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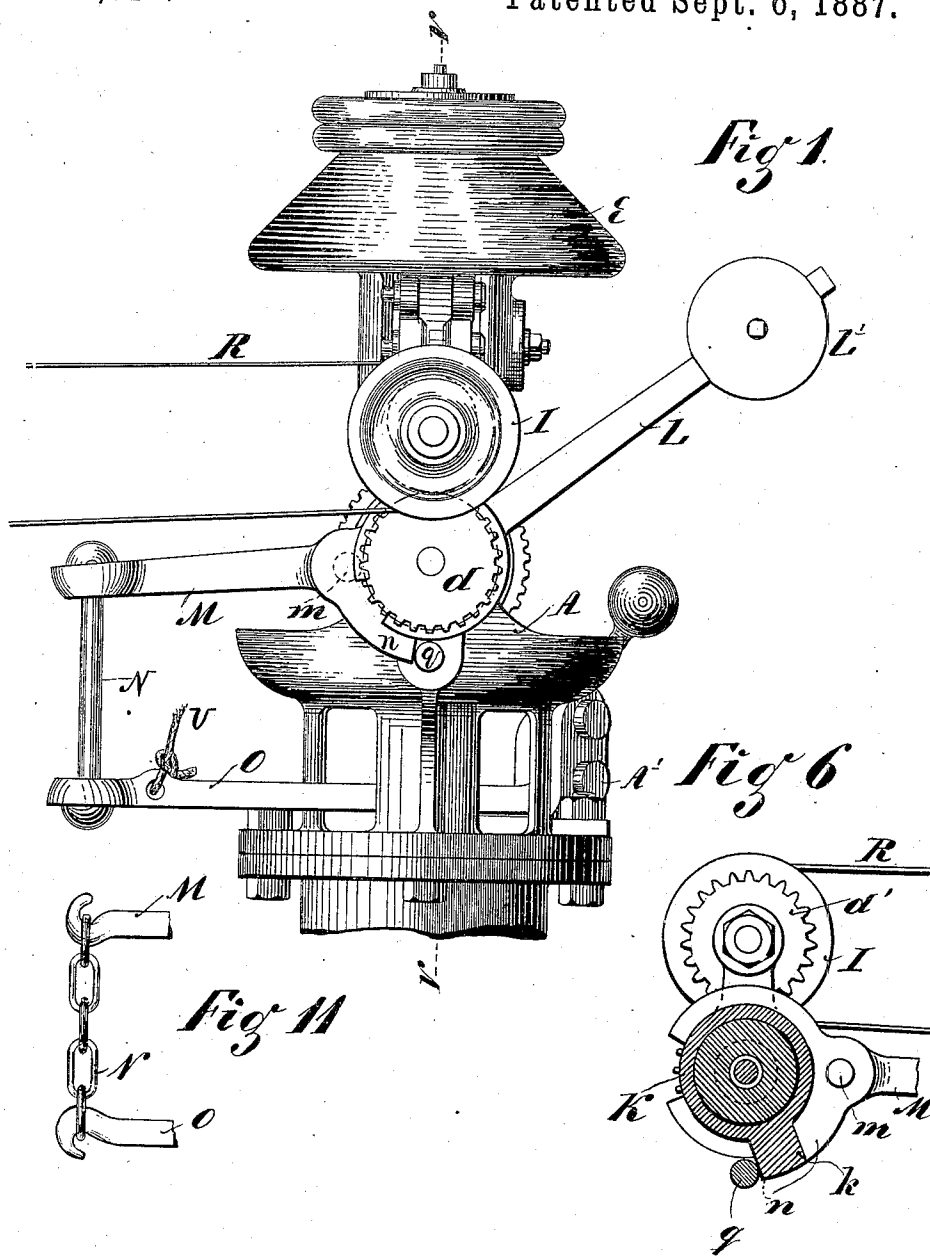
3 Sheets—Sheet 1.

B. V. NORDBERG.

SAFETY STOP FOR GOVERNORS.

No. 369,611.

Patented Sept. 6, 1887.



Witnesses  
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M. E. Oliphant

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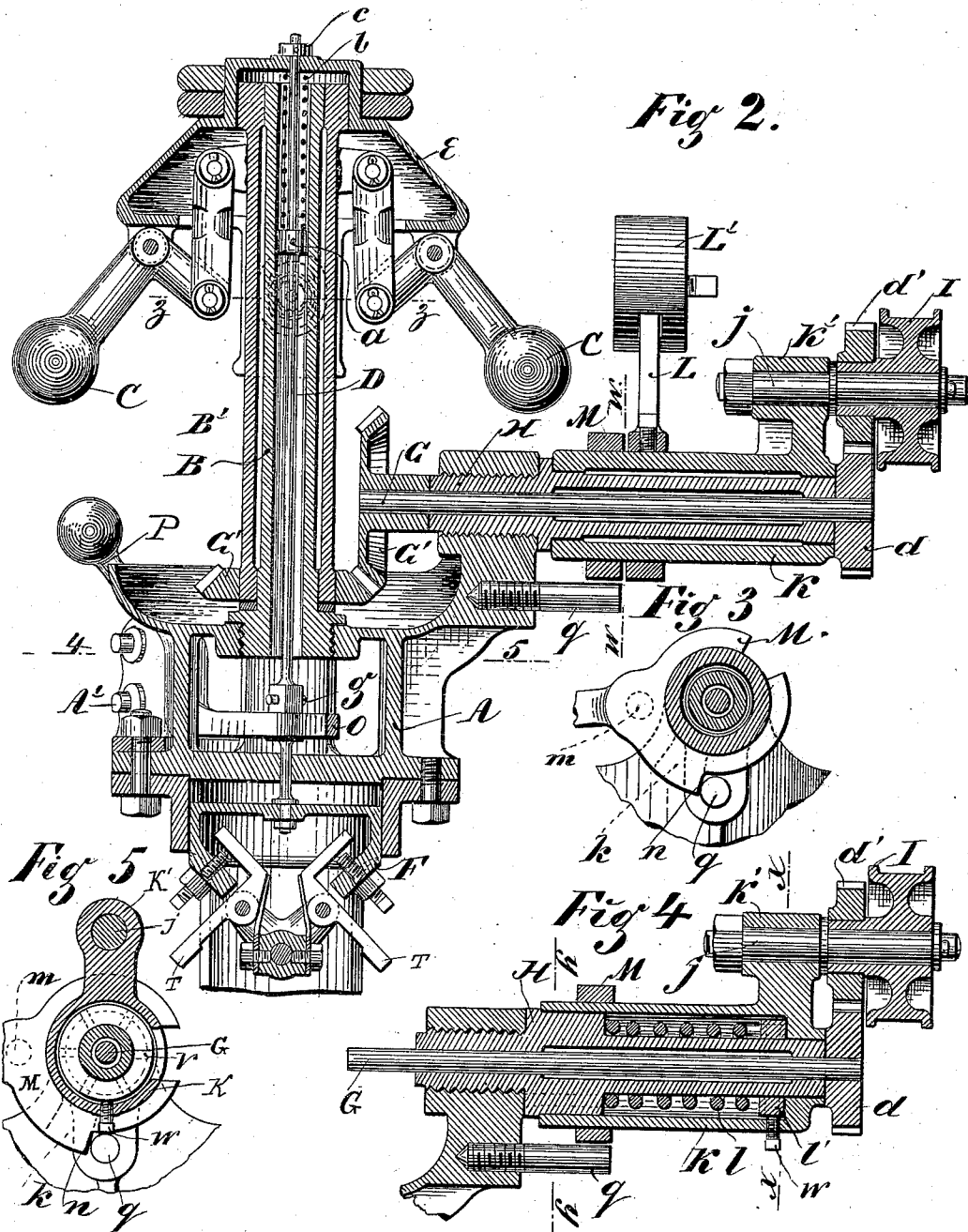
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(No Model.)

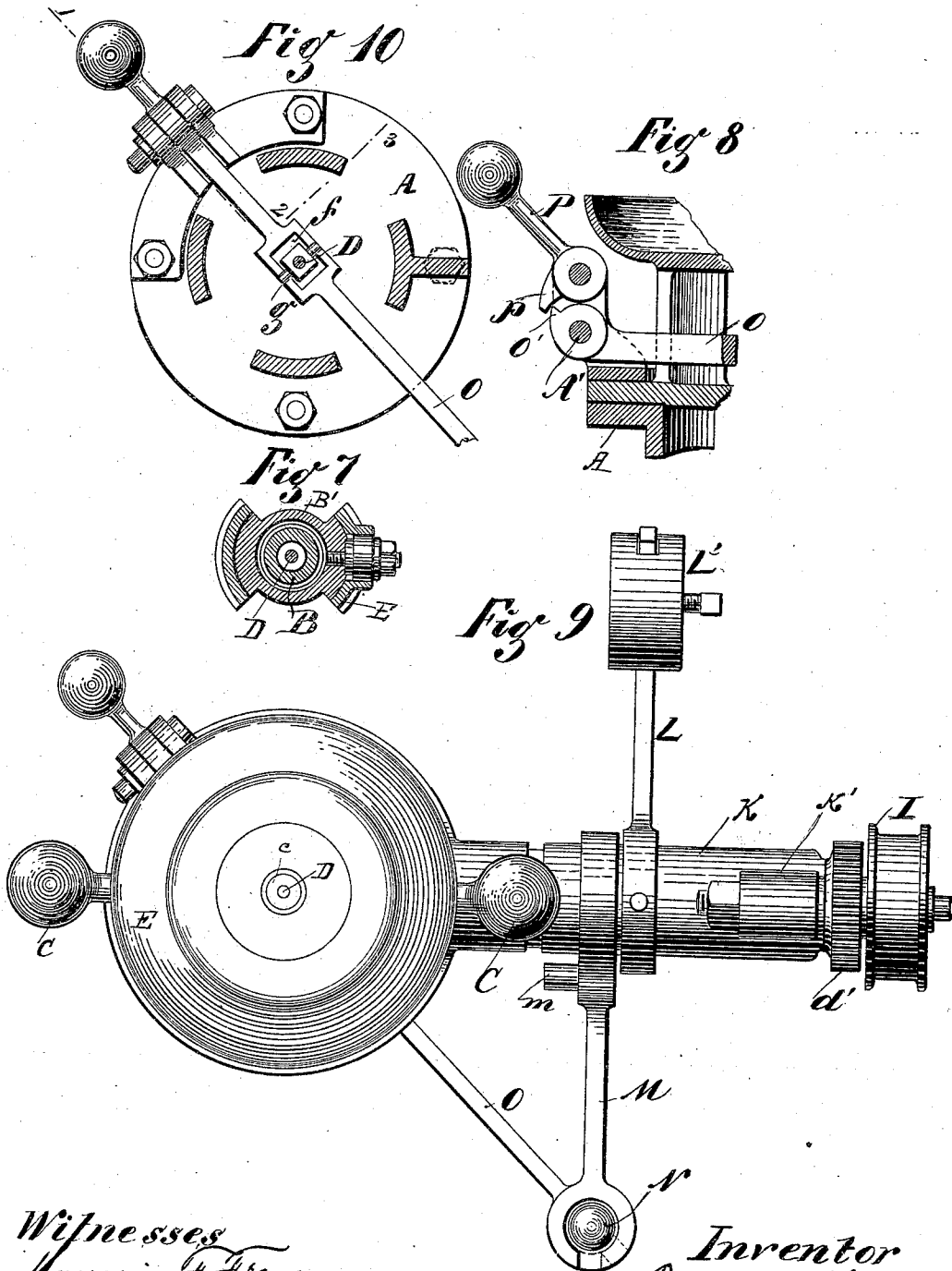
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# UNITED STATES PATENT OFFICE.

BRUNO V. NORDBERG, OF MILWAUKEE, WISCONSIN, ASSIGNOR OF ONE-HALF TO FRED L. HORNEFFER, OF SAME PLACE.

## SAFETY-STOP FOR GOVERNORS.

SPECIFICATION forming part of Letters Patent No. 369,611, dated September 6, 1887.

Application filed February 26, 1887. Serial No. 228,929. (No model.)

*To all whom it may concern:*

Be it known that I, BRUNO V. NORDBERG, of Milwaukee, in the county of Milwaukee, and in the State of Wisconsin, have invented certain new and useful Improvements in Safety-Stops for the Governing Mechanism of Steam-Engines; and I do hereby declare that the following is a full, clear, and exact description thereof.

10 My invention relates to safety-stops for the governing mechanism of steam-engines, and will be fully described hereinafter.

In the drawings, Figure 1 is a side elevation of my device. Fig. 2 is a vertical section on line *v v*, Fig. 1. Fig. 3 is a detail section on line *w w*, Fig. 2, looking from the right. Fig. 4 is a vertical section in detail showing a modification of my device. Fig. 5 is a section on line *x x*, Fig. 4, looking from the right; 20 Fig. 6, a section on line *y y*, Fig. 4, looking from the left. Fig. 7 is a horizontal section on line *z z*, Fig. 2, without the governor-arms. Fig. 8 is a broken sectional detail on lines 1 2 3, Fig. 10. Fig. 9 is a plan view. Fig. 10 is a section on lines 4 5, Fig. 2; and Fig. 11 is a detail of a modified feature of my device.

A is the governor-stand, in which is partly shown trip mechanism similar to that described in my application executed February 30-24, 1887, Serial No. 228,649; but my device is applicable to any trip mechanism or to a throttle-valve directly.

B is a hollow stem that forms part of the stand A, and serves as a bearing for the driving sleeve B' of the governor-arms C.

D is a stem which connects the counterpoise E with a trip-frame, F.

The governor-arms are connected with the hood and driving-sleeve in this instance, as 40 in my application above referred to.

The stem D has a collar, *a*, secured on it near its upper end, on which rests the bottom of a spiral spring, *b*, which is interposed between the collar *a* and the counterpoise E, through which the stem D loosely passes, a nut or washer, *c*, serving to hold the counterpoise on the said stem. This spring *b* merely serves to aid gravity in returning stem D after it has been lifted, and is too light to have any 50 effect upon the counterpoise.

The driving-sleeve B' is connected to a driv-

ing-shaft, G, by gearing G', and this driving-shaft has its bearings in a sleeved bearing, H, that is screwed into the stand A, and shaft G carries a spur-wheel, *d*, that meshes with a 55 pinion, *d'*, on the hub of a pulley, I, the stud *j* of which is secured in a boss, K', of the sleeve K, that surrounds and turns loosely on the sleeve-bearing H.

The sleeve K has clamped about it and rigidly secured thereto one end of an arm, L, the other end of which is weighted, as at L', and has loosely clamped about it one end of an arm, M, from which projects a pin, *m*, while the other end projects at right angles to the 65 sleeve K, and has a countersunk opening to receive one of the balls of a ball-link, N, that connects with a similarly-formed end of a lever, O, that is hinged to the opposite side of the stand A at A'. This last-named lever O 70 is enlarged and slotted, as at *f*, and the stem D passes through it, a pin, *g*, serving to receive the lever O when it is lifted and to cause it to lift the stem. To hold the lever O up after it has been raised I provide the latter 75 with a projection, O', on its hinged end, and just above the pivot of lever O, I pivot an arm, P, having a weighted outer end, and on its hub a pawl, *p*, for engagement with the projection O' when the lever O is in its raised 80 position.

U is a cord or chain which may lead to the room containing the operating mechanism, so that an operative there, by drawing upon it, may lift lever O and stop the engine when oc- 85 casion requires.

When my improved governor is connected to the engine by a belt, R, the latter has the effect of holding the pulley I in the position shown in Figs. 1 and 2 against the tendency 90 of weighted arm L to turn the sleeve K and carry the pulley in an opposite direction and into a horizontal line with the spur-wheel *d*, and while the pulley I is in this position—that is, with its axis on about a vertical line with that 95 of the spur-wheel *d*—the arm M is supported in its lowest position—that is, with its shoulder *n* resting against a pin, *q*, that projects from the stand A—against which also rests a shoulder, *k*, of sleeve K; but should the belt R 100 break or slip off of either of its pulleys the arm L will turn the sleeve K so that its lug *k*

will strike the pin *m* on arm *M* and lift the arm *M*, and through ball-link *N* the lever *O*, which latter in turn raises stem *D* and trip-frame *F*, causing the latter to trip the trip-levers *T* and drop the valve. Of course if no trip mechanism were used the stem *D* would be connected with the throttle-valve instead of to a trip-frame, and the raising of arm *O* would close the throttle-valve instead of raising the trip-frame.

I may substitute a chain for the ball-link, if desirable, as shown in Fig. 11, and I may dispense with the weighted arm *L*, as shown in Figs. 4 and 5, substituting therefor a spiral spring, *l*, surrounding the sleeved bearing *H* by the spring *l*, which is secured to it at one end and to the sleeve *K* at the other, and to regulate the tension of this spring I may secure one end of it to a ring, *l'*, which may be turned by a tool inserted in the holes *v*, (shown in dotted lines, Fig. 5,) and secured, when the proper tension is attained, by a set-bolt, *w*, passed through sleeve *K* against the ring *l'*.

While I have shown the form of governor described in my application above referred to, it is obvious that my safety-stop may be applied to any form of governor.

It would not be a departure from the spirit of my invention to change the relative positions of the parts. For instance, if the belt *R* were vertical instead of horizontal it would be necessary to so arrange the weighted arm *L* or the spring *l* that it would have a tendency to lift the pulley *I* instead of depressing it.

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

1. In a safety-stop for governors, the combination of the sleeve to which the pulley is studded, and means for giving it a tendency to turn against the strain of the pulley-belt, with an arm projecting from the said sleeve in the direction of the strain of the pulley-belt,

and a lever parallel to said arm and connected thereto and to the valve or governor stem, as set forth.

2. In a safety-stop for governors, the combination of the sleeve adapted to resist the strain of the pulley-belt, a weighted arm for giving it this resistance, another arm loosely clamped to said sleeve and projecting from the opposite side thereof, a stop projecting from said sleeve in position to strike a pin on the last-named arm, and a hinged lever connected to said arm and to the valve or governor stem, as set forth.

3. In a safety-stop for governors, the combination, with the sleeved bearing, of the sleeve, to which the pulley is studded, means for giving the latter a tendency to turn on its bearing against the strain of the pulley-belt, a shaft, and gearing connecting the said shaft with the pulley and the driving sleeve of the governor, and an arm and lever connecting the sleeve with the valve or governor stem, as set forth.

4. In a safety-stop for governors, the combination of the sleeve adapted to resist the strain of the pulley-belt, a weighted arm for giving it this resistance, another arm loosely clamped to said sleeve and projecting from the opposite side thereof, a stop projecting from said sleeve in position to strike a pin on the last-named arm, and a hinged lever connected to said arm and to the valve or governor stem, and a spring for returning it when released, as set forth.

In testimony that I claim the foregoing I have hereunto set my hand, at Milwaukee, in the county of Milwaukee and State of Wisconsin, in the presence of two witnesses.

BRUNO V. NORDBERG.

Witnesses:

S. S. STOUT,  
MAURICE F. FREAR.