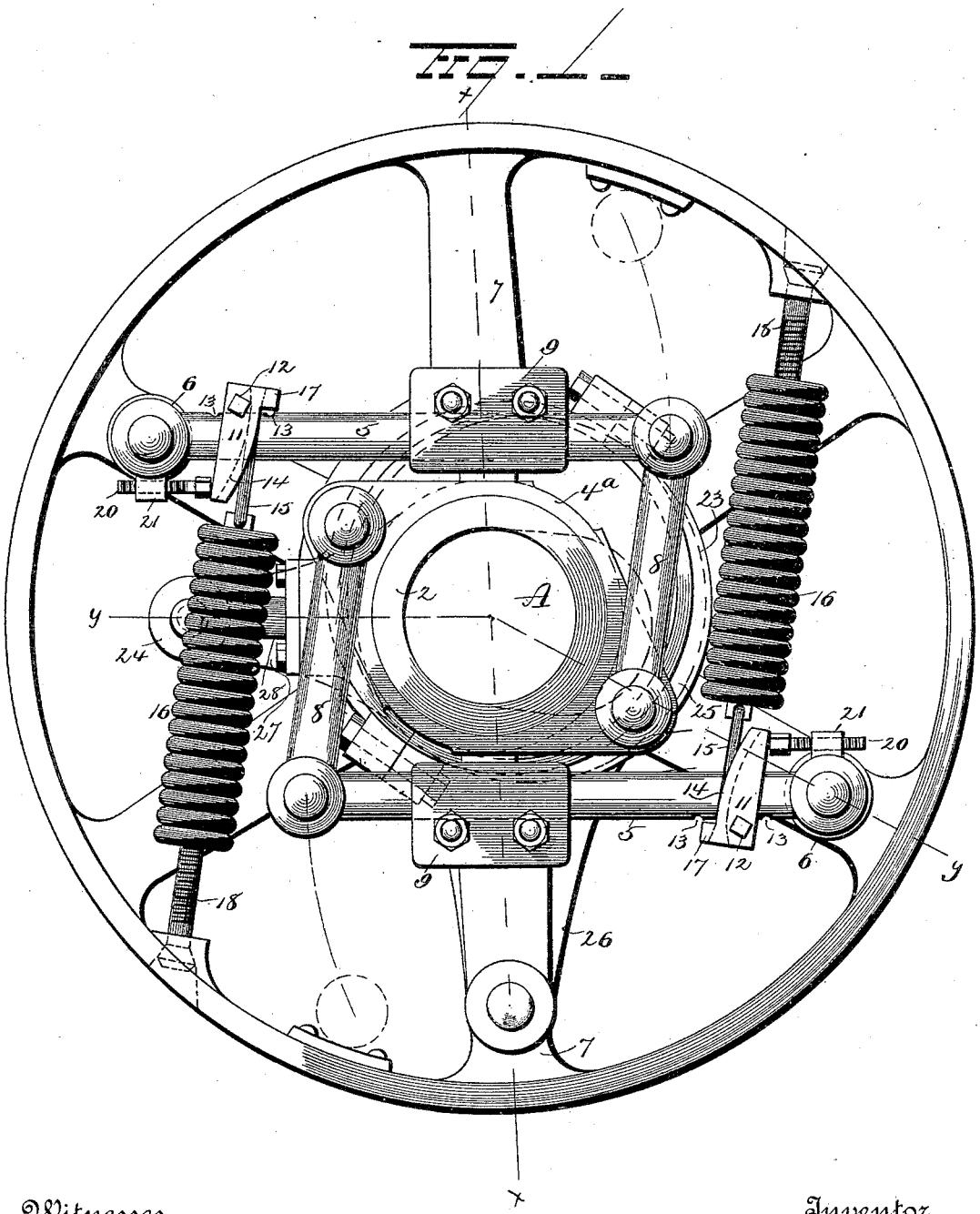
(No Model.) 2 Sheets—Sheet 1.

H. F. JONES.

VALVE GEAR.

No. 423,165. Patented Mar. 11, 1890.

FIG. 1.



Witnesses
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Inventor
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(No Model.) 2 Sheets—Sheet 2.

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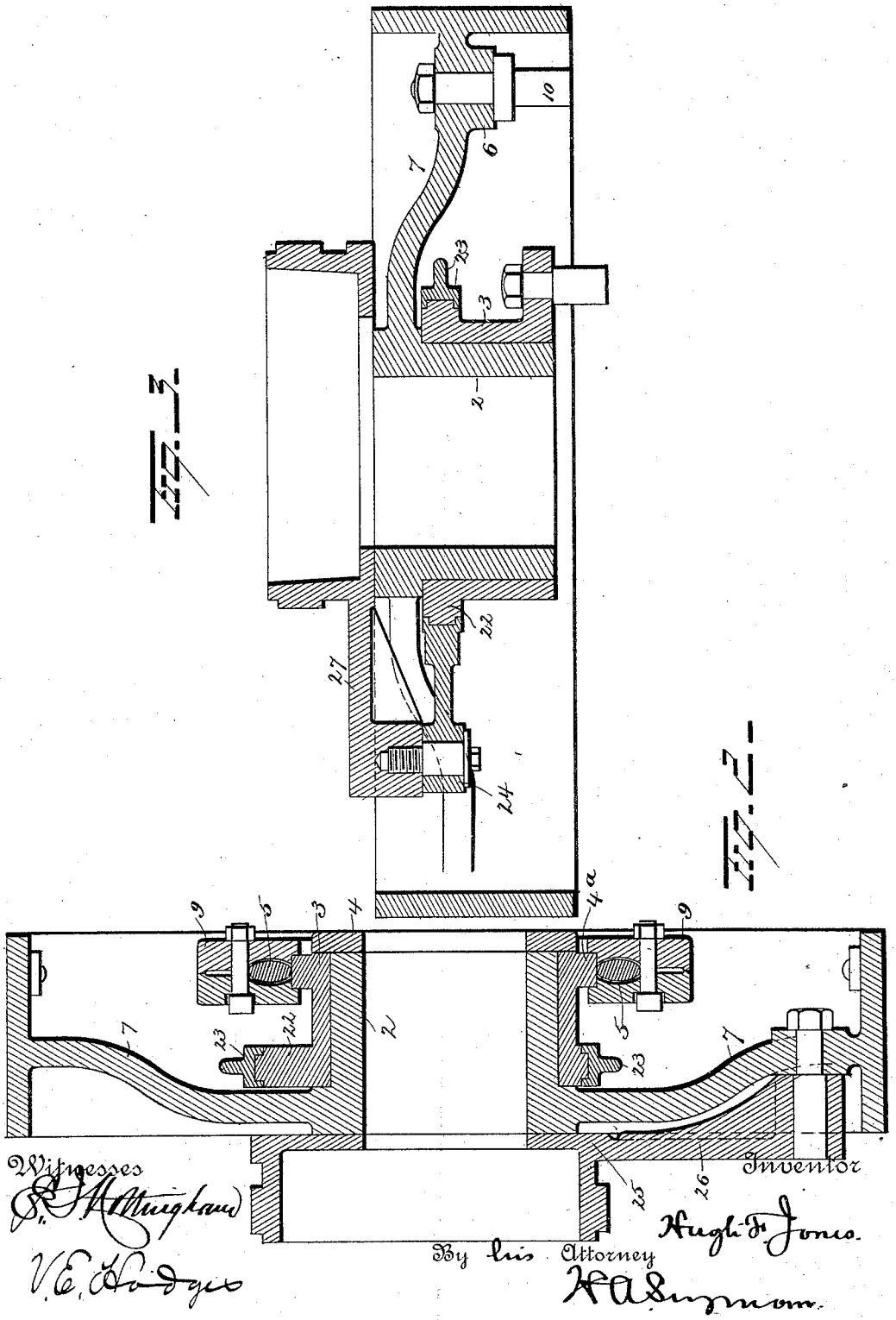

UNITED STATES PATENT OFFICE.

HUGH F. JONES, OF AKRON, OHIO, ASSIGNOR TO THE WEBSTER, CAMP & LANE MACHINE COMPANY, OF SAME PLACE.

VALVE-GEAR.

SPECIFICATION forming part of Letters Patent No. 423,165, dated March 11, 1890.

Application filed November 22, 1889. Serial No. 331,162. (No model.)

To all whom it may concern:

Be it known that I, HUGH F. JONES, of Akron, in the county of Summit and State of Ohio, have invented certain new and useful Improvements in Automatic Valve-Gears; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improvement in automatic shifting eccentric-valve gears, the object being to insure a positive action of the valve and all the parts at any speed; and with this end in view my invention consists in certain novel features of construction and combinations of parts, as will be hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation. Fig. 2 is a transverse section on line *x x*, and Fig. 3 is a similar section taken on line *y y*.

A represents the main drive-shaft, upon one end of which the balance-wheel or governor-carrier 1 is mounted. On the hub 2 of this carrier 1 a sleeve 3 is loosely mounted, and the latter is retained in position on the hub by means of the disk 4, which is held fast to the outer end of the hub by means of screws, bolts, or similar devices. The sleeve 3 is provided at or near its outer end with an annular flange 4^a, or lugs to answer the same function, if preferred, and the two levers upon which the centrifugal weights are located are pivotally connected at diametrically-opposite points with this flange or the lugs, as the case may be. Said levers are represented by the numerals 5 5. They extend from the sleeves 6 6 at their pivoted ends, by means of which they are pivotally connected at opposite points to spokes 7 7 on the governor-carrier in opposite directions and substantially parallel with each other, and at their outer or free ends are loosely connected to the flange or lugs on the sleeve 3 by means of links 8 8. Weights 9 9 are held at proper points on these centrifugal levers 5 5, so as to insure the proper throw of the sleeve upon the hub of the carrier as the latter revolves.

Returning again to the center of oscillation of the centrifugal levers, it may be mentioned that the bearing-sleeves 6 6 of these levers preferably are of a length about equal to the width of the governor-carrier and mounted on sufficient-sized bearings 10 10 to prevent wabbling and lost motion and insure positive action of the parts.

A clip 11 is loosely mounted on each centrifugal lever at or near the sleeves 6 6. These clips are held on the levers by means of pintles 12 12 in notches 13 13, formed for them in the levers. One face of the clips is rounded or in the form of a cam, and these are furnished with grooves 14 14 to receive the loops 15 15 when tension is applied to the spiral springs 16 16. The loops referred to are intended to extend through holes in the lugs 17 17 at the ends of the grooves 14 14.

The spiral springs are hung at one end on the loops 15 15 and at the opposite ends on the adjusting-screws 18 18, the heads of which are located in position in the band of the governor-carrier, to be operated upon by a screw-driver, wrench, or other article to vary the tension of the spring, for as the devices 18 18 are turned in one direction the springs are expanded or drawn out, and by turning them in the opposite direction the springs are allowed to contract. These devices 18 18 are resorted to for more extensive adjustments of the springs. Now for finer adjustments the screws 20 20 are located in lugs 21 21, projecting from the sleeves 6 6, when they may be turned to change the positions of the clips 11 11 on the levers, in order to create a very fine adjustment in varying the tension of the spiral springs. When thus operated upon, the clips swing upon their pintles 12 12, and as they are forced inward by the impingement of the heads of the screws 20 20 against them the tension of the spring is increased and the opposite turns of the springs have the opposite effect.

Sleeve 3 is furnished near its inner end with an eccentric 22, and upon the latter the eccentric-strap 23 is loosely mounted. This strap is made in sections, which are held loosely upon the eccentric and provided with

a screw-eyelet 24, which projects from the strap at a point between two spokes of the governor-carrier.

A pendulum eccentric 25 is located on the opposite side of the carrier and provided with a pair of arms 26 and 27. By means of the former the eccentric is pivoted to one spoke of the carrier and by means of the latter it is loosely connected, through the medium of the laterally-projecting stem 28, with the screw-eyelet 24, so that as the carrier revolves beyond a certain speed the weighted centrifugal levers 5 5 are forced outward from their normal positions, carrying with them the sleeve 3, which is loosely mounted on the hub of the carrier. With the sleeve the eccentric 22 is thrown around, carrying with it the strap 23, and the latter, by its connection with the pendulum eccentric, as set forth, swings said pendulum eccentric, which in turn slides the valve, through the instrumentality of a suitable valve-rod, until the amount of steam is sufficiently reduced to lessen the supply of steam until the parts, due to the action of the spiral springs, relax into their normal positions and the speed decreases. So it may be said that as long as the pendulum eccentric retains its normal relation to the other parts the valve maintains its normal movements; but as the number of revolutions of the carrier are increased the pendulum eccentric swings in the direction of its arm 27 and the length of the slides of the valve is decreased accordingly.

By simply reversing the location of the parts the motion of the carrier may be reversed.

It is evident that slight changes might be resorted to in the form and arrangement of the several parts described without departing from the spirit and scope of my invention, and hence I do not wish to limit myself to the particular construction herein set forth; but,

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

1. The combination, with a governor-carrier and pendulum eccentric, of an eccentric loosely mounted on the hub of the carrier and an eccentric-strap loosely mounted on this eccentric and having loose connection with the pendulum eccentric, whereby the position of the latter is changed, substantially as set forth.

2. The combination, with a governor-carrier and a pendulum eccentric pivoted to the carrier, of a sleeve loosely mounted on the hub of the carrier, said sleeve having an eccentric thereon, and an eccentric-strap loosely mounted on the eccentric and having loose connection with the pendulum eccentric, whereby the position of the latter is changed, substantially as set forth.

3. The combination, with a governor-carrier and a pendulum eccentric pivoted to the carrier and having an arm projecting therefrom, of a sleeve loosely mounted on the hub of the carrier, said sleeve having an eccentric thereon, an eccentric-strap, and means thereon whereby the strap is loosely connected with the arm on the pendulum eccentric, substantially as set forth.

4. The combination, with a governor-carrier, a pendulum lever pivoted to the carrier, and a sleeve loosely mounted on the hub of the carrier, of an eccentric on the sleeve, an eccentric-strap loosely mounted on the latter and having loose connection with the pendulum lever, and centrifugal levers pivoted to the carrier at one end and having loose connection at the opposite end with the sleeve on the hub of the carrier, substantially as set forth.

5. The combination, with a governor-carrier, a pendulum eccentric pivoted thereto, a sleeve having an eccentric thereon loosely mounted on the hub of the carrier, and an eccentric-strap loosely mounted on this eccentric and having loose connection with the pendulum eccentric, of a pair of centrifugal levers pivoted to the carrier and connected to the sleeve on the hub of the carrier, weights on the levers, and springs for keeping them in their normal positions until the speed of the carrier is sufficient to overcome their resistance, substantially as set forth.

6. The combination, with a governor-carrier, a pendulum eccentric pivoted thereto, a sleeve having an eccentric thereon loosely mounted on the hub of the carrier, and an eccentric-strap loosely mounted on the eccentric on the sleeve and having connection with the pendulum eccentric, of a pair of weighted centrifugal levers pivoted to the carrier and having connection with the sleeve, spiral springs extending from the carrier to the levers, and means at each end of the springs for regulating their tension, substantially as set forth.

7. The combination, with a governor-carrier, a pendulum eccentric, a sleeve having an eccentric and loosely mounted on the hub of the carrier, and an eccentric-strap loosely mounted on the eccentric and loosely connected with the pendulum eccentric, of a pair of centrifugal levers pivoted at opposite points within the carrier and connected at their opposite ends by links to the sleeve on the hub of the carrier, springs having adjustable connection with the carrier, clips pivoted on the levers and having cam-faces over which the loops on which the springs are hung pass, and set-screws for adjusting these clips, substantially as set forth.

8. The combination, with a governor-carrier, a pendulum eccentric having two arms, one being pivoted to a spoke of the carrier and the other projecting between two of the spokes, a sleeve having an eccentric and loosely mounted on the hub of the carrier, and an eccentric-strap loosely mounted on this eccentric and having a screw-eyelet, by means of which it has loose connection with the free arm of the pendulum eccentric, of a pair of centrifugal levers pivoted within the

carrier at one end and connected by links at the opposite end to the sleeve, spiral springs extending from the levers to the carrier, clips pivoted on the levers and having connection with the springs, and devices at either end of the springs for regulating their tension, substantially as set forth.

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

HUGH F. JONES.

Witnesses:
STEPHEN H. PITKIN,
W. E. TUFT.