

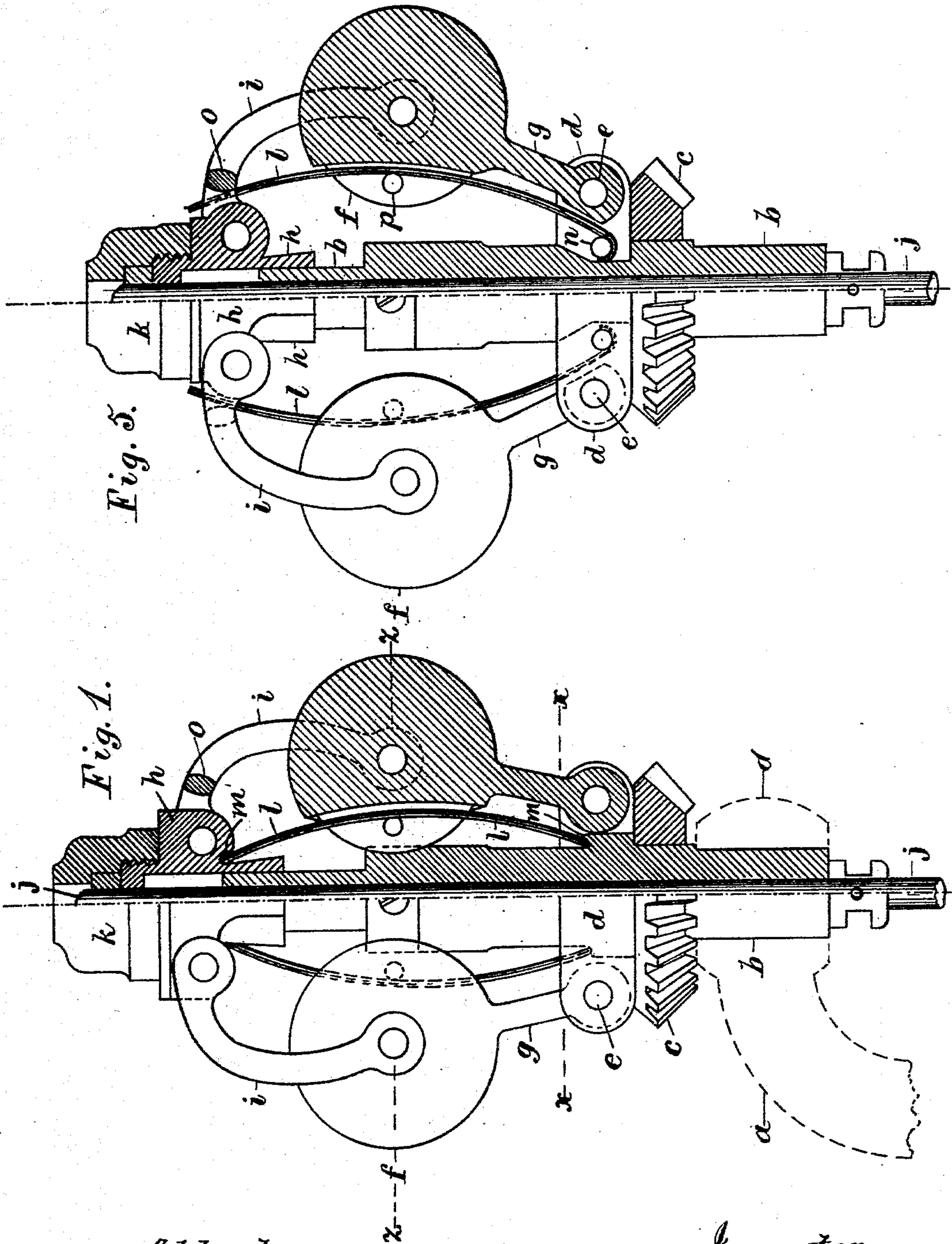
(No Model.)

2 Sheets—Sheet 1.

S. P. LATHROP.  
STEAM ENGINE GOVERNOR.

No. 515,964.

Patented Mar. 6, 1894.



Attest:  
L. Lee  
Edw. S. Murray

Inventor.  
Stephen P. Lathrop,  
per Crane & Miller, Attys.

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Fig. 4.

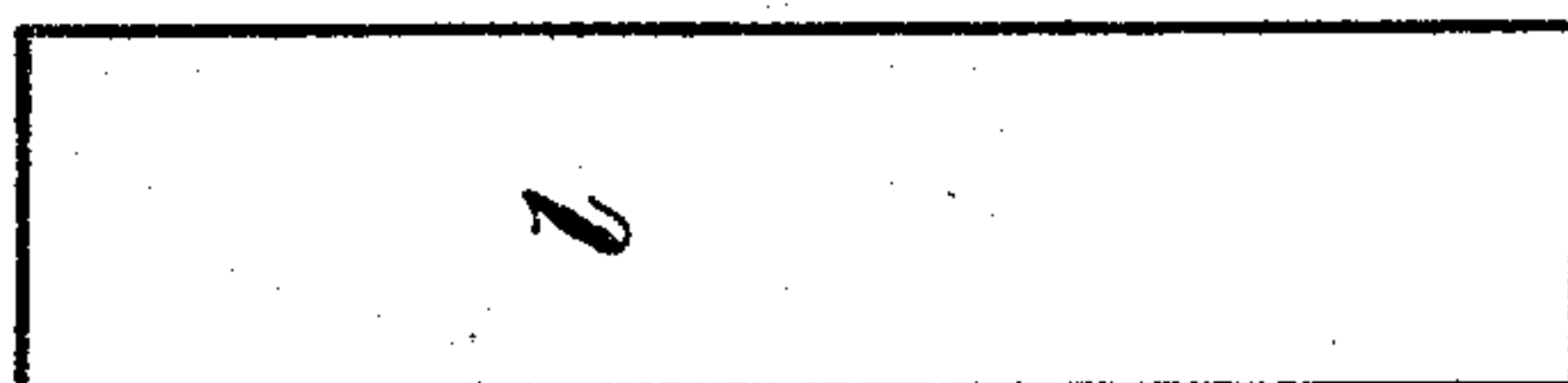


Fig. 3.

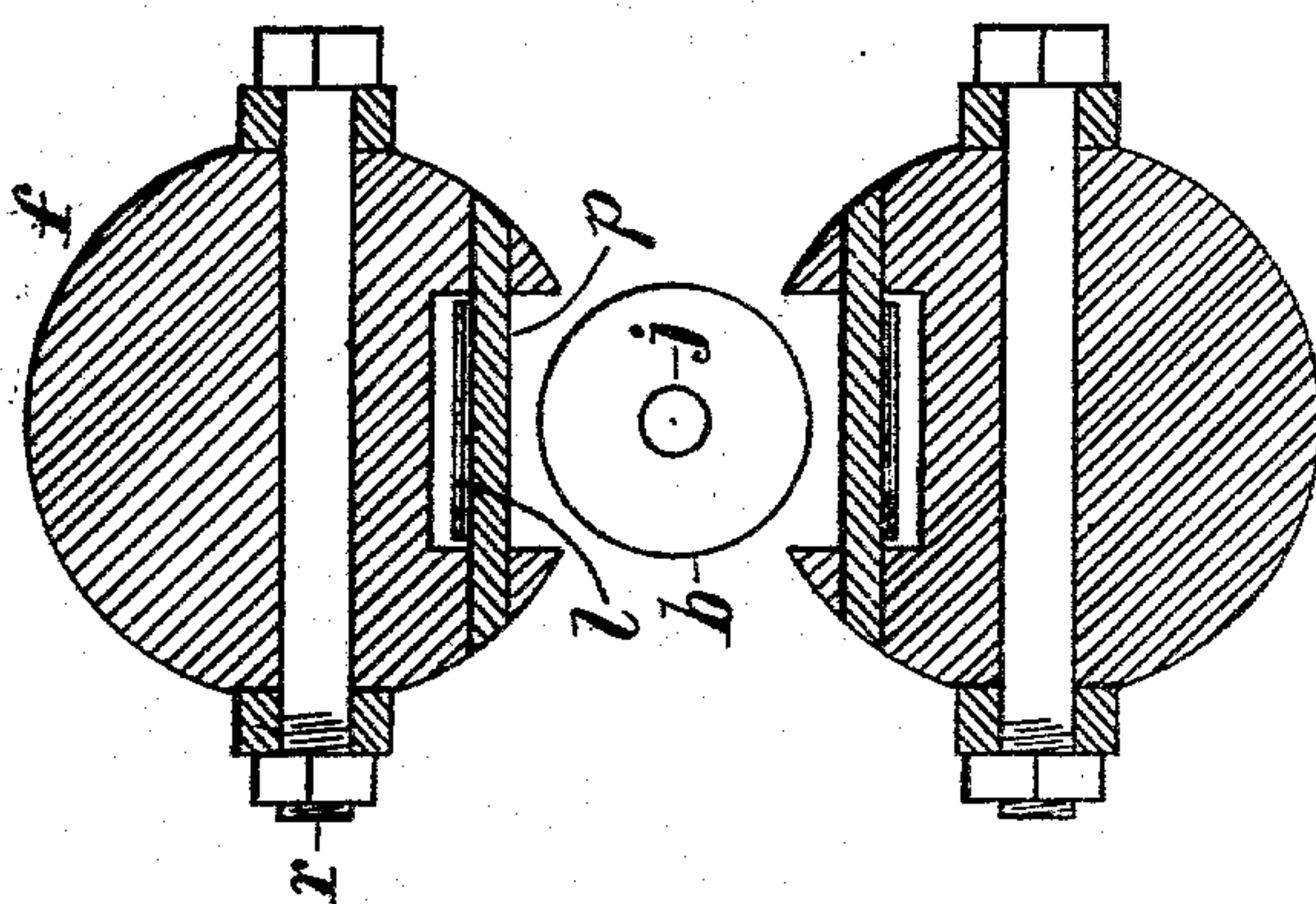
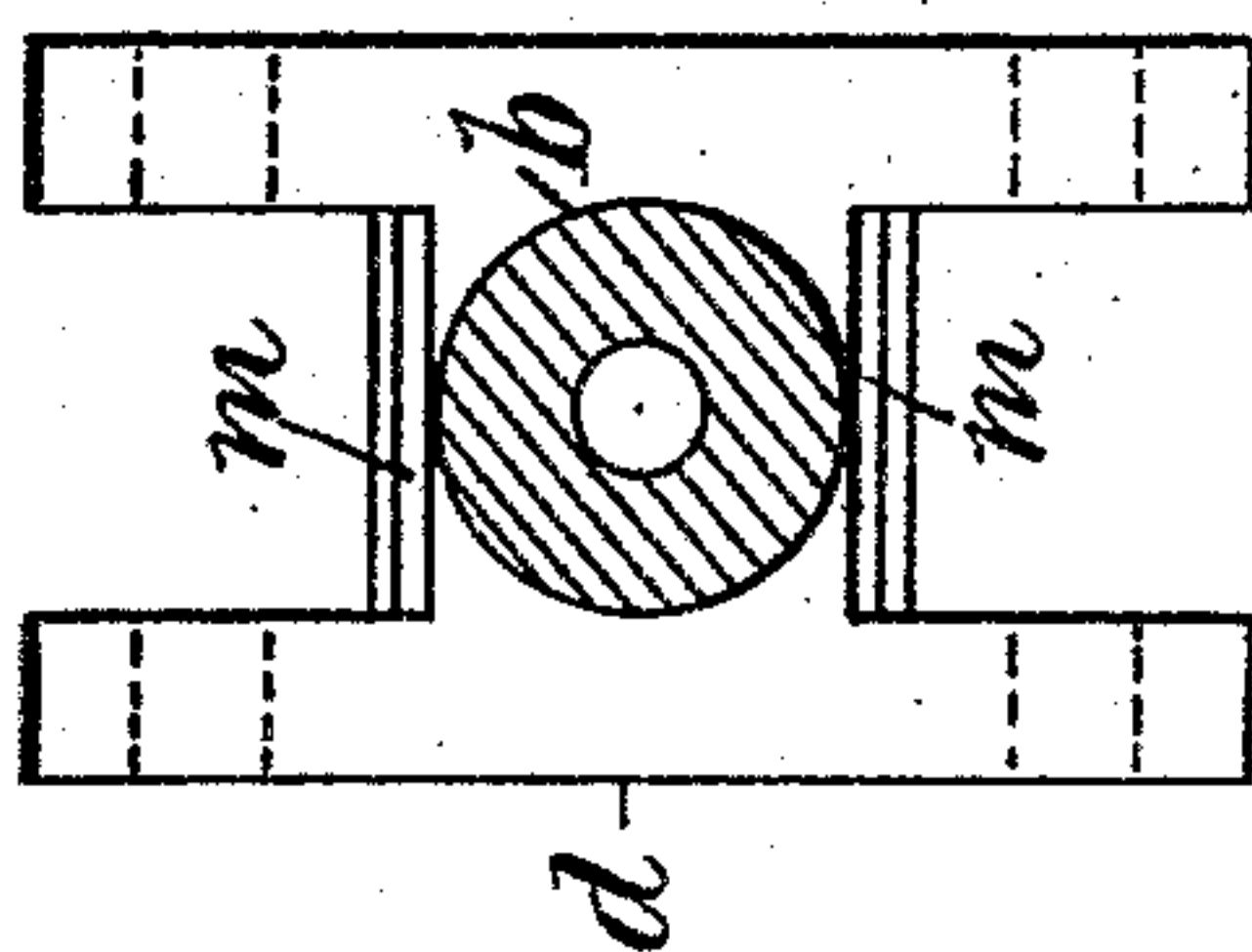


Fig. 2.



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# UNITED STATES PATENT OFFICE.

STEPHEN PARK LATHROP, OF MONTCLAIR, NEW JERSEY, ASSIGNOR TO  
CARRIE D. LATHROP, OF SAME PLACE.

## STEAM-ENGINE GOVERNOR.

SPECIFICATION forming part of Letters Patent No. 515,964, dated March 6, 1894.

Application filed May 18, 1893. Serial No. 474,626. (No model.)

*To all whom it may concern:*

Be it known that I, STEPHEN PARK LATHROP, a citizen of the United States, residing at Montclair, Essex county, New Jersey, have invented certain new and useful Improvements in Steam-Engine Governors, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

10 This invention relates to that class of governors in which the governor weights are connected by links both to a fixed head and to a sliding collar upon the governor spindle and in which the outward movement of the weights  
15 is resisted by a spring.

In my construction a leaf spring is extended inside of the weight, from the fixed head to the sliding collar, and is so connected with the head and collar as to be bent transversely  
20 intermediate to its ends as the weight moves outward. The spring thus resists the outward movement of the weight and retards the action of the governor until the desired velocity is secured. The sliding collar in this class of  
25 governors is swiveled to a valve rod which may be connected with the valve through any intermediate agency, or fixed directly thereto.

The invention will be understood by reference to the annexed drawings, in which—

30 Figure 1 is an elevation in section at the center line, where hatched, of a governor having the ends of the spring fitted to thrust against the head and collar. Fig. 2 is a cross section of the spindle and head on line *x, x*, in Fig. 1. Fig. 3 is a cross section on line *z, z*, in Fig. 1. Fig. 4 shows a spring detached, and Fig. 5 is an elevation like Fig. 1 showing  
35 an alternative arrangement for the spring.

The parts associated with the governor spindle are shown detached from the driving mechanism, as the latter forms no part of my present invention, and the bearing which supports the spindle is therefore indicated merely in dotted lines *a*. The spindle *b* is provided  
40 with the usual gear wheel *c* to rotate the same, and a head *d* provided with pivots *e* to which the weights *f* are jointed by links *g*. A sliding collar *h* is fitted movably to the upper end of the spindle and connected with the weights  
45 by links *i*. The spindle is provided with an internal sliding valve rod *j* which is swiveled

at the top to the collar *h* by a screw cap *k*. The head *d* as shown in Fig. 2, is notched upon its opposite sides to receive the lower ends of the single link *g* projected from the lower side of the weight, and the links *i* which connect the weights with the collar *h* are forked to embrace the opposite sides of the weight and the opposite sides of a lug upon the collar. A brace *o* connects the forked  
55 arms of the links *i* adjacent to the collar *h*.

In Fig. 1 the leaf spring *l* is shown fitted to notches *m* in the adjacent sides of the head and collar, and sprung into place so that its ends press snugly into such notches, when the balls are at rest, as shown in Fig. 1. The outward movement of the balls tends to draw the collar downward toward the head and presses upon the ends of each spring, thus bending it transversely as the balls move outward. A  
60 spring is applied upon the inside of each of the two balls or weights. The transverse bending of the spring may be effected by connecting its middle directly with the ball and holding the ends from movement in any suitable manner.

An alternative arrangement is shown in Fig. 5, in which the lower ends of the springs are fitted to hinge pins *n* extended across the notches in the head *d*, and the upper ends of the springs are placed in contact with the inner side of the brace *o*, which in all the movements of the links *i* remains adjacent to the collar *h*, and thus forms a substantially fixed bearing for the upper end of the spring. Each  
80 spring is shown formed of two thin leaves to increase its elasticity. The weights are shown of ball shape with a notch upon their inner sides to make room for the spring and to insert a pin *p* across the notch to lock the ball to the spring. With the construction shown in Fig. 5, there is no end thrust upon the spring but its opposite ends are held from lateral movement, and the outward movement of the ball bends the spring transversely  
85 between its ends by the engagement of the pin *p* with the spring.

Heretofore leaf springs have been combined with governor weights, but always in such a relation that the weight was connected with the spindle through the spring. It has also  
90 been common in previous constructions to so



connect the spring with the fixed head that the rupture of the spring would disconnect the balls from the sliding collar and thus permit the engine to run away. In my construction the weight is connected positively with the head and collar of the governor by metallic links, and operates normally irrespective of the spring. The breakage of the spring, which normally resists the outward movement of the weights, therefore permits the weights to expand with the utmost freedom and tends to stop the engine instead of accelerating its speed. By connecting the weights with the governor spindle by two sets of links independent of the spring, I am enabled to use the spring for resisting the centrifugal force only, and not as a means for sustaining the weight, and my springs do not therefore require any bolt holes or fastenings which tend to weaken the same.

The spring as shown in Fig. 4, is merely a flat leaf, and if broken by accident can be readily replaced by making a similar spring from any suitable piece of sheet steel.

With the construction shown in Fig. 1, the spring requires no bending or shaping to fit it for use, but is merely a flat plate, which, when cut into rectangular form, may be sprung into the notches *m* which are provided in the adjacent sides of the head and collar.

To facilitate the introduction of the spring, the transverse rivet *r* which connects the

forked link *i* with the weight may be removed, and the weight and links turned out of the way; a sufficient flexure of the spring then permits its application as required.

Having thus set forth my invention, what I claim is—

1. In a governor having weights jointed both to a head upon the spindle and to a collar fitted movably to the same, the combination, with the head, the collar, and the weights, of a flat leaf spring held at its ends adjacent to the head and collar and bent transversely between its ends as the weight moves outward, as herein set forth.

2. In a governor having weights jointed both to a head upon the spindle and to a collar fitted movably to the same, the combination, with the head, the collar and the weights, of spring fulcrum pins in opposite sides of the head, flat leaf springs fitted thereto and extended upon the inner sides of the weights to the sliding collar, and the pins *p* inserted through the weights to engage the middle of the spring, as set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

STEPHEN PARK LATHROP.

Witnesses:

CARRIE D. LATHROP,  
E. H. HOLMES.