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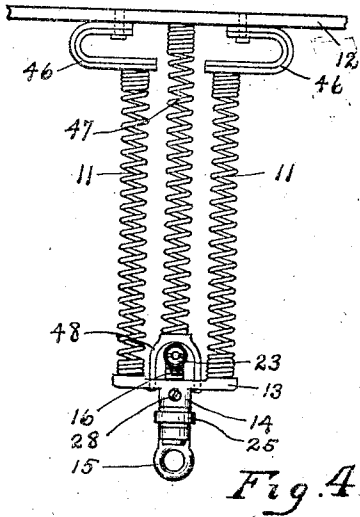
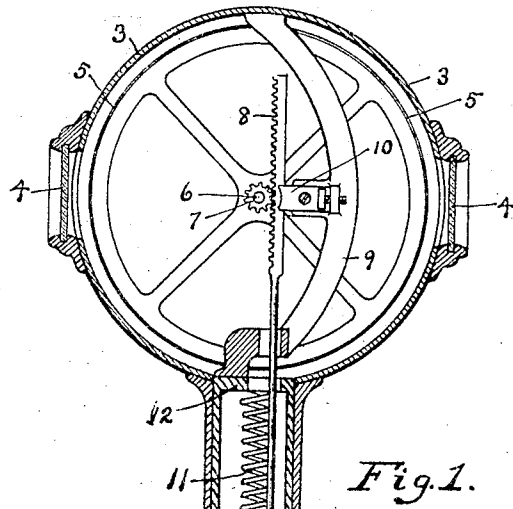
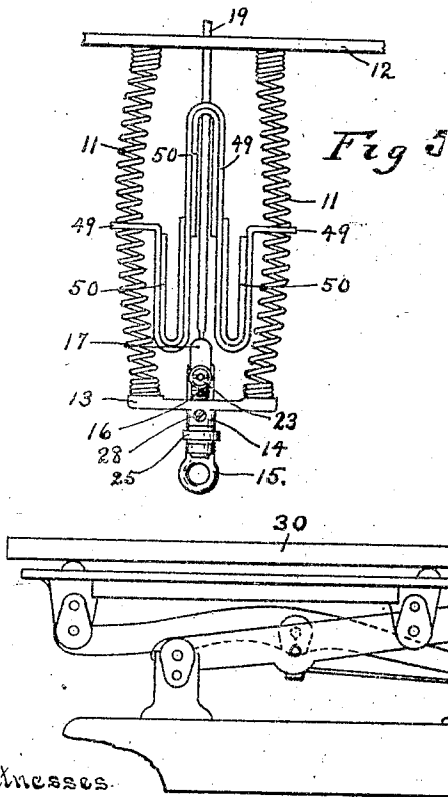
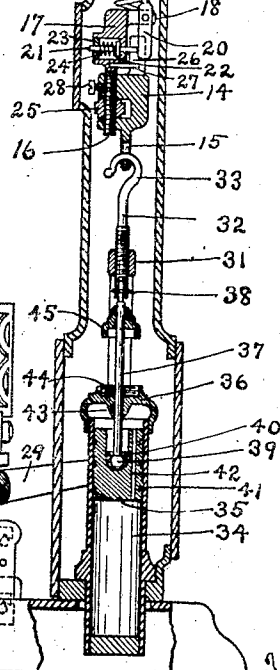
SCALE.

APPLICATION FILED APR. 30, 1908.

Patented June 1, 1909.

2 SHEETS—SHEET 1.

923,530.



Witnesses.

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2 SHEETS—SHEET 2.

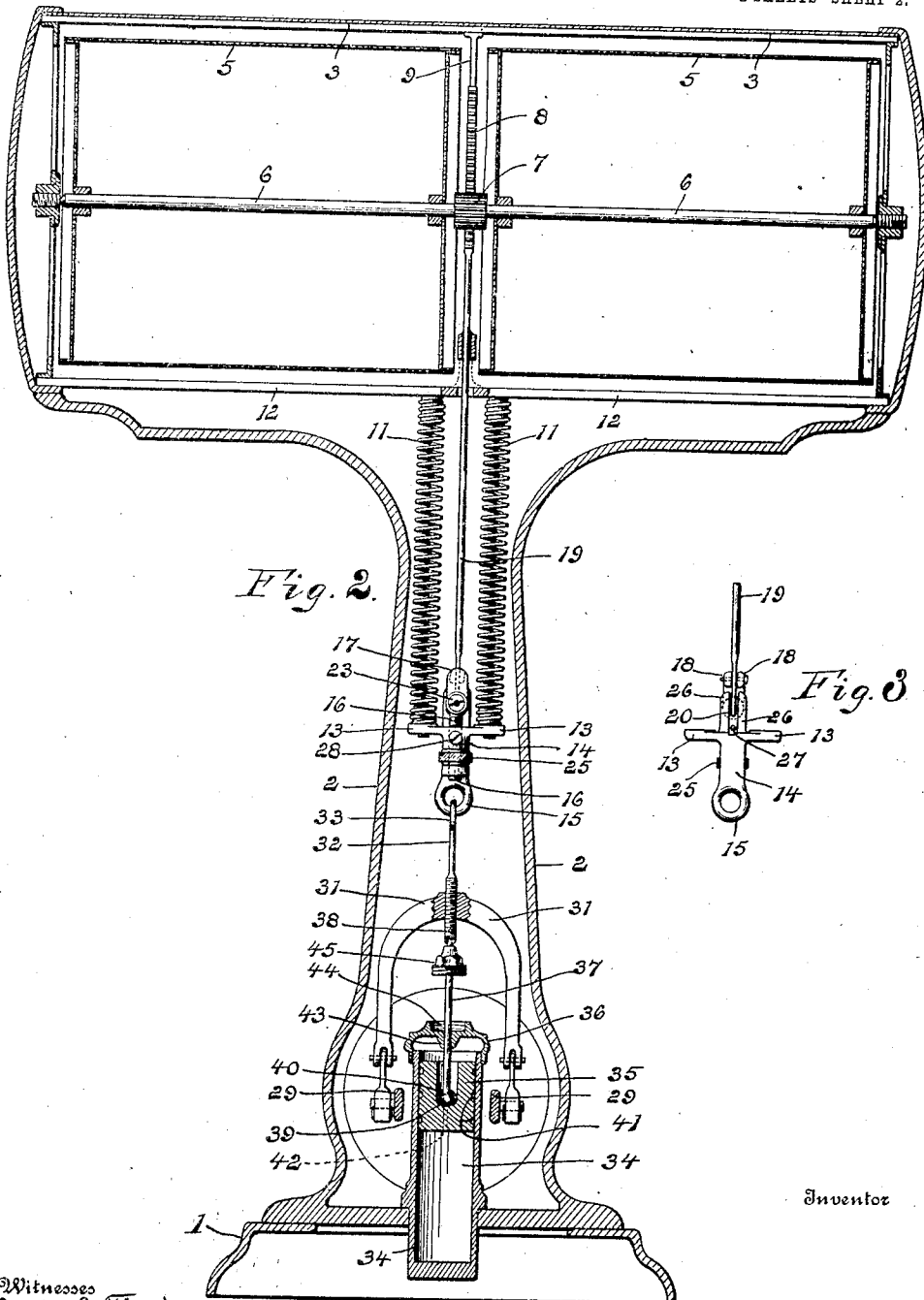


Fig. 2.

Fig. 3.

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UNITED STATES PATENT OFFICE.

LOUIS JAENICHEN, OF DETROIT, MICHIGAN, ASSIGNOR TO THE STANDARD COMPUTING SCALE COMPANY, OF DETROIT, MICHIGAN, A CORPORATION.

SCALE.

No. 923,530.

Specification of Letters Patent.

Patented June 1, 1909.

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To all whom it may concern:

Be it known that I, LOUIS JAENICHEN, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Scales, of which the following is a specification.

This invention relates to improvements in scales and more particularly to spring balance computing scales embodying a platform and platform lever mechanism, a computing drum, springs and means connecting the lever mechanism with the springs and drum to actuate the drum in proportion to the weight placed upon the platform.

The invention consists in providing a cheap, compact and efficient construction embodying certain new and useful features in the construction of the mechanism connecting the platform levers with the springs and drum and in the construction of a suitable dash-pot.

The invention further consists in providing an efficient thermostatic mechanism to correct the variations in the springs due to varying temperatures.

To this end the invention consists in the particular construction, arrangement and combination of parts all as hereinafter more fully described and particularly pointed out in the claims, reference being had to the accompanying drawings in which—

Figure 1 is a vertical section of a device embodying the invention and showing the platform and platform levers in side elevation; Fig. 2 is a vertical section of the same on the line $x-x$ of Fig. 1; Fig. 3 is a detail showing a rear elevation of the head to which the lower ends of the springs are attached; Fig. 4 is a detail showing in elevation a modified arrangement of springs and thermostatic devices to which they are attached; and Fig. 5 is a similar view showing a modified form of thermostat.

As shown in the drawings, 1 is a suitable base upon which is erected a vertical pedestal or hollow standard 2 provided at its upper end with a cylindrical casing 3 having sight openings 4 in its sides through which the markings upon a computing drum 5 may be seen. This drum is made in two parts and secured upon a horizontal shaft 6 which is supported at its ends in the ends of the casing, all as in the usual construction of such drums, and upon the shaft 6 between the

two parts of the drum is a pinion 7 engaged by a rack 8 for turning the pinion and actuating the drum. A bracket 9 extends across the drum-casing between the two parts of the drum and is provided with a guide 10 for the rack.

Two parallel coiled springs 11 are attached at their upper ends in the usual manner to a suitable support 12 below the drum and extend downwardly within the hollow pedestal. The lower ends of these springs are attached in the usual manner to laterally extending arms 13 on a suitable head 14, which head is provided on its lower side with an eye 15 and has a vertical hole to receive a pin 16, said pin being provided at its upper end with a head 17 having rearwardly extending ears 18 between which is pivoted a rod 19 formed integral with or attached to the lower end of the rack 8 at its upper end and extending downward a short distance beyond the point at which it is pivoted to said ears. A horizontal bore or recess is formed in the head 17 and in this recess and extending through the head into engagement with the downwardly projecting end 20 on the rod 19 is a pin 21 provided with a collar 22 engaging the inner end of the recess. A plug 23 provided with an axial opening for the end of the pin 21 is screwed into the outer end of the recess and sleeved upon the pin between this plug and said collar 22 is a coiled spring 24.

In the forward side of the head 14 is cut a notch to receive an adjusting-nut 25 on the screw-threaded shank of the pin 16, and extending upward on the head at each side of the lower end 20 of the rod 19 is a guide-lug 26. A small pin or other projection 27 on the pin 16 projects laterally therefrom between the guide-lugs to prevent the turning of said pin 16 in the head. By turning the adjusting-nut 25 the pin 16 may be adjusted relatively to the head and thus the connection lengthened or shortened and when so adjusted, the pin is held by a set-screw 28. The pin 21 is normally held in contact with the end 20 of the rod 19 by its spring which tends to turn the rod on its pivot and holds the rack 8 in engagement with its pinion. The tension of this spring may be adjusted by screwing the plug 23 in or out.

29 is the main lever of a suitable platform lever mechanism upon which the platform is supported and to the forked rear end of

this lever 29 is attached by suitable links a yoke 31. A draft-rod 32 is provided with a hook 33 at its upper end to engage the eye 15 and its lower end is screw-threaded to engage an axial screw-threaded opening in the yoke 31. The platform levers are thus adjustably connected to the springs 11.

Secured to the base 1 and extending upward between the forked ends of the lever 29 is a cylindrical dash-pot 34 adapted to contain oil or other suitable fluid and in which a suitable piston 35 fits. The dash-pot is provided with a cap 36 and through an axial opening in this cap extends a connecting rod 37 which is pivotally attached at 38 to the lower end of the draft-rod 32 and at its lower end the connecting rod is attached to the piston by means of a universal joint. This joint is formed by providing the piston with an axial bore extending half-way through the piston and providing a ball 39 on the lower end of the connecting rod which is secured within lower end of the bore by means of a cup 40 secured within the bore in any suitable manner. Circumferential grooves 41 are provided in the piston to prevent the liquid from passing upward around the piston and to permit the liquid to pass to the upper side of the piston upon its downward movement a small hole 42 is provided therein. By making the piston of such a size that the fluid is prevented from passing up around it and providing the hole for the passage of the fluid, binding of the piston in the cylinder caused by its tilting, is prevented. To deflect the liquid as it passes up through said hole and prevent its escape through the cap 36 around the connecting rod, said cap is provided with an inwardly projecting cone 43 through the axis of which the connecting rod extends, and to prevent all possibility of leakage in shipping, the cap 36 is provided in its upper side with a screw-threaded socket 44 to receive a screw-threaded plug 45 which is permanently secured upon the connecting rod near its upper end. This plug is located so far up on the stem that it does not interfere with the normal working of the scale by coming in contact with the dash-pot, but by forcing the end of the lever 29 downward abnormally or by disconnecting the connecting rod 32 from the eye 15, the plug may be engaged with the socket in the cap and screwed therein thus effectually sealing the dash-pot for shipment.

As shown in Fig. 4, the springs 11 are attached to the bar 12 by means of U-shaped bars 46, the bars being attached at one end to the bar 12 and provided at the other end with an externally screw-threaded plug to engage the end of the coil of the spring and secure the spring thereto. These U-shaped bars are formed of two flat strips of metal, the strip on the outer side of the U being of a

metal which is much more readily affected by temperature than the strip on the inner side of the U so that as the temperature increases and the springs 11 lengthen, the outer metal will be expanded more than the inner metal of the U-bar and cause the U to contract, pulling up on the coil-spring and taking up its expansion due to the heat. It is found advisable to provide an intermediate spring 47 as shown, this spring being attached in the usual way to the bar 12 at its upper end and at its lower end to the head 14 by a yoke 48, said yoke spanning the upper end of the pin 16.

A modified form of thermostat is shown in Fig. 5 and consists of a bar 49 bent into three U-shaped loops and upon the inner side of each of these loops is secured a U-bar 50 of a metal having a different expansive force. The ends of the bar 49 embrace the coil-springs 11 intermediate their ends and normally hold these springs pressed laterally out of vertical position. When the temperature increases and the springs lengthen, the loops of the thermostat are opened out by the greater expansion of the metal on the inner side of the loops and thus the coil-springs are further spread apart and the effect of their expansion counteracted. It is obvious that other arrangements of U-shaped thermostatic bars may be used and I therefore do not wish to limit myself to the particular arrangement shown. It is also obvious that the two metals forming the loops may be arranged with the metal having the greatest expansion upon either the inner or the outer side of the loop, as desired to cause the loop to either expand or contract with the rise of temperature.

Having thus fully described my invention what I claim is:—

1. In an automatic spring scale, the combination with a base, of a hollow pedestal extending upward from the base, platform levers supported upon the base with one end of one of said levers extending into the lower end of said pedestal, an indicating drum supported upon the upper end of said pedestal, a balance-spring supported at its upper end and extending downward within the hollow pedestal, means within the pedestal connecting the lower end of said spring with the end of said platform lever, means operated by said lever and extending upward within the pedestal to operate the drum, and a dash-pot within the lower end of the pedestal having a piston connected with the means connecting the spring and platform lever.

2. In an automatic spring scale, the combination with platform levers, a horizontal shaft, an indicating drum on said shaft, a pinion on said shaft, a rack to engage the pinion and turn the drum, a balance-spring secured at its upper end below the drum and extending downward therefrom, a head to

which the lower end of the spring is attached, a vertically adjustable pin carried by the head, a rod secured to the rack at its upper end and pivotally attached to said pin near its lower end and extending downward beyond its pivot, spring-actuated means carried by the pin to engage the downwardly projecting end of the rod and turn said rod on its pivot to hold the rack in engagement with its pinion, and means connecting the platform levers and said head.

3. In an automatic spring scale, the combination with platform levers, of an indicating drum, a pinion to turn the drum, a rack engaging the pinion, balance-springs, a head to which the springs are attached at one end and provided with an opening, a screw-threaded pin in said opening, an adjusting-nut engaging the pin to adjust the pin vertically, laterally extending ears on the upper end of the pin, a rod attached at its upper end to the rack and near its lower end pivoted between said ears, spring-actuated means carried by the pin and engaging the downwardly projecting end of the rod, means to prevent the turning of the pin and to permit its vertical adjustment, and a draft-rod connecting the platform levers and the head.

4. In an automatic spring scale, the combination with platform levers, of a horizontal shaft, an indicating drum on said shaft consisting of two parts, a pinion on the shaft between the parts of the drum, a rack engaging said pinion, balance-springs, a head to which the lower ends of the balance-springs are attached, said head being provided with a vertical hole and a notch in its forward side, an adjustable pin having a head and a screw-threaded shank extending through the hole, an adjusting-nut on the pin within the notch, ears on the head of the pin extending laterally therefrom, a rod secured to the rack and pivoted between said ears, a pin extending through a recess in the head of the adjustable pin into engagement with the downwardly projecting end of the rod, a spring on the pin within the recess, a screw-plug to close the outer end of the recess and adjust the spring, upwardly extending parallel lugs on the head, means on the adjustable pin engaging between the lugs, and a draft-rod connecting the platform levers to the head.

5. In an automatic spring scale, the combination with a base, of a hollow pedestal on the base, platform levers on the base, one of

which is provided with a forked end extending into the lower end of the pedestal, an indicating drum upon the upper end of the pedestal, a pinion intermediate the ends of the drum to turn the same, a rack engaging the pinion, balance-springs secured at their upper ends below the drum and extending downward within the hollow pedestal, a head to which the lower ends of the springs are attached, a rod attached to the head at its lower end and to the rack at its upper end, a yoke attached to the forked end of the platform lever, a draft-rod connecting the yoke and said head, a dash-pot within the pedestal between the forked ends of said platform lever, and a piston in the dash-pot connected with the lower end of the draft-rod.

6. In a spring scale, the combination with the weighing mechanism thereof, of a balance-spring and a thermostat consisting of a U-shaped member formed of two thicknesses of metal of different expansions, one end of said member being adapted to engage the spring and by its contraction or expansion to counteract the effect of the contraction or expansion of the spring caused by changes in temperature.

7. In a spring scale, the combination with the weighing mechanism thereof, of a balance-spring and a thermostat consisting of a U-shaped member formed of two thicknesses of metal of different expansions, one end of said member being fixed to a support and the opposite end of the member being attached to one end of the balance-spring and which spring is attached at its opposite end to the weighing mechanism.

8. In a spring scale, the combination with the weighing mechanism thereof, of a pair of balance-springs connected together and to the weighing mechanism at their lower ends, and a thermostat for each spring consisting of a U-shaped member formed of two thicknesses of metal of different expansions, one end of said members being attached to the upper ends of the springs and the other ends of said members being secured to a fixed support.

In testimony whereof I affix my signature in presence of two witnesses.

LOUIS JAENICHEN.

Witnesses:

VINA E. MERTZ,
LEWIS E. FLANDERS.