

(No Model.)

R. L. RAMSAY.

DEVICE FOR OVERCOMING DEAD CENTERS.

No. 411,678.

Patented Sept. 24, 1889.

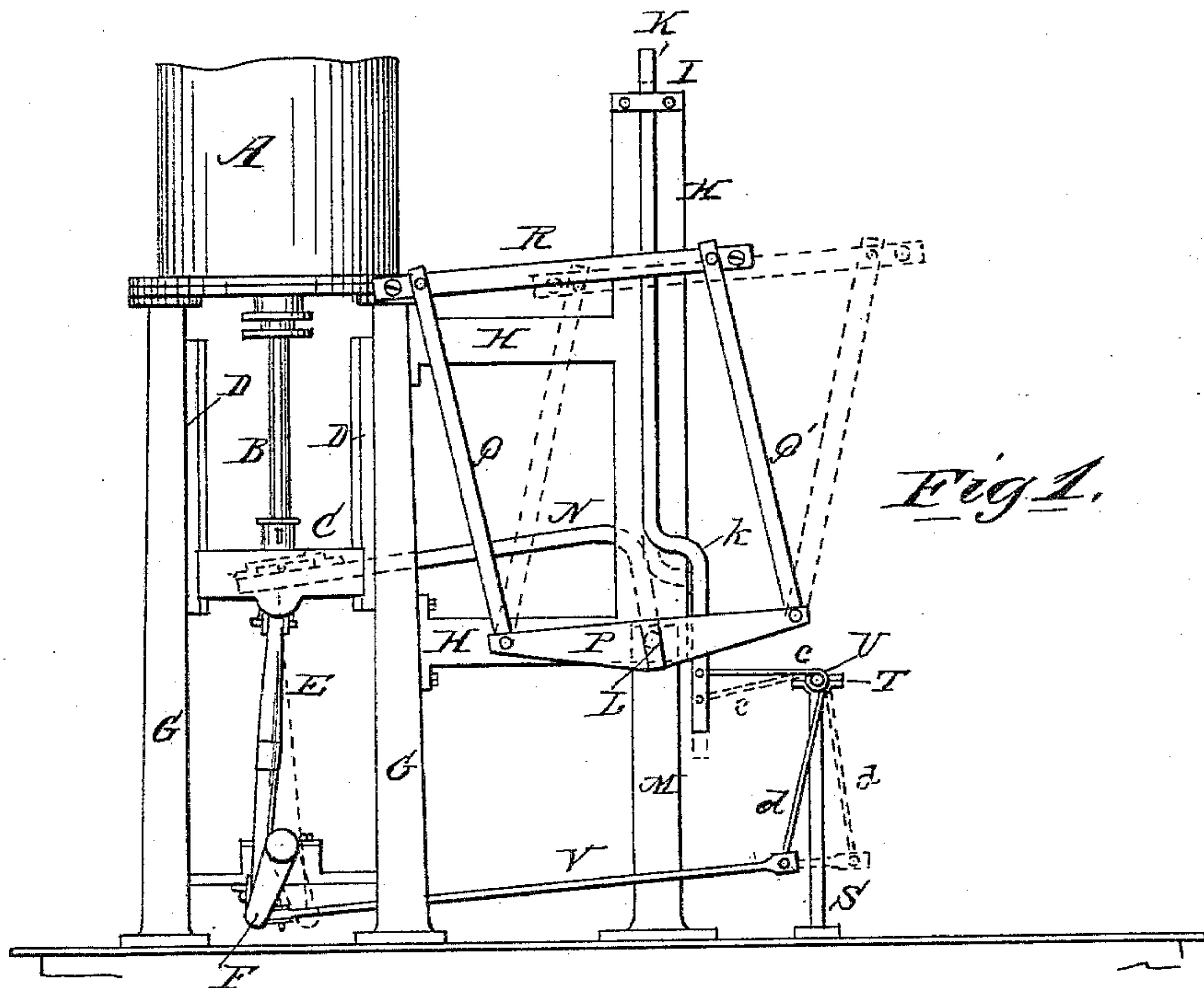


Fig. 1.

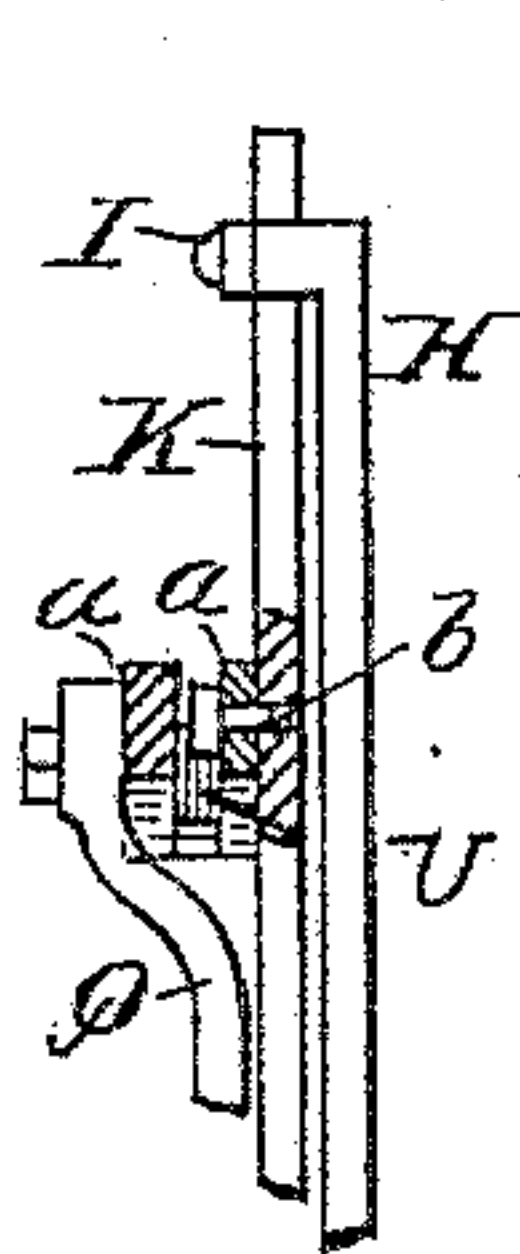


Fig. 3.

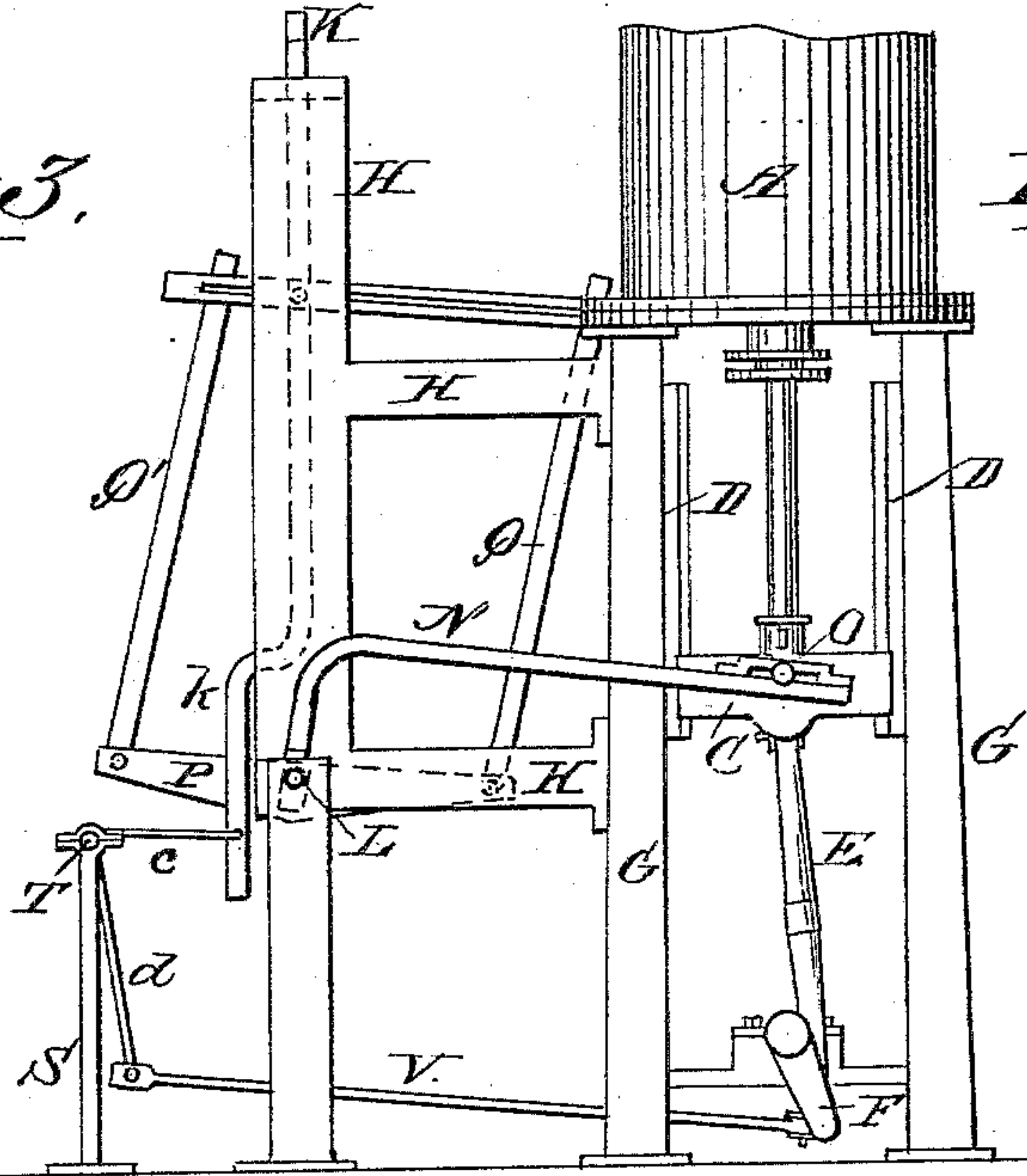


Fig. 2.

WITNESSES.

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# UNITED STATES PATENT OFFICE.

ROBERT LEE RAMSAY, OF VAN CLEAVE, MISSISSIPPI.

## DEVICE FOR OVERCOMING DEAD-CENTERS.

SPECIFICATION forming part of Letters Patent No. 411,678, dated September 24, 1889.

Application filed June 15, 1889. Serial No. 314,348. (No model.)

*To all whom it may concern:*

Be it known that I, ROBERT LEE RAMSAY, a citizen of the United States, residing at Van Cleave, in the county of Jackson and State of Mississippi, have invented certain new and useful Improvements in Devices for Overcoming Dead-Centers; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawings is a side elevation of my improved engine with one of the shaft-bearings removed therefrom. Fig. 2 represents a similar view of the reverse side of the engine, and Fig. 3 a detail sectional view showing the connection of the link to the spring-bar.

The present invention has relation to certain new and useful improvements in steam-engines, and has for its object to provide means for preventing the crank from stopping or hanging on the dead-center, by which the difficulties and dangerous delays which frequently occur by not starting the engine promptly are overcome. I attain these objects by the mechanism substantially as shown in the drawings, and hereinafter described and claimed.

In the accompanying drawings, A represents the cylinder of a vertical engine, supported on the frame or housing G, said housing supporting the guides D of the cross-head C. To the cross-head is attached the piston-rod B and the pitman E, which in turn is connected to the crank F.

Thus far the parts described are common to all vertical engines; but it may be mentioned here that my improvement could be equally as well applied to a horizontal engine.

Upon one side of the engine-housing G is secured a bracket H, which forms a guide I for the spring-bar K and also a bearing for the shaft L, the other bearing of the shaft being in the standard M, which is secured to the floor or bed-plate. Connected at one end to the shaft L, between the bearings in the bracket H and upright M, is the arm N, the opposite end being connected to the cross-head by a pin O, which passes through a slot

in the arm. On the outer end of the shaft L, near the bracket H, is a double lever P, to each end of which are pivotally secured the rods Q Q', and to these rods is secured a reversing-link R, said link being composed of double bars *a a*, one of which is slotted to receive the bolt *b*, that connects it to the spring-bar K, as shown in Fig. 3. This connection permits the link to be slid across the spring-bar, as shown in dotted lines, Fig. 1, the object of which will be explained hereinafter.

The standard S supports the rod T, upon which a spring U rests, and in the present instance I have shown this spring as spiral, with arms *c d*, the former being connected to the spring-rod K and the latter to the end of a connecting-rod V, the other end of which is connected to the crank-pin by the side of the main connecting-rod.

In operation (see Fig. 1) steam has been shut off from the cylinder and the engine is about to stop, the cross-head ascending and carrying with it the crank, and also lifting the end of the bar N, which oscillates the shaft L and lever P. The rod Q' is thereby lowered, it being nearer the spring-rod than the rod Q, the lowering of the rod giving tension to the spring as the crank approaches the dead-center. The spring now acts and pulls the crank over a short distance, and upon the downward stroke the same operation is repeated, and in the drawings is shown the position of the crank after the spring has moved it off the center. The position of the links as shown is for running the engine in one direction; but by shifting the link, as shown in dotted lines, the spring-bar will receive a reverse movement from the engine, and tension will be given to the spring, which will bring the crank to the other side of the center (shown in dotted lines) for running in the opposite direction.

It will be seen that the spring has no tension until the crank approaches the dead-centers, and the accumulated force is expended in moving the crank. The tension for the proper direction that it is desirous for the spring to act is given to it by the shifting of the link. It will also be seen that the link, one arm of the lever P, and the rod Q' could be dispensed with, and the rod made fast to



the spring-bar K, thus causing the shaft to turn always in the direction as shown in Fig. 1.

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

1. In a device for overcoming dead-centers, the combination of the main crank with the spring, the rod connecting the spring to the crank, and means for giving tension to the spring in opposite directions, substantially as and for the purpose specified.

2. In a device for overcoming dead-centers, the combination of the main crank, the rod connecting the spring to the crank, the spring, the bar, the lever, and their connections, and means for oscillating the lever, substantially as and for the purpose described.

3. In a device for overcoming dead-centers, the combination of the main crank with the

spring, the rod connecting the spring to the crank, the spring-bar, the lever, and their connections, the lever-shaft provided with an arm, and the cross-head, substantially as and for the purpose set forth.

4. In a device for overcoming dead-centers, the combination of the main crank with the spring, the rod connecting the spring to the crank, the spring-bar, the link, the double lever, the rods connecting the lever to the links, the lever-shaft provided with an arm, and the cross-head, substantially as and for the purpose described.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

ROBERT LEE RAMSAY.

Witnesses:

A. W. RAMSAY,  
W. P. RAMSAY.