(No Model.) 3 Sheets—Sheet 1.

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MECHANISM FOR OPERATING PUMPS.

No. 535,293. Patented Mar. 5, 1895.

Fig. 8.

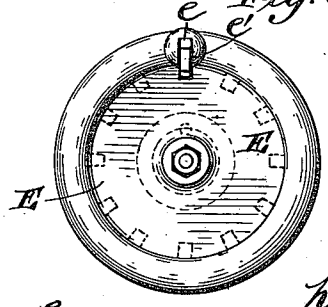

Fig. 1.

Fig. 9.

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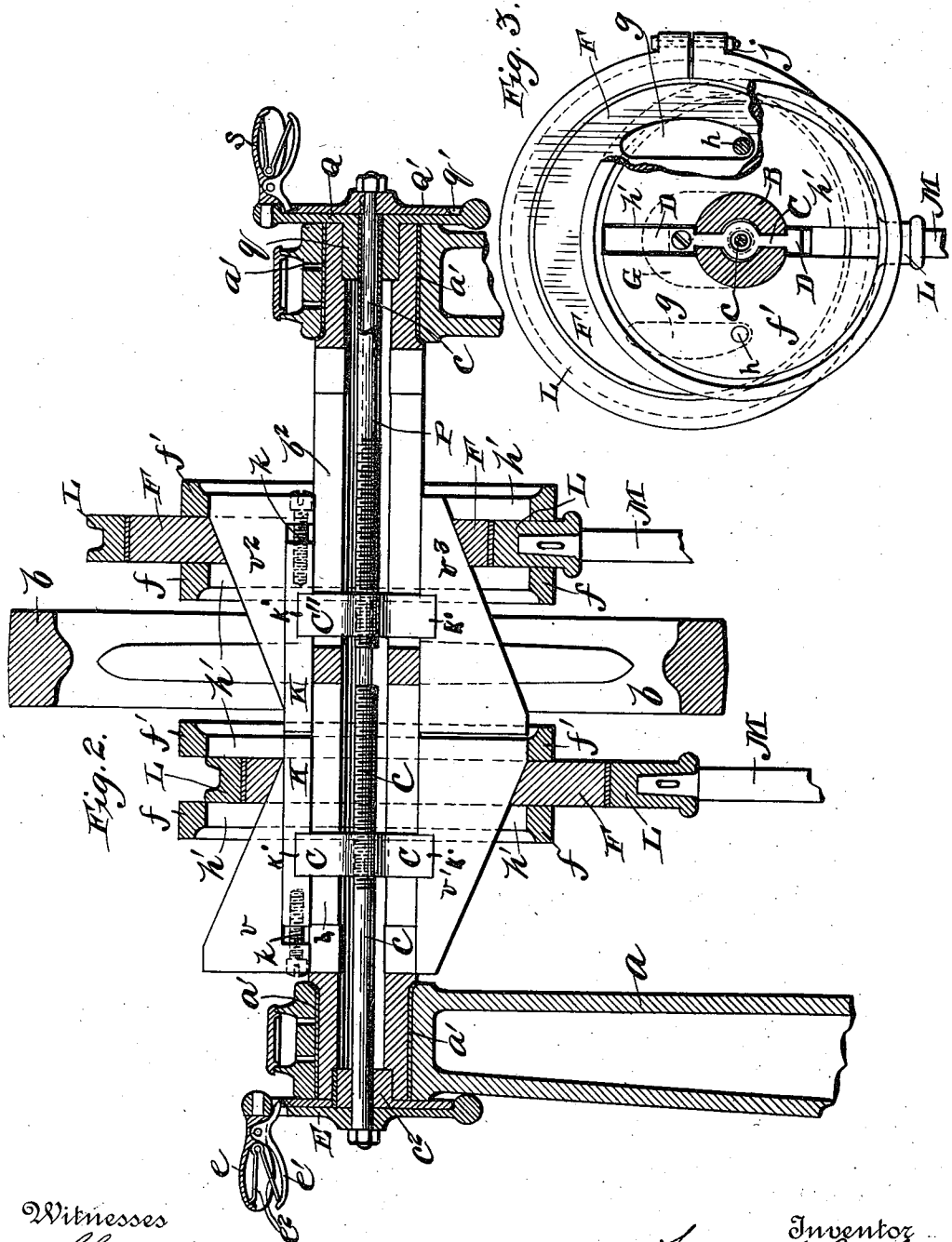

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MECHANISM FOR OPERATING PUMPS.

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Fig. 4.

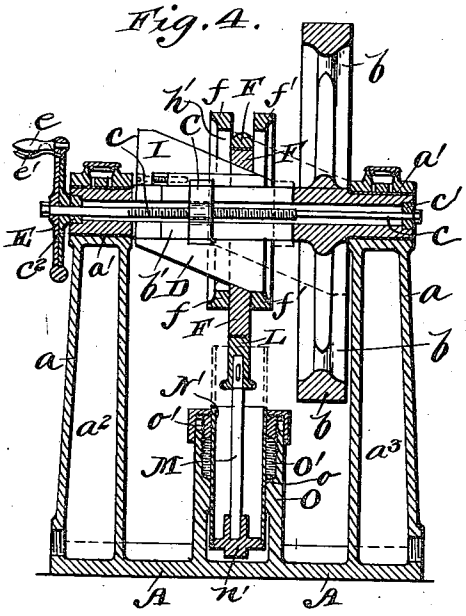


Fig. 5.

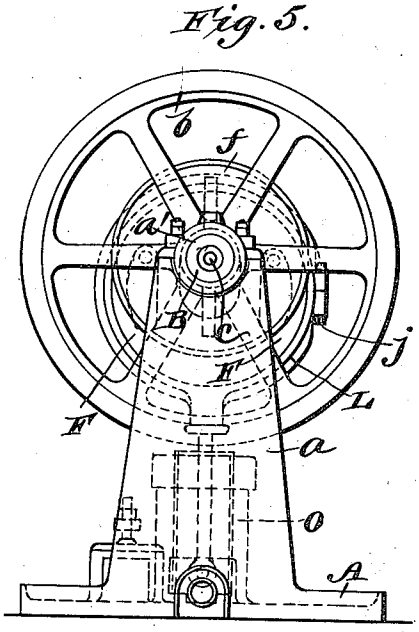


Fig. 6.

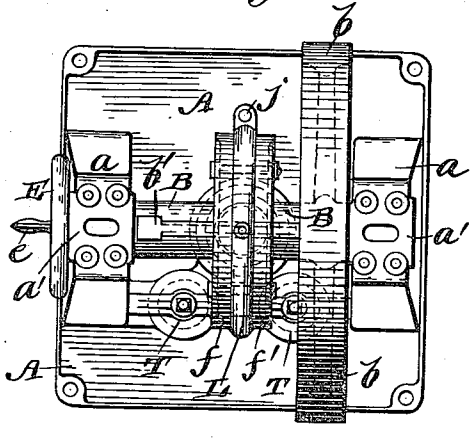
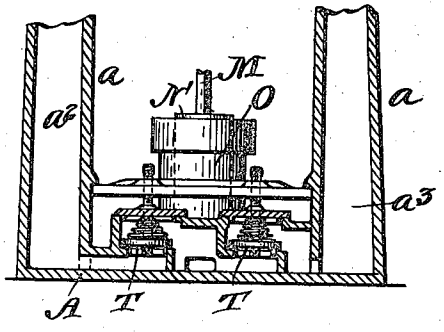


Fig. 7.



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MECHANISM FOR OPERATING PUMPS.

SPECIFICATION forming part of Letters Patent No. 535,293, dated March 5, 1895.

Application filed March 21, 1894. Serial No. 504,531. (No model.)

To all whom it may concern:

Be it known that I, MEREDITH LEITCH, a citizen of the United States, residing at Covington, in the county of Alleghany and State of Virginia, have invented certain new and useful Improvements in Mechanism for Operating Pumps; 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 improvements in pumps with shifting eccentrics, and has more particularly to do with steam boiler and water feed pumps, or other analogous water feeding devices; and the invention consists in the combination of an operating shaft, one or more eccentrics mounted thereon, one or more wedges adapted to increase or decrease the eccentricity of said eccentrics on said shafts, and means for operating said wedge or wedges and locking it or them in any desired position.

It also consists in the combination of an operating shaft, improved eccentrics and adjusting mechanism mounted thereon, and water feeding devices connected to said eccentrics and operated thereby.

It also consists in the combination of an operating shaft, eccentrics mounted thereon, wedges adapted to increase or decrease the eccentricity of said eccentrics on said shaft, means for adjusting parts of said wedges in said eccentrics, means for operating said wedges and water feed pumps connected to said eccentrics and operated thereby.

It also consists in certain other minor combinations as will be hereinafter set forth.

The invention is more fully set forth in the following specification and illustrated in the accompanying drawings, in which—

Figure 1 represents a central vertical section through the devices embodying my invention in one of its forms, one wedge and two pumps being used. Fig. 2 represents a detail central vertical section through said devices, as constructed where two wedges and two pumps are employed. Fig. 3 represents a detail end elevation of one of the eccentrics and its guiding disks. Fig. 4 represents a central vertical section through the devices embodying my invention, as constructed when only one pump is to be operated. Fig. 5 represents an end elevation of the same. Fig. 6 represents a top plan view of the same. Fig. 7 represents a detail central, vertical section through the valves in communication with the said single pump. Fig. 8, Sheet 1, represents a side elevation of the disk and spring actuated catch by means of which the wedge operating screw is turned and fixed in any desired position, and Fig. 9, Sheet 1, represents a central vertical section through the shaft, wedge and wedge operating nut.

A in the drawings represents the base of the apparatus. This base is provided with hollow upright standards *a*, in the upper ends of which are formed journal boxes *a'* in which the hollow shaft B has its ends journaled. This shaft B is provided with a fly or belt wheel *b*, cast integral therewith, and transmitting power from the main engine to said shaft.

The shaft B as before stated, is hollow, and is provided with a slot *b'* through which the operating nut C, mounted on the screw threaded adjusting rod *c*, is adapted to pass to engage and operate the double reversely inclined wedge D. The said rod *c* has its screw threaded portion passed through the screw threaded aperture in the nut C, and thus, when revolved, moves said nut either backward or forward, according to the direction of the rotation. The rear end of the rod is mounted in a block *c'* set into the shaft B, and the forward end passes through a similar block c^2 carrying a perforated disk C', and is rigidly secured to a disk E which overlaps the edges of the disk C'.

The disk E is provided with an operating handle *e* which as a catch *e'* pivoted thereto, and held in its normal position by a spring e^2, which is set in said handle. The end of the catch works through an aperture in said disk E, and is adapted to engage any one of a series of apertures cut about the periphery of the disk C', and thus the said disk E may turn into any desired position and locked to said disk C', which is rigid with the shaft B; the screw *c* fastened to said disk being also operated and locked in the desired position, and thereby the wedge also moved and locked.

A pair of guiding disks $f f'$ are mounted rigidly on the shaft B, for each eccentric F F, said eccentrics being confined respectively between said disks, but being capable of movement in any plane radial to the axis of rotation by reason of their slotted connection with said disks. This slotted connection is formed by means of slots g, g, and G Fig. 3, cut in said eccentrics, the bolts h h passing through the slots g g, and holding said guiding disks $f f'$ in position. The said guiding disks are also provided with slots h' h' through which the adjusting wedges D pass. These wedges also pass through inclined slots f^2 in the eccentrics, and thus, as said wedges are moved backward and forward, the eccentricity of the eccentrics is altered.

The lower portion of the wedge, as shown in Fig. 1, is composed of two oppositely inclined faces, which are adapted to work in the slots of the respective eccentrics. The upper portion is composed of two adjustable wedge blocks I I, having oppositely inclined faces. These blocks are adjustable, independent of each other, by means of adjusting screws k k which pass through lugs on said blocks, and engage a bar K having a recess K′ within which the upper end of the nut C fits, and thus moves said bar, with it, back and forth, and operates the wedges.

An eccentric strap L is passed about each eccentric, and has a plunger rod M secured at its lowest point, so that as said eccentrics revolve, the rods are alternately raised and lowered, and thus operate the pistons connected thereto. The straps are secured about said eccentrics by securing bolts j. These pistons are composed of cylinders N′ having blocks n' at their lower ends which close said ends and thus form the piston. These piston cylinders are adapted to operate in cylinder casings O, which are preferably cast integral with the base. The inner surface of each of these casings is provided with an annular ledge o which forms a seat for supporting the packing O′, which is forced against the piston cylinder to make a water tight joint, by means of screw collars o'. A water inlet and outlet port p is provided in the lower part of each of the casings.

The water first enters an air chamber a^2 of one of the supporting standards a, and is drawn from the same into the first pump and from this pump is forced into an air chamber a^3 formed in the other supporting standard a. The other pump acts in exactly the same manner, but with an alternating action in regard to the first mentioned pump, that is, one pump will be drawing water from chamber a^2 while the other is forcing water into the chamber a^3. Suitable valves are provided in the passages leading to the inlets p so that a backward flow of water in said passages is prevented.

During the pumping operations the chamber a^2 acts as a vacuum chamber, and the chamber a^3 as an air compression chamber, and by means of these chambers a steady feed of the water is secured.

In the form or construction shown in Fig. 2, the wedges for operating or adjusting the eccentrics are formed in four blocks or pieces v v' v^2 v^3, and the bar K is divided in the center, and the portion v attached to one half by means of the adjusting screw k, and then portion v^2 to the other half, in a similar manner. In this form, two nuts C and C″ are employed, one being attached to the blocks v and v', and the other to the blocks v^2 and v^3 by means of recesses k' as shown in Fig. 2.

The nut C″ passes through a slot b^2 similar to b', and is mounted upon a screw threaded sleeve P through which the rod c passes. The sleeve P is rigidly secured in a hub q of a disk Q, which corresponds to the disk E at the opposite end of the shaft. The said hub is adapted to turn loosely in said hollow shaft, when it is desired to rotate the screw threaded sleeve, to move the nut C″ backward or forward, to operate the wedges v^2 and v^3. The disk Q has an operating handle s similar to the handle e. A disk Q′ is attached to this end of the rod c and is provided with notches or recesses q' similar to the disk C′, and adapted to be engaged by the spring catch of the handle s.

It will be seen by the foregoing, that in this construction, the eccentrics can be adjusted to be more or less eccentric either together or separately. When it is desired to adjust the eccentrics together the handle e is turned, thus rotating the rod c and the sleeve P together, and the nuts C and C″ are thus moved in unison, and in the same direction, according to the direction of the rotation of the disk E. When it is desired to rotate either the rod c or the sleeve P independently, the catch on the handle s is loosened from the disk Q′ and the sleeve P alone is rotated, and thus only the wedges v^2 and v^3 are moved. If the disk E were rotated, while the catch on handle s is out of engagement with the disk Q′, the rod c alone would be rotated and thus only the wedges v and v' moved.

In the construction shown in Figs. 4, 5, 6 and 7 only one pumping cylinder, and one operating eccentric, &c., are employed, but in all other respects this form is substantially like that shown in Fig. 1.

In Fig. 7 is shown, at T, a preferred form of valves for preventing the backward flow of water, but any ordinary construction of valves may be substituted, therefor, as this does not form any part of my invention.

It will be seen from the foregoing description that the eccentricity of the eccentrics may be increased or decreased at will by simply turning the handle as in Fig. 1, which movement moves the oppositely inclined wedges back or forward in the slots in the eccentrics and thus moves said eccentrics up or down, one moving up the exact distance that the other moves down which causes the said eccentrics to always stand in the same rela-

tive position to each other, with respect to their throw.

The greater the eccentricity of the eccentrics, the longer the stroke of the pumps will be and the greater the volume of water fed, but as the eccentricity is decreased by moving the wedges the pumps move slower in proportion until they stop entirely when the eccentrics are adjusted to a concentric position on the shaft B, with the latter passing exactly through their centers.

As the bearing surfaces between the wedges and the slots of the eccentrics become worn, the upper portions of the wedges can be moved up by the screws *k* so as to make a perfect joint between said wedges and the eccentrics.

In the form shown in Fig. 2, the wedges can be moved in the eccentric independently of one another and thus either one of the pumps can be made to operate, while the other is stationary, or one can be moving with a long full stroke while the other is moving with a much shorter stroke, or vice versa.

What I claim as my invention is—

1. The combination of an operating shaft, an eccentric movably mounted thereon, a wedge slidable in a slot in said eccentric, a screw threaded rod passing through said shaft, a nut on said rod engaging said wedge, and means for revolving said rod and locking it in any desired position, substantially as described.

2. The combination of an operating shaft, an eccentric movably mounted thereon, a wedge mounted in a slot in said eccentric, a screw threaded rod passing through said shaft, a nut on said rod engaging said wedge, means for revolving said rod and locking it in any desired position, and pumping devices connected to and operated by said eccentric, substantially as described.

3. The combination of an operating shaft, a plurality of eccentrics movably mounted on the same, a plurality of oppositely inclined wedges mounted in slots in said eccentrics, means for moving said wedges through said eccentrics, whereby one eccentric is raised as another is lowered, or vice versa, substantially as described.

4. In a feed water pumping mechanism, the combination of an operating shaft, eccentrics movably mounted on the same independently of each other, oppositely inclined wedges mounted in slots in the respective eccentrics, and means for moving said wedges together or separately, and pumping devices connected to and operated by said eccentrics, substantially as described.

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

MEREDITH LEITCH.

Witnesses:
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G. M. BOOKMAN.