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PATENTED OCT. 18, 1904.

E. B. KIRBY.
BOILER FURNACE DRAFT GOVERNOR.

APPLICATION FILED APR. 20, 1903.

NO MODEL.

Fig. 1.

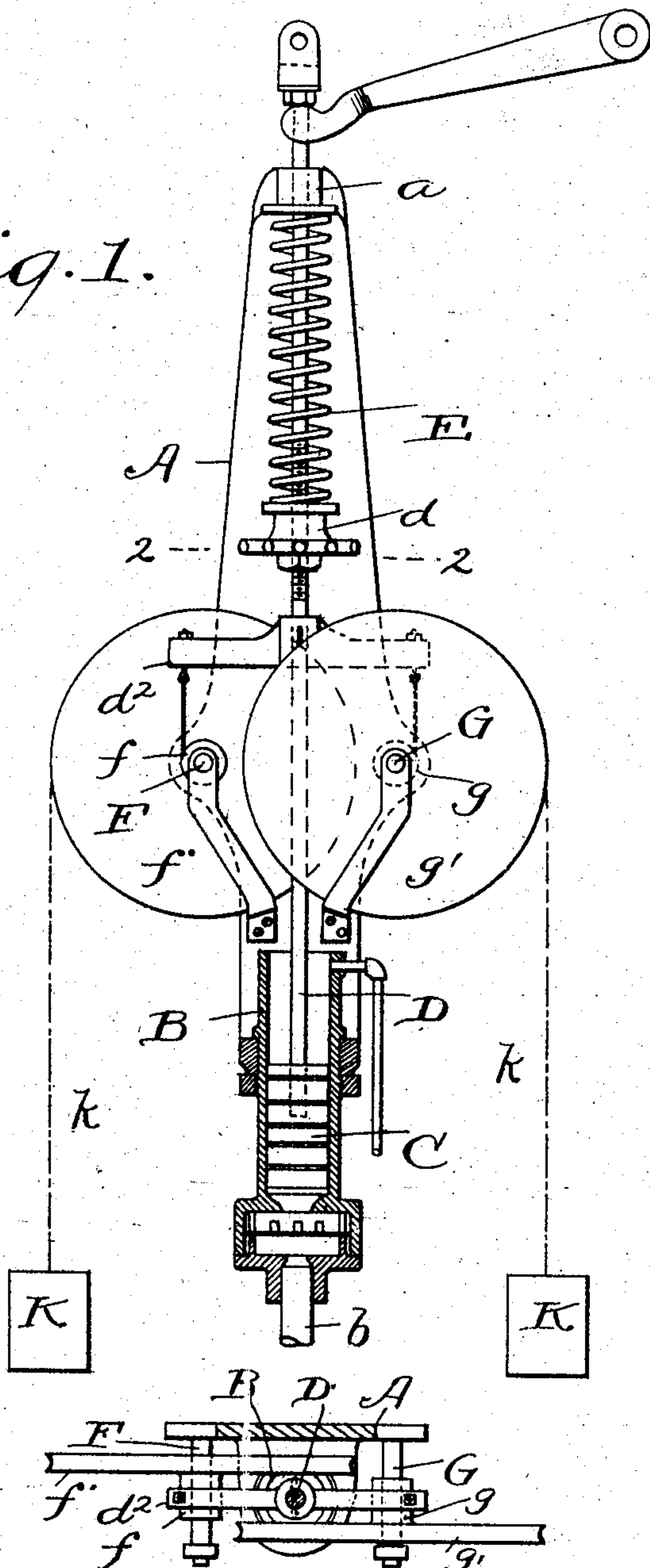


Fig. 2.

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UNITED STATES PATENT OFFICE.

EDMUND B. KIRBY, OF ROSSLAND, CANADA.

BOILER-FURNACE DRAFT-GOVERNOR.

SPECIFICATION forming part of Letters Patent No. 772,519, dated October 18, 1904.

Application filed April 20, 1903. Serial No. 153,564. (No model.)

To all whom it may concern:

Be it known that I, EDMUND B. KIRBY, a citizen of the United States, residing at Rossland, in the Province of British Columbia and Dominion of Canada, have invented a certain new and useful Improvement in Boiler-Furnace Draft-Governors, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

The invention relates to improvements in fluid-pressure regulators adapted especially for controlling the position of the draft appliances of a steam-boiler furnace.

The object of the invention is to provide such a device in a form wherein a spring shall offer increasing resistance to the movement of the parts after the desired minimum pressure of steam in the boiler has been reached, but in which it is not necessary to use a spring large enough to oppose the movements of the parts before such minimum pressure has been reached. In other words, the object of the invention is to provide a device wherein the increased resistance of a small spring may be utilized instead of an excessively heavy and long spring.

In the drawings, Figure 1 is a side elevation, partly in section, of the best-known embodiment of the invention; and Fig. 2 is a sectional plan on the line 2 2.

Referring to the parts by letters, A represents a support, to the lower end of which a pot-cylinder B is secured, said cylinder being connected at its lower end with the steam-space of a boiler by means of a tube *b*.

C is the piston, which is movable with as little friction as possible in said cylinder.

D is the piston-rod, which is seated in a socket in the piston, from which it extends upward through a suitable guide-lug *a* on the upper end of said support.

E represent a compression helical spring which surrounds the piston-rod and lies between said lug *a* and a collar *d*, which is adjustably secured to the rod D below this lug. Until the rod is forced upward by the piston this spring is not subjected to much, if any, pressure tending to compress it.

Two shafts F and G are mounted on the support A. Small sheaves *f* and *g* are secured

to these shafts, respectively, and ropes or cords wound thereon are attached to a yoke *d*², which is in turn secured to the piston-rod. Two large sheaves *f'* *g'* are also attached to these shafts, respectively, and a weight or weights K are suspended from cords *k*, wound upon these large sheaves. It will be seen that if the piston-rod moves upward it can only do so by raising these weights and winding their cords upon the large sheaves. These weights are of such size and the leverage produced by the difference in the sizes of the sheaves *f* *f'* *g* *g'* is such that these weights substantially balance the mechanism against the minimum pressure desired in the boiler. For example, if one desires to maintain in the boiler a pressure which shall vary between one hundred and one hundred and three pounds these weights and the described parts may be arranged to balance one hundred pounds. The spring E will thereafter oppose the movement of the piston and rod caused by the increase of the steam-pressure.

It is obvious that a great variety of specific constructions may be made embodying the generic construction hereinabove described—namely, a construction wherein weights are employed which are capable of balancing the minimum pressure desired and a spring to resist the movement induced by a pressure in excess of the minimum pressure.

Having described my invention, I claim—

1. In a fluid-pressure regulator, the combination with a cylinder, of a piston, a rod secured thereto, a shaft rotatably mounted upon said cylinder, a sheave keyed to said shaft, a rope provided with a weight and passing around said sheave, a smaller winding-drum also keyed to said shaft, an arm secured to said rod, a rope secured to said arm and passing around said small drum, connections between said rod and the draft-damper, and a spring for resisting the pressure under said piston after the resistance caused by said weight is overcome, substantially as described.
2. In a fluid-pressure regulator, the combination with a cylinder, of a piston, a rod secured thereto, a shaft rotatably mounted upon said cylinder, a sheave keyed to said shaft, a rope provided with a weight and passing

around said sheave, a smaller winding-drum
also keyed to said shaft, an arm secured to
said rod, a rope secured to said arm and pass-
ing around said small drum, connections be-
5 tween said rod and the draft-damper, a spring
for resisting the pressure under said piston
after the resistance caused by said weight is
overcome, and means for adjusting the ten-
sion of said spring, substantially as described.
10 3. In a fluid-pressure regulator, the combi-
nation with a cylinder, of a piston, a rod se-
cured thereto, a shaft rotatably mounted upon
said cylinder, a sheave keyed to said shaft, a
rope provided with a weight and passing
15 around said sheave, a smaller winding-drum
also keyed to said shaft, an arm secured to

said rod, a rope secured to said arm and pass-
ing around said small drum, connections be-
tween said rod and the draft-damper, a nut
threaded onto said rod and a spring between 20
said nut and a stationary portion of the de-
vice for resisting the pressure on said piston
after the resistance caused by said weight
thereon has been overcome, substantially as
described. 25

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

EDMUND B. KIRBY.

Witnesses:

C. V. JENKINS,
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