

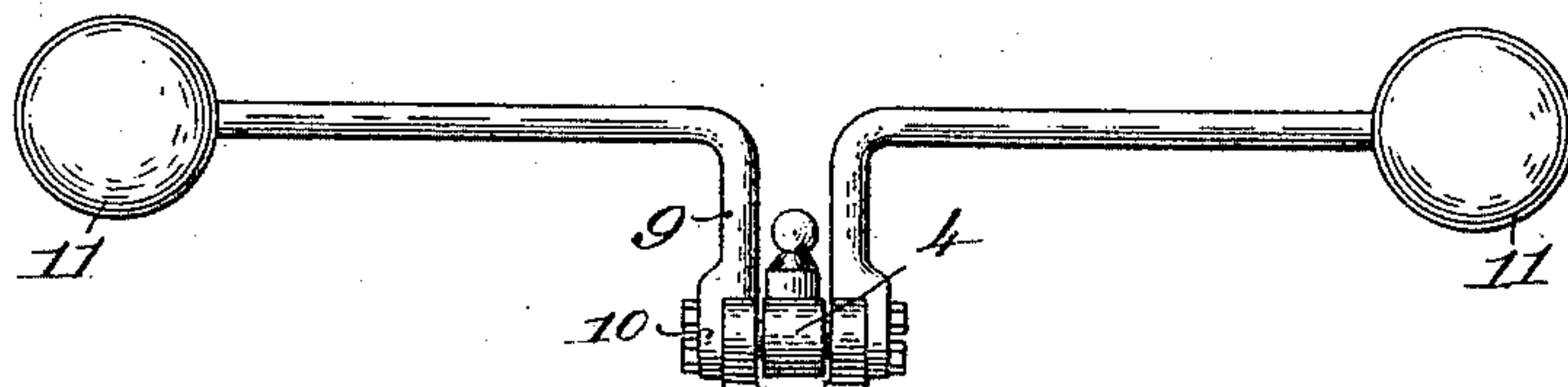
No. 704,486.

Patented July 8, 1902.

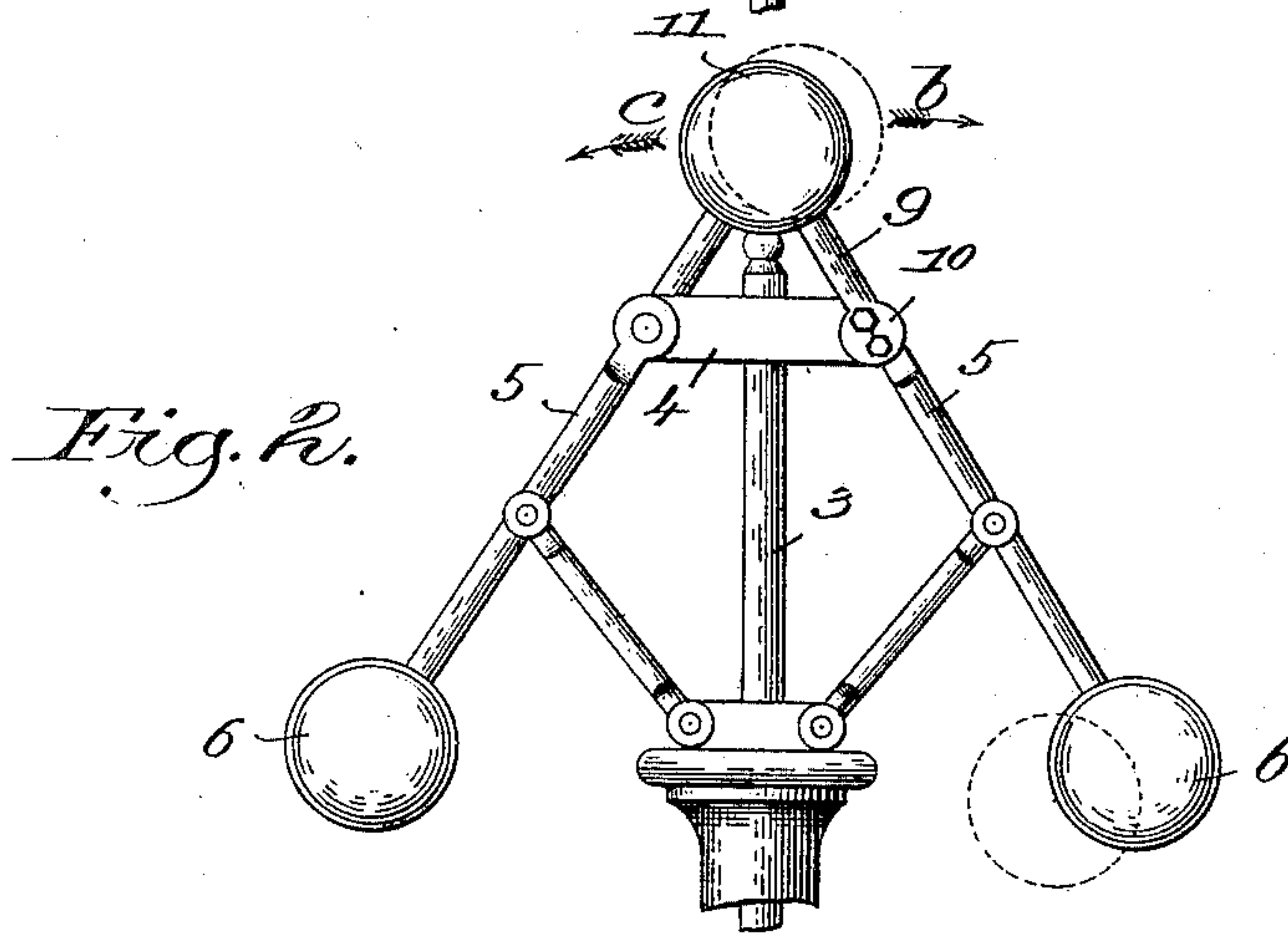
R. J. PATTERSON.  
STEAM ENGINE GOVERNOR.

(Application filed Sept. 27, 1901.)

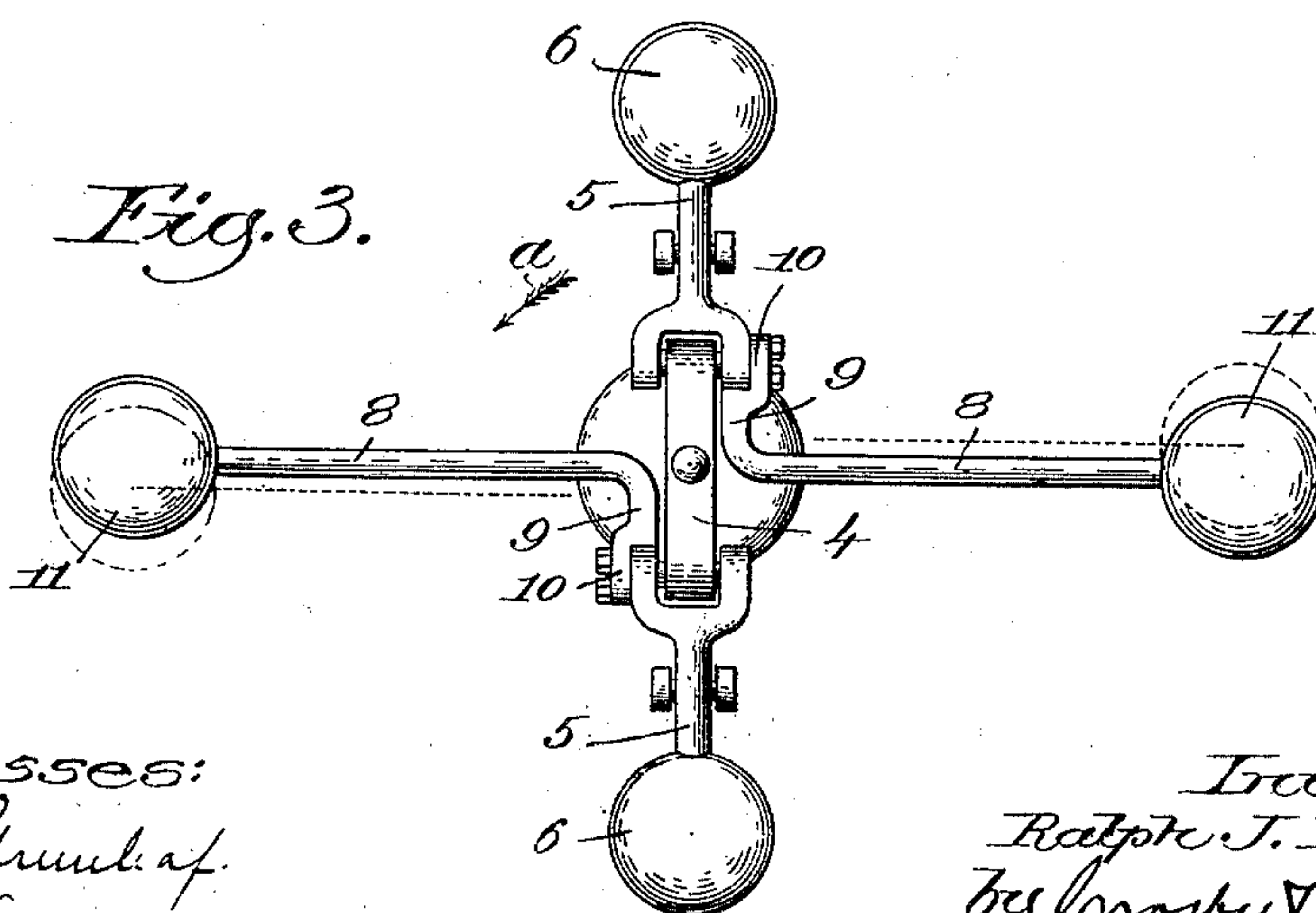
(No Model.)



*Fig. 1.*



*Fig. 2.*



*Fig. 3.*

Witnesses:  
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# UNITED STATES PATENT OFFICE.

RALPH J. PATTERSON, OF WATERVILLE, MAINE.

## STEAM-ENGINE GOVERNOR.

SPECIFICATION forming part of Letters Patent No. 704,486, dated July 8, 1902.

Original application filed April 13, 1901, Serial No. 55,603. Divided and this application filed September 27, 1901. Serial No. 76,759. (No model.)

*To all whom it may concern:*

Be it known that I, RALPH J. PATTERSON, a citizen of the United States, residing at Waterville, in the county of Kennebec and State of Maine, have invented an Improvement in Steam-Engine Governors, of which the following description, in connection with the accompanying drawings, is a specification, like numerals on the drawings representing like parts.

In my copending application, Serial No. 55,603, filed April 13, 1901, and of which this case is a division, is shown and described an inertia device for a centrifugal governor, in which the inertia-weights are carried by and have a relative movement with relation to the governor-spindle, the said governor-weights being so connected to the centrifugal arms that when the centrifugal system decreases its speed suddenly the inertia of the inertia system carries the inertia-weights ahead of the centrifugal system, such forward movement of the inertia system operating to assist in throwing the centrifugal arms downward.

In my present invention I have devised a form of inertia system which instead of being supported upon and rotatable about the governor-spindle is instead supported entirely by centrifugal arms.

In the preferred embodiment of my invention each centrifugal arm has detachably secured thereto at its pivotal point of attachment with the governor-spindle an inertia-arm, which is shown as L shape, one branch of said arm having an inertia-weight secured to the end thereof and extending outwardly at right angles to the governor-spindle. The parts are so arranged that the inertia of the inertia-weights tends to assist in throwing the centrifugal arms outward or inward, according to whether the speed of the engine is increased or decreased.

Referring to the drawings, Figure 1 illustrates a side elevation of my improved governor. Fig. 2 is another view of the same, and Fig. 3 is a top plan view.

In the drawings I have only illustrated a sufficient portion of the ordinary centrifugal governor to enable my invention to be under-

stood, and 3 designates the usual governor-spindle, which will carry at its upper end the usual cross-head 4, to which the centrifugal arms 5 are pivoted in some suitable way, said arms carrying at their ends the centrifugal weights 6. These parts of the governors are such as are found in most centrifugal governors and further description of their operation is not necessary.

Secured to the upper end of each centrifugal arm 5 is an inertia-arm, (shown as L shape,) the shorter branch 9 thereof having an offset portion 10, which is adapted to be bolted to the centrifugal arms 5 at their pivotal point, as illustrated in Figs. 2 and 3.

Preferably the inertia-arm will be so attached to the centrifugal arm that the portion 9 of said centrifugal arm will have the same direction as the centrifugal arm 5, (see Fig. 2,) the said portion 9 of the inertia-arm forming, in effect, an extension of the centrifugal arm. The longer branch of the inertia-arm extends at substantially right angles from the governor-spindle, as shown in Fig. 3, and carries at its end the inertia-weight 11. Under normal conditions, therefore, the inertia-weights are supported above the pivotal point of the centrifugal arms and the two portions 8 of the inertia-weights are in alignment, as shown in Fig. 3.

Assuming that the governor is rotating in the direction of the arrow *a*, Fig. 3, and that the speed of the engine is suddenly decreased, it will be obvious that the speed of rotation of the centrifugal system will correspondingly decrease. The inertia-weights 11, however, tend to carry the same ahead of the centrifugal system, the said weights tending to move in the direction of the arrow *b*, Fig. 2, into the dotted-line position. This movement of the inertia-weights tends to assist the centrifugal weights in dropping from the full-line position (shown in Fig. 2) into the dotted-line position, Fig. 3. It will thus be seen that the inertia of the inertia-weights assists in throwing the centrifugal weights downward to correspond with the decreased speed of the engine, and it will be obvious that if the speed of the engine increases suddenly the inertia of the



inertia-weights will tend to move said weights in the direction of the arrow c, Fig. 2, with reference to the centrifugal system, thereby assisting in throwing the centrifugal weights outward to correspond to the increased speed.

By making my inertia-arms detachable from the centrifugal arms, as illustrated, it will be obvious that the said inertia-arms may be applied to any ordinary centrifugal governor without in any way changing any of the parts of the governor.

In all inertia-governors with which I am familiar the inertia system forms an integral part of the governor and cannot be detached from or attached to the governor without taking the governor to pieces. With my form of inertia device, however, any existing centrifugal governor may be changed into an inertia-governor by simply adding the L-shaped inertia-arms. I desire to state that various changes may be made in the structure of the device without in any way departing from the spirit of my invention.

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

1. In a steam-engine governor, a governor-spindle having centrifugal arms pivoted thereto, and an inertia device secured to each centrifugal arm at the pivotal point of the latter.

2. In a steam-engine governor, a governor-spindle having centrifugal arms pivoted thereto and an inertia device secured to each centrifugal arm at the pivotal point of the latter, the said inertia devices being independent from each other.

3. In a steam-engine governor, a governor-spindle having centrifugal arms pivoted thereto, and an inertia attachment for each centrifugal arm comprising an L-shaped arm having one end adapted to be detachably se-

cured to the centrifugal arm and a weight at the other end.

4. In a steam-engine governor, a governor-spindle, arms pivoted thereto, a centrifugal weight attached to one end of said arms and an inertia device attached to the other end thereof.

5. In a steam-engine governor, a governor-spindle, centrifugal arms pivoted thereto, inertia-arms detachably secured to each centrifugal arm at the pivotal point of the latter, said inertia-arms each being bent to extend at right angles to the governor-spindle and carrying inertia-weights at their ends.

6. In a steam-engine governor, a governor-spindle, centrifugal arms pivoted thereto, an inertia-weight for each centrifugal arm, and means whereby each inertia-weight is carried entirely by its centrifugal arm.

7. In a steam-engine governor, a governor-spindle, centrifugal arms pivoted thereto, and L-shaped arms detachably secured to each of said centrifugal arms, one branch of said L-shaped arms extending in the direction of the centrifugal arms, and the other branch extending at right angles to the governor-spindle, and an inertia-weight secured to the end of each of said L-shaped arms.

8. In a steam-engine governor, a governor-spindle having centrifugal arms pivoted thereto, and an inertia device secured to each centrifugal arm, said inertia devices being independent from each other.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

RALPH J. PATTERSON.

Witnesses:

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H. J. EDWARDS.