L. JAENICHEN & B. W. KING.

SCALE.

APPLICATION FILED FEB. 21, 1910.

998,008.

Patented July 18, 1911.

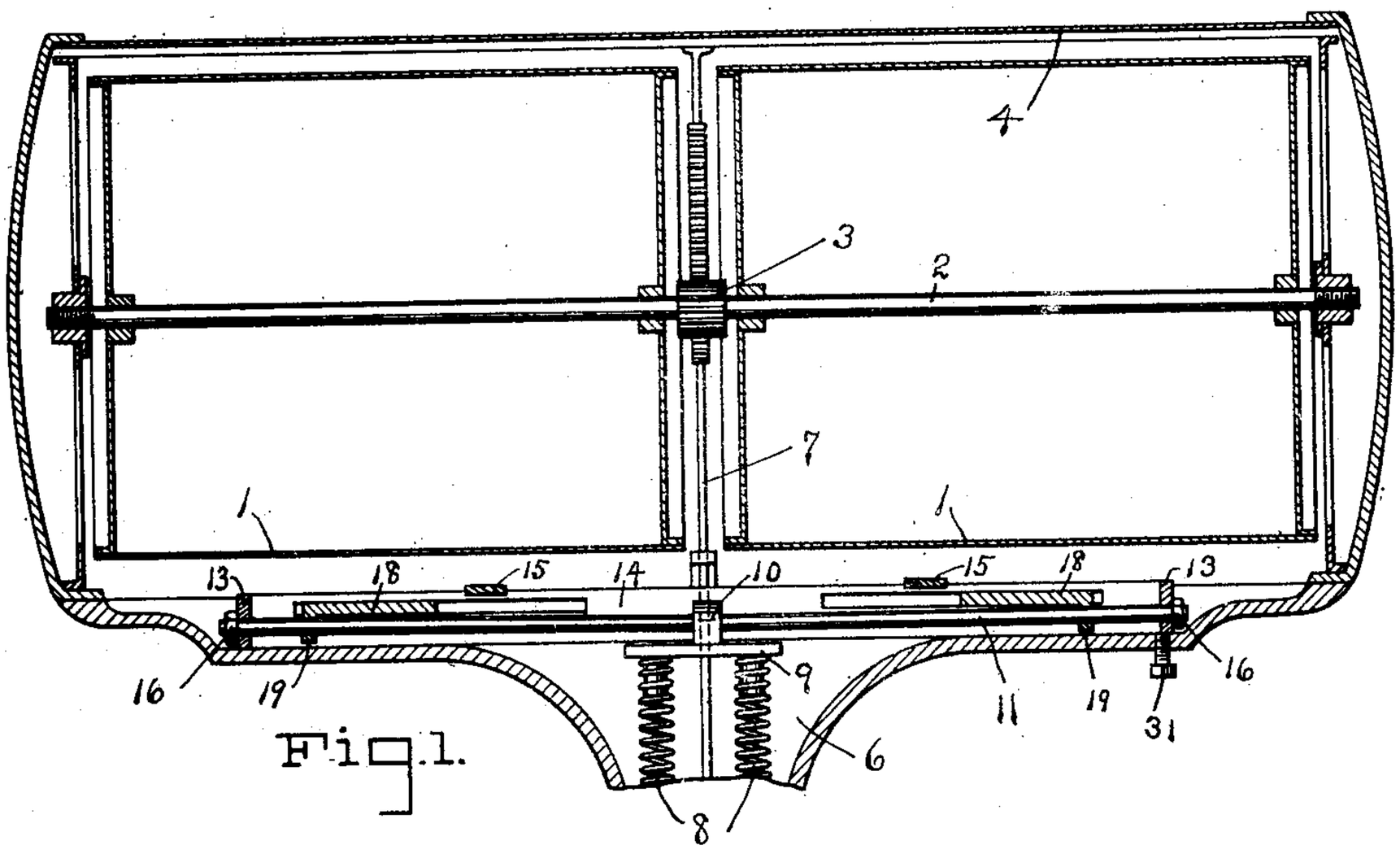

Fig. 1.

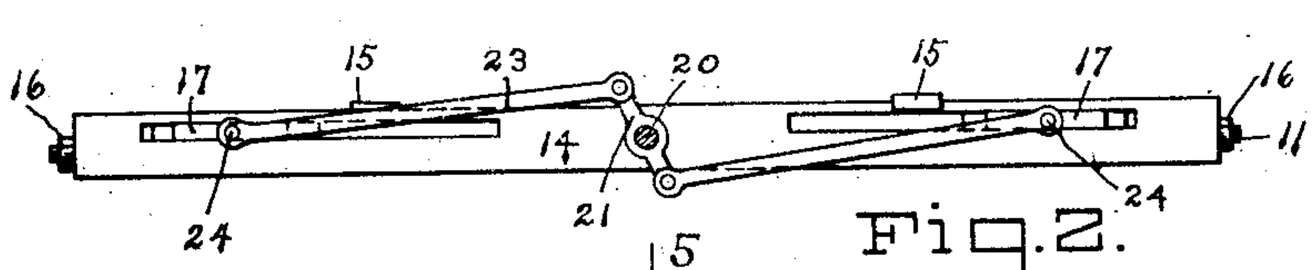

Fig. 2.

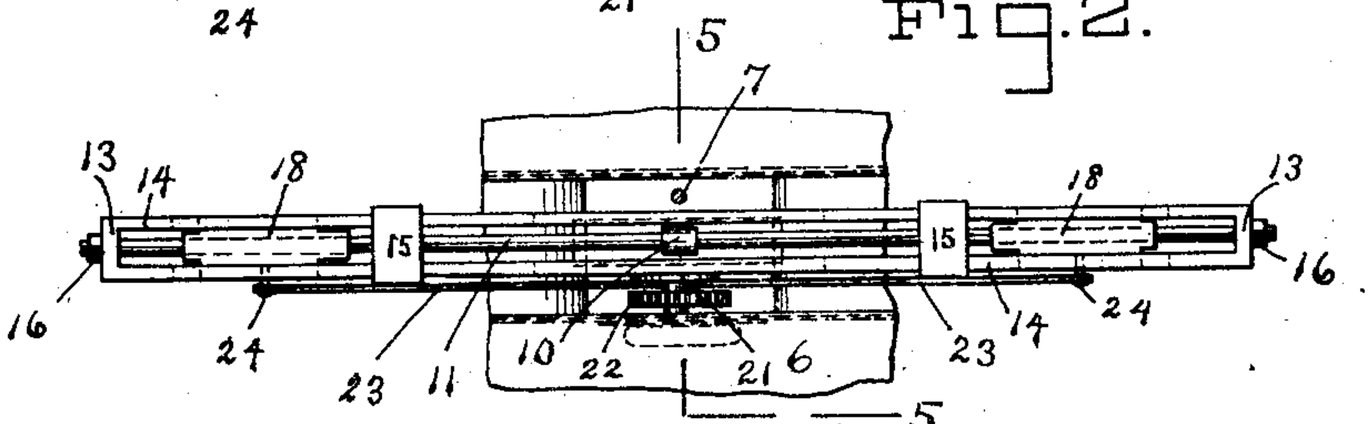

Fig. 3.

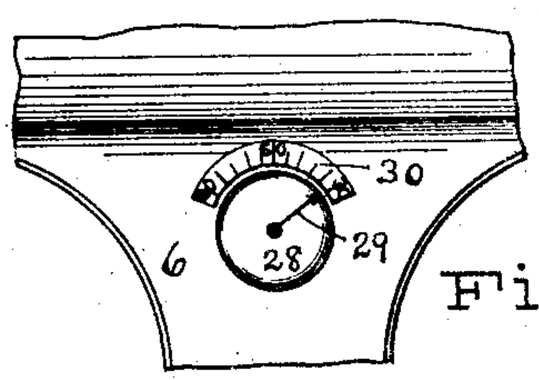

Fig. 4.

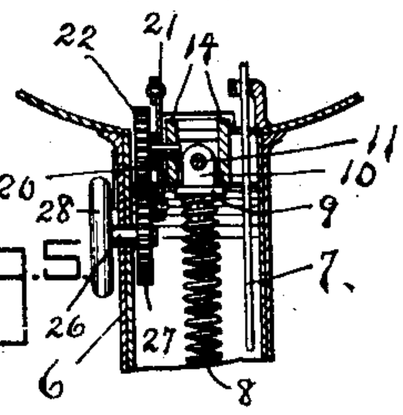

Fig. 5.

WITNESSES.

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UNITED STATES PATENT OFFICE.

LOUIS JAENICHEN AND BERT W. KING, OF DETROIT, MICHIGAN, ASSIGNORS TO STANDARD COMPUTING SCALE COMPANY, LIMITED, OF DETROIT, MICHIGAN, A LIMITED PARTNERSHIP.

SCALE.

998,608. Specification of Letters Patent. Patented July 18, 1911.

Application filed February 21, 1910. Serial No. 545,091.

To all whom it may concern:

Be it known that we, LOUIS JAENICHEN and BERT W. KING, citizens of the United States, and residents of Detroit, in the county of Wayne and State of Michigan, have invented a new and Improved Scale, of which the following is a specification.

This invention relates to spring scales, particularly to the drum type shown in the patent to Jaenichen, dated June 1st, 1909, No. 923,530; and the object of the improvements is to provide a spring mechanism for scales which shall be readily adjustable to compensate for variations in temperature.

In the accompanying drawings, Figure 1 is a vertical cross section of the indicating drum and the upper part of the supporting frame of a spring scale on the line of the drum axis. Fig. 2 is an elevation of the frame of the adjusting device. Fig. 3 is a plan of the adjusting device. Fig. 4 is an elevation of the actuating knob and the indicator. Fig. 5 is a cross section on the line 5—5 of Fig. 3.

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

Scale springs become longer with increasing temperatures and expand or flex more for each equal increase in load than when colder. In the construction shown in the accompanying drawings, a device is provided for counterbalancing the variation in stiffness of the scale springs, and also for bringing the indicating drum to proper position when the scale is unloaded.

The indicating drums 1 are on a shaft 2 having a gear 3 secured thereto, which shaft is journaled near the ends of the shell 4. A pedestal 6 supports this shell and a rod 7 connects the gear 3 and the scale levers. All this mechanism together with the springs 8 may be the same as that shown in the patent above referred to.

The upper ends of the springs 8 connect to the plate 9 having an eye 10 through which a resilient bar 11 extends. This bar is mounted in the ends 13 of an oblong frame, the sides 14 of which may be connected by small cross bars 15 to prevent relative lateral movement. Nuts 16 on the ends of the bar or any other desirable means may be employed to hold it firmly in the ends 13.

The sides 14 are slotted to receive projecting guides 17 of the small plates 18. Perforated lugs 19 extend downward from these plates and engage the lower sides of the bar 11. A short shaft 20 is mounted in the front side plate and carries a double crank 21 and a gear 22, movable with the crank. Links 23 extend from the ends of the arms of the crank 21 to pins 24 on the guides 17. It will be seen that the swinging of the crank 21 will move the supports 19 of the bar 11 toward or from each other and thereby vary the effective length of this spring.

A short shaft 26 is journaled in the front of the pedestal 6 and on its inner end is secured a gear 27 which meshes with the gear 22. A button 28 is the actuating member and has preferably a line 29 which may point to graduations on the indicator 30. Any desirable means may be employed to position the bar 11 in the pedestal, that shown being a screw 31 which engages one of the end pieces 13.

The bar 11 may be straight if desired, in which case an adjusting device for the rod 7 and drums 1 will probably be required. As shown however, the bar 11 curves down slightly. As a result, when the supports 19 are moved toward each other, the plate 9 will be raised.

The operation of the parts is as follows. When the parts are properly proportioned, the construction shown will compensate for all normal changes of temperature; the indicator 30 being shown graduated from 30 to 90 degrees merely as an example. The spring bar 11 will of course, be stiffest when cold so that the supports 19 will be farther apart for lower temperatures. When the springs become warmer, it is necessary to compensate, not only for the decreased stiffness of the bar 11 but also of the springs 8, so the supports 19 will be moved toward each other to greatly reduce the deflection of the bar 11.

It should be understood that the increase or decrease in amount of deflection for given additions of load because of the change in position of the supports 19 will just equal the respective decrease or increase of the amount of deflection of the springs 9, because of this same addition of load, on account of the change in temperature.

By curving the bar 11 downward, compensation is afforded for the expansion increase in length of the springs 8 when unloaded, the movement of the supports 19

toward each other raising the plate 9 and equaling the expansion of the unloaded springs. The lower ends of the springs will therefore be kept at the same height. Any expansion of the pedestal 6 will be equaled by an equal expansion of the rod 7.

Many details of construction may be changed by those skilled in the art without departing from the spirit of this invention.

Having now explained our construction, what we claim as our invention and desire to secure by Letters Patent is:—

1. In a scale, the combination of a frame, a pair of vertical coil-springs, a transverse bar-spring supporting the same at its middle portion, said bar-spring being curved upwardly from its middle portion, and supports engaging the lower side of the bar-spring and simultaneously movable toward and from the coil springs to vary the effective length and height of said bar-spring.

2. In a scale, the combination of a coil-spring, a transverse rod supporting the same, a frame supporting the rod comprising side pieces and end pieces connecting the same, said side pieces having longitudinal slots plates slidably supported in said slots and having downwardly extending perforated lugs engaging the lower side of said bar, a double crank mounted on the frame, links connecting the arms of the crank and said plates, and means to reciprocate said crank to move said plates and lugs toward and from each other to vary the effective length of said rod.

3. In a scale, the combination of a frame, a pair of vertical coil-springs, a transverse bar-spring supporting the same, said bar-spring being curved upwardly from its middle portion, supports engaging the lower side of the bar-spring, and manually operated means for moving the supports toward and from each other to vary the effective length and height of said bar-spring.

4. In a scale, the combination of a coil-spring, a transverse rod supporting the same, a frame supporting the rod comprising side pieces and end pieces connecting the same, said side pieces having longitudinal slots, plates slidably supported in said slots and having downwardly extending perforated lugs engaging the lower side of said bar, and means to move said plates and lugs toward and from each other to vary the effective length of said rod.

5. In a scale, the combination of a coil spring, a transverse bar supporting the same intermediate the ends of the bar, a frame to support the ends of the bar, slidable plates carried by the frame and engaging the lower side of the bar, and means to move said plates toward and from the coil spring to vary the effective length of the bar.

In testimony whereof, we have hereunto set our hands in the presence of two subscribing witnesses.

LOUIS JAENICHEN.
BERT W. KING.

Witnesses:
GEORGE E. RENTON,
JOSEPH M. BUCHER.