

No. 706,252.

Patented Aug. 5, 1902.

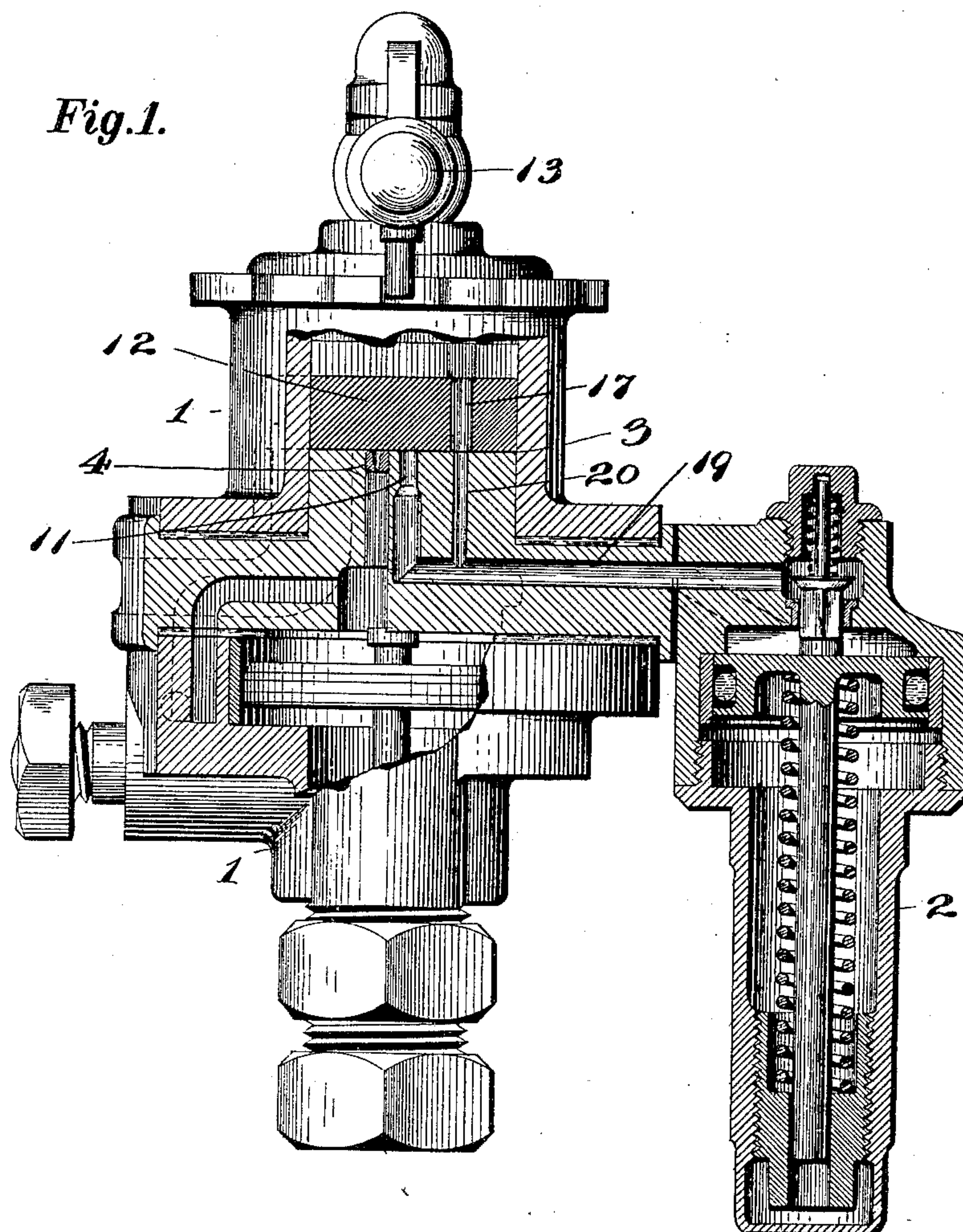
F. A. McKELVEY.

AIR BRAKE.

(Application filed June 17, 1901.)

(No Model.)

4 Sheets—Sheet 1.



Witnesses.

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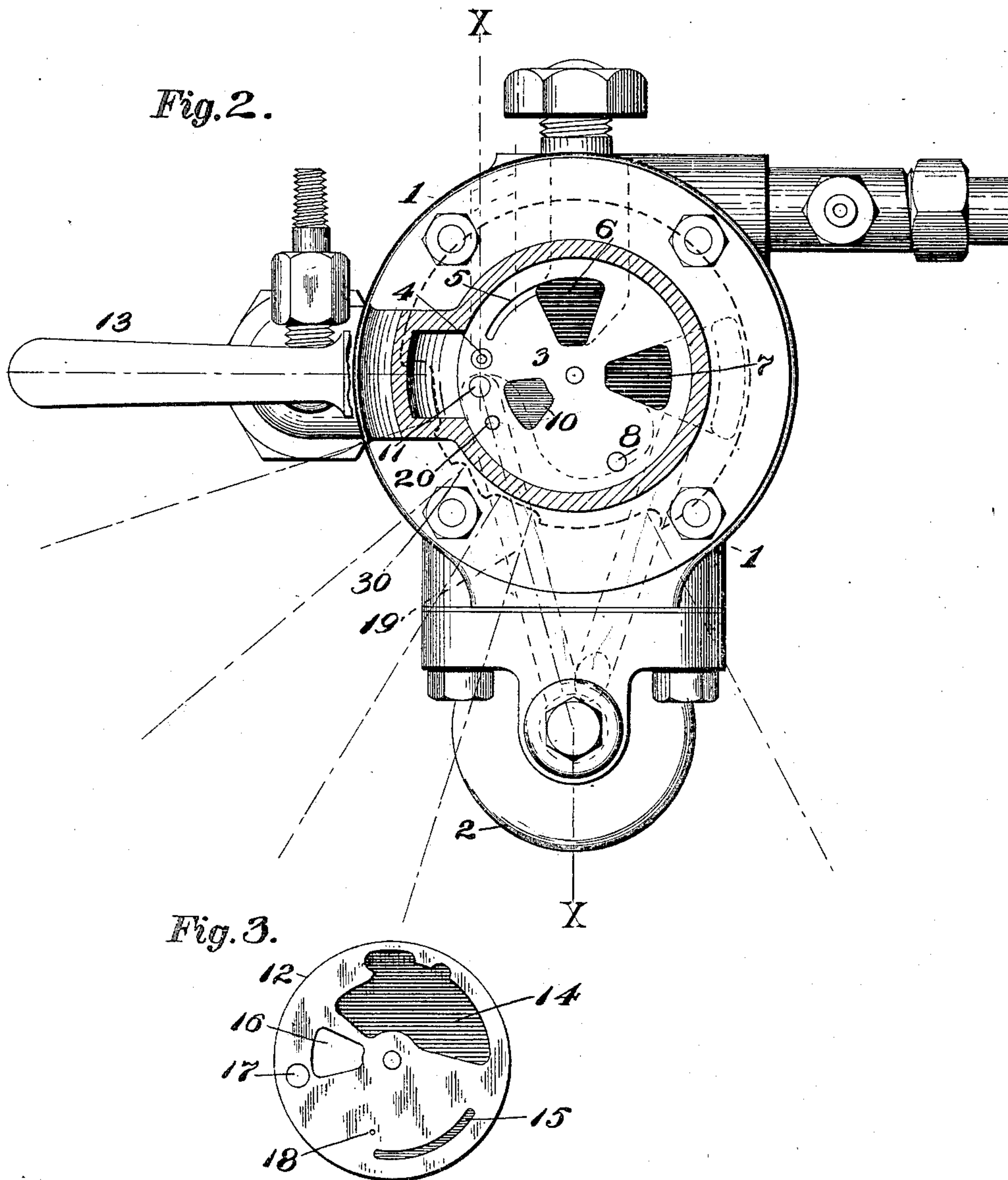
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4 Sheets—Sheet 2.



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Fig. 4.

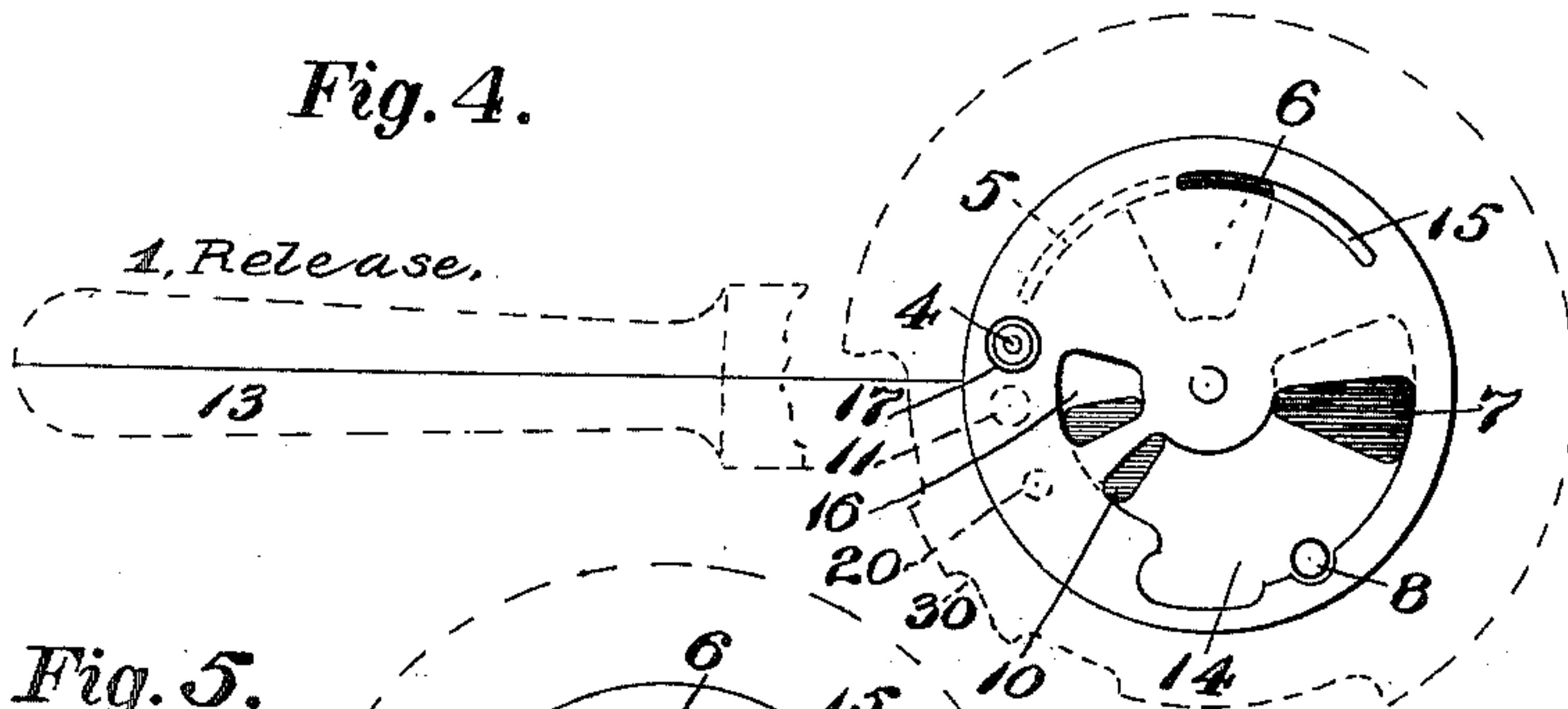


Fig. 5.

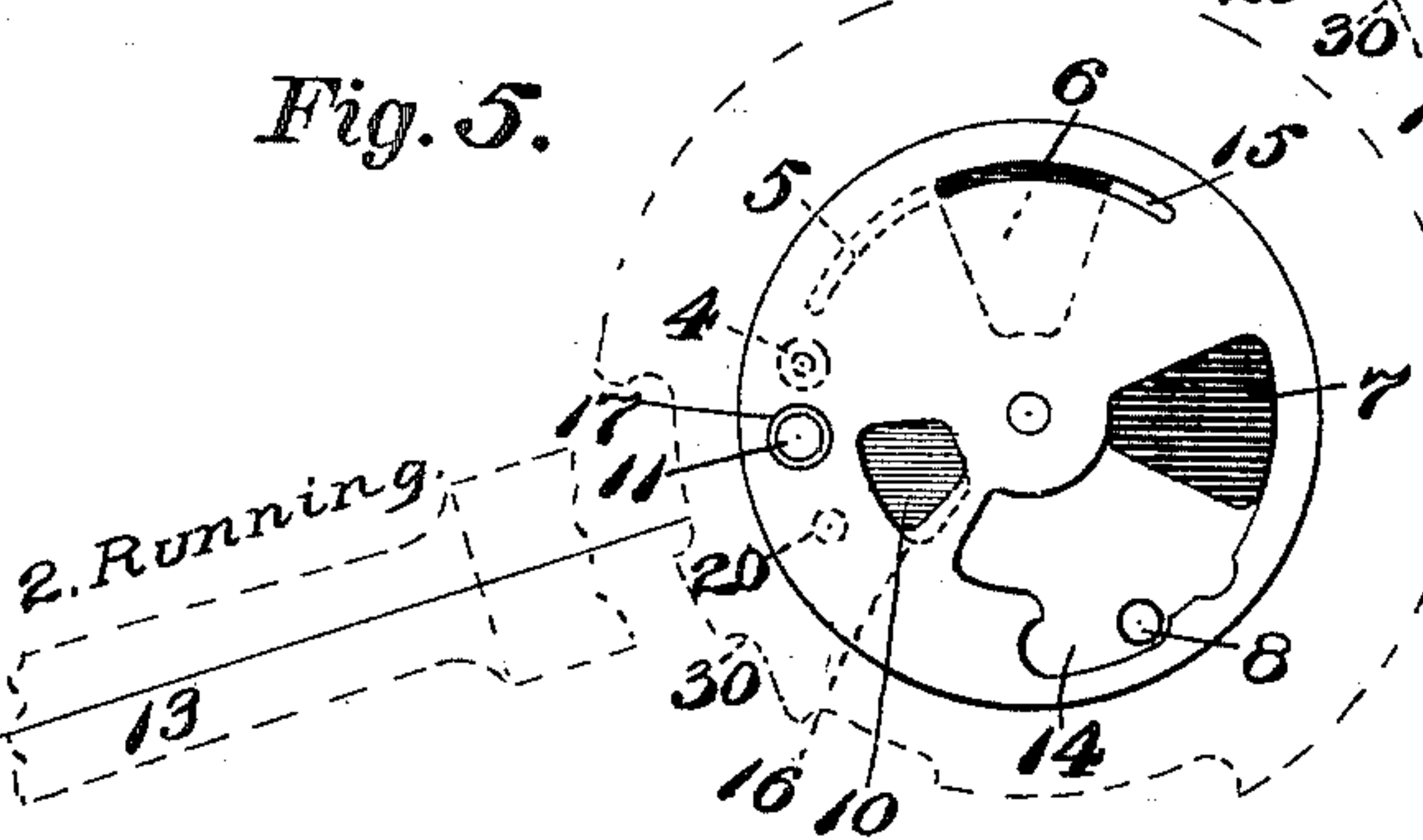


Fig. 6.

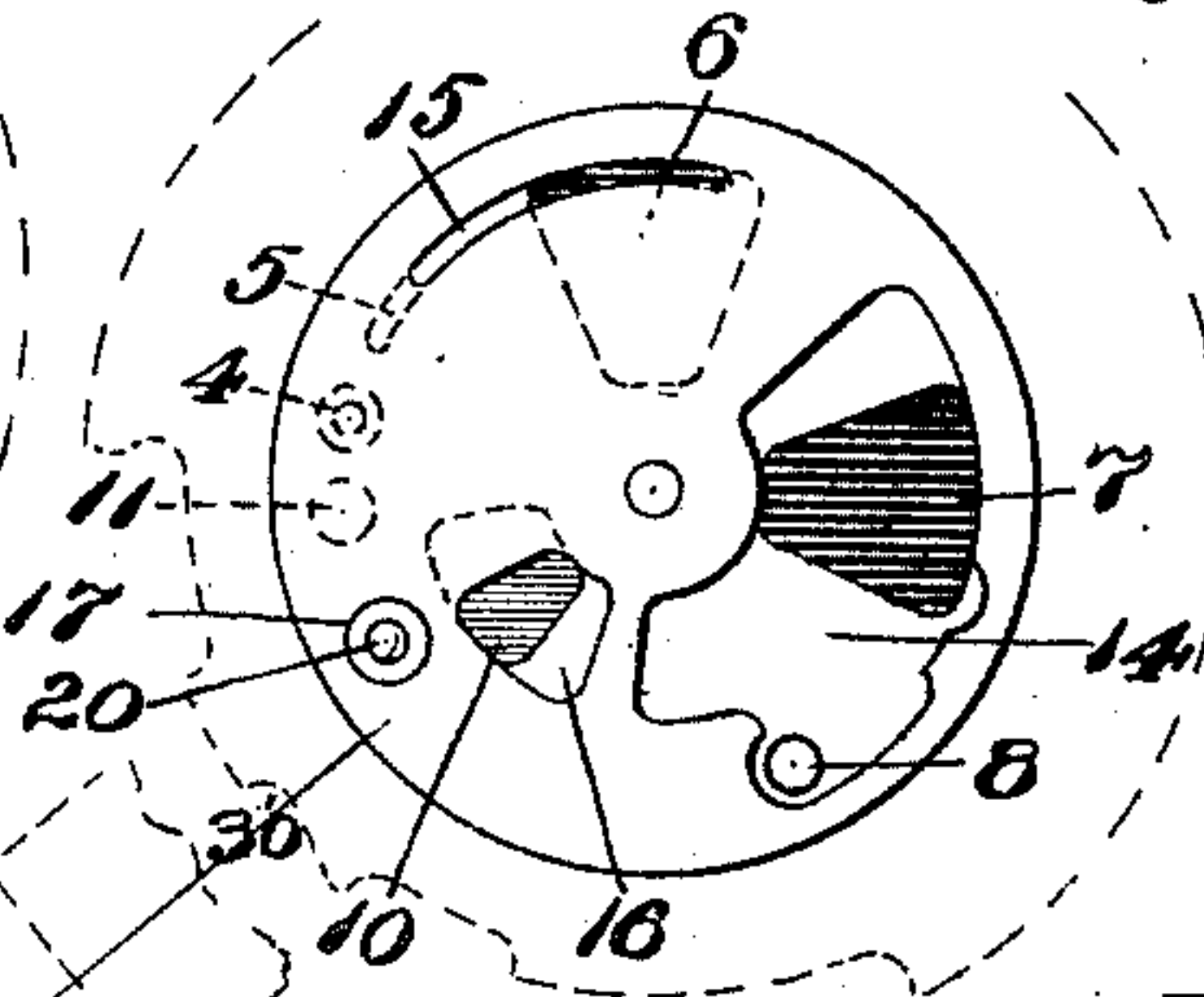


Fig. 7.

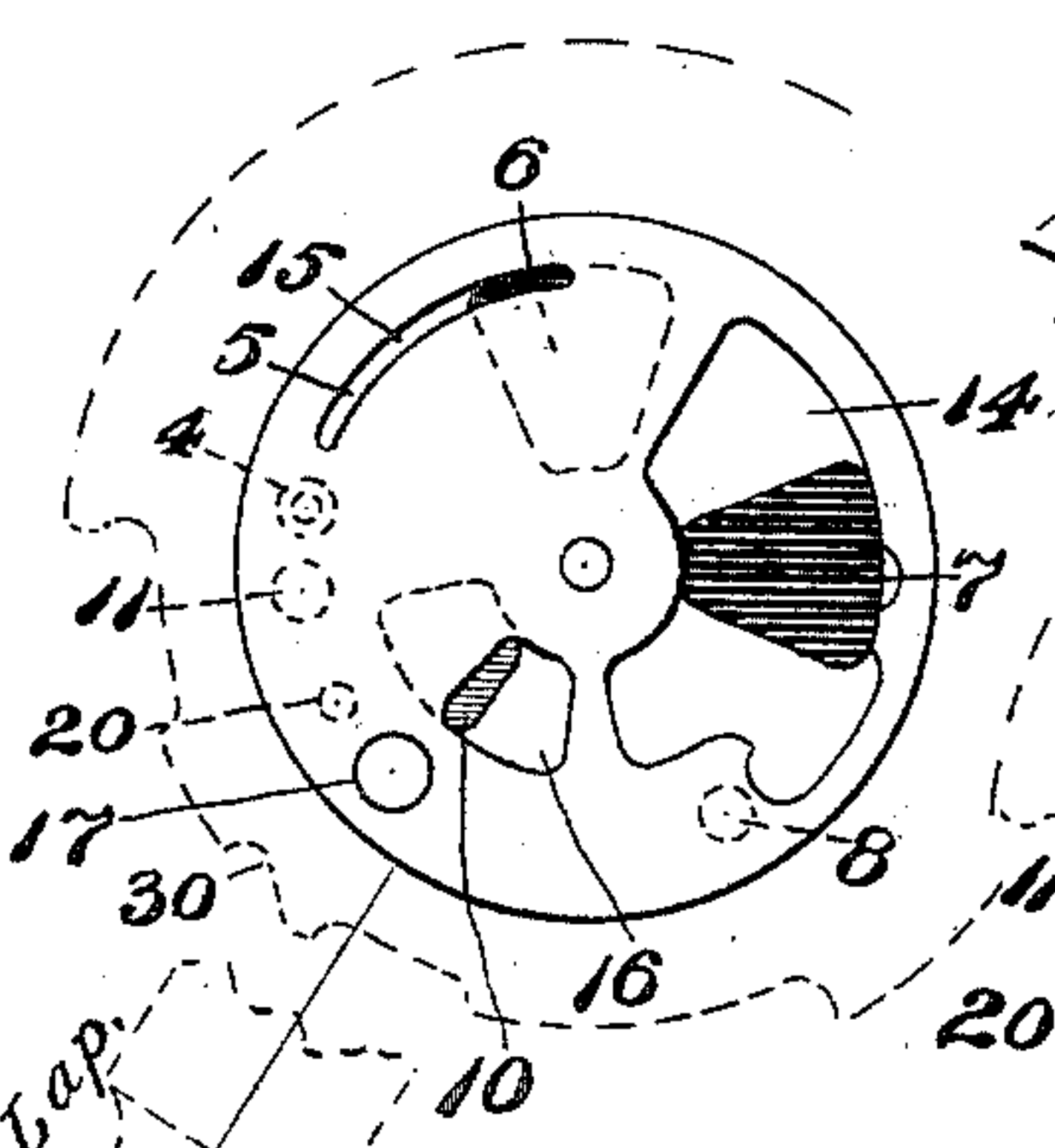


Fig. 8.

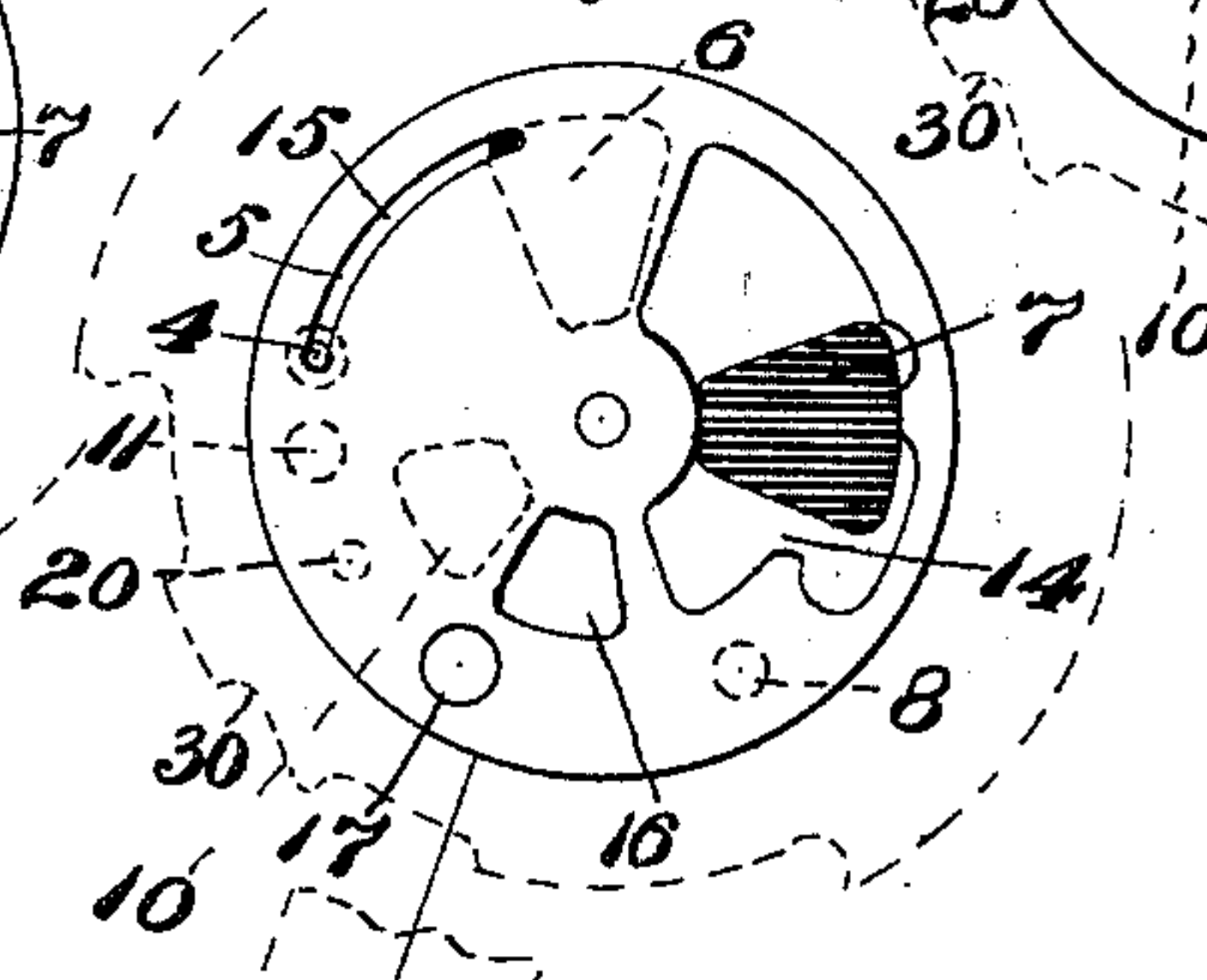
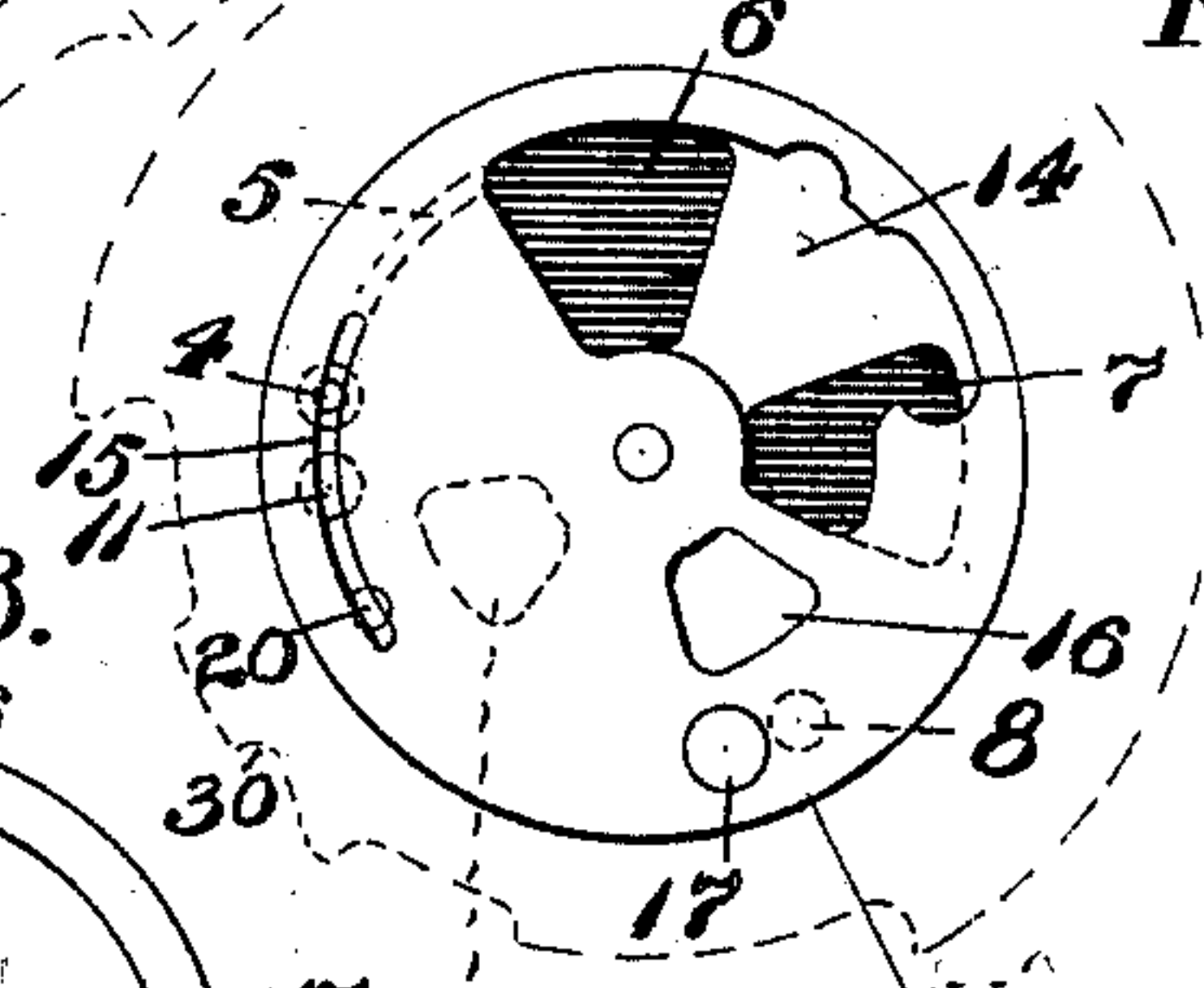


Fig. 9.



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4 Sheets—Sheet 4.

Fig. 10.

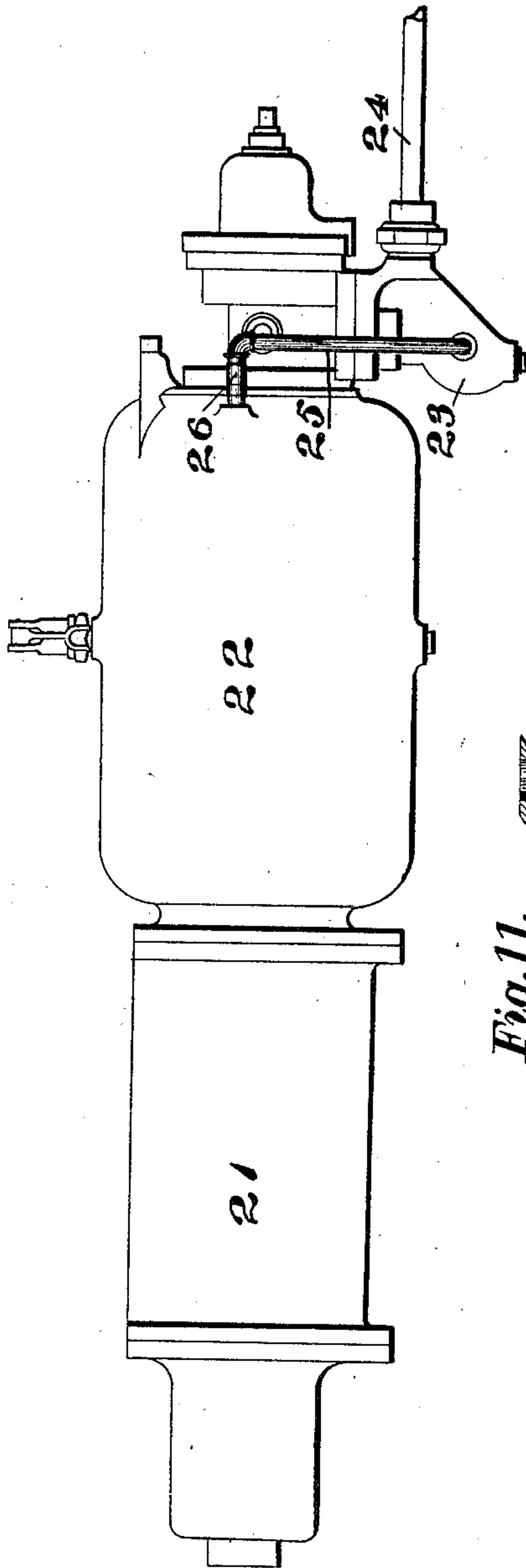
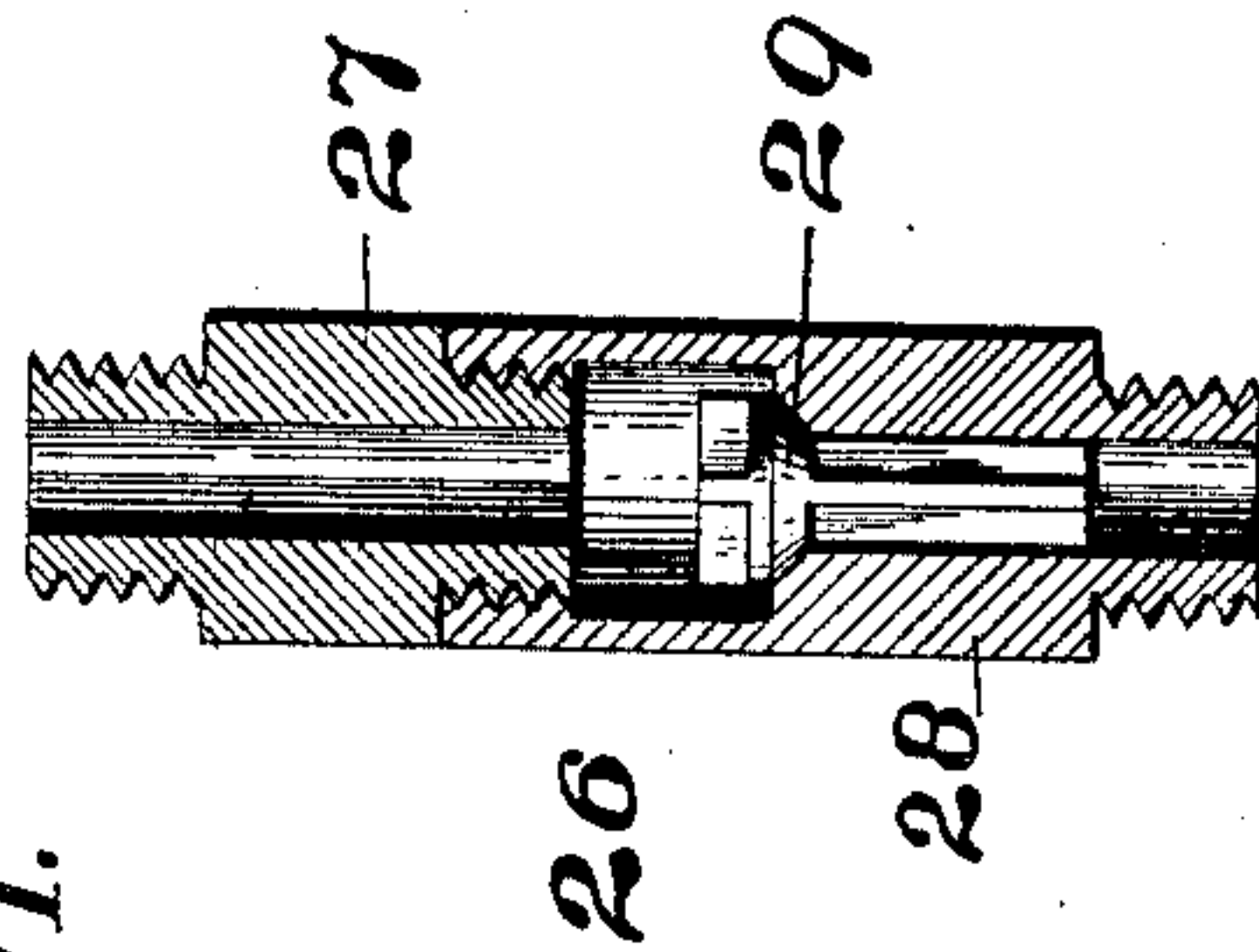


Fig. 11.



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UNITED STATES PATENT OFFICE.

FRANK A. MCKELVEY, OF KNOXVILLE, PENNSYLVANIA.

AIR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 706,252, dated August 5, 1902.

Application filed June 17, 1901. Serial No. 64,881. (No model.)

To all whom it may concern:

Be it known that I, FRANK A. MCKELVEY, a citizen of the United States of America, residing at Knoxville, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Air-Brakes; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to improvements in air-brakes, and has for its object the provision of means whereby the auxiliary reservoir and train-line connected thereto may be recharged to full train-line pressure without releasing the brakes.

I have in the accompanying drawings illustrated and shall further on describe my invention as forming part of what is known as the "Westinghouse air-brake system," but do not limit myself to this or any other particular air-brake system, as my improvements are such as are applicable to others of similar nature. As the essential features of my invention reside in the engineer's valve, auxiliary reservoir, and train-line connected thereto and as the operation of such systems and the detail parts embodied in their construction are fully understood by those familiar with the art only such parts as are necessary to make my improvements understood are illustrated and described.

Referring to the accompanying drawings, Figure 1 is a vertical side view of the engineer's valve, partly in section, on the line X X of Fig. 2, showing my improvements. Fig. 2 is a plan view of the same in section through the valve-chamber, showing my improvements therein. Fig. 3 is an inverted plan view of the valve, showing its arrangements of ports. Figs. 4, 5, 6, 7, 8, and 9 are plan views illustrating the several operative positions, including my new recharging position. Fig. 10 is a longitudinal side view of an auxiliary reservoir and triple valve having my improvements in connection therewith. Fig. 11 is a vertical sectional view through the check-valve, which forms a part of the improvements in connection with the auxiliary reservoir and triple valve.

Describing said views in detail, the numeral

1 indicates the engineer's valve, which is provided with the customary interior channels and ports. The numeral 2 represents the train-line governor attached to said valve. Within the upper portion of the said engineer's valve is the valve-seat 3, having therein the usual preliminary exhaust-ports 4 and 5, direct application and exhaust port 6, direct application and supply port 7, equalizing-port 8, supply-port 10, and feed-port 11. A rotary valve 12, connected to a handle 13, is arranged within said body to engage the valve-seat. This valve is provided with the customary cavities 14 and 15, ports 16 and 17, and the warning or whistle port 18. My improvements in this portion of the apparatus consists of forming my new recharging-port 20 through the valve-seat to communicate with the passage 19, which connects the aforesaid port 11 with the train-line governor.

At Figs. 10 and 11 the numeral 21 represents the brake-cylinder, 22 the auxiliary reservoir, 23 the triple valve, and 24 a portion of the train-line. My improvements in this portion of the apparatus consist of connecting the base of the triple valve and auxiliary reservoir by a pipe 25, having arranged therein the check-valve 26. The check-valve in this instance is composed of the two tubular parts 27 and 28, connected one to the other and having therein the valve 29. At Figs. 4, 5, 6, 7, 8, and 9, wherein the several operative positions of the valve and its seat are shown, it will be observed that the running, release, lap, service, and emergency positions are practically the same as heretofore in this form of valve, the only alteration in the valve-seat being that the port 10 is somewhat shortened, the port 8 moved a slightly greater distance away from the port 7, and the port 11 is shifted a trifle nearer the port 4 to permit placing my new recharging-port 20. Slight departures are also made in the valve-ports and cavities to properly register with those of the seat. An additional stop or notch is also formed in the flange at the top of the valve-casing for my new position.

The operation of recharging the auxiliary reservoir in this system with my improvements thereon would be as follows: After service application has been made by turning the valve to service position to cause a reduction

of air-pressure in the train-line to set the brakes the valve is brought to the recharging position, Figs. 1 and 6, admitting air through the port 20 into the train-line, there-
 5 by gradually recharging the auxiliary reservoir through the pipe connection 25 to train-line pressure while the brakes are still applied. When the necessary reduction takes place or is made in the train-line to set the
 10 brakes, the check-valve 26 in the pipe connection closes by virtue of the air-pressure in the auxiliary reservoir being greater than that in the line, and when the valve is turned to the recharging position the air admitted into
 15 the line opens said valve to permit such recharging. By these additions to the system it is readily seen that the auxiliary reservoirs along the train-line may easily be recharged at any time during the application of the
 20 brakes, thereby assuring the engineer absolute control and safety on all grades.

As before stated, I do not limit my improvements to this particular air-brake system, as their simplicity is such as will permit their
 25 application to others.

The pipe connection 25, with check-valve therein, does not necessarily require connection with the hollow space at the base of the triple valve, as that end thereof may be con-
 30 nected to the train-line at any suitable point, or possibly a port could be formed within the triple-valve body and provided with a check-valve as a passage for the air from the train-line to the auxiliary reservoir. Modifications
 35 are also possible in the engineer's valve for positioning the recharging-port to conduct the air therefrom to the train-line without departing from the principles involved in said improvements.

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

1. In an air-brake system employing a single train-line wherein the engineer's valve is con-
 45 nected with an equalizing discharge-valve, the combination with the engineer's valve, the train-line, and auxiliary reservoir, of a supplemental feed-port in the engineer's valve to communicate with the train-line, a sup-
 50 plemental air-passage from the train-line to the auxiliary reservoir, and an air-pressure-actuated check-valve in said passage which is adapted to open automatically by the pressure in the train-line when recharging said
 55 reservoir during brake application and close automatically by the pressure in the reservoir when a reduction is made in said line.

2. In an air-brake system employing a single train-line wherein the engineer's valve is connected with an equalizing discharge-valve 60 and a train-line governor is arranged between said line and engineer's valve, the combination with the engineer's valve, train-line, and auxiliary reservoir, of a supplemental feed-
 65 port in the engineer's valve to communicate with the train-line, a supplemental air-passage from the train-line to the auxiliary reservoir, and an air-pressure-actuated check-valve in said passage which is adapted to open auto-
 70 matically by the pressure in the train-line when recharging said reservoir during brake application and close automatically by the pressure in the reservoir when a reduction is made in said line.

3. In an air-brake system employing a single 75 train-line wherein the engineer's valve is connected with an equalizing discharge-valve and the auxiliary reservoir and train-line has means therebetween to permit recharging of
 80 said reservoir during brake application and prevent a return of air in said line when a reduction is made therein, of a supplemental feed-port in said engineer's valve.

4. In an air-brake system employing a single 85 train-line wherein the engineer's valve is connected with an equalizing discharge-valve and a train-line governor is arranged between said line and engineer's valve and the aux-
 90 iliary reservoir and train-line has means therebetween to permit recharging of said reservoir during brake application and prevent a return of air in said line when a reduction is made therein, of a supplemental feed-port in
 said engineer's valve.

5. In an engineer's air-brake valve provided 95 with an equalizing discharge-valve and having a train-line governor to regulate the supply of air to the train-line, the combination therewith of a supplemental feed-port extending from the valve-seat to the passage lead-
 100 ing from the governor to the main feed-passage.

6. In an engineer's air-brake valve provided 105 with an equalizing discharge-valve and having a train-line governor to regulate the supply of air to the train-line, of a supplemental feed-port in said engineer's valve.

In testimony whereof I have hereunto affixed my signature in the presence of two subscribing witnesses.

FRANK A. MCKELVEY.

Witnesses:

RICHARD S. HARRISON,
 E. D. HICKMAN.