

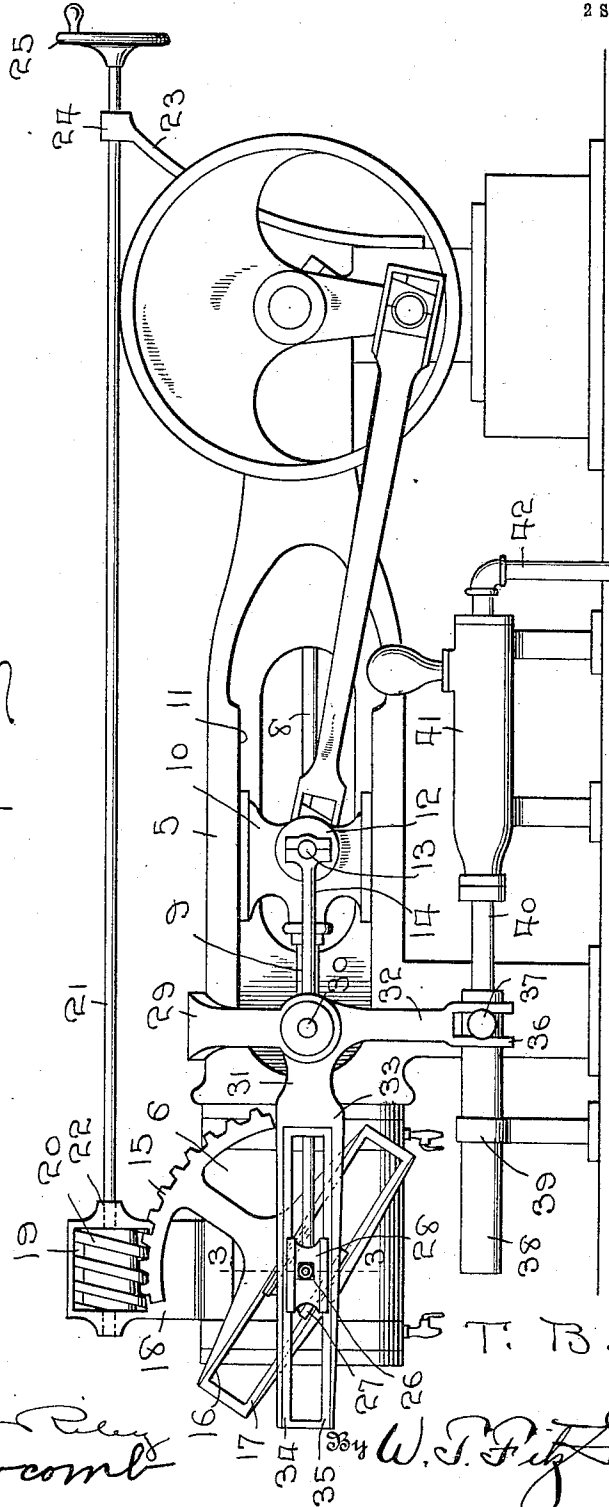
T. B. VALE.
POWER TRANSMISSION MECHANISM.
APPLICATION FILED MAR. 16, 1912.

1,065,643.

Patented June 24, 1913.

2 SHEETS—SHEET 1.

Fig. 1.



Witnesses

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2 SHEETS—SHEET 2.

Fig. 2.

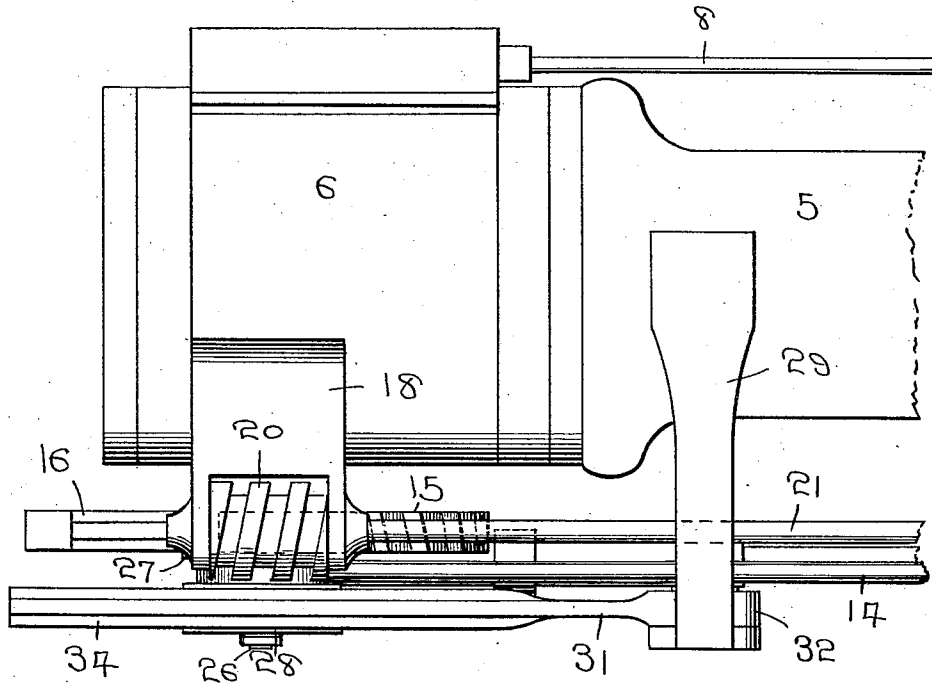
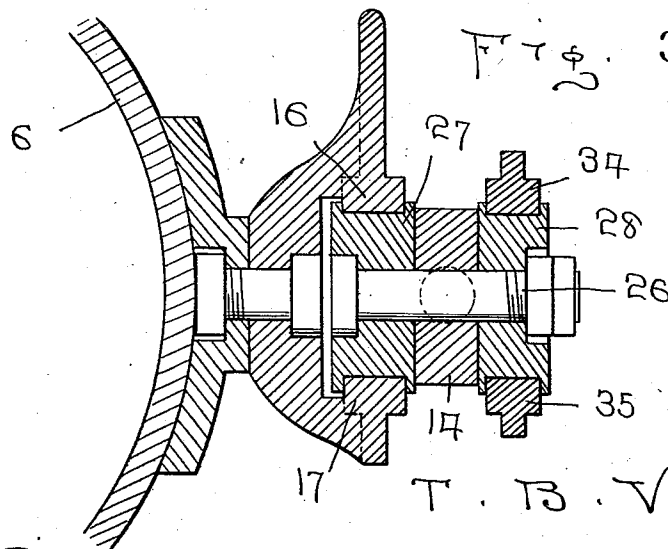


Fig. 3.



Witnesses

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UNITED STATES PATENT OFFICE.

THOMAS BOWMAN VALE, OF ROGERS, OHIO.

POWER-TRANSMISSION MECHANISM.

1,065,643.

Specification of Letters Patent.

Patented June 24, 1913.

Application filed March 16, 1912. Serial No. 684,158.

To all whom it may concern:

Be it known that I, THOMAS BOWMAN VALE, a citizen of the United States, residing at Rogers, in the county of Columbiana and State of Ohio, have invented certain new and useful Improvements in Power-Transmission Mechanism; 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.

This invention relates to power transmission mechanism, and it more particularly relates to a combination of elements co-operatively connecting a steam engine to a pump, the latter being adapted to supply water to the boiler of said engine.

The prime object of my invention is to co-operatively connect a steam engine and a pump for varying the supply of water being fed to a boiler, connected with said pump, whereby the water supply may be easily regulated by the engineer, and with the maximum degree of efficiency and the minimum loss of power.

Other objects and advantages may be recited hereinafter and in the claim.

In the accompanying drawings, which are made a part of this application, Figure 1 is a side elevational view of an engine and a pump co-operatively connected with my improved power transmission mechanism. Fig. 2 is a plan view of a fragment of the engine having my improved power transmission mechanism applied, and, Fig. 3 is a vertical sectional view taken on the line 3—3 of Fig. 1.

Referring to the drawings, in which similar reference numerals designate corresponding parts throughout the several views, the body or frame of the engine is represented by the numeral 5, and to this frame is secured the usual cylinder 6, steam chest 7, eccentric rod 8, piston rod 9, and cross-head 10. The cross-head is adapted to reciprocate between the usual guides 11. The cross-head 10 is provided with a laterally extending boss 12 having a wrist-pin 13 extending therefrom, the link 14 being pivoted thereto.

Pivotally secured to the side of the cylinder 6 on a fixed pivot is a rocker member consisting of a toothed segment 15 and a pair of parallel spaced guide bars 16 and 17 on opposite sides of and extending longi-

tudinally and equally in opposite directions from said pivot.

A standard 18 is secured on the top of the cylinder 6 and carries a housing 19, in which is seated a screw or worm 20, connected with a rod 21, which is journaled in the housing at 22. A standard 23 and a bearing 24 support the other end of the rod 21, which carries a hand wheel 25, by which the screw 20 may be rotated. Said screw 20 is in mesh with the teeth of the segment 15, and therefore, when the screw 20 is rotated, the segment 15 is moved arcuately and it is obvious that when the segment is moved to the extreme position opposite that which is shown in Fig. 1, the guide bars 16 and 17 will be inclined in an opposite direction from that shown. One end of the link 14 carries a block having a pivot pin 26 extending laterally from its opposite sides, and cross-heads 27 and 28, respectively, are pivoted on said pivot pin.

Secured on the frame 5 of the engine is a lateral and depending arm 29, to which is pivotally secured, at 30, a bell-crank lever 31 consisting of a normally vertical arm 32 and a normally horizontal arm 33, the latter being provided with spaced guide bars 34 and 35. The arm 32 is bifurcated at its lower end, and the furcations 36 of said arm embrace the opposite sides of a wrist-pin 37, projecting laterally from a guide rod 38, slidably seated in the bearings 39 and connected with a pump piston 40. The pump cylinder 41 is provided with an intake pipe 42, and a feed pipe or outlet pipe may be connected, in any proper manner, with said pump for supplying water to a boiler or the like (not shown).

In operation, considering the various elements to be in the position shown in Fig. 1; as the cross-head 10 is reciprocated the link 14 is reciprocated therewith and the cross-head 27 is thereby caused to slide along the inclined path between the guides 16 and 17, crossing the fixed pivot of the rocker member in each direction and carrying the cross-head 28 therewith. Obviously, the cross-head 28 reciprocates between the guides 34 and 35, and in doing so carries the free end of the arm 33 upward and downward alternately, twice in each complete movement from end to end of said guides as the cross-head 27 reciprocates along said inclined path. It is obvious that two oscillatory motions are thereby impart-

ed to the arms 32 and 33 during each single reciprocation of the link 14, and the guide rod 38 and piston 40 are thereby reciprocated twice as often as the cross-head 10 for
5 actuating the pump at double speed. Now, assuming that the rod 21 and screw 19 are rotated until the guide rods 16 and 17 reach a horizontal position, it will be seen that the guides 34 and 35 will be parallel
10 therewith, and therefore, no motion would be transmitted to the arm 32 or piston 40. If, however, the guide bars 16 and 17 are inclined slightly, a slight motion will be imparted to the pump piston rod and a
15 small quantity of water will be pumped.

It is obvious, from the foregoing, that the rate of pumping may be varied in proportion to the inclination of the guide bars 16 and 17, and that this inclination of the
20 guide bars is varied through the medium of the rod 21 and hand wheel 25.

While I have described my improved transmission mechanism as being operatively connected with a pumping engine, it
25 is to be understood that the several accompanying elements may be varied in form, so as to be operatively connected with a machine other than a pumping engine. Therefore, in the following, the machine to which
30 this transmission mechanism is operatively connected will be called a motor, and it will be understood that the term "motor" applies broadly to any kind or character of machine with which this transmission mechanism
35 is capable of being operatively connected.

I do not limit invention to the exact combination of parts, mechanism or details of construction as herein described and shown,

but my invention may only be limited by a reasonable interpretation of the following
40 claim.

What I claim is:

The combination with a motor comprising a member adapted to be rectilinearly reciprocated in fixed guides and a driven
45 mechanism comprising a member likewise reciprocable in fixed rectilinear guides, of a transmission mechanism comprising a fixed pivot, a rocker member mounted centrally on the fixed pivot and provided with
50 parallel guide bars on opposite sides of and extending longitudinally and equally in opposite directions from said fixed pivot, a second fixed pivot, an elbow lever pivotally
55 mounted at its angle on said second fixed pivot, having one arm connected with the reciprocable member of the driven mechanism and the other arm formed into parallel
60 guide bars, a link connected with the reciprocable member of the motor, a block carried by said link, a pivot pin in and projecting laterally from said block, a cross-head slidably fitted in the guide bars of the
65 rocker member and pivotally mounted on said pivot pin, a second cross-head slidably fitted in the guide bars of the elbow lever and likewise pivotally mounted on said pivot pin, and means for adjusting the
70 rocker member on its fixed pivot.

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

THOMAS BOWMAN VALE.

Witnesses:

ELI C. VALE,

GRACE M. WILLIAMS.