

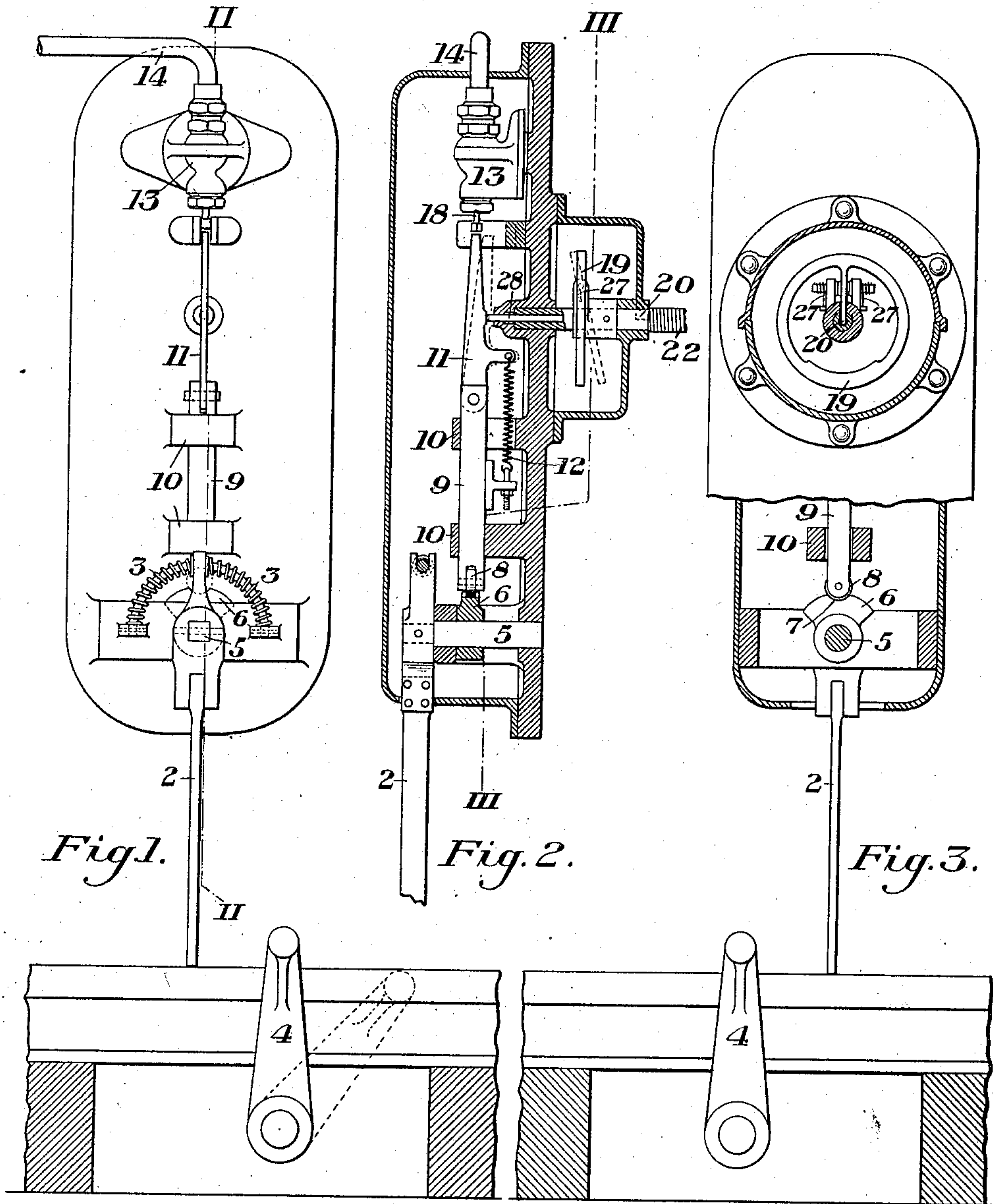
J. G. SCHREUDER & V. K. SPICER.  
 APPARATUS FOR AUTOMATICALLY CONTROLLING THE SPEED OF TRAINS.

APPLICATION FILED AUG. 8, 1907.

903,416.

Patented Nov. 10, 1908.

2 SHEETS—SHEET 1.



WITNESSES

*R. A. Balderson*  
*W. W. Swartz*

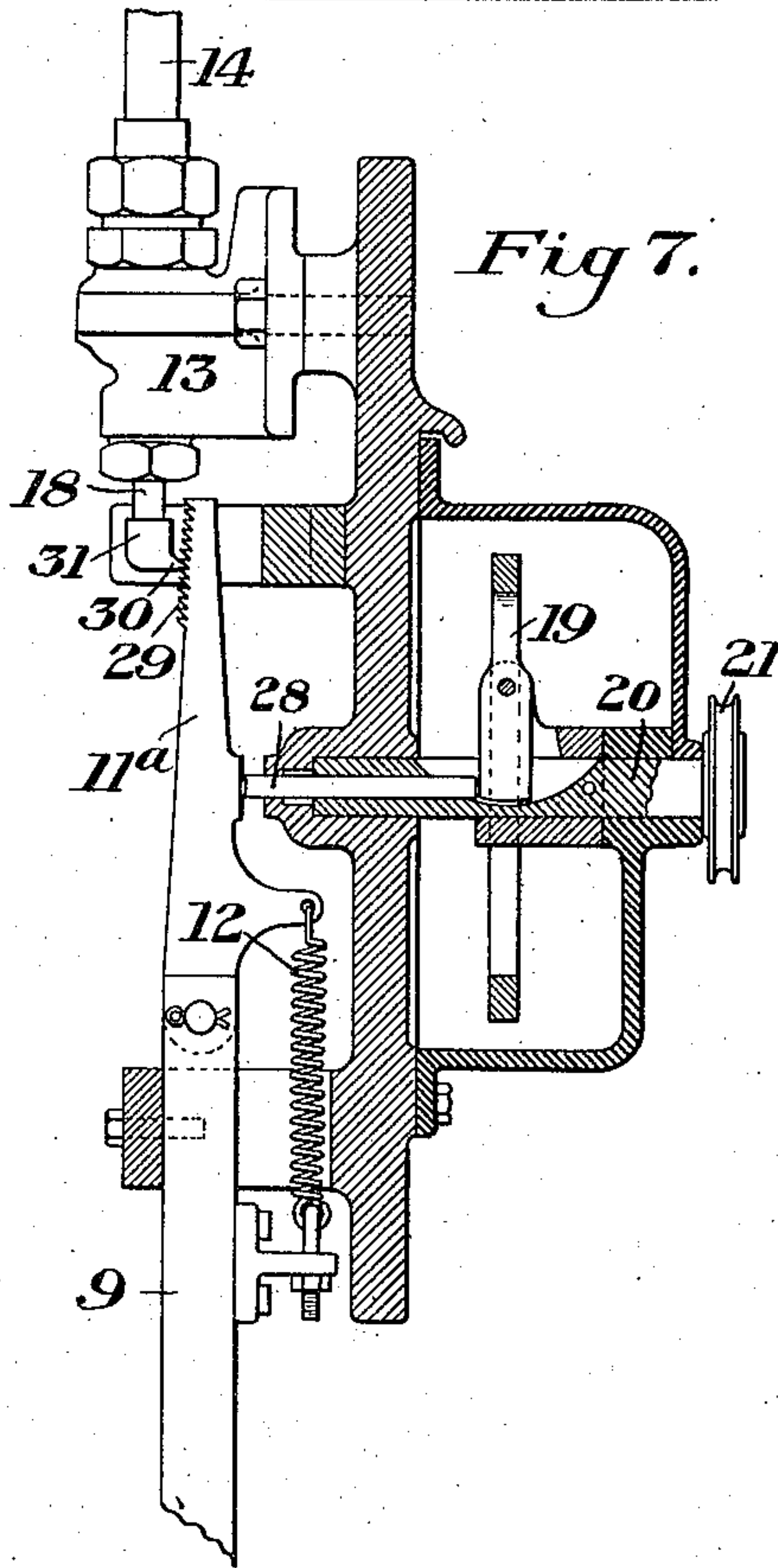
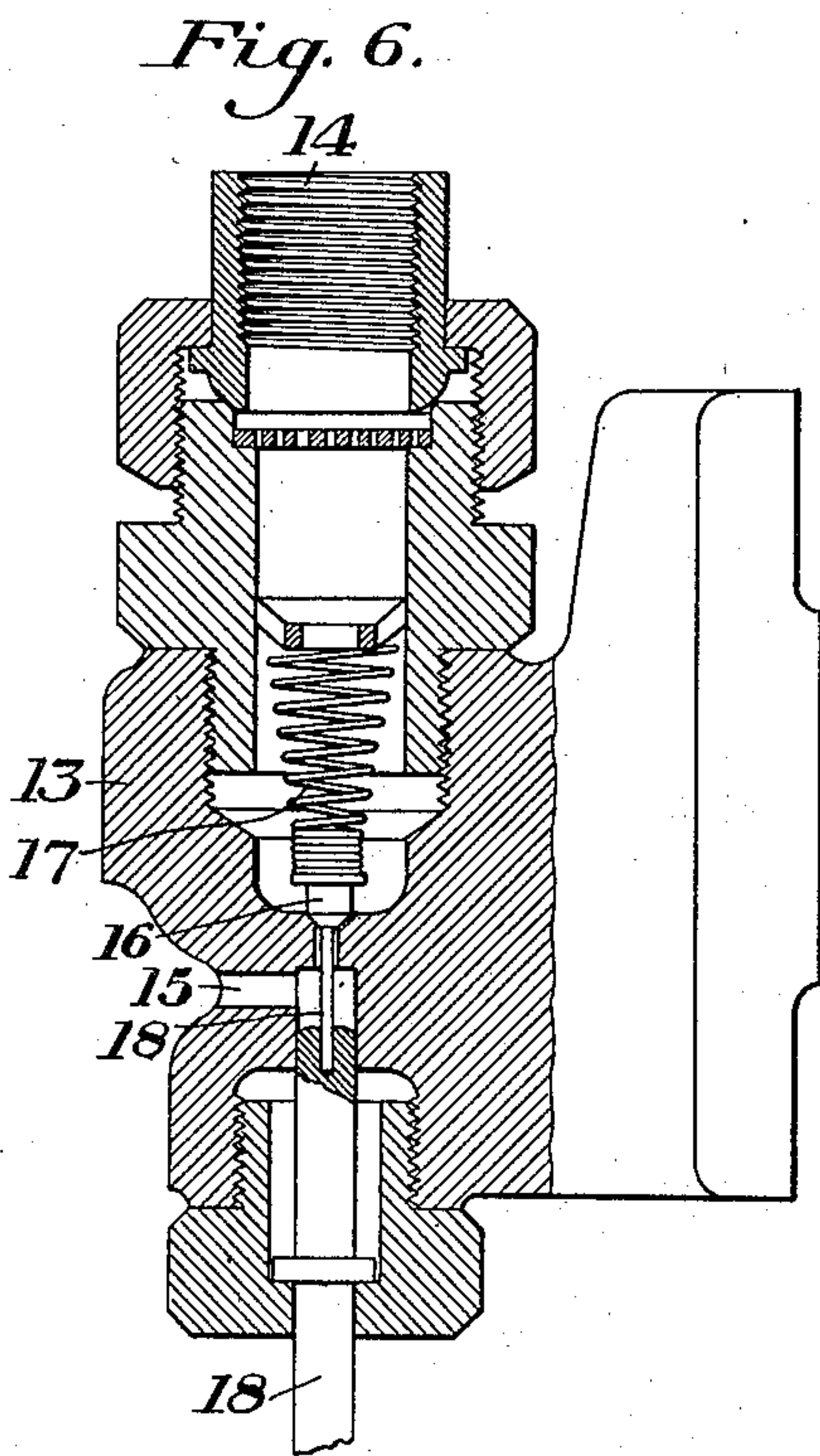
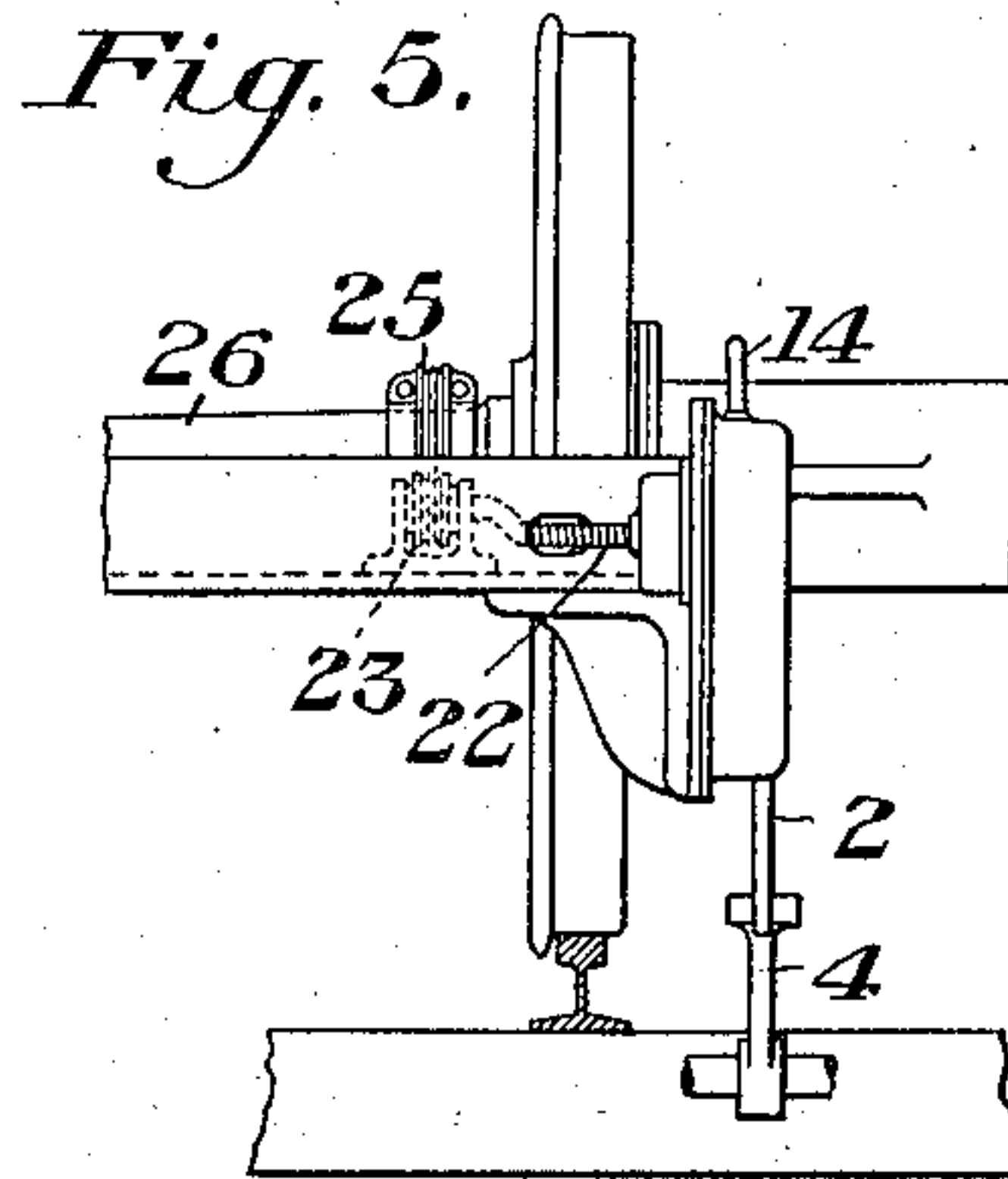
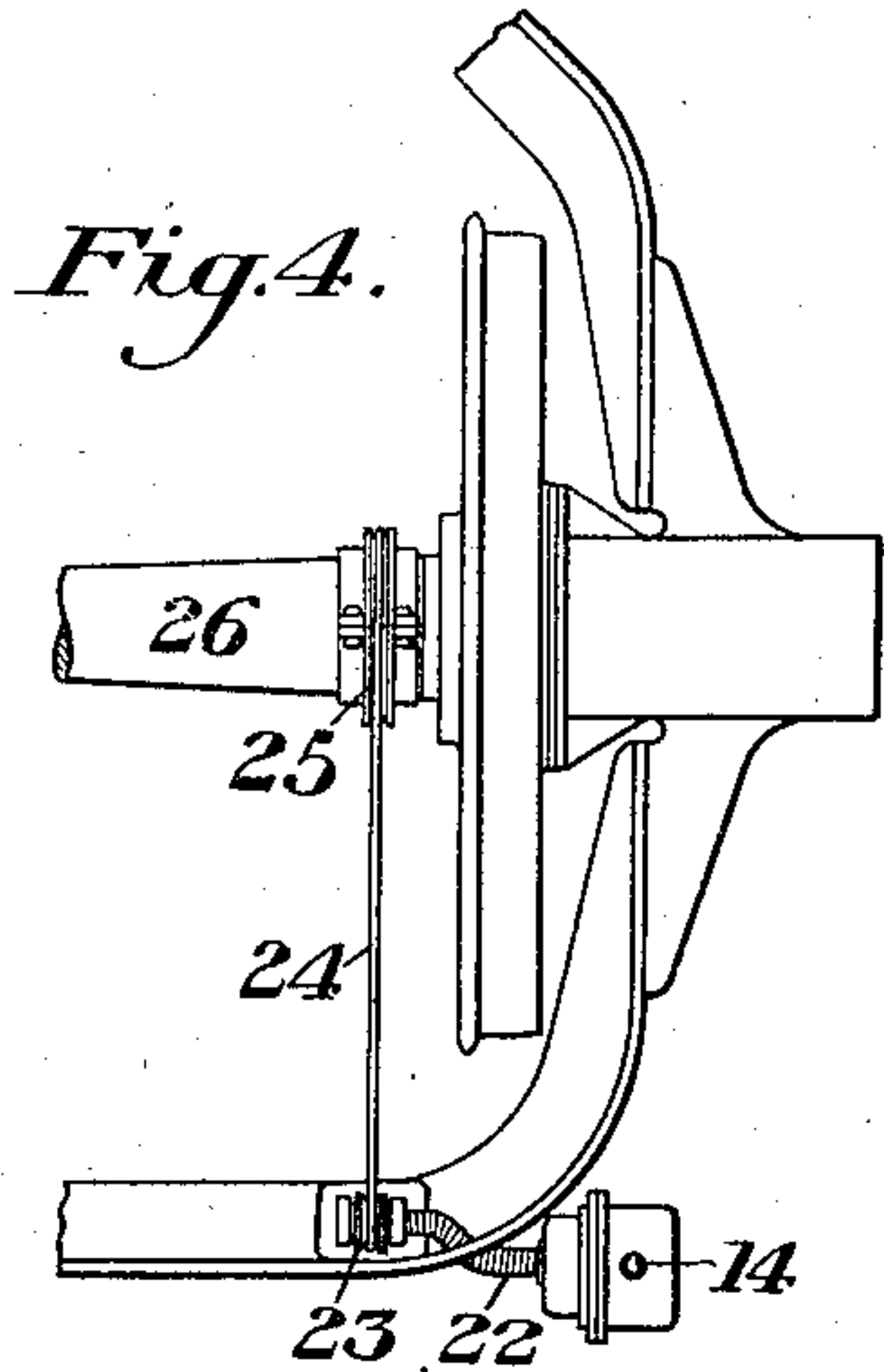
INVENTORS

*J. G. Schreuder*  
*V. K. Spicer*  
*By Baker, Decker & Carmichael,*  
*their Attys.*

J. G. SCHREUDER & V. K. SPICER.  
 APPARATUS FOR AUTOMATICALLY CONTROLLING THE SPEED OF TRAINS.  
 APPLICATION FILED AUG. 8, 1907.

903,416.

Patented Nov. 10, 1908.  
 2 SHEETS—SHEET 2.



WITNESSES

*R. A. Balderson.*  
*W. W. Swartz*

INVENTORS

*J. G. Schreuder*  
*V. K. Spicer,*  
*by Bohrer, Byrnes & Parmelee,*  
*their Attys.*



# UNITED STATES PATENT OFFICE.

JENS G. SCHREUDER, OF EDGEWOOD PARK, PENNSYLVANIA, AND VIBE K. SPICER, OF CHICAGO, ILLINOIS, ASSIGNORS TO THE UNION SWITCH & SIGNAL COMPANY, OF SWISSVALE, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

## APPARATUS FOR AUTOMATICALLY CONTROLLING THE SPEED OF TRAINS.

No. 903,416.

Specification of Letters Patent.

Patented Nov. 10, 1908.

Application filed August 8, 1907. Serial No. 387,599½

*To all whom it may concern:*

Be it known that we, JENS G. SCHREUDER, of Edgewood Park, Allegheny county, Pennsylvania, and VIBE K. SPICER, of Chicago, Cook county, Illinois, have invented a new and useful Apparatus for Automatically Controlling the Speed of Trains, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a front view of valve-operating mechanism embodying our invention; Fig. 2 is a section on the line II—II of Fig. 1; Fig. 3 is a section on the line III—III of Fig. 2; Fig. 4 is a plan view showing one way of driving the speed governor; and Fig. 5 is an end view of the same; Fig. 6 is a detail sectional view of the valve; and Fig. 7 is a view similar to Fig. 2 but showing a modification.

The object of our invention is to provide means for automatically controlling the speed of railway trains, (and by the term "trains" as used herein we include all forms of railway vehicles whether single or attached), in passing distant signals, at curves, or at any other point along the right of way where it is desirable to limit the speed.

In accordance with our invention, we provide trip mechanism carried by the train, preferably on the engine or motor and arranged to effect operation of a speed reducing device. This trip mechanism is operated by means on the trackway at the desired points provided the speed of the train exceeds the predetermined limit; otherwise, the trip mechanism remains inactive. We preferably cause such mechanism when actuated, to operate an air valve which may directly cause the application of brakes, or which may operate a second valve or other mechanism for controlling either the brakes or the throttle valve of the engine, or both.

Referring to the drawings, the numeral 2 designates a depending trip arm or lever which is carried preferably at some suitable point on the engine or motor car, being normally held in the central position by means of the opposing springs 3, which also serve to take up the shock of the impact when said arm engages the trip device 4 placed along the right of way. The arm 2 is secured to a rock shaft 5, which also carries a cam 6, hav-

ing a central depression 7 in which rests a roller 8 on the lower end of a vertically movable bar 9 supported in suitable guides 10. Pivotaly secured to the upper end of the bar 9 is an actuating finger 11, which is normally held in the position shown in dotted lines in Fig. 2 by the action of a spring 12.

13 designates a valve casing having a connection at 14 with the train pipe of the air brake system, and also having an escape opening 15 to the atmosphere. This escape opening is normally closed by a valve 16 held seated by a spring 17. Said valve has a depending stem 18 which projects beyond the lower end of the casing 13 in position to be engaged by the actuating finger 11.

19 designates a centrifugal device, which is arranged to be driven from the axle of the engine or other rotating part on the engine or train. This device is carried by a shaft 20 which may be driven by a direct belt or other connection with one of the axles by means of a pulley 21 as shown in Fig. 7. Inasmuch, however, as it will usually not be practicable to obtain a direct driving connection for this shaft, it is preferably driven by a flexible shaft 22 driven by pulley 23, which is in turn driven by a belt 24 to a wheel or pulley 25 on one of the axles 26. We do not, however, limit ourselves to any particular method of driving this shaft. The centrifugal device 19 may be an ordinary ball governor, or it may be any other well known centrifugal acting device of this character. In the form shown, it consists of a disk which normally stands at an angle to the vertical, as indicated in dotted lines in Fig. 2, and which, by the speed of rotation is caused to move toward a vertical plane against the action of a spring 27. This movement causes the actuation of an endwise movable rod 28, whose free end is in contact with the actuating finger 11 before described.

The trip devices 4 are secured to the trackway at the approach to curves, distance signals, or other points, where it is desired to limit the speed. They may be controlled by connection with signal or switch mechanism, or they may be simply clamped to the track in position to engage the trip arm 2. When the trip arm 2 engages one of these trips, if the speed of the train is below the predetermined limit, the bar 10 and finger



11 will simply be actuated idly, the spring 12 holding the finger 11 in a position in which it cannot engage with the depending valve stem 18. If, however, the speed of the train exceeds the predetermined limit, the action of the centrifugal device 19 will have moved the rod 28 sufficiently to move the actuating finger 11 into the position shown in full lines in Fig. 2, so that when the trip arm engages with the track trip and the shaft 5 is thereby rocked, the action of the cam 6 will move the bar 10 and finger 11 vertically, thereby unseating the valve 16 and permitting air to escape at the port 15. This, as above stated, may either directly effect the application of the brakes, or may cause the operation of auxiliary valve mechanism through which the brakes or the throttle valve, or both, are controlled.

In the modification shown in Fig. 7, the pivoted actuating finger 11<sup>a</sup> which corresponds to the finger 11 of the form first described, is formed at its upper end with a series of teeth or notches 29, which are adapted to engage a tooth 30 of a pawl 31 on the lower end of the depending valve stem 18. Normally the finger 11<sup>a</sup> is held by the spring 12<sup>a</sup> in such position that the teeth 29 will not engage the tooth 30. When, however, the speed exceeds the limit the operation of the centrifugal device 19 moves the finger 11<sup>a</sup> to cause the engagement of the tooth 30 with one of the teeth 29, so that when the trip arm is actuated, the resulting vertical movement of the finger 11<sup>a</sup> will operate the valve stem to unseat the valve.

The advantages of our invention consist in the provision of the means whereby the speed of the train may be automatically checked at any desired point along the roadway, provided its speed approaching that point is in excess of the limit; otherwise, the mechanism is entirely inoperative and the train proceeds in its regular way.

Various changes may be made in the details of construction and arrangement without departing from the spirit and scope of our invention, since

What we claim is:—

1. In apparatus for controlling the speed of trains, a controlling device, trip actuat-

ing mechanism on the train for actuating said device, a governor controlled by the speed of the train, and a connection operated by the governor for moving the trip-actuated mechanism into position to operate said device; substantially as described.

2. In apparatus for controlling the speed of trains, a controlling device, a trip mechanism on the train for actuating said device, means along the trackway for actuating the trip mechanism, a governor controlled by the speed of the train and a connection actuated by the governor and arranged to move the trip-actuated mechanism into position to operate the controlling device; substantially as described.

3. In apparatus for controlling the speed of trains, a normally closed controlling valve, an actuating device arranged to unseat said valve, and normally held out of engagement therewith, a governor controlled by the speed of the train moving said device into operative position, and a trip lever for actuating said device; substantially as described.

4. In apparatus for controlling the speed of trains, a normally closed controlling valve, a pivoted actuating finger for operating said valve to open it, a governor controlled by the speed of the train for moving said finger into operative position, and a trip lever operatively connected with said finger; substantially as described.

5. In apparatus for controlling the speed of trains, a pivoted trip lever, a rock shaft actuated by said lever, a cam on said shaft, and valve actuating mechanism operated by the cam together with means controlled by the speed of the train and controlling the operating connection between the cam device and the valve; substantially as described.

In testimony whereof, we have hereunto set our hands.

JENS G. SCHREUDER.  
VIBE K. SPICER.

Witnesses as to Jens G. Schreuder:

C. C. WHITE,  
JAMES CHALMERS, Jr.

Witnesses as to Vibe K. Spicer:

GEO. MARLOFF,  
W. S. CLEVINGER.