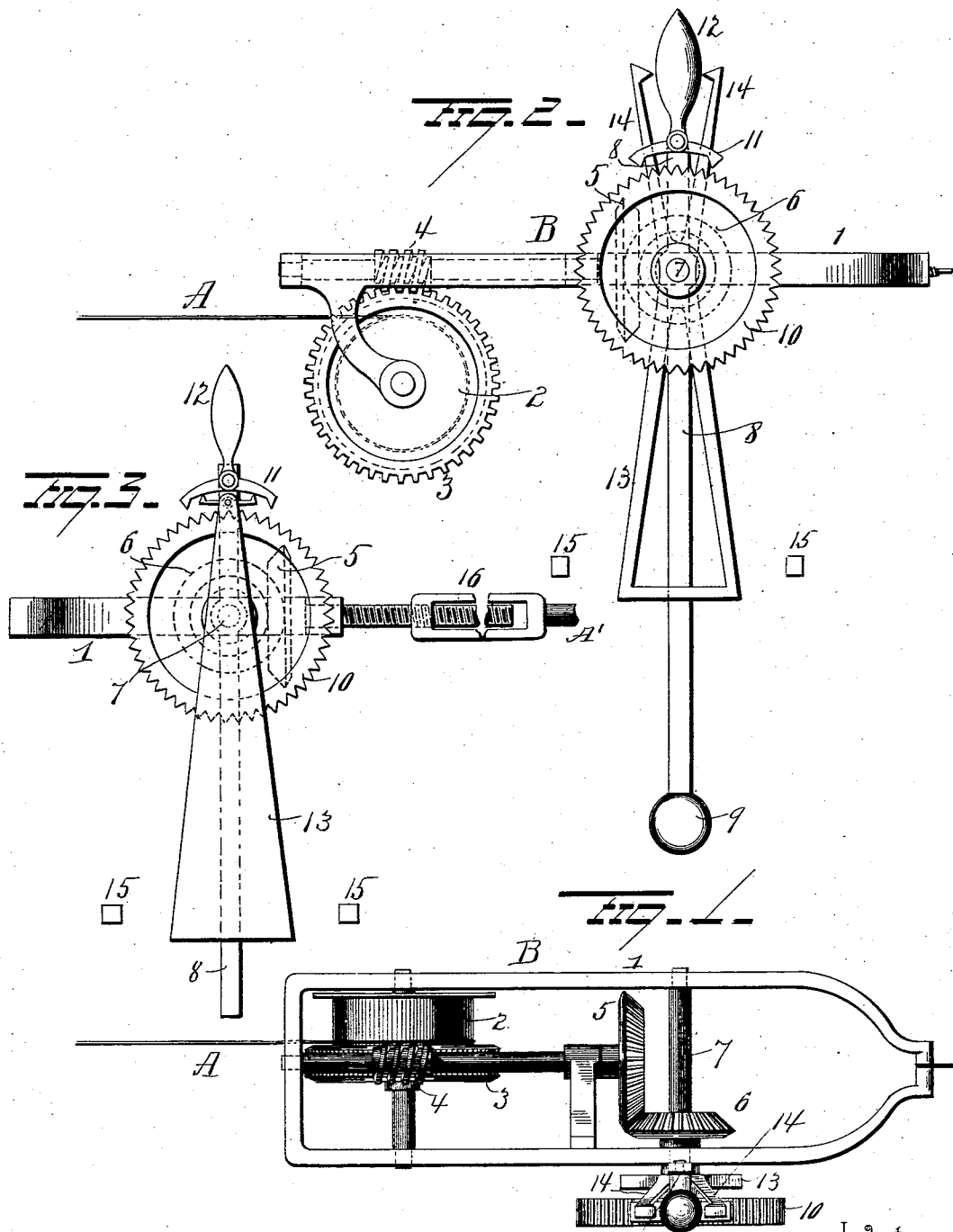


(No Model.)

G. ALLEN.
SYSTEM FOR OPERATING OIL WELLS.

No. 569,157.

Patented Oct. 13, 1896.



Witnesses

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GEORGE ALLEN, OF FRANKLIN, PENNSYLVANIA.

SYSTEM FOR OPERATING OIL-WELLS.

SPECIFICATION forming part of Letters Patent No. 569,157, dated October 13, 1896.

Application filed June 18, 1896. Serial No. 595,920. (No model.)

To all whom it may concern:

Be it known that I, GEORGE ALLEN, a resident of Franklin, in the county of Venango and State of Pennsylvania, have invented certain new and useful Improvements in Systems for Operating Oil-Wells; 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.

My invention relates to an improvement in systems for operating oil-wells.

It has been heretofore proposed to operate a number of oil-wells from a central source of power and to transmit motion from such central source of power to the devices in the wells by means of wire or cable-lines, rods, &c. These lines or rods are often from one to two thousand feet in length and have a play of about eighteen inches. The difference in temperature on the iron rods or wires and the effect of the weather on wooden rods causes them to vary so much in length that the valves in the working barrels either strike together or are too far apart.

It is the object of my invention to provide means whereby to maintain the connections between the source of power and the operating devices in the well of uniform length under all conditions of the weather.

A further object is to provide means whereby a connection between driving and driven mechanism will be automatically maintained at a uniform length.

With these objects in view the invention consists in the combination, with a connection between driving and driven mechanism, of means constructed and adapted to maintain said connection of uniform length under varying conditions of temperature and weather.

The invention further consists in a system of oil-well-operating mechanism comprising a connection for transmitting motion from the driving mechanism to the operating devices in the well, and devices between the ends of said connection constructed and adapted to compensate for the varying effect of the temperature and weather on said connection, whereby to automatically maintain the latter of uniform length.

The invention further consists in certain novel features of construction and combina-

tions and arrangements of parts, as hereinafter set forth, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a plan view illustrating my improvements. Fig. 2 is a side elevation. Fig. 3 is a view illustrating modifications.

A represents a connection for the purpose of transmitting motion from a driving to a driven mechanism, and for the purpose to which my invention is to be applied it represents a wire line for transmitting motion from a central source of power to the operating devices in an oil-well. At a suitable point between the ends of the wire line A my improved compensating device B is located. In constructing this device or mechanism I employ a frame 1, and after severing the wire line one end is attached to one end of said frame and the end of the other section of the wire line is wound a drum 2, mounted in said frame 1. The shaft of the drum 2 is provided with a worm-wheel 3, with which a worm-shaft 4 meshes. The worm-shaft is mounted in suitable bearings in the frame 1 and is provided at one end with a bevel-pinion 5, which meshes with and receives motion from a bevel-pinion 6, secured to a shaft 7, mounted transversely in the frame 1. A lever 8 is mounted loosely between its ends on the shaft 7, the lower arm of said lever being preferably made longer than the upper arm and provided at its lower extremity with a weight 9, whereby to maintain said lever normally in a vertical position. A ratchet-wheel 10 is secured to the shaft 7, and above said ratchet-wheel a double dog 11 is pivotally connected to the upper end of the lever 8 and provided with a weight 12, adapted to retain the dog in the position to which it may be moved.

A weighted arm 13 is mounted loosely on the shaft 7 and depends therefrom, said arm being provided with upwardly-projecting fingers 14 14, which terminate at opposite sides of the weight 12 of dog 11. At opposite sides of the lower portions of the lever 8 and weighted arm 13 stops 15 15 are secured to the ground or to any suitable support independent of the frame 1, said stops being spaced apart sufficiently to permit the normal play of the wire line and the compensating devices attached thereto.

From the construction and arrangement of

parts above described it will be seen that when the wire or connection A becomes too long the weighted arm 13 will strike one of the stops 15, and thus cause one of the fingers 14 to strike the weight 12 and throw the dog 11 in engagement with the ratchet-wheel 10. As the wire A continues to move back and forth the lever 8 will strike said stop and be caused to turn on its fulcrum, thus moving the dog 11 and transmitting motion to the ratchet-wheel 10. The motion thus transmitted to the ratchet-wheel will cause the shaft 7 to turn and transmit motion through the gears 5 and 6 to the worm-shaft 4, and from the latter to the worm-wheel 3 on the drum-shaft, thereby causing the latter to turn and wind the wire A thereon until the proper length of said wire or connection A between the driving mechanism and the driven mechanism shall have been restored, whereupon the lever 8 will cease to strike the stop and the parts will automatically return to their normal positions.

It is evident that when the wire or connection A becomes too short the lever 8 and weighted arm 13 will engage the other stop 15, and the devices will be operated to unwind the wire A and permit it to return to its normal working length.

In Fig. 3 the invention is shown applied to a connection consisting of a rod instead of a wire. Instead of the drum above described a turning-buckle 16 is connected to the rod A', the screw of said turnbuckle being secured to the gear 5 and the worm-gear dispensed with. In the modified form of construction the weighted arm 13 is pivotally connected to the lever 8 instead of being mounted on the shaft 7. It is clear that with the modified construction the variations in the length of the rod or connections A will be compensated for by turning the screw of the turnbuckle in one direction or the other, and that this will be accomplished in the same manner as motion is transmitted to the drum in the preferred form of the invention.

My improvements are simple in construction, automatic in operation, and effectual in all respects in the performance of their functions.

Various slight changes might be made in the details of construction of my invention without departing from the spirit thereof or limiting its scope, and hence I do not wish to limit myself to the precise details herein set forth.

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

1. In a system for the transmission of power, the combination with a connecting medium between the driving and driven mechanism, of a compensating device interposed between the ends of the connecting medium and constituting a part thereof, and fixed stops with which the compensating device engages, the parts being constructed and ar-

ranged to automatically shorten or lengthen the connecting medium, and thereby maintain it at any predetermined length, substantially as set forth.

2. In a system for the transmission of power, the combination with a reciprocating connecting medium between the driving and driven mechanism, of a compensating device for shortening and lengthening said connecting medium, and fixed stops with which said compensating device engages and by which it is caused to operate, substantially as set forth.

3. In a system for the transmission of power, the combination with a reciprocating connecting medium between the driving and driven mechanism, of a compensating device interposed between and connecting two sections of the connecting medium, said compensating device comprising means for shortening or lengthening the connecting medium, and fixed stops with which the compensating device engages, substantially as set forth.

4. In a system for the transmission of power, the combination with a reciprocating connecting medium between the driving and driven mechanism, of a compensating device interposed between and connecting two sections of the connecting medium, said compensating device being provided with a ratchet and pawl, and devices connected therewith for taking up the slack of and imparting slack to the connecting medium, and fixed stops with which the compensating device engages and governs its action, substantially as set forth.

5. The combination with a connection between driving and driven mechanism, of a compensating device connected with said connection and consisting of a lever, a ratchet device to be operated by said lever, a weighted arm, means for operating said weighted arm to throw the ratchet device in operation and for moving said lever to move the ratchet devices and devices between the ratchet devices and said connection, whereby to lengthen and shorten the latter automatically, substantially as set forth.

6. The combination with a connection between driving and driven mechanism, of a compensating device attached to said connection, said compensating device comprising a ratchet device, a lever for operating said ratchet device, gearing between said ratchet device and said connection, a weighted arm constructed and adapted to move the dog of the ratchet device into operative position automatically, and a stop for moving said weighted arm and for moving the lever on its fulcrum whereby to transmit motion to the ratchet device and gearing for the purpose of lengthening or shortening said connection, substantially as set forth.

7. The combination with a connection between driving and driven mechanism, of a compensating device attached thereto, said compensating device comprising, a pivoted

lever, means for causing said lever to move on its fulcrum, a ratchet-wheel, gearing connected with said ratchet-wheel for causing said connection to be lengthened or shortened, a double dog adapted to engage the ratchet-wheel, said dog being pivoted to said lever and provided with a weight, and means for automatically throwing one or the other end of said dog in engagement with the ratchet-wheel, substantially as set forth.

8. In a compensating device, the combination with a frame, devices mounted in said frame and adapted to lengthen or shorten the rod or connection between driving and driven mechanism, a shaft mounted in said frame and geared with said devices, a ratchet-wheel secured to said shaft, a lever mounted loosely on said shaft, stops for moving said lever on its fulcrum, a weighted dog pivotally connected to said lever, a pivotally-supported weighted arm and fingers projecting from said weighted arm and adapted to strike the dog and throw it in engagement with the ratchet-wheel, said weighted arm being constructed and adapted to be operated by said stops, substantially as set forth.

9. In a compensating device, the combination with a frame, of a drum mounted therein

and adapted to receive a section of wire or cable thereon, said frame being adapted to have another section of said wire or cable attached thereto, a worm-wheel on the shaft of said drum, a worm-shaft meshing with the worm-wheel, a gear secured to said worm-shaft, a transverse shaft, a gear on said transverse shaft and meshing with said first-mentioned gear, a ratchet-wheel secured to the transverse shaft, a weighted lever loosely mounted on said transverse shaft, a weighted dog attached to said lever and adapted to engage the ratchet-wheel, a weighted arm mounted on the transverse shaft, fingers projecting from said weighted arm and terminating at opposite sides of the weight on the dog, and stops for operating said weight-arm for throwing the dog and for moving said lever for operating the ratchet devices, substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

GEORGE ALLEN.

Witnesses:

CHAS. H. HARRIS,
R. A. PLANER.