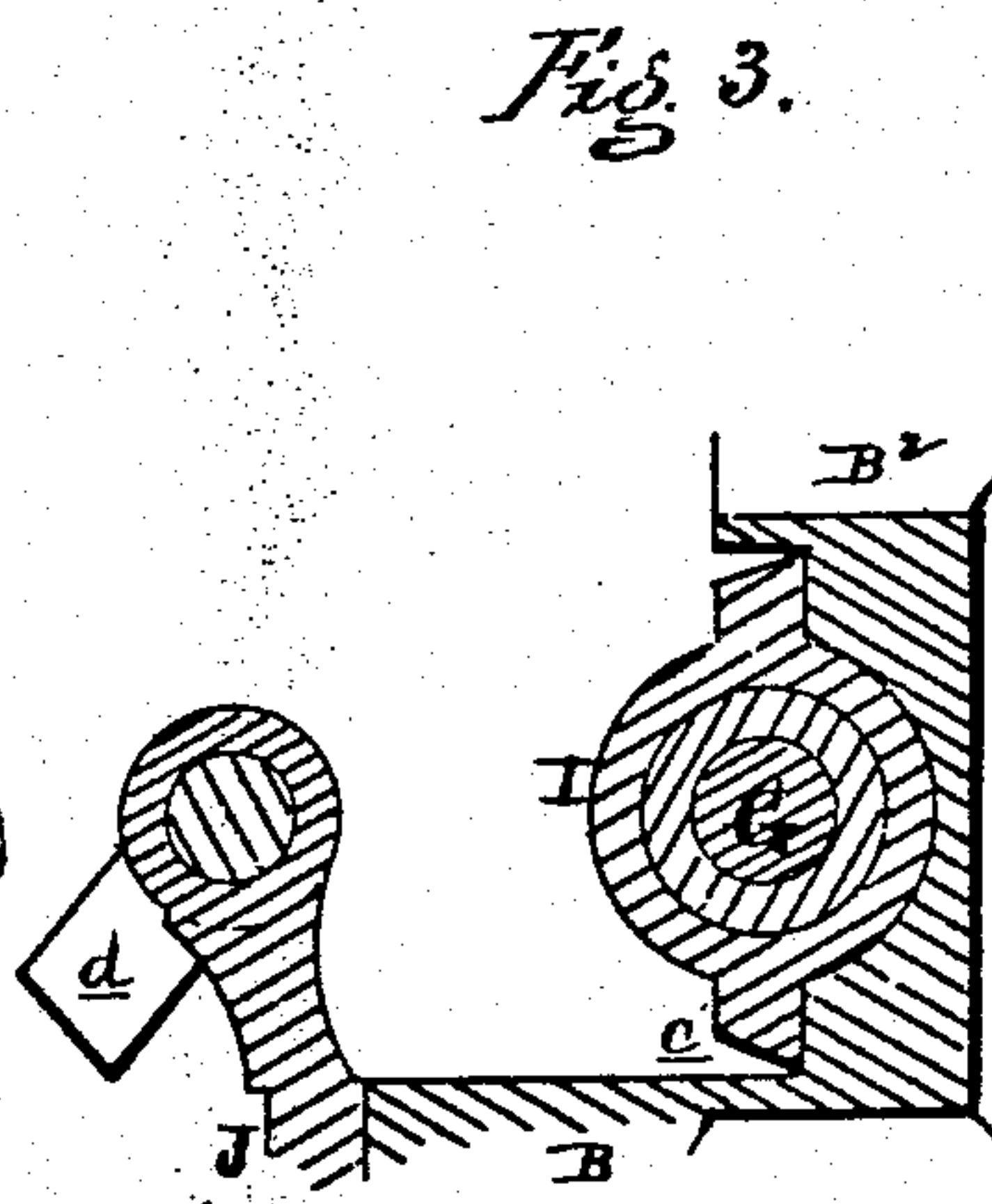
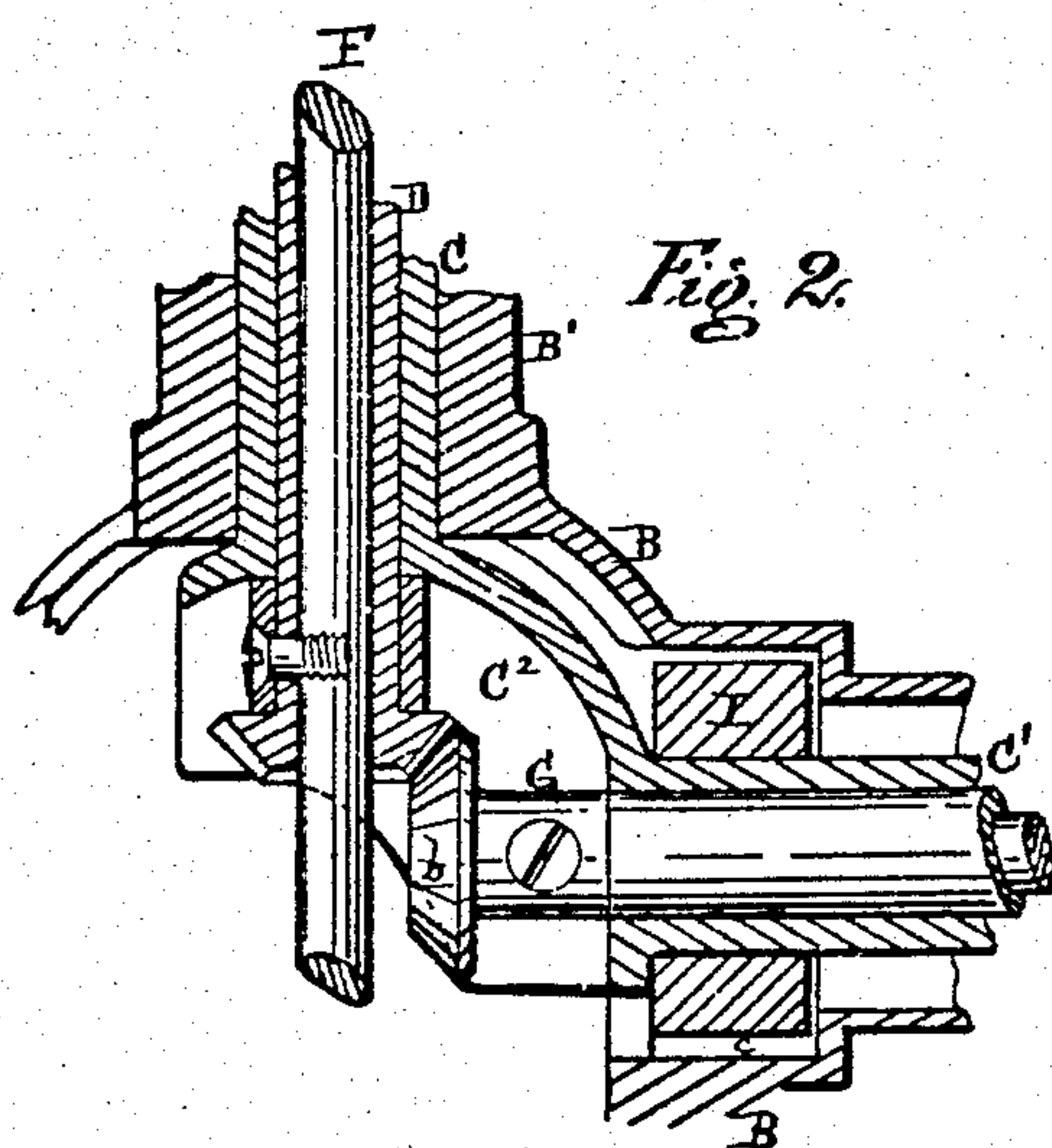
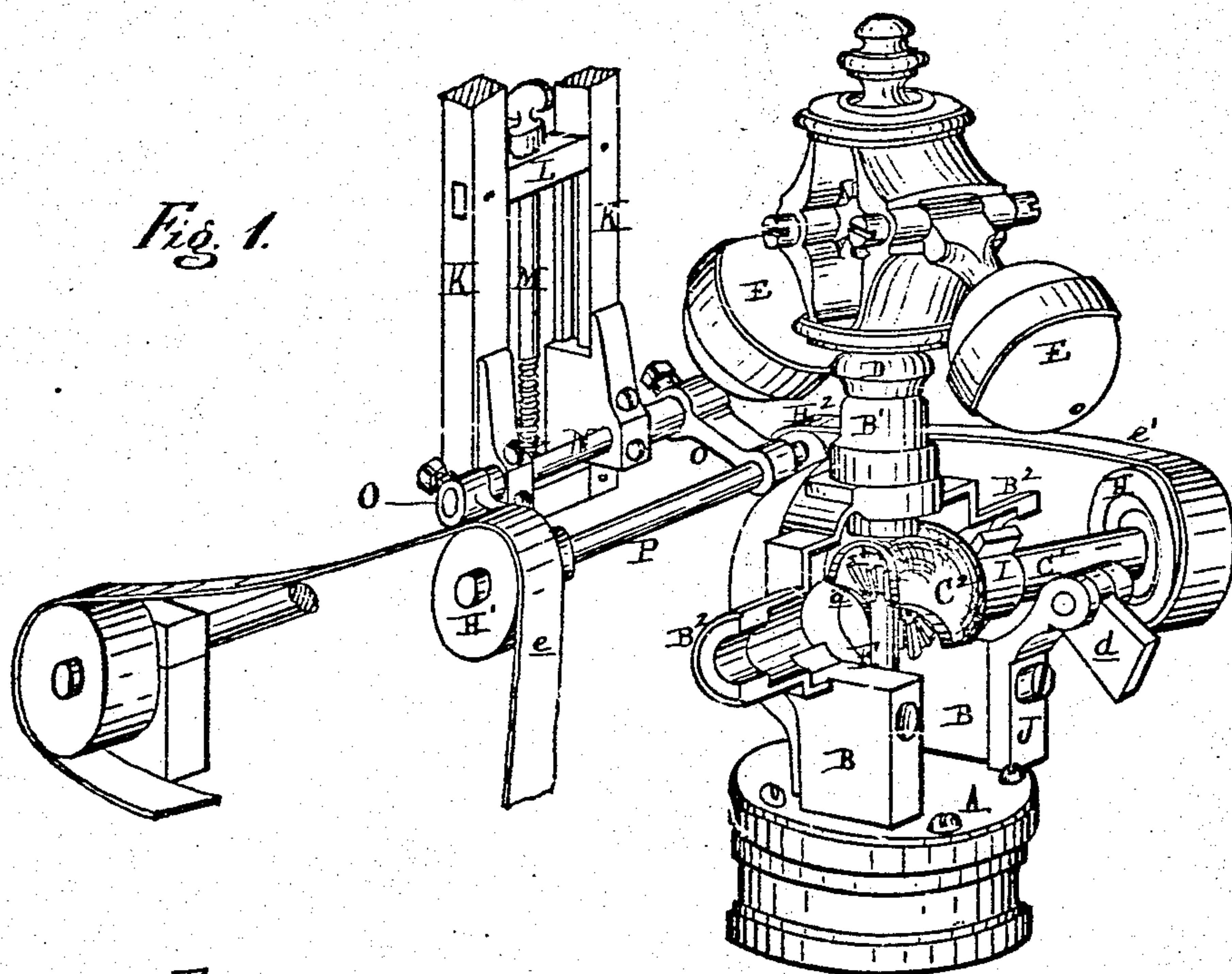


T. WARREN.  
Stop-Motions for Steam-Engine Governors.

No. 151,940.

Patented June 9, 1874.



Attest:  
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# UNITED STATES PATENT OFFICE.

THOMAS WARREN, OF FLINT, MICHIGAN.

## IMPROVEMENT IN STOP-MOTIONS FOR STEAM-ENGINE GOVERNORS.

Specification forming part of Letters Patent No. 151,940, dated June 9, 1874; application filed April 14, 1874.

*To all whom it may concern:*

Be it known that I, THOMAS WARREN, of Flint, in the county of Genesee and State of Michigan, have invented an Improvement in Stop-Motion for Steam-Engine Governors, of which the following is a specification:

The first part of this invention relates to the construction of a governor in such a manner that, when the driving-belt breaks or runs off the pulley, the head, with the arms, will drop and carry down the spindle far enough to have the valve close the steam-ports, and thus stop the engine. The second part of the invention relates to the peculiar method of hanging a counter-shaft, if one be used in connection with the governor, whereby, if the belt from the engine-shaft to the counter-shaft breaks or runs off, the engine will be instantly stopped by the dropping of the governor-spindle, as above specified.

Figure 1 is a perspective view of my improved governor and stop-motion as applied to the governor and counter-shaft, showing the positions of the various parts when the belt which drives the counter-shaft is broken. Fig. 2 is a sectional elevation at *xx* in Figs. 1 and 3, the latter being a cross-section at *yy* in Fig. 2.

In the drawing, A represents the cap of the governor valve-case, on which is erected the open frame B, terminating at the top in a vertical sleeve, B<sup>1</sup>, in which is inserted the vertical arm C of an L-shaped sleeve, whose horizontal arm C<sup>1</sup> is connected therewith by a shell, C<sup>2</sup>, all being cast in one piece. D is the rotating head, having a tubular stem, which is passed down through the sleeve C, carrying at its lower end the bevel-pinion *a*. E are the weighted arms, hung in the frame of the head, their inner ends engaging with the spool on the upper part of the valve-stem F. The base of the head-frame rests upon the top of the sleeve-arm C. G is the driving-shaft of the governor, rotating in the sleeve C<sup>1</sup>, which forms its bearing. At its inner end is a bevel-gear, *b*, meshing with the pinion *a* to give the head its rotary movement. H is the driving-pulley on the outer end of the shaft G. The frame B has two horizontal brackets, B<sup>2</sup>, on opposite sides, in either of which the arm C<sup>1</sup> may be placed, so that the same governor will

answer for either right-hand or left-hand connected engines; but one bracket is necessary, however, if the governor be specially made for either style of connection. The bracket is bored, like a half of a box, for the arm C<sup>1</sup>, which has sleeved on its inner part a collar, I, having a wedge-shaped stud, *c*, on its bottom, which rests upon the flat top of the frame-base B to support the arm-sleeve C<sup>1</sup> in a horizontal position. Unless some extraneous force were applied to either the arm C<sup>1</sup> directly or to it through the collar I, the latter would fall forward out of the bracket and carry the arm with it, as seen in Fig. 1, and lower the spindle far enough to have the valve close the ports. As a temporary device for sustaining the parts in position, I bolt a plate, J, to the face of the frame-base, and pivot in its head a stop, *d*, which may be thrown over against the collar, and so keep it in the bracket. This stop should be thrown away from the collar when the governor is in running order, so that, in case the belt which drives the governor breaks or runs off the pulley, the arm C<sup>1</sup> will drop out of the bracket and close the ports.

It frequently becomes necessary in practice to drive the governor from a counter-shaft overhead, instead of by a belt from the crank-shaft of the engine. In such a case, if the belt which drives the counter-shaft breaks or runs off, the governor would let the engine race, and, perhaps, cause great damage and endanger the lives of those in its vicinity. To overcome this difficulty is the object of the second part of my invention, in which—

K represents a frame pendent from the engine-room ceiling. In this frame is a sliding tightener-frame, L, which may be raised and lowered by a screw, M, passing through a girt in the frame K. N is a shaft, journaled in projecting bearings across the frame L. To each end of this shaft is secured a pendent arm, O, and through the lower ends of these arms the counter-shaft P is journaled, with a pulley, H<sup>1</sup>, on one end, and another, H<sup>2</sup>, on the other. Around this latter a belt, *e*, passes from the engine-shaft, and over the pulleys H<sup>1</sup> H an endless belt, *e'*, runs, so that the counter-shaft is like a pendulum, held stationary by the opposing strains of the two belts. If the



belt  $e'$  breaks or runs off the pulleys the arm  $C^1$  will drop out of the bracket and stop the engine. In like manner, if the belt  $e$  breaks or runs off, the arm  $C^1$  will drop out of the bracket, pulling forward the counter-shaft, as seen in Fig. 1. The screw  $M$  serves to tighten the endless belts by drawing up the frame  $L$ .

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The L-shaped sleeve  $C$ ,  $C^1$ ,  $C^2$ , forming bearings for the head  $D$ , and the shaft  $G$ , and the collar  $I$ , in combination with the frame  $B$

and bracket  $B^2$ , substantially as and for the purpose set forth.

2. The combination, with the shaft  $G$ , arranged as described, of the counter-shaft  $P$ , suspended by the radius-arms  $O$  from the shaft  $N$ , L-shaped sleeve, and bracket  $B^2$ , substantially as and for the purpose set forth.

THOMAS WARREN.

Witnesses:

H. F. EBERTS,  
C. E. HUESTIS.