

B. W. KING.

SCALE.

APPLICATION FILED JUNE 20, 1910.

973,669.

Patented Oct. 25, 1910.

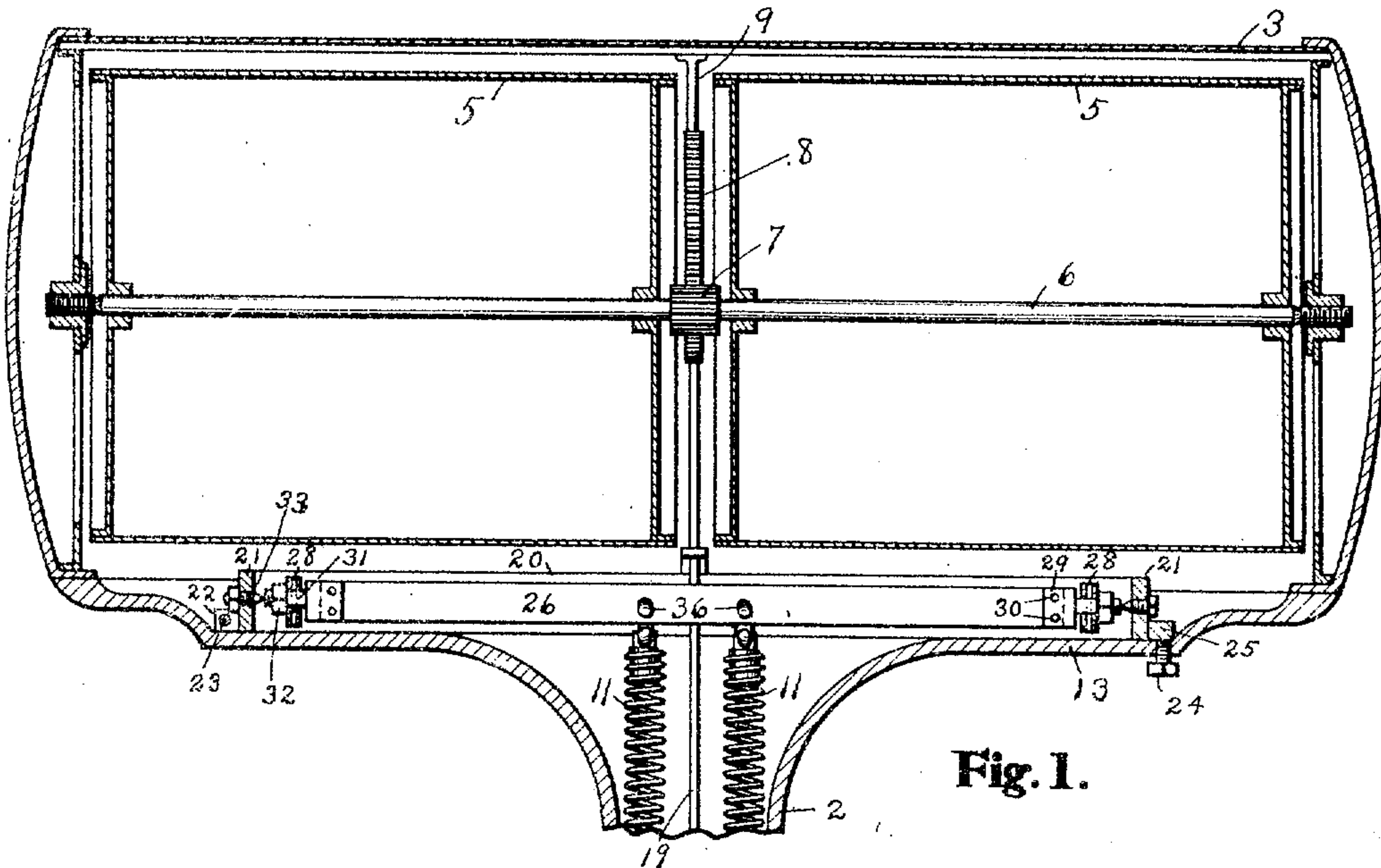


Fig. 1.

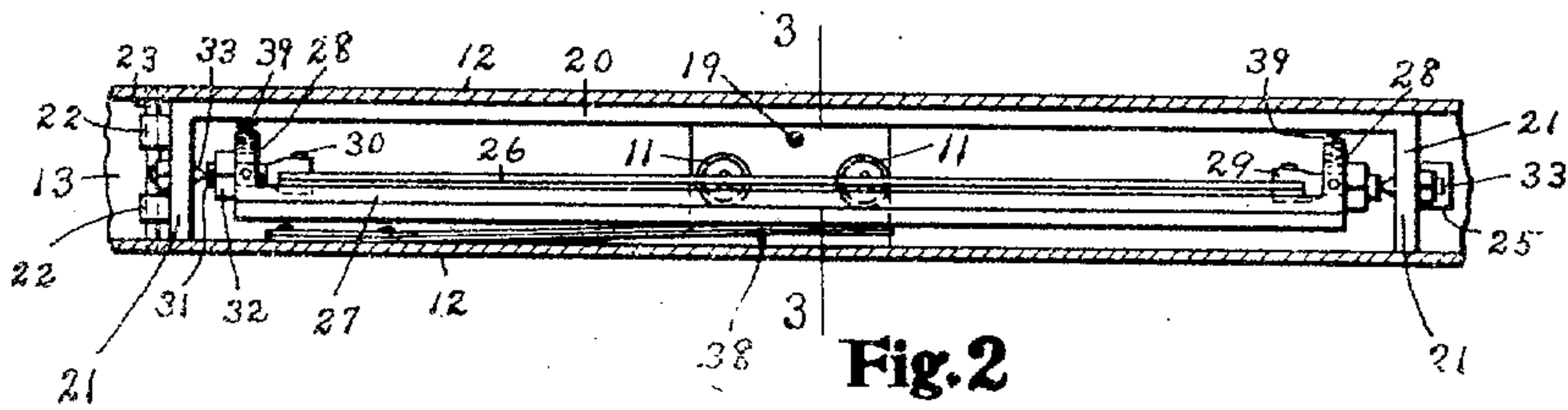


Fig. 2.

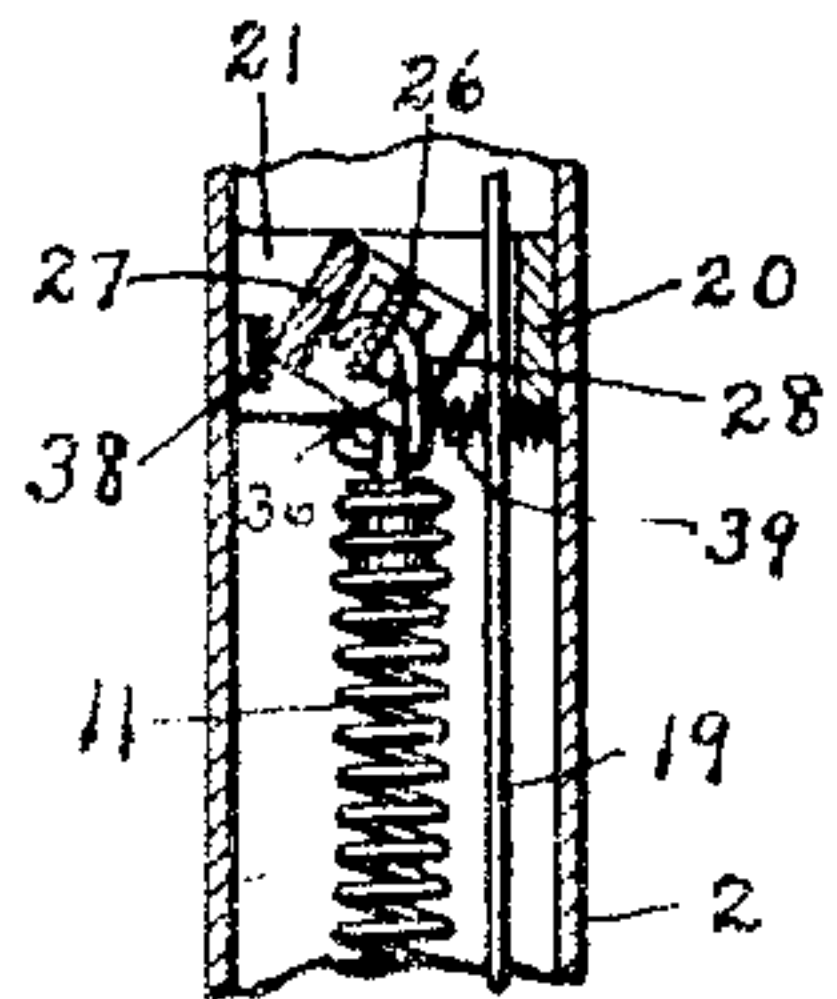


Fig. 3.

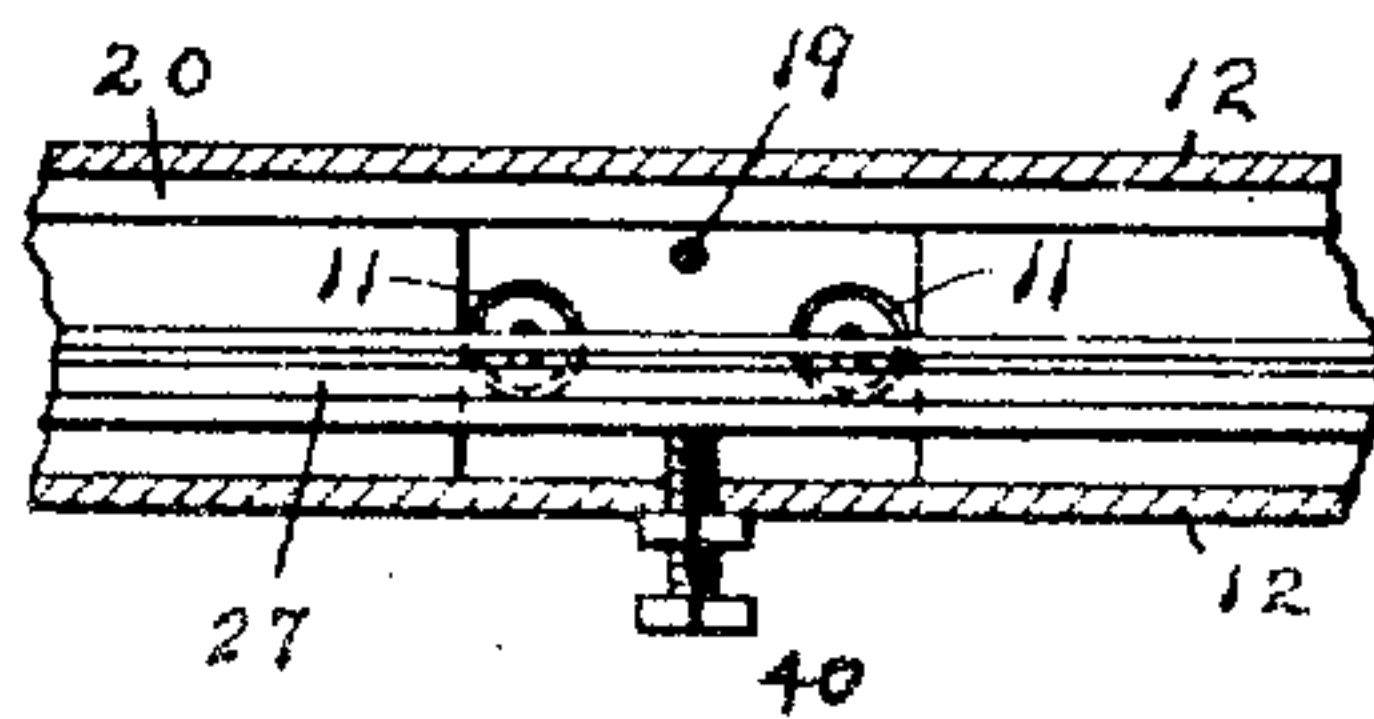


Fig. 4.

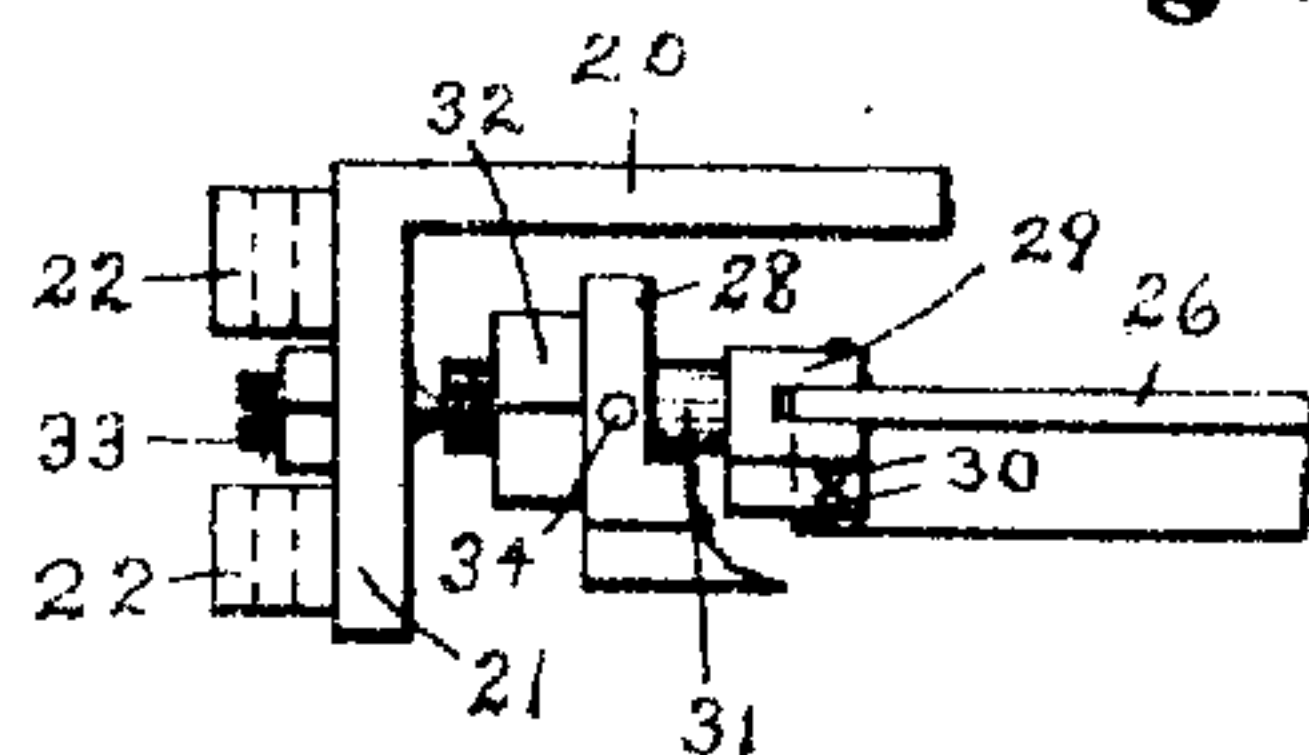


Fig. 5.

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Witnesses

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# UNITED STATES PATENT OFFICE.

BERT W. KING, OF DETROIT, MICHIGAN, ASSIGNOR TO STANDARD COMPUTING SCALE COMPANY, LIMITED, OF DETROIT, MICHIGAN, A LIMITED PARTNERSHIP OF MICHIGAN.

SCALE.

973,669.

Specification of Letters Patent.

Patented Oct. 25, 1910.

Application filed June 20, 1910. Serial No. 567,768.

To all whom it may concern:

Be it known that I, BERT W. KING, a citizen of the United States, and a resident of Detroit, in the county of Wayne and State of Michigan, have invented a new and useful Scale, of which the following is a specification.

This invention relates to means for neutralizing the effects of changes in temperature on the counter-balancing springs of scales, and the object of my invention is to provide a correcting device of this kind which shall be simple, effective and easily adjusted.

In the accompanying drawing, Figure 1 is a vertical, longitudinal section of the indicating drum and upper portion of the pedestal of a spring-scale having this improved neutralizing device mounted below the drum. Fig. 2 is a plan of the neutralizing device. Fig. 3 is a cross section on the line 3—3 of Fig. 2. Fig. 4 is a plan of a slightly modified form of controlling device. Fig. 5 is a plan of one end of this device on a larger scale.

Similar reference characters refer to like parts throughout the several views.

The device hereinafter described may be used in connection with many types of spring scales having weight indicators movable in proportion to the weight on the platform, that shown in the drawings being generally similar to the scale shown in the patent to Jaenichen, No. 923,530, dated June 1st, 1909. The cylindrical shell 3 incloses a shaft 6, on which are mounted the drums 5 and gear 7. A vertically movable rod 19 connects with the lower end of the springs 11 and has a rack 8 at its upper end which engages the gear 7. A guide 9 holds the upper end of the rod in position. The pedestal 2 has its upper end formed T-shaped with sides 12 and bottom 13, and the outer ends of the arms of the T join the heads of the shell 3.

A support for the upper ends of the springs 11 is mounted in the upper end of the pedestal. It comprises an adjustable frame having a side 20 and ends 21. Perforated lugs 22 on one end are mounted on the pin 23 which extends through the sides 12 of the pedestal, while an adjusting screw 24 may engage the lug 25 at the other end of the frame. As this frame supports the

upper ends of the springs 11, any initial extension of the springs because of increase in temperature may be met by raising the frame, thus bringing the upper end of the rod 19 and the drums 5 to normal initial position. Revolvably mounted in this frame is a transverse spring 26 having diameters of unequal length, and preferably rectangular in cross-section. The initial stiffness of this transverse spring depends upon the tension, and it is therefore mounted in a revoluble tensioning bar 27, having perforated ends 28.

Any desired connection between the spring and its tensioning bar may be employed. That shown consists of blocks 29 secured to the ends of the spring 26 by means of pins 30, and from these blocks the threaded studs 31 extend through the ends 28. See Fig. 5. Nuts 32 insure a proper tension on the spring 26, while pins 34 may be driven through small holes through the ends 28 and the studs 31 after the nuts have been properly tightened. These studs have conical depressions in their ends to receive the points of the screws 33 carried by the ends 21 of the frame. The spring 26 and the tensioning bar are therefore revolubly mounted in the upper end of the pedestal, and the position of the bar and spring will determine the flexure of the spring under predetermined loads.

The load-springs 11 connect to hooks 36 in any desirable manner and these hooks engage in holes in the transverse spring 26. As shown in Fig. 3, small springs 39 may engage the ends 28 of the tensioning-bar and tend to swing the same so that the spring 26 will have a greater inclination from the vertical. Secured to a side of the pedestal is an adjusting member 38, of two metals having different coefficients of expansion, preferably steel and aluminum or brass, which form a thermostat so constructed that the free end will swing inward with increasing temperatures. This member, having greater strength than the springs 39, will turn the tensioning-bar in such a manner that the transverse spring 26 will be more nearly vertical with increased temperature.

Within reasonable limits, comprising an angle of about fifteen degrees, a flat spring 26 mounted as shown in the drawings, will



increase substantially regularly in stiffness with each degree of decrease of inclination from the vertical. As the load-springs 11 decrease in stiffness with increasing temperature, a properly proportioned and mounted transverse-spring 26 may be employed in connection with proper adjusting mechanism to neutralize the changes in the springs 11.

10 Instead of automatic mechanism, any manually operated device such as the adjusting screw 40, Fig. 4, may be employed to change the inclination of the transverse spring 26.

15 Many other changes in construction can be made by those skilled in the art without departing from the spirit of my invention.

Having now explained my construction what I claim as my invention and desire to

20 secure by Letters Patent is:—

1. In a scale, the combination of a frame, a tensioning bar revolubly mounted therein, a transverse spring carried by said bar, which spring is unequally flexible in different directions load springs hung to the middle of the transverse spring, and means to revolve the transverse spring.

2. In a scale, the combination of a frame, a transverse spring revoluble therein and 30 having diameters of unequal length, load springs suspended from the middle of the transverse spring, and means to revolve the transverse spring.

3. In a scale, the combination of a frame, a transverse spring revoluble therein and 35 having diameters of unequal length, automatic means to revolve said spring to cause the same to increase in height with increasing temperatures, and load springs suspended from said transverse spring.

4. In a scale, the combination of a transverse spring unequally flexible in different directions, a bar to tension the same, a frame, pivots for the spring and bar mounted in 45 the frame, means to revolve the spring and bar, and load-springs suspended from the middle of the transverse-spring.

5. In a scale, the combination of a frame, a tensioning bar revolubly mounted therein, 50 a transverse spring carried by said bar load springs hung to the middle of the trans-

verse spring, and automatic means to revolve the tensioning bar and the transverse spring.

6. In a scale, the combination of a frame, a transverse spring revoluble therein and 55 having diameters of unequal length, load springs suspended from the middle of the transverse spring, and automatic means to revolve the transverse spring in proportion to the changes in temperature.

7. In a scale, the combination of a frame, a flat transverse spring, a bar revolubly mounted in said frame, means connected to the ends of the spring and mounted in the tensioning bar to tension said spring, auto- 65 matic means to revolve said spring and bar to cause the same to increase in height with increasing temperatures, and load springs suspended from said transverse spring.

8. In a scale, the combination of a pedestal, a substantially horizontal frame adjust- 70 ably mounted therein, a tensioning bar revolubly mounted on said frame, a flat transverse spring carried by said bar and tensioned thereby, load-springs suspended from the transverse spring, and an adjusting device engaging the tensioning-bar and adapted to control the revolution of the same according to the changes in temperature.

9. In a scale, the combination of a pedestal, of pendulous load-sustaining devices, a substantially horizontal, revoluble spring supporting the same, said spring being unequally flexible in different directions and 85 means for revolving said spring to vary its flexibility.

10. In a scale, the combination of a frame, a spring revoluble therein, and unequally flexible in different directions automatic 90 means for revolving said spring to vary its flexibility inversely with the temperature, and load-sustaining devices engaging said spring.

In testimony whereof I have signed this 95 specification in the presence of two subscribing witnesses.

BERT W. KING.

Witnesses.

GEORGE E. RENLON,  
IDA E. SNELLING.