

J. C. HOADLEY.
Governors for Steam-Engines.

No. 148,560.

Patented March 17, 1874.

Fig. 1.

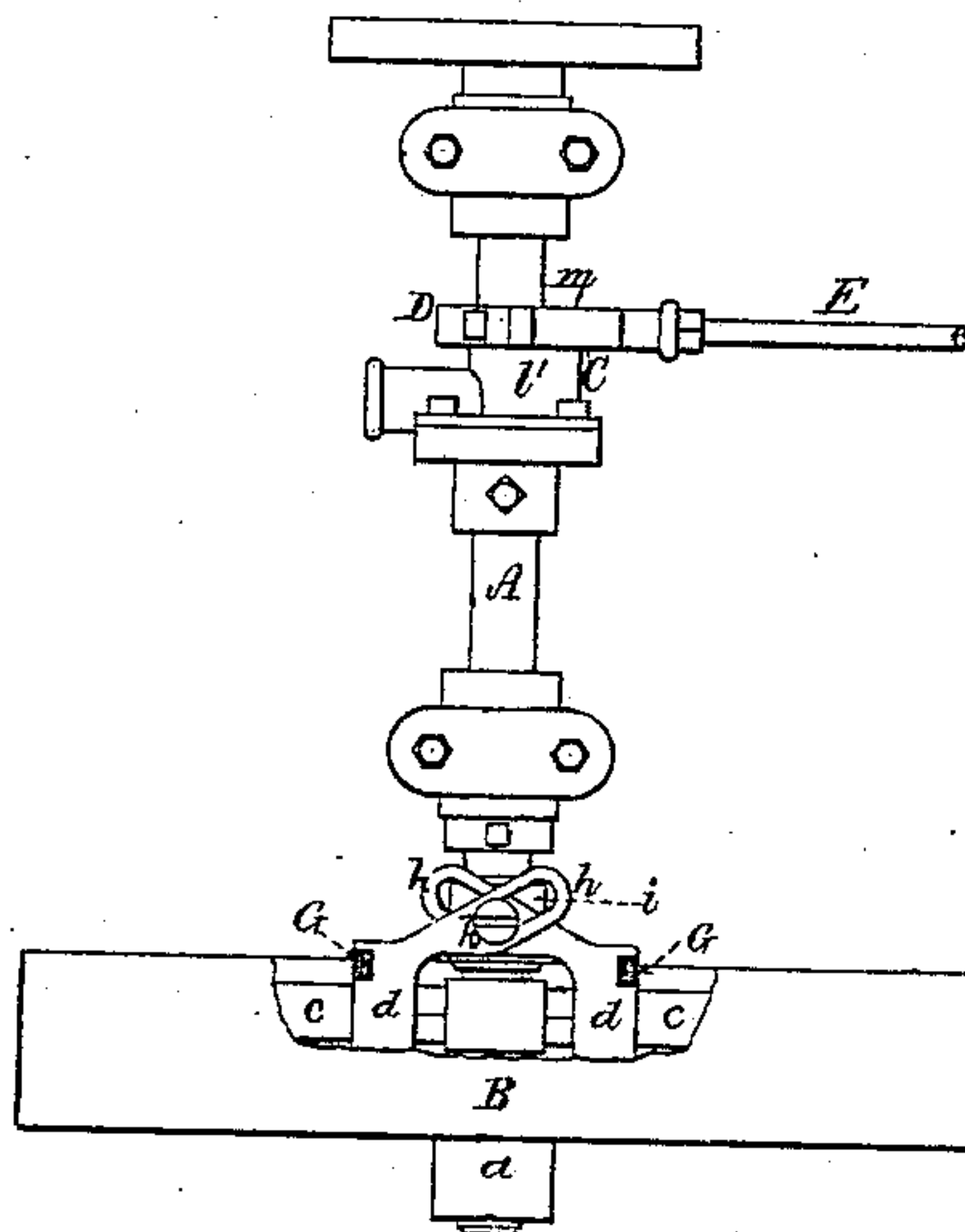


Fig. 2.

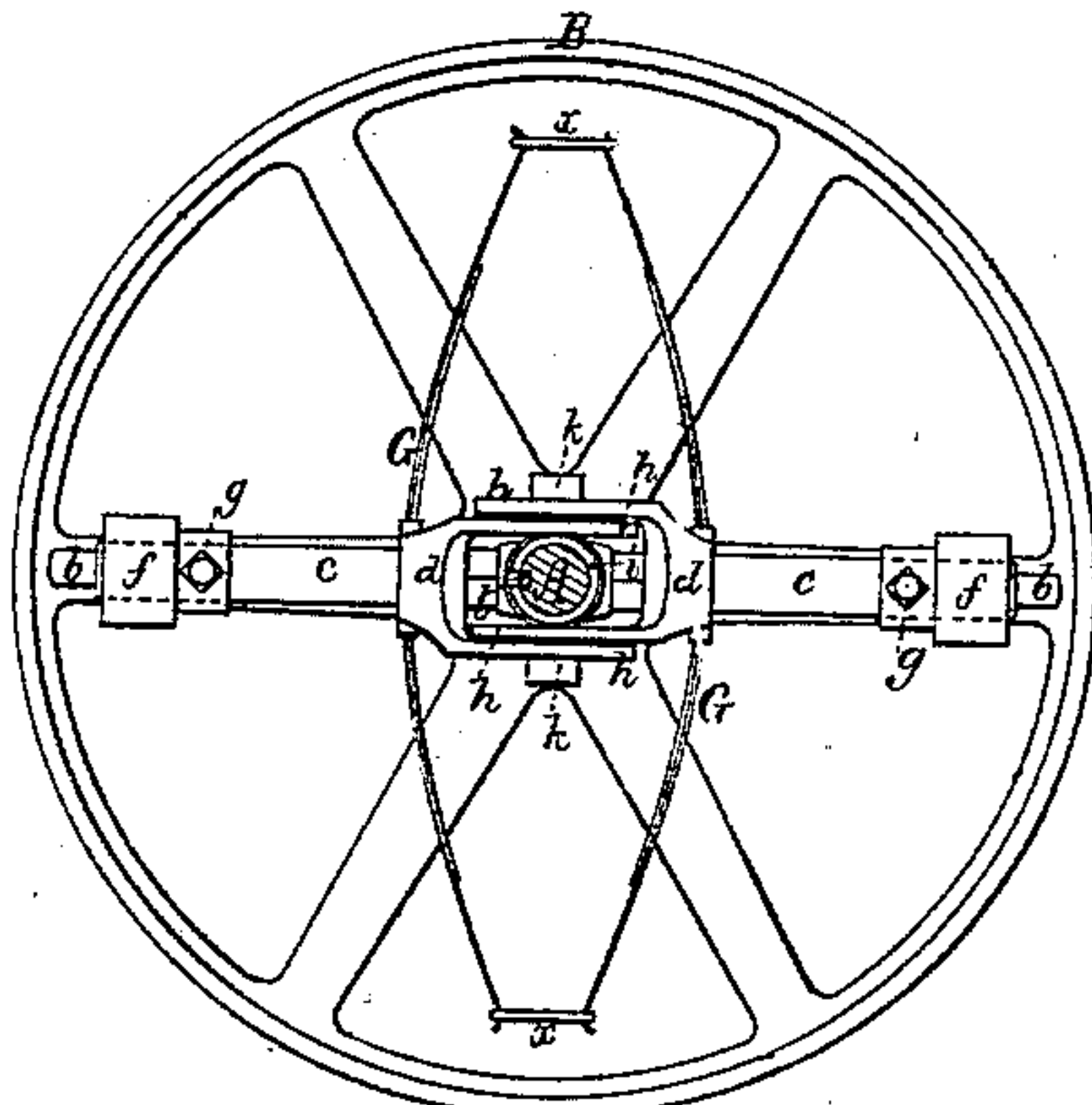


Fig. 3.

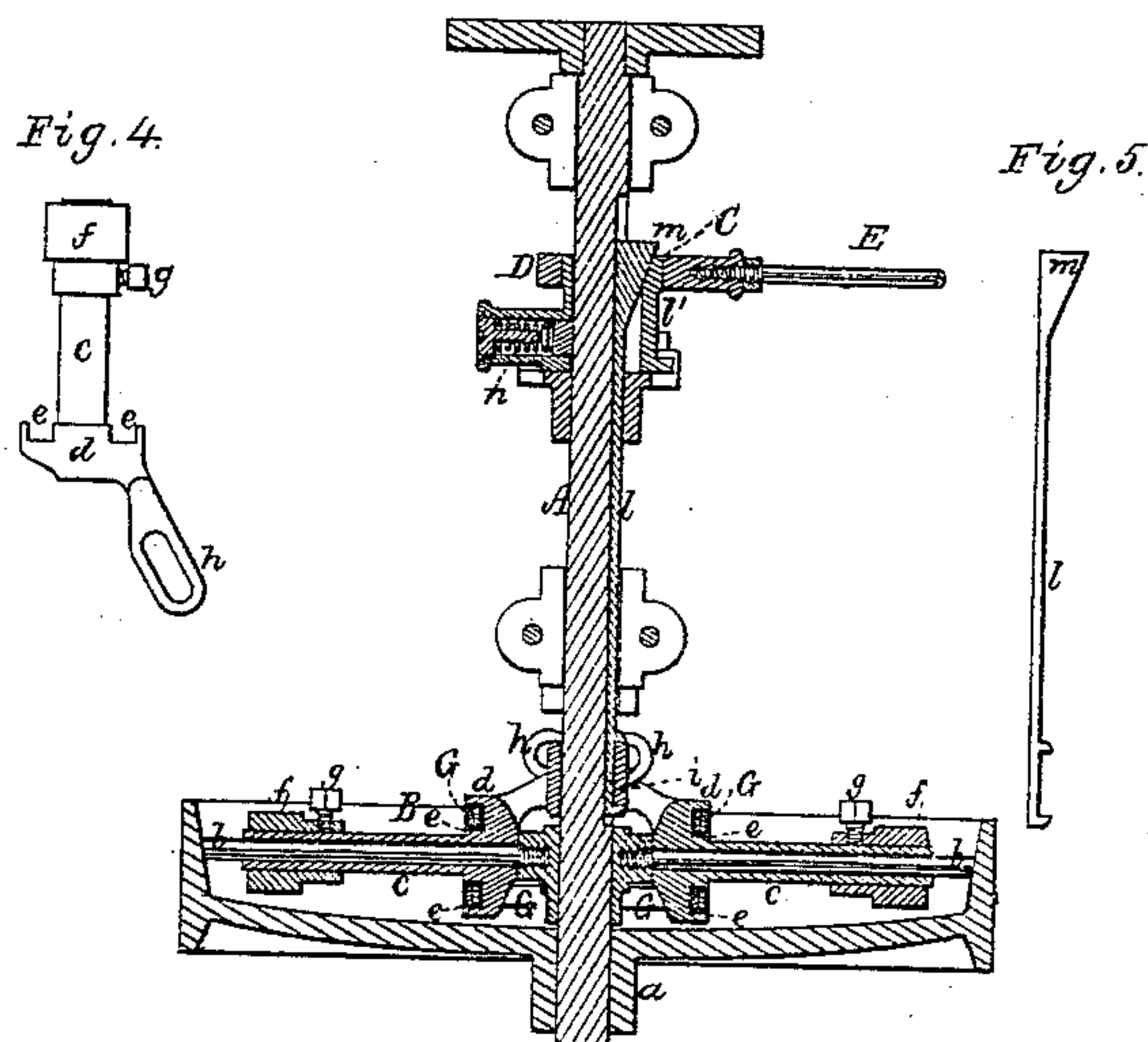


Fig. 4.

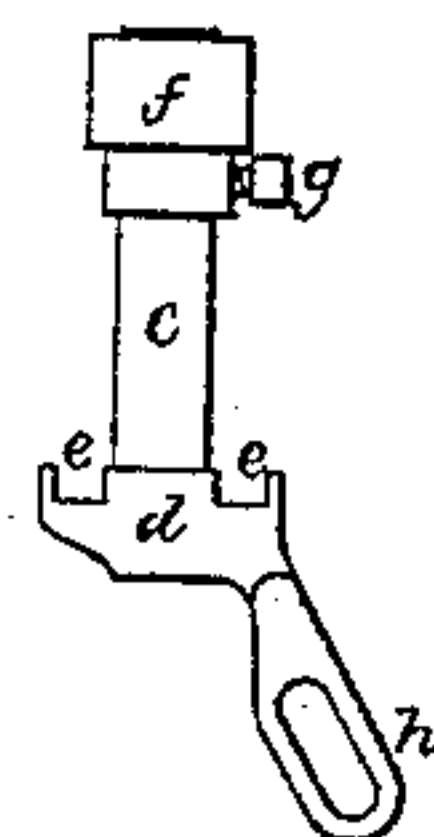


Fig. 5.



Witnesses.
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by his attorney.
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UNITED STATES PATENT OFFICE.

JOHN C. HOADLEY, OF LAWRENCE, MASSACHUSETTS.

IMPROVEMENT IN GOVERNORS FOR STEAM-ENGINES.

Specification forming part of Letters Patent No. 148,560, dated March 17, 1874; application filed February 4, 1874.

To all whom it may concern:

Be it known that I, JOHN C. HOADLEY, of Lawrence, of the county of Essex and State of Massachusetts, have invented a new and useful Improvement in Governors for Steam-Engines; and do hereby declare the same to be fully described in the following specification and represented in the accompanying drawings, of which—

Figure 1 is a top view of a steam-engine shaft, fly-wheel, eccentric collar, and rod with my improvement applied thereto. Fig. 2 is a rear elevation of the governor and fly-wheel. Fig. 3 is a horizontal section of the driving-shaft, the eccentric, and the fly-wheel and governor.

In several respects the governor is like that shown and described in the specification and drawings of Letters Patent No. 144,098, dated October 28, 1873, with which the valve-eccentric has of necessity to be arranged in close proximity with the fly-wheel and governor.

One object of my present invention is to enable me to dispose of the eccentric at a greater distance from the fly or band wheel, or as circumstances may require, thereby saving the necessity of placing the two in close proximity. Another purpose of the invention is to dispense with the counterbalance-weight applied to the crossed slotted arms; also, to apply to better advantage the actuating-springs of the sleeves carrying the crossed slotted arms.

In the drawings, A denotes the driving-shaft, and B the fly-wheel, which is represented as a band wheel or pulley. From the hub *a* of the said wheel B, or from a separate hub fixed on the shaft, there are projected in line with each other, and in opposite directions within the wheel, two arms, *b b*, and there is arranged on each of such arms, concentrically, one of a pair of tubular sleeves or slides, *c c*. Each of said slides, at its inner end, is provided with a head, *d*, to project from it in opposite directions, and notched to receive two bow-springs. Fig. 4 is a side view of one of the sleeves and its recessed head, the notches or recesses being shown at *e e*. In each notch an elliptic or bow spring, G, at its middle is placed, the spring of each notch of one head being, at its ends, connected, by links *x x*, with a corresponding spring of a notch of the other head, all as

shown. Each head is provided with two bow-springs, arranged on opposite sides of the sleeve, and at equal distances from the axis thereof. The sleeves, by being furnished with heads arranged and notched as described and shown, not only enable me to use entire bow-springs, but to dispose of them on opposite sides of each sleeve, so as to prevent the sleeve from being pressed obliquely so as to bind on its arm. In the governor shown in the Patent 144,098, there are projected from each sleeve, in opposite directions, two half bow-springs, they being fixed within the head of the sleeve. Notching the heads, and applying an entire bow-spring to each notch, is far preferable, and readily admits of easy application of the spring to the head, or its removal therefrom.

Each sleeve *c* has a tubular weight, *f*, arranged concentrically to slide lengthwise on it, the weight being furnished with a screw, *g*, for clamping it to the sleeve. By means of the screw, and such an application of the weight to the sleeve, the weight may be readily moved and adjusted on the sleeve, nearer to or farther from the axis of the fly-wheel, as occasion may require, to vary the centrifugal power of the weight. From each sleeve-head there projects obliquely, and on opposite sides of the driving-shaft, all in manner as shown, two slotted arms, *h h*, those of one pair crossing those of the other. By this arrangement of the arms, those on one side of the driving-shaft counterbalance those on the other, and thus render unnecessary counterbalance-weights, as applied to the two slotted arms, as shown in my said patent. From a sleeve or short tubular shaft, *i*, arranged between the pairs of arms, and on the driving-shaft, studs or screws *k k* are extended through the slots of the arms. Furthermore, the driving-shaft is grooved lengthwise to receive a slide-bar, *l*, provided at its rear end with a wedge, *m*, such slide-bar being shown in side view in Fig. 5. The said bar is to be so constructed with or applied to the sleeve *i* as to be moved longitudinally by it when such sleeve is in movement on and lengthwise of the driving-shaft. The wedge extends transversely through the valve eccentric *e*, whose encompassing collar is shown at D, and valve-rod at E. The eccentric, as represented, is formed on the end of or constitut-

ing part of a tube, *l'*, encompassing the driving-shaft, and so applied to it and supported as to be capable of sliding or moving rectilinearly transversely of the shaft, the tube being furnished with a spring, *n*, to move it in a direction counter to that effected by the wedge. By forcing the wedge away from the fly-wheel, the eccentricity of the eccentric will be varied or diminished by the action of the spring, a counter-movement of the wedge operating to increase the amount of said eccentricity. From the above it will be seen that as the velocity of the fly or band wheel may be increased the sleeves *c c* will be moved outward upon the arms *b b*, whereby, by the action of the grooved and crossed arms *h h h h*, the sleeve *i* and the slide-bar *l* will be moved on the driving-shaft, so as to cause the wedge *m* to move, to enable the spring *n* to vary or diminish the eccentricity of the eccentric with reference to the shaft. On decrease in the velocity of the fly-wheel taking place, the eccentricity of the eccentric will be changed or increased by the wedge.

What I claim as my invention in the fly or band wheel governor, or with reference to such, the driving-shaft, and valve-rod eccentric, is as follows:

1. The two pairs of slotted arms *h h*, arranged and combined, as represented, with the two radial sleeves *c c*, applied to the arms *b b*, and also with the sleeve *i*, arranged on the driving-shaft, all being substantially as shown.

2. The bar *l* and its wedge *m*, arranged and combined with the driving-shaft, the valve-rod eccentric, and the spring *n*, and the sleeve *i*, applied to the said shaft, and connected with the crossed and slotted arms, all as set forth.

3. The sleeves *c c*, provided with the notched heads *d d*, and having the entire bow-springs *G G* arranged in the notches of said heads, all substantially as explained and represented.

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Witnesses:

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